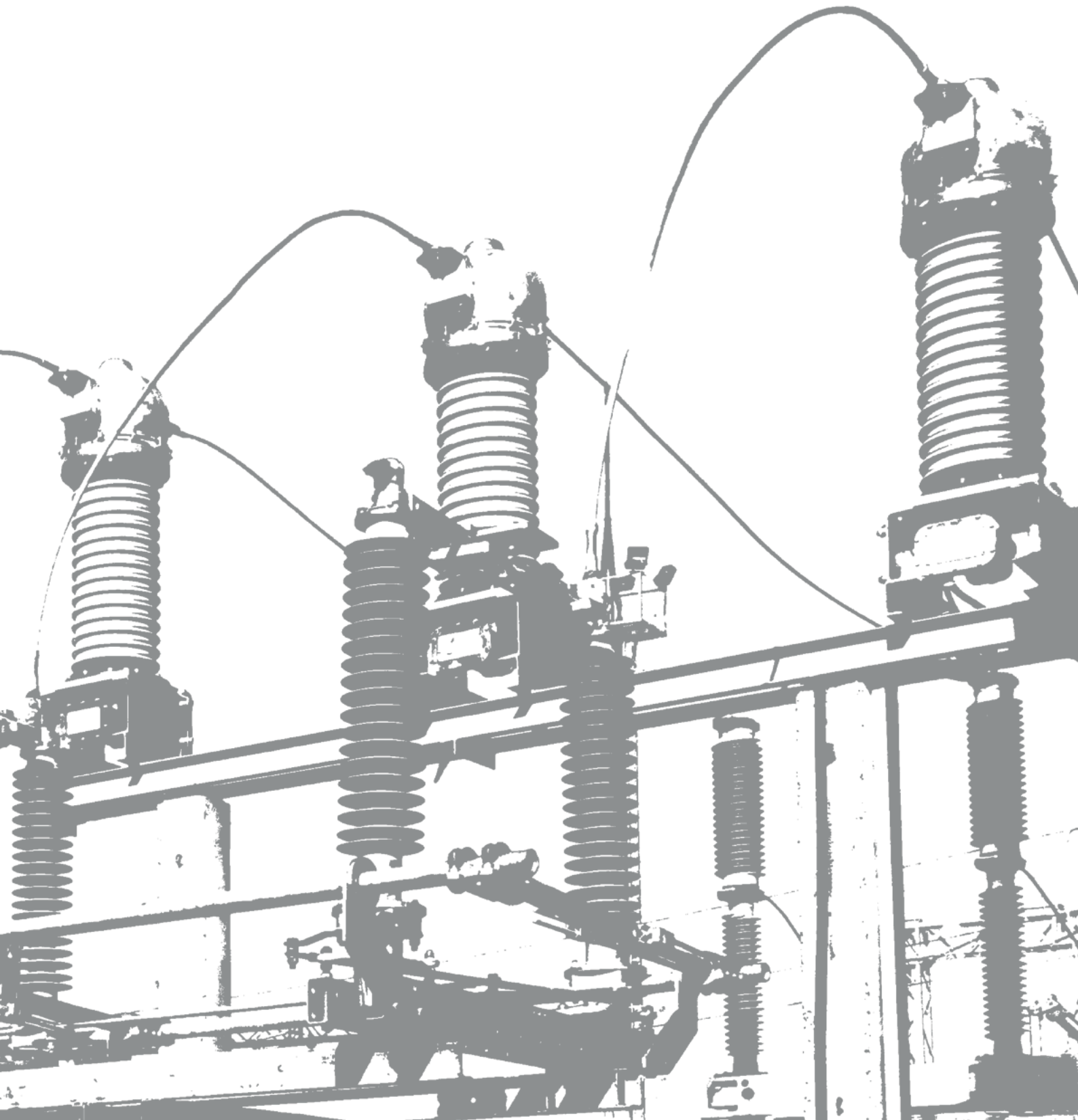


# intellirent

division of ElectroRent Corp

Rental | Support | Logistics

888.902.6111



## We rent and support electrical testing equipment

As part of the Electro Rent family, we have more resources, more capability, and more inventory to serve the electrical testing and power industries. Our passion to the industry is unwavering. We pride ourselves on customer service and technical expertise on the equipment we rent.

We carefully select the right equipment for your **rental**, prepare it in real-world conditions, complete for the application. It's field ready.

Testing needs **support**; the apparatus, the test equipment, the technician, and the job. It's all we do.

We make the connection between **logistics** and the job, wherever it is. Putting a label on a box isn't enough. We proactively monitor the shipment, adapt, and ensure delivery commitment.

rental | support | logistics



Smarter solutions for testing and technology

*Electro Rent is a leading global provider of test and technology solutions that since 1965 has enabled customers to accelerate innovation and optimize investments. Electro Rent's rental, lease, sales, and asset management solutions serve industry-leading innovators in communications, aerospace and defense, automotive, energy, education, and general electronics.*

# Table of Contents

## Electrical Testing Equipment

Power Analysis	2
Data Acquisition	18
Photovoltaic	20
Relay and Protection Test	24
Battery	38
Low and Medium Voltage Breakers	50
High Voltage Breakers	74
SF <sub>6</sub> Analysis	88
Transformer Test and Diagnostic	92
Cable and Bus	114
Asset Management	120
Partial Discharge	130
Ground Test	138
Meters and Meter Test	142
Telecommunications	143
Motor and Rotating Apparatus	160
Infrared Cameras	168
Patient Care Area	174
Electrical Safety	176
High Potential Test Sets	180
Insulation Resistance	188
Low Resistance Ohmmeters	190
Cable Fault Location	192
Process Calibration	204

## Telecommunications Equipment

Table of Contents	211
Copper Certificate Test	212
Telecom – Drive Test	213
Fiber Optic Test – Fusion Splicers	214
Fiber Optic Test – Optical Loss Test Sets	216
Fiber Optic Test – OTDRs	217
Fiber Optic Test – Inspection	219
Ethernet Test	220
5G Tower Test	222
Best Practices	224

## Index

Electrical Testing Equipment	225
Tech Tips	239
Telecommunications Equipment	240
Intellirent Substation (inside back cover)	IBC



**Fluke 1777/1750**  
Power Quality Analyzer

- Automatically Measure Power and Power Quality Parameters
- At-a-Glance Power Quality Health for Faster Troubleshooting
- Easy to Use Touch Screen Color Display for Viewing V/A/Hz, Power, Dips, Swells, and Harmonics Data
- Capture High-Speed Transients up to 8 kV
- Power Directly from the Measurement Circuit without a Line Cord
- Wi-Fi and Blue Tooth Communications
- 32 GB of Memory Storage on the Included SD Memory Card
- I17XX-FLEX6000 24 iFLEX 6000A 24 IN (2.0M) Current Probes (Fluke 1777 Model)
- FLUKE-17XX Flat Cable Voltage Test Lead 3-Phase+N
- Alternative CT's are Available Upon Request



**Fluke 1750 Current Probes**

intellirent Provides a Comprehensive Selection of Current Probes for Use with the Fluke 1750. Current Probes to Support Your Specific Application are Included with the Selected Power Quality Analyzer at No Additional Rental Cost.

Current Probe	Type	Measurement Range	Jaw Opening
Fluke 3110	24" Flexible	2A - 100A	Approx 8"
Fluke 3210	24" Flexible	20A - 1000A	Approx 8"
Fluke 3310	24" Flexible	100A - 5000A	Approx 8"
Fluke 3312	48" Flexible	100A - 5000A	Approx 15"
Fluke 3005/15S-PR	Rigid	10mA - 5A	3/4"
Fluke 3014	Rigid	100mA - 40A	3/4"
Fluke 3100R	Rigid	1A - 1000A	3 1/2 x 4 1/2"
Proflex ACF-5000_3/24	24" Flexible	100mA - 5000A in Three Ranges	Approx 8"
Proflex ACF-5000_3/36	36" Flexible	100mA - 5000A in Three Ranges	Approx 11"





## CHK Miro PQ45

Power Quality Analyzer (600V or 1000V)

- Portable, Rugged, and Precise Power Quality Analyzer, Suitable for Outdoor Use
- Ease of Use Software, Enables User to Execute Studies within Minutes
- Onboard 8GB Memory, with Software Identifying Memory Usage Before Recording is Set
- Customized Compliance Reporting and Analysis Tools, Including Voltage and Harmonic Reports
- Powered by Phase A Voltage (600V Unit Only), 5 Minute Battery Backup, External DC Supply Provided
- 4 X Current Channels; 4 X Isolated Voltage Inputs, with Independent Neutrals
- 2 X Temperature Ports Provided, Complete with Sensors, Ideal for Transformer Monitoring
- Automatic Current Sensor Detection...No Configuration Required
- Optional Remote Monitoring Available with Additional Wireless Modem Attachment
- AC and DC Measurements, 384 Samples/Cycle (19.2kHz)
- 600V and 1000V Capable Units Available for Different Applications



## Dranetz HDPQ

### Power Quality Analyzer

- Top of the Line Dranetz Power Quality Analyzer
- Record up to 1000V AC or DC at 512 Samples/Cycle
- User Friendly Tablet-Like GUI with Mini-Report Generated and Emailed from Instrument
- Eight Independent Channels with High and Low Inputs for Voltage Channels
- Communication/Configuration/Download by Ethernet, WiFi, USB or Bluetooth
- Apple and Android Apps with Real Time Metering and Alarm Registry Available
- Measures Values and Characterizes Events to All Industry Standards, Including IEC 61000-4 30 Class A, IEC 61000-4-+7, IEEE 1159, IEEE 519 and IEEE 1459
- Transient Capture at 1 $\mu$ S/Channel to 2000V Peak
- User Customizable Operating/Recording Modes
- 10,000 Cycle Pre/Post Trigger Buffer
- Onboard Intelligent AnswerModule Provides Consultant Like Analysis of Sag Directivity, Capacitor Switching Transient Identification/ Directivity and Motor Analysis Reporting



## Dranetz PX5

### Power Quality Analyzer

- High Speed Monitoring, Data and Waveform Capture, up to 1 Microsecond/Channel, of All Power, Energy, Distortion and Power Quality Parameters
- Simple Setup and Configuration Through Touch Screen Interface
- Automatic or Wizard Configuration
- Automatic Circuit Type Verification to Minimize Erroneous Data Recording Sessions
- Comprehensive Control of Thresholds, Triggers and Monitoring Parameters
- Powerful Reporting Software, DranView Professional or DranView Enterprise, for in Depth and Comprehensive Reporting and Analysis
- Current Ranges from 100mA to 6000A with Available Current Probes
- Dranetz PX4-400 Model Extends Frequency Measurement Range to 400 Hz

## Dranetz Dranview Professional or Enterprise

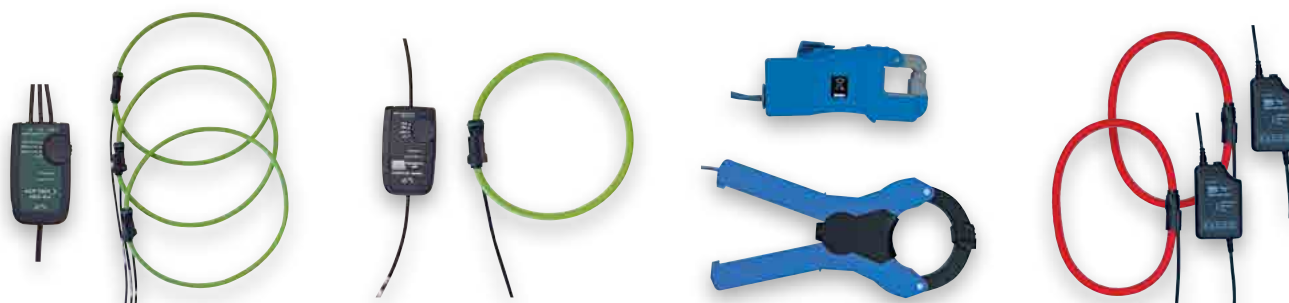
### Power Quality Analysis Software

- Suitable for Use with Data Files from PX5 or HDPQ
- Simple to Quickly Navigate and View or Export Trend, Event or Cumulative Data
- Comprehensive Automatic Report Generation
- Powerful Analytic Capabilities
- Customizable Options for User's Preferences
- HASP Key is Required for Software Operation and is Provided at No Rental Cost with the Rental of a PX5 or HDPQ



## Dranetz Current Probes

intellirent Offers a Comprehensive Selection of Current Probes for Use with the Dranetz PX5. Current Probes to Support Your Specific Application are Included with Your Rental at No Additional Rental Cost.



## Dranetz PX5 and HDPQ Current Probes

Current Probe	Type			Measurement Range	Jaw Opening
3000XL24	24" Flexible	AC Only	Three Range	3-30A, 30-300A, 300-3000A	Approx 8"
3000XL36	36" Flexible	AC Only	Three Range	3-30A, 30-300A, 300-3000A	Approx 11"
3000XL48	48" Flexible	AC Only	Three Range	3-30A, 30-300A, 300-3000A	Approx 15"
6000XL24	24" Flexible	AC Only	Three Range	6-60A, 60-600A, 600-6000A	Approx 8"
6000XL36	36" Flexible	AC Only	Three Range	6-60A, 60-600A, 600-6000A	Approx 11"
6000XL48	48" Flexible	AC Only	Three Range	6-60A, 60-600A, 600-6000A	Approx 15"
PR150	Rigid	AC or DC	Single Range	15A-150A	2"
PR1500B	Rigid	AC or DC	Single Range	150A-1500A	2"
Proflex ACP 3003_3/24	24" Flexible	AC Only	Three Range	3-30A, 30-300A, 300-3000A	Approx 8"
Proflex ACP 3003_3/36	36" Flexible	AC Only	Three Range	3-30A, 30-300A, 300-3000A	Approx 11"
Proflex ACP 6003_3/24	24" Flexible	AC Only	Three Range	6-60A, 60-600A, 600-6000A	Approx 8"
Proflex ACP 6003_3/36	36" Flexible	AC Only	Three Range	6-60A, 60-600A, 600-6000A	Approx 11"
TR-2500	Rigid	AC Only	Dual Range	10-100A, 100-500A	Approx 2 1/4"
TR-2510	Rigid	AC Only	Dual Range	100mA-5A, 5A-10A	Approx 5/8"
TR-2520	Rigid	AC Only	Three Range	100A-300A, 300A-1000A, 1000A-3000A	Approx 2 3/4"



## AEMC PEL 102/PEL 103

### Power and Energy Datalogger

- Simple to Use, Low Cost, Reliable and Practical Datalogger for Load Study Applications
- Measures, Nearly Every Circuit Type, Including Single Phase, Split Phase, Three Phase (Multiple Types) and DC Circuits, Suitable for Use in 50/60Hz, 400Hz and DC Applications
- Direct Voltage Measurements to 1700V Phase-to-Phase or 1000V Phase-Neutral
- Simultaneous RMS Measurements of Each Phase at 128 Samples/Cycle and DC
- Measures Basic Parameters: Current, Voltage, Frequency, Power Factor, Phase Rotation
- Measures Power: kVA, kW and kVAR
- Measures Energy: kVAh, kWh (Source/Load Indicator) and kVARh (Quadrant Indicator)
- Records Cost of Energy Usage
- Permits Configuration of Ratios for Medium or High Voltage PT and CT Secondary Circuits
- Calculated THD for Voltage and Current
- Independent Harmonics to the 50th Order for Current and Voltage
- Provided by intelliRent as a Complete Kit with 24", 12000A Current Probes, Voltage Leads/ Alligator Clips, Software, Preconfigured Laptop Computer, Card Reader, etc. User's Choice of CT's Available Upon Request

## AEMC PEL 105

### Weatherproof Power and Energy Datalogger

- All the Functionality of the PEL-103 in an Innovative Weatherproof Enclosure
- Add the 2137.82 for a Pole Mounted Stand-Alone and Isolated Power Datalogger
- Measures, Nearly Every Circuit Type, Including Single Phase, Split Phase, Three Phase (Multiple Types) and DC Circuits, Suitable for Use in 50/60Hz, 400Hz and DC Applications
- Direct Voltage Measurements to 1700V
- Records Cost of Energy Usage



## Available Current Probes

### Current Probes for AEMC PEL-102/PEL-103/PEL-105

Current Probe	Type	Measurement Range	Excitation
AmpFlex 193-24-BK	AC Flexible	200mA-12,000A	Instrument
Ampflex 193-36-BK	AC Flexible	200mA-12,000A	Instrument
J93	DC Rigid	50 to 5000A	Battery
MiniFlex MA193	AC Flexible	200mA-3000A	Instrument
MN93	AC Rigid	2 to 240A	Instrument
MN193	AC Rigid	5mA to 6A	Instrument
MR193	AC Rigid	10 to 1000A	Battery
SL261	AC or DC Rigid	100mA to 10A or 1 to 100A	Battery
SR193	AC Rigid	1 to 1200A	Instrument



## AEMC 2137.77

### Power Cord Eliminator for PEL-102/PEL-103

- Eliminates the Requirement for a Separate 110V Circuit to Power up a PEL
- Adapts Instrument Power from the Phases Being Recorded
- Suitable for Use on Single Phase, Three Phase, or DC Circuits up to 480V
- Isolates Measurement from Instrument Power
- Phase-to-Neutral Voltage Range: 110V AC to 277V AC
- Phase-to-Phase Voltage Range: 110V AC to 480V AC





## Fluke 437 SII

### Power Quality Analyzer

- 400Hz Operation According to MIL-STD 1399 for use in Avionic and Military Applications
- Shipboard Power Measurement System Analyzes According to MIL-STD 1399 to Automatically Give a Full Evaluation of Voltage, Current and Power
- Get At-a-Glance Power Quality Health Data in Real-Time so You Can Make Better Maintenance Decisions
- Measure All Three Phases and Neutral with the Included Flexible Current Probes
- Quickly Account for Lost Revenues Due to Wasted Energy
- Easily See How Motor Startups Can Affect Motor Drive Performance
- Safety Rating: 600V CAT IV/1000V CAT III Rated for Use at the Service Entrance
- Fluke Connect Compatible – View Data Locally on the Instrument, via Fluke Connect Mobile App and PowerLog 430-II Desktop Software



## Fluke 438 SII

### Power Quality Analyzer with Motor Analysis Capability

- Effectively Evaluate Electrical and Mechanical Performance Just by Hooking up Voltage and Measuring Current, Providing You with an Unprecedented Level of Data
- Key Motor Analysis Parameters Like Speed, Torque and Mechanical Power and Calculates Motor Efficiency without Mechanical Sensors
- Full Power Quality and Electrical Energy Analyzer Functionality
- Highest Safety Rating in Industry; 1000V Cat III / 600V Cat IV
- Calculates Mechanical Power and Efficiency without Mechanical Sensors, Just Connect to the Input Conductors
- Measures Electrical Power Parameters Such as Voltage, Current, Power, Apparent Power, Power Factor, Harmonic Distortion and Unbalance to Identify Characteristics that Impact Motor Efficiency
- Identify Power Quality Issues Such as Dips, Swells, Transients, Harmonics and Unbalance
- Uses Powerwave Data Capture to Capture Fast RMS Data, and Show Half-Cycle Averages and Waveforms to Characterize Electrical System Dynamics (Generator Start-ups, ups Switching etc.)
- Offers Waveform Capture Function to Capture 100/120 Cycles (50/60Hz) of Each Detected Event, in all Modes, without Set-up
- Uses Automatic Transient Mode to Capture Waveform Data at 200kS/s on All Phases Simultaneously up to 6kV
- Automatically Calculate Motor Derating According to NEMA/IEC Guidelines



## Fluke 435 SII

### Power Quality Analyzer

- Measures Three Phases with Neutral at 200kS/s on Each Channel Simultaneously
- Available from intellirent with a Wide Variety of Current Probes from 5A (for Monitoring Secondaries) to 5000A Flexible Current Probes
- Measures and Records:
  - Voltage (AC and DC) to 1000V
  - Current (AC and DC) to 5000A
  - Peak Voltage and Peak Current
  - Crest Factor
  - Frequency
  - Dips and Swells
  - Harmonics
  - Power and Energy
  - Flicker
  - Unbalance
- Interharmonics, Advanced Energy, Transient and Inrush are Available on Fluke 435 SII Model



## Fluke 43B

### Single Phase Power Quality Analyzer

- Measures and Trends Single Phase Voltage to 1kV, Current to 3000A, Frequency, Power Harmonics, Voltage Sags, Transients and Current Inrush
- Record Two Selectable Parameters for up to 16 Days
- Internal Measurement of 20 Parameters
- Provided by intellirent with FlukeView Software



## Fluke 345

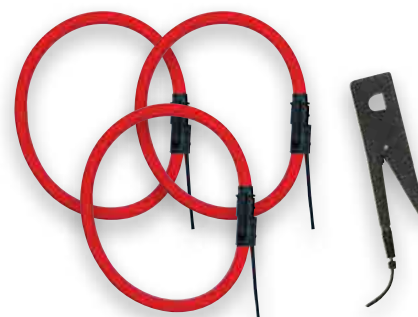
### Single Phase Power Quality Clamp On

- Combines Functionality of a Power Analyzer, Power Quality Recorder, Scope, Data Logger, Clamp On Ammeter and Current Probe into one Handheld Package
- Optimal for Troubleshooting Electrical Loads, VFDs, High Efficiency Lighting and Other Loads Using Switching Electronics
- Bright Color Display Shows Scope, Harmonics, Current, Voltage, Frequency, Power Factor and Power/Energy Values
- Inrush Capture
- Brief Load Studies



## Current Probes for Fluke 435/437/438 SII

Current Probe	Type	Range(s)		Jaw Opening
i200S	Rigid	Dual Range	100mA-24A, 500mA-200A	3/4"
i30S	Rigid	Single Range	30mA-20A	3/4"
i400S	Rigid	Dual Range	500mA-40A, 5A-400A	1 1/4"
i5S	Rigid	Single Range	5A-400A	Approx 5/8"
i5SPQ3	Rigid	Single Range	10mA-6A	Approx 5/8"
i6000S	Rigid	Three Range	6A-60A, 60A-600A, 600A - 600A	Approx 8"







## Fluke 190-204

### Four Channel, 200MHz Oscilloscope

- High Performance with Four Independent Floating and Isolated Inputs, Each up to 1000V
- Up to 5 GS/s Real Time Sampling
- 10,000 Points per Trace Recording/Waveform Capture
- Isolated USB Port for Direct Data Storage or Data Transfer
- Automatic Triggering on Fast, Slow and Complex Signals
- ScopeRecord Roll Mode Reads 30,000 Points per Input Channel for 60Hz Signal Analysis
- TrendPlot Paperless Recorder Mode with Deep Memory for Long-Term Automatic Measurements
- All Functions of a Standard Fluke Multimeter
- Accepts Inputs from Current Probes with a BNC Output



## Fluke 196

### Two Channel, 100MHz Oscilloscope

- Measures Current to 4000A and Voltage to 1kV at 200MHz
- High Resolution Color Display
- Sample Rate of 1 GS/s
- Divisions of 2mV – 100V
- ScopeRecord Mode Will Record 27,500 Points per Input
- Internal Memory of up to 15 Screens and Setups
- Provided by intellirent with FlukeView Scopemeter Software



## Fluke 123, 124 and 125

### Dual Input 40MHz Oscilloscope

- Measures Current to 400A and Voltage to 1kV at 40MHz
- High Resolution Monochrome Display
- Sample Rate of 25MS/s
- Divisions of 5mV – 500V
- Scope Record Mode Will Record 512 Min/Max Points per Input
- Internal Memory of up to 20 Screens and Setups
- Provided by intellirent with FlukeView Scopemeter Software

## Fluke 1748

### Three Phase Power Quality Logger

- Recording Functions: Voltage, Current, Power, Power Factor, Frequency; Energy Forward/Reverse; Peak Demand; THD; Voltage and Current Harmonics and Inter-Harmonics (to 50th); Flicker; Unbalance; Rapid Voltage Change Events; Dips, Swells, Interruption and Transient Events Tables; Mains Signaling; Inrush Current; Transients (Low Frequency)/ and Waveform Deviation Events
- Communication: Ethernet; USB (Mini B); WiFi Download Instrument to Device, with Two External USB Ports, Accommodates Wired and Wireless Connections for Setup and Highspeed Data Download
- Measure All Three Voltage and Current Phases Plus Neutral Current
- More than 20 Separate Logging Sessions can be Stored in Logger
- Meets IEC 61000-4-30 Class A Edition 3 Standard for Testing and Measurement Techniques and Power Quality Measurement Methods
- Auto-Correction Function Automatically Indicates Connection Errors via an Amber Light on Unit's Power Button, which Turns Green Once Corrected



## Fluke 1738

### Power Quality Logger

- Three Phase Power and Energy Consumption Analyzer
- Measures Three Phase Voltage, Current, Power, Harmonics, Dips, Swells, Inrush Current, Event Waveforms, and Captures High Resolution RMS Profiles
- Onboard Adapter Allows for the Measured Circuit to Power Unit
- Fluke Energy Analyze+ Software Enables Automatic Reporting, Customized Reporting, and Report Export Directly to MS Office



## Fluke 1735/1736

### Power Quality Loggers

- Record Power and Associated Parameters for up to 45 Days
- Monitor Maximum Power Demand Over User-Defined Averaging Periods
- Measure All Three Phases and Neutral with Included 4 Flexible Current Probes
- Compact, Rugged Design with IP65 Case, 600V Cat III
- View Graphs and Generate Reports with intellirent Included Power Log Software

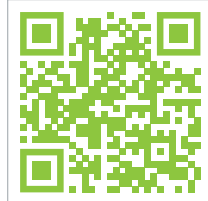


## Tech Tip

### Loose Connections

If you have taken a distribution panel offline for whatever reason, it is a good time to use one of the most important power quality tools, the screwdriver. Be sure to wear the proper safety equipment and to follow all necessary safety precautions. In most facilities, the current flows for only part of the day. Today, this current often contains heat-generating harmonic currents. The heating/cooling/heating/cooling cycle and the resulting expansion and contraction of the wires can cause the connections to loosen over time. This loosening increases the impedance of the connection, which further increases the heating effects. Tightening loose connections with a screwdriver can help reduce voltage drops and minimize the fire potential.

For additional tech tips try the [my intelliRent app](#) by scanning here



### Hioki 3169

#### Power Quality Analyzer

- Simultaneously Measure Demand and Harmonic Waveforms that Share the Same Voltage Line Over 4-Circuits
- Digital Sampling, PLL Synchronization or 50/60Hz Fixed Clock Measurement Methods
- V 150V to 600V AC, 3 Ranges, I 500mA to 5000A AC
- V, I, Active/ Reactive/ Apparent Power, Active/ Reactive Power Integration, Power Factor, Frequency, Harmonic Waveform Value (up to 40th Order)



### Hioki 3196

#### Power Quality Analyzer

- Measurements can be Taken from Single-Phase 2-Wire, Single-Phase 3-Wire, 3-Phase 3-Wire, or 3-Phase 4-Wire Lines
- Up to One Month of Continuous Measurement Data can be Recorded in Internal Memory
- The Ability to Instantly Display Details About Items Such as Monitored Waveforms Simply by Selecting them from an Event List Makes Analysis Easier
- 256 Points/Cycle for Sampling Frequency

## Hioki 3197

### Power Quality Analyzer

- Power Quality Analyzer Capable of Measuring and Recording Single-Phase or Three-Phase (2-, 3-, or 4-Wire) Circuits Consumption and Power Quality
- Internal Storage Allows for up to 125 Days of Monitoring Capabilities
- Quick Set Ability, Enables Default Values for Testing Parameters, Allowing for Reduced Setup Time
- Easily Transfer Data Between Unit and Laptop, with Supplied USB Cable, to the Graphical User Interface Software
- An Assortment of Current Probes are Available for Inclusion Ranging from 5000A to 100A
- Measures and Records the Power Consumption and Power Quality of Single-Phase or Three-Phase 2-, 3-, or 4-Wire Circuits for Installing and Maintaining Electrical Systems
- Measures Current; Voltage (Including Peak); Demand; Frequency; Power Factor; Displacement Power Factor; Harmonics and Harmonic Distortion; K Factor; and Active, Reactive, and Apparent Power
- Verifies Proper Wiring to Help Ensure Measurement Accuracy
- Meets EN Safety Standard 61010 and is Certified for Category III Installations up to 600V and Category IV up to 300V



## Hioki PW3198

### Power Quality Analyzer

- Measures Single-Phase 2 or 3 Wire, Three-Phase 3 or 4 Wire Power Plus One Extra Input Channel for Voltage, Current, or Power Measurement (AC or DC Measuring)
- Ideal for Measuring Power and Efficiency Between Input and Output on EV Rapid Chargers
- Up to 400Hz Line Measurement
- Ability to Measure Transient Voltages of up to 6000V in as Little to 0.5μs (2MS/S)
- Verify Power Problems in Accordance with the IEC61000-4-30 Class A Standard
- High Accuracy and Continuous Gapless Recording
- Cat IV 600V - Safe Enough for Incoming Power Lines
- Broadband Voltage Range Lets You Measure Even High-Order Harmonic Components of up to 80kHz
- Wide Dynamic Range from Low Voltages up to 1300V (3P4W Line-to-Line Voltage)

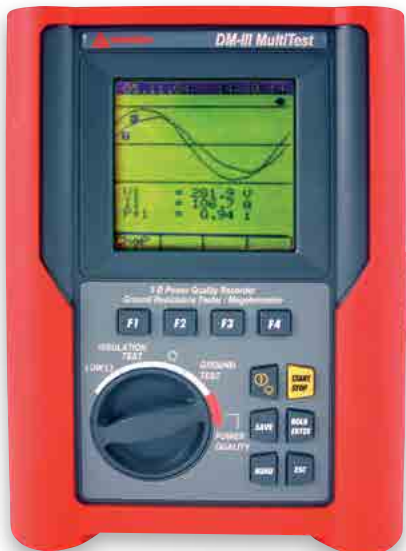




## AEMC 8336

### Power Quality Analyzer

- Hand Held Monitoring, Data and Waveform Capture for AC or DC Circuits up to 256 Samples/Cycle
- Large Color Display Includes Direct Access to Waveforms, Transients, Harmonic Bar Graphs, Events, Trend Recordings, and Power Statistics
- Large 8GB Removable Memory Card Enables Extended Recording of any Power Parameters, (Harmonics, Transients, Waveform Distortion, Crest Factors, Transformer K-Factor, Short/Long Flicker and Unbalance)
- Backup Battery Life of 13 Hours, 25 Hours in Record Mode
- Available from intellirent with a Wide Selection of Current Probes, from 1A (Rigid) up to 6500A (Flexible)
- Verification of Power Distribution Circuits and In-Plant Troubleshooting of Power Distribution Panels and Individual Machinery
- Monitors Pad Mount Transformers and Phase Unbalances
- Determine Harmonic Problems Originating from Source or Load
- Determine Transformer K-Factor
- Energy Metering (kVAh, VARh, kWh)



## Amprobe DM-III MultiTest

### Power Quality Analyzer

- Measures and Records Three Phase Power, Energy, Power Quality and Harmonics
- Measures Voltage to 600V, Current to 3000A with Included 3000A Flexible Current Probe, Peak Demand, Frequency and Power Factor
- Event Sampling Includes Sags, Surges, Harmonics (THD and Individual to 49th) Calculates kW, VAR, VA, and kWh
- Readings can be Viewed During the Recording, After the Recording is Complete on the LCD or After Downloading Into the Included Download Suite Software
- Charting and Exporting Recorded Results Is Simple and Convenient
- No Software Key or Registration Required
- Battery Backup Records for Six Hours
- Includes Phase Sequence Indicator, Ground Tester, and 1kV Megohmmeter
- USB Communications Facilitates Simplified Download
- Provided by intellirent with Download Suite Software for Graph and Table Generator or Export to MS Excel



## AEMC OX5042 Oscilloscope

### Two Channel Oscilloscope

- Hand Held, 2 Channel, 40MHz Oscilloscope
- Two Separate 8000- Count TRMS Digital Multimeters
- Built-in Dual Channel Harmonic Analyzer Out to the 31st Harmonic (Fundamental Between 40Hz and 450Hz)
- Color 3.5" TFT LCD 320 x 240 with Led Back-Lighting
- 2 MB of Storage are Available for Recording Data
- On All Channels: Auto, Triggered, One-Shot and Trigger Roll
- Powerful SX-Metro Software Allows for Real-Time Views of Traces, Importing Stored Traces, and Easy to Export Functions
- 2500 Acquisition Points per Channel Viewable on Screen or Stored to Internal Memory
- Intellirent Supplied MN251T (Rigid Current Probes) Allows for Current Readings from 0.5A to 240A



## AEMC PowerPad 8435

### Power Quality Analyzer

- Measurement Capabilities of 1000V RMS AC/DC, for up to Five-Wire Systems
- 32 GB SD-Card Memory Allows up to 50 Snapshots, 210 Captured Events, 1 Inrush, and 10,000 Alarm Events
- Voltage and Current Transient Detection Enabled
- Weatherproof, Rugged, and Portable
- Measurement of TRMS Voltages up to 1000V RMS AD/DC for Two-, Three-, Four- or Five-Wire Systems
- Measurement of TRMS Currents up to 6500A RMS (Sensor Dependent)
- Direct Measurement of Neutral Current and Voltage
- Frequency Measurement (40Hz to 70Hz Systems)
- Records and Displays Trend Data as Fast as Once per Second for One Month up to 25 Variables
- Captures up to 210 Transient Occurrences on All V and A Inputs
- Measures Harmonics (Referenced to the Fundamental or RMS Value) for Voltage, Current, or Power up to the 50th Harmonic





## Arbiter 928A

### Power System Multimeter

- Practical Hand-Held Power System Analyzer with .1% Precision
- Two Input Channels (Current or Voltage) for Comparison or Analysis of Power Quantity or Power Quality
- Measures Voltage and Current, Phase Angle (Phase Angle Difference) Frequency, Harmonics and Power/Energy Quantities
- Measures Harmonics, Flicker, Sags, Surges, and Interruption
- Bright LCD Displays Numeric Values or Scope
- Available from intellirent with a Variety of Current Probes



## Arbiter 929A or 931A

### Power System Analyzer

- Basic Accuracy of .05% of Reading and .05° of Phase for Full Three Phase Power Analysis Capability
- Long Life Battery (More than 8 Hour Continuous Run Time) and Smaller than a Lunch Box
- Bright, Easy to Read and Understand Graphical Display
- Store, Recall and Last Setup Functions
- Optically Isolated Series Interface
- Datalog to Internal Memory or Export by Serial with Real Time/ Date Stamps
- Measures Voltage and Current, Phase Angle, Frequency, Harmonics, Waveform and Power/Energy Values
- Onboard Timer for Event Comparison
- Available from intellirent with a Variety of Current Probes



## Yokogawa WT500

### Precision Power Analyzer

- Single and Three Phase Precision Power Analysis
- Basic Accuracy of .1% for Voltage Measurements up to 1000V (AC or DC), 40A and Measurement Bandwidth from DC to 100KHz for Full Harmonic Analysis
- Onboard USB Port for Communications or Direct Data Save to USB Drive
- Simple Setup and Operation
- Direct Current Input up to 40A or Use with Current Probes with mA/A Output
- Large FFT Displays Numerical Values, Scope or Menu Structure
- Display Forms for Waveform, Trend, Vector or Bar Graphs
- Simple Setup and Display of Efficiency



## Flex-Core 3PT3

### Three Phase 5kV PT

- 5kV:120V Delta Delta Connection
- Fused Input
- Provided by intellirent with Input Cable (40kV DC Wire) and Alligator Clips for 5kV Connections
- Terminal Output Connections
- 5.6kV Insulation Class, 60kV BIL Full Wave
- Approximately 45 lbs
- 60Hz Only
- Thermal Rating:
  - 350VA at 30°C
  - 225VA at 55°C
- UL Recognized
- For Indoor Use Only



## Flex-Core PTG5

### Single Phase 15kV PT

- 15kV:120V Single Phase PT
- Fused Input
- Provided by intellirent with Input Cable (40kV DC Wire) and Alligator Clips for 15kV Connections
- 15.5kV Insulation Class, 110kV BIL Full Wave
- Approximately 88 lbs
- 60Hz Only
- 0.3 WXYZ, 1.2ZZ at 100% rated voltage with 120V based ANSI burden
- 0.3 WXYZ, 1.2Z at 58% rated voltage with 69.3V based ANSI burden
- Thermal Rating:
  - 1500VA at 30°C
  - 1000VA at 55°C
- For Indoor Use Only





## CHK Miro PQ45

Power Quality Analyzer (600V or 1000V)

- Portable, Rugged, and Precise Power Quality Analyzer
- Ease of Use Software, Enables User to Execute Studies within Minutes
- Onboard 8GB Memory, with Software Identifying Memory Usage Before Recording is Set
- Auto Powered by Phase A Voltage (600V Unit Only), 5 Minute Battery Backup, External DC Supply Provided
- 600V and 1000V Capable Units Available for Different Applications
- Auto Identifying and Scaling Current Probes
- Ability to Log All Parameters Every 200 Milliseconds
- Suitable for Outdoor Use

## Tech Tip

### Causes of Transients

Transients are very short duration disturbances, less than 1/4 cycle of power frequency and, more often, measured in microseconds. They used to be referred to as impulses, surges, spikes, or glitches. But those terms can have ambiguous meanings, so the term "transient" was adopted by the IEEE and other standards groups.

Common causes of voltage transients are power factor capacitor banks being switched on or off, lightning striking a conductor or adjacent to a conductor, arcing from a phase conductor coming in contact with some sort of ground potential (such as a tree), and the notches resulting from the commutation period of the SCRs on rectified input 3 phase power supplies (such as in ASDs).

Possible effects of transients include data corruption on memory devices, equipment damage, data transmission errors, intermittent equipment operation, reduced equipment life, and irreproducible problems. Transients are often "sneaky", in that they happen very quickly and randomly, and many power quality monitors will not capture them, especially the higher frequency transients.

## Astromed TMX

### 18 Channel Data Acquisition System

- 18 Channel Data Acquisition System
- Optimal for Load Step Tests, Generator and UPS Commissioning
- Record Any Input Signal at User Defined Sample Rates Up to 800KHz
- Monitors AC or DC Voltage Directly to 1kV, or Precision Analysis at mV Levels
- Available from intellirent with Input Accessories to Monitor Any Current or High Voltage
- User Defined Triggers Based on Signal Thresholds, Windows or Slew
- Trend Recording with Time Based Triggers
- Massive Internal Hard Drive Captures Long Recording Sessions at High Speed
- Derived Channels for Mathematical Comparisons of Input Values
- 17" Touchscreen Display Permits Real Time Data (with Signal Traces and Meters), Review of Previously Recorded Data, Scope Mode, Configuration or Windows Interface
- All Standard Computer Interfaces for Data Transfer
- Available from intellirent with Mouse and Keyboard
- Provided by intellirent Configured for Your Application and with Over-the-Phone Training Before and During the Project to Support Field Personnel
- Accepts Three Input Modules of Six Analog Signals Each
- Accepts GPS Input for Time Synch
- Video, Audio, Digital, GPS and IRIG Inputs Recorded
- Daisy Chain TMX Units Together for 96 Contemporaneous Channel Recordings



## Astromed TMX Input Modules

### UNIV-6

- 6 Channels of 250V AC or DC
- Sample rate up to 800KHz
- Attenuation of 200mV FS to 800V FS
- Bridge Input 5mV FS to 2V FS

### IHVM-6

- 6 Channels of 600V AC or 1kV DC
- Sample rate up to 800KHz
- Attenuation of 1V FS to 2000V FS

### TMR-IR

- Adds GPS Time and Location Synchronization to TMX Recorded Data
- Enables Synchronization with External Metering
- Provided by intellirent with a Power Supply and 50' Antenna Cable





## Solmetric PVA-1000 and PVA-1500

### I-V Curve Tracer

- Designed for I-V Curve Analysis on Multiple Solar Arrays
- Measures and Displays I-V and P-V Curves and Key Parameter Values
- Advanced Built-in PV Models Provide Immediate PV Performance Checking
- Database of More than 70,000 Modules, with Automatic Updates
- Automates Data Management, Analysis, and Reporting
- Measures String-After-String, Combiner-After-Combiner, without Overheating or Slowing Down Your Measurements
- Preconfigured Laptop Included with Your Rental, Easy to use Software, with Wireless Interface for Safety and Mobility
- Accurately Measures High-Efficiency Modules and Strings
- Select the Appropriate Model, 1,000 or 1,500 for Proper Voltage Requirement
- High Thermal Capacity: >800 Measurements at 25°C Ambient, 250 Measurements at 45°C Ambient, in Example PV System with 1300V VOC, 16 Strings per Combiner Box, and 5 Minutes to Move to Next Combiner Box
- Clear, Colorful, Touch-Capable Software Runs on Your Tablet or Notebook PC, Providing Rich Insight into PV Performance



## Seaward Solar Utility Pro PV String Checker

- Large Display Designed for Reading in Direct Sunlight
- 1500V / 40A Rated
- Direct MC4 Connections, with the Option to Add a Conversion Lead Set for Safer Connections in Combiner Boxes
- Simple Single Button Test
- Rugged Case Designed for Continuous Site Work
- Store up to 999 Complete Record Sets
- CSV Output to PC to Review Data
- Pairs to Solar Survey 200R Irradiance Meter to Capture the Irradiance and Temperature Measurements at the Time to Test (Single Person Testing)
- Test Multiple Strings in Parallel
- Test Open Circuit Voltage (VOC), Short Circuit Current (Isc), Irradiance (W/m2), Ambient Temperature and More



## Seaward PV210 Kit

### I-V Curve Tracer

- Measures PV String Open Circuit and Maximum Power Point Voltage up to 1000V DC
- Performs All-in-One Commissioning Tests and I-V Curve Tracing with Automatic Fill Factor Calculation
- Ground (Earth) Continuity Measurement with Test Lead Null
- Memory for up to 999 Records with USB Download to PC
- Instant NFC Data Transfer using the PV Mobile App
- Simple Push Button Operation Making it an Efficient and Versatile Tester for PV Systems
- Stores 999 Datasets and Once Downloaded to the Solarcert Software, Comparison to the Standard Test Conditions can be Made
- Measures Ground (Earth) Continuity, Open Circuit Voltage, Short Circuit Current, Maximum Power Point Voltage, Current and Power (with AC/DC Clamp)
- Provides Fill Factor of the PV Module or System Under Test

## HT Instruments I-V500w

### I-V Curve Tracer



- DC String Tester with an I-V Curve Tracer, up to 1,500V DC
- Carries Out All IEC62446 Commissioning Tests
- 3 Selectable Test Modes
- IEC62446 Tests Just the I-V Curve Trace
- IEC62446 and I-V Curve Trace in One Test (Takes Around 10 Seconds Per String)
- 999 Test Memory to Download to Solarcert Elements V2 Software
- Separate Insulation Resistance Test Included in a One-Button Auto Sequence Test
- Highly Portable
- All in One Solar PV Tester
- Custom Management of Internal PV Module Database, 30 Internal/ 30,000 on Software/App
- Temperature Measurement of Cell and Environment
- Summary Table of Main Electric Parameters
- Measurement of Irradiation with Reference Cell

## Tech Tip

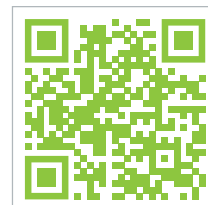
### What is I-V Curve Tracing?

