

SCOPE

International Product Brochure



Years of Experience

30⁺

Simple solutions for difficult measurements[®]

SCOPE

A pioneer in offering solutions for the power Sector



SCOPE began operations in 1988 with the intent of designing portable digital Test and Measuring instruments to ensure the optimum performance of major electrical equipment used in power generation, transmission & distribution. SCOPE mastered the art of making electronics work in switchyard environment of up to 1200kV very early and today we are one of the few companies in the world to be able to do so.

Over the past 30 plus years of operations, we have moved on from T&M solutions to developing components and systems that are capable of testing, commissioning, periodic maintenance and automation of power transmission and distribution systems. As is our philosophy, our products and systems applicable universally in all sub-stations regardless of the make of the capital equipment used while building them.... and they are simple to implement, operate and maintain. Now we are truly a complete power system management company... We offer Simple Solutions for Power System Management !

We at SCOPE are committed to offer products, services and unique solutions of the highest quality at right price through the process of close interactions with customer, incorporating latest & smart technological developments, continuous learning and improvement within the company. To ensure this we have an independent and well-equipped R&D, "State of the Art" factory, elaborate calibration setup, an interactive sales force and a dedicated field support team.

For quick response to customer requirements, we have strategically located set-ups across India. Our corporate office is headquartered in Mumbai, whereas our R&D and factory are located in Pune. Regional sales & service offices situated at Delhi, Chennai and Kolkata ensure that we are always close to our customers. We are reaching out to rest of the world through our partners in various countries. We are now a trusted brand for field-testing instruments & solutions in more than 45 countries across five continents.

Our approach of seeking synergistic solutions to our customer's needs has enriched the quality of our ultimate goal. Customer Satisfaction. In fact, we owe our growth to the confidence with which our customers approach us for solutions. This has led us to expand our horizons beyond Test & Measurement and offer a comprehensive range of products, software and solutions for Power Sector Management. We now manufacture Control & Relay Panels and offer Sub-station automation & smart grid solutions including RTUs and SCADA.

We present a brief introduction of our products and capabilities through this catalogue and hope that you will make challenging demands on us.

In a nutshell, we now offer Simple Solutions for Power System Management.

Business Verticals of SCOPE's Power System Management

Test and Measurement Instruments Division – T&M

Design, Development, Manufacturing & Marketing of T&M Instruments for Power Sector equipment of up to 1200kV.

- Test & Measurement Instruments for HV / EHV / UHV Sub-station Equipment
- On-line Monitoring Systems for EHV / UHV Sub-station Equipment and Transmission lines
- Supply of complete package of T&M Instruments, Tools & Tackles and Safety Equipment to projects through dedicated Project Business Group (PBG)
- Calibration and Annual Maintenance Contract Services
- Customised Industrial Aluminium Cases and Molded Cases
- Professional Training Services to Electrical Utilities

Protection and Automation Division

Engineering, Manufacturing & Supply of indigenous Protection & Sub-station Automation Solutions for up to 765kV.

- Control & Relay Panels
- Relays and BCUs
- Sub-station Automation Solutions, RTUs, AMUs, PMUs & Ethernet Switches
- SCADA, EMS, DMS
- Power System Studies
- Relay co-ordination & Configuration
- Controlled Switching Device for point-on-wave operation of Circuit Breakers

Power System Services Division - ISOSCELES

Testing & Commissioning and Operation & Maintenance services for substations up to 765kV.

- Routine & Specialised Testing Services for existing Sub-stations
- Complete Testing & Commissioning of new Sub-stations up to 765kV including Sub-station Automation
- Operation & Maintenance Contracts for electrical utilities of up to 765kV
- Specialised Commissioning Services for RTU based Automation and Controlled Switching Devices
- Contracts for comprehensive RLA / RLE Studies
- Professional Training Services to Electrical Utilities



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SCOPE T&M

Test and Measuring Instruments Division

SCOPE T&M division focuses on the manufacture and supply of portable test and measuring instruments to the power Sector. This division was first division of company & was started on 13th January, 1988 after eight months of pre-operative product development period to become India's first test and measuring instruments manufacturer which had made electronics work in extremely high electromagnetic induction prevailing in live EHV & UHV Sub-stations.

We have an independent R&D lab, where a team of highly qualified & experienced engineers are engaged in doing fundamental development in the field of test & measurement, acquiring knowledge and expertise on latest technology & trend on global basis and adapt them quickly to suite Indian environment and customer needs. We have capability to convert a concept into a product. The in-house hardware and software development capability gives us total control over the product being sold.

SCOPE had done pioneering work in field of CB testing and had developed some unique products in close association with Indian utilities and CB manufacturers. SCOPE is the only Indian and one of very few of global manufacturers for some of the cutting edge technology products like DCRM for CBs and LCM for LAs. Similarly SCOPE is probably only company who had supplied on-line monitoring systems for CBs & LAs of 1200kV. Many of our products had won the best product awards on global platforms like ELECRAMA.

In order to expand the products & services to customers from power Sector & industry, SCOPE has forged partnership with companies from Russia, Brazil, Canada, China, Germany.

Under SCOPE T&M, following groups & activities are performed:

- **Manufactured Products Group:** Design, development, manufacturing, marketing & maintenance of various Test & Measuring instruments for HV/EHV Sub-station equipment.
- **Agency Business Group:** Marketing & maintenance of various test & measuring instruments for HV/EHV Sub-station equipment & transmission lines. These are manufactured by our global partners.
- **Project Business Group:** Supply of complete package of T&M, tools & tackles, safety equipment, lab instruments package etc. to Ecomputer contractors for various projects.
- **Cases Group:** Manufacturing & marketing of customized industrial aluminum cases as well as marketing of moulded cases.
- **Customer Support Group:** Dedicated to provide after sales support like repairs, calibration, up-gradation, annual maintenance contracts & training for products supplied by SCOPE.



SCOPE Protect

Protection and Automation Division

To meet the growing demand for protection systems in energy sector, SCOPE has ventured into the protection & automation and is offering various solutions & services for Power System Management. Over three decades of experience and domain knowledge in the power sector has led SCOPE to attain expertise in Power System Management as well. Since the inception of this division, SCOPE has expanded its solutions portfolio by adding products & solutions including numerical relays, RTU, SCADA, IoT based Solutions and is now offering end to end solutions Power System management.

SCOPE has in-house engineering team, a modern manufacturing & testing set-up and large pool of field testing & commissioning engineers. A short span of time we have executed several contracts namely centralized bus-bar protection, transformer protection & feeder protection up to 765kV. SCOPE Protect has also executed contracts for 400kV complete control and relay panels with sub-station automation systems in India. Additionally, we offer customized system solutions according to actual on-site conditions in order to satisfy customers' requirements.

We offer the following solutions and services under the umbrella of SCOPE Protect:

- **Control & Relay Panel Assembly and System Integration Jobs:** With over 6,000 square feet factory setup at Pune, we can handle multiple projects at a time with an expertise in assembling the panels, checking the schemes, quality inspection, factory testing and finally offering the factory inspections for total integrated systems.
- **Automation Solutions:** We provide RTU based automation solutions in collaboration with Vizimax from Canada. This is extremely useful and cost effective solution for the conventional sub-stations to convert it to fully automated sub-station, making it compatible to smart grid.
- **SCADA Solutions:** SCOPE Action.NET SCADA, compliant with IEC-61850, Certified by KEMA is a powerful platform/framework to provide a rich, unique and intuitive user interface, dynamic graphics complemented by a graphic editor and real-time data acquisition capabilities from an extensive library of industry protocols including IEC 60870-101/104, MODBUS, DNP 3.0, OPC UA/DA etc. SCOPE Action.NET comprehensive feature set also includes easy information exchange and data access with databases such as Microsoft SQL Server, OSIsoft(TM) PI Systems, Oracle, Sybase, Informix, MySQL and others.
- **Controlled Switching Device:** Our experience in understanding the circuit breaker has helped us a lot to bring this solution of point-on-wave control for closing or opening of CB in collaboration with Vizimax, Canada. Depending on the application, the CB is closed or opened on voltage zero or current zero thereby not only saving the abuse of CB, but most importantly the equipment protected by that CB. It has proven its efficacy and we had installed it on various types & makes of CB for various applications.
- **Consultancy and Engineering Services:** Our experienced engineering team can understand the customer's requirements and customise the systems according to their changing requirement. We will give consultancy services for designing better and efficient protection & automation systems by incorporating better technological advancements. We also provide consultancy for power system studies by providing the load flow studies or analysis.



ISOSCELES

Power Sector Services Division

To augment the total solutions approach, we provide services to the power industry through our group company ISOSCELES Sales & Service Pvt.Ltd. ISOSCELES was started in 2006 and over the last 13 years, it has earned an excellent reputation for itself by responding quickly to critical testing requirements of power utilities, EPC, OEMs and industrial customers spread all over India & Abroad. It created the culture of completing the projects ahead of deadlines, which was unseen earlier in this sector which was plagued by “per day” method of quoting. We have recently expanded our services to countries outside India as well.

Our large pool of well-trained engineers conduct a wide range of activities efficiently and deliver reports that can be acted upon to increase the life and performance of assets used in power generation, transmission and distribution. Being a SCOPE group company it has inherited the ability of correct interpretation of results of various diagnostic tests.

ISOSCELES offers professional and time bound services that have resulted in significant direct and indirect savings in terms of equipment replacement and power outage costs. We have served the requirements of a large number of EPC contractors by completing testing & commissioning activities for new Sub-stations and obtaining Take Over Certificates (TOC) in a timely manner.

Services Offered

- Testing and Commissioning of new Sub-stations of up to 765kV
- Operations & Maintenance Contracts of sub-stations up to 765kV
- Routine & Specialised testing services for existing Sub-stations
- Earth quality analysis & Infra-red thermo-vision scanning
- Retrofitting of relays & relay panels and automation of Sub-stations
- Specialised commissioning services for RTU based automation, SCADA integration & Controlled Switching Devices
- Annual Testing Contracts (ATCs), Comprehensive RLA / RLE studies
- Comprehensive Maintenance Management and Database Management of test results for Sub-stations through web based SCHELOG software.
- Training to users on equipment testing & maintenance and power system protection



HISAC Ultima



Circuit Breaker Dynamic Test System

HISAC Ultima – Circuit Breaker Dynamic Test System from SCOPE . The ultimate solution for testing Circuit Breakers of all types. HISAC Ultima is the complete analyser for checking the dynamic performance of circuit breakers in live EHV switchyards upto 765kV.

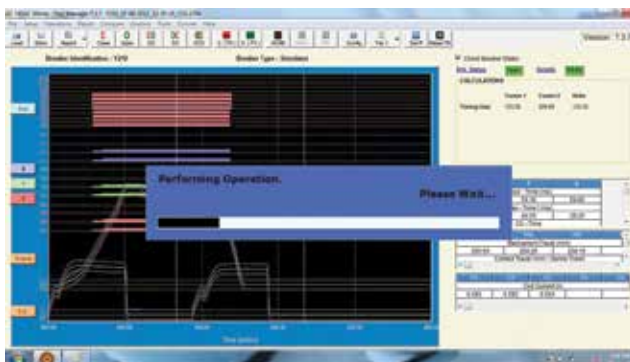
HISAC Ultima can carry out Dynamic Contact Resistance Measurement on SIX breaks of THREE poles in one operation thereby significantly reducing stress on circuit breaker & testing downtime.

It offers flexibility to create pre-programmed Test Plans including all test settings for all types of circuit breakers available in a switchyard that can simply be recalled at the time of actual testing. This saves you from doing all settings in switchyards.

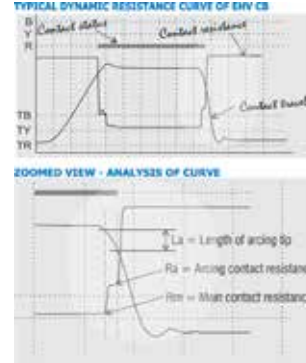
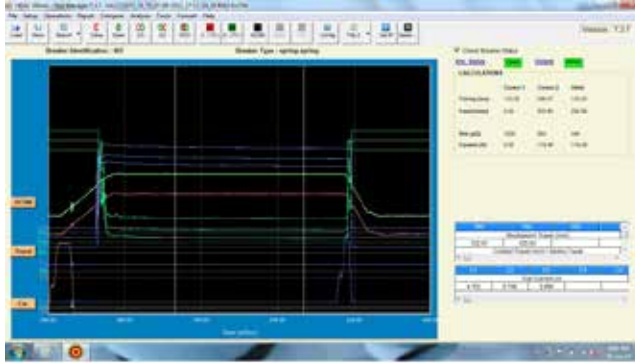
The analysis software offers a range of utilities which enables effective Condition Monitoring of circuit breaker by comparing present test data with previous test data and predicting future performance.