If using a digital multimeter is like measuring a patient's blood pressure and heart rhythm, using an I-V curve tracer is like administering an MRI. Rather than being EMTs responding to an emergency, we should be physicians helping to keep our patients healthy through preventative maintenance and regular screening.

While it is possible for technicians in the field to get a basic snapshot of system performance and diagnose many field failures using affordable and widely available tools like digital multimeters and clamp meters, I-V curve tracers have two unique advantages. First, I-V curve tracers make it easier and safer to take Isc measurements. Second, curve tracers can reveal what happens to an array under load. The four key measurements that can be performed with a digital multimeter (Voc, Vmp, Imp, Isc) are inadequate if we want to get a picture of how the PV system responds to a varying load. Without disassembling an array, it can be difficult to determine if a perceived problem is just a function of varying environmental conditions, a single bypass diode that has failed, or high resistance in a corroded connector.

The stakeholders in newly built systems want to verify that all the PV modules are of consistent quality, that they were not damaged during shipment or assembly, and that the array is producing at the contracted capacity. These stakeholders would also like a permanent record of the as-built system performance, a benchmark for comparison as arrays age and degrade—particularly in cases where warranty negotiations are required.

For additional tech tips try the [my intellirent app](#) by scanning here



### Additional Equipment Solutions for Solar Array Commissioning:



- Fluke 1587 for Insulation Resistance Testing, See Page 53



- AEMC PEL-103 for Power Data Logging, See Page 6

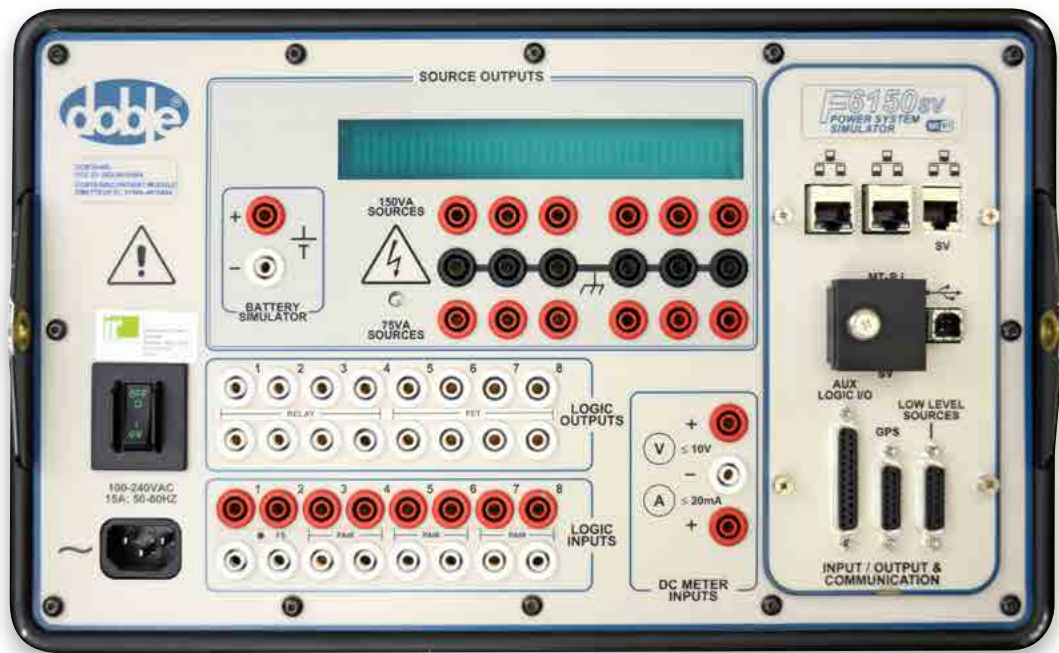


- Miro CHK PQ45 for Power Quality/Harmonic Analysis, See Page 3



- AEMC 6474 for Ground Testing, See Page 141





## Doble F6150SV

### Full Function Three Phase Relay Test System

- Fully Automated Testing Through Protest Test Plans
- Simple, Manual Testing Through Control Panel Software
- F6150SV Model is Optimized for Testing IEC 61850 Based Protection Devices (GOOSE Protocol) at the Process-Bus Level and Station-Bus Level Using Sampled Values and GOOSE Messages
- Both F6150e and F6150SV Models Include WiFi
- Provided by intellirent with a Preconfigured Laptop Computer or Doble DUC with Appropriate Leads and Connections for Most Relay Testing Applications
- Standard Configuration Includes Three 300V AC Outputs and Three 30A Outputs Simultaneously
- Software Adjustment Permits a Variety of Other Configurations, Including Four Voltages and Four Currents, A Single Current at 675VA and Much More
- Variable Phase Angle, Frequency Generation, Phase Shifting and Onboard DC
- Suitable for Testing 0.2 Class Metering CTs and Transducers
- Source for Energizing Relays Before Control Power is Available
- Includes Doble Transwin Software for Comtrade Config File (.cfg) Playback
- Optional Satellite Antenna Provides for End-to-End Testing
- Optional F6051 Component Enables End-to-End Testing with Access to Station Time Clocks
- Optional Doble F6300 Increases Current Output and Quantity of Channels

## Doble F6895

### GPS Antenna for Doble F6150

- Enables End-to-End Testing Between F6150 Instruments
- Note: F6150 Must be Configured with F6885 Option
- Provided by intellirent with a Power Supply and a 100' Cable



## Doble F6051

### IRIG-B Protocol Converter for Doble F6150

- Enables End-to-End Testing When GPS Access is Limited by Physical Constraints or CIP Compliance Concerns
- Suitable for Locations Where IRIG-B Source is Available
- Note: F6150 Instrument Must be Configured with F6885 Option
- Compact and Simple to Configure



## Doble RTS 7

### Dongle for Relay Test Software

- Works with Tests Sets from Doble, Manta, ISA, Megger, Omicron and SMC
- Includes Over 600 Test Routines for Popular Relay Models
- Automated Settings Import, Supporting Popular Relay Models
- Automatic Compensation of Applied Settings within Test Actions and Pass/Fail Tolerances for Automated Assessment
- Sequence Component Line Modeling for Automatic Impedance-Based Fault Calculations
- COMTRADE Playback, SS1 File Importing/Playback, Multi-Sequence State Editing, Time-Compensated End-to-End Testing Supporting Multi-Vendor Test Sets
- Technical Support for RTS Rental Available from intellirent at no Additional Charge





## Omicron CMC-356

### Three Phase Relay Test System

- High Versatility and Functionality for All Generations and Types of Protective Relays, Including High Burden Electromechanical Relays
- Standard Configuration Includes Six Current Outputs (in Three Phase Mode, 64A/860VA per Channel or One Channel at 128A/1000VA) for Maximum Flexibility and Range of Applications
- Three Phase Voltage Outputs, and Separate Single Phase Voltage to Accommodate Sync Check Functions
- 10 Binary Inputs, Configurable for Potential Free, or Voltage Wetted up to 300V
- 4 Binary Outputs for Breaker Simulation, or Logic Testing
- Optional GPS or IRIG-B Accessories for End-to-End Testing
- Simulates Transient Faults, Power Swing, CT Saturation, CB or Rogowski Coil Simulation
- Transient Playback Through Comtrade, PL4 (EMTP), etc.
- Binary Inputs Convert to 10 Channel Recorder for Typical Power Values, Transients, Trend Recordings and Harmonic Analysis with Enerlyzer Option
- Provided by intellirent with a Laptop Preconfigured with Test Universe Software for Automated Testing or CMControl for Manual Testing
- Laptop Also Contains Complete Library of Protection Test Templates From Omicron
- Lightweight (37 lbs) and Easily Transported in Ruggedized Case

## Omicron CMC-310

### Three Phase Relay Test System

- Designed for Basic Three Phase Testing of Protection Devices and Meters
- Controlled by the Simple and Intuitive Touchscreen CMControl Front Panel or CMControl P Software on a Windows PC or Android Tablet
- Onboard DC Source Voltage
- Three Voltage Outputs at 300V or One at 600V
- Three Current Outputs at 32A/430VA Per Channel or One Channel at 64A/870VA
- Optimized for Quick Manual Testing and Shooting Loops
- Permits Checking SCADA Annunciations and Measurement Values
- Permits Testing of Watthour Metering with a Radian Standard
- CT/VT Polarity or Wiring Checks
- Lightweight and Compact Design
- Reliable and Economical Solution
- Provided by intellirent Complete with a CMControl Panel and Comprehensive Lead Set



## Omicron CMIRIG-B

### IRIG-B Protocol Converter

- Enables End to End Testing When GPS Access is Limited by Physical Constraints or CIP Compliance Concerns
- Suitable for Locations Where IRIG-G Source Is Available or Two CMC Instruments Are in Close Proximity
- Enables Master/Slave Functionality Between Two CMC Instruments
- Suitable for Testing Wide Area Protection with IRIG-B Functionality Using the IRIG-B Time Protocol Generated by the CMC Instrument



## Omicron CMGPS

### GPS Antenna for Omicron CMC Instruments

- Enables Synchronization of Time Bases in CMC Instruments or DANE0 400 Test Set
- Suitable for End-to-End Testing Between Two CMC Instruments
- Provided by intellirent with a 100' Cable





## Manta MTS-5100/MTS-5000

### Three Phase Relay Test System

- Direct Front Panel Interface for All Functions
- Lightweight and Portable Design
- Automatic Reporting with No External Software or PC Required
- Operation with or without PC
- Compatible with Enoserv RTS Keys
- Steady State Testing
- Dynamic Testing
- Transient Waveform Testing
- Intuitive All-in-One Design, No Options Required
- High VA Output
- Six AC/DC Current Outputs
- Four AC/DC Voltage Outputs
- 12 Contact (0-250V) Inputs
- 4 Contact Outputs
- Transducer Voltage/Input
- \*Onboard Memory and External USB Memory Drive
- \*GPS Synchronized Testing for End-to-End Applications
- \*IEEE 61850

\*5100 only



## Doble F8300

### Multi-Phase Modular Relay Test System

- Differential Testing with 3 Phases of 300V L-N and 6 Currents
- Generation Station Testing with 4 Phases of 150V L-N
- Robust Transmission Scheme Testing and Transformer Differential with 4 Phases of 150V L-N, 8 Programmable Logic I/O, 6 Currents
- Ph-Ph Transformer Protection Testing with 12 Logic I/O, 4 Voltages at 150V, 4 Currents
- Transformer Differential Testing with 4 Phase at 150V for Testing Transmission Protection
- Analog and Digital Testing Combined in Single-Phase and Three-Phase Instruments
- Configurations of Chassis and Voltage, Current and Logic I/O Modules for a Range of Test Applications
- Innovative Color-Programmable LED Light Rings for Visual Recognition of Sources and Logic
- Embedded Time Protocol and Network Synchronization Functions
- Ethernet, USB, IRIG-B and Optical Fiber Connectivity
- IEC 61850-Compliant IED and Network Communications
- Easy Pairing and Networking with Other F8000 Instruments
- Rugged Protective Bumpers for Field Use or Mounting Brackets for Installing in 19" Racks
- Seamless Compatibility with Existing Protection Suite v5 and RTS v7 Test Procedures



## Megger SMRT46D

### Multi-Phase Relay Test System

- Integrated Smart Touch View Interface Provides Stand-Alone Operation using Intuitive High Resolution Graphic Touchscreen, No PC Required to Operate
- 4 Voltage Channels, 0-300V AC/DC, 3 Current Channels, with Convertible Voltage Channels Provides 1 Voltage and 6 Currents
- High Current Output - 60 Amps At 300VA per Phase
- Convertible Voltage Channels – 15 Amps at 120VA
- Dynamic, Transient and GPS Satellite Synchronized End-to-End Testing Capability
- IEC 61850 Testing Capability
- 10 Binary Inputs Suitable for Sensing Dry Contacts, or Voltage Rated to 300V AC/DC
- 6 Independent Binary Outputs, Galvanically Isolated for Breaker Simulation or Logic Testing
- Suitable for Both Electromechanical and Digital Relay Testing



## Tech Tip

### Testing Multi-Phase Relays

For the proper testing of multi-phase IEDs, it is essential to provide a multi-phase source of voltage and current. Testing a multi-phase protective element with a single-phase source can lead to false assessment. Some calculations of fault values rely on measured values from a non-faulted phase. Typically, all possible faults should be simulated for each protective element. All utilized CT and PT inputs must be taken into consideration during the testing process. Additionally, all binary inputs and outputs utilized by the IED must be accounted for in the test equipment because it is equally important to test all logic associated with the IED's operation.

For additional tech tips try the **my intellirent** app by scanning here



**my**  
intellirent



## Megger SMRT36

### Three Phase Relay Test System

- Three Convertible Channels (300V or 15A) and Three 60A Channels
- 10 Binary Inputs and 6 Binary Outputs
- Bluetooth, USB or Ethernet Communication Between SMRT36 and Computer
- Optional Chaining SMRT36 Units Together for Up to 24 Outputs
- Megger's Smart Touch View Interface (STVI) Provides Simple Touchscreen Graphical Interface for Testing Most Relays
- Real Time Display of Phasor and Values
- Variable Battery Simulator
- High Current Output Suitable for Modern and Electromechanical Applications
- Complex Impedance Testing Simplified with Built-in Relay Library
- Onboard Storage of Test Results in PowerDB Format or Immediate Export to Optional Computer Controller
- Compact and Lightweight (26 lbs)



## Megger SMRT410

### Multi-Phase Relay Test System

- Six Current Channels at 60A per Phase
- IEC 61850 Testing Capability
- Integrated Smart Touch View Interface
- Multi-Colored Graphics with Intuitive Navigation
- Stand-Alone Operation, No PC Required to Operate
- High Current Output - 60A at 300VA per Phase
- Flexible Output Design Provides up to 10 Currents
- Dynamic, Transient and GPS Satellite Synchronized End-to-End Testing Capability
- Suitable VA for Electromechanical Relays
- Four Voltage Channels up to 300V at 150VA, Convertible to Currents 15A at 120VA per Phase
- Wireless Control via Bluetooth





## Omicron ARCO 400

### Universal Recloser Test Set

- Easy Testing Solution for Any Recloser Control
- Smart Connect for Recognizing Recloser Specific Adapter Cables
- Compact and Lightweight for Easy Transportation
- Rugged Design for Use in Harsh Weather Conditions
- Easy-to-Use Software Requires no Special Training
- Guided Testing Workflow Reduces Test Time
- Creation of Test Plans and Pre-Defined Test Values
- Application of Standardized Testing Procedures
- GPS Synchronized Automated Distribution Scheme Test
- Creates Detailed Test Reports for Documentation Purposes
- Supplied with All Required Adapter Cables from intellirent



## Cooper Power Systems (Eaton) KVFI

### Cooper/Eaton Pad Mounted VFI Switchgear

- Designed to be Used with Cooper Power Systems/Eaton Pad-Mounted VFI Switchgear
- Simulates Fault Current for Verification of Minimum Trip Values and Time Current Characteristics of Tri-Phase and TPG Electronic Control boards
- Onboard Flux-Shift Trippers Enable Self-Checking of the VFI Tester
- Performs Minimum-Trip Tests, Time Current Curve Characteristic Tests, Control Operation Test, Instantaneous Trip Test, Battery and Flux-Shift Tests
- Includes Time-Current Curve Characteristics Modifier
- Limited Testing of SCADA Accessory Board Functions Including Verification of the Minimum Trip Multiplier Function and Inrush Restraint Feature



## Cooper Power Systems (Eaton) METK1

### MET Recloser Controller Tester

- Ideal for Testing ME Form 2, Form 3, Form 3A, Form 4A, Form 4C, Form 4D, Form 5, Form 6, Type FX, Type FXA, and FXB Controls
- Self-Contained and Ruggedized Unit
- Verifies Operation of the Electronic Recloser Control
- Verifies Electrical Operation of the Recloser
- Note: Power Must be Available for the Recloser for Electrical Operation
- Recloser Simulator Circuit Indicates Operation with LEDs and Simulates Response Time of the Recloser Mechanism to Trip and Close Signals



## Cooper Power Systems (Eaton) KMET45811

### KMET Triple/Single Adaptor

- Adapts KMET1 Test Set to Triple/Single Control
- Provided by intellirent at No Rental Charge with the KMET1
- Provides Visual Open/Close Indication Independently Per Phase
- Amphenol Plugs Simplify Connections



## Cooper Power Systems (Eaton) DC Nova

### 14 Pin to 19 Pin Adaptor

- Adapts KMET1 Test Set to DC Nova Control
- Provided by intellirent at No Rental Charge with the KMET1
- Amphenol Plugs Simplify Connections



## Components and Accessories for Relay Testing Applications Available from intellirent

intellirent supports the entire testing application. For relays and other protective devices, this is particularly important because these devices have become increasingly complex and require more than just the test equipment to properly communicate, test and calibrate the device.

Manufacturer	Model	Description
ABB	1355D32G04	14 Position Test Jack
ABB	1164046	10 Position Test Jack
Altek	942	Frequency Calibrator
Doble	F6895	GPS Antenna for Doble F6150
Doble	F6051	IRIG-B Protocol Converter for Doble F6150
Doble	F2010	Mini Controller for F2000 Series Frequency Adjustment
Doble	F6300	Amplifier/Booster for F6150 Instruments (Adds 6 x Convertible I/E Channels)
GE	12XLA12A1	10 Position Test Jack
GE	F485	Communications Converter for RS-232, RS-485 and Fiber Optic Signals
GE	12XLA13A1	10 Position Test Jack
IET Labs	RS-200	Wide Range Decade Box to Simulate Relay RTD Inputs
Omicron	CMGPS	GPS Antenna and Power Supply for CMC Instruments
Omicron	CMIRIG-B	IRIG-B Time Protocol Converter for CMC Instruments
Omicron	CMA-156	Amplifier/Booster for CMC Instruments (Adds 6 x I Channels)
Omicron	CMS-156	Amplifier/Booster for CMC Instruments (Adds 3 x I and 3 x E Channels)
Prime Technology	7010T	Decade Box to Simulate Relay RTD Inputs
Programma	TM-200	Digital Event Timer
Schweitzer	SEL-4520	Arc-Flash Simulator
Schweitzer	SEL-4388	Mirrored Bits Tester
States	V1TP10	10 Position Test Jack
States	FTP14	14 Position Test Jack
States	150LF	Current Duckbill/Current Thief



## ETI 616001

### Automatic Network Protector Test System

- Capable of Testing Network Protectors with MNPR, Microprocessor, Solid State or Electromechanical Relays
- User Friendly Push Button Interface
- Encoder Knob Simplifies Adjustments of Test Parameters and Settings
- Tests Can be Run in Either Manual or Hands-Off Mode
- Electronically Synthesized Waveform Generation
- Detachable 20' Test Leads
- Capable of Reading and Programming Settings on ETI MNPR
- Electronic Storage of Test Results for Later Review
- Three Phase 120/208V or 277/480V Three Phase Input
- Simple Firmware Updates



## ETI 616004

### Variable Transformer

- Seamless Integration with ETI 616001
- Adds Manual Control Functionality to 616001
- Provided as a Kit with the 616001
- Input Voltage: 125/216V AC  $\pm 10\%$  Or 277/480V AC  $\pm 10\%$ , 60Hz, 3 Phase Wye
- Output Voltage:
  - Adjustable from 0 to 300V AC (Line to Neutral) on 216V Input Setting
  - Adjustable from 0 to 277V AC (Line to Neutral) on 480V Input Setting
- Output Rating: 7.3KVA
- The Variac Box is Protected from Damage Caused by Rain or High Humidity
- The Variac Box is Not Submersible



## Megger NTS-300

### Network Protector Test System

- Self-Contained Two Piece Test System for GE and Westinghouse Secondary Network Protectors
- Permits Overall Close Test, Overall Trip Test and Mechanism Test
- Verifies Operating Characteristics at Reduced Voltages in Accordance with NEMA Standards
- Permits Reverse Current Trip Test and Overvoltage Close Test on Master Relay
- Permits Time-Delay Test and Instantaneous Pickup Test on Desensitizing Relay
- Suitable for use on 216V and 480V systems
- High Current Output Permits Testing of High Instantaneous Settings and Verification of Trip Characteristics at 120° and 240°
- 0, 10 and 60° Phasing Angles
- Auto Ranging, Solid-State, Digital Meters
- Portable Two Piece Design Permits Entry into Manholes
- Equivalent to the Cutler-Hammer/Eaton and Older Style Westinghouse Network Protector Tester System





## PowerComm PCA-4125

### All-in-One Power Communications Analyzer

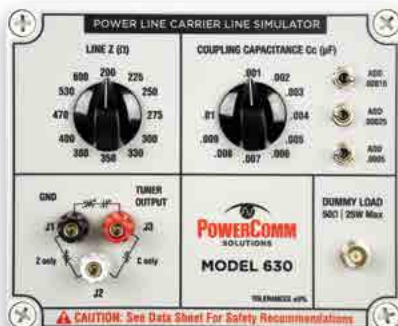
- Single Unit with all Power Communications Functions:
  - Selective Level Meter
  - Signal Generator
  - Impedance Meter
  - VSWR and LCR Meter
  - Frequency Response Analyzer
  - Oscilloscope
- Field Ready and Complete with Fittings and Accessories
- Save, Recall and Download Field Test Setups and Results
- Provided by intellirent with Power Line Carrier Simulator and Complete Adaptor/Connector Set at No Additional Rental Cost



## PowerComm 470

### Coax Adaptor and Connector Kit

- Designed for the System Protection Engineer Responsible for the Alignment and Maintenance of Power Line Carrier Systems
- Includes All Coax Series Fittings, Couplers and Adaptors Required for Connecting PowerComm PCA-4125 to System Equipment
- Includes a Trimmer Tool for Making Adjustments
- Provided by intellirent in a Form Fitted Carrying Case to Ensure Each Component is Included



## PowerComm 630

### Power Line Carrier Line Simulator

- Provides an Easy Method for Pre-Tuning and Troubleshooting Line Tuners
- Simulates Coupling Capacitor Values and Characteristic Line Impedance
- Adjustable Line Impedance at Typical Settings on Most Line Tuner Impedance Matching Transformers
- Adjustable Coupling Capacitance of Almost Any CCVT Using a 10 Position Rotary Switch
- Onboard 50Ω 25W Non-Inductive Dummy Load Accessible by a Standard BNC Female Connector



## PowerComm 560

### Power Line Carrier Application Simulator

- Verifies Instrumentation Settings and Connections
- Simple Hardware Interface Simulates Common Power Line Carrier Applications
- Validates Test Instrumentation Settings and Connections
- Ensures Measures are Taken Correctly



## Schweitzer SEL-4520

### Arc-Flash Test Module

- Provides a Convenient Way to Test the Operation of Arc-Flash Detection Relays Installed in Metal-Clad and Metal-Enclosed Switchgear
- Specifically Designed for the SEL-751 and SEL-751A Feeder Protection Relays
- Suitable for Use with Any Relay or Protective System that Uses Light and Over Current to Sense an Arc Flash Event
- Simple Push Button Operation
- Rugged and Reliable



## Schweitzer SEL-4388

### Mirrored Bits Tester

- Push Buttons Simulate Inputs to Force Transmit Mirrored Bits for Testing Communications Links
- Reduces Commissioning and Maintenance Time
- Automatically Detects and Displays SEL Mirrored Bits Information, Addresses and Data Rate
- Easily Identifies Cable Usage



## Prime Technology 7010T

### RTD Substitution Box

- Real Four Wire Substitution of RTDs at 0.01% Accuracy
- Six Decades for Precision Adjustment
- 10 to 111.110Ω
- Two, Three or Four Wire Connections



## Programma (Megger) TM-200

### Digital Event Timer

- Precise and Reliable Event Timer for a Wide Range of Applications
- Start and Stop Timer Based on Voltage On-Off or Off-On or Contact Open-Close or Close-Open
- Suitable for Basic Breaker Timing Applications
- Suitable Voltage Signal to 275V DC or 250V AC
- Rugged and Simple





## Megger Torkel 950

Variable DC Voltage Load Bank

- Complete Stand-Alone Discharge Test System
- Batteries Can be Tested in Service
- Dynamic Discharge Technology – Full Power at All Voltages
- High Discharge Capacity Allows for Shorter Test Times
- Real Time Monitoring During Test
- Max Current 220A, Voltage 500V DC
- BVM Cell Monitor Control Integrated in the System
- Safety in All Details, i.e. Detection of Blocked Airflow
- All Values are Stored and are Easily Transferred via USB-Stick to a PC for Evaluation
- Quick Report for Pass/Fail Analysis

## Megger Torkel 930

### Variable DC Voltage Load Bank

- Complete Stand-Alone Discharge Test System
- Batteries Can be Tested in Service
- Dynamic Discharge Technology – Full Power at All Voltages
- High Discharge Capacity Allows for Shorter Test Times
- Real Time Monitoring During Test
- Max Current 220A, Voltage 330V DC
- BVM Cell Monitor Control integrated in the System
- Safety in All Details, i.e. Detection of Blocked Airflow
- All Values are Stored and are Easily Transferred via USB-Stick to a PC for Evaluation
- Quick Report for Pass/Fail Analysis



## Megger Torkel 860

### Variable DC Voltage Load Bank

- Ideal for Battery Discharge Analysis in Switchgear Batteries and Similar Applications in accordance with IEEE Standards
- Provided by intellirent as a Complete System with Megger BVM600; all Required Cabling and Current Probes, and a Preconfigured Laptop Computer with PowerDB
- Enables Batteries to be Tested in Service
- User Adjustable Voltage for 12V to 250V Applications
- Single Unit Loads to 110A, Expandable with Additional Torkel 860s or Torkel TXL870s
- Combine with Other Load Bank Systems with the Megger XA-12990 Current Probe for Total Load Monitoring and Trending
- User Adjustable Alarms and Shutdown Points to Avoid Excessive Discharge
- Easily Expanded to Larger Battery Banks using TXL 870 Loads Banks, Available from intellirent
- View Data in Real Time and Provides Comprehensive Reporting and Trending through PowerDB





## Megger TXL 890

### Auxiliary Load for Torkel Series

- Extra Load Unit for Torkel Battery Test Systems
- Provides Higher Load Currents for Use in Constant Current or Constant Power Tests
- TXL Extra Loads are Connected Directly to the Battery, and Torkel Measures the Total Current Using a Clamp-on Ammeter
- Discharging Process Controlled by a Torkel Unit
- Connect Directly to the Battery Under Test
- Together, Torkel and the TXL Extra Loads Form a System that Can Discharge Batteries with Currents of up to Several kA
- Built-in Protection System Against Over-Heating and Malfunctioning Cooling Fans
- Designed for Use with Megger Torkel Battery Load Testers



## Megger TXL 870

### Auxiliary Load for Torkel Series

- Provides Higher Load Currents to Expand Capacity of Torkel 860 System
- Connects in Parallel with Other Torkel Systems or Other Load Banks Directly to Batteries being Tested
- Discharging Process Controlled by a Torkel Unit
- Connect Directly to the Battery Under Test
- Integrates with Automation Provided by Torkel 860, PowerDB Software and Megger BVM
- Built-in Protection System Against Over-Heating and Malfunctioning Cooling Fans

## Megger BVM-300/BVM-600

### Individual Battery Voltage Dataloggers

- Automates Battery Discharge Analysis Applications
- Quick and Intuitive Setup and Configuration
- Auto Discovery Feature Determines Quantity of Batteries and System Configuration
- Meets NERC and FERC Regulations, IEEE and IEC Requirements
- Daisy-Chain Design Allows Expandability Up to 120 Batteries
- Standard BVM-600 System includes 61 Single Battery Dataloggers
- Integrates with TorkelWin or PowerDB Software for Viewing Real-Time Data or Comprehensive Trending and Reporting
- Wide Voltage Range of 0-5V or 0-20V DC per BVM
- Each Unit is Identical, Eliminating Complex Battery Connection Charts and Connecting Multiple Leads to individual Battery Terminals
- Units Connect to Each Other Using CAT 5 Jumpers for Simplified Connections



## Megger XA-12990

### Current Probe for Torkel Systems

- DC Clamp-on Ammeter, 1000A/1V DC and 2x5m Cable
- 200A and 1000A DC Current Probe Suitable for Use with Torkel Systems
- Measures Current Outside Torkel System for Cumulative Current Recording
- Integrates with Alarm Parameters to Mitigate Over-Discharge





## DV Power BLU360V

### BLU Series Battery Load Unit

- Lightweight – 45.5 lbs
- Powerful – Discharge Power up to 28.4kW
- Battery Voltage: 6 to 480V DC
- Discharge Current – up to 160A DC
- Battery Internal Resistance Measurement According to IEC 60896
- Expandable Range for Larger Banks Using BXL-V Extra Load Units
- Current Measurement Range Using Current Clamp 0A – 1000A DC
- User – Adjustable Alarm and Shutdown Parameters to Prevent Excessive Discharge
- Testing without Disconnecting the Regular Load
- Detailed Test Analysis Using DV-B Win Software
- Test Resume Feature in Case of Interrupted Power Supply



## DV Power BXL-V

### Extra Battery Load Unit for BLU Series

- Used in a System with BLU Device to Increase Load Capacity
- Lightweight, 28 lbs without Accessories
- Discharge Power of up to 32.4kW
- Voltage Measurement Range: up to 500V DC
- Discharge Current up to 310A DC
- Measurement Resolution – Current 1A, Voltage 1V
- Discharge Process Controlled by BLU Device
- Connects to Battery Terminals and Parallel to BLU Device



## DV Power BVS

### Individual Battery Voltage Dataloggers

- Automated String and Cell Voltage, String Current and Ambient Temperature and Cell Temperature Measurements During Capacity Tests
- Detection and Notification of Failing Cells
- Real Time Cell Condition Assessment by Monitoring and Recording Cell Voltages from the Set Modules During a Battery Capacity (Discharge) Testing as Well as Charging Procedure
- Cell Voltage
- Intercell Connection Voltage
- Reliable and Easy to Operate
- Detailed Test Analysis and Reporting Provided Using DV-B Win Software



## Cannon L Series Load Banks

### DC and Three Phase AC Basic Load Banks

- Simple and Familiar Controls
- Compact and Lightweight
- Separate 110V Input for Controls and Fans
- Analog Metering on Standard Models
- D Models Include a Digital Controller Package
- Provided by intellirent with the User's Choice of Cabling

Model	Voltage	Load
L-10T	12V DC 24V DC 48V DC	15/25/50/100/190A 30/50/100/200/380A 60/100/200/360A
L-48-500	48V DC	0-500A
L-121-250	120V DC	0-250A
L-121-500	120V DC	0-500A
L-63	208V AC 3 Phase	30kW
L-69-80	208V AC 3 Phase 480V AC 3 Phase	80kW 100kW
L-69-80D	208V AC 3 Phase 480V AC 3 Phase	80kW 100kW

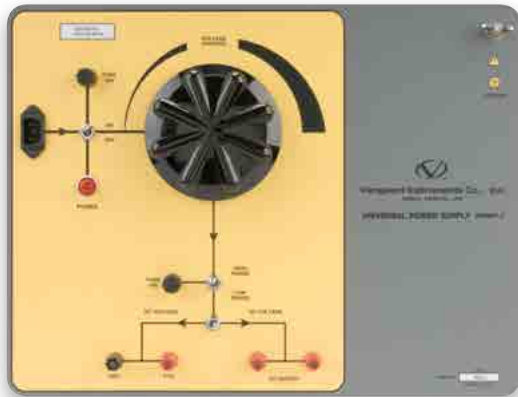


## ASCO Avtron 2500

### Portable Suitcase AC Load Bank

- Load Capacity: up to 100kW at 240V and 480V AC, 3-Phase, 60Hz, Derates to 80kW at 208V AC, 3-Phase, 60Hz; 52.8kW at 240V AC, 1-Phase, 60Hz; and 13.3kW at 120V AC, 1-Phase, 60Hz
- Duty Cycle: Rated for Continuous Operation
- Load Step Resolution: 12.5kW Minimum at 240V and 480V AC, 3-Phase; Derates at Other Voltages
- Controls: Local Manual Control Panel Includes Main Power On-Off Switch
- Instrumentation: Digital Monitoring via Full Digital Metering (V, A, Hz, kW) with Automated Data Acquisition and Real Time Data Logging, Software IrDA Converter Supplied
- Control/Cooling Power: Requires 120V Single-Phase 60Hz Power Source; Line Cord Provided
- Cooling System: Approximately 2112 CFM Cooling is Provided by Eight Integral Cooling Fans
- Load Elements: Industrial Grade Resistor Wire Elements, Wound and Supported on Mica Base
- Safety Features: Cooling Air Loss Protection, Fuses for Short-Circuit Protection
- Load Connections: Quick Disconnect Cam-Type Male Connectors on the Front of the Load Bank
- Load Cable Set: Standard 10ft Three Phase Load Cable Set with Mating Female Connectors and Lugs





## Vanguard UPS S2

### AC/DC Power Supply

- Variable AC/DC Power Supply
- Isolated Variable 1-300V DC Source
- Isolated Variable 1-240V AC Source
- 10 Ampere Continuous Current
- Input Power 100V – 120V AC or 200V – 240V AC (Factory Pre-Set), 50/60Hz
- DC Output Voltage 10 – 300V DC at 10 Amperes
- AC Output Voltage 10 – 240V AC at 10 Amperes
- Safety Designed to Meet UL 61010A-1 and CAN/CSA C22.2 No. 1010.1-92 Standards
- Environment Operating: -10° to 50° C (15°F to +122° F); Storage: -30° C to 70° C (-22°F to +158° F)
- Cables Power Cord, Ground Cable, 10-Foot Test Leads
- Weight 55 lbs



## Megger B10E

### AC/DC Power Supply

- AC/DC Power Supply
- Reliable and Stable AC/DC Power Supply for Circuit Breaker Testing
- Continuously Variable 24-250V AC or DC Output
- Separate Outputs for Close Coil, Trip Coil and Spring Charging Motor Voltage
- Direct Triggering for Minimum Trip Voltage Testing
- Output for AC or DC Voltage Supplied to Closing/Breaking Coil
- Changeover Switch Used to Select Either AC or DC Coil Outputs
- Changeover Switch Used to Select Either Coil Outputs or Spring-Charging Motor Outputs
- DC Voltage Outputs for Spring-Charging Motor
- Provide Unsmoothed, Half-Wave Rectified DC Ranging up to 18A
- Button for Turning on Spring-Charging Motor Voltage
- Current Shunt Used to Measure External Current in Coils or Spring-Charging Motor
- Reset Button for Thermal, Overload and/or Time-Limit Cut-Outs

## Megger BITE 3

### Battery Impedance Test Set

- Determines Health of Lead-Acid Cells up to 2000Ah
- On-Line Testing with Pass/Warning/Fail Calculations
- Measures Impedance, interconnection Resistance and Cell Voltage
- Windows CE Operating System with More than 16 MB of Memory
- Measures Float and Ripple Currents



## Megger 246100B/BGFT

### Battery Ground Fault Tracer

- Identifies and Locates Ground Faults in Ungrounded DC Systems
- Operates in Energized Systems
- Digital Display of Voltage and Current Amplitudes
- Optional Bridge Measurement of Fault Resistance (from 1kΩ to 399kΩ)
- Soft-Start Charging System Prevents Sensitive Relay Tripping
- Simplifies Fault Tracing by Identification of Fault Characteristics
- Includes Line Operated Transmitter and Battery Operated Receiver for Remote Tracing



## Tech Tip

### Battery Test Interval Guidelines - Helpful for Substation Battery Testing

- Perform a capacity test when the battery is new as part of the acceptance test
- Perform an impedance test at the same time to establish baseline values for the battery
- Repeat the above within two years for warranty purposes
- Perform an impedance test every year on flooded cells and quarterly on VRLA cells
- Perform capacity tests at least every 25% of the expected service life
- Perform capacity test annually when the battery has reached 85% of its expected service life or if the capacity has dropped more than 10% since the previous test — or is below 90% of the manufacturer's rating.
- Perform a capacity test if the impedance value has changed significantly
- Follow a given practice (preferably from the IEEE standard) for all temperature, voltage, gravity measurements, etc., and fill in a report...this will be a great help for trending and fault tracing
- Contact your Technical Specialist at intellirent for the proper battery test equipment solution



## Multi-Tech 760

### AC/DC Ground Fault Locator

- Detects and Locates Ground Faults on Energized Circuits
- Suitable for use on 120V to 600V, AC or DC, Delta or Wye Circuits
- Easy and Safe to Operate
- Fully Automatic Phase/Voltage Selection
- Determines Which Phase is Grounded; Hand-Held Pickup Probe Traces Signal Tone to Exact Point of Fault
- Portable and Suitable for Use Anywhere in the System
- Adjustable Signal Tone Audible with Probe up to 5' from Conduit
- Provided by intellirent with a 10' Extension Probe to Trace Overhead Circuits
- Provided by intellirent with Signal Generator, Exploring Probe, Three Phase Power able, Single Phase Line Cord, Extension Probe and Cabling



## Eagle Eye GFL-1000

### DC Ground Fault Locator

- Ground Fault Testing for Both Online and Offline DC Systems
- Waveform Analysis Will Analyze the interference Signal in the Circuit
- Output Voltage: 24V, 48V, 110V, 220V, 500V, 1000V DC
- Output Frequency: 10Hz
- Output Current Limitation: 5mA or Unlimited (Max 25mA) Fault from the Positive Bus to Ground, or Load to Ground
- Fault between Bus Bars (Partial Short Circuit)
- Fault from a Branch to Ground
- Fault from Bus to a Separate Circuit ('Wire Mix' Connection)
- Quickly and Simply Detects, Tracks and Locates Grounding Faults
- Measures Current Leakage of DC Systems with High Resistance
- Output Voltage of up to 1kV (Very Low Current) for Locating Faults in Offline Systems
- Adjustable Output Frequency on Signal Receiver Avoids Interference from the DC System
- Provided by intellirent Complete with Signal Generator, Receiver, and Two Current Detectors
- Additional Signal Receivers Work Simultaneously to Narrow Down Searching Scope to Locate Faults More Quick

## Fluke BT521

### Battery Analyzer

- Intuitive User Interface with Rugged and Complete Accessories
- Measures Battery Resistance, DC and AC Voltage, DC and AC Current, AC Ripple, Frequency and Battery Temperature
- Sequence Measurement Mode Allows for Automatic or Manual Testing of Battery Strings with Automatic Measurement Storage of Voltage, Resistance and Temperature
- Stored Values can be Reviewed on instrument Before Downloading for Spot Analysis or Data Verification
- Permits Battery Discharge Voltage Measurements and Recording when Combined with a DC Load Bank
- Provided by intellirent with the intelligent Test Probe Set, Which Includes Integrated LCD Display, Infrared Temperature Measurement, Flashlight, Audio Feedback and Captures Voltage/Resistance Readings
- Fluke Battery Management Software Catalogs and Trends Data and Produces Comprehensive Reports
- Wireless or USB Communication for Data Download



## Alber CRT-400

### Battery Analyzer

- Compact and Portable System Designed to Meet IEEE Standards for Battery Testing
- Measurement and Results not Affected by Ripple (AC Noise), Natural Battery Capacitance or the Magnitude of Test Current
- Large, Backlit LCD
- Battery or Line Powered
- Measures and Records Cell Voltage, Internal Battery Resistance and Intercell Resistance
- Internal Resistance Measurements Detect Failing Cells before Failure
- Onboard USB Flash Drive for Simple Transition of Data to PC
- Included Battery Analysis Software Identifies Problematic Cells, Creates Reports and Archives Data
- Test Battery Cells from 0-16V
- Includes Battery Test Clamps and Multiple Alligator Clip Options
- Provided by intellirent with interchangeable Spike Probes



## Alber DMA35N/DMA35-CRT

### Datalogging Battery Hydrometer/Density Meter

- Measures and Records Density and Related Values in Seconds
- DMA35-CRT Model Integrates with Alber CRT-400 for Comprehensive Reporting Through Alber Battery Analysis Software
- Robust and Reliable System
- Serial as Well as Infrared Data Transfer to PC or Cellcorder for Consolidation of Test Data
- Measure and Record SGU/Temp in Seconds
- One Hand Operation
- Physical Dimension - 5.5" x 5.4" x 1"
- Weights 13 Ounces
- Automatically Compensates Specific Gravity for Fluid Temperature
- Splash Proof Membrane Keypad
- Supplied with Replacement Sample Hoses







### Eagle Eye IBEX Ultra Battery Analyzer

- Small, Lightweight and Provides Quick Results
- Measures Resistance, Conductance, Connection (Strap) Resistance, Voltage, DC Current and Ripple Current
- Simple to Operate
- Internal Storage of 4800 Measurements and 80 Alarm Settings
- Provided by intellirent with Comprehensive Exmons Pro software for Trending and Report Generation
- Provided by intellirent with a DC Clamp Meter for Ripple Measurement and Battery Test Probes and Temperature Probe
- Combines with the SG Ultra Max for a Complete NERC Compliance Kit



### Eagle Eye SG Ultra Max Datalogging Digital Battery Hydrometer/Density Meter

- Measures and Records Density and Related Values in Seconds
- Integrates with Eagle Eye IbeX Ultra for Comprehensive Reporting Through Exmons Pro software
- Robust and Reliable System



### Eagle Eye SG-1000 Digital Hydrometer

- Measures Specific Gravity of Electrolyte
- Internal Pump Draws Electrolyte Into Sample Chamber
- Simple One-Button Test
- Automatic Temperature Compensation



### SBS 2003 Digital Hydrometer

- Measures Specific Gravity, Ambient Temperature and Count within 3 Seconds
- Automatic Temperature Compensation to 77° F (or 25° C)
- Time Savings: 5 Times Faster Than Conventional Methods
- Stores up to 1000 Readings
- Wirelessly Transfers Testing Data via Bluetooth to Provided Software to Create an Excel Report



## Midtronics CAD-5500

### Battery Management Tool

- Provides Battery Management and Testing for Telecom Networks, Data Centers, Utilities
- Provides Battery Conductance, Voltage and Integrated Temperature Measurement
- Guided Test Interface /AH Test Algorithm/ Discharge Manager
- Includes Probes, Clamps and Cable and USB Cable
- Celltraq Express Report Software
- USB Drive for Excel Data Transfer



## Midtronics CTE-1000

### Stationary Battery String Analyzer

- Tests Individual 2, 6, and 12-Volt Lead Acid Cells or Monoblocs in Any Common Configuration
- Voltage Range 1V - 15V DC
- Conductance 100 - 9,999 Siemens
- Up to 480 Consecutive Test Results Stored Internally
- Accuracy is +/- 2% Across Test Range
- Voltmeter Resolution to 10 mV DC



## SBS 6500

### Datalogging Digital Battery Resistance Tester

- Measures the Impedance (Internal Resistance), Voltage, and Temperature of Batteries
- Tests Flooded Lead Acid, VRLA, NiCad, Li-ion and NiMH Batteries and Strings
- Voltage Testing Range Of 0-100V DC
- Large 3.8 inch LCD Backlit Display
- On-Screen Pass/Warning/Fail Indication During Testing Based on Set Parameters
- Instantly Retests and Recalls Readings On-Site



## SBS 3500

### Battery Systems Storage Hydrometer

- Range 0.0000-3.0000g/cm<sup>3</sup>
- Measuring Time 2-3 seconds
- Displays and Logs Temperature and Specific Gravity (S.G.)
- Accuracy +/- 0.001
- Automatically Temperature Compensated to 77F (25C)
- Stores up to 1024 Measurement Results with Time Stamp
- Tests Lead Acid and NiCad Batteries





## AEMC 6240/6250

### 10A Low Resistance Ohmmeter (DLRO)

- Provided by intellirent with Kelvin Probes (Pictured)
- Battery Operated, Light Weight and Compact Design
- User Selectable Test Current and Resistance Ranges
- 6250 Model Adds Internal Storage of Readings with Data Storage and Analysis Software Included
- Includes Temperature Compensation and User Selectable Resistive or Inductive Materials Measurement



## Raytech Micro Junior II

### 10A Low Resistance Ohmmeter (DLRO)

- Provided by intellirent with Kelvin Probes (pictured)
- Automated Measurement Detection and Storage Modes
- Onboard Printer
- Automatic Polarity Reversal
- Battery Operated
- Field Rugged



## Megger DLRO600

### 600A Low Resistance Ohmmeter (DLRO)

- Test Currents from 10A to 600A
- Internal Storage of Test Data for Download or Printing on Site with Optional Printer
- Lightweight Compact Design 33 lbs
- Provided by intellirent with Heavy Duty Alligator Clamp or Optional C-Clamps

## Raytech Micro Centurion II

### 200A Low Resistance Ohmmeter (DLRO)

- Selectable Output from 10A to 200A
- Onboard Printer
- Provided by intellirent with Heavy Duty Alligator Clamps and 15' Cables
- High Precision – Measurements from  $.01\mu\Omega$  to  $20\mu\Omega$  with Resolution of  $0.0\mu\Omega$
- Internal Memory Records 2000 Test Results
- Heavy Duty and Field Rugged



## AEMC 6292

### 200A Low Resistance Ohmmeter (DLRO)

- Accurately Measure Resistances from  $.1\mu\Omega$  up to  $1\Omega$
- Continuous Output Current
- User Variable Output to 200A DC (Continuous)
- Direct Viewing of Results on the LCD and Stabilized Reading Hold
- Programmable Test Duration of up to 120 Seconds
- Stores up to 8000 Test Results
- USB Communications
- Lightweight and Simple



## Vanguard Auto Ohm 200 S3

### 200A Low Resistance Ohmmeter (DLRO)

- Lightweight and Compact Design 17 lbs
- Full QWERTY Keyboard
- Stores Test Records in Onboard Memory or to USB Flash Drive
- 1-200A Test Current
- Programmable Current Rise and Fall Rates
- Auto-Test Mode Permits Applying Sense Leads Across Points of Interest
- Provided by intellirent with User's Choice of Test Cable Lengths and Connectors





### AEMC 5050/5060

#### 5kV Insulation Resistance Meter (Megohmmeter)

- Line or Battery Operated
- Test Voltages of 500V, 1000V, 2500V and 5000V
- Insulation Measurement to 10TΩ
- Direct Measurement and Display of Resistance, Test Voltage, Test Duration, Capacitance and Leakage Current
- Large Backlit Display
- Field Portable and Rugged
- Automatic Calculation of DAR, PI and DD
- AEMC 5060 Model Adds Results Storage and Download Capability



### AEMC 6255

#### 10A Low Resistance Ohmmeter (DLRO)

- Measure from 1μΩ (0.1μΩ Resolution) to 2500.0Ω
- Test Current Selection of 1mA, 10mA, 100mA, 1A, and 10A
- Tests up to 60 Minutes at 10A
- RTD Temperature Probe (Optional)
- Selectable Metal Types
- Automatic and Manual Temperature Correction
- Two Programmable Alarm Set Points
- Stores up to 1500 Test Results
- Selectable Inductive or Resistive Test Modes
- Automatic Multiple Test Mode (Multiple Tests without Pressing the Test Button)



### AEMC 6505

#### 5kV Insulation Resistance Meter (Megohmmeter)

- Line or Battery Operated
- Test Voltages of 500V, 1kV, 2.5kV and 5kV
- Insulation Resistance Measurement to 10TΩ
- Direct Measurement and Display of Resistance, Test Voltage Test Duration, Capacitance and Leakage Current
- Large Backlit Display
- Field Portable and Rugged
- Automatic Calculation of DAR, PI and DD

## AEMC 6550/6555

### 10kV/15kV Insulation Resistance Meter (Megohmmeters)

- Line or Battery Operated
- Test Voltages of 500V, 1kV, 2.5kV, 5kV, 10kV (6550) and 15kV (6555)
- Optional Ramping Voltages between 40 and 10kV (6550) and 15kV (6555)
- Step Voltage Measurements with Ramping from 40 through 1100V or from 500 to 10kV (6550) or 15kV (6555)
- Non-Destructive (Early Break) Test at Pre-Programmed Current Leakage Values or Burn to Fault
- Insulation Resistance Measurement to 10TΩ
- Direct Measurement and Display of Resistance, Test Voltage, Test Duration, Capacitance and Leakage Current
- Field Portable and Rugged
- Automatic Calculation of DAR, PI and DD
- Test Results and Configuration Recorded and Downloadable Through AEMC DataView Software with Onboard USB Port
- Stores up to 80,000 Measurements



## Fluke 1587

### 1kV Insulation Resistance Multimeter (Megohmmeter)

- All the Functionality of a Fluke 87 with Additional Functional of a 1kV Megohmmeter
- Compact, Hand-Held and Easy-to-Use
- Disposable Battery Operated
- Automatic Discharge of Capacitive Voltage
- Test Smoothing Reading of Insulation Resistance
- Field Rugged and Reliable



## Tech Tip

### Maintaining Medium-Voltage Circuit Breakers

There are three basic electrical tests that should be performed on medium-voltage circuit breakers as part of a preventive maintenance program.

- 1. Contact Resistance** - The main contacts and primary stabs need to be checked periodically to detect abnormal wear, inadequate lubrication, and loose pivot points inside the circuit breaker. Poorly maintained or damaged contacts can cause arcing, single phasing, and electrical fires.
- 2. Insulation Resistance Test** - Weak insulation can result in a catastrophic failure, especially during arc interruption. The insulation resistance test is useful for detecting major defects in the insulation system, but it can also be used as a final safety check before returning the breaker to service.
- 3. Dielectric Withstand Voltage Test** - The use of an AC high potential test set is recommended when testing medium-voltage circuit breakers. Always use the test voltages specified by the manufacturer. When recommendations are not available or not provided, NETA Maintenance Specifications can be used.





**ABB 504**  
Power Shield Trip Units (ITE)



**ABB 505**  
Power Shield Trip Units



**ABB 606**  
MPS Trip Units



**ABB 607**  
MPSC Trip Units



**ABB BTSB**  
MPS, MPSC and MPSC 2000 Trip Units



**ABB Ekip T and P**  
Accessories for Emax 2 and Tmax XT



**ABB PRO10/T**  
EMax/SACE Trip Units



**ABB TT1**  
EMax/SACE PR Trip Units





**Allen Bradley 140G-ELTT**  
AB/Rockwell Automation 140G and 140MG  
Circuit Breakers



**Allen Bradley 193-DNCT**  
DeviceNet Configuration Terminal



**Cooper Power Systems  
(Eaton) DC Nova**  
DC Nova Controllers



**Cooper Power Systems KMET45811**  
Triple Single Adaptor for MET/Kyle Reclosers



**Cooper Power Systems KVFI**  
Cooper/Eaton Pad Mounted  
VFI Switchgear



**Cooper Power Systems METK1**  
MET/Kyle Reclosers



**Cutler Hammer 1232C50G05**  
Seltronic and Series C Circuit Breakers



**Cutler Hammer 1232C50G06**  
Seltronic and Series C Circuit Breakers



**Cutler Hammer 1232C50G10**  
Seltronic and Series C Circuit Breakers



**Cutler Hammer 1255C48G01**  
SPB Breakers (Certain Trip Units)



**Cutler Hammer 140D481G02**  
Amptector Trip Units



**Cutler Hammer 140D481G03**  
Amptector and Digitrip Trip Units



**Cutler Hammer 5720B69G01**  
Magnum DS Ground Fault Defeat Jumper



**Cutler Hammer 70C1056**  
Digitrip Trip Units (+ Style)



**Cutler Hammer 7801C57**  
OPTIM Series Trip Units



**Cutler Hammer 8312A63H01**  
MPCV Controller



**Cutler Hammer 8779C02G01**  
140D481G03 Adaptor for DS/DSII  
Circuit Breakers



**Cutler Hammer 8779C02G03**  
140D481G03 Adaptor for DS/DSII  
Circuit Breakers



**Cutler Hammer 8779C02G04**  
140D481G03 Adaptor for Magnum  
DS Circuit Breakers



**Cutler Hammer MTK2000**  
Magnum DS Circuit Breakers



**Cutler Hammer PRTBAPMDV**  
Power Supply for Digitrip Trip Units



**Cutler Hammer S140D481G02**  
Ampetector Trip Units



**Cutler Hammer SPBPTK**  
Pow-R-Trip Units



**FPE DDT-TLR**  
Federal Pioneer (FPE) TLR and ILR Trip Units



**GE Entellisys Test Kit**  
Secondary Injection for Low Voltage Switchgear



**GE GTUTK20**  
Entelliguard Trip Units



**GE PST1-1**  
Power Sensor Trip Units



**GE SST GFD**  
Ground Fault Defeat Cable for SST Trip Units



**GE TAKTS1**  
ECS/SST and VersaTrip Trip Units



**GE TAKTS2**  
ECS/SST and VersaTrip Trip Units



**GE TTS-1**  
VersaTrip Trip Units



**GE TVRMS2**  
MicroVersa Trip, MVT+, MVT PM Trip Units



**GE TVTGD9**  
Ground Fault Cable for Original  
MicroVersaTrip Trip Units



**MadTest Instruments DSM4i1**  
140D481G03 Adaptor for DS/DSII/ Magnum  
DS Circuit Breakers



**Satin American ETC-PTS**  
ETC Trip Units



**Schneider Electric LV485500**  
Pact Series Breakers



**GE TVTS1**  
MicroVersaTrip Trip Units



**Merlin Gerin 34547**  
MicroLogic and STR Trip Units



**Satin American ETC-PTS2**  
ETC12 Trip Units



**Siemens BDA Plus**  
Breaker Data Adaptor for  
WL Circuit Breakers





**Siemens EPSP18V**  
Power Supply for VL Circuit Breakers



**Siemens PTS-4**  
Static Trip, Static Trip II and Static Trip III Trip Units



**Siemens SBAPM**  
Power Supply for SB Circuit Breakers



**Siemens TD500**  
Secondary Injection Test Set for Siemens 3VA Circuit Breakers with ETU Trip Units



**Siemens TS-31**  
SB Circuit Breakers



**Siemens VLTS (ELTPHB)**  
VL Circuit Breakers



**Siemens WLTS**  
WL Circuit Breakers



**SMC LET-400-RD**  
Primary Injection and Ground Fault Test Set





**SMC PTE-30-CH**  
Portable Relay Trip Timer



**Square D RP Adaptors**  
MicroLogic Rating Plug Adaptors - Reset  
Module, SEPTIK2, Trip Indicator



**Square D S33595**  
MicroLogic, ET and STR Trip Units



**Square D STRV00910**  
Micrologic 3.2, 3.3, 5.2, 5.3, 6.2 and 6.3  
Trip Unit Test Kit (UTA Tester)



**Square D CBTM3/CBTM4A**  
UTS-3 Adaptor for Some Series  
1, 2, 3 and 4 Breakers



**Square D S33594**  
MicroLogic, ET and STR Trip Units



**Square D S434206**  
Power Supply for Micrologic 3.2, 3.3, 5.2,  
5.3, 6.2 and 6.3 Trip Units



**Square D UTS-3**  
MicroLogic Trip Units



**SureTrip CON1111**  
140D481G03 Adaptor for SureTrip/  
WestTrip Trip Units



**Utility Relay 1-AC-PRO-MP-TS**  
AC-PRO-MP Trip Units for MasterPact Breakers



**Utility Relay 1-AC-PRO-TS**  
AC-PRO Trip Units



**Utility Relay 1-AC2-PRO-TS**  
AC-PRO Trip Units



**Utility Relay 1-Zero-Hertz-TS**  
AC-PRO DC Trip Units



**Westinghouse 1255C48G02**  
Seltronic and Series C Circuit Breakers



**Westinghouse Breaker  
Calibration Unit**  
Seltronic and Series C Circuit Breakers



**Westinghouse SCBII**  
Seltronic and Series C Circuit Breakers

Manufacturer	Model	Trip Unit/Circuit Breaker Reference
ABB	504	Power Shield Trip Units (ITE)
ABB	505	Power Shield Trip Units
ABB	606	MPS Trip Units
ABB	607	MPSC Trip Units
ABB	BTSB	MPS, MPSC and MPSC 2000 Trip Units
ABB	EKIP T and P	Accessories for Emax 2 and Tmax XT
ABB	PR010/T	EMax/SACE Trip Units
ABB	TT1	EMax/SACE PR Trip Units
Allen Bradley	140G-ELTT	AB/Rockwell Automation 140G and 140MG Circuit Breakers
Allen Bradley	193-DNCT	DeviceNet Configuration Terminal
Cooper Power Systems	DC Nova Adaptor	DC Nova Controllers
Cooper Power Systems	KMET45811	Triple Single Adaptor for MET/Kyle Reclosers
Cooper Power Systems	KVFI	Cooper/Eaton Pad Mounted VFI Switchgear
Cooper Power Systems	METK1	MET/Kyle Reclosers
Cutler Hammer	1232C50G05	Seltronic and Series C Circuit Breakers
Cutler Hammer	1232C50G06	Seltronic and Series C Circuit Breakers
Cutler Hammer	1232C50G10	Seltronic and Series C Circuit Breakers
Cutler Hammer	1255C48G01	SPB Breakers (Certain Trip Units)
Cutler Hammer	140D481G02	Amptector Trip Units
Cutler Hammer	140D481G03	Amptector and Digitrip Trip Units
Cutler Hammer	5720B69G01	Magnum DS Ground Fault Defeat Jumper
Cutler Hammer	70C1056	Digitrip Trip Units (+ Style)
Cutler Hammer	7801C57	OPTIM Series Trip Units
Cutler Hammer	8312A63H01	MPCV Controller
Cutler Hammer	8779C02G01	140D481G03 Adaptor for DS/DSII Circuit Breakers
Cutler Hammer	8779C02G03	140D481G03 Adaptor for DS/DSII Circuit Breakers
Cutler Hammer	8779C02G04	140D481G03 Adaptor for Magnum DS Circuit Breakers
Cutler Hammer	MTK2000	Magnum DS Circuit Breakers
Cutler Hammer	PRTBAPMDV	Power Supply for Digitrip Trip Units
Cutler Hammer	S140D481G02	Amptector Trip Units
Cutler Hammer	SPBPTK	Pow-R-Trip Units
FPE	DDT-TLR	Federal Pioneer (FPE) TLR and ILR Trip Units
GE	Entellisys Test Kit 03	Entelliguard Trip Units
GE	GTUTK20	Entelliguard Trip Units
GE	PST1-1	Power Sensor Trip Units
GE	SST GFD	Ground Fault Defeat Cable for SST Trip Units
GE	TAKTS1	ECS/SST and VersaTrip Trip Units
GE	TAKTS2	ECS/SST and VersaTrip Trip Units
GE	TTS-1	VersaTrip Trip Units
GE	TVRMS2	MicroVersaTrip, MVT +, MVT PM, and Power + Trip Units
GE	TVTGD9	Ground Fault Cable for Original MicroVersaTrip Trip Units
GE	TVTS1	MicroVersaTrip Trip Units
MadTest Instruments	DSM4i1	140D481G03 Adaptor for DS/DSII/ Magnum DS Circuit Breakers
Merlin Gerin	34547	MicroLogic and STR Trip Units
Satin American	ETC-PTS	ETC Trip Units
Satin American	ETC-PTS2	ETC12 Trip Units
Schneider	LV485500	Pact Series Breakers
Siemens	BDA Plus	Breaker Data Adaptor for WL Circuit Breakers
Siemens	EPSP18V	Power Supply for VL Circuit Breakers
Siemens	PTS-4	Static Trip, Static Trip II and Static Trip III Trip Units
Siemens	SBAPM	Power Supply for SB Circuit Breakers
Siemens	TD500	Secondary Injection Test Set for Siemens 3VA Circuit Breakers with ETU Trip Units
Siemens	TS-31	SB Circuit Breakers
Siemens	VLTS (ELTPHB)	VL Circuit Breakers
Siemens	WLTS	WL Circuit Breakers
SMC	LET-400-RD	Primary Injection and Ground Fault Test Set
SMC	PTE-30-CH	Portable Relay Trip Timer
Square D	CBTM3/CBMT4A	UTS-3 Adaptor for Some Series 1, 2, 3 and 4 Breakers
Square D	RP Adaptors	MicroLogic Rating Plug Adaptors - Reset Module, SEPTIK2, Trip Indicator
Square D	S33594	MicroLogic, ET and STR Trip Units
Square D	S33595	MicroLogic, ET and STR Trip Unit
Square D	S434206	Power Supply for Micrologic 3.2, 3.3, 5.2, 5.3, 6.2 and 6.3 Trip Units
Square D	STRV00910	Micrologic 3.2, 3.3, 5.2, 5.3, 6.2 and 6.3 Trip Unit Test Kit (UTA Tester)
Square D	UTS-3	MicroLogic Trip Units
Suretrip	CON1111	140D481G03 Adaptor for SureTrip/WestTrip Trip Units
Utility Relay	1-AC-PRO-MP-TS	AC-PRO-MP Trip Units for MasterPact Breakers
Utility Relay	1-AC-PRO-TS	AC-PRO Trip Units
Utility Relay	1-AC2-PRO-TS	AC-PRO Trip Units
Utility Relay	1-Zero-Hertz-TS	AC-PRO DC Trip Units
Westinghouse	1255C48G02	Seltronic and Series C Circuit Breakers
Westinghouse	Breaker Calibration Unit	Seltronic and Series C Circuit Breakers
Westinghouse	SCBII	Seltronic and Series C Circuit Breakers



**Megger CB-832**  
2000A High Current Test Set

- Instantaneous Current to 2000A or Continuous Current to 500A
- Memory Ammeter and Seconds/Cycles Timer
- Simple, Manual Controls with Robust Construction

Duty Cycle:

Output	Maximum Time On	Minimum Time Off
500A	30 Mins	30 Mins
1000A	3 Mins	8 Mins
1500A	30 Seconds	4 Mins
2000A	7 Seconds	2 Mins



**Megger CB-845**  
4500A High Current Test Set

- Instantaneous Current to 4500A or Continuous Current to 1200A
- Memory Ammeter and Seconds/Cycles Timer
- Two Man Portable; Controller Weighs 70 lbs, Output Transformer Weighs 123 lbs
- Input Voltage 208 and 240V, 30A
- Provided by intellirent with Input Cables and Custom Output Cabling to Meet Specific Customer Requirements



**Vanguard PCI-600**  
600A High Current Test Set

- Programmable High Current Source for Utility Substation Applications for Relay or Breaker Applications
- Onboard Multifunction Timer
- Measures Internal and External Currents
- Simple Operations and Controls

Output at 120V	Time
3.9V at 600A	20 Sec
4.2V at 500A	30 Sec
4.6V at 400A	1 Min
4.9V at 300A	2 Min
5.3V at 200A	5 Min
5.6V at 100A	1 Hour

## Megger MS-2

### 500A High Current Test Set

- Instantaneous Current to 500A or Continuous Current to 240A
- Memory Ammeter and Seconds/Cycles Timer
- Lightweight and Compact 33 lbs
- Provided by intellirent with 5' Heavy Duty (No. 4) Test Leads



## Megger SPI-225

### 2000A High Current Test Set

- Up to 2000A Output
- Smallest Primary Injection Test System in its Class
- Output Current Regulation
- Designed for Switchgear Commissioning, Circuit Breaker, CT Commissioning, Ground Grid and Relay Testing
- Software Includes Thousands of Circuit Breaker TCC Curves



## Vanguard MCCB-500

### 2500A High Current Test Set

- Programmable High Current Source Appropriate for Testing Molded-Case Circuit Breakers and Thermal Magnetic or Solid State Overload Motor Protection Relays
  - Robust Design for Field Applications
  - Onboard Multifunction Timer
  - Simple Operation and Controls
  - Three Current Taps: 500A at 4V, 125A at 14V and 25A at 70V
  - Available in Single Piece or Two Piece Configuration
- Duty Cycle:

Output	Maximum Time On	Minimum Time Off
200A	Continuous	Continuous
500A	30 Minutes	30 Minutes
1000A	5 Minutes	15 Minutes
2000A	30 Seconds	5 Minutes
2500A	3 Seconds	5 Minutes







**Electrical Test Instruments PI-4000/PI-6000**  
40000A/60000A High Current Test Set

- Intuitive and Reliable MAC-20 and MAC-21 Digital Instrumentation Package and Memory Ammeter and Seconds/Cycles Timer
- 240V or 480V Input (Switch Selectable)
- 240V Limits Output to 30kA for PI-6000
- Provided by intellirent with ½" and ¾" Stabs, Input Power Cables and Output Cables to Meet the User's Specific Requirement

**Electrical Test Instruments PI-4000**

PI-4000 Duty Cycle					
9V (Parallel)	18V (Series)	Overload	Duty	Max Time On	Max Time Off
4000A	2000A	1 x	100%	Continuous	N/A
5600A	2800A	1.4 x	50%	15 Min	15 Min
8000A	4000A	2 x	25%	5 Min	15 Min
12000A	6000A	3 x	10%	1.5 Min	15 Min
16000A	8000A	4 x	6%	45 Sec	15 Min
20000A	10000A	5 x	4%	4 Sec	2 Min
28000A	14000A	7 x	2%	2 Sec	2 Min
40000A	20000A	10 x	1%	1 Sec	2 Min

**Electrical Test Instruments PI-6000**

PI-6000 Duty Cycle					
9V (Parallel)	18V (Series)	Overload	Duty	Max Time On	Max Time Off
6000A	3000A	1 x	100%	Continuous	N/A
8400A	4200A	1.4 x	50%	15 Min	15 Min
12000A	6000A	2 x	25%	5 Min	15 Min
18000A	9000A	3 x	10%	1.5 Min	15 Min
24000A	12000A	4 x	6%	45 Sec	15 Min
30000A	15000A	5 x	4%	4 Sec	2 Min
42000A	21000A	7 x	2%	2 Sec	2 Min
60000A	30000A	10 x	1%	1 Sec	2 Min





## Megger DDA6000

### 60000A High Current Test Set

- Digital Controller Includes Memory Ammeter, Timer, and Voltmeter
- Intuitive DDA-1 Controller Provides for Simple Operation
- Provided by intellirent with Universal 1/2" and 3/4" Stab, Input Power Cables and Output Cables to Meet Specific Customer Requirements
- Maximum Current at 480V Input:
  - 6250A Maximum Continuous Current
  - 60000A Maximum Current Through a Circuit Breaker
  - 100000A Maximum Current Through a Short Circuit
- 30 Minutes On/30 Minutes Off Duty Cycle
- Weight 1350 lbs
- Available from intellirent with Optional Megger AT-1 Input Autotransformer for 208/240 Source

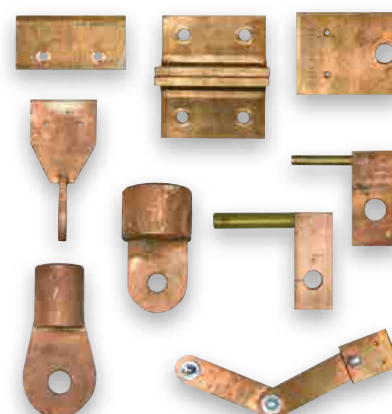


Megger DDA-6000 Duty Cycle		
Current	Maximum Time On	Minimum Time Off
4500A	Continuous	N/A
6250A	30 Mins	30 Mins
10000A	15 Mins	45 Mins
30000A	2 Mins	60 Mins
60000A	5 Seconds	12 Mins

## Electrical Test Instruments OP-114/124

### Universal Adjustable Stab Kit

- Works for Bolt Pattern on Electrical Test Instruments or Megger High Current Test Sets
- Adjustable Arms Allow the Operator to Adjust Outputs to Meet Breaker Finger Clusters Rather Than Adjusting the Height of the Breaker
- Vertical or Horizontal Configuration
- Provided by intellirent with Stab Pins for Large and Small Molded Case Breakers
- Includes 2", 3", and 3 1/2" Round Stabs
- Includes Multiple 1/4" Shims to Adjust Thickness of 1/2" or 3/4" Vertical or Horizontal Stabs





**Megger DDA-1600**  
16000A High Current Test Set

- Ideal for Testing Circuit Breakers up to 1600A
- Modular and Portable Design – Heaviest Component is 210 lbs
- Convenient 480V/150A Input Service
- Available from intellirent with a Transport Cart and Stab Mounting Kit
- Series/Parallel Selection Adjusts for a Higher Output Voltage and Reduced Current
- Variable Pulse Time and Firing Angle Output Current Control
- Simple and Familiar Controls Represent the Latest Digital Signal Processing Technology
- Maximum Continuous Current of 1600A; Instantaneous Current of 19,200A Through an Air Frame Circuit Breaker or 14,400A Through a Molded Case Circuit Breaker



**Electrical Test Instruments PI-1600**  
16000A High Current Test Set

- Convenient One-Man Portable Three Piece Design
- Intuitive and Rugged MAC-20 Digital Controller with Memory Ammeter and Seconds/Cycles Timer
- 240V Input
- Optional Autotransformer for 480V Input
- Provided by intellirent with 1/2" and 3/4" Universal Stabs, Input Power Cables and Output Cables to Meet Specific Customer Requirements

4.2V Series/ Parallel	8.4V Series	Overload	Duty	Max On Time	Max Off Time	Max Input Current at 240V
1600A	800A	1 X	100%	Continuous	N/A	38A
2250A	1125A	1.4 X	50%	15 Min	15 Min	53A
3200A	1600A	2 X	25%	5 Min	15 Min	75A
4800A	2400A	3 X	10%	2.5 Min	20 Min	112A
6400A	3200A	4 X	6%	75 Sec	20 Min	150A
8000A	4000A	5 X	4%	4 Sec	2 Min	187A
11200A	5600A	7 X	2%	2 Sec	2 Min	262A
16000A	8000A	10 X	1%	.6 Sec	1 Min	375A



**Electrical Test Instruments AT-10B**  
480V-240V Step Down Transformer

- Allows ETI's PI-1600 or PI-800 Circuit Breaker Testers to be Used at Full-Capacity on 240V AC and 480V AC Lines
- Provides 240V AC at 10kVA
- Adds Convenience and Flexibility to the Electrical Test Instruments PI-800 or PI-1600
- Design Enables Stacking with the PI-1600 or PI-800 System
- Provided by intellirent with Jumpers to the PI-800/PI-1600 and the User's Choice of Input Power Cables

## Phenix HC-1/HC-2

### 1000A/2000A High Current Test Set

- Instantaneous Current to 1000A or Continuous Current to 240A (HC-1)
- Instantaneous Current to 2000A or Continuous Current to 500A (HC-2)
- Memory Ammeter and Seconds/Cycles Timer
- Weight 70 lbs (HC-1) or 115 lbs (HC-2)
- Provided by intellirent with 5' Heavy Duty Test Cables
- Simple Controls
- Rugged and Reliable



## Phenix HC-3/HC-5

### 3000A/5000A High Current Test Set

- Instantaneous Current to 3000A or Continuous Current to 800A (HC-3)
- Instantaneous Current to 5000A or Continuous Current to 1000A (HC-5)
- Convenient, Hand Truck Mounted Construction;
- Large Inflated Tires –Conveniently Mobile in Tight Spaces and Over Uneven Terrain
- Provided by intellirent with the User's Choice of Test Cabling and Breaker Test Pins
- Weight 280 lbs (HC-3) or 320 lbs (HC-5)
- Reliable, Simple, and Built for Field Use



## Primary Injection Test Sets Available from intellirent

Manufacturer	Model	Instantaneous Output Current	Input Voltage	Pieces
Electrical Test Instruments	PI-250	500A	120V	One
Electrical Test Instruments	PI-800	8000A	240V or 480V *	Two *
Electrical Test Instruments	PI-1600	16000A	240V or 480V *	Three *
Electrical Test Instruments	PI-2500	25000A	480V	One
Electrical Test Instruments	PI-4000	40000A	480V	One
Electrical Test Instruments	PI-4000B	40000A	240V or 480V	One
Electrical Test Instruments	PI-5000	50000A	480V	One
Electrical Test Instruments	PI-6000	60000A	480V	One
Megger	MS-2	500A	120V	One
Megger	CB-832	2000A	120V	One
Megger	CB-845	4500A	240V	Two
Megger	DDA-1600	16000A	480V	Three
Megger	DDA-3000	30000A	480V	One
Megger	CB-8160/MAC	60000A	480V	One
Megger	CB-120DC	24000A DC	480V	Two
Omicron	CPC-100/CB2	2000A AC	120V	Two
Omicron	CPC-100	400A DC/800A AC	120V	One
Phenix	HC-1	1000A	120V	One
Phenix	HC-2	2000A	120V	One
Phenix	HC-3	3000A	240V	Hand Truck Mounted
Phenix	HC-5	5000A	240V	Hand Truck Mounted
Vanguard	MCCB-250	500A	120V	One
Vanguard	MCCB-500	2500A	120V	One
Vanguard	MCCB-500 (2 pc)	2500A	120V	Two
Vanguard	PCI-600	600A	120V	One

\* Optional AT-10B Changes Input Voltage to 480V and Adds an Extra Piece

## High Voltage PFT-303CM/PFT-503CM

30kV/50kV AC Hipot

- 0-100mA output Current; Total Output 3kVA (Capacitive Loads)
- Analog Meters Display Leakage Current and Voltage Output
- 20' Shielded Output Cable with Alligator Clip
- Weight 75 lbs
- Ideal for Testing Low Capacitance Substation Apparatus: Vacuum Bottles, Breakers, Switchgear, Bushing, Reclosers, Small Transformers and Small Motors
- Not Suitable for ISO Phase Bus Applications or Cable Testing



## High Voltage PFT-652CM

65kV AC Hipot

- Two Piece Design Improves Portability and Reduces Transportation Cost
- 2kVA (Capacitive) Total Output
- Simple Connections and Setup
- Analog Metering for Current Leakage and Voltage Output
- 20' Shielded Output Cable with Alligator Clamp
- Ideal for Low Capacitance Substation Apparatus
- Not Suitable for ISO Phase Bus or Cable Applications



## Vanguard VBT-60/VBT-80

60kV/80kV Vacuum Bottle Test Set

- Automated Testing from 10kV to 60kV/80kV DC in 5kV Steps
- Selectable Dwell Time from 5 Seconds to 2 Minutes
- Digital Voltage and Current Display
- Failure Indicator LED
- Lightweight 10 lbs
- Display Indicates Test Voltage and mA Leakage During Test
- Selectable Overcurrent Limits of 100, 200 and 300mA



## Vanguard VBT-75

75kV Vacuum Bottle Test Set

- Automated Testing from 10 to 75kV in 5kV Steps
- Selectable Dwell Time from 5 Seconds to 2 Minutes
- Digital Voltage and Current Display
- Failure Indicator LED
- Onboard Printer Documents Results
- Lightweight 10 lbs
- Display Indicates Test Voltage and mA Leakage During Test
- User Selectable Overcurrent Limits







## Vacuum Interrupters MAC-TS4

### Magnetron Atmospheric Condition Vacuum Bottle Test System

- Quantitative Test Predicts the Useful Life of a Vacuum Bottle Rather than Go/No-Go Tests Using an AC or DC Hipot
- Uses the Penning Discharge Principle to Determine Pressure Inside the Vacuum Bottle
- Pressure, Wear, and Operations Count Can Predict Remaining Service Life
- Provided by intellirent with Magnetic Coils Matched to Your Specific Bottle and Circuit Breaker
- Most Prevalent Applications Require the Flexible Magnetic Coil, which is Provided by intellirent with the TS4
- Data Analysis and Technology Based on Measurements of More than 3000 Vacuum Interrupters
- Portable, Easy and Safe to Operate
- System is Compatible with Either Fixed or Flexible Magnetic Coils
- Measure Range:  $1 \times 10^{-5}$  Pa to  $1 \times 10^{-1}$  Pa
- Measure Accuracy:  $\pm 10\%$  of the Reading
- Back-Lit LCD Screen (320 x 240 Pixels); Viewable in Bright Sunlight and Low Light Conditions
- Provided by intellirent with Software to Download Stored Results, Generate Test Reports and Everything Required to Perform Vacuum Bottle Testing in the Field or Shop

## Vacuum Interrupters PowerVac V1

### Rigid Magnetic Coil for GE PowerVac Circuit Breakers

- Enables Testing of GE PowerVac Breakers without Disassembly
- Used in Conjunction with the MAC-TS4, the Unit Slides Over the PowerVac Pole Assembly
- Determines the Remaining Service Life of a PowerVac Vacuum Bottle
- Rigid Coils Reduce the Downtime Required to Test Vacuum Interrupters in the Field
- Helps Prevent Unnecessary Damage to Your Circuit Breakers and Contractors by Identifying Impending Failures Before they Happen





## Vanguard DigiTMR S2/DigiTMR S2-PC

### Circuit Breaker Timer and Travel Analyzer

- Operates with Insertion Resistors up to 7000Ω
- Initiates Breaker Operation
- Trip/Close Coil Current Monitoring Capabilities
- Determines Contact Time, Stroke, Velocity Over-Travel and Contact Wipe
- Monitors all Three Breaker Poles at Once
- Onboard Printer for Immediate Results Documentation
- Onboard Test Plan Storage for Repetitive Tests
- Stand Alone Operation or Computer Interface Allows for Data Collection and Operational Control
- USB PC Interface and USB Flash Drive Interface
- Onboard Data Storage for up to 200 Test Results and up to 100 Test Plans
- Simplified Connections with One Main Contact Assembly
- Single Transducer Input
- Provided by intellirent with the User's Choice of Transducer
- DigiTMR S2-PC S2 Model Eliminates Front Panel Control for Exclusive Computer Interface



## Programma (Megger) TM-200

### Digital Event Timer

- For Use with the CSU600a Current Supply Unit or ODEN a Primary Current Injection Test System
- Testing Relays with Sverker 650 also Requires an Extra Timer if More than One Timing Cycle is to be Measured
- Simple and Intuitive Front Panel Controls
- Broad Range of Applications
- Potential Free (Dry) or Voltage Triggered Input Contacts
- Rugged and Compact

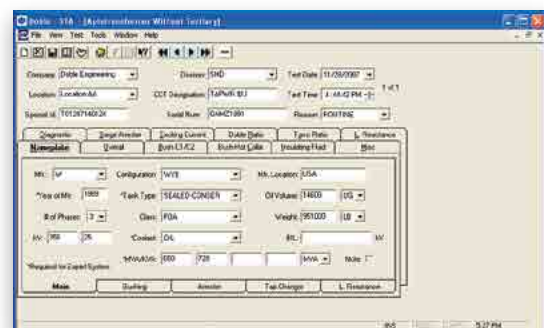
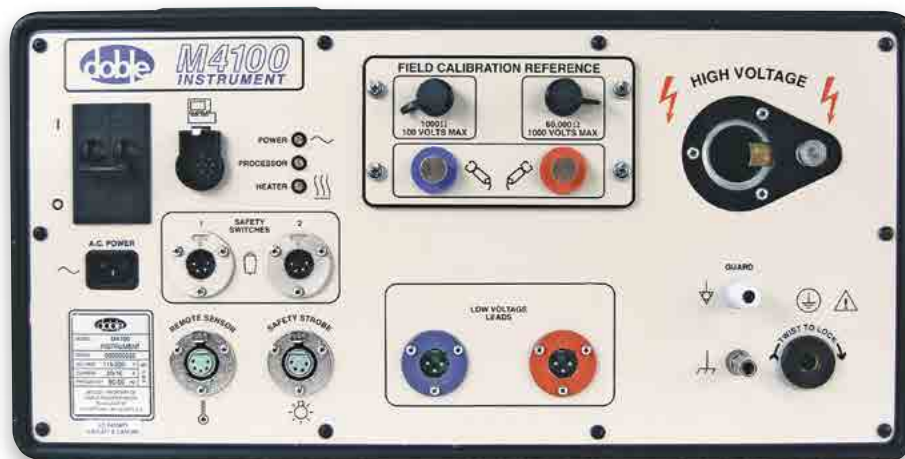