Features

- Tests all types of circuit breakers - LV, HV, EHV & UHV for all critical performance parameters of all the poles / breaks in a single shot
- Measures Main & PIR contact timings, bounce, non simultaneity of contacts and auxiliary contact timings
- Analyses contact travel characteristics for speed, insertion, contact gap, over-travel and rebound with suitable transducer and mounting fixture
- Records trip and close coil current characteristics
- Registers the signature of Dynamic Contact Resistance of main and arcing contacts, of all the 6 breaks simultaneously
- Displays test settings, graphical and tabulated test results
- Prints test report in graphical format with test header and calculation footer, on external optional printer
- Incorporates powerful Windows based Test Manager Software to control & operate instrument; view, analyse and handle graphical test data on a laptop at high resolution
- Selects pre-programmed setup parameters and pass/fail limits through software
- Connects to circuit breaker with wear resistant test leads of adequate length, having quick-fit connectors, suitable for EHV circuit breakers
- Moves easily within switchyard as the set can be mounted on a specially designed Trolley having large wheels & mains supply distribution board
- Travel – For evaluating travel characteristics of operating mechanisms, SCOPE offers rotary and linear resistive travel transducers with universal / specially designed fixtures to suit a variety of CBs



- DCRM module captures dynamic variation in contact resistance of main & arcing contacts during breaker operation
- Each DCRM module has in built independent isolated, rechargeable battery based 100A DC source The result is plotted in graphical form on the software screen, which can be further analysed for finding parameters such as contact gap, total insertion, arcing tip insertion, main and arcing contact resistance values etc.
- Additional optional modules are available to measure PIR value and for monitoring Station DC (Coil voltage), Motor current or other static parameters through configurable Analog channels
- Type Tested as per IEC 60068-2, IEC 61326-1 & IEC 61010-1. CE marked



Specifications

Parameters	HISAC Ultima
Trigger Options	C, O, C-O, O-C, O-C-O
Contact Timing Channel	24 : 4 Main + 4 PIR per pole, 3 pole simultaneously
Auxiliary Contact Timing Channel	8 : 4 Dry + 4 Wet Expandable up to 6 Dry + 6 Wet
Best Time Resolution	50µS
Coil Current Channel	3/6 : Trip / Close coil current
Travel Channel	3/6 : Travel characteristic
Analog Channel for DCRM Input (Optional)	1 / 2 / 3 / 6 - as per DCRM modules selected
DCRM Resistance Range & Current (Optional)	1000 / 2000 / 4000 / 8000 µΩ Selectable, Current 100A DC
Static Contact Resistance (CRM) Channel	As per DCRM modules selected
CRM Resistance Range	1000 / 2000 / 4000 / 8000 µΩ Selectable
Configurable Analog Channel (Optional)	Up to 6 : For inputs of station battery voltage, PIR value, motor current.
PIR value Measurement (Optional)	0 - 5000Ω with the resolution of 1Ω
Sampling Speed	1 / 2 / 5 / 10 / 20 kC Selectable
Display	Display of laptop
Operation	Interactive menu through laptop
Communication Port	Ethernet
Printer	External through laptop (Optional)
Memory	Memory of laptop
Dimensions	HISAC Ultima - 500 x 270 x 300 mm, DCRM Rack - 500 x 270 x 250 mm
Instrument Weight	HISAC Ultima - 12 kg Ultima DCRM Rack - 18 Kg (3 DCRM modules per Rack)
Input Power	110 V/230V AC ± 15%, 50/60 Hz ± 10%



HISAC Swift

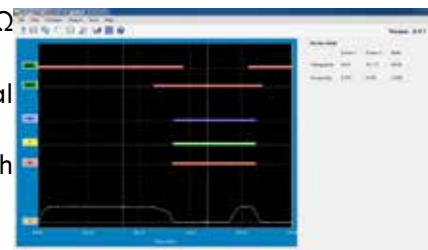
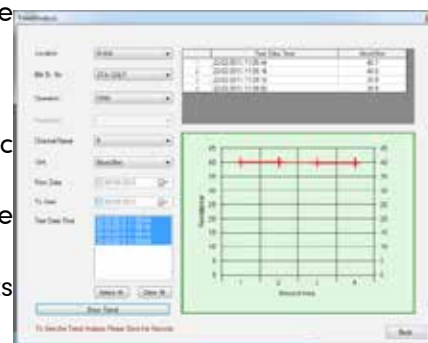
Circuit Breaker Operational Analyser

SCOPE offers HISAC Swift - Circuit Breaker Operational Analyser for checking the performance of the circuit breakers. The Analyser contains various intelligent measuring modules designed for measuring parameters such as contact timings of Main, PIR & Auxiliary Contacts, Close & Trip Coil Current characteristics and Static Contact Resistance of three poles simultaneously. The results can be directly viewed on the TFT touch screen display in graphical as well as numerical form. It is possible to print the graph on built-in thermal printer or download record to computer for further analysis on CPlot software. All these facilities in one instrument make it best suited for gang operated CBs.



Features

- Operations: C, O, C-O, O-C, O-C-O with configurable delays and Static Contact Resistance
- When Setup menu is invoked through the touch-screen keyboard, it is possible to access saved system settings and data of Breaker under test
- Contact Timing: Channels for 3 Main, 3 PIR & 2 Auxiliary (Wet / Dry) Contacts with 0.05mS resolution
- Coil Current: One internal channel to measure Close and Trip coil current
- Three multiplexed channels to measure Static Contact Resistance up to 2Ω with resolution of 0.1μΩ
- TFT color graphical display with touch screen displays test settings, numerical & graphical test results with full resolution
- Printout through inbuilt, 58mm thermal printer for printing test header, graph and calculations
- Provided with in-built memory to store up to 100 records
- Windows™ based CPlot software to download the record to computer through USB connectivity for further analysis & storage
- Type Tested as per IEC 60068-2, IEC 61326-1 & IEC 61010-1. CE marked



Specifications

Channels	Configuration	Range	Resolution	Accuracy
Contact Timing Channels	6 : 1 Main + 1 PIR per pole, 3 poles Simultaneously	Measurement duration 1mS to 4S @ 1kC, 0.05mS to 200mS @ 20kC	1mS @ 1kC 0.05mS @ 20kC	Value ± 0.05% ± resolution
Auxiliary Contact Timing Channels	2 : Dry / Wet Selectable	15 to 300V DC (for Wet Channels)	1mS @ 1kC 0.05mS @ 20kC	Value ± 0.05% ± resolution
Coil Current Channel	1 : Trip / Close coil current	1, 2, 5, 10, 25, 50 A DC	0.1% of selected range	Value ± 1% ± resolution
Contact Res. Channels	3 : Multiplexed 3 Channels. 10 A Max.	200μΩ, 2000μΩ, 20mΩ, 200mΩ & 2Ω - Auto ranging	0.1μΩ @ 200μΩ	Value ± 2% ± 5 x resolution

- Breaker Control : Two solid state contacts rated at 50A, 300V AC/DC for breaker operation
- Sampling Speed : 20kC, 10kC, 5kC, 2kC & 1kC, selectable
- Plot Length : 200mS at 20kC, 400mS at 10kC, 800mS at 5kC, 2000mS at 2kC and 4000mS at 1kC
- Display : 320 x 240 pixel, 5.7" colour TFT LCD with touch screen
- Printer : 58 mm paper width, in-built thermal printer
- Environment : 0 to 50°C, 95% RH (non condensing)
- Power : 94 - 264 V AC, 50/60 Hz ± 10%, 110 VA

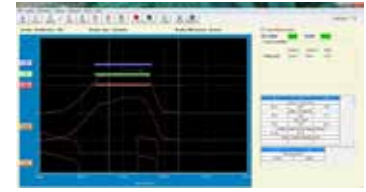
CBSCOPE

Loco Circuit Breaker Test System

The ultimate solution for testing Loco Circuit Breakers of all types & makes. CBSCOPE checking the dynamic performance of Single bottle, Double bottle & Loco VCBs.

Features

- CBSCOPE Measures timings, bounce and simultaneity of contacts
- Analyses contact travel characteristics for speed, contact gap, over-travel and rebound
- Records trip / holding and close coil current characteristics
- Displays settings, graphical and tabulated test results, also prints test report on external printer (optional)
- Incorporates powerful Windows based Test Manager Software to control / operate instrument and also to view and analyse the test data on optional laptop / computer
- Specially designed test commands for all Loco VCB testing in-built
- Analysis of test result provides inputs to assess and correct
 - Settings for contact timings
 - Closing and Opening speed, over-travel, rebound and contact gap
 - Trip / Close release mechanism setting



Specifications

Channels	Configuration	Range	Resolution	Accuracy
Contact Timing Channels	3 : 2 for double bottle VCB, 1 spare	Measurement duration 1mS to 40S @ 1kC, 0.05mS to 2S @ 20kC	1mS at 1kC 0.05mS at 20kC	Value ± 0.05% ± 1 digit
Coil Current Channels	2 : Trip / Holding & Close Coil current	1, 2, 5, 10, 25 A DC	0.1% of range at 1A, 0.004% of range at 25A	Value ± 0.5% ± 1 digit
Travel Channels	2 : Travel Characteristics	0 - 5V DC	1.2mV at 25A	Value ± 0.5% ± 1 digit

- Breaker Control : Two solid state contacts rated at 35A, 300V AC/DC for breaker operation (Close & Trip)
- Trigger Options : Loco breaker C, O and for other breakers C, O, C-O, O-C, O-C-O with configurable delay
- Sampling Speed : 20kC, 10kC, 5kC, 2kC & 1kC selectable
- Travel Channels : For linear / rotary resistive transducers, 0-5V DC excitation source in-built
- Communication Port : Ethernet port for communication between laptop and instrument
- Power : 110 V/230V AC ± 15%, 50/60 Hz ± 10%, supplied with suitable Test Leads & Aluminium Transport Case

SCOT UT series

Universal Time Interval Meter

Truly Universal Time Interval meter for a variety of time interval measurement requirements such as Response time of Relays, Contactors, MCBs, MCCBs, other electro-mechanical switching devices, fusing time of Fuse elements etc.

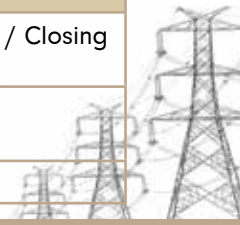
Features

- 16 operation modes enable measurement of variety of time intervals, measures from mS to hours
- Designed to work reliably on industrial shop-floors and in laboratories
- Unique feature of identifying errors in set up of test configuration
- Tamper-proof test results through time stamping on the test data
- Optional computer connectivity and downloading software



Specifications

Parameter	SCOT MUT	SCOT MUT4
Trigger Options	16 Operation Modes with selectable START / STOP Combination of Contact Opening / Closing & Voltage Application / Removal (AC/DC)	
Range, Resolution & Accuracy	1mS to 1999S, 1mS & Value ± 0.05% ± 1 digit	0.1mS to 9999S, 0.1mS & Value ± 0.05% ± 1 digit
Display & Memory	4 line 20 character backlit LCD, 50 results	



SCOT+ Series

Circuit Breaker Time Interval Meter

SCOPE offers its modern generation of iconic SCOT Series Circuit Breaker Time Interval Meters in all new super-light avatars, based on cutting edge micro controllers & powered by embedded technology.

User can choose from two models, SCOT M3K+ and SCOT MXP+ depending on type of circuit breaker and testing to be done.

Features

- A radically new design makes SCOT the lightest available CB Time Interval Meter
- High sampling frequency of up to 10kC offers high timing resolution of 0.1mS
- In-built rechargeable Li-ion battery operated with battery monitor and cut off circuit to protect the battery against deep discharge
- In-built real time clock, memory and printer* with Test Date / Time stamping on each record enables time references for future use
- Computer Downloading & Analysis including 'Trend Analysis' through "CData SCOT+" Software
- Instrument debug options like contact status check, command check, memory check, printer check*, computer downloading check
- Simple operation - Tests can be conducted even by the technicians
- Supplied with rugged test lead set, suitable for testing EHV CBs
- Enclosed in ultra rugged IP67 class molded case
- The instrument is supplied with "CData SCOT+" software CD, Calibration Certificate, and Test leads suitable for testing of EHV class circuit breakers
- Type Tested as per IEC 60068-2, IEC 61326-1 & IEC 61010-1, CE marked

Specifications

Parameters	SCOT M3K+	SCOT MXP+
Contact Timing Channels	3 (3 Main contacts, end to end, 3 poles Simultaneously)	12 (Up to 2 Main + 2 PIR contacts per pole, 3 poles simultaneously, i.e. 6 Main + 6 PIR contacts simultaneously)
Sampling Speed	10kC, 5kC, 2kC, 1kC & 100C, Selectable	
Timing Range	1S, 2S, 5S, 10S & 100S respectively for respective Sampling Speeds	
Resolution	0.1mS, 0.2mS, 0.5mS, 1mS & 10mS respectively for respective Timing Range	
Accuracy	Value \pm 0.05% \pm 1 digit	
Breaker Control	Two solid state contacts rated at 35A, 300V AC/DC for breaker operation	
Trigger Options	Close, Open, Close-Open	
Display	4 Line X 20 character backlit LCD	
Printer	In-built, 58 mm thermal printer (Available only in SCOPT MXP+)	
Keypad	5 keys	
Memory	In-built, 100 DUT IDs, 100 records each	
Inbuilt Battery	Rechargeable Li-Ion, 11.1V, 4Ah	
Battery Charger	Input Supply: 90 to 275 V AC, 50/60 Hz \pm 10%; Output Voltage: 13.5V DC, 1000mA	
Communication Port	USB	
Software	Windows based "CData SCOT+"	
Environment	0°C to 50°C, Upto 95% RH (Non condensing)	
Dimensions	300 x 250 x 200 mm	
Instrument Weight	5 kg	

Note: * -Feature available only in SCOT MXP+



SCOT MXP+	
SCOPE T&M Pvt. Ltd. PUNE, INDIA-411 026	

LOCATION :	Pune
BRK. TYPE :	SFM
BRK. ID. :	Bay 3
SR. No. :	1234
MAKE :	CGL
SAMP. SPD. :	10 kC
PIR :	DISABLE
DATE :	04/01/14
TIME :	16:26:19

OPERATION:OPEN	
R-PH(mS)	
M1=	22.8 M2= 22.9
Y-PH(mS)	
M1=	24.4 M2= 24.4
B-PH(mS)	
M1=	22.8 M2= 22.9

SA Series

Leakage Current Analyser for Surge/Lightning Arrester

Leakage Current Analysers (SA 30i+, SA 30i) and Leakage Current Meter (SA10i) from SCOPE are ingenious on-line test systems for Residual Life Assessment of Metal Oxide (ZnO) Surge Arresters.