## Tech Tip

### First Trip Testing Method for Circuit Breakers

A circuit breaker spends most of its lifetime conducting a current without any operation. However, if the circuit breaker has not been operated for a long time, the latch friction may increase. Information about the latch friction can be obtained from the coil current waveform recorded during the first trip operation. If the circuit breaker has not operated in a year, first trip testing will show if the circuit breaker is slower due to problems such as corrosion in the mechanism linkages. When a fault occurs, it is expected that the circuit breaker will operate correctly. Unfortunately, environmental contaminants, hardened grease, vibration, and other factors can adversely affect the operating time of the circuit breaker. Frequently, this problem is cleared after the first operation of the breaker, and thus the original cause can't be detected in subsequent testing. Modern circuit breaker analyzers offer an online testing mode that can record the first on-line trip time without insulation from the system. You can discuss this with your intellirent technical expert. Online first trip testing provides 3 key benefits:

1. Saves time and resources
2. Determines whether a circuit breaker needs offline diagnostic testing
3. Captures circuit breaker slow operation on first trip test



## Doble M4100 (M4000) 12kV Power Factor Test Set

- Rugged Construction for Field Use with Laboratory Accuracy and Precision
- Industry Standard for Testing Electrical Apparatus such as Transformers, Generators and Cables
- Evaluates Integrity of High Voltage Substation Apparatus by Measuring Power Factor/Tan Delta
- Measures Capacitance to Evaluate Physical Changes
- Measures Accurately in High Electrostatic and Electromagnetic Conditions
- Measures Excitation Current to Evaluate Transformer Magnetizing Circuit
- Line Frequency Modulation Technology Eliminates Substation Interference
- Automated Testing Procedures Through DTA or Manual Through M4000 Clipboard
- Provided by intellirent with an M4000 and DTA Pre-Configured Laptop Computer or DUC, and all Application Appropriate Accessories
- Internal Field Calibration Reference Ensures Accurate Testing
- Built in Diagnostics Provide Information on Instrument Status
- Output Current to 300mA at 10kV (Total Output Power 3kVA) for Better Replication of In-Service Conditions
- Optional Type C Resonator Increases Output Capacity
- Optional M4110 Available for Measuring the Impedance (Leakage Reactance) of the Apparatus Under Test
- Optional M4140 Available for Measuring Capacitance of Capacitor Banks
- Optional Liquid Insulation Test Cell for Measuring Insulating Characteristics of Oil
- Optional TTR Capacitor for Measuring Transformer Ratio



## Omicron CPC-100/TD-1

### 12kV Multifunction Power Factor Test Set

- A Complete Transformer Test System, Including 12kV Power Factor Tests
- Measures Capacitance, Dissipation Factor  $\tan \delta$  (Tan Delta), Power Factor  $\cos \phi$ , Watts Losses, Power (Effective Power, Apparent Power and Reactive Power), and Impedance (Absolute Value, Phase, Inductance, Resistance, Quality) with Optional TD-1 Component
- Onboard Computer Driven Test Plans to Replicate or Trend Power Factor Tests with Existing Values
- Applies Up to 12kV at Variable Frequencies Which Enhances Diagnosis of Insulation Aging
- Automatic Power Factor Testing via Omicron's Primary Test Manager Software with the Included Pre-Configured Laptop Computer or Via Front Panel Controls (Includes Test Templates)
- Automated Testing of Power Transformers, Primary Testing of CTs, VTs, Resistance Testing and More
- Optimal for Emergent Requirements or Remote Applications - One Device Replaces Multiple Instruments
- Onboard or Computer Driven Test Plans for "Push Button to Start" Automation
- Automatic Results Storage and Report Generation
- Stand Alone Functionality for:
  - Ratio, Burden and Polarity, Phase and Magnitude Error, Excitation Curve, Winding Resistance, Secondary Burden and Dielectric Withstand Tests for CTs and PTs
  - Ratio, Winding Resistance, Tap Changer Testing, Excitation Current, Short Circuit Impedance Measurement and Leakage Reactance Testing of Transformers
  - Contact Resistance, Winding Resistance, Ground Resistance or Measurement of Complex Impedances
  - Single Phase Testing of Primary and Secondary Relays (Including Over Current, Over Voltage, Undervoltage and Frequency Relays)
- Flexible AC and DC Power Supply to 2kV AC, 400A DC, 800A AC
- Optional CP CB2 Boosts Current Output to 2000A AC
- USB, Serial or Ethernet Interface
- Optional CPOL Permits Polarity Verification at Multiple Test Points



## Vanguard CT-7000 S3

### Circuit Breaker Timer and Travel Analyzer

- Fourth Generation Circuit Breaker Analyzer from Vanguard
- Fully Analyzes Performance by Measuring Main Contact and Resistor Contact Timing, Stroke, Velocity, Over-Travel, Bounce Back and Contact Wipes
- Contact and Motion/Travel Analyzed on All Breaker Operations: Open, Close, Open-Close and Close-Open
- Optional "On-Line Timing" or First Trip Analysis
- Initiates All Breaker Operations
- USB Computer Interface for Executing Test Plans and Manual Control
- Separate USB for Flash Drive Connection
- Operates with Insertion Resistors up to 7000Ωs
- Trip/Close Coil Current Monitoring Capabilities
- Monitors all 3 Breaker Poles Simultaneously
- Available from intellirent with Three or Six Timing Channels
- Onboard Printer for Immediate Results Documentation
- Internal Data Storage of 200 Test Results and 100 Test Plans
- Three Transducer Inputs
- Full QWERTY Keyboard
- Provided by intellirent with Application Appropriate Transducer(s)



## Vanguard CT-8000 S3

### Circuit Breaker Timer and Travel Analyzer with Dynamic Resistance Measurement

- Fourth Generation Circuit Breaker Analyzer from Vanguard
- Performs Dynamic Resistance Tests with Onboard 200A DLRO
- Fully Analyzes Performance by Measuring Main Contact and Resistor Contact Timing, Stroke, Velocity, Over-Travel, Bounce Back and Contact Wipes
- Contact and Motion/Travel Analyzed on All Breaker Operations: Open, Close, Open-Close and Close-Open
- Integrated "On-Line Timing" or First Trip Analysis
- Initiates All Breaker Operations
- USB Computer Interface for Executing Test Plans and Manual Control
- Separate USB for Flash Drive Connection
- Operates with Insertion Resistors up to 7000Ωs
- Trip/Close Coil Current Monitoring Capabilities
- Monitors all Three Breaker Poles Simultaneously
- Available from intellirent with Three or Six Timing Channels
- Onboard Printer for Immediate Results Documentation
- Internal Data Storage of 200 Test Results and 100 Test Plans
- Three Transducer Inputs
- Full QWERTY Keyboard
- Provided by intellirent with Application Appropriate Transducer(s)

## Vanguard Auto Ohm 200 S3

### 200A Low Resistance Ohmmeter (DLRO)

- Lightweight and Compact Design (17 lbs)
- Full QWERTY Keyboard
- Stores Test Records in Onboard Memory or to USB Flash Drive
- 1-200A Test Current
- Programmable Current Rise and Fall Rates
- Auto-Test Mode Permits Applying Sense Leads Across Points of Interest
- Provided by intellirent with User's Choice of Test Cable Lengths and Connectors



## Transducers for Vanguard Circuit Breaker Timer and Travel Analyzers

Suitable for Use with Vanguard DigiTMR S2, DigiTMR S2-PC, CT-6500 S2, CT-7000 S3 and CT-8000 S3

Model	Description
Doble Adaptor	Enables any Doble Transducer to Interface with a Vanguard Timer
LT-10	10" Linear Transducer
LT-24	24" Linear Transducer
LT-HMA	Linear/Slide ABB HMA Transducer
Resistor Adaptor	Connects any Resistor Type Transducer to a Vanguard Timer
RT-HMB	Rotary ABB HMB Transducer
RT-MAG	Magnetic Gimbal Mount Rotary Transducer
RT-PM	Plate Mount Rotary Transducer
TR-String	Universal String Transducer





**Doble TDR9100**  
Circuit Breaker Timer and Travel Analyzer

- 4th Generation Circuit Breaker Analyzer from Doble
- Controls Circuit Breaker Trip and Close Commands and Supports Trip (O), Close (C), Reclose (O-0.3s-C), Tripfree (CO), O-CO, O-0.3S-CO, First Trip (O) and Slow Close (C) Functionality
- Includes Four Breaks Per Phase, Three Transducer Connections and Six Event Channels
- Operated by T-Doble Software Provided on a Pre-Configured Laptop or Doble DUC
- Quick, Accurate and Efficient Testing
- Provides Main Contact Timing, Travel/Motion, Resistance and Capacitance Measurements
- Expandable with Two or Three Systems for Multiple Contact Applications
- Field Portable and Ruggedized Enclosure
- Complete Test Results Provided in T-Doble, PDF, Excel or Word Formats
- Includes Pre-Insertion Resistor and Capacitor Measurement Capability
- Detects Main Contact and Resistor Contact Timing Errors
- Provided by intellirent with the User's Choice of Transducers, a Complete OCD and EHV Breaker Contact Cable Systems with Extensions, Analog/ Aux Cable Kit, Current Probe (for Online Timing or First Trip Testing), and Safety Switch



Contact intellirent for Assistance Selecting the Appropriate Transducer for Your Application Under the Chart.

**Transducers for Doble Circuit Breaker Timer and Travel Analyzers**  
Available from intellirent with Doble TDR9100 or TDR900

Type	Description
TR-3170	Digital Gold Rotary Transducer
TR-3171	Specifically Designed for ABB AHMA 4/8 Mechanisms
TR-3173	GE Air Magnetic Adapter (specify 13kV or 4kV)
TR-3174	GE Air Magnetic Adapter (2000+ amperes)
TR-3175	HVB-IPO Adapter with Spacer
TR-3176	HVB Ganged Operator Adapter
TR-3177	General Purpose Tank Adapter
TR-3178	HVB-IPO Spacer
TR-3179	GE VB-1
TR-3180	ABB HPL Insulator Column
TR-3181	ABB HPL Mechanism Cabinet
TR-3184	Travel Transducer Adapter, Westinghouse SF6 Breakers (TR-3170 Only)
TR-3185	Universal Mechanical Transducer Mounting
TR-3186	Specifically Designed for ABB HMB 4/8 Mechanisms
TR-3187	Bell Crank Translator
TR-3188	Alstom T155/2 GIS Breaker
TR-3189	Specifically Designed Linear Transducer for ABB HMB 4/8/11 Hydraulic Mechanisms
TR-3190	Digital Combination Rotary and Linear Transducer



## Raytech Micro Centurion II

### 200A Low Resistance Ohmmeter (DLRO)

- Selectable Output from 10A to 200A
- Provided by intellirent with Heavy Duty Alligator Clamps and 15' Cables
- High Precision – Measurements from  $.01\mu\Omega$  to  $20\mu\Omega$  with Resolution of  $0.0\mu\Omega$
- Pure Filtered DC Power Source for the Highest Accuracy Readings
- Single or Continuous Measurement with Automatic Data Storage
- Single Push Button Operation
- Centronics (Parallel) Interface and RS232 (Serial) Interface
- Automatic Shut Off for Over-Temperature Condition
- Internal Memory Records 2000 Test Results
- Onboard Printer



## HIGHTEST TECHNOLOGY ARES-200D

### 200A Low Resistance Ohmmeter (DLRO)

- Adjustable Output from 1A to 200A
- Measurements from  $0.1\mu\Omega$  to  $5\Omega$
- Ability to Measure Static Resistance, Giving Insight Into Contact Points on Circuit Breakers
- 15 Second Quick Test Feature
- Supplied by intellirent with 33ft Measurement Cables
- Weight 22lbs
- Internal Memory Records 200 Test Results
- USB Port Allows for Easy Transfer of Test Results to a USB Storage Device
- Onboard Printer





## Omicron CIBANO 500

### Circuit Breaker Analyzer

- Combines a Circuit Breaker Timer, 100A Static DLRO, Minimum Pick Up and Undervoltage Source, and a Coil and Motor Power Supply in One Instrument
- Unique Cabling Connection System Dramatically Reduces Connection Time and Effort
- Contact and Motion/Travel Analyzed on All Breaker Operations: Open, Close, Open-Close and Close-Open
- Operated by Primary Test Manager Software Which Produces a Comprehensive Report with All Tests
- Onboard DC Source Provides Stable, Constant Output During Testing
- Isolation from Substation Supply Increases Safety
- Provided by intellirent with a Preconfigured Laptop Computer
- Lightweight and Portable, Approximately 44 lbs



## Omicron CB TN3

### Transducer Node for CIBANO 500

- Provides Travel/Motion Input for CIBANO 500
- Includes Three Analog and Three Digital Channels
- Available from intellirent with Magnetic Tape Encoder for Both Linear and Rotary Mechanisms
- Suitable for Use with Most 3rd Party Transducers
- Single Output to CIBANO Minimizes Cable Connection Effort



## Omicron CB MC2

### Contact Module for CIBANO 500

- Enhances Functionality and Convenience of CIBANO 500
- Adds Dynamic Contact Resistance Measurement
- Eliminates Rewiring for Different Tests
- Moves Contact and Resistance (Both Static and Dynamic) Connections Closer to the Breaker for Shorter and Lighter Connection Leads



## Megger DLRO600

### 600A Low Resistance Ohmmeter (DLRO)

- Test Currents from 10 to 600A
- Internal Storage of Test Data for Download or Printing on Site with Optional Printer
- Lightweight (33 lbs) Compact Design
- Provided by intellirent with Heavy Duty Alligator Clamp or Optional C Clamps

## Programma (Megger) B10E

### AC/DC Power Supply

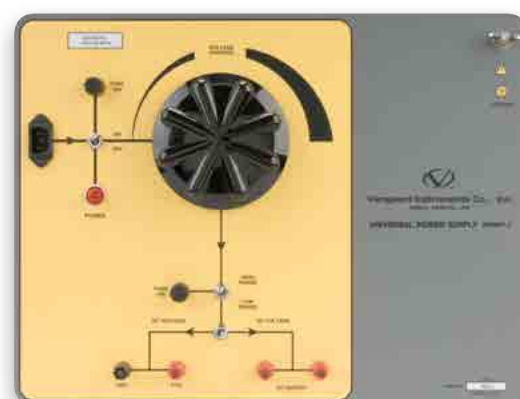
- Reliable and Stable System Ideal for Minimum Trip Voltage Testing
- Continuously Variable 24-250V AC or DC
- Separate Outputs for Close Coil, Trip Coil and Spring Charging Motor Voltages
- Direct Triggering for Minimum Trip Voltage Testing
- DC Voltage is Ripple Free
- Change Over Switch Used to Select Either Coil Outputs or Spring Charging Motor Outputs



## Vanguard UPS S2

### AC/DC Power Supply

- Current Capability of 10A Continuous in Either AC or DC Voltage Ranges
- Ideal for Use as a Substitute Primary Power Source When Station Batteries are not Available
- Suitable for Operating Circuit Breakers, Powering Substation Relays or for Unregulated Charging of Substation Batteries
- Variable DC Output Voltage of 300VDC Max
- Variable AC Output Voltage of 240VAC Max
- 110V Line Powered
- Weight 55 lbs



## Camlin Profile P3

### Circuit Breaker Analyzer

- Capture and Record Total Trip Time
- Capture the Vital First Trip Operation, using the Technology of Total Trip Time to Provide the Composite Trip Time of Your Protection Relay and Circuit Breaker
- Onsite Analysis Will Display and Overlay up to 4 Records in Graphical Form
- Enables Rapid Onsite Analysis of Potential Defects by Comparing a First Trip or Close Profile to Subsequent Circuit Breaker Operations
- Powerful Diagnostics Provides Accurate Information on the Main Contact Operating Time, Auxiliary Contact Operating Time, Condition of Close and Trip Coils, Condition of DC Battery Circuit, Auxiliary Contact Condition Etc
- Pro Software Facilitates a Protection Relay and Captures Circuit Breaker Trip Times with Seamless Fluidity





### High Voltage ALT-60/120

60kV/120kV AC Hipot with 7kVA Output

- Two Piece Design and Hand Truck Mount for Controller and Tank Improve Portability
- Side Tap at 60kV Provides 115mA Capacity
- Top Tap at 120kV Provides 58mA Capacity
- 120V/25A Input
- Ideal for Iso Phase Bus Testing, Aerial Lift Devices and Elevated Platforms, Most Common Dielectric Withstand Tests, and as a Source Voltage for Apparatus PD Testing
- Not Suitable for Cable Testing



### Phenix BK130/36

36kV/130kV AC Hipot with 6.5kV Output

- Two Piece Design and Hand Truck Mount for Controller and Tank Improve Portability
- Side Tap at 36kV Provides 180mA Capacity
- Top Tap at 130kV Provides 50mA Capacity
- 120V/30A Input
- Adjustable Overload Circuit
- Includes 50' Output Cable
- Ideal for Iso Phase Bus Testing, Aerial Lift Devices and Elevated Platforms, Most Common Dielectric Withstand Tests, and as a Source Voltage for Apparatus PD Testing
- Not Suitable for Cable Testing

## Phenix 6CP-50/100-7.5 and 6CP-50/100-10

50kV/100kV AC Hipots with 7.5kVA/10kVA Output

- Two Piece Design and Hand Truck Mount for Controller and Tank Improve Portability
- Side Tap at 50kV Provides 150mA (7.5kVA Model) or 200mA (10kVA Model) Capacity
- Top Tap at 100kV Provides 75mA (7.5kVA Model) or 100mA (10kVA Model) Capacity
- 7.5kVA Model Powered by 120V; 10kVA Model Powered by 230V
- Adjustable Overload Circuit
- Ideal for Iso Phase Bus Testing, Aerial Lift Devices and Elevated Platforms, Most Common Dielectric Withstand Tests, and as a Source Voltage for Apparatus PD Testing
- Minimal Partial Discharge – Less than 4pC at 100kV and Less than 3pC at 80kV
- Not Suitable for Cable Testing



## Tech Tip

### Safety First At intellirent!

There are many things to consider when testing an HV Breaker, but safety is first and foremost:

- Wear Proper PPE
- Disconnect the Breaker Control Circuit from Test Equipment Before Performing Work on the Breaker
- Observe Proper Polarity
- Use Touch Proof Connectors when Possible
- Connect Ground to Test Equipment
- Always Comply with Local Safety Regulations
- Always Exercise Care Before Operating a Breaker to Make Sure the Breaker is Cleared of Personnel Before Operating; and Make Sure the Breaker is Grounded
- Finally, Slow Down and be 100% Conscience of Your Surroundings

For additional tech tips try the **my intellirent** app by scanning here



**my**  
intellirent





## Vanguard CVT-765

### Coupling Capacitor Voltage Transformer Tester

- Measures CCVT, PT and VT Turns Ratio
- Variable Excitation Voltage of 7500V for CCVTs with Ratings to 765kV
- Instrument Displays Turns-Ratio, Winding Polarity and Winding Phase Angle
- Simple and Intuitive Controls
- Calculates Turns Ratio Percentage Error When Nameplate Voltages Are Provided by the User
- Onboard Memory Stores 128 Records of up to 33 Readings
- Onboard USB Port for Memory Stick Enhances Data Portability



## UE Systems UltraProbe 10,000

### Digital Ultrasound Inspection System

- Ideal for Predictive and Condition-Based Maintenance Programs
- Identifies the Presence of Corona and Partial Discharge in Energized Medium and High Voltage Systems
- Perform Condition Analysis, Record Sounds, Store and Manage Data in One System
- Records up to 400 Sound Files Onboard
- Unique "Spin and Click" Control Navigates Onboard Menu Structure Similar to a Mouse
- Comprehensive UltraTrend DMS PC Software Allows Application Selection for Most Accurate Reporting and Trending: Generic, Valve Leak, Bearings, Electrical and Steam
- Instrument Accepts Inputs from External Devices for Contemporaneous Data Storage of Thermometers and Tachometers
- Available from intellirent with a Wide Variety of Accessories to Support Specific Requirements: Focusing Cones, Laser Assisted Parabolic Dish, Contact Probe for Metal-Clad Switchgear, and Flexible Head for Reaching into Cabinets



## PMDT PDetector

### Comprehensive Online Partial Discharge (PD) Analyzer

- One Instrument Solution for a Wide Variety of Substation Apparatus and Cables
- Represents the Latest Technology in Both Electromagnetic and Acoustical Sensors to Identify and Find PD in Energized Substations and Switchgear
- Uses Ultra High Frequency (UHF), Transient Earth Voltage (TEV), High Frequency CT (HFCT or RFCT), Acoustical Contact, Airborne Acoustic Sensors
- Hand Held Instrument is Small, Lightweight and Portable
- Short Learning Curve – Operators Can Become Proficient in Minutes
- Phase Resolved Display Documents PD Over the Sine Wave to Ensure Measured PD is from the Circuit Under Test and Not Background or Nominal Noise
- Wireless Line Synchronization is Accomplished Wirelessly Using the Instrument Charger
- Suitable for Use on Power Cables, Transformers, GIS, Switchgear and other Substation Apparatus
- Provided by intellirent with PDetector Software to Catalog and Trend Results and Produce Professional Reports
- Additional Details are Available on Page 136

## Doble M4140

### Capacitor Bank Test Accessories for Doble M4000

- Requires Both M4100 (M4000) and M4110 to Operate
- Functions as a Current Source with the M4110
- Uses the M4100 (M4000) to Measure Series, Parallel, Series-Parallel, and Parallel-Series Capacitor Bank Leakage
- Enables Individual or Overall (Grouped) Capacitor Measurement



## ABB CB-2000

### Portable Capacitance Meter

- Compact, Self-Contained Capacitor Bank Analysis
- Permits Measurements of Individual Capacitors without Breaking Connections
- Battery Operated and Easily Portable
- Onboard Memory Can be Transferred to a PC for Report Generation or Data Trending and Analysis
- Data from PC can be Transferred to CB-2000 for on the Spot Analysis
- Provided by intellirent with Large, Wide Jaw Current Probe to Accommodate a Wide Variety of Capacitor Bushings



## Current Technologies DTS-2

### Surge Suppression Filter System Analyzer

- Simple, Active On-Site Testing of 10 Mode Dual-Function Suppression Filters
- Generates Test Transients from Onboard Inductor; Charge Current of 3A Induces a Surge Voltage that Increases Until Clamped by Device Under Test
- Safety Interlock Prevents Test if Positive or Negative Voltage is Present on Terminals
- Monitors Voltage of Connection Suppression Filter Systems to Permit Troubleshooting of RMS Undervoltages or Overvoltages
- Provides Benchmark Clamp Voltage for Future Comparison
- Real Time Testing Identifies Potential Issues Before Protected Loads are Affected
- Ideal for Use on All Current Technology Suppression Filter Systems (Some Models Require a DTS-2 Adaptor)
- Simple Push Button Operation

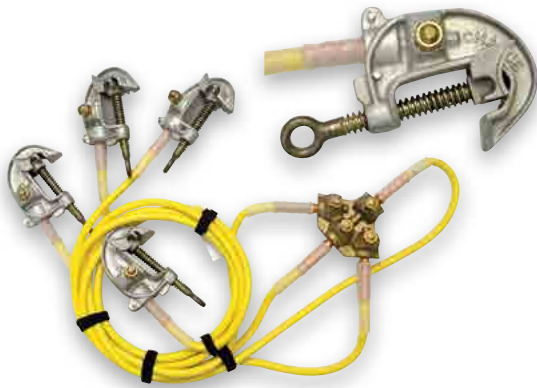




## Tristate TSW-45

### 5kV Phase Sequence Indicator

- Connects to All Three Phase Simultaneously and Provides Instant Readings
- Avoid Relay Misoperations by Verifying Proper Phase Wiring
- Compact and Rugged
- Suitable for Use on 480V to 4160V Circuits
- Phase Indication Provided by intelligent with ABC or CBA indicator Lights
- Open Phase Detection to Indicate Open Phase, Open Lead or No Contact of Test Clip
- Includes 36" Leads



## Intellirent Ground Cluster

### Available from intellirent in Multiple Configurations

- Large Variety of Available Clusters Assures Proper Application
- Typical 15' 4/0 Cables with Connections for A Phase, B Phase, C Phase, and Ground
- Provided by intellirent with Duckbill or C-Type Clamps
- Clamps Adjustable with a Hook Type Hotstick
- All intellirent Clusters are Inspected Before Each Shipment to Provide Confidence and Ensure Safety
- Clusters are Always Well Maintained Between Rental Periods



## ABB 560D16101

### Travel Recorder Kit

- Required for Testing on ABB 72PM Breakers
- Includes Mounting Clamp, Adaptor Plate and Arm
- Connects to Vanguard Linear Transducer or Doble Linear/Rotary Transducer

## Tech Tip

### Testing SF<sub>6</sub> Gas Quality

Over the past few years, testing of SF<sub>6</sub> gas quality has become increasingly important, and with the EPA setting guidelines for loss reporting and taxes on SF<sub>6</sub> bottles and possible fines to utilities, proper testing is now more important than ever. Let alone the increased consciousness to improve a utility grid's uptime by ensuring proper insulation characteristics of SF<sub>6</sub> gas in HV electrical apparatus. Included with variations in gas suppliers' quality processes and measuring processes, it is now important to understand SF<sub>6</sub> gas quality measurement techniques and test equipment available. A few mysteries and inconsistencies exist, and at intellirent, our technical team can help! In the US, the 3 most important measurements, in order of popularity and history, are:

1. Moisture (aka dew point, or humidity) most conveniently expressed in ppmv. (but also can be in degree C or degree C with ref to 20 degree C)
2. Purity expressed in % of SF<sub>6</sub> in the gas sample tested
3. Decomposition products, usually measured by SO<sub>2</sub> detection

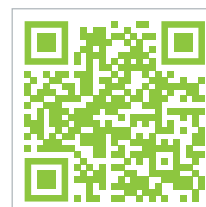
Typical values for the above are:

1. Moisture: < 50 ppmv for new gas, < 150 ppmv for gas in use in a breaker or GIS and >150 ppmv is wet gas that needed drying or re-conditioning and > 400 ppmv is definitely dangerous to use.
2. Purity: < 97% should be replaced, > 97% and to 100% is good usable gas, 99.7 to 100% is new good gas.
3. Decomposition products: In most tests, it is 0 ppm, and up to 100 ppm is generally not a problem. Over 500 ppm is a problem that definitely needs attention, and it indicates acidic compounds are present in the breaker (white powder), which can erode most components and certainly be dangerous to human hands, eyes, and lungs if exposed while working on an open breaker chamber.

Digging deeper into each:

1. Moisture: There are two basic sensor technologies here,  
A - Alumina oxide electronic detection and B - Chilled mirror physical property detection
2. Purity: There are two basic technologies here,  
A - Speed of sound comparison of SF<sub>6</sub> gas vs air and B - Chilled mirror condensation detection
3. Decomposition products: Unfortunately, the only detection sensor here in SF<sub>6</sub> combo test instruments is an electrochemical sensor that has a limited operational life of 18 to 24 months once activated.

All test set manufacturers use this same sensor at present. There is also a Draeger tube technology that uses visual detection of multiple gases, including SO<sub>2</sub>, but not SF<sub>6</sub>. It is quite subjective, though, and its use is decreasing in the industry.



For additional tech tips try the **my intellirent** app by scanning here



## **RH Systems RHS973**

### SF<sub>6</sub> Analyzer with Recirculation

- Compact, Accurate and Reliable
- Determines SF<sub>6</sub> Moisture Content, Purity (Density) and SO<sub>2</sub>
- Uses Dew Point Mirror Principal for Reduced Downtime and Increased Accuracy
- User Configurable Color Touchscreen is Intuitive and Simple to Operate; Steps User Through Testing Process
- Connect-and-Go; Comprehensive and Automatic Testing
- Stores Data for Later Download through RS-232
- Automatic Calibration Check Verifies Calibration Points before Each Test
- Lightweight, Compact Bench Top Configuration
- Provided by intellirent Complete with Adaptor, Regulator and Fitting Kit



## **intellirent GQ**

### Regulator, Fitting and Adaptor Kit for SF<sub>6</sub> Analysis

- Essential Adapter Kit for Seamless Testing Between Most SF<sub>6</sub> Analyzer's and Your Apparatus, Includes:
- RECTUS 21 Male Quick Disconnect to 1/4" Female JIC
- RECTUS 21 Male Quick Disconnect to 3/8" Female JIC
- RECTUS 21 Male Quick Disconnect to 1/2" Female JIC
- RECTUS 21 Male Quick Disconnect to 1 1/4" Female JIC
- RECTUS 21 Male Quick Disconnect to 1/4" Male NPT (3pcs)
- RECTUS 21 Male Quick Disconnect to DN20 Female
- RECTUS 21 Male Quick Disconnect to Aeroquip
- RECTUS 21 Male Quick Disconnect to Malmquist Female
- RECTUS 21 Male Quick Disconnect DN8 Female
- SF<sub>6</sub> Sampling Regulator with RECTUS 21M QD



## Dilo 3-038R-R303

### SF<sub>6</sub> Analyzer with Recirculation

- Determines SF<sub>6</sub> Moisture Content, Purity (Density) and SO<sub>2</sub>
- Intuitive Menu Driven Interface Steps Operator through Testing
- Touchscreen Control
- Onboard SF<sub>6</sub> Storage Vessel and Pump Back to Test Specimen Ensures Zero Emissions Operation
- Ruggedized Field use Enclosure
- Stores Data for Later Review on the Instrument or Download to a USB Port
- User Adjustable Limit Values
- Provided by intellirent Complete with Adaptor, Regulator and Fitting Kit



## Dilo 3-038R-032 NP

### SF<sub>6</sub> and CF<sub>4</sub> Analyzer

- Determines SF<sub>6</sub> and CF<sub>4</sub> Moisture Content, Purity (Density) and SO<sub>2</sub>
- Intuitive Menu Driven Interface Steps Operator through Testing
- Quick Test Results, Less than Seven Minutes Typical
- Touchscreen Control
- Gas Outlet Allows for Collection of Exhaust Gases for Emissions Free Testing
- Portable and Lightweight Benchtop Configuration
- Stores Data for Later Review on the Instrument or Download to a USB Port
- User Adjustable Limit Values
- Provided by intellirent Complete with Adaptor, Regulator and Fitting Kit



## Dilo AAK

### Regulator, Fitting and Adaptor Kit for SF<sub>6</sub> Analysis

- Everything Required to Connect an SF<sub>6</sub> Analyzer to your Apparatus, Includes:
  - SF<sub>6</sub> Regulator Assembly
  - SN8 Self Sealing Male to 3/8 Male NPT
  - 1/4" FJIC
  - 3/8" JFIC
  - Siemens Aeroquip/SPS
  - DN20 Self Sealing Male to 1 1/4" Parker (ITE, Westinghouse, ABB PA)
  - DN20 Self Sealing Male to 3/8" Female NPT
  - DN80 Self Sealing Male to 1" Male NPT
  - DN20 Self Sealing male to Malmquist (ABB PM)





## Fluke ii910/900

### Acoustical Imager

- The ii910 Detects Partial Discharge Signatures Including Corona, Surface Tracking, and Arcing
- The ii910/900 Both Detect Leaks in Compressed Air, Compressed Gas, and Vacuum Systems
- Operating Distances: 0.5m to 70m (ii900), 0.5 to 120m (ii910)
- Frequency Range: 2kHz to 52kHz (ii900), 2kHz to 100kHz (ii910)
- Rechargeable Battery, with up to 6 Hours of Battery Life
- Straightforward, Intuitive Interface to Isolate the Sound Frequency of the Leak and Filter Out Loud Background Noise
- Ensure Proper Air Pressure to Your Pneumatic Equipment
- Improve Reliability in Your Production Line
- 7" LCD Touchscreen that Overlays a SoundMap on a Visual Image for Quick Leak Location Identification



## Vaisala DM70

### Dewpoint Analyzer

- Accurate, Fast Measurements for SF<sub>6</sub> or Transformer Nitrogen Blanket Applications
- Measures Temperature, Dewpoint, Absolute Humidity and Relative Humidity
- Provided by intellirent with Sampling Cell and Fitting Kit
- Measurement Ranges from -60 to 60°C (-76 to 140°F) and 40 to 200K ppm



## Dilo 3-033-R002

### SF<sub>6</sub> Detector

- LED Display of SF<sub>6</sub> Intensity or Concentration
- Multiple Levels of Sensitivity with Real Time Adjustment
- Battery Operated, Lightweight and Simple to Operate

## Fluke Ti450-SF<sub>6</sub> SF<sub>6</sub> Gas/Infrared Camera

- Detects and Pinpoints the Exact Location of the SF<sub>6</sub> Leak – without Shutting Down Equipment
- Quick Entry/Exit Button Allowing Quick Toggling Between Gas Imaging and Infrared Mode
- 320 x 240 Resolution for Gas and Infrared Images; Super Resolution Increases to 640 x 480, Only in Infrared Mode
- Get In-Focus Images in Both Infrared and Gas Modes with a Touch of a Button with Lasersharp Auto Focus
- Wirelessly Connect Your Camera to the Fluke Connect System to Make Faster Decisions
- Team Members Can See the Same Data and Collaborate on Identifying the Problem or Authorize Work Before You've Left the Inspection Site
- Capture Clear, Accurate Infrared Images Focused Throughout the Entire Field of View with Multisharp Focus
- Provided by intellirent with Fluke SmartView Software



## EMT ZW-3-R SF<sub>6</sub> Analyzer with Recirculation

- Fast, 1 Minute Analysis for Testing, Analysis, and Results, up to 10 Parameters
- Zerowaste 3 Gas Rapide SF<sub>6</sub> Analyzer
- Integrated Resistive Touch Panel
- Powerful PC Analysis Software Connects via USB to Laptop
- Battery Life of > 8 hours
- Weight 38 lbs



## EMT-ADT-KIT (Included) (Adapter and Fitting Kit with Regulator for SF<sub>6</sub>)





## Omicron CPC-100/TD-1

### 12kV Multifunction Power Factor Test Set

- A Complete Transformer Test System, Including 12kV Power Factor Tests
- Measures Capacitance, Dissipation Factor  $\tan\delta$  (Tan Delta), Power Factor  $\cos\phi$ , Watts Losses, Power (Effective Power, Apparent Power and Reactive Power), and Impedance (Absolute Value, Phase, Inductance, Resistance, Quality) with Optional TD-1 Component
- Onboard Computer Driven Test Plans to Replicate or Trend Power Factor Tests with Existing Values
- Automatic Power Factor Testing via Omicron's Primary Test Manager Software with the Included Pre-Configured Laptop Computer or Via Front Panel Controls (Includes Test Templates)
- Provides for Automated Testing of Power Transformers, CTs, VTs, Resistance Testing and More
- Onboard or Computer Driven Test Plans for "Push Button to Start" Automation
- Automatic Results Storage and Report Generation
- Stand Alone Functionality for:
  - Ratio, Burden and Polarity, Phase and Magnitude Error, Excitation Curve, Winding Resistance, Secondary Burden and Dielectric Withstand Tests for CTs and PTs
  - Ratio, Winding Resistance, Tap Changer Testing, Excitation Current, Short Circuit Impedance Measurement and Leakage Reactance Testing of Transformers
  - Contact Resistance, Winding Resistance, Ground Resistance or Measurement of Complex Impedances
  - Single Phase Testing of Primary and Secondary Relays (Including Over Current, Over Voltage, Under Voltage and Frequency Relays)
- Flexible AC and DC Power Supply to 2kV AC, 400A DC, 800A AC
- Optional CP CB2 Boosts Current Output to 2000A AC
- USB, Serial or Ethernet Interface
- Optional CPOL Permits Polarity Verification at Multiple Test Points

## Omicron CP SB1

### Switch Box for Automated Testing of Transformers

- Used with Omicron CPC-100
- Provides Connections for Three Phase Winding Resistance and Three Phase TTR Measurements
- Greatly Reduces Test Time for TTR and DC Winding Resistance Measurements
- Automatically Moves the OLTC Through all Positions to Record Values
- Primary Test Manager Software Provides Automated (Sequential) Testing of All Phases and Each Tap Changer Position
- Accommodates Dynamic Winding Resistance with Automated Recording of Slope and Ripple for OLTC health
- Permits One-Time Cable Connections Reducing Time Spent Connecting Cables
- Minimizes Erroneous Results with Automated Testing
- Light-Weight, Easy to Connect



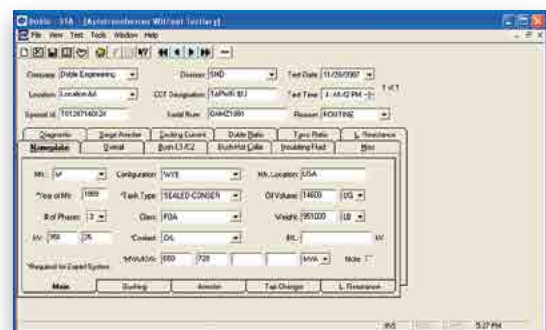
## Omicron CR500

### Compensating Reactor for CPC-100/TD-1

- Permits Testing of Insulation Quality of Large Motors, Generators, Cables and Other High Capacitance Apparatus
- Compact and Lightweight
- Multiple CR500 Units Can be Paralleled to for Dissipation Factor/ Power Factor Testing and Tip up Tests
- Compensates for up to 1 $\mu$ F (4A) with 12kV Test Voltage
- Suitable for Use as a PD High Voltage Source to Provide Compensation for up to 2 $\mu$ F
- Variable Frequency (15Hz to 400Hz) Facilities Optimal Compensation During Long Run Tests







## 12kV Power Factor Test Set

## 12kV Power Factor Test Set

- Rugged Construction for Field Use with Laboratory Accuracy and Precision
- Industry Standard for Testing Electrical Apparatus such as Transformers, Generators and Cables
- Evaluates Integrity of High Voltage Substation Apparatus by Measuring Power Factor/Tan Delta
- Measures Capacitance to Evaluate Physical Changes
- Measures Accurately in High Electrostatic and Electromagnetic Conditions
- Measures Excitation Current to Evaluate Transformer Magnetizing Circuit
- Line Frequency Modulation Technology Eliminates Substation Interference
- Automated Testing Procedures Through DTA or Manual Through M4000 Clipboard
- Provided by intelligent with an M4000 and DTA Pre-Configured Laptop Computer or DUC, and all Application Appropriate Accessories
- Internal Field Calibration Reference Ensures Accurate Testing
- Built in Diagnostics Provide Information on Instrument Status
- Output Current to 300mA at 10kV (Total Output Power 3kVA) for Better Replication of In-Service Conditions
- Optional Type C Resonator Increases Output Capacity
- Optional M4110 Available for Measuring the Impedance (Leakage Reactance) of the Apparatus Under Test
- Optional M4140 Available for Measuring Capacitance of Capacitor Banks
- Optional Liquid Insulation Test Cell for Measuring Insulating Characteristics of Oil
- Optional TTR Capacitor for Measuring Transformer Ratio



## Also Available from intellirent with the Doble M4100 (M4000)

Model	Description
Doble 03B-0706-01 TTR Capacitor	Facilitates TTR Test at High Voltages While Performing Power Factor Tests
Doble M4110 Leakage Reactance Module	Enables Transformer Impedance Testing and Capacitance Measurement of Capacitor Banks with M4140 Accessory Kit
Doble Type C Resonating Inductor	Enables Testing of High Capacitance Test Specimens

## Doble M7100

### Multifunction Transformer Tester

- Dual-Function High-Voltage Lead Design Allows You to Switch Between Source and Measurement—Both Capabilities are within Each HV Lead
- True 4-Terminal Measurements
- Complete Solution for High and Low Voltage Testing
- Test Lead System Dramatically Reduces Ladder Trip Times for Wiring
- Greatly Reduces Overall Testing Time
- Variable Frequency Power Factor/Tan Delta
- Demagnetization Feature
- 3 Phase Turns Ratio at 10kV
- Leakage Reactance 1Ø and 3Ø equivalent
- 3 Phase Winding DC Resistance
- 3 Phase 10kV (Single Phase) Exciting Current and Loss
- Enhanced Safety with Special Safety Switch Design and Emergency Stop Switch
- Runs Doble Test Assistant Software on intellirent Provided Laptop





## Megger TRAX

### Multifunction Transformer and Substation Test System

- Power Factor/Tan Delta Capacitance Testing up to 12kV with HV Option
- Variable Frequency Voltage Source to Indicate Conductive Losses in the Low Range
- Leakage Reactance, FRSL, Excitation
- Dynamic Winding Resistance, Including Tap-Changer Testing
- High Voltage TTR
- Demag Function
- Primary Testing of CT's and PT's
- Individual Temperature Correction
- Ground Impedance Testing
- Contact Resistance
- Line Impedance/ K-Factor
- 4-Channel Power Multimeter
- Oscilloscope
- High Current Booster and Three-Phase Switch Box Available as Options
- Easy and Concise Reporting with intelligent Supplied Laptop

## Raytech CAPO 2.5/CAPO 12

### 2.5kV/12kV Power Factor Test Sets

- Battery Operated Single Piece System is Lightweight and Extremely Portable, Design Dramatically Reduces Freight Costs
- Simple to Operate and Field-Rugged with Laboratory Grade Precision
- Raytech Precision, Simplicity and Reliability
- Simple and Intuitive Touchscreen Interface Walks Operator Through Testing
- Field Rugged
- Measures Dissipation Factor ( $\tan\delta$ ), Power Factor ( $\cos\phi$ ), Capacitance, Inductance, Quality Factor, and Power (Watts)
- All Results are Corrected to 10kV for Comparison with Existing or Historical Test Data
- Automatically Variable Test Frequency from 10Hz to 400Hz
- Onboard Printer for Immediate Results Documentation
- Onboard USB Port for Results Portability with a Standard USB Memory Stick
- Provided by intellirent with a Complete Accessory Kit for Your Application
- Capo 2.5 Unit is Rated for 2.5kV - Weight 49 lbs
- Capo 12 Unit is Rated for 12kV - Weight 79 lbs



## Megger CB-100

### Low Voltage Capacitance and Insulation Power Factor Test Set

- Lightweight (21 lbs) and Portable
- Output of 26V at 100Hz Minimizes 60Hz Interference
- Performs UST and GST Configuration Testing
- Direct Reading of Capacitance and Dissipation Factor
- Designed for Testing in the Laboratory, Shop or Substation
- Self-Contained Instrument that Accurately Measures Insulation Characteristics
- Unit Tests Complex Insulating Systems Without Changing Leads
- Simple Manual Interface
- Optimal for Transformer Dry Out





### AEMC 5050/5060

#### 5kV Insulation Resistance Meter (Megohmmeter)

- Line or Battery Operated
- Test Voltages of 500V, 1000V, 2500V and 5000V
- Insulation Measurement to 10TΩ
- Direct Measurement and Display of Resistance, Test Voltage, Test Duration, Capacitance and Leakage Current
- Large Backlit Display
- Field Portable and Rugged
- Automatic Calculation of DAR, PI and DD
- AEMC 5060 Model Adds Results Storage and Download Capability



### Megger S1-552/2 and S1-1052/2

#### 5kV/10kV Insulation Resistance Meter (Megohmmeter)

- Simple to Use with Intuitive Controls and Features
- Battery or Line Operated
- Vary Test Voltages in 10V Increments Between 50V and 1kV and in 25V Increments from 1kV to 5kV
- Performs PI, Step Voltage, Dielectric Discharge, Dielectric Absorption Ratio Automatically
- Burn and Breakdown Functions Available in Insulation Resistance Mode
- Load Capacitance is Measured and Reported when Tests are Concluded
- Provided by intellirent with Download Software
- S1-1052/2 Extends Voltage Output Range to 10kV



### AEMC 6550/6555

#### 10kV/15kV Insulation Resistance Meters (Megohmmeters)

- Line or Battery Operated
- Graphical Display
- Test Voltages of 500V, 1kV, 2.5kV, 5kV, 10kV (6550) and 15kV (6555)
- Optional Ramping Voltages Between 40 and 10kV (6550) and 15kV (6555)
- Step Voltage Measurements with Ramping from 40 through 1100V or from 500 to 10kV (6550) or 15kV (6555)
- Non-Destructive (Early Break) Test at Pre-Programmed Current Leakage Values or Burn to Fault
- Insulation Resistance Measurement to 10T Ω
- Direct Measurement and Display of Resistance, Test Voltage Test Duration, Capacitance and Leakage Current
- Large Backlit Display
- Field Portable and Rugged
- Automatic Calculation of DAR, PI and DD
- Test Results and Configuration Recorded and Downloadable Through AEMC DataView Software with Onboard USB Port
- Stores up to 80,000 Measurements



## Raytech TR-1

### Single Phase TTR

- Lightweight (7 lbs) and Battery Operated
- Measures Transformer, PT or CT Ratio and Polarity
- Raytech TR-1P Includes Onboard Printer
- Internal Storage of 50 Test Results
- Ratio Measurement from 0.8 to 4,000 Turns
- Fully Automatic, Continuous Operation System
- System is Housed in a Rugged, Lightweight, Waterproof Case
- Battery-Operated Instrument, which can be Recharged with Line Voltage, or an optional DC Car Adapter
- Reverse Polarity Test
- Continuity Test



## AEMC DTR8510

### Single Phase TTR

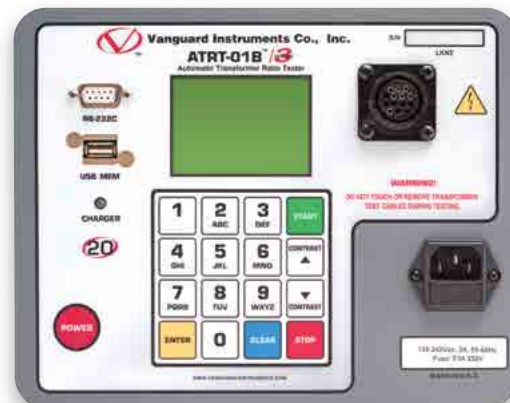
- Battery Operated Digital System
- Ideal for Testing PTs, CTs (Ratio and Polarity) and Some Power Transformers
- Displays Turns Ratio, Winding Polarity, Excitation Current and Deviation from Nameplate Data
- Warns of Incorrect Lead Connections, Reverse Polarity and Open/Short Circuits
- Simple, Basic Controls and Operation
- DC Test Mode Eliminates Errors Resulting from Magnetic Build up
- Records up to 10,000 Results Which Can be Downloaded to DataView Software for Trending and Reporting



## Vanguard ATRT-01 S3

### Single Phase TTR

- Fourth Generation Microprocessor Based System
- Standard ATRT-01 S3 is Line Powered, ATRT-01B S3 is Battery Powered
- Displays Turns Ratio, Winding Polarity, Excitation Current and Deviation from Nameplate Data
- Measures Ratios from 0.8 – 15,000:1
- Output Voltage of 4V or 40V (User Selectable)
- Operates from Faceplate with Simple Controls or Automated Testing through Vanguard's TTRA S2 Transformer Analysis Software
- Records Data to Internal Memory or USB Flash Drive

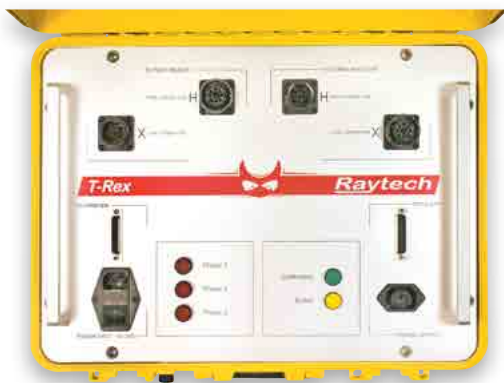




## Raytech TR-SPY Mark III

### Three Phase TTR

- Simplified and Convenient Touchscreen User Interface for Test Setup, Results Display and Documentation Storage
- USB Interface for Documentation and Test Plan Transfer
- Automated Test Voltage Selection
- Automatic Measurements of Voltage, Turns Ratio, Current and Phase Displacement
- Automatic Phase Vector Detection
- Includes Percent Error vs Nameplate Data for Secondary and Tertiary Windings
- Onboard or Computer Based User Configured Transformer Test Plans
- Graphical Tap Changer Display
- Tap Changer Interface (Input and Output)
- Optional Raytech T-Rex Automates Testing by Measuring Phase Relationships of Transformer Windings While Applying Three Phase Voltage



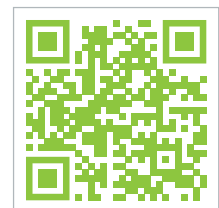
## Raytech T-Rex

### Three Phase Voltage Option

- Fully Automatic with Seamless Integration to Raytech TR-SPY Mark II
- Measure Phase Relationships of Transformer Windings while Applying Three Phase Voltage
- Especially Useful when Measuring Ratio of Zig-Zag Type Transformers
- Fully remote controlled by TR-Mark II R, TR-Mark III R, and TR-Mark III R 250V
- Single Hook up to the Transformer
- Outputs a Pure Three Phase Sine Wave
- Automatic Selection of Test Voltage Frequency
- Measures Phase Relationships Other than Multiples of 30°
- Measures Phase Shifting Transformer
- Measures Power Rectifier Transformer



View and download equipment manuals from the **my intellirent** app



For additional tech tips try the **my intellirent** app by scanning here

## HIGHTEST TECHNOLOGY TURA-03

### Three Phase TTR

- Turns Ratio Measurement
- (Single-Phase and Three-Phase Measurement)
- Ranges from 0.8 to 50,000 Ratio Measurement
- High Accuracy (0.08%)
- 1V, 4V, 10V, 40V, 100V and 250V AC Test Voltage
- Ratio Error Measurement
- Magnetic Balance Test
- Excitation Current, Phase Angle, Polarity Measurement
- Built-in Printer
- Automatic Vector Group Detection Feature
- Internal Memory, USB Flash Drive
- PC Control via USB Cable
- 7-inch Large Color Touch Display



## Vanguard ATRT-03A S2

### Three Phase TTR

- Third Generation Microprocessor Based Automatic Three Phase TTR
- Measures Turns-Ratio, Excitation Current and Phase Angle Readings
- Built-in Transformer Detection Automatically Identifies 130 Different Transformer Configurations
- Onboard Load Tap Changer
- Battery or Line Powered
- Measures Ratios from .8 to 15,000:1
- Stores up to 128 Transformer Test Plans in Memory
- Stores up to 112 Sets of Test Results in Onboard Memory
- Simplified Data Transfer through USB Flash Drive
- Onboard Printer for Immediate Results Documentation



## Vanguard Tri-Phase

### True Three Phase TTR

- Generates True Three Phase Excitation Test Voltage So Any Transformer Type Can be Measured, Including Exotic Winding Configurations
- Ideal for Use on Phase Shifting Winding Configurations
- Measures Turns-Ratio, Excitation Current and Phase Angle Readings
- Built-in Transformer Detection Automatically Identifies 130 Different Transformer Configurations
- Onboard Load Tap Changer
- Measures Ratios from .8 to 15,000:1
- Stores up to 128 Transformer Test Plans in Memory
- Stores up to 112 Sets of Test Results in Onboard Memory
- Simplified Data Transfer through USB Flash Drive
- Onboard Printer for Immediate Results Documentation





## Raytech WR-14

### Winding Resistance Test Set with Demagnetization

- 15A Output for Testing Most Transformers with Repeatable Readings
- Automatically Demagnetizes Winding Upon Test Completion
- Battery or Line Powered
- Two Measurement Channels and Onboard Printer Convenience
- Bright Touchscreen Interface or Full Computer Control
- Color Coded Connections and Simple interface for Fast Familiarization
- Automatic Discharge Circuit
- Onboard Storage of Results
- Lightweight (21 lbs)



## Raytech WR-50-12

### Winding Resistance Test Set with Demagnetization

- 50A Output for Testing the Largest Transformers with Repeatable Readings
- Automatically Demagnetizes Winding Upon Test Completion
- Two Measurement Channels and Onboard Printer Convenience
- Bright Touchscreen Interface or Full Computer Control
- Color Coded Connections and Simple interface for Fast Familiarization
- Automatic Discharge Circuit
- Optional Heat Run Software and Three RTD Inputs



## HV Technologies 2293

### Automatic Transformer Winding Analyzer

- Simple "One-Time-Connection" Designed for Testing of Three Phase Power and Distribution Transformers
- Combines Winding Resistance and Turns Ratio measurements in "One-Time-Connection"
- Adjustable Output Current: 32A
- Resistance Measurement: 0.1  $\mu\Omega$  - 320k $\Omega$
- Measures Ratios from 1.0 – 10,000: 1
- Automatically Demagnetizes Transformer Core
- Onboard Printer for Immediate Results Documentation

## HIGHTEST TECHNOLOGY WINRES-20B

### Winding Resistance Test Set

- 2 Channels Resistance Measurement
- Measurements from  $0.01 \mu\Omega$  to  $100,000 \Omega$
- $0.001A$  to  $20A$  DC Adjustable Current Output
- High Accuracy (0.1%)
- Demagnetization Feature
- User-Friendly Operation Menu
- Temperature Correction
- Built-in Printer (2.28-inch)
- Data Management Platform (DMP Software) Allows WINRES-20B Analyze and Manage Results on PC
- Built-in Battery
- Internal Memory, USB Flash Drive
- PC Control via USB Cable
- 7-inch Large Color Touch Display
- Emergency Stop



## Vanguard TRM-20/TRM-40

### 20A/40A Winding Resistance Test Sets

- Ideal for Measuring Winding Resistance of Transformers, Motors or Generators and Other Inductive Devices
- Two Measurement Channels Provide a Quick and Stable Reading
- Adjustable Output Current: TRM-20 Outputs 1-20A, TRM-40 Outputs 1-40A
- Automatic Demagnetization of Winding
- Automatic Discharge Upon Completing the Test
- Corrects Reading for Temperature if User Enters Values
- Make-Before-Break Mode Provides a Dynamic Resistance Graph of the Load Tap Changer
- Onboard LTC Controller Changes Taps from the Instrument Front Panel
- RS-232, USB and Bluetooth Interface to Vanguard Transformer Winding Resistance Analyzer Software
- Measures Resistance from  $1\mu\Omega$  to  $2k\Omega$ , also Suitable for Contact Resistance on Large Circuit Breakers and Other Substation Equipment
- Onboard Printer for Immediate Results Documentation



## Vanguard TRM-203/TRM-403

### Three Phase 20A/40A Winding Resistance Test Sets

- Connects to All Three Phases (One Winding) Simultaneously: One Test for the Primary, One Test for the Secondary
- Provides Individual Delta or Wye (with No Neutral) Winding Resistance Values
- Ideal for Measuring Winding Resistance of Transformers, Motors or Generators and Other Inductive Devices
- Two Measurement Channels Provide a Quick and Stable Reading
- Adjustable Output Current: TRM-20 Outputs 1-20A, TRM-40 Outputs 1-40A
- Automatic Demagnetization of Winding
- Automatic Discharge upon Completing the Test
- Corrects Reading for Temperature if User Enters Values
- Make-Before-Break Mode Provides a Dynamic Resistance Graph of the Load Tap Changer
- Onboard LTC Controller Changes Taps from the Instrument Front Panel
- RS-232, USB and Bluetooth Interface to Vanguard Transformer Winding Resistance Analyzer Software
- Measures Resistance from  $1\mu\Omega$  to  $2k\Omega$ , also Suitable for Contact Resistance on Large Circuit Breakers and Other Substation Equipment
- Onboard Printer for Immediate Results Documentation







## Vanguard CVT-765

### Coupling Capacitor Voltage Transformer Tester

- Portable, Automatic, CVT, VT, PT Turns-Ration Tester
- Variable Excitation Voltage of 7500V for CCVTs with Ratings to 765kV
- Back-Lit LCD, Viewable in Direct Sunlight
- Instrument Displays Turns-Ratio, Winding Polarity and Winding Phase Angle
- Simple and Intuitive Controls
- Calculates Turns Ratio Percentage Error when Nameplate Voltages are Provided by the User
- Onboard Memory Stores 128 Records of up to 33 Readings
- Onboard USB Port for Memory Stick Enhances Data Portability
- Verifies Polarity with In-Phase or Out-of-Phase Indication
- Measures According to ANSI/IEEE C57.121.90
- Meets IEC 61010A-1 Safety Standards



## Vanguard LTCA-10/40

### 10A/40A Load Tap Changer Analyzers

- Controls Tap Changer from the Front Panel
- Measures Winding Resistance of Highly Inductive Power Transformers
- Measures and Graphs LTC Motor Current with Dynamic Resistance Measurements
- Three Measurement Channels Allow Measurement of Three Windings Simultaneously
- Four-Wire Connections Ensure Lead Resistance is Eliminated from Measurement Value
- Calculates Equivalent Resistance Values with User's Input of Apparatus Temperature
- Measures and Graphs the Resistance Trace
- LTCA-10 Outputs 10A, LTCA-40 Outputs 40A, Each with a 60V DC Source
- Automatic Discharge to Ensure Operator Safety
- Measures from  $1\mu\Omega$  to  $500\Omega$
- USB Port for Results Portability and USB Computer Interface
- Onboard Printer for Immediate Results Documentation

## Doble M5500/M5400

### Sweep Frequency Response Analyzer

- Lightweight and Rugged Portable Test Instrument
- Typical Sweep Speeds Between 15 and 30 Seconds for Reduced Overall Testing Time
- Default Frequency Range of 20 Hz to 2 MHz, with Expanded Range from 10 Hz to 25 MHz
- Dynamic Range > 150 dB
- Wired or Wireless Connection to the Controlling PC
- Includes New SFRA v6 Software for Control and Analysis
- Ensure Transformer Performance, Reduce Maintenance Costs, and Increase the Service Life of Transformers
- Identify Problems Such as Core Movement, Winding Deformation and Displacement, Faulty Core Grounds, Partial Winding Collapse, Hoop Buckling, Broken or Loose Clamping Structures, Shorted Turns and Open Windings
- Measurements are Highly Accurate and Repeatable so Even Subtle Changes Can be Used for Diagnostic Purposes



## Megger IDAX 300S

### Dielectric Response Analyzer

- State-of-the-Art Measurement of Moisture Content,  $\tan\delta$  and Oil Conductivity Using DFR (Dielectric Frequency Response)
- Easy-to-Use Software with Automated Measurement Flow and Analysis of Test Results
- Traffic Light Interpretation of Test Results
- Dedicated Test Procedures for Power Transformers, Bushings and Current Transformers
- Automated Individual Temperature Correction (ITC) for Accurate Comparison with Reference Data/Tests
- Reliable Measurements Even in High-Interference Environments
- Interfaces to High Voltage Amplifiers



## High Voltage Ohm Check

### Neutral Resistance Tester

- Concentric Resistance Analysis Instrument which Injects AC Current Through Live Cable Neutrals
- Tests for the Corresponding Voltage Drop, Calculating Neutral Resistance
- High Voltage Ohm-Check Models Receive an Input Power of 1800 VA and 120V at 60Hz and Produce an Output Power of 0-48V AC
- Helps Technicians Prevent Shock Hazard Conditions by Locating Stray Currents and Voltages
- Helps Overload Protection Systems Function Normally During a Cable Fault
- High Voltage Ohm-Check Testers are Commonly Rented to Fulfill Requirements for Substation Ground Cable Integrity Testing Like IEEE Std 81-2012
- Lightweight and Portable, Easy to Set up, and Once Configured, Tests Take Less than Ten Seconds





## Omicron TESTRANO 600

### Three Phase Multifunction Transformer Test System

- State of the Art Design Greatly Reduces Wiring Times, Simplifies Comprehensive Transformer Testing
- Performs 3-Phase Transformer Turns Ratio, DC Winding Resistance, and Leakage Reactance/Short-Circuit Impedance
- Dynamic DC Winding Resistance also Verifies Condition of the OLTC by Recording Slope and Ripple
- Variable Frequency Test Voltages Allow for Testing Frequency Response of Stray Losses, the Only Dielectric Test to Determine Shorted Conductor Bundles
- Large Onboard Color Touch Screen for Simple Test Set-up and Execution
- Operate Using intellirent's Supplied Preconfigured Laptop Running Omicron's Primary Test Manager
- Weighs 44 lbs
- Combined with Omicron TD-1, 12, or 15 Adds Power Factor and Excitation Tests
- Variable Frequency Power Factor Detects Conductive Losses (Moisture) in Insulation



## Omicron FRANEO 800

### Sweep Frequency Response Analyzer

- Tests Mechanical and Electrical Integrity of Power Transformers Using SFRA Principle
- Detects Winding Defects and Faults in Core without Opening Transformer
- High Dynamic Range – 145 dB
- Innovative Connection Technique Ensures Repeatability of Results
- Simple and Intuitive Software Guides User through Test Setup, Execution and Assessment for Easy Analysis without Expert Knowledge

#### Identifies:

- Axial and Radial Winding Deformation
- Displacements between Primary and Secondary Winding
- Partial Winding Collapse
- Shorted or Open Turns
- Faulting Grounding of Core or Screens
- Core Movement
- Broken Clamping Structures
- Problematic Internal Connections
- Quick Setup, Testing, Trending, Comparison and Reporting Results
- Compact and Easily Portable

## Omicron DIRANA

### Dielectric Response Analyzer

- Off-Line Test to Determine Precise Moisture Content in the Insulation Systems of Oil-Filled Transformers and Bushings
- Test Assets Filled with Mineral Oil, Natural and Synthetic Ester as Well as Air or Vacuum
- Test Times are Reduced by Utilizing Both FDS and PDC+ Algorithms-Less than 2 Hours
- Reliably measures Moisture Content in Oil-Paper Insulation for New or Aged Insulation
- Provided by intellirent with Detailed Connection Diagrams for Most Measurement Scenarios
- Integrated Database Grades Moisture Level (No Expert Knowledge Required)
- Automated Assessment, and Supported Method by IEEE Std C57-161-2018
- Preconfigured Laptop Computer with DIRANA software Provided by intellirent



## Omicron CT Analyzer

### Automatic Current Transformer Analyzer

- Automatically Determines All Relevant CT Test Values and Compares Results with Selected Standard
- Evaluates CTs to the IEC or IEEE Standard within Seconds – Push to Test Convenience
- Ideal for On-Site, Lab or Factory Testing and Calibration of Metering and Protection CTs
- High Measurement Accuracy: 0.02% (Suitable for Class 0.1 Metering CTs)
- Small and Lightweight, Approximately 17 lbs
- Full Test Sequence and Pass or Fail Result in Under 1 Minute
- Tests Run at 120V to Ensure Operator Safety
- Automatically Determines:
  - Accuracy of the Ratio and Phase Angle
  - Nominal and Connected Burden
  - CT Excitation and Saturation
  - Burden Impedance
  - Winding Resistance (CT)
  - Saturated and Non-Saturated Inductance
  - CT Polarity
  - ALF and FS (Direct and Indirect)
  - CT Residual Magnetism
- Data is provided in XLM Format for Portability Between Applications
- RemAnalyzer Software Provides Residual Magnetism, Plots Flux Density and Field Strength, and Analyzes Remanence Condition Before Returning CT to Service
- Simple Transfer of CT Analyzer Results Data to NetSim and RelaySimTest for Network Simulation
- Optional Manual QuickTest Provides Manual Control to Emulate Manual Source/Meter Measurements



## Omicron CT SB2

### Multi-Tap Adaptor for CT Analyzer

## Qualitrol KIT-930

### Sudden Pressure Relay Test Kit

- Complete Field Test Kit for Performing Confidence Testing of Qualitrol 930 Electronic Pressure Monitor
- Complies with NERC Standard PRC-005-6
- Includes all Required Components, Tools and Power Supplies
- Housed in a Rugged Carrying Case
- Simple "go/no-go" Field Testing of All Qualitrol 930 Monitors
- Test the Fast Pressure Rise by Actual Simulation
- Test the Fast Pressure Rise Response
- Verify the 4-20mA Output of Each Pressure Transducer from the Monitors Front Panel
- Test and Calibrate Slow Pressure Rise Alarm and Set Point
- Test the Power Status Alarm

## Qualitrol KIT-013-1

### Sudden Pressure Relay Test Kit

- Suitable for Field Testing Transformer Rapid Pressure Relays
- Self-Contained Kit with Pressure Source Pump, Timer, Gauge, Fittings, Tubes and Tools
- Portable Verification of Proper Rapid Pressure Rise Relay Operation
- Allows Simple "Go/No-Go" Field Testing of All Qualitrol RPRRs
- Rugged Case with Shoulder Strap for Carrying Unit into the Field
- Rugged Carrying Case Feature Integrated Components for Field Testing
- Contains Power Supply, Test Lights and Operation Buttons Integrated into Case
- Setup and Test Instructions Permanently Affixed to Inside of Case
- Battery Operated

## Arbiter 921A

### Combustible Gas Meter

- Measures Total Combustible Gases (TCG) in Oil Filled Transformer Nitrogen Gas Blankets
- Excellent Indicator of Transformer Health for Routine or Predictive Maintenance Activities
- Provided by intellirent with Cylinders of Instrument Air, Zero Grade Nitrogen and 1% Methane in Nitrogen for On-Site Calibration
- Built-in Gas Pressure Sensor
- Provided by intellirent with Regulators and Accessories





## Vaisala MM70

### Moisture and Temperature Meter for Oil Filled Transformers

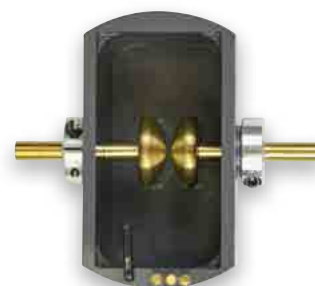
- Moisture and Temperature Meter for Oil Filled Transformers and Oil Pipelines
- Measurement Independent of Oil Type, Age and Temperature - Indicates Margin to Oil Saturation
- In-Line Process Checking Through Ball Valve, No Need to Drain the Oil
- Rugged and Reliable Construction
- Multi-Probe Operation; Dewpoint and CO<sub>2</sub> Probes Can also be Connected
- Vaisala Humicap Sensor - Proven Field Performance Since 1973



## High Voltage DTS-60D/A

### 60kV Oil Dielectric Test Set

- Performs Repeatable, Accurate Measurement of Breakdown Voltage of Insulating Oils
- Ruggedized for Field Use, Accurate for Lab Use
- Three Rates of Rise: 500V/2000V/3000V Per Second
- Arc Detection with Automatic Shutdown and Measurement Hold
- Window panel for Test Observation
- Failure indicator
- Window Panel for Observation
- Provided by intellirent with both ASTM D877/87 and D1816/84 Test Cells (Others Available Upon Request)
- DTS-60A Adds Full Programming and Automation with Onboard
- Printer, Internal Results Storage and RS-232 Interface, User Defined Test





## Vanguard EZCT-2000C+

### Full Function Multi-Tap CT Tester

- Third Generation Microprocessor Based CT Test System
- Fully Automated Testing by Front Panel, Android App or Computer Controlled Through PC Software
- Performs CT Excitation, Current Ratio, Polarity and Phase Angle Tests
- Measures Insulation Resistance and Winding Resistance of CT Secondary Windings
- Measures CT Load Burden
- Automatically Demagnetizes CT when Performing CT Excitation Test
- Internal Storage of Test Plans – Easy Setup of Test Plans or Quick Manual Testing through Front Panel Controls
- Connects to All Secondary Terminals of the CT for Fully Automated Testing without User Intervention
- Plots Multiple Saturation Curves for Comprehensive and Professional Report Generation
- Documents Current Ratio and Current Phase Error Tables
- Onboard Printer for Immediate Results Documentation
- Full QWERTY Keyboard on Front Panel for Report Header Input and Orderly Data Storage
- Onboard USB for Flash Driven Connections and USB Port for Simple Computer Connections



## Vanguard EZCT-2KA

### Automated Multi-Tap CT Test Set

- Measures Excitation Voltage and Current, Turns Ratio, Winding Polarity on Single and Multi-Tap CTs
- Excitation Voltages to 2000V AC, Current up to 10A (at 300V)
- Fully Automated, Connects to All CT Output Terminals Simultaneously – No Lead Switching Required
- Plots Multiple Saturation Curves
- Operations from the Front Panel or Through Computer Control
- CT Ratio and Excitation Knee Point Calculated and Charted Automatically
- Five Voltage Test Settings – 50, 300, 500 and 1200 and 2000V AC
- Measures DC Resistance in CT Windings
- Onboard Memory Stores 140 Test Records (Of 10 Saturation Curves) and 128 Test Plans
- Ratio Accuracies of 1% or Better
- Extended 35' Lead Lengths

## Vanguard EZCT-S2A

### Automated CT Test Set

- Measures Excitation Voltage and Current, Turns Ratio, Winding Polarity on Single and Multi-Tap CT's
- Excitation Voltages up to 1200V, Current to 2A (at 200V)
- Operation from Front Panel or Through Computer Control
- CT Ratio and Excitation Knee Point Calculated and Charted Automatically
- Capable of Testing 0.8 Through 5000 to 1 CT Ratios
- EZCT-10 Model Increases Excitation Current to 10A (at 200V)
- Store up to 128 CT Test Plans in Flash EEPROM
- Utilizing Predefined Test Plans Greatly Simplifies the CT Testing Process
- Onboard Printer for Immediate Results Documentation
- Computer Controlled to Execute Tests, and Store Tabulated Test Results



## Raytech CT-T1

### Full Function Multi-Tap CT Tester

- Microprocessor Based CT Test System Measures CT Excitation, Current Ratio and Winding Polarity
- Single Connection Harness Permits All Taps to be Tested Automatically, without User Intervention
- Fully Automatic Knee Point Detection and Documentation
- Ratio Range of 0.9 to 15,000
- Manual or Automatic Demagnetization and Measurements
- Automatic Test Voltage Range Selection with Adjustable Limits
- Simple Touchscreen Interface
- Internal Storage of 10,000 Measurements
- Onboard Printer for Immediate Results Documentation
- USB for Computer Control and for Flash Drive
- High Accuracy - +/-0.5% for Most CTs
- 2000V Output with Resolution of 10mV
- 10A Current Output with Resolution of .01mA
- Lightweight and Portable at Approximately 44 lbs
- Field Rugged





## MTE HYDROCAL 1011 genX P

### Portable Dissolved Gas Analyzer

- Simple to Use, Quick, and Highly Accurate Results with Automated Assessment
- Individual Measurement of Hydrogen (H<sub>2</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Acetylene (C<sub>2</sub>H<sub>2</sub>), Ethylene (C<sub>2</sub>H<sub>4</sub>), Ethane (C<sub>2</sub>H<sub>6</sub>), Oxygen (O<sub>2</sub>), Nitrogen (N<sub>2</sub>) and Propane (C<sub>3</sub>H<sub>8</sub>)
- Moisture in Oil (H<sub>2</sub>O) Measurement
- Maintenance-Free Measurement System with Headspace Gas Extraction, IEC 60567
- Operation by Integrated 7" color TFT (800x480 pixel) Touch-Screen or Via genX Webserver from Any Smart Phone, Notepad or PC, Provides Tabular Results and Color Duvall Triangle
- SD Memory of Test results, History and Diagnostic Data of Power Transformers and Oil-Filled Electrical Equipment
- Communication Interfaces Wi-Fi, USB or ETHERNET 10/100 Mbit/s
- Integrated Thermal Report Printer



## Trojan Dry-Out Systems TDOS 1000 HV

### Transformer Dry Out System

- Effective Removal of Gases and Moisture on Energized Transformers of All Sizes, Oil Volumes and Types (Conservator; Nitrogen Blanket)
- Portable Unit that Can be Easily Rotated Between Transformers
- Designed for Unattended Operation on Energized Power Transformers
- Absorbent Based System with Patented Automatic Filter Redrying Technology
- Three (3) Selectable Online Oil Treatment Cycles (Water in Oil Analysis; Oil Degasification; Moisture Removal)
- Simple, Safe and Easy to Operate Using Onboard Touch Screen
- PLC Controlled with HMI Interactive Screen
- Multiple Interlocked Safety Cut-Outs Automatically Shut Down and Isolate the System from the Transformer
- Remote Communications Standard: Monitoring, Operation and Data Download
- In Conjunction with the Trojan Factory Experts, intellirent Will Provide 100% Technical Support for Installation, Monitoring, and Decommissioning

## RF Systems VJ-ADV-3.9-3

### Video Borescope Kit

- Viewtech's 3.9mm Video Borescope
- Huge Number of Applications where Visual Inspections are Critical
- For Application Passageways that are Small
- Comes Equipped with 1.5m or 3.0m Insertion Tubes
- Removable Stand
- Optional Magnetic Floor Plate Stand
- Rugged Carrying Case
- 2 Rechargeable Li-ion Batteries
- Battery Charger, AV Cords, and 16GB SD Card



## Tech Tip

### Power Factor Variables

Variable frequency power factor testing provides valuable information relative to conductive losses present in a power transformer's insulation system. Some of these losses are inert furans, or sludge present in the oil. However, it could also be an indication of excessive moisture, which can lead to premature failure. By measuring and recording power factor values in the 10 to 60Hz range, conductive losses would be indicated if the measured power factor is higher than the 60Hz value, and further investigation, such as DFR, should be applied. However, if the measured power factor is lower in this range, with all certainty, the insulation system does not have a moisture issue. Simply relying on an oil screen for moisture should not be recommended since equilibrium curves are prone to error, and there is always a chance for samples to become contaminated after being drawn. Talk with one of our technical experts for further information.

For additional tech tips try the **my**  
intellirent app by scanning here



**my**  
intellirent

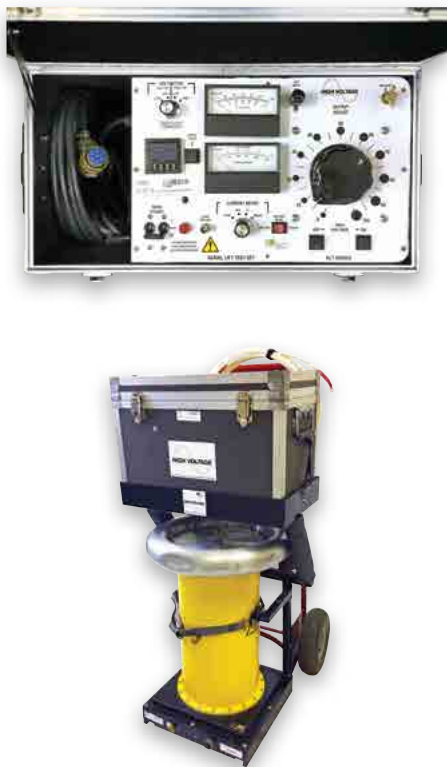




High Voltage PTS Series DC Hipots

- Continuously Adjustable Output Voltage
- Dual Range Voltage Meter
- Microamp and Megohm Scales for Leakage Current and Insulation Resistance Measurement
- 20' Shielded Output Cable with Alligator Clip
- Switchable Guard/Ground Load Return Path

Model	Output Voltage	Output Amps	Design	Controller Weight	High Voltage Tank Weight
PTS-75	75kV	10mA	1-pc	68 lbs	N/A
PTS-80	80kV	10mA	1-pc	62 lbs	N/A
PTS-130	130kV	10mA	2-pc	35 lbs	82 lbs
PTS-200	200kV	5mA	2-pc	35 lbs	150 lbs
PTS-300	300kV	5mA	2-pc	35 lbs	380 lbs



High Voltage ALT-60/120  
60kV/120kV AC Hipot with 7kVA Output

- Two Piece Design and Hand Truck Mount for Controller and Tank Improve Portability
- Side Tap at 60kV Provides 120mA Capacity
- Top Tap at 120kV Provides 60mA Capacity
- 120V/30A Input
- Ideal for Iso Phase Bus Testing, Aerial Lift Devices and Elevated Platforms, Most Common Dielectric Withstand Tests, and as a Source Voltage for Apparatus PD Testing
- Not Suitable for Cable Testing

## High Voltage VLF-6022CM

VLF Hipot, 62kV Peak (44kV RMS)

- Output Voltage is 62kV Peak
- Adjustable Output Frequency of 0.1Hz, 0.05Hz, or 0.02Hz (Sinusoidal)
- Capable of Testing 35kV Cable up to a Maximum Distance of 20 Miles
- Metering Includes Voltmeter  $\pm 0-65$ kV AC Peak, Charging Current Meter 0-100mA Peak, and Load Capacitance Meter 0-6 $\mu$  Farads
- 20' Shielded Output Cable
- Two Piece Design; Controller Weight 75 lbs/High Voltage Tank Weight 120 lbs



## High Voltage VLF-12011CMF

VLF Hipot, 120kV Peak (85kV RMS)

- Provides a 120kV AC Peak Output Voltage, Suitable for VLF Hipot Testing 69kV Cable and as a Voltage Source for Partial Discharge and Tan Delta Testing of 115kV Cable
- Complete Control Package Including Cable Burn Mode, Which Reduces Fault Arc Overvoltage Events so That Conventional Thumpers Can be Deployed for Fault Locating
- This Model Comes in a One-Piece Package with Cable Reels
- Designed for Withstand Testing of 69kV Cable Systems Per IEEE 400.2-2013 and Insulation Testing of Large Rotating Machines Per IEEE 433-2009
- With Output Frequency Options of 0.1Hz, 0.05Hz, 0.02Hz, and 0.01Hz the VLF-12011CMF Can Test Cables up to 50,000 Feet Long
- Includes Zero Start Interlock Circuit and External Interlock Provisions on All Equipment
- Weights: Control: 20 lbs, Regulator: 160 lbs, HV Tank: 390 lbs, Overall: 853 lbs
- Outputs: Sinusoidal, 0-120kV AC Peak, 0.1/0.05/0.02/0.01Hz Frequency Continuous Duty
- 100 ft Shielded X-Ray Output Cable with Dual Cable Reels
- Load: 0.55 $\mu$ F (Approx 5,000 ft of Cable) at 0.1Hz, 1.1 $\mu$ F (Approx 10,000 ft of Cable) at 0.05Hz, 2.75 $\mu$ F (Approx 25,000 ft of Cable) at 0.02Hz, 5.5 $\mu$ F (Approx 50,000 ft of Cable) at 0.01Hz





**HV Diagnostics VLF Hipots**

34kV, 60kV and 90kV Hipots for VLF Withstand Testing,  
Tan Delta (Dissipation Factor) and Offline Partial Discharge Cable Testing

- Compact, Single-Piece Construction for Improved Portability and Logistics Compared to AC or DC Hipots with Similar Cable Testing Capability
- Simple and Intuitive Menu Driven User Interface
- Consistent Controls, Menus and Connections on Each Model Ensures Minimal Learning Curve from Instrument to Instrument
- Appropriate for Testing Cables, Capacitors, Switchgear, Transformers, Rotating Equipment, Insulators and Bushings
- Meets Requirements of a Type I Withstand Testing According to IEEE 400.2 and Other National and International Standards
- User Specified or Automatically Adjusted Output Frequency According to Measured Capacitance (.1Hz to .01Hz in .01Hz Steps)
- Sinusoidal, Cosine Rectangular, or DC Output Waveform
- True Symmetrical Sinusoidal, Load Independent Output Waveforms Across Full Load Range
- Short Circuit Protection with Active Arc Management
- Digital Metering Displays Voltage (RMS or Peak), Capacitance, Resistance, Elapsed Time, and Flashover Voltage
- Storage of Test Results and Test Sequences (Test Plans) in Internal Memory and Onboard USB Port for USB Flash Drive
- HVA Control Center Software Produces Professional Reports
- Keyed Safety Interlock and Emergency Shutdown
- Seamless Integration with HV Diagnostics Tan Delta Measurement Systems, HV Diagnostics Partial Discharge Analysis Equipment

	Peak/DC Output	RMS Output	Max Load at .1Hz	Max Load at .01Hz	Weight	Input Voltage	Compatible TD System	Typical Application
HVA34	34kV	24kV RMS	0.5µF	12.0µF	44 lbs	120V/400VA	TD-34	15kV Maintenance/ Acceptance Testing, or 25kV Maintenance Testing
HVA60	60kV	44kV RMS	1.0µF	10.0µF	126 lbs	120V/1.5kVA	TD-60	35kV Maintenance/ Acceptance Testing
HVA90	90kV	64kV RMS	1.0µF	10.0µF	280 lbs	120V/1.5kVA (Reduced) 240V/3kVA (Full Output)	TD-90	69kV Cable Maintenance/ Acceptance Testing



## HV Diagnostics Tan Delta Measurement Systems

30kV, 34kV, 60kV and 90kV Tan Delta (Dissipation Factor) Test Systems

- High Voltage Tan Delta Measurement System for Testing XLPE, PE, EPR, PILC, etc. Cables
- Provides Type II Diagnostic Testing and Meets Requirements of IEEE 400.2 and Other National and International Standards
- Seamless Integration with HV Diagnostics HVA Series Hipots
- Compact and Battery Operated
- Simple and Convenient Setup
- Solid State, Air Insulated Design
- Configuration and Data Extraction through Stable Bluetooth Connection
- Provided by intellirent with a Preconfigured Laptop Computer and a Complete Kit with Tripod, Corona Mitigation Accessories, and Cabling for Connection to HVA Series Hipot and Connection to Cable
- Provided by intellirent with Intuitive TD Control Center which Displays Individual Voltage/Waveform, Loss Angle Data and Plots Tan Delta Curve
- Real Time Display of Actual Waveform Output and Data
- Visual Indication of Tan Delta Levels with LED Indicators

Model	Peak Voltage	RMS Voltage	Weight	Dimensions (Length x Diameter)
TD-30	33kV	23kV	7 lbs	9.5" x 3.5"
TD-34	34kV	24kV	7 lbs	9.5" x 3.5"
TD-60	62kV	44kV	11 lbs	18" x 5"
TD-90	90kV	64kV	24 lbs	26" x 5"
TD-60-MC	62kV	44kV	32 lbs	25" x 12"
TD-90-MC	90kV	64kV	35 lbs	31" x 12"



## HV Diagnostics HVA28-TD/HVA34-TD/HVA45-TD

Combination 28/34/45kV VLF Hipot and Tan Delta Measurement System

- The Smallest VLF/DC Unit on the Market Now Includes an Integrated Tan Delta Measurement System to Perform Advanced Electrical Insulation Diagnostics
- Extremely Useful when Performing Advanced Diagnostics on Cable Systems as it Provides Valuable Information as to the Condition of the Cable Insulation and Shield
- Integrated TD Unit
- TD Resolution  $\pm 1 \times 10^{-4}$
- TD Analysis and Reporting Using TD Control Center
- Digital RMS Metering
- Smallest Unit Available
- Bluetooth/USB Memory Stick PC Interface
- Color LCD Display
- Lightweight and Extremely Portable
- Insulation Resistance and Capacitance Measurement
- Perform Advanced Diagnostics on MV Cables According to IEEE 400-2012 and IEEE 400.2-2013
- Output Frequency Optimization
- Real Time Oscilloscope Display
- Auto and Manual Test Sequences
- Internal Storage of Test Reports
- Unlimited Duty Cycle
- Flashover Voltage Detection
- Low Maintenance, Oil-Free Design
- RMS Digital Metering of Current and Voltage



## HV Diagnostics HVA30-7

34kV Peak (24kV RMS), High Output (7kVA) VLF Hipot

- Designed Primarily for Electrical Utilities that Have Large Complex Cable Networks that Demand a Very Powerful Test Instrument to Overcome the Large Loads Presented by These Long Cable Systems
- Can be Used for Testing Many Other Electrical Apparatus Like Transformers, Motors/Generators, Switchgear, etc.
- Internal Storage of Test Reports
- Download to PC and/or USB Flash Drive
- Unlimited Duty Cycle
- Flashover Voltage Detection
- Bright Backlit LCD Display
- Weight 125 lbs
- Power Supply Immunity and Independence
- Low Maintenance, Oil-Free Design



## Elastimold Load Break

### Cable Test KIT 160-15kV/270-25kV/370-35kV

- Required for Withstand Testing of Medium Voltage Cables with Load Break Terminations
- Includes Insulated Parking Bushings (3) and Insulated Feed Through Bushings (3)
- Uses Basic Parking Stand Mount
- May be Used with an Insulated Hot Stick and Secured into Place on the Parking Stand
- Molded EPDM interface
- Fits a Standard ANSI Bushing Well Interface
- HEX-Broach Included for Torque Installation
- Color-Coded for Easy kV Class Identification
- Properly Vented to Alleviate a Vacuum Flashover
- A PBT Interface Reduces Sticking Inside the Bushing
- Both the Parking Bushing and LoadBreak Insert Meet ANSI/IEEE Standard 386, Latest Revision
- Waterproof, Rugged, and Lightweight Carrying Case



## Elastimold Dead Break

### Cable Test KIT 650-15/25kV/750-35kV

- Includes Insulated Plugs (3), Insulated Feed Through Bushing (1), and Threaded Studs (3)
- 15/25kV and 35kV Deadbreak Insulating Plugs
- Hex Nut Provides a Capacitive Test Point
- Threaded Stud Included for Ease of Connection
- Allows De-Energized Connection of Two 600 Amp Connectors
- Both the Insulating Plug and Connecting Plug Meet ANSI/IEEE Standard 386, Latest Revision



# asset management

Where technicians, equipment and jobs intersect

asset management comes in many forms and intellirent helps you choose the best solution based on your needs. Our app and portal-based platforms are built for testing organizations.