The instruments measure and directly display the values of resistive and total leakage current and are capable of working accurately and safely in switch-yards of up to 1200kV.

SA 30i and SA 30i+ measures Third Harmonic Resistive Leakage Current (THRC) with system harmonic compensation in accordance with IEC 60099-5 B2 (best recommended).

SA10i, a hand held Leakage Current Meter measures THRC without system harmonic compensation in accordance with IEC 60099-5 B1.

Features

- Simple, light weight, portable, feature-rich, affordable.
- Measures Third Harmonic Resistive Leakage Current (THRC) with system harmonic compensation*, and Total Leakage Current.
- SA30i+ has Wireless CT and Wireless Field Probe to ensure isolated and completely ungrounded measurement for human and instrument safety.
- In-built temperature measurement facility to calculate temperature compensated leakage current values.
- Results are displays on LCD, Printed on in-built thermal printer*, and can be stored in the in-built memory of instrument.
- In-built standard calibration source for self-calibration check facility.
- USB communication port to transfer data to computer SA identity creation, Data Management, Analysis and Trend Analysis through supplied SADATA software.
- Facility for testing of GIS LAs available optionally through Field PT input (IEC 60099-5 A1)
- The instrument is supplied along with low noise Clamp-on CT , Field Probe assembly for system harmonic compensation*, Test Leads suitable for EHV class LAs*, Thermal printer & paper roll*, SADATA software installation CD.
- Type tested as per IEC 60068-2, IEC 61326-1, IEC 61010-1, CE marked.

Note: * -Feature available in SA 30i and SA 30i+

Specifications

Parameters	SA 30i+	SA 30i	SA 10i
Total Leakage Current Range	Up to 20mA	Up to 10mA	
Resistive Leakage Current Range	Up to 20mA	Up to 10mA	
Resolution	1µA in all ranges		
Inputs	External Wireless Clamp-on CT, External Wireless Field Probe and Optional External PT (110V AC)	External Clamp-on CT, External Field Probe and Optional External PT (110V AC)	External Clamp-on CT
Compensation	Automatic for Noise, System Voltage, System Harmonic & Temperature		Automatic for Noise, System Voltage & Temperature
Temperature Sensor	In-built, PT100		
Self-Calibration Check	In-built source available		Not available
Memory	2000 results	1000 results	
Printer	In-built Thermal Printer		Not available
Battery	Internal, Rechargeable 11V / 2200 mAh, Li-ion Battery	Internal, Rechargeable 11V / 6000 mAh, Li-ion Battery	Internal, Rechargeable 7.4V / 1150 mAh, Li-ion Battery
Dimensions	340 X 295 X 155 mm	415 X 330 X 200 mm	190 X 129 X 50mm
Instrument Weight	6.5 kg	7.5 kg	1.5 kg



CRM Series

Contact Resistance Meter

SCOPE offers its hugely popular CRM series Contact Resistance Meters, CRM 100B/100B+, CRM 200B/200B+ and CRM 100C in all new super-light avatars. The Plus (+) series is based on cutting-edge ultra capacitor technology.

CRM directly measures micro-ohm values at 100A / 200A DC under live EHV / UHV switchyard conditions quickly & accurately.



CRM100B

Common features of CRM 100B / 100B+ / 200B / 200B+ / 100C

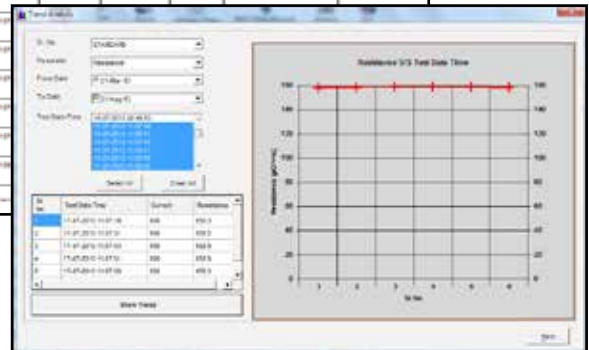
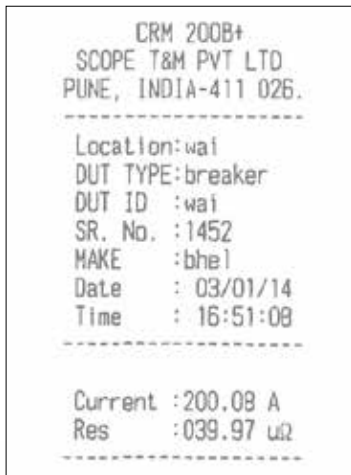
- Lightweight meters that directly measures & displays resistance in $\mu\Omega$
- Works reliably in live EHV / UHV switchyards up to 765kV
- Typically used for measurement of contact resistance of Circuit Breaker Contacts, Isolators, Bus Bar Joints, Earth Switch Joints, Cable Joints etc.
- 100A / 200A DC injection
- Uses Kelvin's 4 wire measurement principle
- Direct readout of test current and micro-ohms on display
- Easy to connect and use
- Battery operated (Except CRM 100C)
- Simple operation - Extremely easy to setup and use
- Type Tested as per IEC 60068-2, IEC 61326-1, IEC 61010-1, CE marked
- The instrument is supplied with CData CRM+ software CD and calibrated test leads suitable for testing of EHV / UHV class circuit breakers



CRM200B+

Features available only in CRM 100B+ and CRM 200B+

- In-built real time clock, memory and printer with time-stamp on each record
- Auto ranging
- Analysis including 'Trend Analysis' with supplied "CData CRM+" Software
- Software generated report can be exported to PDF or MS Excel
- Housed in ultra rugged IP67 class molded case



Features available only in CRM100C

- Powerful continuous 100A DC source
- Selectable lower current ranges to test objects having higher resistance / lower current rating
- Internal memory (Optional) Computer connectivity and CData CRM software (Optional)



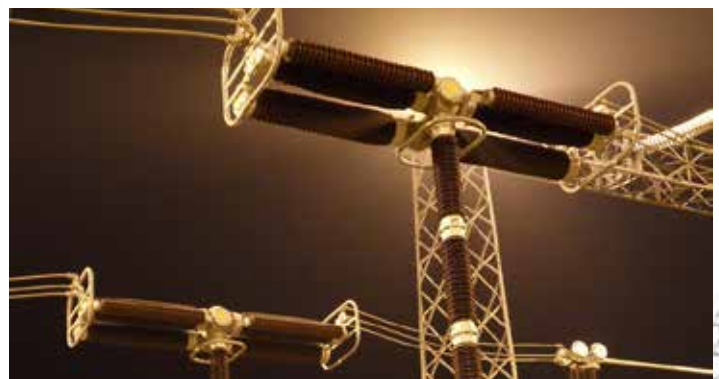
CRM100C

Specifications

Parameters	CRM100B	CRM200B	CRM100B+	CRM200B+
Test Current (DC)	100A	200A	100A	200A
Resistance Range	0 -199.9 $\mu\Omega$ & 1999 $\mu\Omega$	0 - 199.9 $\mu\Omega$, 1999 $\mu\Omega$ & 19.99m Ω	0-199.9 $\mu\Omega$, 1999 $\mu\Omega$, 19.99m Ω ; Auto ranging	0-199.99 $\mu\Omega$, 1999.9 $\mu\Omega$, 19.999m Ω ; Auto ranging
Resolution	0.1 $\mu\Omega$ & 1 $\mu\Omega$ on Resp. Ranges	0.1 $\mu\Omega$, 1 $\mu\Omega$ & 10 $\mu\Omega$ on Resp. Ranges	0.1 $\mu\Omega$, 1 $\mu\Omega$ & 10 $\mu\Omega$ on Resp. Ranges	0.01 $\mu\Omega$, 0.1 $\mu\Omega$ & 1 $\mu\Omega$ on Resp. Ranges
Accuracy	Value \pm 2% \pm 1 digit	Value \pm 1% \pm 1 digit	Value \pm 2% \pm 1 digit	Value \pm 1% \pm 1 digit
Display	Two, 3½ digit, ½ inch LCD		4 Line X 20 character backlit LCD, 3½ digit	4 Line X 20 character backlit LCD, 4½ digit
Operation	Stand-alone		Stand-alone & Computer Control	
Inbuilt Battery	6V, 4Ah, 2nos.		11.1V, 6Ah	
Memory	Not available		100 DUT IDs, 1000 records each	
Printer	Not available		In-built, Thermal Printer	
Battery Charger	110 V/230V AC \pm 15%, 50/60 Hz \pm 10%		90 to 275V AC, 50/60Hz \pm 10%	
Environment	0°C to 50°C, Upto 95% RH (Non condensing)			
Instrument Weight	9 kg	10 kg	4 kg	5 kg

Continuous Current Contact Resistance Meter – CRM100C

Parameters	CRM100C
Test Current (DC)	100A, 50A, 20A, 10A - Selectable
Resistance Range	199.9 $\mu\Omega$, 1999 $\mu\Omega$, 19.99m Ω , 199.9m Ω , 1999m Ω - Selectable
Resolution	0.1 $\mu\Omega$, 1 $\mu\Omega$, 10 $\mu\Omega$, 0.1m Ω & 1m Ω on Resp. Ranges
Accuracy	Value \pm 0.5% \pm 5 digits
Display	4 line 20 character backlit LCD display
Instrument Weight	11kg
Power	110 V/230V AC \pm 15%, 50/60 Hz \pm 10%
Environment	0 to 50°C, Upto 95%RH (Non condensing)



TRM Series

Winding Resistance Meter

TRM Series Winding Resistance Meters are designed for field testing as well as for factory testing of large rotating machines & transformers up to 1000MVA, 765kV class under live switchyard conditions. DC Winding Resistance values of highly inductive objects like transformers, generators, motor etc. are directly displayed. A backlit LCD with a user-friendly menu sets up the instrument for the test. These meters are protected against the back-emf offered by large inductive windings.