We provide three tiers of asset management services: equipment tracking, fleet management, and optimization. Call 888.902.6111 for additional information or a demonstration.

## equipment tracking

- GPS and bluetooth
- tool-room, truck and jobsite
- lost prevention and accountability

## fleet management

- *equipment tracking plus*
- functional testing and equipment cleaning
- accessories replacement and maintenance
- shipping
- repair and calibration

## optimization

- *fleet management plus*
- reporting
- dashboards
- maximize fleet utilization
- buy vs rent decision

## Download the free my intellirent app



search equipment, view specifications, manuals or accessories



view or download equipment manuals



browse past, current, pending order tracking



view current rentals and calibration certificates



new rental requests



Available at



## Phenix 440-20 DC Hipot, 40kV

### 40kV Portable DC Hipot

- The Phenix Technologies 44-20 40kV DC Digital Hipot Tester is a Simple Digital Single-Piece Portable DC Hipot Dielectric Tester
- Output Voltage is Continuously Adjustable Over Entire Range
- Adjustable Overcurrent Trip Point from 10%-110% of Each Individual Current Range
- Large, Easy to Read, High Accuracy Digital Meters
- Analog 0-100% of Range Current Meter for Visual Charge Indication
- Input Circuit Breaker/Power Switch
- Thermal Resettable Overload
- Built in Discharge Circuit Rated at 6 Kilojoules (kJ)
- Removable Line Cord
- "Zero Start" Interlock



## Phenix BK130/36

### 36kV/130kV AC Hipot with 6.5kV Output

- Ideal High Voltage Source for Offline Partial Discharge Testing of Apparatus; Not Suitable for Cable Testing
- Two-Piece Design and Hand Truck Mount for Controller and Tank Improve Portability
- Side Tap at 36kV Provides 180mA Capacity, Top Tap at 130kV Provides 50mA Capacity
- 120V/30A Input
- Adjustable Overload Circuit
- Includes 50' Output Cable



## Phenix 6CP-50/100-10

### 50kV/100kV AC Hipot with 10kVA Output

- Ideal High Voltage Source for Offline Partial Discharge Testing of Apparatus; Not Suitable for Cable Testing
- Minimal Partial Discharge – Less than 4pC at 100kV and Less than 3pC at 80kV
- Two-Piece Design and Hand Truck Mount for Controller and Tank Improve Portability
- Side Tap at 50kV Provides 200mA Capacity; Top Tap at 100kV Provides 100mA Capacity
- 240V/30A Input
- Adjustable Overload Circuit



## VON XF25-1563v2

Combination Arc Reflection TDR and 25kV Thumper/Hipot

- Very High Output Power – 1563 Joules
- 120V Line Powered or Battery Operated with Onboard Battery Charger
- Ideal for use on 35kV Cables
- Fast Three Step Procedure to Fault Location
- Onboard TDR (Cable Radar) Automatically Marks End of Cable and Fault Location(s) with Distances
- Large Screen Provides Clear Feedback for TDR Trace
- Large Pneumatic Wheels for Ease of Transport over Rough Terrain and Stability
- A Total Fault Location Solution when Paired with the Aquatronics SDAD Acoustical Detector



## High Voltage CDS-2010U

20kV Thumper and Arc Reflection TDR

- Full Output Power (1000 Joules) Available at 5kV Limits Risk of Collateral Damage to Cable
- 120V Line Powered
- Arc Reflection and Current Impulse TDR Interface
- Seamless Integration with the High Voltage, TDR1669
- Hipot Burn Current of up to 400mA DC for Quick Fault Conditioning
- Ideal for Use on 35kV Cables
- Field Rugged
- Familiar and Simple Controls
- A Total Fault Location Solution when Paired with the Aquatronics SDAD Acoustical Detector and the High Voltage TDR1669
- Full Impulse Energy at 5kV/10kV/20kV, Variable Hipot/Burn in All 3 Taps (400mA at 5kV tap, 200mA at 10kV tap, 100mA at 20kV tap), EPR High Voltage Output Cable that Stays Flexible Even in Cold Weather
- TDR/Radar Ready, and Extremely Durable and Portable Design with Small Footprint for Years of Reliable Operation
- Available in 120V AC, 25A Input and 230V AC, 15A Input



## Innovative Utility Products Fault Wizard

### Complete Fault Location System

- Single Piece High Voltage Thumper, ARC Reflection TDR, DC Hipot and Low Voltage TDR
- Rugged and Reliable Compact Design (Weight 50 lbs)
- Simplified Transportation Through Common Express Carriers
- Single Operator Portable
- Battery or Line Powered
- Ideal for Testing up to 15kV Shielded Cable
- Quickly Indicates Fault Type and Actual Distance to Fault in Feet
- Simple to Operate and Identify Fault Location for Less Familiar Users
- Sophisticated Circuitry Ignores Transformer Reflection and Locks on Fault Location
- Locates Faults to 10,000 ft (Maximum Capacitance of 7uF)
- Variable Impulse Voltage (Thump) for Minimal Cable Damage
- Variable Velocity of Propagation for Precision Adjustment to Specific Application
- 350 Joule Pulse Can Often be Heard Above Ground
- Included Fault Wizard Software Enables Viewing and Recording Of Trace



## Aquatronics SDAD

### Acoustical Fault Detector

- Excellent Companion to High Voltage CDS-2010 or VON XF25 for Audible Confirmation of Fault Location
- Two Channel System Enables Directional Fault Indication
- Bright Backlit Screen Indicates Distance to Fault and Fault Depth
- Includes Stirrup Probes for Hard Surfaces
- Fault Centering Function Quickly Orients User to Fault Location
- Basic Direction-to-Fault with Centering Ability
- Time-Based Distance to Fault, Triggered by Ballistic Impulse (Magnetic Thumper Wave) to Eliminate False Tripping Due to Background Noise
- Fault Depth Indication
- Locates Ground Faults on Medium Voltage Cables Inconjunction with a Thumper
- Simple Operation







## Megger CFL535G

### Advanced Dual Trace Stand-Alone TDR

- Dual Channel System Measures Two Cables (or Two Conductors) Simultaneously
- Xpert Mode Evaluates Cable under Test and Adjusts to Ideal Settings
- One Press of the XPert Button Identifies the First Major Event on the Cable
- Second Pulse Function Identifies Near (Test) End Faults
- Manual Control Permits Fine Settings Adjustments and Full User Control
- Large Color Screen for Improved Readability
- Dual Trace and Dual Cursors Immediately Identify Distances
- Five Output Impedance Settings Available, Plus Auto Impedance Matching
- TraceXpert PC Software Enables Reporting of Results
- Ideal Companion for Offline Partial Discharge Testing of Cables or Cable Fault Location Systems



## High Voltage TDR-1669

### Time Domain Reflectometer (TDR)

- Seamless Integration with High Voltage CDS-2010U
- Connects to Thumper via Standard BNC Cable
- Low Voltage TDR Mode Enables Cable End Identification and Velocity Factor Adjustment
- Onboard Memory of 15 Traces
- Dual-Trace Overlays Previous Results
- Measures Cable Ends to 48,000 ft
- Zooms to 4x on 3000' Range for Precise Event Examination
- Displays Distance, Velocity Factor, Range and Operation Menus
- Large 10.5" Sunlight-Readable LCD Display
- Arc Reflection Method
- 3 $\phi$  Comparison and Difference
- Automatic Cursor Placement
- Built in Memory to Save Waveforms
- RS232 Serial Port to Download Data to intellirent Provided PC at No Additional Charge
- Field Portable

## HV Diagnostics EZ-Cable ID

### Single and Three Phase Cable and Phase Identification System

- Designed to Avoid Live Cable Cut-Ins
- Simple Operation, Menu Driven Interface
- Accurately and Effectively Identifies Either Single or Three Phase Cables Anywhere (Simultaneously) Along the Length of the Cable
- Effective for Use on Single or Multi-Conductor Cable
- Works in Energized and De-Energized Applications, Including High Load Carrying Conductors
- Measured Current/Frequency for Energized Cables
- Provided by intellirent as a Complete Kit with Receiver, Transmitter and User's Choice of Inductive Clamp(s) or Flexible Coils



## Amprobe AT-7030

### Advanced Wire/Circuit Tracing System

- Comprehensive Kit Includes All Required Components for Tracing Low Voltage Circuits in Walls, Ceilings, Floors and Corners
- Innovative New Antenna Design and Advanced Signal Processor Provides the Exact Location and Orientation of Wires/Circuits
- Effective in Both Energized and De-Energized Applications
- Locates Breakers and Fuses
- Pinpoints Shorts and Opens
- High Resolution Color LCD Displays Active Process and Menu
- Three Output Modes – High for Normal Circuits, Low for Precision Tracing in Difficult or Congested Areas, and Clamp Model for Boosted Induction Signal by the Included Clamp
- Provided by intellirent as Complete Kit with Receiver, Transmitter, Leads, Inductive Clamp, Hanger and Booster Battery



## Tasco CMT42S

### Circuit Mapper System

- Maps 42 Branch Circuits from a Panel with a Single Transmitter and Receiver
- Transmitter Connects to 42 Circuits with Voltage Leads and Miniature Induction Clamps
- Effective on Energized and De-Energized Systems
- LCD Display on the Receiver Indicates the Circuit Number According to the Induction Clamp for that Circuit
- Considerable Time Savings - Eliminates Tracing Individual Circuits
- Non-Contact Setting Allows Signals to be Read Through Insulation without Direct Contact



### **Amprobe AT-3500**

#### **Underground Cable Locator**

- Locates Underground Energized and De-Energized Conductors
- Uses Three Modes to Ensure Accuracy – Passive Power, Passive Radio and Active Signal Generation
- Signal Generator Outputs by RF, Induction Clamp or Direction Connection
- Active Depth Indication up to 16'
- Automatic Gain Control Results in Fast Signal Location and Control
- Provided by intellirent Complete with Receiver, Transmitter, Leads, Induction Probe and Ground Stake



### **3M Dynatel 2273**

#### **Underground Cable and Fault Locator**

- Measures and Pinpoints Sheath and Conductor Faults
- Pinpoints Insulation Faults on Un-Shielded Buried Cables
- Locate Underground Cable Path and Depth
- Discriminates between Low and High Resistance Faults
- Visual and Audible Indicators
- Locates Energized or De-Energized Cable
- Included Signal Generator Operates on Four Active Trace Frequencies: Direct Connect or Clamp Induction, Passive RF Detection (Radio) and 50/60Hz Power Signal Detection
- Provided by intellirent with A-Frame Fault Locator
- Simple Operation for Less Experienced Users



### **3M Dynatel 1420**

#### **EMS-iD Locator**

- Microprocessor Based Locator for Underground Markers
- Quickly and Accurately Locate, Read or Write to 3M iD Markers
- Pinpoints Depth and Location of Existing Models of Passive EMS Markers
- Locates Two Separate Marker Frequencies Independently
- Detects all Seven EMS Marker Frequencies
- Unaffected by Metallic Conduit or Pipes, AC Power or Electronic Markers for Other Utilities
- Provided by intellirent with Locator PC Tools Software



## Amprobe AT-4005

### Wire/Circuit Tracing System

- Quickly Trace Energized and Non-Energized Wires Effortlessly with the Amprobe AT-4000 Wire Tracer Series
- The AT-4005 Combines Features and Functions to Make Locating Wires More Accurate and Your Job More Efficient
- Comprehensive Kit Includes All Required Components for Tracing Circuits in Walls, Ceilings, Floors and Corners
- Effective in Both Energized and De-Energized Applications
- Get Accurate Readings without Rotating the Unit – Receiver is not Position Sensitive
- Locates Shorts and Disconnected Wires
- Locates Breakers and Fuses
- Operates Safely and Easily without Interrupting Power or Interfering with Sensitive Electronic Equipment
- Provided by intellirent Complete with Receiver, Transmitter, 110V Plug Kit and Alligator Clips, Grounding Leads, Induction Clamp, Battery Pack and Booster Battery



## EA Technology UltraTEV Plus2

### Handheld Partial Discharge (PD) Detector

- Rapidly Survey the Condition of an Entire Substation and Check that Working Environments are Safe
- Combines Additional Sensing Capabilities with Real Time Advanced Analytical Features
- Has the Ability to Distinguish True PD from Noise and Other Interference
- Changes in PD Activity Levels Can be Compared Between Assets and Analyzed Over Time, Providing a Clear Indication if Further Investigation is Required
- Accurately Measure and Locate PD Activity, Enabling You to Identify Potential Faults Before they Lead to Failures
- Optimize Maintenance Cycles and Asset Life Through a Better Understanding of Asset Condition, Comparing PD Results Over Time to Identify Trends
- Provides Numerical and Audible Ultrasonic Readings for Classification of PD
- Provides Numerical and Audible TEV Readings for Interpretation of PD





## Fluke Versiv OFF-100QJ

### OptiFiber Pro OTDR

- Full Function OTDR Ideal for Testing Substation, Plant and Data Center Fiber Optic Networks
- SmartLoop OTDR Reduces Testing Time by Performing Bi-Directional Averaged OTDR Testing of Two Fibers from One End
- Eliminates Testing from Both Ends
- Provided by intellirent with Quad OTDR and CertiFiber Pro Multimode Kit, Inspection Kit, Multimode and Singlemode Launch Cables and Connection Adaptors
- EventMap View Eliminates Tedious OTDR Trace Analysis
- Simple Characterization of All Connectors, Splices and Areas of High Loss
- Quick Test Mode Performs Test in Less Than Two Seconds
- Onboard Configurations for Certain Fiber Configurations
- Onboard Visual Fault Locator
- Ideal for Troubleshooting and Certification

## Fluke FOS/FOM

### Fiber Optic Light Source and Power Meter

- FOS Source Produces Constant Signal at 850/1300nm
- FOM Meter Connects to Standard Fluke Multimeter to Measure Light Loss in dB
- Ideal for Checking Patch Cable Continuity in Substation Applications
- Very Simple to Operate



## EXFO MAX-715B-M1 OTDR

### Hand-Held Optical Loss Testing and Visual Fault Locator

- Tablet-Inspired OTDR Line that is Handy, Lightweight and Rugged Enough for Any Outside Plant Environment
- Optimized for the Point-to-Point Testing and Troubleshooting of FTTx Architectures, and is Ideal for Testing Short Fibers
- FTTx Last-Mile Installation and Troubleshooting
- FTTA Fiber-DAS Installations
- CATV/HFC Network Testing
- Short Access-Network Testing
- 7-inch, Outdoor-Enhanced Touchscreen





## Qualitrol KIT-057-1

### Portable Fiber Optic Thermometer

- Easily Verify Probes Throughout Installation
- Fully Functional Through Front Interface
- Highly Accurate Across Wide Temperature Range
- Captures Measurements for Later Review and Documenting
- Battery Operated
- Data Storage to Onboard 2GB SD Card
- Direct PC Communication Using Included OptiLink Software
- Ideal for Mobile Monitoring of Neoptix T2 Temperature Probe During or After Installation



## OFS P10188-04

### ST Insertion Loss Test Kit

- Compatible with OFS HCS Fiber Family of 50µm, 62.5µm, 200µm and 400µm Fibers, Cables and Components
- Measures Insertion Loss across Above Fiber Sizes
- Quick and Simple Operation
- Provided with Light Source, Power Meter, Adapter Cap(s), Splice Bushing(s), Launch Jumper Cables, Quick Start Guide, and Owner's Manual



## Noyes Fiber CKSM2

### Multimode and Singlemode Test Kit and Set Reference

- Includes CSM1-2 Optical Power Meter, CSS1-MM Dual LED Light Source and CSS1-SM Dual LASERT Source
- Ideal for Performing Insertion Loss Measurements on Multimode and Single Model Fiber Optic Links
- Palm-Sized, Rugged and Lightweight
- Certifies Links per TIA/EIA Standards
- CW and Modulated Tone
- 270Hz, 330Hz, 1000Hz, and 2000Hz Supported Tone
- Power Measurements in dBm or µW; Insertion Loss in dB
- Reference Power Level Storage
- Battery Operated





## **HV Diagnostics PD60-2/TD / HV Diagnostics PD90-2/TD**

Partial Discharge and Tan Delta Analyzers

- Compatible with HV Diagnostics HVA Series VLF Hipot Test Sets
- Flexible Separate Standalone Coupling Capacitor and Filter for Ease of Setup and Portability
- Battery or AC Power Operation
- Provided by intellirent with HVD Suite Software on a Pre-Configured Laptop
- Rugged and Portable
- Automatic and Manual Control of Gain, Trigger, and Filtering Options
- Analog and Digital Noise Mitigating Algorithms and Filtering Options
- Ergonomic Process Driven Menu Guided User Interface
- Multiple Display Format of PD Activity Includes Phase Resolved Pattern, PD Mapping, Raw Signal, PD Intensity, PD Clusters, Voltage Dependence, Background Noise etc.
- Detection of PDIV and PDEV
- PD60-2/TD is Rated at 62kV Peak; Ideal for Acceptant or Maintenance Testing of Cables up to 35kV
- PD90-2/TD is Rated at 90kV Peak; Ideal for Acceptant or Maintenance Testing of Cables up to 69kV
- Quick and Easy Reporting Functionality
- Corona Protection Toroids Included
- All Cables and Accessories Included in the Injection Molded Transport Case with Wheels and Pull Handle



## HV Diagnostics PD30-E

Offline Partial Discharge Analyzer

- Compatible with HV Diagnostics HVA Series VLF Hipot Test Sets
- Ideal Companion for HV Diagnostics HVA28-TD VLF/Tan Delta Test Set
- Weighs Only 64 lbs, Extremely Portable and Rugged
- Battery or AC Power Operation
- Provided by intellirent with HVD Suite Software on a Pre-Configured Laptop
- Automatic and Manual Control of Gain, Trigger, and Filtering Options
- Analog and Digital Noise Mitigating Algorithms and Filtering Options
- Multiple Display Format of PD Activity Includes Phase Resolved Pattern, PD Mapping, Raw Signal, PD Intensity, PD Clusters, Voltage Dependence, Background Noise, etc.
- Detection of PDIV and PDEV
- Rated at 34kV Peak
- Quick and Easy Reporting Functionality
- Corona Protection Toroids Included
- All Cables and Accessories Included in the Injection Molded Transport Case with Wheels and Pull Handle



## PMDT PDiagnostic-M

### Online Partial Discharge Monitoring System

- Monitors for PD in Real Time via 10 Customizable Channels Simultaneously
- Acoustic-Electric Combination Detection/Analysis Technology is Adopted for Superior Data Analysis
- Provides PRPD, PRPS, AE Amplitude, and AE Waveform Spectrums
- Features Adjustable Data Sampling Intervals, Adjustable Alarm Thresholds, Data Trending, and Automatic PD Diagnostic Results with PD Types or Noise to Determine the Severity
- Employs Weatherproof Design which is Suitable for Both Outdoor and Indoor Use, and is Ideal for Short-Term Monitoring Requirements with Fast and Easy Installation
- Advanced Data Diagnostic Capability by Utilizing Deep Learning via Our PMDTCLOUD
- Connects to the Network via 3G/4G and Transmits the Data to the PMDTCLOUD
- The PMDTCLOUD Manages Multiple Assets from Numerous Substations with Several Users Simultaneously from One Server
- Login to the PMDTCLOUD via Any Secured Web-Enabled Device for Access to the Latest Data and Current Asset Condition Information
- An Android/iOS Smart Phone Application is Supplied with the PMDTCLOUD for Users to View the Data and Displays the Alarm in Real Time



## High Voltage Sources for Offline PD Analysis

Manufacturer	Model	Output Voltage	Input	Pieces	Total Weight	Typical Application
High Voltage	ALT-120/60	60V/120kV AC	120V	2	206 Lbs	Apparatus
HV Diagnostics	HVA34	34kV VLF	120V	1	44 lbs	15kV Cable
HV Diagnostics	HVA60	60kV VLF	120V	1	126 lbs	35kV Cable
HV Diagnostics	HVA90	90kV VLF	120V	1	280 lbs	69kV Cable
Phenix	BK130/36	36kV/130kV AC	120V	2	227 lbs	Apparatus
Phenix	6CP-50/100-7.5 (120V)	50kV/100kV AC	120V	2	311 lbs	Apparatus
Phenix	6CP-50/100-7.5 (240V)	50kV/100kV AC	240V	2	311 lbs	Apparatus
Phenix	6CP-50/100-10	50kV/100kV AC	240V	2	443 lbs	High Capacitance Apparatus
Phenix	6CP-200/100-10	100kV/200kV AC	240V	4	656 lbs	High Capacitance Apparatus





## Omicron MPD 800

### Partial Discharge Analyzer

- The MPD 800 is the Successor to the MPD 600 Partial Discharge (PD) Measurement and Analysis System, to Bringing PD Testing to A New Level
- PD Frequency Range of 6kHz to 35MHz
- Established Features Were Redesigned, Resulting in the Most Powerful, Accurate and Robust Test System on the Market
- MPD 800 is Ideal for Factory and On-Site Testing, Even in the Most Demanding Environments
- Includes Excellent Filtering Features, Even the Smallest PD Pulses Can be Separated from Interference and Analyzed
- Two Robust Fiber-Optic Input Channels
- Improved MPD Suite Software Can be Further Simplified by Defining Individual User Profiles to Help Save Time
- Provides Standard-Compliant PD Measurements According to IEEE and IEC Standards
- All Parameters Can be Automatically Set or Reports Generated with the Click of a Button
- The MPD 800 System Can be Easily Expanded by Connecting Multiple Devices
- Perform Synchronous PD Measurements of up to 20 Measurement Points
- Complete with all Required Accessories, for Cables, Transformers, Bus, and Rotating Machinery



## Omicron MPD 600

### Partial Discharge Analyzer

- Advanced Cable Mode Guides User Through Entire Measurement Process
- Advanced Transformer Test Mode Guides Workflow for QIEC and/or RIV PD Measurements on Power Transformers
- OMS605 Model Ruggedized for Field Use and Increased Portability
- Available from intellirent with a Wide Variety of Input Sensors and Adaptors
- High Immunity to Interference
- Quickly Expanded to Multiple Channels by Combining MPD 600 Systems
- Digital Filtering Mitigates Drift
- Galvantic Isolation Through Fiber Optic Connections
- Battery Powered to Eliminate Input Power Noise
- Included UHF620 Sensor Substantially Expands Measurement Range
- Suitable for Commissioning and Onsite or Online Diagnostics
- Measures Narrow Band, Medium Band and Wideband Measurements
- Provided by intellirent with Advanced MPD Software; Enables One-Click Results and Documentation
- Most Parameters and Settings Automatically Determined and Adjusted
- Includes Configurable Real-Time Oscilloscope View for PD and Voltage Input
- Flexible PD Event Visualization, Including Phase Resolved Histogram View
- Ellipse View for Reproduction of Classic Analog Feel

## Omicron CAL540

### PD Charge Calibrator for Omicron PD Analyzers

- Calibrates Omicron MPD 600 and MPD 800 Immediately Prior to Use
- Generates a User Variable PD Charge to Verify Proper Functionality of PD Analyzer
- Synchronizes Pulses to Input Power Frequency with Onboard Light Sensor
- Battery Operated and Simple Push Button Operation



## Omicron UHF620

### Expansion Unit for PD Sensor Range

- Extends the Measurable Bandwidth of the MPD600 to the VHF and UHF Ranges
- Ideal Tool for Measuring PD in GIS and Power Transformers
- Enables User to Narrow the Sensor Bandwidth to Mitigate Noise
- Decouples Measurement from Operating Voltage



## Omicron MCT200

### High Frequency CT

- Ideal for Online PD Analysis of High Voltage Cables
- Easily Separated and Clamped around Ground Connections without Disconnecting the Ground
- Suitable for Periodic Testing or Permanent Installation
- Ample Clearance for Large Cable Grounds



## Omicron MCC205/200

### Coupling Capacitor

- Couples the MPD 600 and MPD 800 to the High Voltage Apparatus Under Test
- PD Free to Nominal Voltage
- Mounted on a Portable, Wheeled Stand
- Available from intellirent in Multiple Voltage Configurations



## Omicron MONTESTO 200

### Portable Online Partial Discharge Monitoring System

- Portable, Two-in-One Solution for Temporary Online PD Monitoring and Online PD Measurement
- Evaluates PD Activity at a Given Time and Offers a Snapshot of Insulation Condition Status when the Asset is in Operation
- Data Gathered During Temporary Online PD Monitoring and Online PD Measurement Enables the User to Determine when Electrical Equipment is at Risk of Failure
- Suitable for PD Measuring and Monitoring of Motors and Generators, Power Transformers, and MV/HV Cables





## PMDT PDeTECTOR

### Comprehensive Online Partial Discharge (PD) Analyzer

- One Instrument Solution for a Wide Variety of Substation Apparatus and Cables
- Represents the Latest Technology in both Electromagnetic and Acoustical Sensors to Identify and Find PD in Energized Substations and Switchgear
- Provided by intellirent with Ultra High Frequency (UHF), Transient Earth Voltage (TEV), High Frequency CT (HFCT or RFCT), Acoustical Contact, Airborne Acoustic Sensors
- Instrument Identifies Specific PD Type: Void, Corona, Surface, Particle or Floating Electrode
- Phase Resolved Display Documents PD Over the Sine Wave to Ensure Measured PD is from the Circuit Under Test and Not Background or Nominal Noise
- PRPD (2D) and PRPS (3D) Compare UHF and HFCT Signals to Local Power Signal
- AE and Ultraonic Values Displayed as RMS, Peak, Frequency Content (x1 and x2), Phase, Pulse and Wave Spectrum
- Wireless Line Synchronization is Accomplished using the Instrument Charger
- Suitable for Use on Power Cables, Transformers, GIS, Switchgear and other Substation Apparatus
- PDeTECTOR Software to Catalog, Trend Results and Produce Professional Reports Included
- Programmable Alarms Document Exact PD Signature so Reports are Clear to Those Unfamiliar with PD Testing
- Software Exports Results to Excel or PDF
- Onboard RFID Asset Tagging and Intelligent Patrol Functions Automatically Document the Specific Substation Assets Being Tested

	Sensor Type	Frequency Range	Function/Application
AE	Acoustic Contact	20kHz-300kHz	Ideal for Oil and SF <sub>6</sub> Tanks
Dish	Parabolic Dish	to 40kHz	Concentrated Ultrasonic Sensor for Overhead or Measurements from a Distance
HFCT	High Frequency CT	500kHz - 50MHz	Clamps Around Grounding Leads and Cable Drains, Wireless Sensor
IU	Internal Ultrasound	to 40kHz	Built into Main Handheld Unit
TEV	Transient Earth Voltage	3MHz - 100MHz	Built into Main Handheld Unit
UE	Ultrasound Extension	to 40kHz	External Hand Held Probe for Non-Conductive Contact Measurements
UHF	Ultra High Frequency	300MHz - 1.5GHz	All PD Products UHF Emissions, Sensor is Hand Held and Wireless

## EA Technologies UltraTEV Plus

### Multifunction Partial Discharge Analyzer

- Quickly Identify Presence and Severity of Partial Discharge in Electrical Apparatus
- Baselines Partial Discharge Activity to Direct Maintenance Activities
- Measures Surface Partial Discharge As Numerical dB Values and Measures Internal Partial Discharge as TEV Values
- Gathers Partial Discharge Data for Comparison and Trending
- Automatically Grades Condition of Transient Earth Voltages (TEV) and Ultrasonic Values for Immediate Analysis
- Simple and Intuitive Operation Though Menu Driven, Multifunction Display
- Provided by intellirent with UltraDish Parabolic Waveform Concentrator, Flexible Sensor, External Microphone, and Surface Probe
- Contact Probe, and Headphones for Surface, Internal or Overhead Applications
- Increase On-Site Productivity by Rapidly Collecting Key Condition Information in an Accurate and Consistent Manner Using Survey Mode
- Detect PD in a Wider Range of Assets with the Inclusion of Cable PD Technology
- Highly User Friendly with Little Training Required Offering Time and Efficiency Savings



## Doble Spark P3

### Offline Partial Discharge Analyzer

- Universal Partial Discharge (PD) and Electromagnetic Interference (EMI) Analyzer
- Utilizes a Software Defined Radio Signal Detector to Identify Characteristics of Insulation System Deterioration that Could Lead to the Failure of High Voltage Equipment
- Detects Signals From Sensors in a Frequency Range Between 9kHz to 2GHz for PD and EMI, and DC to 500kHz for Acoustic and Reference Voltage Measurements
- Automatic Classification System Enables Users of All Experience Levels to Easily Distinguish Partial Discharge Activity from Nuisance Signals
- Classifies Different Types of PD/EMI defects in High-Voltage Apparatus, Including:
  - Rotating Machines (PD Couplers, HFCT Sensors)
  - Power Transformers (HFCT Sensors, UHF Antennas, Acoustic Microphones)
  - Instrument Transformers (HFCT Sensors)
  - Switchgear (GIS and AIS – TEV Sensors, UHF Antennas, HFCT, Acoustic Sensors, Spacer Sensors, Window Sensors)
  - Cables and Accessories (HFCT, UHF Sensors, Acoustic Sensors)





## Omicron CPC-100/CU-1

### Ground and Line Impedance Measurement System

- Measures Line Impedance and K-Factor on Overhead Lines and Power Cables
- Determines Ground Impedance and Touch-and-Step Potential on Large Systems
- Provided by intellirent with the GB1 Grounding Unit to Ensure User Safety
- Determines True Test Values by Power Line Injection Method
- HGT1 Provides Simple and Accurate Touch-and-Step Potential Measurements
- Measures Reduction Factor on Ground Wires and Cable Shields
- Complies with EN 50522 and IEEE 80/81 Requirements
- Results Unaffected by Input Power Frequency
- Automatically Records Results with Included Software
- Couples Power Lines into Signal Cables and Provides Mutual Coupling of Parallel Overhead Lines
- Selective Frequency Measurement and Digital Filtering Ensures Laboratory Grade Accuracy
- One-Man Portable System
- Intuitive Reporting and Assessment with Dedicated Templates
- Optional Accessories Available from intellirent, CU1, Rogowski Coils, Handheld GPS Device, GB1 and HGT1



## AEMC 6416/6417

### Clamp on Ground Tester

- Measures Ground Rod and Grid Resistance without Driving Temporary Ground Rods or Running Leads
- Verifies Quality of Grounding Connections/Bonds and Continuity of Ground Loops
- Measures Ground Current
- Jaw Opening of 1 ½"
- Provides Ground Voltage Indication and Warns of Possible Unsafe Conditions
- Large, Multifunction Display is Easy to Read in Bright Sunlight
- User Adjustable Test Frequency Improves Accuracy in Inductive Environment
- Onboard Storage of Measured Results with Time-Stamp
- Results Can be Displayed or Transferred by Bluetooth to PC or to Android App (6417 Model Only)



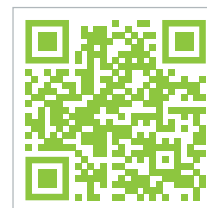
## Advanced Geosciences SuperSting R1

### Multifunction Ground Test System

- Measures Resistivity, Induced Polarization (IP) and Self (or Spontaneous) Potential (SP) on Ground Systems
- Field Portable and Rugged Instrument Provides Laboratory Grade Accuracy and Precision
- Single-Channel or Multi-Channel Systems Available
- Internal Power Transmitter Provides Traditional Vertical Electrical Sound (VES), Mise-A-La-Masse Measurements or Multi-Electrode Electrical Tomography in 2D, 3D, and Time Lapse
- Provides Visual Results of Ground Resistivity or Induced Polarization in 2D or 3D Slices
- Performs Streaming, or Spontaneous Potential Measurements
- Supports a Multitude of Traditional Arrays or User Defined
- Suitable for Use with Either Passive or Active Electrodes



View and download equipment manuals  
from the **my intellirent** app



For additional tech tips  
try the **my intellirent**  
app by scanning here



## Megger DET3TC/ICLAMP

### Multifunction ART Ground Tester

- Simple One Button Operation
- Selectable Test Voltages (25V or 50V)
- 0.01Ω to 2000Ω Range
- Provided by intellirent Complete with Leads and Temporary Ground Rods
- Automatic Noise Check and Rejection to 40V Peak-to-Peak
- Use in Conjunction with Megger IClamp for Attached Rod Technique Testing
- Measure Leakage Current from 0.5A to 19.9A
- Enables Testing of On-Site Grounds Separately without Removing Utility Connection
- Performs both 2-Point and 3-Point Testing
- ART (Attached Rod Technique) Capability Allows Testing of the Rod without the Need for Disconnection
- Microprocessor Control Ensures Improved Error Detection
- Clear Warnings and Error Indicators Help Prevent Test Failure
- Accuracy of 2% of Reading Enhances Reliability of Measurements
- Voltmeter Enables Measurements of Ground Voltage and Increases Operator Safety



## Fluke 1623/1625

### Multifunction Geo Earth Ground Test Systems

- Performs Earth Ground Loop Resistances using Clamps Only (Stakeless Testing), Fall-of-Potential, Earth Resistivity, and Selective Testing (or Attached Rod Technique)
- Fluke 1623 Provides One-Button Measurement Concept
- Automatic Frequency Control Mitigates Interference
- Adjustable Limits for Immediate Results Verification
- In Addition, the Fluke 1625 Offers These Advanced Features:
  - Automatic Frequency Control (AFC) - Identifies Existing Interference and Chooses a Measurement Frequency to Minimize Its Effect, Providing More Accurate Earth Ground Value
  - R\* Measurement – Calculates Earth Ground Impedance at 55 Hz to More Accurately Reflect the Earth Ground Resistance that a Fault-to Earth Ground Would See
  - Adjustable Limits - for Quicker Testing
  - 3-Pole and 4-Pole Fall of Potential (Using Stakes)
  - 4-Pole Soil Resistivity Testing (Using Stakes)
  - Selective Testing (Using 1 Clamp and Stakes)
  - Stakeless Testing (Using 2 Clamps Only)
- Provided by intellirent as a Complete Kit with Leads, Current Probes, and Stakes

## AEMC 6472/6474

### Multifunction Ground Tester w/Tower Ground Attachment

- Performs all Types of Ground and Earth Resistance Measurements, Including Bond Resistance, Ground Resistance (with and without clamps), Soil Resistivity, Earth Coupling, and Step & Touch Potential
- GroundFlex Adaptor Model 6474 and GroundFlex Sensors Enable Leakage Current and Ground Resistance Measurements of Tower Legs without Disconnecting Overhead Ground
- Performs Resistivity Measurements Through Wenner and Schlumberger Methods
- Automatically Rejects Interference Voltages up to 60V Peak
- Provided by intellirent as a Complete Kit for 3-Point, 4-Point and 4-Point Selective Test Methods as Well as Tower Ground Measurements with 6474 Attachment



## AEMC 6470-B

### Multifunction Ground Tester

- Performs Fall-of-Potential, Soil Resistivity and Bonding Tests
- Automatic Lead Compensation
- Manual or Automatic Frequency Scan from 40Hz to 513Hz to Mitigate Interference
- Selectable Test Voltages of 16V or 32V; up to 250mA Test Current
- Automatic Calculation of Rho and User Selection of Wenner or Schlumberger Test Methods
- Automatic Recognition of Electrode Connections and Resistances
- Two and Four Wire DC Resistance Measurements (Bond Testing) with Polarity Reversal
- Onboard USB Port for Results Download to DataView Software
- Provided by intellirent with Ground Test Kit Complete with Leads and Ground Rods



## Megger DET2/2

### High Output Multifunction Ground Tester

- Ideal for Large Ground Systems or Applications Requiring Long Leads
- High Resolution (1mΩ) and High Accuracy
- Performs Fall-of-Potential, Soil Resistivity, and Point-to-Point Tests
- User Adjustable Test Voltage to 50V (max)
- User Adjustable Wideband Test Frequency to Mitigate Interference
- Robust and Field Rugged
- Provided by intellirent with Ground Test Kit Complete with Leads and Ground Rods





## Arbiter 928A

### Power System Multimeter

- Practical Hand-Held Power System Analyzer with 0.1% Precision
- Two Input Channels (Current or Voltage) for Comparison or Analysis of Power Quantity or Power Quality
- Measures Voltage and Current, Phase Angle (Phase Angle Difference) Frequency, Harmonics and Power/Energy Quantities
- Measures Harmonics, Flicker, Sags, Surges, and Interruption
- Bright LCD displays Numeric Values or Scope
- Available from intellirent with a Variety of Current Probes



## Arbiter 929A or 931A

### Power System Analyzer

- Basic Accuracy of .05% of Reading and .05° of Phase for Full Three Phase Power Analysis Capability
- Long Life Battery (More than 8 Hour Continuous Run Time) and Smaller than a Lunch Box
- Bright, Easy to Read and Understand Graphical Display
- Store, Recall and Last Setup Functions
- Optically Isolated Series Interface
- Datalog to Internal Memory or Export by Serial with Real Time/ Date Stamps
- Measures Voltage and Current, Phase Angle, Frequency, Harmonics, Waveform and Power/Energy Values
- Onboard Timer for Event Comparison
- Available from intellirent with a Variety of Current Probes



## Megger PMM-1

### Power System Multimeter

- Light Weight (13 lbs) and Simple to Use with Intuitive Controls
- Battery or Line Operated
- Measure Voltage, Current (100A Directly or Higher with Optional CTs), Phase Angle, Power, Reactive Power, Frequency, Harmonics, and Time (Seconds or Cycles)
- Onboard Datalogger Records Events
- Displays Three Phase Voltage, Current, Phase Angle, Power, Reactive Power, Power Factor, and Frequency Simultaneously
- Variable PT and CT Ratios for Display of Primary Values

## Keysight U1732C

100Hz/120Hz/1kHz/10kHz Handheld LCR Meter

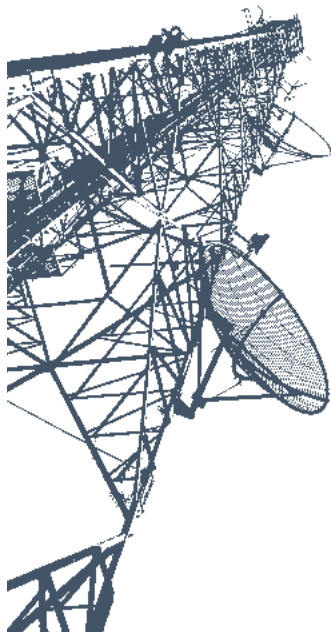
- 20,000 Counts Resolution
- 0.2% Accuracy
- Wide LCR Ranges with 3 to 5 Selectable Test Frequencies (up to 100kHz for U1733C)
- Auto Identification(Ai) which Automatically Determines and Displays Component Type and Measurements
- Detailed Component Analysis with DCR, ESR, Z, D, Q,  $\theta$  Functions
- Battery Life of 16 hours/AC-Powered
- IR-to-USB Connectivity for Data Logging to PC



## Fluke 87/789

True RMS Multimeter

- Measure AC and DC Voltage, AC and DC Current, Resistance, Capacitance, Frequency, Temperature and Conductance
- Industry Standard with Simple, Intuitive Operation
- Available from intellirent with a Wide Variety of Input Modules for Pressure, Current to 2000A, Voltage to 40kV, Fiber Optic Measurement, Temperature, and More
- Available in Intrinsically Safe Version
- Fluke 287 Model Provides Datalogger Functionality with Software
- Fluke 789 Model Adds Capability to Source and Measure 4-20mA with 0.05% Accuracy



## Telecommunications Equipment

**Electro Rent** offers a wide range of products from industry-leading manufacturers in cellular wireless, fiber optic installation, drive test, 5G and Ethernet. Our experts can help find tailored solutions to access the latest test technology and make best use of your budget.



Please contact **800.966.8277**





**Radian RX-30-PQ-A**  
Three Phase Reference Standard

- Three-Phase Reference Standard
- Guaranteed Accuracy to +/- 0.04% (RX-30) or +/- 0.02% (RX-31)
- Extended Measurement Range
- Accurate in Extreme Environments
- The RX Uses the Latest Digital Signal Processing (DSP) Technology Incorporating Nine High Speed 1,000,000 Samples/Second A/D Converters
- Available from intellirent in Multiple Configurations
- Provided by intellirent with the User's Choice of Input Adaptors at No Additional Rental Cost



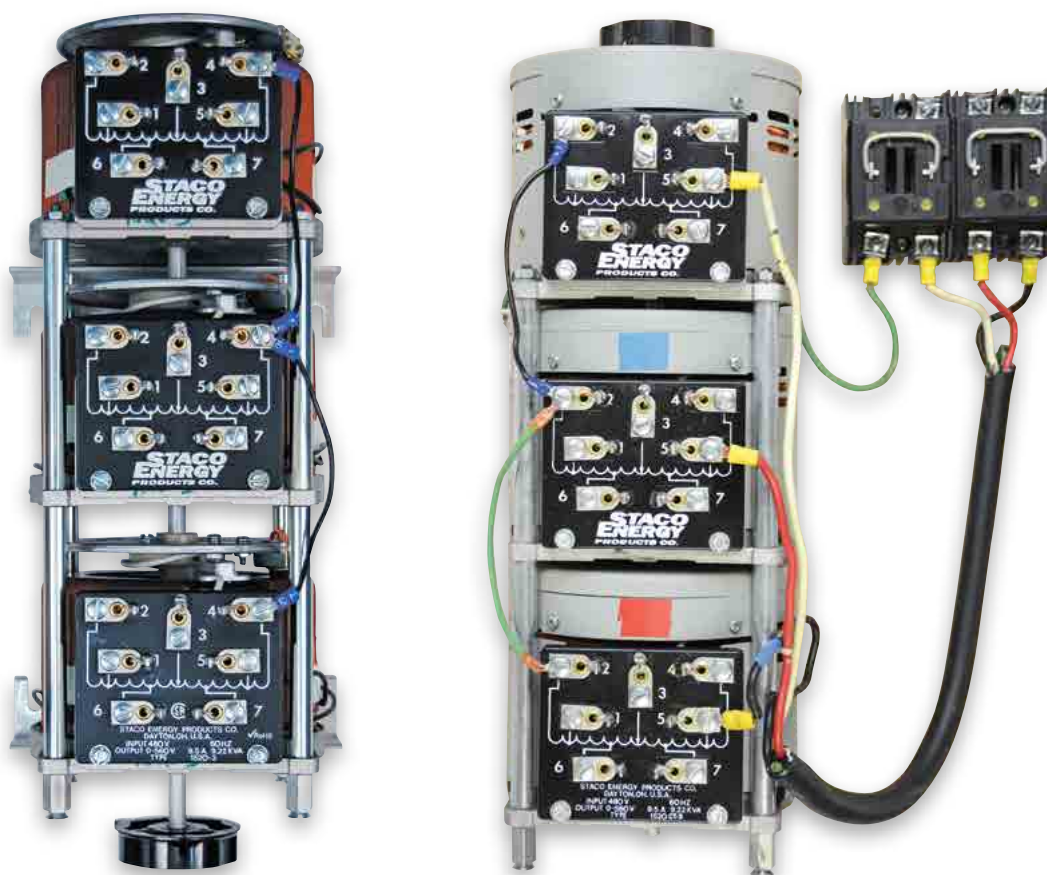
**Radian RD20/RD21**  
Watthour Standard

- Versatile Single Phase Standard with Typical Accuracy of 0.005% Throughout Operating Range
- Integrated Analog to Digital Signal Converter for Real World Waveform Measurement
- Four Quadrant Measurement Registers Forward and Reverse Energy Flow and Documents Voltage, Current, Power and Energy (Active, Reactive, and Apparent)
- Optional Harmonic Analysis Through 50th Harmonic Order
- Built in Comparator Provides Automatic Calculation of Test Results
- BNC for Input/Gating, Pulse Outputs and Phase Synch or Analog Sense
- Available from intellirent in Multiple Configurations
- Provided by intellirent with the User's Choice of Input Adaptors at No Additional Rental Cost



**Pickup Inputs for Radian RD20/RD21**

Type	Description
RM-1Hv	Optical Pickup for Visible LED
RM-111	Automated Comparator
RM-1S	Remote Reset Switch
RM-KYZ	Pulse Input (KYZ) Adapter, Form C Only
RR-1H	Optical Pickup for Infrared LED
RR-DS/SM	Meter Disk Sensor with 4-pin Plug, Suction Mount
RR-DS/F	Meter Disk Sensor with 4-pin Plug, Field Mount
RR-KYZ	Pulse Input (KYZ) Adapter, Form A and Form C



## Staco Variable Transformers

Single Phase and Three Phase Variacs for 120V, 240V and 480V Applications

- Continually Variable Output Voltage that Can be Adjusted from 0% to 117% of the Unit's Input Voltage
- Staco Energy Products' Full Range of Variable Transformers Offer the Exceptional Versatility and Reliability Required for so Many of Today's Voltage Control Applications in both Industrial and Laboratory Environments
- All of Staco Energy Products' Variable Transformers can be Ganged with a Common Rotor Shaft and Wired for Three Phase Operation, in Either Open Delta or Wye Configuration
- Robust, Simple to Use on a Variety of Applications, Including Relay Testing, Testing of OLTC Controls, and Any Secondary Voltage Control Application

Available from intellirent in Cased or Uncased Versions, with or without Fuse Protection Blocks

Model	Input	Output	Load
1020B-CT	120V Single Phase	0-280V	3.5A
1020B-3-CT	480V Three Phase	0-560V	3.5A
1520-CT	120V Single Phase	0-280V	9.5A
1520-3-CT	480V Three Phase	0-560V	9.5A
2520-CT	120V Single Phase	0-280V	10A
6020-3Y-E	480V Three Phase	0-560V	35A



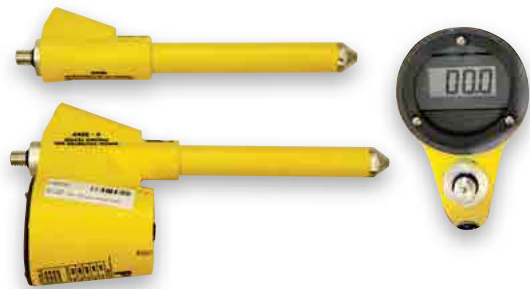
### **Bierer PD800W** 800kV Wireless Phasing Kit

- Suitable for Phasing, Voltage Detection, Phase Sequence and Phase Angle Measurements on 120V – 69kV Circuits
- Large, Easy to Read Digital Display
- Functional with Capacitive Test Points, URD Systems, Overhead and Transmission/Substation Systems
- Wireless – Does Not Require an Interconnect Cable
- Non-Contact Voltage Detection from 69kV-800kV
- Direct Contact from 120V-69kV
- Operating Range of 100 ft
- Provided by intellirent with Extension Handles



### **Bierer PR1Comp** GPS Enabled Phasing Kit

- Determines Phase Relationships Over Long Distances
- Read Time Measurements – No Requirement for Calculations or Data Transfer from One Location to Another
- Ensures Absolute Phase Identification, Transmission and Distribution Phasing, Secondary Phasing, Mobile Substation Phasing
- Includes a PD800W, Sending Unit, Receiving Unit, GPS Antenna, and Extension Handles
- Suitable for Use on Circuits from 120V to 765kV



### **Bierer PD25** 25kV Phasing Kit

- Field Rugged for Utility, Industrial and Mine Safety Applications
- Suitable for Use in Low and Medium Voltage Applications up to 122kV without Direct Contact
- Low Voltage Setting for Checking Voltage Presence in Breaker Panels, Breakers, Power Outlets and Wiring
- Visual and Audible Voltage Indication
- Self-Test Verifies Proper Operation
- Available from intellirent with a TIC-410A for Voltages Over 1kV



### **Amprobe TIC300 PRO** Low, Medium and High Voltage Tic Tracer

- Non-Contact
- Rugged and Reliable
- Suitable for Use on Circuits to 122kV
- Visible and Audible Indication of Voltage Presence
- Handle with Universal Spline Connection
- Available from intellirent with a TIC-410A Extension Hot Stick

## HD Electric TAG 5000

### Wireless Phasing Kit

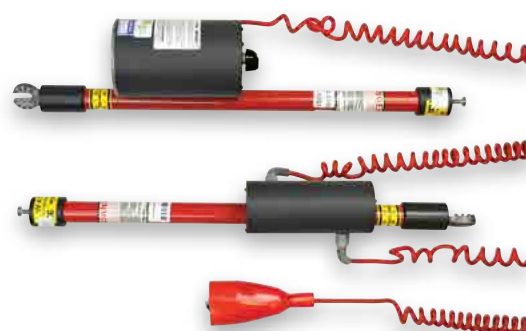
- Transmitter and Receiver Communicate by RF Signal Eliminating Need for Cable
- Transmits Through Walls and Cabinet Steel up to 35'
- Operational Range to 230kV
- Universal Spline Connection Suitable for Connection to a Variety of Hotsticks and Extension Handles
- Provided by intellirent with Hook, 90° Tip and 3-6' Extension Handles



## HD Electric PRM-100

### High Voltage Phase Rotation Meter

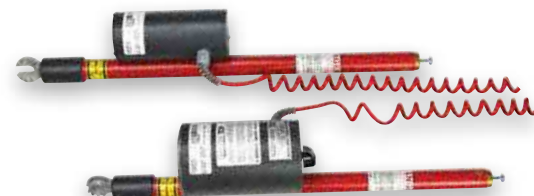
- Determines Leading Phase of Two Phases in a Three Phase System
- Dual Voltage Range – 0-5kV and 0-15kV
- Optional Resistor Sticks Increase Range to 45kV
- 15 Foot Coiled Cable Between Test Points, Plus 15 Feet to Ground Reference Clamp
- Large, 3" Analog Meter for Quick Visual Indication of Deflection
- Available from intellirent with Extension Handles



## HD Electric Mark V

### 50kV Phasing Kit

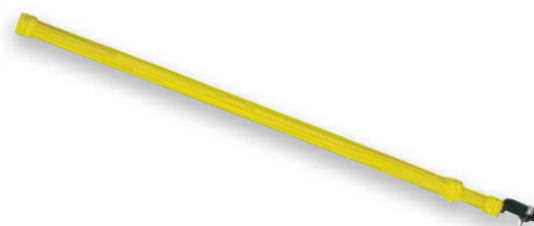
- Large Auto Ranging LCD Reads to 50kV
- Dual Stick Design Optimal for Phasing
- 15' Coiled Connection Lead
- Available from intellirent with 3' or 6' Hot Sticks



## Amprobe TIC-410A

### Adjustable Hotstick

- Equipped with a Universal Spline Connection
- Extends from 33" to 57"
- Suitable for Use with Voltage Detectors and Phasing Kits
- Lightweight and Rugged





## Sensorlink Amp LiteWire

### Fiber Optic Coupled Ammeter

- Open Horseshoe Design Slips on and Off Conductor easily
- Simple One Button Operation
- Suitable for Use on Systems to 150kV
- Rejection of Stray Magnetic Fields
- 0-2000A at +/- 1.5% Accuracy
- Fiber Optic Isolation of Signal to Coupling Device
- Analog Output for Waveform Analysis
- Spline Type Hotstick Connection
- Available from intellirent with the User's Choice of Hosticks or Extension Handles



## Sensorlink Volt LiteWire

### Fiber Optic Coupled Voltmeter

- Measures up to 40kV AC
- Simple One Button Operation
- Rejection of Stray Magnetic Fields
- Fiber Optic Isolation of Signal to Coupling Device
- Analog Output for Waveform Analysis
- Spline Type Hotstick Connection
- Available from intellirent with the User's Choice of Hosticks or Extension Handles



## Sensorlink 6-920

### High Voltage Recording Ammeter

- Provided by intellirent with Three Open Sensor CTs
- Suitable for Use on 69kV Systems
- Sensor Opening of 1.3"
- +/-1% Accuracy to 1000A
- Provided by intellirent with Softlink Software and IrDA Communications Cable
- Installed Using a Shotgun Hotstick



## Airflow TH3631

### Thermohygrometer

- Designed for Measurement and Datalogging
- Free PC Program Allows User to Transfer Recorded Data to a Computer for Evaluation
- LCD Backlight
- Temperature and Air Relative Humidity Reading
- Dew Point Temperature Reading Selectable
- Built-in Sensors



## Fluke 773

### Milliamp Clamp Meter

- Loop Calibrator that Measures 4-20mA Signals without Breaking the Loop
- Source 4-20mA Signals for Testing Control System I/O or I/Ps
- Simulate 4-20mA Signals for Testing Control System I/O
- Measure 4-20mA Signals with In-Circuit Measurement
- Simultaneously Measure mA In-Circuit with 24V Loop Power for Powering and Testing Transmitters
- Source mA Output Signals in a Linear Ramp or 25 % Step Output - Automatically Change the 4-20mA Output for Remote Testing
- Power Saving Features, Auto-Off, Backlight Timeout Extend Battery Life
- DC Voltage Measurement to Verify 24V Power Supplies or Voltage I/O Signals
- Source DC Voltage to Test Input Devices that Accept a 1 to 5 Volt or 0 to 10 Volt Signal



## RKI GX-2009

### Safety Four Gas Analyzer

- Small, Lightweight Safety Gas Analyzer for LEL, O<sub>2</sub>, H<sub>2</sub>S and CO
- Suitable for Personal Monitoring and Confined Spaces
- Alarm Indication is Visual, Audible and Mechanical
- Waterproof and Dustproof
- Onboard Datalogging for up to 300 Hours for 8 Alarm Trends
- 20 Hours of Operation on Included Rechargeable Batteries
- Automatic Backlight on Large, Bright LCD
- Intrinsically Safe
- Available from intellirent with Bump Gas Kit and Air Pump





## HV Diagnostics EZ-Cable ID

### Single and Three Phase Cable and Phase Identification System

- Designed to Avoid Live Cable Cut-ins
- Simple Operation, Menu Driven Interface
- Accurately and Effectively Identifies Either Single or Three Phase Cables Anywhere (Simultaneously) Along the Length of the Cable
- Effective for Use on Single or Multi-Conductor Cable
- Works in Energized and De-Energized Applications, Including High Load Carrying Conductors
- Measured Current/Frequency for Energized Cables
- Provided by intellirent as a Complete Kit with Receiver, Transmitter and User's Choice of Inductive Clamp(s) or Flexible Coils



## Amprobe AT-7030

### Advanced Wire/Circuit Tracing System

- Comprehensive Kit Includes All Required Components for Tracing Low Voltage Circuits in Walls, Ceilings, Floors and Corners
- Innovative New Antenna Design and Advanced Signal Processor Provides the Exact Location and Orientation of Wires/Circuits
- Effective in Both Energized and De-Energized Applications
- Locates Breakers and Fuses
- Pinpoints Shorts and Opens
- High Resolution Color LCD Displays Active Process and Menu
- Three Output Modes – High for Normal Circuits, Low for Precision Tracing in Difficult or Congested Areas, and Clamp Model for Boosted Induction Signal by the Included Clamp
- Provided by intellirent as Complete Kit with Receiver, Transmitter, Leads, Inductive Clamp, Hanger and Booster Battery



## Amprobe AT-4005

### Wire/Circuit Tracing System

- Comprehensive Kit Includes All Required Components for Tracing Circuits in Walls, Ceilings, Floors and Corners
- Effective in Both Energized and De-Energized Applications
- Locates Shorts and Disconnected Wires
- Locates Breakers and Fuses
- Provided by intellirent Complete with Receiver, Transmitter, 110V Plug Kit, Alligator Clips, Grounding Leads, Induction Clamp, Battery Pack and Booster Battery

## Tasco CMT42S

### Circuit Mapper System

- Maps 42 Branch Circuits from a Panel with a Single Transmitter and Receiver
- Transmitter Connects to 42 Circuits with Voltage Leads and Miniature Induction Clamps
- Effective on Energized and De-Energized Systems
- LCD Display on the Receiver Indicates the Circuit Number According to the Induction Clamp for that Circuit
- Considerable Time Savings - Eliminates Tracing Individual Circuits
- Non-Contact Setting Allows Signals to be Read Through Insulation without Direct Contact



## 3M Dynatel 2273/1420

### Underground Cable and Fault Locator

- Measures and Pinpoints Sheath and Conductor Faults
- Pinpoints Insulation Faults on Un-Shielded Buried Cables
- Locate Underground Cable Path and Depth
- Discriminates between Low and High Resistance Faults
- Visual and Audible Indicators
- Locates Energized or De-Energized Cable
- Included Signal Generator Operates on Four Active Trace Frequencies: Direct Connect or Clamp Induction, Passive RF Detection (Radio) and 50/60Hz Power Signal Detection
- Provided by intellirent with A-Frame Fault Locator
- Simple Operation
- Dynatel 1420 Product Locates and Identifies EMS-iD Markers – See Page 200 for Additional Details



## Amprobe AT-3500

### Underground Cable Locator

- Locates Underground Energized and De-Energized Conductors
- Uses Three Mode to Ensure Accuracy – Passive Power, Passive Radio and Active Signal Generation
- Signal Generator Outputs by RF, Induction Clamp or Direction Connection
- Active Depth Indication up to 16'
- Automatic Gain Control Results in Fast Signal Location and Control
- Provided by intellirent Complete with Receiver, Transmitter, Leads, Induction Probe and Ground Stake





## ProStat PRS-812RM

### Surface Resistance Meter Standard

- Precision Resistance Measurements from  $0.1\Omega$  to  $1.0 \times 10^{12}\Omega$
- Fully Automatic, Automatic-Manual and Fully Manual Measurement Modes
- Constant Voltage Output
- Displays Synchronous Analog Scale with x1, x10 and x100 Multipliers with Programmable LEDs
- Multiple Test Voltages from 0.01V to 100V
- Datalogging – up to 80 Measurements with Calculated Minimum, Maximum and Averages in Accordance with ESD Association Standard ANSI/ESD S4.1, ESD TR53, ANSI/ESD S4.1, ANSI/ESD S7.1, ANSI/ESD STM97.1



## ProStat PRS-812

### Surface Resistance Meter Kit

- Precision Resistance Measurements from  $.1$  to  $1 \times 10^{12}$
- Fully Automatic, Automatic-Manual and Fully Manual Measurement Modes
- Constant Voltage Output
- Displays Synchronous Analog Scale with x1, x10 and x100 Multipliers with Programmable LEDs
- Multiple Test Voltages from .01V to 100V
- Datalogging – up to 80 Measurements with Calculated Minimum, Maximum and Averages



## DESCO 19787

### Surface Resistance Meter Kit

- Measures Resistance Point-to-Point ( $R_{tt}$ ) or Surface to Ground ( $R_{tg}$ ) in Accordance with ESD Association Standard ANSI/ESD S4.1, ESD TR53, ANSI/ESD S4.1, ANSI/ESD S7.1, ANSI/ESD STM97.1
- Resistance Range Greater than  $1 \times 10^3$  to Less than  $1 \times 10^{12}\Omega$
- Under Load Voltages of 10 and 100V (+/-5%)
- Measures Ambient Temperature and Relative Humidity
- Provided by intellirent with Shielded Test Leads and Weights
- Electrification Period of 15 Seconds, but Quick Check Bypasses Delay

## Fluke DSX-8000

### Fiber Optic Inspection Kit

- Cat 5e, 6, 6A, 8, Class FA, and I/II Cable Certifier
- Testing and Certification of Twisted Pair Cabling up to 40GB
- Able to Test for Transverse Conversion Loss and Equal Level Transverse Conversion Transfer Loss
- Easily Saves up to 12,000 Test Records
- 8 Second Test Time on Cat 6A Cables
- Easy to Interpret Cable Test Results from the Onboard Display, Quickly Help in Fixing and Diagnosing Bad Cables
- OLTS, OTDR, and Fiber Inspection Kits Available Upon Request Through intellirent



## Agilent 1732B

### Handheld Capacitance/LCR Meter

- Quick, Basic LCR Measurements
- Hand Held with Simplified Controls
- Measures Resistance from 0.001 to 9.999MΩ
- Measures Capacitance from 0.01pF to 19.99mF
- Measures Inductance from 0.01uH to 999.9H
- Onboard Data Storage and Download Through Included Software and IR/USB Communications Cable



## Fluke 1664FC

### Multifunction Installation Tester

- Includes "Insulation Pre-Test" that Detects when Appliances are Connected to the System and Stops the Test
- Runs Seven Installation Tests Automatically in One Sequence with a Single Connection Through Auto Test
- Allows You to Share Test Results in Real Time Over Your Smartphone via Fluke Connect Measurements
- Compact, Lightweight (Less than 3 lbs) with Padded Neck-Strap to Free Your Hands
- Rotary Dial Knob Clearly Indicates which Function is Selected, All in One Spot with No Complex Multi-Level Menus
- Offers Additional High Current Loop Mode for Faster Measurements than Loop Tests with Non-Trip Mode for RCDs
- Includes Z-Max Memory for Loop Tests to Support Easy Evaluation of the Highest Loop Test Value
- Provides Unique Zero Adapter for Fast, Reliable and Accurate Test Lead and Mains Cord Compensation







## Fluke ii910/900

### Acoustical Imager

- The ii910 Detects Partial Discharge Signatures Including Corona, Surface Tracking, and Arcing
- The ii910/900 Both Detect Leaks in Compressed Air, Compressed Gas, and Vacuum Systems
- Operating Distances: 0.5m to 70m (ii900), 0.5 to 120m (ii910)
- Frequency Range: 2kHz to 52kHz (ii900), 2kHz to 100kHz (ii910)
- Rechargeable Battery, with up to 6 Hours of Battery Life
- Straightforward, Intuitive Interface to Isolate the Sound Frequency of the Leak and Filter Out Loud Background Noise
- Ensure Proper Air Pressure to Your Pneumatic Equipment
- Lower Utility Costs
- Reduce Leak Detection Time
- Improve Reliability in Your Production Line
- LeakQ Report Generator
- 7" LCD Touchscreen that Overlays a SoundMap on a Visual Image for Quick Leak Location Identification
- Image and Video Tagging, Annotation, and Organization using Folders
- Leak Sizing to Help Determine Priority for Repairs
- Report Tool to Share Visuals, Tagging, Notes, and More with Others

## Tech Tip

### The Need for an Electronic Electric Meter

The performance and functionality of electronic meters supersede that of the electromechanical meter. The former works using the Ferrari principle. Here's what that means:

The meter records energy depending on a flux developed by the integration of current and voltage. An electromagnetic meter has severe drawbacks like accuracy drifts and instability over time.

But, electrical meters are highly reliable. Despite this, you'll need to use high-quality equipment for testing electric meters. That's the only way to offer quality and reliable data that your customers need. For proper selection of the right test asset, consult one of our technical experts for the best advice.

For additional tech tips try the **my**  
**intellirent** app by scanning here



**my**  
intellirent

## Amprobe CR50A

### Capacitance and Resistance Meter

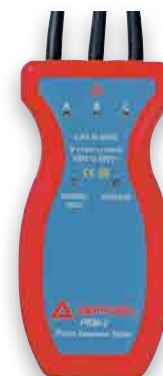
- Simple, Hand-Held Meter for Capacitance and Resistance Measurements
- Large, Clear Display
- Zero-Adjust Potentiometers to Ensure Accuracy for Lower Measurements
- Continuity and Diode Test Functions
- Resistance Ranges from 0-20Ω to 2MΩ
- Capacitance Ranges from 0-200pF to 20mF



## Amprobe PRM2

### Phase Sequence Indicator

- Small and Lightweight (less than 1 lbs)
- Capable of Operation from 100V to 600V with a Frequency Range from 45Hz to 65 Hz
- Powered by Circuit Under Test
- Identifies 3-Phase Sequence and Open Phase Check
- Motor Shaft Rotation Indication Protected by CAT III Circuitry



## AEMC 6608/6609

### Phase Sequence and Motor Rotation Indicator

- Identify Proper Phase Rotation on 3-Phase Systems
- Ideal for Validating Proper Secondary Wiring on Transformer Differential Relays
- Avoid Improper Metering and Nuisance Trips Due to Rolled Phases
- Compact and Rugged Meter for Identification of Phase Sequence
- Identifies Live and Open/De-Energized Phases
- Ideal Tool for Measuring the Proper Rotation of Motors, Conveyors, Pumps and Other Electrical Devices Interconnected on the Power Line System
- Operating Voltage of 40V to 600V (Phase to Phase)





## TESTO 350-P4

### Portable Emission Analyzer

- Measure Temperature, Draft Pressure, O<sub>2</sub>, CO<sub>2</sub>, CO, NO, NO<sub>2</sub>, SO<sub>2</sub>, Velocity, Differential Pressure with Cells for Hydrocarbons
- Includes Interchangeable, Pre-Calibrated Sensors with Temperature Control
- CO Sample Dilution System for Test Range Expansion
- Complete Onboard Sample Conditioning
- Ultra-Rugged Construction
- Innovative Sensor Technology
- Brilliant HD Color Display
- Simple Intuitive Operation
- Improved Accuracy
- Weight 30 lbs



## Fluke 971

### Temperature and Humidity Meter (Thermohygrometer)

- Compact and Lightweight Handheld Meter
- Measures Temperature from -4°F to 140°F
- Min/Max/Average Hold, Saves up to 99 Data Point
- Backlit Dual Display of Humidity and Temperature
- Measures Dew Point and Wet Bulb Temperatures
- 99 Record Storage Capacity
- Ergonomic Design with Belt Clip and Protective Holster
- Quick Response Capacitance Sensor

## AEMC CA811

### Lightmeter

- Portable, Simple and Robust Hand Held Meter
- CIE Optical Sensor Designed to Meet Sensitivity of the Human Eye
- Removable Sensor Probe
- Optimal for Safety and Health Compliance
- Measures in Lux or Foot Candles
- Max Hold Function



## Fluke 922

### Airflow Meter/Micromanometer

- Combines the Functionality of a Differential Pressure Manometer, Airflow Meter and Air Velocity Meter into One Hand Held and Simple Package
- Monitors Static or Differential Pressure Across Components or Orifice Place
- Rugged Design Optimal for Field Use
- User-Defined Duct Shape and Size for Accuracy
- Min/Max/Average Hold Functions



## Vanguard SGT-600

### Safety Ground Integrity Tester

- Measures Resistance Value of Safety Grounds and Attached Ferrules from  $1\mu\Omega$  to  $1000m\Omega$
- Onboard 600A DC Micro-Ohmmeter Exceeds ASTM Standards
- User Input for Ground Length and Temperature
- Provides Pass/Fail Indicator and Test Report Can be Printed with Onboard Printer or Saved to Memory
- Stores up to 100 Records with Internal Memory or More with Onboard Flash Drive USB Port
- Provided by intellirent with Vanguard VUS Software for Report Generation or Results Storage and Trending



## Bierer GT400

### Safety Ground Integrity Tester

- Measures Resistance at ASTM Rated Current of 400A DC
- Large LED Display Indicates Total  $m\Omega$  Through Cable and Ferrules
- Compact and Easy-to-Read Reference Chart
- Onboard Voltmeter Allows for Troubleshooting Clamps and Ferrule Connections
- Easily Converts for Testing Elbows, Bushings, Mechanical Jumpers, Substation Clamps, Truck Grounds and Cluster Grounds





Multimeters Available from intellirent

Manufacturer	Model	Description
Agilent	34401A	Benchtop Precision Multimeter
Arbiter	928A	Single Phase Power System Multimeter with Current Probe
Arbiter	929A	Three Phase Power Meter
Arbiter	931A	Three Phase Power Meter with Transducer Calibrator, Timer and Recorder
Fluke	789	Comprehensive Multimeter with Onboard Loop (Process) Calibrator
Fluke	233	Comprehensive Multimeter with Detachable Meter Face
Fluke	289	Comprehensive Multimeter with Integrated Datalogger
Fluke	87V	Comprehensive Multimeter
Fluke	89V	Comprehensive Multimeter with Memory and Communication Functions
Fluke	8845A	Benchtop Precision Multimeter
Fluke	435	Power Quality Analyzer
Fluke	125	Dual Input 40MHz Oscilloscope
Fluke	190-204	200MHz Four Channel Oscilloscope
Fluke	CNX3000	Comprehensive Multimeter with Wireless Interface to Other CNX Components
Fluke	28	Intrinsically Safe Basic Multimeter
Fluke	1587	Comprehensive Multimeter with Onboard 1kV Insulation Resistance Meter
Fluke	43B	Single Phase Power Quality Meter
Manta	MTS-1030	Three Phase Power Meter
Megger	PMM-1	Power System Multimeter
Simpson Electric	260	Traditional Analog AC/DC Voltage and Resistance Meter
Westinghouse	PI-161	Analog Phase Angle/Comparison Meter
Yokogawa	WT500	Precision Power Analyzer





## Standalone and Scaled Output Current Probes

Manufacturer	Model	Type	Size	AC/DC	Range	Onboard Display	Scaled Output
AEMC	30000-24-1-0.1	Flexible	36"	AC	30kA		✓
AEMC	3000-24-2-1	Flexible	24"	AC	3000A		✓
AEMC	6000-36-2-0.1	Flexible	36"	AC	6000A		✓
AEMC	MF3000-10-2-1	Flexible	10"	AC	3000A		✓
AEMC	SL261	Rigid	1/2"	AC/DC	100A		✓
AEMC	MR521	Rigid	1 1/2"	AC/DC	1500A		✓
AEMC	MN02	Rigid	3/8"	AC	100A		✓
AEMC	MN05	Rigid	3/8"	AC	100A		✓
AEMC	2620	Rigid	6"	AC	400A		✓
AEMC	SL206	Rigid	3/8"	AC/DC	80A		✓
AEMC	K100	Rigid	3/8"	AC/DC	100A		✓
Amprobe	CT-600	Rigid	1/5"	AC/DC	600A		✓
AYA	P3C-7500-C	Rigid	3"	AC/DC	7500A		✓
AYA	P3C-4000-2	Rigid	3"	AC/DC	4000A		✓
AYA	H3C-4000-2	Rigid	3"	AC/DC	4000A		✓
Extech	EX830	Rigid	2"	AC/DC	1000A	✓	
Fluke	i2500-18	Flexible	18"	AC	2000A		✓
Fluke	i400	Rigid	1/5"	AC	400A		✓
Fluke	365	Rigid	1"	AC/DC	200A	✓	
Fluke	376 2500A	Rigid/Flexible	2"/24"	AC/DC	1000A/2500A	✓	
Fluke	376	Rigid	2"	AC/DC	1000A	✓	
Fluke	375	Rigid	2"	AC/DC	1000A	✓	
Fluke	381	Rigid	2"	AC/DC	1000A	✓	
Fluke	336	Rigid	2"	AC/DC	600A	✓	
Fluke	i3000s	Flexible	24"	AC	3000A		✓
Fluke	i-200	Rigid	1"	AC	200A		✓
Fluke	i-2000	Flexible	24"	AC	2000A		✓
Fluke	i-410	Rigid	2"	AC/DC	400A		✓
Fluke	i30	Rigid	1/2"	AC/DC	30A		✓
Fluke	i1010	Rigid	2"	AC/DC	1000A		✓



**PdMA MCEMax**  
5kV Motor Analyzer

- Versatile and Comprehensive System for Troubleshooting and Trending Energized or De-Energized Motors
- Portable and Battery Operated
- Computer Based Testing Ensures All Relevant Data is Captured for Analytics, Report Generation and Data Trending
- Monitors Power Circuit, Insulation, Stator, Rotor and Air Gap
- Offline System Provides Automatic PI, IR, DAR and Step Voltage Tests from 250V to 5000V Test Voltages
- Offline System Provides Capacitance, Inductance and Resistance Measurements
- Onboard Expert System Analyzes Data On-the-Spot for Immediate Results Interpretation

Data Includes:

Offline Analysis	Online Analysis
Balance of Resistance	In-Rush/Start-Up
Balance of Inductance	Phase-to-Phase Voltage RMS
Corrected Ground Resistance	% Full Load Amps
DC Armature Tests	Power Factor
Dielectric Absorption Ratio	Crest Factor
Field Capacitance	Impedance Imbalance
Field Inductance	Phase Current RMS
Field Ground Resistance	Power (kW, kVA, kVAR)
Field Resistance	Phase Impedance
Ground Capacitance	Phase-to-Neutral Voltage RMS
Measured Ground Resistance	Total Harmonic Distortion (THD)
Phase-to-Phase Resistance	Current Spectral Analysis
Phase-to-Phase Inductance	High Frequency Eccentricity Analysis
Polarization Index	Voltage Imbalance
Rotor Influence	Average Current RMS
Synchronous Motor Tests	Efficiency
Wound Rotor Motor Tests	Output Power and Torque

## All-Test Pro AT5

### Offline Motor Analyzer

- Versatile System Performs Motor Circuit Analysis on All Motor Types, Including: Induction, Synchronous, AC, DC, Brushless DC, Servo, Wound Rotor, Single Phase Motors
- Analyzes All Motor Components
- Performs Initial Test Value Static (TVSTM) for Baseline Reference to All Future Tests on the Same Motor
- No Need to Have a Computer During Testing – Tests are Executed from the Instrument and Results are Stored in Instrument Memory
- Detects Faults at Early Stages before Motor Failure
- Identifies Deteriorating or Contaminated Insulation and Deep Winding Faults
- Testing is Quick and Simple, Instrument Walks the User through Testing; Results Delivered in Moments
- Connects at Motor Leads or at the Motor Control Center up to 1000' Away from the Motor
- Comprehensive Reporting Includes Expert System Analysis for Fault Diagnosis and Data Trending
- Hand-Held and Battery Operated
- Onboard Storage for Hundreds of Tests
- MCA Basic Software Downloads and Trends Results and Produces Comprehensive Reports
- Provided by intellirent as a Complete Kit with All Associated Leads, Connections, and a Laptop Computer Pre-Configured with MCA Basic Software



## All-Test Pro ATPOL II

### Online Motor Analyzer

- Power Quality and Motor Circuit Analyzer in One Hand-Held Instrument
- Provides Diagnostic Evaluation of Stator (Electrically and Mechanically), Rotor, Air Gap and Entire Driven Load
- Bluetooth Communications for Remote Operation or Downloading Test Results
- ESA (Motor Analyzer) Mode Evaluates: Quality of Incoming Power, Control Circuit, Motor Itself, and Driven Load
- PQ Mode Permits Energy Data Logging, Harmonic Analysis, Voltage and Current Trending, Waveform Capture of Events, Transients and Other Anomalies
- Ideal for Use on AC Induction and DC Motors Generators, Wound Rotor Motors, and Synchronous Motors
- Enables Nameplate Data Entry Before Testing, When Starting Testing or Adjustment After Testing
- Suitable for Connection to Circuits up to 1kV
- Automatic Determination of: Line Frequency, Running Speed and Pole Pass Frequency, Stator Slot and Rotor Bar Fault Frequencies, Static or Dynamic Eccentricity Faults, Evaluation of Incoming Power, Including Harmonics, and Calculates Efficiency for AC induction and DC Motors
- Verifies Proper Connections to Ensure Useful Data
- Field Rugged and Easy to Use
- Included PSM Software Prepares a Comprehensive Report Detailing both Electrical and Mechanical Conditions of Entire Motor or Generator





### Fluke 805 Vibration Meter

- Measures Acceleration, Velocity and Displacement from 10Hz to 1kHz
- Onboard Accelerometer with LED System Indicating Appropriate Contact Pressure
- Innovative Sensor Design Corrects for Device Angle and Contact Pressure
- Crest Factor + Provides Reliable Bearing Assessment Using Direct Sensor Tip Measurements
- External Accelerometer for Hard to Reach Areas
- Temperature Measurement with Spot IR Sensor
- Large, High Resolution Screen Displays All Results
- Data Export to USB Can be Opened in Excel
- Onboard Memory Saves up to 3500 Measurements



### Fluke 810 Full Function Vibration Analyzer

- Onboard Identification and Location of Common Mechanical Faults (Bearings, Misalignment, Unbalance and Looseness)
- Graded Fault Severity for Maintenance Prioritization
- Integrated 2GB Memory for Complete Machine Analysis
- Integrated Laser Tachometer
- Tri Axial Analysis of Acceleration, Displacement and Velocity
- Document and Trend Results with Included Software
- Suitable for Analysis of Rotating Equipment from 200RPM to 12,000 RPM
- Simple and Intuitive Setup, Measurement and Diagnosis



### Fluke 725 Multifunction Process Calibrator

- Simultaneous Input and Output Visible on Split Screen
- Measures and Sources Thermocouple and RTDs
- Calibrates Loops, Voltage, mV, and Frequency
- Measures Resistance and Provides Loop Power
- Optional Pressure Modules Available in all PSIA, PSID, and PSIG Ranges
- Fluke 725EX Model is Intrinsically Safe

## Omicron CPC-100/TD-1

### 12kV Multifunction Power Factor Test Set

- A Complete Transformer Test System, Including 12kV Power Factor Tests
- Measures Capacitance, Dissipation Factor  $\tan\delta$  (Tan Delta), Power Factor  $\cos\phi$ , Watts Losses, Power (Effective Power, Apparent Power and Reactive Power), and Impedance (Absolute Value, Phase, Inductance, Resistance, Quality) with Optional TD-1 Component
- Onboard Computer Driven Test Plans to Replicate or Trend Power Factor Tests with Existing Values
- Applies up to 12kV at Variable Frequencies Which Enhances Diagnosis of Insulation Ageing
- Automatic Power Factor Testing via Omicron's Primary Test Manager Software with the Included Pre-Configured Laptop Computer or Via Front Panel Controls (Includes Test Templates)
- Provides for Automated Testing of Power Transformers, CTs, VTs, Resistance Testing and More
- Optimal for Emergent Requirements or Remote Applications - One Device Replaces Multiple Instruments
- Onboard or Computer Driven Test Plans for "Push Button to Start" Automation
- Automatic Results Storage and Report Generation
- Stand Alone Functionality for:
  - Ratio, Burden and Polarity, Phase and Magnitude Error, Excitation Curve, Winding Resistance, Secondary Burden and Dielectric Withstand Tests for CTs and PTs
  - Ratio, Winding Resistance, Tap Changer Testing, Excitation Current, Short Circuit Impedance Measurement and Leakage Reactance Testing of Transformers
  - Contact Resistance, Winding Resistance, Ground Resistance or Measurement of Complex Impedances
  - Single Phase Testing of Primary and Secondary Relays (Including Over Current, Over Voltage, Undervoltage and Frequency Relays)
- Flexible AC and DC Power Supply to 2kV AC, 400A DC, 800A AC
- Optional CP CB2 Boosts Current Output to 2000A AC
- USB, Serial or Ethernet Interface
- Optional CPOL Permits Polarity Verification at Multiple Test Points



## Omicron CR500

### Compensating Reactor for CPC-100/TD-1

- Permits Testing of Insulation Quality of Large Motors, Generators, Cables and Other High Capacitance Apparatus
- Compact and Lightweight
- Multiple CR500 Units Can be Paralleled to for Dissipation Factor/ Power Factor Testing and Tip up Tests
- Compensates for up to  $1\mu F$  (4A) with 12kV Test Voltage
- Also Suitable for Use as a PD High Voltage Source to Provide Compensation for up to  $2\mu F$
- Variable Frequency (15Hz to 400Hz) Facilitates Optimal Compensation During Long Run Tests



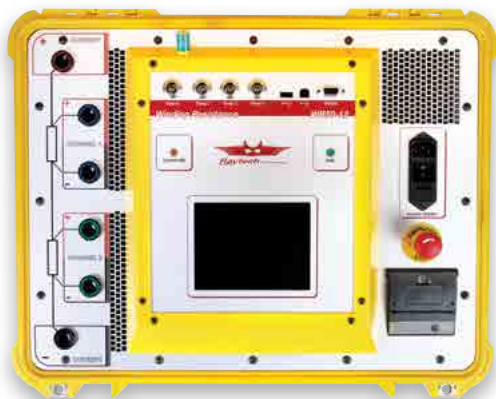




### Raytech WR-14

#### Winding Resistance Test Set with Demagnetization

- 15A Output for Testing Most Transformers with Repeatable Readings
- Automatically Demagnetizes Winding upon Test Completion
- Battery or Line Powered
- Two Measurement Channels and Onboard Printer
- Bright Touchscreen Interface or Full Computer Control
- Color Coded Connections and Simple interface for Fast Familiarization
- Automatic Discharge Circuit
- Onboard Storage of Results
- Lightweight (21 lbs)