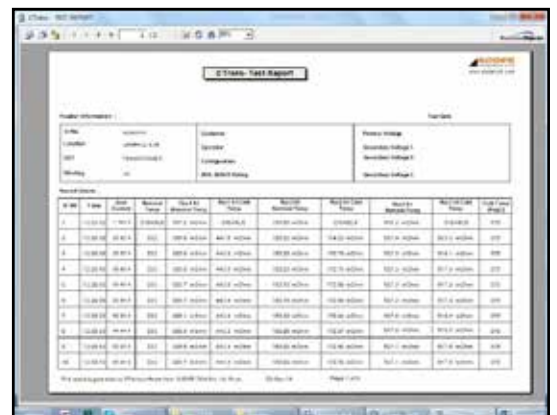
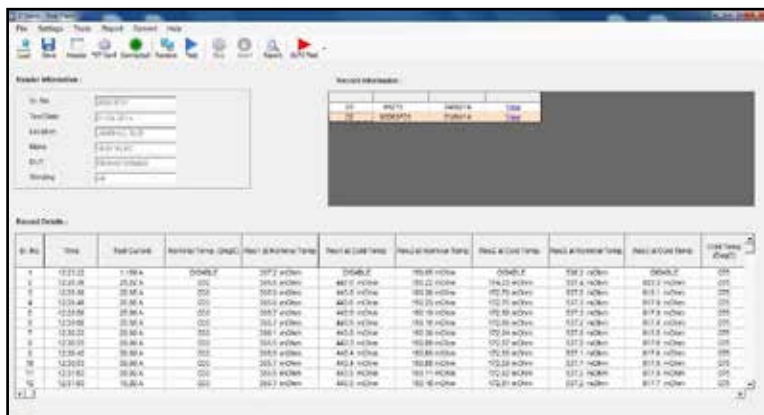
TRM 50+

Features of TRM 25 / TRM 25+ / TRM 50 / TRM 50+

- 50V DC open circuit voltage for quick stabilization of current
- Injects up to 25/50 A current and measures resistance up to 2000Ω
- Has 3/6* Resistance channels, 3/6* Test Current channels and one Temperature input channel
- Temperature measurement channel and automatic temperature correction of winding resistance for copper & aluminium windings
- One-time connection and simultaneous measurement on three phases of primary or / and* secondary windings
- It is not necessary to compensate lead resistance, as Kelvin's four wire measurement method is used
- OLTC operation and automatic measurement of resistance at all tap positions with indication of OLTC discontinuity, if any
- Automatic and fast back-emf discharge with indication
- Demagnetization facility available
- 5.7" colour TFT display with touch screen and interactive menu offers easy user interface
- Inbuilt memory and thermal printer available. Displays, prints and stores test reports in the form of text header and tabulated test results
- Can be operated in stand-alone mode or by control through external computer
- Powerful Windows based software, CTrans TRM offers to setup, operate, capture, view and analyse test data. Test Report can also be generated
- Housed in rugged IP 67 class molded carrying case for enhanced transport - worthiness
- The instrument is supplied with Test Lead Set suitable for testing EHV transformers & RTD temperature sensor
- Type Tested as per IEC 60068, IEC 61326, IEC 61010 & IEC 61000, CE marked
- OLTC dynamic test facility with current v/s time graph. (Optional)



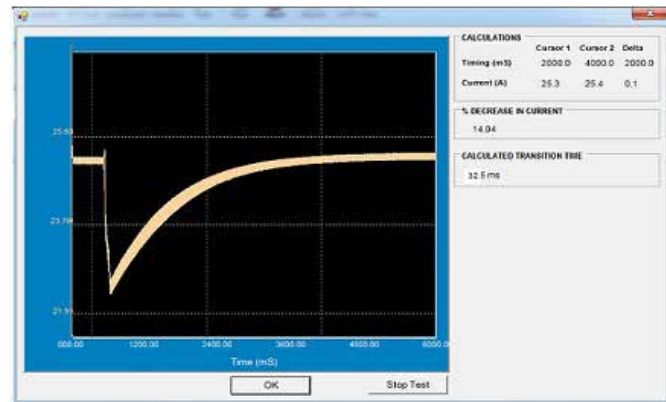
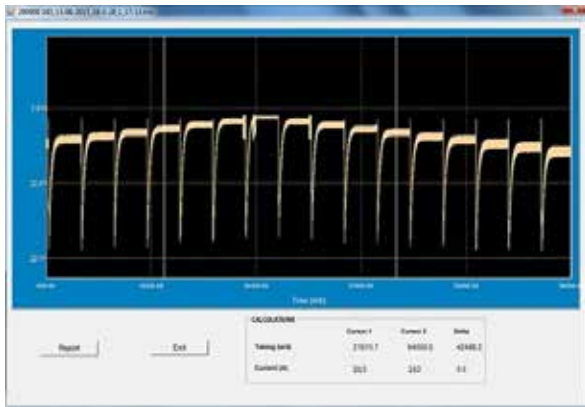
TRM 104



OLTC Dynamic Testing Feature

Tap changer failures account for a significant number of failures on power transformers. OLTC failures are caused by degradation of OLTC contacts. SCOPE offers dynamic OLTC test facility with TRM to identify weaknesses in the OLTC assembly. The test is conducted in computer control mode at higher sampling speed of 10KHz

- This test records variation in current flowing through the OLTC during tap change, against time
- Gives % drop in current and transition time
- The drop in current during OLTC transition indicates change in transition resistance
- It is also possible to calculate transition time which shows health of mechanism
- This optional feature extends the capability of the basic instrument making it ideal test equipment for testing of transformers.



Specifications

Parameters	TRM 14	TRM 104	TRM 25 / TRM 25+	TRM 50 / 50+
Resistance Channels	2	2	3 / 6	3 / 6
Temperature Channel	Not Available		1	
Selectable Current Ranges	1A, 0.1A, 0.01A	10A, 1A, 0.1A, 0.01A	25A, 10A, 5A, 1A, 0.1A, 0.01A	50A, 40A, 25A, 10A, 5A, 1A, 0.1A, 0.01A
Resistance Range	Up to 2000Ω		Up to 2000Ω Auto ranging	
Best Resolution	1μΩ	0.1μΩ		
Accuracy	Value ± 0.5% ± 2 digits			
Open Circuit Voltage	30V DC		50V DC	
Protection	Back-EMF, Over temperature, Accidental disconnection of leads			
Back-emf Discharge	Automatic			
Demagnetization	Not Available		Yes	
OLTC Discontinuity Indication	Yes			
Temperature Correction	Not Available		Yes (For Aluminium & Copper)	
Display	4 line 20 character backlit LCD		5.7", 320 x 240 pixels TFT touch screen display	
Memory	Not Available		100 DUT IDs with 5000 results each	
Inbuilt Printer	Not Available		Thermal printer	
Communication Port	Not Available		Ethernet	
Dimensions (mm)	475 x 405 x 175	475 x 405 x 230	630 x 500 x 305	630 x 500 x 305
Instrument Weight	10 kg	15 kg	26 kg	28 kg
OLTC Dynamic Test Facility (Optional)	Not Available		1 or 3 channels	

TTRM Series

Transformer Turns Ratio Meter

SCOPE's Single Phase (TTRM 101 / TTRM 102) and Three Phase (TTRM 301 / TTRM 302), Transformer Turns Ratio Meters are rugged yet light weight and highly reliable instruments to measure turns ratio of transformers in live switchyards up to 765kV.

TTRM is equally suitable for use on manufacturing shop floor and test laboratories. It can be used for testing of single / three phase power transformers (star or delta connected, with or without neutral), CTs and PTs.



Features of TTRM 102 and TTRM 302

- Measures Turns Ratio, Excitation Current and Phase Deviation between HV and LV windings of three phase and single phase transformers
- Automatic Vector Group Detection of three phase transformers*
- Automatic Tap Position indication
- 5.7" colour TFT display with touch screen and interactive menu makes it easy to use
- In-built memory and thermal printer is available. Displays, prints and stores test reports in the form of text header and tabulated test results
- In-built real time clock facilitates test time stamping on each record enabling time references for future use.
- Ethernet port to communicate with laptop / computer
- USB interface for connecting pen drive for quick data backup at any location
- Powerful Windows based software, 'CTrans TTRM' offers creation of Transformer identity and upload it to the instrument. Field test results are automatically stored under selected ID. Test results it can be downloaded from instrument to computer for viewing, storage and analysis. Test report can also be generated
- Housed in ultra-rugged IP 67 class molded carrying case for enhanced transport-worthiness
- The instrument is supplied with Test Lead Set suitable for testing EHV transformers
- Type Tested as per IEC 60068-2, IEC 61326-1, IEC 61010-1, CE marked.

SCOPE also offers other basic models namely TTRM 101 and TTRM 301.

Note : *- Feature available only in TTRM 302

Specifications

Parameters	TTRM 101	TTRM 102	TTRM 301	TTRM 302
Configuration	Single Phase	Single Phase	Three Phase	Three Phase
Excitation Voltage	10V, 40V and 100V			
Turns Ratio Range	0.8 to 20000			
Turns Ratio Accuracy & Resolution	Best Accuracy: Value $\pm 0.03\%$ \pm Resolution @ 100V ; Resolution: 5 digits			
Excitation Current Range	-	Up to 2A	-	Up to 2A
Excitation Current Accuracy & Resolution	-	Accuracy: Value $\pm 1\text{mA}$ \pm resolution Resolution: 1mA	-	Accuracy: Value $\pm 1\text{mA}$ \pm resolution Resolution: 1mA
Phase Deviation Range	-	± 180 Degrees	-	± 180 Degrees
Phase Deviation Accuracy & Resolution	-	Accuracy: $\pm 0.05^\circ \pm$ resolution Resolution: 0.05°	-	Accuracy: $\pm 0.05^\circ \pm$ resolution Resolution: 0.05°
Automatic Vector Group Detection	-	-	-	Yes
OLTC Control	Yes			
Memory	100 transformer IDs, 1000 records each			
Communication	Ethernet, USB			
Power	110 V/230V AC $\pm 15\%$, 50/60 Hz $\pm 10\%$, 75VA			
Dimensions	435 X 315 X 175 mm			
Weight	10 kg			

Dir CT

CT Polarity Tester

SCOPE offers Dir CT, a CT Polarity Tester specially designed to verify correctness of polarity of current transformer cores in live EHV / UHV switch-yards. Polarity test is one of the most common yet crucial tests required to be conducted on current transformers at the time of manufacturing, site commissioning & maintenance.

Features

- Simple, Portable, Lightweight, Hand-held device for various type of CT's
- Easy and fast single handed button operation
- Gives analog indication (Forward & Reverse) of current transformer polarity
- Gives reliable performance over extended usage
- Operating Voltage : 3V DC, AA size alkaline batteries, 1.5V - 2 Nos
- Display : Sensitive Analog Indicator. Forward & Reverse Polarity
- Environment : 0 to 50°C, Up to 95% RH (Non - Condensing)
- Dimensions : 205 X 115 X 50 mm
- Weight : 400 gm
- Instrument is supplied with Test Lead Set and Soft Carrying Case



MagD Series

Step-Up Transformer

MagD is specially designed to cater the needs of testing of Instrument Transformers. Before new systems are put into service or after any occurrence of fault, Instrument Transformers need to be tested for their outputs. It is to be ensured that Instrument Transformers give proper outputs to protection relays.

Features

- Prepares excitation curves quickly and easily
- Knee-point test of CTs
- De-magnetise transformer cores
- Conducts turns-ratio test of voltage transformers
- Inbuilt voltmeter and ammeter
- HV and LV outputs available separately
- Online switching between HV and LV outputs
- Visual Indicators for HV/LV output ON
- Two-Hand operation enhances user safety
- Interlocking feature for Variac Zero position for user safety
- Thermal cut-off for instrument and user safety
- Supplied with specially designed high voltage cables and rugged carrying case



Specifications

Parameters	MagD
Mains input supply	230 V AC \pm 15%, 50 Hz \pm 10%
Protection	Thermal cut-off , Variac zero interlock, Two-hand control
Dimensions	- 500 x 230 x 300 mm
Voltmeter	0 - 250V AC for LV out, 0 - 2.2 / 3 / 5 kV AC for HV out
LV output	0V to 250V AC, 8A; Continuous
Operating temperature	0 to 50 °C
Humidity	Up to 95% RH, non-condensing

Models Available

Parameters	MagD 20	MagD 21	MagD 30	MagD 31	MagD 50	MagD 51
HV & LV Output	HV Only	Both	HV Only	Both	HV Only	Both
HV Output	0-2200V, 0.5A Continuous, 1A for 35 Sec, 10min OFF		0-3000V, 0.4A Continuous 0.8A for 35Sec,10min OFF		0-5000V, 0.3A Continuous 0.6A for 35Sec, 10min OFF	

HPT Series

AC & DC Hipot Testers

HPT Series Hi-Pot Test Sets is available in three different combinations, viz., Power Frequency AC, DC and AC-DC Combined HV Test Sets for testing of transformers, motors, insulators, cables etc. Further, these test sets are capable of giving continuously variable HV from zero to maximum rated output voltage.

HPT Series testers are specifically designed for safe and accurate measurement of leakage current to evaluate insulation integrity. These testers are moveable, one end ground test systems, ideal for HV testing. Accurate leakage measurements are ensured by placing the current meter in the return path of the HV. Years of Design, engineering and manufacturing experience have made our HPT testers the most durable, easily operated and the best designed sets in the segment.

The product has been designed considering the importance of safety of the operator. The kit has various interlock to avoid any kind of accident while doing the high voltage testing.

Features

- Zero Start Interlock
- Open Ground Facility
- HT On/Off Lamp Indication
- Over Current Protection
- Short Circuit Protection
- Audio Visual Alarm
- Emergency Stop Button
- Compact, Portable and Rugged
- Suitable for Field Use

Specifications

- Input Voltage : 230V AC / 50Hz
- Voltage & Current Display : Analog Meter or 3½ Digital Meter
- Measurements Accuracy : $\pm 2\% \pm 1$ Digit



Standard Models				
Output Voltage (in kV)	Current (in mA)	Available Options		
		AC	DC	AC-DC
3	200	✓	✓	✓
5	200	✓	✓	✓
10	100	✓	✓	✓
15	100	✓	✓	✓
20	50	✓	✓	✓
25	50	✓	✓	✓
30	25	✓	✓	✓
40	25	✓	✓	✓
50	10	✓	✓	✓

Note: Other configurations available as per desired specification

Model Example				Final Model Name
Series	Voltage in kV	Output Type	Type Code	
HPT	3	AC	A	HPT 3A
HPT	25	DC	D	HPT 25D
HPT	50	AC-DC	C	HPT 50C

Prima Series

Primary Injection Set

Prima Series is designed for Primary Current Injection Testing of Current Transformers, Protection Relays & Circuit Breakers during their Factory Test, Commissioning and Routine Testing. It is also used to test the Turns Ratio of Current Transformers and for other applications that require variable high currents. The Kit is designed for most optimal use of man and machine and is suitable to work in live switchyard conditions. Prima consists of a Control Unit and a low weight Loading Transformer, enabling the user to take the Loading Transformer nearest to the CT terminal. Thus, the weight of both the output lead and overall kit reduces considerably. The innovative design of Prima gives the ultimate flexibility to the user to use the full capacity of the Loading Transformer by adjusting the output voltage and current as per requirement.



Features

- A radically new design makes Prima the lightest available kit in its category
- Secondary Current Measurement feature - unique in its category
- Front Panel operation with fool-proof connectors
- Modular design for easy transportation
- Current output up to 1000A / 2000A / 3000A AC (depending upon model)
- Continuously variable output current with course and fine control
- Direct display of Primary Current and Secondary Current in the control unit
- Configurable current output of 'Rated', 'Rated/2' & 'Rated/4'
- Auto cut off if the output current exceeds 110% of the selected range
- Timer Function
- Protected by MCB
- Standalone operation with Inbuilt LCD display

Specifications

Parameters	Prima 1	Prima 2	Prima 3
Primary Continuous Current Ranges	0 - 250 / 500 / 1000A	0 - 500 / 1000 / 2000A	0 - 750 / 1500 / 3000A
Resolution & Accuracy	1A, Value \pm 1%		
Secondary Current Measurement Ranges	0 - 1A / 5A		
Resolution & Accuracy	1mA, Value \pm 1%		
Timer Range	0 - 1999mS / 19.99S / 199.9S		
Mains Supply	230V \pm 15%, 50Hz \pm 10%, Single Phase		
Environment	0 - 50°C, Up to 95% RH (Non-condensing)		
Weight (Including all leads)	85kg	90kg	95kg



CFL Series

Cable Fault Locator

SCOPE offers CFL Series, Cable Fault Locator Test System, the ultimate solution for locating all types of underground cable faults in minimum time, thus saving long outages and consequential revenue loss & inconvenience.

SCOPE offers a full range of products required for fault location of LT/HT power and telecom cables. It includes various models of Surge Generators (Thumpers), Pre-Locators, Pin-Pointers, SIM Filters and Audio Generators.

The utility of Surge Generators can be further enhanced by optional in-built features like DC Hi-pot, Burn Down and Sheath Fault Locator.

Appropriate models can be chosen and product configuration can be optimized based on application.

Various constituent models of Cable Fault Locator Test System are:

Surge Generator (Thumper): CFL SG 1605 / 1610 / 1620 / 3210 / 3215 / 3220

Pre Locator: CFL PL2 / PL2+ / PL3 / PL3+ / PL4+

Pin Pointer cum Route Tracer: CFL PP3 / PP3+

Audio Generator: CFL AG2

SIM Filter: CFL SIMF

Cable Identification System: CFL CIS

Soft Discharge Rod: CFL DDR series

Cable Fault Surge Generator: CFL SG Series

CFL SG Series offer voltages up to 16kV / 32kV and energy up to 2000J.

Features

- Compact, rugged design
- Key-lock Switch to restrict unauthorized operation
- Variac Zero, HV Switch & Output Plug Interlock for HV circuit
- Over-heat Protection at 70°C
- DC Test System (Hi-Pot, Burn Down & Sheath Fault)
- Over-current Trip-in DC Test System
- Earth Indication Emergency Off

Specifications

Parameters	CFL SG 1605 / SG 1610 / SG 1620	CFL SG 3210 / SG 3215 / SG 3220
Output Voltage Range	0-4, 0-8, 0-16kV	0-8, 0-16, 0-32kV
Output Energy	500J / 1000J / 2000J	1000J / 1500J / 2000J
Impulse Period Sequence	Single Impulse / 3S / 6S / 9S or other as desired	
Fault Distance Measurement Modes Supported	ICM (Impulse Current Method), SIM (Secondary Impulse Method)	
Output Indication	Moving Coil Meters	
Power	230V AC $\pm 10\%$, 50/60Hz	
Housing	Elegant, rugged aluminium housing Or mounted on optional trolley	
Dimensions	532 X 422 X 654 mm	700 X 700 X 900 mm
Weight (approx.)	55 kg / 60 kg / 65 kg	95 kg / 105 kg / 115 kg
Optional 'DC Hi-Pot' Mode		
DC Hi-Pot Ranges	Voltage: 0-32kV, Current: up to 24mA	
Optional 'Burn Down' Mode		
DC Burn Down Ranges	Voltage: 0-8, 0-16, 0-32kV, Current: 0-240, 0-120, 0-60mA	
Optional 'Sheath Fault Locator' Mode		
DC Sheath Fault Ranges	Voltage: 0-8kV, Current: 0-240mA Test Timing Intervals: Single Impulse, 3S / 6S / 9S or other as desired	



CFL SG

Cable Fault Pre Locators: CFL PL Series

CFL PL Series, Cable Fault Pre-Locators from SCOPE are the ultimate solution for locating underground cable faults in minimum time.

Features

- Measuring range up to 256Km
- Large LCD display
- Simple & User friendly operation
- Adjustable balance of instrument resistance to suit the cable under test
- Adjustable gain for optimal waveform resolution
- Large range of Propagation Velocity enables testing of all type of cables including pilot and telecoms cable
- Facility to store & compare waveforms
- Housed in rugged, IP67 class moulded case



CFL PL3



CFL PL4

Specifications

Parameters	CFL PL2	CFL PL3	CFL PL2+	CFLPL3+	CFL PL4+
TDR	✓	✓	✓	✓	✓
ICM / ICE	✓	✓	-	✓	✓
SIM / MIM / ARC	-	✓	✓	✓	✓
Decay	-	-	-	✓	✓
Bridge	-	-	-	-	-
Sampling Rate (MHz)	100	100	100	800	800
Measurement Range	16km		50km	128km	256km
Pulse Width (nS to μ S)	40 - 3.56		10 - 100		
VoP Range (m/ μ s)	100-300				
Display Size	5"		5.7"		10.4"
Display Type	Monochrome			Colour	

Cable Fault Route Tracer cum Pinpointer: CFL PP Series

CFL PP series is suitable for pin-pointing of fault location as well as route tracing of any type of cable. For pinpointing it is used along with CFL SG Series Surge Generators and for route tracing it is used along-with CFL AG Series Audio Frequency Generators.

Features

- Can be used for both pinpointing as well as route tracing
- Both magnetic & acoustic inputs making pinpointing very convenient (Co-incidence Method)
- Digital filters to eliminate external noise
- Highly sensitive magnetic signal pick up
- Mute function for headphones to disable noise while moving
- Live loaded cable detection with 50 Hz frequency using route tracing coil (CFL PP3+)
- Large LCD display with backlit facility
- Internal Li-ion chargeable battery
- Specially made light weight case ensuring minimum strain to operator
- Water resistant and dust proof design
- User friendly and simple operation



CFL PP3+



Specifications

Parameters	CFL PP3	CFL PP3+
Channels	Acoustic and magnetic	
Function	Cable Route Tracing and Fault Pin-pointing	Cable Route Tracing, Fault Pin-pointing and Live loaded cable detection
Operating Principle	Coincidence Method	
Gain	>120dB adjustable for both Acoustic and Magnetic	
Frequency Range	70 Hz to 3000 Hz with automatic filtering	
Headphone	3.5mm jack	
Rechargeable Battery	7.4 V Li-ion	11.1 V Li-ion
Power supply	90V-270V AC, 50/60 Hz	
Display	5", Monochrome backlit LCD, 240 x 128 pixel	5.7", TFT Touch Screen, 320 x 240 pixel
Environmental	-10 °C to 55°C, 95% RH (Non-Condensing)	
Dimension	230 x 140 x 170 mm	231 x 90 x 135 mm
Weight	1.5 kg	1.2 kg

Cable Fault Audio Generator : CFL AG2

Audio Frequency Generator has been designed to be used for cable route tracing, pin-pointing of low resistance welded faults, joint location and cable identification.

Features

- Automatic impedance matching
- High audio power output
- Quartz stabilized frequency
- Clean and distortion free signal output
- Output in seven ranges, selectable manually or automatically
- User friendly operation with minimum controls and Analog Ammeter display
- Overload protection
- Over current protection and indication



CFL PP3+

Specifications

- Max. Output Power : 20W
- Max. Output Current : 2.8A ± 20%
- Frequency : 1kHz Sine Wave
- Output Voltage : In 7 steps 4-7V / 15-25V / 30-40V / 60-70V / 90-100V / 150-170V / 200-230V
- Operating Modes : Continuous and Intermittent
- Input Supply : 230V AC ±10%, 50Hz ±10%
- Protection : Over Current
- Environment : 0 to 50°C, 95% RH (Non-condensing)
- Dimension & weight : 275 x 255 x 130 mm, 5kg



CFL SIMF

Cable Fault SIM Filter : CFL SIMF

SIM Filter is a passive filter which uses energy of surge generator for stabilizing the SIM Filter, CFL SIMF works in conjunction with SCOPE's Cable Fault Pre Locator CFL Cable Fault Surge Generator, CFL SG Series, up to 16kV

Specifications

- Arc Stabilization Time : ≥20mS
- HV Input : Max. 35kV DC Negative Polarity
- Input Power Supply : AC 230V ± 10%, 50 ±1Hz
- Environment : -10°C to 50°C, 95% RH (Non-condensing)
- Dimension : 380 x 282 x 535 mm
- Weight : 25 kg

Cable Identification System: CFL CIS

After excavation, sometimes it is confusing to identify the right cable from bunch of similar appearance cables. Cable identification is very important for safety of field personnel – Cutting a wrong cable can be fatal. So, we require a Cable Identification System having current direction facility to identify the wanted cable.

Cable Identification is the most critical and safety related sequence during all the procedure of cable fault location. The correct identification of a cable out of a bundle of cables, where most of them can be cables in service, has to be carried out not only carefully, but also by means of an instrument widely eliminating the possibility of human error or misinterpretation.

The Cable Identification System, CFL CIS from SCOPE is the ultimate solution for identifying wanted cable from a bunch of cables in a trench, pit or cable rack. The SCOPE's Cable Identification System CFL CIS is designed to fulfill these most important safety aspects.



CFL CIS

Features

- User Friendly LED Indication for Right & Wrong Cable Identification from multiple cables
- Flexible coil is thin, flexible for easy insertion between closely mounted conductors or where access is restricted and provided with locking facility for contact firmness
- Two different ranges of pulse current which enables the accurate Cable Identification in all types power cables
- 10 Stages Amplifier Setting for Better Signal Receiving
- Operation Via both Mains Supply and Internal Li-Ion Rechargeable battery
- Compact, Light Weight, water resistant and dust proof design
- Belt arrangement for receiver to easy carrying
- User friendly and simple operation

Specifications

Parameters	CFL CIS
Pulse Voltage	55VDC / 36VDC
Pulse Current	100A / 60A
Pulse Sequence	30 pulses/ min, User configurable
Pulse Width	72ms
Power Supply	100 to 265 VAC 50/60Hz
Battery	11.1 V Li-ion Rechargeable Battery
Operating Time	6 Hours
Weight	6 Kg approx.
Dimension	339mm x 295mm x 152 mm
Environmental	-20°C to +55 °C, 95% RH(Non-Condensing)

Parameters	CFL CIS-R
Display Type	LED scale
Flexible Clamp	150mm Diameter
Sensitivity	100% at 31.25Ω loop resistance
Amplifier Setting	10 stages
Battery	11.1 V Li-ion Rechargeable Battery
Operating Time	8 Hours
Weight	0.7 Kg approx.
Dimension	210mm x 124mm x 51 mm
Environmental	-20°C to +55 °C, 95% RH(Non-Condensing)

BLUe Series



Battery Loading Unit

Battery banks have become an inseparable part of uninterrupted or back-up power supply arrangements in various industries like Power, Telecom, IT etc. In substations the critical protection, control & communication systems run on battery power. Hence the reliability of these battery banks is crucial to ensure smooth operation of equipment which they are serving. The capacity of battery may get reduced significantly before the expected life span of battery due to various reasons. The only way to assess the continual health of battery banks is periodical maintenance inspection & testing. Conducting a discharge test on batteries is most effective way to check the battery capacity.

SCOPE introduces BLUe Series Battery Loading Units; these are moveable instruments for controlled & monitored discharge of batteries. They are designed for integrated site discharge test, design & QC test and also for monitoring discharge process of battery bank with connected load. Each single autonomous unit having built-in display, keypad and wireless communication with computer makes it very easy to use. It comes in different configurations ranging from 12V to 380V discharge voltages and 50A to 300A discharge currents.

Various options are available to control & monitor the discharge process. With the help of optional Cell Monitoring Unit - CELLMon, voltage of each individual cell can be monitored & data sent to main BLUe unit and then from main unit to computer via wireless communication. Each BLUe unit is supplied with computer downloading & analysis software for real time monitoring of discharge process.

Measurement

Easy user interface with direct display of voltage & discharge current makes discharging a very easy task. Different models cover different types of cells (1.2V, 2V, 6V and 12V) and battery banks (24V, 48V, 110V, 220V and 380V). Discharge time, Discharge capacity, cell cut-off voltage & total cut-off voltage these are the four options available in BLUe to stop/auto shutdown the discharging process.

The optional CELLMon - Data Acquisition Unit monitors discharging values of each cell & could be viewed on the LCD display of the instrument or computer simultaneously by using the analyzing software. Wireless communication technology enables it to continuously monitor & display the real time discharge process of all individual cells via monitoring terminal. Thus surveillance of each cell is done as well as suspected cell can be targeted & removed.

Optional Cell Monitoring Unit - CELLMon

CELLMon continuously monitors voltage of each cell connected to it and wirelessly sends data to BLUe main unit. It is rugged and capable to monitor all type of batteries (1.2V, 2V, 6V and 12V). Single CELLMon can be connected with 12 cells of 1.2V, 2V or 4 cells of 6V / 12V. BLUe can record overall voltage discharge current & discharge capacity even without CELLMon

Specifications

BLUe	0512/0513	0522/0523	0842	0852	1111/1112	1120A /1120 B	1121/1122	1131
Application	T	T	T	W	P	T/P	T/P	T/P
Discharge Voltage : Current	48V: 200 / 300A	24V: 200 / 300A 48V: 200 / 300A	24V: 100A 36V: 150A 48V: 200A 80V: 200A	12V: 100A 24V: 200A 36V: 200A 48V: 200A 80V: 200A	110V: 100 / 200A	12V: 50 / 50A 110V: 50 / 25A	48V: 100 / 200A 110V: 100 / 200A	12V: 100A 24V: 50A 110V: 75A
Accuracy	Current : Value \pm 1%; Voltage : 0.5%							
Resolution	Current : 0.1 A or 0.5% of range whichever is higher; Voltage : 0.1V							
P _{Max} (kW)	11 / 16.5	11 / 16.5	18.4	18.4	12.6 / 25	6.5 / 3.25	12.6 / 25	9.5

Application : P - Power Utility, T - Telecom, U - UPS, W - Wide Voltage Range

Features

- Controller and Load in a Single unit with Master and Slave mode
- 4 programmable conditions for auto shut-down of discharge process
- Recovery from left-out point facility - in case of abnormal interruption of discharge cycle
- Parallel connection of multiple units for high discharge capacity
- Real-time data acquisition and display of voltage for each cell with the help of CELLMon - Data Acquisition Unit
- Accurate results and vivid waveforms
- Auto sorting for lag-out batteries during discharging
- AC & DC power supply modes for different needs
- Integrated functions for displaying, controlling and discharging
- Safe circuit design to avoid damage to battery while testing
- Direct USB drive compatibility or wireless connectivity for convenient data transfer to computer
- Powerful data management & analysis software for data analysis and reporting
- Dynamic discharge and static discharge data auto-saving
- Thermal cut-off and automatic overload protection
- Portable unit with wheels - convenient for onsite testing



Battery Discharge Monitor: Downloading and Analysis Software

The analysing software allows user to conduct real time monitoring for discharging process of battery bank. User need to install / configure software on their computer. By using data base, user can backup, save & recover the testing data. Measured data can be transferred to a personal computer via USB drive for further analysis. The main BLUe unit is connected to the computer through wireless communication

After initialization of discharge process, analysing software automatically starts monitoring the process & receives all data from main unit of BLUe.



Specifications

Sr. No.	Specifications	Particulars
1	Power	110 V/230V AC \pm 15%, 50/60 Hz \pm 10%
2	Sampling Frequency	5 Samples / min
3	Display	LCD ,128x64 pixel
4	Temperature	0°C To 50°C
5	Humidity	Up to 95% RH (non condensing)

BLUe	2210 / 2211 / 2212	2221A	2221B/2222	2252	3810 / 3811	4410	4420
Application	P	P	T/P	T/P/U	U	U	U
Discharge Voltage : Current	220V: 50 / 100 / 200A	110V: 100A 220V: 100A	48V: 100 / 200A 220V: 100 / 200A	12V: 50A 24V: 100A 48V: 200A 110V: 75A 220V: 150A	380V: 50 / 100A	440V: 50A	220V: 50A 440V: 50A
Accuracy	Current : Value \pm 1%; Voltage : 0.5%						
Resolution	Current : 0.1 A or 0.5% of range whichever is higher; Voltage : 0.1V						
P _{Max} (kW)	12.6 / 25.3 / 50	25	25.3 / 50	39	21 / 43.7	25.3	25.3

PD Analyser

Portable Diagnostic Systems for Various Applications

This is an 'All in One' solution for detection, analysis & localisation of partial discharges in the insulation of high-voltage Transformers, Cables, GIS, Generators and Motors.

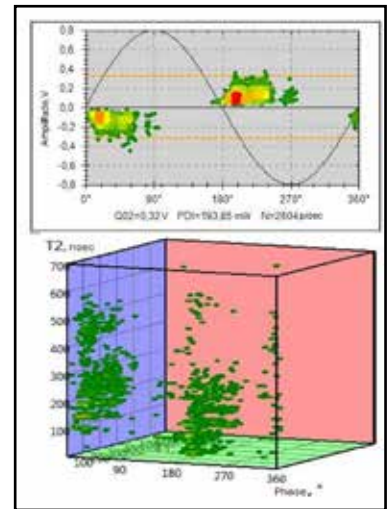
The PD Analyser is an extremely useful device for condition estimation of high-voltage insulation. This multi-purpose device is designed for

- Partial discharge measuring in high-voltage insulation at a high noise level
- PD detection & identification of various types of defects for effective insulation condition estimation



Features

- Three / Six independent measuring channels in which signals are measured simultaneously. This function enables to see pulses from partial discharges are distributed and where they are located in high-voltage equipment
- Built-in intelligent system 'PD-Expert' used for automatic diagnosis of insulation defects in high-voltage equipment
- Built-in hardware and firmware features to solve the problem of noise and crosstalk in the process of partial discharge measurement
- Identifies the type of the insulation defect and its severity
- 'PD Expert' Software separates stray pulses and partial discharges while comparing their frequency and time of arrival
- 'PD Expert' Software uses phase resolved partial discharge (PRPD) and time frequency analysis (PD-Cloud)
- 'PD Expert' Software has the database of the most popular defect images which can be upgraded with new diagnostic information
- Automatic report generation on the condition of the insulation of the high-voltage equipment



Specifications

Parameters	PD Analyser 3	PD-Analyser HF/UHF
Number of measuring channels	3	6 or 6
Sensor Options	HF, UHF	TEV, HF, UHF
HF discharge pulse frequency	0.5 - 20 MHz	
VHF discharge pulse frequency	10 -100 MHz	
UHF discharge pulse frequency	200 - 1500 MHz	
HF discharge amplitude	20 - 100000 pC	
UHF discharge amplitude	-70 to -25 dBm	
Computer connection	USB, Wi-Fi	USB
Supply voltage	90 - 260V AC	
Operating temperature range	-10 to 50°C	
Dimension	220 x 160 x 45 mm	520 x 435 x 230 mm
Weight	12 kg	25 kg



AR700

Defect Location in High-Voltage Equipment Insulation by Acoustic PD

The AR700 measures acoustic signals with multiple relocatable acoustic sensors mounted on the transformer. The software determines the defect location using the time difference of all incoming signals. Finally, these coordinates are shown in a 3D model of the transformer.

AR700 device is used for measuring of acoustic signals on the external surfaces of gas-insulated switchgears, power transformers and other grounded tank high-voltage equipment. The acoustic signals are caused by partial discharges in the insulation, which is the site of the defects.

The advantage of AR700 device is the quick installation of the relocatable acoustic PD sensors on the grounded external surface of high-voltage equipment. The sensors have magnetic holders thus making it unnecessary to de-energize the equipment for the sensors installation.

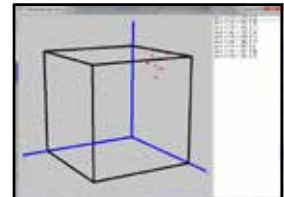
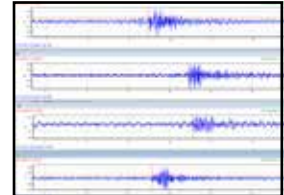
AR700 device has 4 synchronic channels for acoustic signal measurement. This gives the possibility not only to detect defects in the insulation, but also to locate them. The 3D location function of the AR700 device is unique for acoustic devices.

Features

- The signal analyses and the PD zone location can be carried out both in manual and automatic modes.
- Software calculates the fault location based on the time difference between the incoming signals and report is generated regarding PD source location.
- Convenient and handy - light weight, small size and battery operated
- Can be used for multiple assets like Transformers, CTs, GIS, Cables, Switchgear Panel etc.
- Defect type identification by synchronised measurement of PD

Specifications

Parameters	AR700
Acoustic channels for PD measuring	4
Frequency range of acoustic sensors	30 - 300 kHz
High-frequency channels for PD measuring	1
Frequency range of high-frequency sensors	0.1 - 20 MHz
LCD resolution	480x272pixel
computer connection	USB
Operating temperature range	-20 to +60°C
Humidity	<98%, non-condensing.
Operating time from build-in accumulator	8 hours
Device weight, without sensors	1.1 kg
Dimensions of transportation case	520x435x230mm
Device weight in carrying case	12kg



DIM-Loc4

Universal Portable PD Diagnostic System

The DIM-Loc4 universal device is used for PD measurement and analysis for various applications. The device is suitable for PD measurement in Power Transformers, Instrument Transformers (CTs and PTs), AIS & GIS Switchgear, Cables and Insulators.

The DIM-Loc4 has unique four sensor technology in one equipment - Acoustic, HF, TEV and UHF. The equipment is supplied with UHF antenna, TEV sensor and other sensors in Low frequency (Acoustic), High Frequency (HF), Very High Frequency (VHF) and Ultra High Frequency (UHF) range.

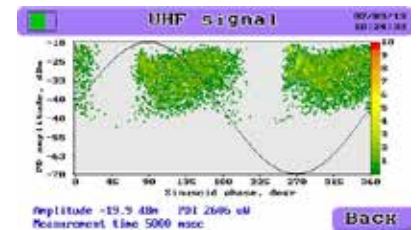
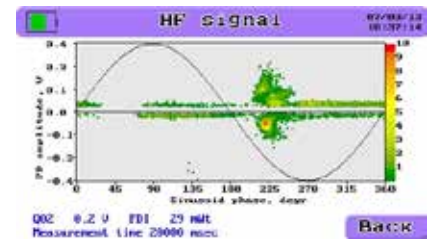
Antennas are especially useful for measurement of PD electromagnetic radiation and effectively surveying the whole substation in a matter of minutes.

Features

- Tells us the 'Type of defect' enabling us to know the root cause of the defect and take necessary action
- The software classifies the severity of defect by classifying it in 'No defect' and indicating the danger level as 'Low', 'Medium' and 'High'
- Allows automatic analysis and automatic report generation

Application

- Insulation condition express-diagnostics. At this level PD presence/ absence, PD quantity and time trends are assessed.
- Periodic insulation condition monitoring by DIM-Loc4 device, data storing and processing with 'PD Expert' diagnostic system
- Intelligent PD analysis



Specifications

Parameters	DIM-Loc4
Measuring Channels	3 numbers
Acoustic Channel	30 - 300 kHz
HF Channel	0.5 - 30 MHz
VHF Channel	10 -100 MHz
UHF Channel	200 - 1500 MHz

Parameters	DIM-Loc4
LCD Resolution	640 x 480 pixel
Computer Interface	USB
Temperature	-20 to 50°C
Dimension	220 x 170 x 35 mm
Instrument Weight	1 kg

3i

Handheld Online Partial Discharge Detector

The 3i Partial Discharge detector is a combination of Acoustic and TEV based technology for insulation condition estimation in a variety of assets. This portable multi-purpose device is effective for high voltage insulation monitoring in live conditions. The device is designed for PD measurement in Switchgear, Terminations and joints of Cables, GIS, Tanks of Transformers etc.

Specifications

The 3i can detect PD a in few seconds thus making it ideal for condition based maintenance tool.



Parameters	3i
PD sensors	2 internal, 3 external
Acoustic sensor frequency range	40 ± 2 kHz
TEV sensor frequency range	10 - 100 MHz
RFCT sensor frequency range	0.1 - 10MHz
Resolution	+1 dB
Acoustic channel dynamic range	80 dB

Parameters	3i
TEV channel dynamic range	60 dB
Connectivity	USB, Headphone
Battery life	12 hours
Operating Temperature	-20 to 55°C
Dimensions	220 x 85 x 45 mm
Weight	400g

TM25R

Tower Footing Resistance Meter (High Frequency)

Transmission towers are electrically grounded by ground wires. Due to the existence of this connection, any attempt to measure a tower footing resistance by any conventional earth tester leads to wrong results. To make this kind of test feasible, TM25R is the most appropriate tool for a fast, safe and reliable grounding resistance measurement in each tower of charged transmission line, without disconnecting the ground wire. The equipment only measures the ground resistance of the Tower under measurement, including its base.



Specifications

Parameters	TM25R
Measurement Range	0 to 300Ω
Test Current	20mA Automatic
Display	Alphanumeric display (LCD)
Max. Earth Resistance of Auxiliary Rods	2,000Ω (Current Rod) , 2,000Ω (Voltage Rod)
Power Supply	Internal rechargeable battery
Operating Temperature	-5°C to 50°C
Humidity	Up to 95% RH (non condensing)
Equipment Weight	4.9kg
Operation Frequency	25,000Hz
Measurement Accuracy	± 2.5 % of reading ± 1 digit
Data Output	USB
Built-In Memory	It allows for the storage of 2,000 test readings in its internal NVRAM memory
Battery Charger	12V - 2A, Charges on single phase 230V AC
Storage Temperature	-15°C to 65°C
Dimensions	340 x 295 x 152 mm
Accessories Weight	Approx. 16.5kg

Earth Resistance & Soil Resistivity Meter

The MTD 20KWe & EM 4058 Digital Earth Testers enable measurement of Earth Resistances and Soil Specific Resistivity, and also the spurious voltages caused by parasitic voltages present in the soil. An internal current generator injects alternating current on the soil through an auxiliary rod. The voltage generated over the earth resistance is measured by the apparatus, and the resistance value is evaluated. The test current is automatically regulated. Optional in-built printer and two test frequencies 270Hz & 1470Hz available for EM 4058.



Specifications

Parameters	MTD 20KWe	EM 4058
Measurement Ranges	Resistance - 0-20Ω, 0-200Ω, 0-2000Ω, 0-20KΩ, Voltage - 0-200V AC	Resistance (Autoranging) - 0-20KΩ, Resistivity 0-50KΩm Voltage - 0-60V AC
Measurement Accuracy	Resistance ±2% of Reading ±1% of range Voltage ±2% of Reading ±1% of range	Resistance ±2% of Reading ±2 Digit Voltage ±3% of Reading ±2 Digit
Measurement Resolution	Resistance - 0.01Ω, Voltage - 0.1V	Resistance - 0.01Ω, Resistivity - 0.01Ωm Voltage - 0.1V
Operating Temperature	-10°C to 50°C	-10°C to 50°C
Equipment Weight	Approximately 2.3kg (without accessories)	Approximately 3kg (without accessories)
Dimensions	221 x 189 x 99 mm	274 x 250 x 124 mm

Insulation Resistance Testers

- Microprocessor controlled battery operated Insulation Testers & Analysers
- Low (50V to 1000V), Medium (up to 5000V) & High (up to 20kV) Voltage Models
- Wide Range in multiple scales for precise measurement of Insulation Resistance
- Measurement of AI, PI, Capacitance (Model specific)
- Step Voltage Test, Pass Fail Test & Timer Function (Model specific)
- Inbuilt Printer, Memory & computer Connectivity (Model specific)
- Rugged, Portable kits with IP 54 Protection & CE Marking.



TI Series

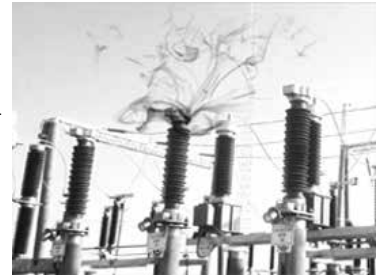
Gas Infrared Camera

ULIRvision Gas Infrared Camera TG Series are patented products and enable to scan and diagnose SF6 leaks even in small amounts in the electrical Sub-stations and equipment. TI Series TI320+ & TI 330+ Gas Camera spots and detects gas leakage accurately with vivid thermal video images from ground level, whether leakage is nearby or few meters away. Such measurement does not require shut down.



Features

- Cooled QWIP detector, Resolution 320 x 240, Sensitivity <math><0.025^\circ</math>
- It also offers Temperature measurement
- Dual-application: Gas leakage detection and thermography application
- Temperature range: - Inspection without interruption in process
- Interchangeable lenses available
- Folding and - Rugged and portable design



Specifications

Parameters	TI 320+	TI 330+
Detected Gas	SF6, NH3, ClO2, C2H4, C2H4O2, MEK	CH4, C2H6, C4H10, C3H8, C8H18, H4O, MEK, MIBK
Measurement Distance	> 0.5m	
Image frequency	50Hz	
Temp Measurement	<math>-20^\circ\text{c}< <math="" <math>500^\circ\text{c}<="" math>="" math>,="" to="">\pm 2^\circ\text{C}</math></math>-20^\circ\text{c}<>	<math>-20^\circ\text{c}< <math="" <math>350^\circ\text{c}<="" math>="" math>,="" to="">\pm 2^\circ\text{C}</math></math>-20^\circ\text{c}<>
Temperature Sensitivity / NETD	$\leq 25\text{mk @ } 30^\circ\text{C}</math>$	
Spectral Range	9.8 - 11.2 $\mu\text{m}</math>$	3.1 - 3.5 $\mu\text{m}</math>$
Visual Camera	5 mega pixels	
Image Format	JPEG (Visual or Thermal)	
Video Format	CVBS	
Image Display	5.0", <math>270^\circ< colour="" lcd<="" math>="" td="" tiltable=""> </math>270^\circ<>	
Weight	2.5 kg	

TI Series

Thermal Imaging Camera

Infrared signals cannot be seen by human eyes- however all objects with a temperature above absolute zero emit infrared thermal radiations. Only thermal imaging cameras can convert infrared radiations into electrical signals to make them visible.

TI series cameras with high thermal sensitivity which can identify the smallest temperature variation from an object and display it by excellent thermal images. A potential fault is always accompanied by partial over-heating or over-cooling. The user can locate over-heated or over-cooled part with ULRvision's Thermal Imaging Camera instantaneously and more detail analysis about fault can be performed in Thermal Imaging Analysis Software.

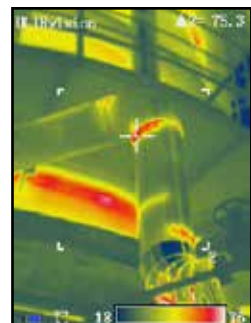
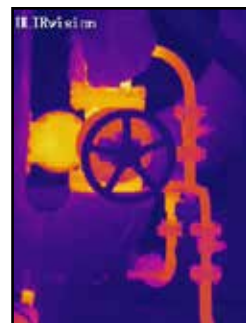
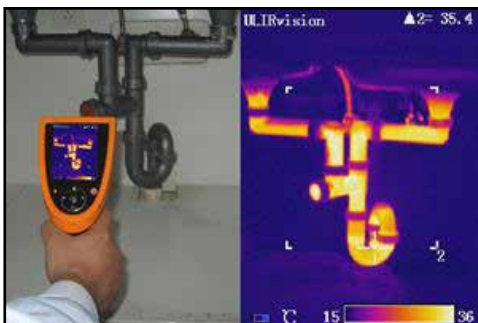


Features

- Excellent thermal image and high accurate temperature measurement
- Wide temperature measurement range Laser pointer helps user to locate object easily while at operation
- Automatic temperature correction.
- Exchangeable IR lenses for more flexibility
- Built in microphone to record 40 S voice annotations
- High temperature measurement option by fitting high-temperature filter lens
- Automatic Hot/Cold/Average spot recognition and easy operating menu
- Multifunction computer Analysis Software IRSee

Specifications

Parameters	TI175	TI395	TI400S	TI600S
Temperature Range	-20°C to +100°C / 0°C to 250°C Std Up to 1200°C Optional		-20°C to +150°C / 100°C to 600°C Std Up to 1200°C Optional	
Accuracy	±2°C or ±2% of reading			
Detector type	Uncooled FPA (Micro-bolometer)			
Detector resolution	160 X 120 Pixels	384 X 288 Pixels		640 x 480 Pixels
Spatial Resolution(IFOV)	2.3mrad	1.2mrad	1.2mrad	0.68mrad
Display	3.2", 270° tiltable LCD, 800x480 pixels		5", 270° tiltable LCD, 800x480 pixels	
Digital Zoom	1~4x continuous		1~10x continuous	
Field of View (FOV)/ Minimum Focus Distance (*Optional Accessory)	24°×18°/ 30cm (Standard lens) 45°×34°/ 15 cm (Wide angle lens)* 12°×9°/ 1m (Telephoto lens)* 6°×4.5°/ 3m (Telephoto lens)*		24°×18°/ 50cm (Standard lens) 47°×35°/ 25 cm (Wide angle lens)* 12°×9°/ 1m (Telephoto lens)* 6.3°×4.7°/ 4m (Telephoto lens)*	



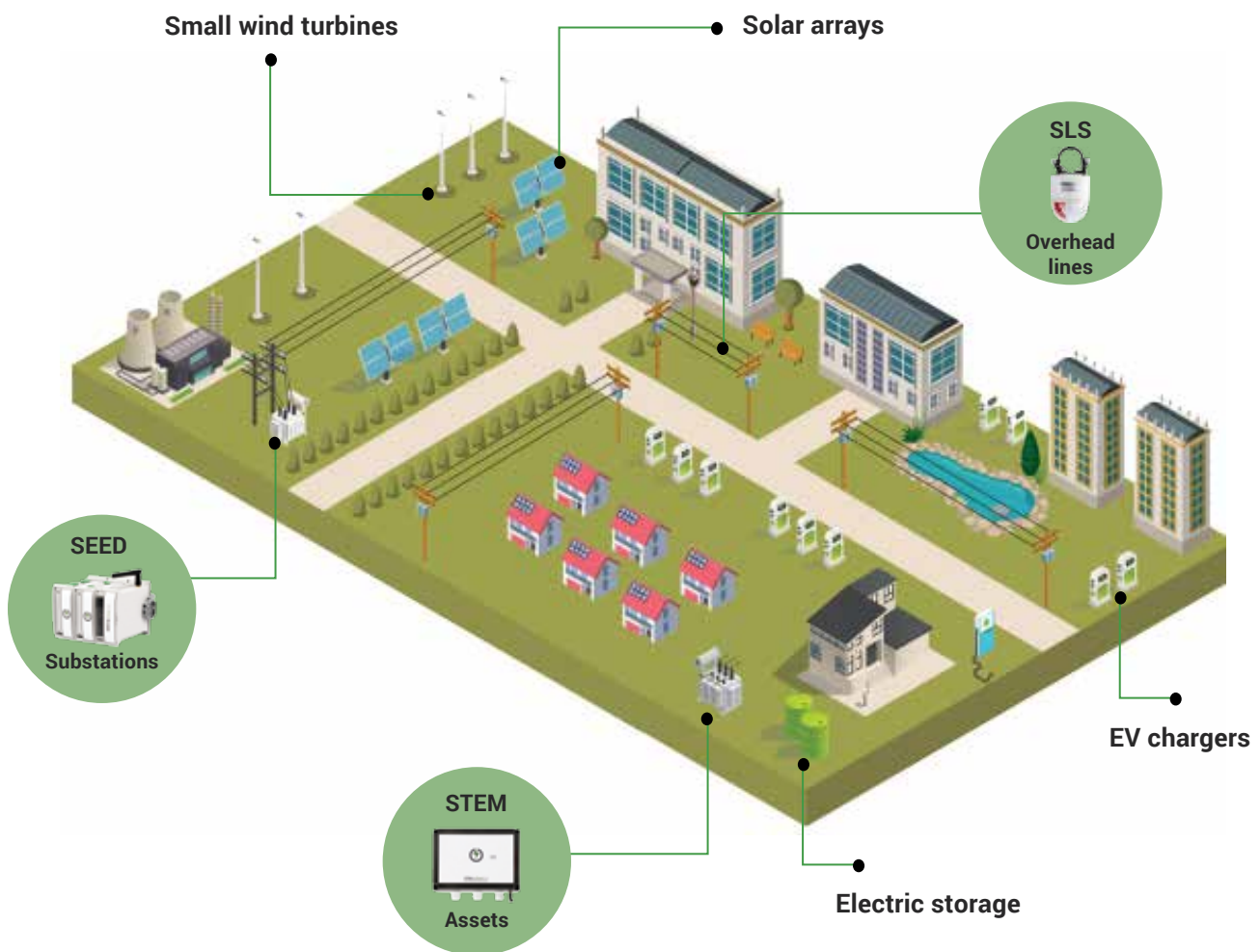
IoT based Automation Solutions

Electricity distribution network operators globally face a range of issues in delivering clean, affordable and secure energy. Increased demand for electricity coupled with the rapid shifting of supply to distributed generation requires grid operators to increase monitoring, analytics and optimisation to continue to provide a cost-effective service. Instead of installing expensive, cumbersome SCADA systems and making costly grid expansions.

OrxaGrid provides a smarter, lower cost alternative through retrofitting IoT enabled devices on critical grid nodes and monitoring them for efficiency improvements.

OrxaGrid develops sensors and predictive solutions that help electric grids reduce losses, reduce the need for capacity expansions and increase the integration of distributed energy resources. OrxaGrid achieves its objectives by focusing on:

- Real time monitoring of substation feeders, overhead lines and distribution transformers
- Instantaneous fault detection, duration and type
- Grid optimization results to grid operators through machine learning algorithms such as forecasting load imbalances, predicting electricity theft and technical faults, identifying spare capacities.



Grid Analytics Platform

Analyse power quality data from electricity feeders at different voltage levels (MV, LV substations, overhead lines, smart meters) and asset data from power and distribution transformers to predict the grid anomalies.

Typical grid anomalies that OrxaGrid's machine learning algorithms predict are:

- Predicting network inefficiencies such as voltage violations and phase imbalances
- Predicting power outages (momentary or permanent) due to overload, short circuit or earth fault
- Predicting transformer asset failures and inefficiencies



SCOPE PBG

Project Business Division

If you are a production manager, plant engineer, supervisor of some power plant, in-charge of a substation or even owner of a small manufacturing unit, then you will be always wondering how to effectively test & monitor the complete flow of production activities. At that time testing & measuring instruments or monitoring tools will help you to carry your work more effectively & smoothly.

In the current industry scenario, Testing instruments play a major role in the effective working, better production, quality control and finally in financial growth of any manufacturing unit. They work as a catalyst to boost the productivity and quality in any industry.

Testing instruments or equipments are utilized in almost every industry from Power, Engineering, Railways, Pharmaceutical, food & beverages, construction, metal, oil & gas, refineries, cement etc. Testing of raw materials and finished products including monitoring of complete manufacturing process is a routine affair at all industries.

And it is here that you need trustworthy partner who will be a single point source for all your testing & measurement needs...

SCOPE T&M Pvt. Ltd., popularly known as SCOPE, is India's first T&M Company which to make electronic instruments work in extremely high Electromagnetic Noise prevailing in EHV & UHV Sub-station. SCOPE became a pioneer in developing portable Testing & Measuring instruments for Power Sector in India and specializes in offering measuring solutions for Users as well as Manufacturers of equipments used in Generation, Transmission and Distribution of power. We offer a range of Field Testing Instruments capable of working in live switchyards and solutions for improving efficiency of capital equipment in the Power Industry.

Our approach of seeking synergetic solutions to our customer's needs has enriched the quality of our ultimate goal - Customer Satisfaction. In fact, we owe our growth to the confidence with which our customers approach us for solutions. We offer Simple solutions for difficult measurements®.

Professionals demand reliable, accurate test instruments to help isolate problems, manage vital processes and solve problems before they interrupt work-flow or cause hazards in the facility. SCOPE PBG has been founded by SCOPE with the mission to become a "One Stop Shop" for all of your plant maintenance needs. This is your single point resource for all test and measurement equipment needs. We only work with world class brands, which you trust - at the right price. We are making it easier than ever to meet your equipment needs with our service.

With the in-depth knowledge and understanding of Switchyard / Sub-station equipment and their testing requirements for last 30 years, SCOPE has now become the single point source for the supply requirements of Tools and Tackles and executing the Project Orders on Turnkey basis. Thus, SCOPE PBG has become the Project Partner for almost all the EPCs across the country. EPCs are outsourcing their procurement process of complete electrical lab packages to us. We partner with fellow manufacturer from industry and offer everything needed in that package. We have already executed such packages for various Substations, Power plants and other Industries.



Laboratory Package : We offer all types of Testing and Measurement Instruments, Tools and Tackles and other products required in the Laboratory. Our range covers the following:

- Generator Testing & Maintenance Tools
- Transformer Testing & Maintenance Tools
- CT, PT, CVT Testing & Maintenance Tools
- Insulation Oil Testing & Maintenance Tools
- Circuit Breaker Testing & Maintenance Tools
- Switchgear Testing & Maintenance Tools
- Gas Insulated Sub-station (GIS) Testing & Maintenance Tools
- SF6 Gas Testing & Maintenance Tools
- Surge (Lightning) Arrester Testing & Maintenance Tools
- Insulator / Insulation Testing & Maintenance Tools
- Earth Switch, Isolator & Bus Bar Testing & Maintenance Tools
- Transmission Tower & Line Testing & Maintenance Tools
- Cable Testing & Maintenance Tools
- Energy Meter Testing & Maintenance Tools
- Relay and Control Panel Testing & Maintenance Tools
- Power Measurement Tools
- Battery Testing & Maintenance Tools
- Motor Testing & Maintenance Tools
- Heavy Machinery Testing & Maintenance Tools
- Soil Quality / Earthing Testing & Maintenance Tools
- Communication Products Testing & Maintenance Tools
- Fibre Optic / Optical Fibre Testing & Maintenance Tools
- Environmental Testing Tools
- Hand Tools
- Common / Multipurpose Testing & Maintenance Tools
- Safety Tools
- Control & Instrumentation Laboratory Instruments
- Calibration Instruments

Test Laboratory Package : We undertake the contract for setting-up of the Test Laboratories. We can do the job on turnkey basis or on consultancy basis.

- Turnkey Laboratory Set-up : We design the complete setup of the Lab, Instruments required, their specifications, sources in consultation of customer. Based on the finalized design, we setup the lab and supply all the furniture and instruments - you get a ready lab
- Laboratory Consultancy : We offer consultancy to customer to setup their Lab, drafting the specification, finalization of probable sources, technical evaluation of the products and finally recommending the best suitable product / instrument to the end customer. You can leave your worries to us - we'll recommend you the best options available in the market based on your requirement and budget.



SCOPE CSG

Customer Support Group

We at SCOPE take pride in ensuring that instruments supplied by us are always in good working condition and within valid calibration limits. Providing prompt & on-site after sales service support is our constant endeavor. In order to enrich the goal of customer satisfaction we have a range of services that go beyond "conformance to specifications" like technical support on usage, precautions, trouble-shooting, how to....., is it possible to....., etc.

The CSG provides the following services:

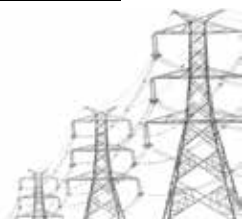
- Repairs & Servicing of instruments
- Periodical Calibration with traceability to NPL
- Comprehensive Annual Maintenance Contracts (AMC)
- Product up-gradation
- Training on operation & maintenance of instruments, test results interpretation

We provide above support on-site as well as at our Service Centers located at Pune, Delhi, Chennai & Kolkata. We have team of highly skilled & trained engineers located at these places who are highly customer focused.

We are still providing service for instruments as old as 20 years. In order to enhance the usable life of instruments we also offer up-gradation of old products at a nominal cost. It helps improve performance, reliability & serviceability. It also guards products from unavailability of some of the components that become obsolete in fast changing electronics field. Under AMC scheme, our engineers periodically visit the site, check all components for deviation in performance, perform calibration once in year and also give training / retraining to customers. If there are any design modifications incorporated to improve the reliability & performance of products, these modifications are also incorporated in old instruments as part of AMC.

We also conduct comprehensive workshops & training programs for Utility engineers covering usage, do's and don'ts of instruments, precautions to be taken during usage in live switchyards, correct test procedures, maintenance & upkeep of kits and most importantly correct interpretation of test results to assess the condition of test object. CSG assists customers use products to their fullest potential.

****For more information or enquiries mail to service@scopetnm.com***



Product Certifications

Most of our products follow International Standards for type-testing

- Environmental Tests - IEC 60068
 - ◆ Dry Heat Test - IEC 60068-2-2
 - ◆ Steady State Damp Heat Test - IEC 60068-2-78
 - ◆ Vibration Test - IEC 60068-2-6
 - ◆ Bump Test - IEC 60068-2-29
 - ◆ Shock Test - IEC 60068-2-27
 - ◆ Change of Temperature Test - IEC 60068-2-14
- Safety Test - IEC 61010-1
- EMI/EMC Test - IEC 61326-1
 - ◆ Electrostatic Discharge Test - IEC 61000-4-2
 - ◆ Radiated Susceptibility Test - IEC 61000-4-3
 - ◆ Burst Test - IEC 61000-4-4
 - ◆ Surge Test - IEC 61000-4-5
 - ◆ Conducted RF Test - IEC 61000-4-6
 - ◆ Rated Power Frequency Magnetic field - IEC 61000-4-8
 - ◆ Voltage Dip & Short Interruption Test - IEC 61000-4-11
 - ◆ Radiated Emission Test - CISPR 11
- IP 54 & IP 67 class Cases for product
- CE certification

Please refer to individual product literature for applicable product specific standards.

Our Valuable Customers



Customer Segments

- Power Utilities
 - Generation
 - Transmission
 - Distribution
- OEMs & EPC Contractors
- Railways
- Metal, Oil & Gas, Fertilizers, Cement Industries
- Test Laboratories
- Testing & Commissioning Companies

SCOPE is Partner Company in
1200kV
National Test Station Project of
POWERGRID at Bina, INDIA



Recognitions



Best Product Award in "Overall Category"
Wireless Leakage Current Analyser



Best Product Award
LA Leakage Current Analyser



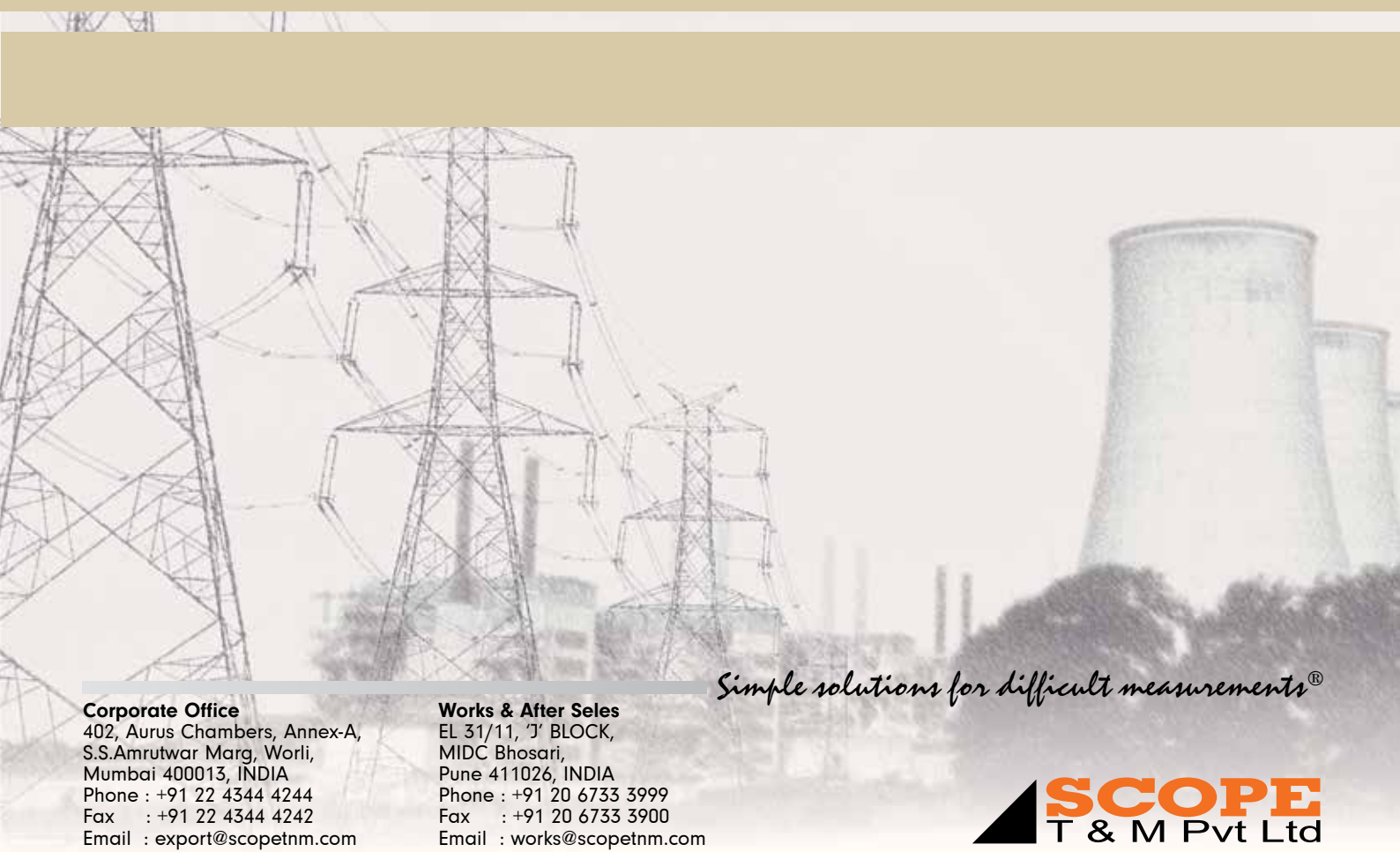
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Distribution, Industry ...

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