### Raytech WR-50-12

#### Winding Resistance Test Set with Demagnetization

- 50A Output for Testing the Largest Transformers with Repeatable Readings
- Automatically Demagnetizes Winding upon Test Completion
- Two Measurement Channels and Onboard Printer
- Bright Touchscreen Interface or Full Computer Control
- Color Coded Connections and Simple interface for Fast Familiarization
- Automatic Discharge Circuit
- Optional Heat Run Software and Three RTD Inputs

## AEMC 6550/6555

### 10kV/15kV Insulation Resistance Meters (Megohmmeters)

- Line or Battery Operated
- Test Voltages of 500V, 1kV, 2.5kV, 5kV, 10kV (6550) and 15kV (6555)
- Optional Ramping Voltages between 40V and 10kV (6550) and 15kV (6555)
- Step Voltage Measurements with Ramping from 40V through 1100V or from 500V to 10kV (6550) or 15kV (6555)
- Non-Destructive (Early Break) Test at Pre-Programmed Current Leakage Values or Burn to Fault
- Insulation Resistance Measurement to 10TΩ
- Direct Measurement and Display of Resistance, Test Voltage Test Duration, Capacitance and Leakage Current
- Field Portable, Rugged and Large Backlit Display
- Automatic Calculation of DAR, PI and DD
- Test Results and Configuration Recorded and Downloadable Through AEMC DataView Software with Onboard USB Port
- Stores up to 80,000 Measurements



## Doble M4100 (M4000)

### 12kV Power Factor Test Set

- Rugged Construction for Field Use with Laboratory Accuracy and Precision
- Industry Standard for Testing Electrical Apparatus such as Transformers, Generators, and Cables
- Evaluates Integrity of High Voltage Substation Apparatus by Measuring Power Factor/Tan Delta
- Measures Capacitance to Evaluate Physical Changes
- Measures Accurately in High Electrostatic and Electromagnetic Conditions
- Line Frequency Modulation Technology Eliminates Substation Interference
- Automated Testing Procedures Through DTA or Manual Through M4000 Clipboard
- Provided by intellirent with Pre-Configured Laptop, Safety Strobe, Temperature/Humidity Transmitter
- Internal Field Calibration Reference Ensures Accurate Testing
- Built in Diagnostics Provide Information on Instrument Status
- Output Current to 300mA at 10kV (Total Output Power 3kVA) for Better Replication of In-Service Conditions
- Optional Type C Resonator Increases Output Capacity



## Doble Type C

### Resonating Inductor

- Increases Output Capacity of Doble M4000 for Generators and Other Capacitive Apparatus
- No Software or Additional Hardware Required
- Available for Rental Individually or with Doble M4000





### **Baker AWA-IV/12 HO PP30**

Static Motor Analyzer/Surge Tester, 30kV, High Output

- High Output Advanced Winding Analyzer, Automated Surge / Hipot / Resistance Tester
- Simple-to-use Instrument with an Intuitive, Touch-Screen User Interface
- Detects Problems that Low-Voltage Testers Cannot Find by Performing a Comprehensive set of Both High and Low Voltage Tests
- Results are Presented in Simple, Easy-to-Understand Graphs and Reports that Give Motor Maintenance Professionals the Information they Need to Minimize Costs and Unplanned Downtime
- All Test Results Can be Saved and Stored on the Baker AWA-IV, but they Can Also be Backed up or Copied to a Server or a Desktop PC
- Performs the Following Tests: Resistance, Mega-Ohm, Surge, DC Continuous Ramped, or Step-Voltage, Polarization Index (PI) Dielectric Analysis (DA), and DC Hipot



### **Baker DX12 HO**

Static Motor Analyzer/Surge Tester, 12kV, High Output

- Fully Test DC Motors, Including Bar to Bar Armature Testing
- Push to Test (PTT) Lock to Hold Voltage During DC Tests
- Test Fractional HP Motors to 40 Megawatt Generators
- High and Low Voltage Testing Capability in One Unit
- Test the Motor Circuit and All of the Insulation
- Modular Design to Meet Your Testing Needs
- 2 GB Internal Test Storage Capacity
- Color VGA Touch Screen
- Measurements from  $0.002\Omega$  to  $200,000\Omega$
- Measurements from  $0.001\mu F$  to  $26\mu F$
- Measurements from  $0.05mH$  to  $5000mH$

## Fluke MDA-550

### Motor Drive Power Quality Analyzer

- Key Measurements: Inverter Output Voltage, DC Bus Voltage and Ripple Voltage, Harmonics, Unbalance
- Three Powerful Test Tools in one: Motor-Drive Analyzer, Waveform Analyzer and Recording Data Logger All in One
- Measure Key Motor-Drive Parameters Including Voltage, Current, DC Bus Voltage Level and AC Ripple, Voltage and Current Unbalance and Harmonics, Voltage Modulation, and Motor Shaft Voltage Discharges
- Perform Extended Harmonics Measurements to Identify the Effects of Low and High Order Harmonics on Your Electrical Power System
- Conduct Guided Measurements for Motor-Drive Input, DC Bus, Drive Output, Motor Input and Shaft Measurements with Graphical Step-by-Step Voltage and Current Connection Diagrams
- Use Simplified Measurement Setup with Preset Measurement Profiles to Automatically Trigger Data Collection Based on the Chosen Test Procedure
- Create Reports Quickly and Easily that are Perfect for Documenting Troubleshooting and Collaborative Work with Others
- Measure Additional Electrical Parameters with Full 500MHz Oscilloscope, Meter and Recording Capability for Complete Range of Electrical and Electronic Measurement on Industrial Systems
- Highest Safety Rating - 600V CAT IV/1000V CAT III Rated for Use at the Service Entrance and Downstream



## Commtest VB7

### Vibration Analyzer

- Enhanced Ergonomics and User Interface
- True Left and Right-Handed Operation
- Larger, Higher Resolution Screen (480x320, White LED Backlight)
- Improved Measurement Range: 1000 g, 25000 mm/s, 2500 mm
- Lower Operating Temperature (-10 °C)
- Cross Channel Phase Analysis
- Simultaneous Spectrum and Waveform Measurement
- 6Pack Measurement Mode Allowing up to 12 Measurements to be Taken Simultaneously Across Two Channels
- Average Value Mode for DC-Coupled Sensors
- Support for Acceleration, Displacement, Velocity and Current Sensors
- Process Parameter Input via Keypad with Trend and Alarm Capability in Ascent Software





## Flir T420

### Infrared Camera

- IR Resolution: 320 x 420 Pixels
- Image Frequency: 60Hz
- Temperature Range: -4°F to 1202°F
- MSX Enhancement to Thermal Images Adds Visible Spectrum Definition to IR Images in Real Time
- Scalable Picture-in-Picture and Fused Image Display
- Large, Bright Touchscreen Display Rotates for Optimal Viewing Angle
- 3.1 MPixel Visual Camera with Onboard Video Lamp and Laser Pointer
- WiFi Connectivity for Image Transfer or Remote Control Through iOS and Android Devices
- Removable Large SD Card for Onboard Image Storage and Transfer to Computer
- Delta T and Multiple Measurement Spots
- 60 Second Voice Recording or On-Screen Annotations
- Instant Report Generation – Provides PDF Directly from the Camera
- Provided by intellirent with Flir QuickReport Analysis and Reporting Software



## Flir T530

### Infrared Camera

- 180° Rotating Optical Block and Vivid 4" Capacitive Touch Screen
- IR Resolution: 320 x 240 Pixels
- Image Frequency: 30Hz
- Temperature Range: -4°F to 1202°F
- Up to 464 x 348 Pixel Native Resolution (161,472 Points of Measurement)
- Fast and Precise Laser-Assisted Autofocus
- Laser Distance and On-Screen Area Measurement
- Customizable Work Folders
- Intelligent, Interchangeable AutoCal Lenses



## Flir T640

### Infrared Camera

- Includes 15° Telephoto Lens
- IR Resolution: 640 x 480 Pixels
- Image Frequency: 30Hz
- Temperature Range: -40°F to 3632°F
- MSX Enhancement
- Field of View (FOV) Match
- WiFi Connectivity
- High Temperature Range
- Scalable P-i-P and Thermal Fusion
- Capture Multiple Measurements



## Flir E95

### Infrared Camera

- Features Interchangeable Telephoto Lenses (24°, 42°, 14°) that Can be set up to Auto-Calibrate with the Camera for Quick Swapping in the Field
- IR Resolution: 464 x 348 Pixels
- Image Frequency: 30Hz
- Temperature Range: 32°F to 1200°F
- Vibrant 4" Optically-Bonded Touchscreen
- Fast and Responsive Interface, Improved Organization, Reporting Options and Enables Easy Diagnosis and Reporting
- Rapid-Response Touch Screen with Intuitive Gestures
- Updated GUI with Improved Flow and Feedback
- Logical Navigation on Screen and in Menus
- New Folder and Naming Structure Makes Finding Images Easier
- Automatic GPS Tagging and Compass Help Identify Locations
- WiFi Connects Camera to Mobile Devices or In-Plant Networks to Notify Your Team Immediately of Your Findings





## Fluke Ti480-PRO

### Infrared Camera

- SuperResolution Technology (with SmartView Software): Get 4x Pixel Data to Capture and Combine Multiple Images to Create 1280 x 960 Image
- IR Resolution: 640 x 480 Pixels
- Image Frequency: 60Hz
- Temperature Range: -4°F to 1832°F
- IFOV with Standard Lens (Spatial Resolution): 0.93 mRad, D:S 1065:1
- Field of View: 34 °H x 24 °V
- Minimum Focus Distance: 15 cm (Approx. 6 in)
- MultiSharp Focus Technology Captures Clear, Accurate Image Focused Throughout Field of View
- LaserSharp Auto Focus Technology Uses Built-in Laser Distance Meter to Calculate and Displays Distance from Designated Target
- Wireless Connectivity to PC, iPhone, iPad (iOS 4s and Later), Android (4.3 and up), and WiFi to LAN (Where Available)
- Fluke Connect App Lets You Connect Camera to Smartphone/Device; Images Taken Automatically Upload to Fluke Connect App for Saving/Sharing
- IR-Fusion Technology with AutoBlend Mode and Picture-in-Picture (PIP) Adds Context of Visible Details to Infrared Images
- Display: Rugged 3.5 Inch (Landscape) 640 x 480 LCD Touchscreen



## AEMC 1954

### Infrared Camera

- Provides Crisp, Clear Thermal and Actual Images without the Need for Adjustments
- IR Resolution: 120 x 160 Pixels
- Image Frequency: 9Hz
- Temperature Range: -4°F to 1202°F
- Stability of 80mK at 86°F
- Audio Narration Can be Recorded with Thermograms
- Provide Additional Text and Description to be Stored with Each Image
- Automatic Non-Uniformity Temperature Correction
- Compensates for Any Internal Drift to Improve Accuracy
- Measurement Data can Also be Stored with Each Thermogram
- Wirelessly Connect via Bluetooth to Compatible AEMC Test Instruments and Loggers, Enabling You to Combine Electrical and Physical Measurements to the Imaging Data
- Locate the Cold and Hot Spots in the Image
- CamReport Software



## UNiRCO CoroCam 7

### Corona Effects Camera

- Easy to Use, Makes Detection and Location of Corona Discharges Effective and Fast
- Easily Visualize and Locate Corona and Electric Arc Discharges Through Ultraviolet Imaging
- The High-Sensitivity Detector Detects the Smallest Corona Discharges That Can be Recorded as a High-Resolution Image or Video
- Detects UV-C Emissions up to  $2.05 \times 10^{-18} \text{ W/cm}^2$
- Motorized Solar Blind (SB) Filter Removal in Non-Solar Blind (NSB) Mode to Increase Sensitivity for Use at Night or Indoors
- Synchronized Uv and Visible Zoom From 1x (Defined as  $8^\circ \times 6^\circ / 10^\circ$  Diagonal) up to 4x System Zoom (Optical for the Visible Channel and Digital for the UV Channel)
- Fast Boot up Avoids the Need for Power Saving Modes
- Software Updates Will be Monitored and Installed by Intellirent



## Fluke Ti32

### Infrared Camera with IR Fusion Technology

- Field Rugged and Optimized for Use in Harsh Environments
- IR Resolution: 320 x 240 Pixels
- Image Frequency: 60Hz
- Temperature Range: -4°F to +1112°F
- Tested to Withstand a 6' Drop
- Convenient Pistol Grip Design
- Fluke's NETD Thermal Sensitivity Identifies Minute Differences in Temperatures
- Merge Infrared and Real Light Images for Image Location Identification and Effective Reporting Through IR Fusion Technology
- Optional Wide Angle and Telephoto Lenses
- Field Replaceable Batteries for Maximum Flexibility
- Intuitive Three Button Menu
- Voice Recording
- Emissivity Correction, Single Hand Focus Capability and Temperature Compensation
- Provided by intellirent with Powerful and Comprehensive Fluke SmartView Software

## Fluke Ti400

### Infrared Camera

- High Resolution, Smart Phone Like Capacitive Touch Screen
- IR Resolution: 320 x 240 Pixels
- Image Frequency: 60Hz
- Temperature Range: -4°F to +2192°F
- Quickly Detects Issues with IR-Fusion and AutoBlend
- Wireless Image Transfer to PC, iOS and Android Devices
- Integrate up to 5 Different Measurements Sources with CNX Functionality
- One-Handed, Simple Operation
- Captures additional Visual Images to Document Location or Site Details with IR-PhotoNotes Annotation System
- Permits Streaming of Recorded Video or Images to PC or TV using HDMI
- Voice Recording Saves with Recorded Images
- Optional Interchangeable Lenses for Functionality in a Variety of Applications
- 5 MP Visual Light Images
- Provided by intellirent with SmartView Software and SmartView App for Analysis and Reporting



## Fluke TiS-9HZ

### Infrared Camera

- IR Resolution: 120 x 120 Pixels
- Image Frequency: 9Hz
- Temperature Range: -4°F to +212°F
- Thermal Sensitivity of <0.1°C Captures Images Faster and Easier, a Key Feature for Inspection Tools
- Large Display Screen, at 9.3cm (3.7")
- Rugged and Ergonomic Design, Engineered to Work in Tough Work Environments and Can Withstand a 2m Drop
- Residential: Detect Air Infiltration; Missing or Improperly Installed Insulation; Roof and Duct Leaks; HVAC/R Testing; in Floor Heating; and Moisture Intrusion and Condensation Issues
- Commercial: Roof Leak Inspection; Commercial HVAC/R Testing; Moisture Detection; Finding Steam Traps; Electrical Inspections and Motors Pumps and Hydraulics; Commercial Energy Loss; and Plumbing



## Fluke TiX580

### Infrared Camera

- Thermal Sensitivity  $\leq 0.05^{\circ}\text{C}$  at  $30^{\circ}\text{C}$  Target Temp (50mK)
- IR Resolution: 640 x 480 Pixels
- Image Frequency: 60Hz
- Temperature Range: -4°F to 1832°F
- Easily Navigate Over, Under and Around Objects with the 240° Rotating Lens
- Enhance Image Quality and Temperature Measurement Accuracy with SuperResolution Technology; Turn 640 x 480 Images into 1280 x 960 Images and get 4x the Resolution and Pixels
- Instantly get In-Focus Images with Pinpoint Accuracy with LaserSharp Auto Focus Technology
- Quick In-Field Analysis with IR-Fusion Technology
- Always Have References Handy with IR-PhotoNotes Annotation System
- Connect to Network of Wireless Test and Measurement Tools with Fluke Connect
- Text and Voice Recording and Annotation Saves Additional Details with Image File







## Hampden Engineering MVO-1-PB/MVO-60Hz-IT Ground Integrity and Resistance Test Set

- Simple and Basic Means of Measuring Ground Impedance for Receptacle Grounds in Patient Care Areas
- Designed Specifically to Meet NFPA99 Requirements
- Measures Both Resistance and Potential Difference (Equipotential)
- Large, Analog Display Permits Exact Readings
- Color Coded Display Provides Qualitative Indication of Results
- 9V Battery Operated
- Provided by intellirent as a Kit with Both MVO-1-PB and MVO-60Hz-IT



## Bender LT-3000 Line Isolation Monitor Tester

- Simple and Intuitive Operation
- Determines Integrity of Isolated Systems and Grounding
- Tests Both Line Isolation Monitors and GFCI Receptacles
- Large LCD Display
- Operates on System Voltages up to 240V
- Measures System Leakage Current



## Amprobe INSP-3 Wiring Inspector Circuit Tester

- Verifies Wiring and Connections Comply with Code
- Plugs Directly into the Outlet being Tested
- Large Display Shows All Relevant Test Data
- Applies a User Selectable 10A, 15A or 20A Load to the Circuit Under Test
- Won't Trip Breakers During Testing

## Bionix Safety Technologies R7000

### Biomedical Electrical Safety Analyzer (NFPA 99)

- Advanced Device for Health Care Facilities to Simplify Their Methods of Compliance to Center of Medicaid Services (CMS) Expectations and Requirements of National Fire and Protection Agency (NFPA 99)
- Allows Healthcare Facilities to Automatically Perform up to 12 Tests Per Receptacle, Documenting Results Into NFPA Compliant Reports that are recognized by the Joint Commission
- Reduces the Time Spent Testing Receptacles and Generating NFPA Compliant Reports, Allowing Health Care Facilities to Save Money, While Enabling Compliance and Promoting Patient Safety
- Touchscreen Allows Trouble-Free Data Entry
- Large Display Shows Multiple Test Results
- Preloading Capabilities Eliminate Repetitive Typing
- Time and Date are Automatically Recorded
- Detachable Reference Cord Allows Either Comparative or Simplified Test Routines
- Report Commander Software Creates Fully Formatted Reports
- Sizable Memory Stores Test Results for up to 10,000 Outlets



## Fluke Biomedical ESA609

### Biomedical Electrical Safety Analyzer (NFPA 99)

- IEC Standards Compliance: ANSI/AAMI ES1, NFPA 99, and Parts of IEC62353 and IEC60601-1
- Portable: Featherweight Design, Functional Strap, and Tilt Stand Make it Easy for Transportation and Operation on-the-go (Onsite or Offsite)
- User-Friendly: Quick Push-Button Operation for Rapid Testing
- Rugged: Rubberized Case and Ingress Protection Rating of IP30 Help Prevent Damage when Dropped
- Global Use: the ESA609 Will Operate at 120V and 230V
- Test Current Consumption up to 20A for a Diverse Set of Medical Devices
- All Parameters Needed for Basic Electrical Safety Testing: Line (Mains) Voltage, Ground Wire (or Protective Earth) Resistance, Equipment Current, Ground Wire (Earth) Leakage, Chassis (Enclosure) Leakage, Direct Equipment Leakage, and Point to Point Leakage and Resistance
- Rigorously Tested for Safety and Reliability, with CE, CSA and Australia RCM in Addition to Fluke Quality





## RKI GX-2009

### Safety Four Gas Analyzer

- Small, Lightweight Safety Gas Analyzer
- Simultaneous detection of 4 gases, °CH<sub>4</sub>, O<sub>2</sub>, NO<sub>2</sub> and CO or °CH<sub>4</sub>, O<sub>2</sub>, H<sub>2</sub>S and CO
- Suitable for Personal Monitoring and Confined Spaces
- Alarm Indication is Visual, Audible and Mechanical
- Calibration and Bump Test Lock Out or Reminder Controls
- Vibration Alarm
- Waterproof and Dustproof
- Onboard Datalogging for up to 300 Hours for 8 Alarm Trends
- 20 Hours of Operation on Included Rechargeable Batteries
- Calibration and Bump Test Lock Out or Reminder Controls
- Automatic Backlight on Large, Bright LCD
- Intrinsically Safe
- Available from intellirent with Bump Gas Kit and Air Pump Vibration Alarm



## RKI Eagle 2

### Six Gas Monitor with Sample Draw

- Monitors LEL, O<sub>2</sub>, H<sub>2</sub>S, CO, VOC (Low or High Range), and Plug and Play Sensors for NH<sub>3</sub>, AsH<sub>3</sub>, Cl<sub>2</sub>, HCN, PH<sub>3</sub> and SO<sub>2</sub>
- H<sub>2</sub> Specific LEL/PPM Detection
- Methane Elimination for Environmental Use
- PID (Photoionization Detector) for Low or High Range VOC Detection, Humidity and Contamination Resistant
- EPA Method 21 VOC Monitoring
- Ergonomic RFI / EMI / Chemical / Weather Resistant Enclosure
- Long-Lift Pump for Ranges up to 135'
- Internal Hydrophobic Dust Filter
- External Probe with Hydrophobic Filter
- Intrinsically Safe Design
- Extended Battery Life; 16 Hours on Alkaline Batteries or 18 Hours on NiMH Batteries

## Vanguard SGT-200

### Safety Ground Tester

- 200A DC Micro-Ohmmeter Designed Specifically to Measure the Resistance of Protective In-Service Grounding and Jumper Cable Assemblies
- Measures the Resistance of the Grounding Cables, Clamps and Ferrules
- Measures the Resistance Value from 1 Micro-Ohm to 1000 Milliohms
- Measured Resistance Values can be Compared Against the Calculated Values (Using the ASTM 2249-03 Standard)
- Pass/Fail Results Can be Printed Along with the Measured Resistance Values
- Test Results are Printed on the Unit's Built-in 2.5" Thermal Printer
- By Using a DC Current, There is No Need to Uncoil the Cable Under Test



## Vanguard SGT-600

### Safety Ground Integrity Tester

- Measures Resistance Value of Safety Grounds and Attached Ferrules from  $1\mu\Omega$  to  $1000m\Omega$
- Onboard 600A DC Micro-Ohmmeter Exceeds ASTM Standards
- User Input for Ground Length and Temperature
- Provides Pass/Fail Indicator and Test Report Can be Printed with Onboard Printer or Saved to Memory
- Stores up to 100 Records with Internal Memory or More with Onboard Flash Drive USB Port
- Provided by intellirent with Vanguard VUS Software for Report Generation or Results Storage and Trending



## Amprobe AT-7030

### Advanced Wire/Circuit Tracing System

- Comprehensive Kit Includes All Required Components for Tracing Low Voltage Circuits in Walls, Ceilings, Floors and Corners
- Innovative New Antenna Design and Advanced Signal Processor Provides the Exact Location and Orientation of Wires/Circuits
- Effective in Both Energized and De-Energized Applications
- Locates Breakers and Fuses
- Pinpoints Shorts and Opens
- High Resolution Color LCD Displays Active Process and Menu
- Three Output Modes – High for Normal Circuits, Low for Precision Tracing in Difficult or Congested Areas, and Clamp Model for Boosted Induction Signal by the Included Clamp
- Provided by intellirent as Complete Kit with Receiver, Transmitter, Leads, Inductive Clamp, Hanger and Booster Battery





## Intellirent Ground Cluster

Available from intellirent in Multiple Configurations

- Large Variety of Available Clusters Assures Proper Application
- Typical 15' 4/0 Cables with Connections for A Phase, B Phase, C Phase, and Ground
- Provided by intellirent with Duckbill or C-Type Clamps
- Clamps Adjustable with a Hook Type Hotstick
- All intellirent Clusters are Inspected Before Each Shipment to Provide Confidence and Ensure Safety
- Clusters are Always Well Maintained Between Rental Periods



## Brenco GR1/0-15X15CL

Yellow Ground Cluster 1/0 - 15' Legs

- Ground Cluster with 1/0, 15' Cables
- Easily Identifiable in Yellow
- Provided by intellirent with Duckbill Clamps
- Clamps Adjustable with a Hook Type Hotstick



## Brenco GR1/0-20

Yellow Ground 1/0 15' with C600-2276 Clamps

- 15' Length Leg Grounding Cable Set
- Easily Identifiable in Yellow
- Provided by intellirent with C-Type Clamps
- Clamps Adjustable with a Hook Type Hotstick



## AEMC 275HVD

### Non-Contact Voltage Detector

- Suitable for Use from 80V to 275kV in 8 Switch Selectable Voltage Ranges
- Audible and Visual Indication of Voltage
- Lightweight for Easier Control When in Use on a Hotstick
- Universal Spline Connection
- Includes Shotgun Adaptor
- Self Test Function



## Amprobe TIC300 PRO

### Low, Medium and High Voltage Tic Tracer

- Non-Contact
- Rugged and Reliable
- Suitable for Use on Circuits to 122kV
- Visible and Audible Indication of Voltage Presence
- Handle with Universal Spline Connection
- Available from intellirent with a TIC-410A Extension Hot Stick



## Hastings HV-230

### Insulated Hot-Stick, 30' (Telescopic)

- 30' Fiberglass Telescoping Hot Stick
- Unique Triangle Design, Enables Easier Locking While Extended the Hot Stick
- Ergonomic Design Ensures Better Handling for Field Use
- Units Entire Weight is 10 lbs, Making for Easier Maneuverability
- Smooth Gloss Finish, Allows for Easy Cleaning and Waxing



## Macron Safety MS-USTS-25

### Insulated Hot-Stick, 17' to 25' (Telescopic)

- Telescopic Safety Fiberglass Hot Stick
- Lightweight to Ensure Easier Maneuverability on Any Application
- Three Operating Lengths 26', 21', and 17'
- Easily Replace Hot Stick Tip with the Tip Lock Button
- Meets ASTM F711, ASTM F1826, and OSHA 1926.951(d) Standards





## HV Diagnostics HVA28-TD

### 28kV VLF Hipot and Tan Delta Measurement System

- The Smallest VLF/DC Unit on the Market Now Includes an Integrated Tan Delta Measurement System to Perform Advanced Electrical Insulation Diagnostics
- TD Analysis and Reporting Using TD Control Center
- Digital RMS Metering
- Bluetooth/USB Memory Stick PC Interface
- Color LCD Display
- Weight 31 lbs
- Insulation Resistance and Capacitance Measurement
- Perform Advanced Diagnostics on MV Cables According to IEEE 400-2012 and IEEE 400.2-2013
- VLF Sinewave/Squarewave and DC Outputs
- VLF Mode: 21kV RMS/30kV Peak Output
- DC Mode:  $\pm 28$ kV Output
- Cable Jacket/Sheath Testing Mode



## HV Diagnostics HVA30-7

### 34kV Peak (24kV RMS), High Output (7kVA) VLF Hipot

- Designed Primarily for Electrical Utilities that Have Large Complex Cable Networks that Demand a Very Powerful Test Instrument to Overcome the Large Loads Presented by These Long Cable Systems
- Can be Used for Testing Many Other Electrical Apparatus Like Transformers, Motors/Generators, Switchgear, etc.
- Internal Storage of Test Reports
- Download to PC and/or USB Flash Drive
- Unlimited Duty Cycle
- Flashover Voltage Detection
- Bright Backlit LCD Display
- Weight 125 lbs
- Low Maintenance, Oil-Free Design
- HVA Control Center – User Friendly Software for Immediate, Professional Detailed Reporting and Setup
- VLF Sinewave/Squarewave and DC Outputs
- VLF Mode: 24kV RMS/34kV Peak Output
- DC Mode:  $\pm 34$ kV Output

## HV Diagnostics HVA34

### 34kV VLF Hipot

- The HVA30 Was Upgraded to the HVA34 to Accommodate the New Testing Requirements for 25kV Rated Cables as Per the Latest Revision of IEEE400.2 Testing Standard
- A Single Piece Design, Capable of Testing up to 120,000ft/37km of Cable
- Ideal for Maintenance Testing of Cables up to 25kV and Acceptance Testing of Cables up to 15kV
- Weight 44 lbs
- Perform Tests Automatically Using User Configured Programs
- Oscilloscope Display of Output Waveform
- Insulation Resistance and Capacitance Measurement
- RMS Metering of Current and Voltage
- Output Frequency Optimization
- VLF Sinewave/Squarewave and DC Outputs
- VLF Mode: 24kV RMS/34kV Peak Output
- DC Mode:  $\pm 34$ kV Output



## HV Diagnostics HVA45-TD

### 45kV VLF Hipot and Tan Delta Measurement System

- Fully Compliance with the IEEE 400, IEEE 400.2, IEC 60502, CENELEC HD620/621 Guides and Standards
- 45kV Peak Output and Integrated Tan Delta
- Designed to Perform Diagnostic Testing on Cables up to 35kV and Acceptance Testing of Cables up to 25kV
- Pure AC VLF, and DC (+ or - Polarity)
- Load Independent Sinusoidal 0.1Hz
- Integrated TD
- TD Resolution  $\pm 1 \times 10^{-4}$
- TD Analysis and Reporting Using TD Control Center
- Digital RMS Metering
- 4.3" Color LCD Display
- Weight 86 lbs
- Insulation Resistance and Capacitance Measurement
- VLF Sinewave/Squarewave and DC Outputs
- VLF Mode: 32kV RMS/45kV Peak Output
- DC Mode:  $\pm 45$ kV Output





## HV Diagnostics HVA60

### 60kV VLF Hipot

- Designed for Acceptance and Maintenance Testing of Medium Voltage Cables up to 35kV
- Popular, Single Piece Instrument is Widely Used on Long 35kV Cable Systems Found in Electrical Utilities, Wind and Solar Farms, etc.
- By Utilizing VLF AC and DC Outputs, the HVA60 Can Also be Used for Testing Vacuum Bottles, Cable Jackets/Sheaths, Rotating Machines, Transformers, Switchgear, and More
- Single Piece Design
- Weight 126 lbs
- Perform Tests Automatically Using User Configured Programs
- Real Time Oscilloscope Display
- Insulation Resistance and Capacitance Measurement
- RMS Metering of Current and Voltage
- Output Frequency Optimization
- VLF Sinewave/Squarewave and DC Outputs
- VLF Mode: 44kV RMS/62kV Peak Output
- DC Mode:  $\pm 60$ kV Output



## HV Diagnostics HVA90

### 90kV VLF Hipot

- Designed for Maintenance Testing of Cables up to 69kV and Acceptance Testing of Cables up to 46kV
- Facilitates Testing of Very Long Cables
- Produces Some of the Highest VLF AC Voltages
- Maximum Output Load Capability up to 10 $\mu$ F (100,000ft)
- Single Piece Design
- Weight 280 lbs
- Perform Tests Automatically Using User Configured Programs
- Real Time Oscilloscope Display
- RMS Metering of Current and Voltage
- Output Frequency Optimization
- Insulation Resistance and Capacitance Measurement
- VLF Sinewave/Squarewave and DC outputs
- VLF Mode: 64kV RMS/90kV Peak Output
- DC Mode:  $\pm 90$ kV Output

## Phenix 440-20

### 40kV DC Hipot

- Easy To Use, Digital, Single-Piece Portable DC Dielectric Test Set
- Output Voltage is Continuously Adjustable Over Entire Range
- Adjustable Overcurrent Trip Point from 10%-110% at Each Individual Current Range
- Large, Easy to Read, High Accuracy Digital Meters
- Analog Full-Range Current Meter for Visual Charge Indication
- Input Circuit Breaker/Power Switch
- Thermal Resettable Overload
- Built in Discharge Circuit Rated at 3 Kilojoules (kJ)
- Removable Line Cord
- "Zero Start" Interlock
- Includes 20' Output Cable with Clips and Boot, 20' Return Lead with Clips and Boot, 20' Ground Lead with Clips and Boot, and 7' Input Line Cord



## Tech Tip

### Operator Checklist for Hipot Testing

#### Basic Safety Guidelines and Procedures

1. Only properly trained operators should be allowed to use the equipment and have access to the test area.
2. Do not make any connections to a device under test, (DUT) unless you have verified the high voltage warning light is OFF.
3. Never touch a DUT, the tester, or the test leads.
4. When connecting leads to the DUT, always connect the ground clip first.
5. Never touch the metal of a high voltage probe or HV test lead directly. Only touch the insulated parts and only when no high voltage is present.
6. When possible, use interlocked test fixtures only.
7. Verify all DUT connections before starting a test. Make sure no other objects are near the DUT or the tester.
8. Keep the area neat and uncluttered and avoid crossing test leads.
9. Suspend the test leads to minimize capacitive coupling.
10. Follow the prescribed procedure for each test exactly as written.
11. Verify all setup conditions before starting a test and examine all leads for signs of wear.
12. At the completion of a test, observe that the HV light is out. If the test was DC, the discharge may take some time.
13. Ensure the tester and test station use all the built-in safety features and functions of the Hipot tester.
14. Make sure the AC mains to the tester are properly installed with low impedance ground connections. Also, make sure that the emergency switch disconnects all power from the tester and the DUT and all electrical equipment and feeds in the testing area.
15. The operator and nearby co-workers should be trained in compression-only CPR in the event of a heart attack event or contact with high voltage.

**Intellirent wants its customers to always stay safe!**





## High Voltage VLF-12011CMF

VLF Hipot, 120kV Peak (85kV RMS)

- Provides a 120kV AC Peak Output Voltage, Suitable for VLF Hipot Testing 69kV Cable and as a Voltage Source for Partial Discharge and Tan Delta Testing of 115kV Cable
- Complete Control Package Including Cable Burn Mode, Which Reduces Fault Arc Overvoltage Events so That Conventional Thumpers Can be Deployed for Fault Locating
- This Model Comes in a One-Piece Package with Cable Reels
- Designed for Withstand Testing of 69kV Cable Systems Per IEEE 400.2-2013 and Insulation Testing of Large Rotating Machines Per IEEE 433-2009
- With Output Frequency Options of 0.1Hz, 0.05Hz, 0.02Hz, and 0.01Hz the VLF-12011CMF Can Test Cables up to 50,000 Feet Long
- Includes Zero Start Interlock Circuit and External Interlock Provisions on All Equipment
- Weights: Control: 20 lbs, Regulator: 160 lbs, HV Tank: 390 lbs, Overall: 853 lbs
- Outputs: Sinusoidal, 0-120kV AC Peak, 0.1/0.05/0.02/0.01Hz Frequency Continuous Duty
- 100 ft Shielded X-Ray Output Cable with Dual Cable Reels
- Load: 0.55 $\mu$ F (Approx 5,000 ft of Cable) at 0.1Hz, 1.1 $\mu$ F (Approx 10,000 ft of Cable) at 0.05Hz, 2.75 $\mu$ F (Approx 25,000 ft of Cable) at 0.02Hz, 5.5 $\mu$ F (Approx 50,000 ft of Cable) at 0.01Hz

## High Voltage PTS-300

300kV DC Hipot



- Two Range Voltmeter and Five Range Current Meter
- M $\Omega$  Readings at Any Output Voltage (with Analog Meters)
- Insulated Return Guard Circuit to Bypass Stray Leakage Currents
- Rugged Case (Field) with Cushion Grip Handles and Storage for Leads
- Internal Discharge Resistors to Assist External Bleed Resistors
- External Safety Interlock Provision
- Weight 440 lbs
- Automatic Transit Protected Meters Rated 100 $\mu$ A for Durability
- Benchtop or Field Controller Available, Analog or Digital Metering
- Output: 300kV DC at 5mA with Field Controller
- Polarity: Negative Output, Positive Ground

## Associated Research 3770

### AC/DC Hipot and Insulation Tester

- Compact Hipot Tester with a Built-in Insulation Resistance (IR) test
- Enhanced Graphic LCD and can be Used as a Bench-Top Instrument or Remotely Controlled via RS-232
- Provides a Simplified Interface and the Latest in Technology and Safety Features
- Entry Level Solution for AC/DC/IR Hipot Testing Applications
- Manual 5kV AC and 6kV DC Hipot Tester
- Performs AC, DC, and Ground Continuity Testing
- Measures Insulation Resistance to 9999MΩ



## Associated Research 7850

### AC/DC Hipot and Insulation Tester

- AC/DC Hipot Tester with Insulation Resistance
- 5kV AC at 30mA
- 6kV DC at 10mA
- Insulation Resistance Readings from 0.10MΩ – 99.9MΩ
- Improves Traceability with Onboard Data Storage
- Automate Testing with a Variety of Communication Interfaces
- Intuitive Touch Screen Interface
- Rackmount and Benchtop Use Capable



## GW Instek GPT-9803

### AC/DC Hipot and Insulation Tester

- 200VA AC Test Capacity
- 240 x 64 Ice Blue Dot Matrix LCD
- Manual/Auto Mode
- Function Key for Quick Selecting
- High Intensity Flash for Caution and Status Indication
- Safety INTERLOCK function
- Zero Crossing Turn-on Operation
- Controllable Ramp-up Time
- True RMS Current Measurement
- High Resolution: 1uA for Measuring Current, 2V for Setting Voltage
- PWM Amplifier to Enhance the Power Efficiency and Reliable Testing





**High Voltage ALT-60/120**



**High Voltage PTS-80**



**Hipotronics 880PL**



**HV Diagnostics HVA28-TD**



**HV Diagnostics HVA60**



**Innovative Utility Products Fault Wizard**



**Phenix 6CP-200/100-10**



**Vanguard VBT-80**



**Vitrek V61**



**Von XF25-1563**

## AC, DC, and VLF Hipots Available from intellirent

Manufacturer	Model	Voltage	Range	Output Current	Output Power	Input Voltage	Weight
High Voltage	ALT-60/120	AC	60kV 120kV	120mA at 60kV 60mA at 120kV	0.375kVA	120V	210 lbs
High Voltage	PTS-37.5	DC	37.5kV	10mA	1.5kVA	120V	50 lbs
High Voltage	PTS-75	DC	75kV	10mA	0.75kVA	120V	68 lbs
High Voltage	PTS-80	DC	80kV	10mA	0.8kVA	120V	62 lbs
High Voltage	PTS-130	DC	130kV	10mA	1.3kVA	120V	116 lbs
High Voltage	PTS-200	DC	200kV	5mA	1kVA	120V	184 lbs
High Voltage	PFT-301CM	AC	30kV	33mA	1kVA	120V	45 lbs
High Voltage	PFT-303CM	AC	30kV	100mA	3kVA	120V	75 lbs
High Voltage	PFT-503CM	AC	50kV	60mA	3kVA	120V	80 lbs
High Voltage	PFT-652CM	AC	65kV	30mA	2kVA	120V	91 lbs
High Voltage	VLF-34E	VLF or DC	34kV	5μF Load at 0.01Hz		120V	45 lbs
High Voltage	VLF-6022CM	VLF	60kV	5.5μF Load at 0.02Hz		120V	175 lbs
High Voltage	CDS-2010U	DC	20kV	400mA (Burn Current)		120V	260 lbs
Hipotronics	880PL	DC	80kV	10mA	0.8kVA	120V	90 lbs
HV Diagnostics	HVA28-TD	VLF or DC	28kV	10μF Load at 0.01Hz		120V	31 lbs
HV Diagnostics	HVA30	VLF or DC	30kV	10μF Load at 0.01Hz		120V	44 lbs
HV Diagnostics	HVA34	VLF or DC	34kV	12μF Load at 0.01Hz		120V	44 lbs
HV Diagnostics	HVA60	VLF or DC	60kV	5μF Load at 0.01Hz		120V	100 lbs
HV Diagnostics	HVA90	VLF or DC	90kV	10μF Load at 0.01Hz		120V/240V	280 lbs
Innovative Utility Products	Fault Wizard	DC	10kV	12.5mA (Burn Current)		Batt/120V	50 lbs
Megger	230425	AC or DC	4kV AC 5kV DC	12mA AC 17mA DC	0.05kVA	120V	10 lbs
Phenix	BK130/36	AC	36kV 130kV	180mA at 36kV 50mA at 130kV	6.5kVA	120V	227 lbs
Phenix	6CP-100/50-7.5	AC	50kV 100kV	150mA at 50kV 75mA at 100kV	7.5kVA	120V	311 lbs
Phenix	6CP-100/50-7.5	AC	50kV 100kV	150mA at 50kV 75mA at 100kV	7.5kVA	240V	311 lbs
Phenix	6CP-100/50-10	AC	50kV 100kV	200mA at 50kV 100mA at 100kV	10kVA	240V	443 lbs
Phenix	6CP-200/100-10	AC	100kV 200kV	100mA at 100kV 50mA at 200kV	10kVA	240V	656 lbs
Vanguard	VBT-60	DC	60kV	0.3mA	0.02kVA	120V	15 lbs
Vanguard	VBT-75	DC	75kV	0.3mA	0.02kVA	120V	15 lbs
Vanguard	VBT-80	DC	80kV	0.3mA	0.02kVA	120V	15 lbs
Vitretek	V61	AC or DC	5kV AC 6kV DC	40mA AC 10mA DC	0.2kVA	120V	15 lbs
VON	XF25-1563	DC	25kV	150mA (Burn Current)		Batt/120V	260 lbs



**AEMC 6505**



**AEMC 5050**



**AEMC 5060**



**AEMC 6526**



**Fluke 1587**



**High Voltage PTS-80**



**Megger MIT415**



**Megger S1-568**



**Megger S1-1052**



**Megger S1-1568**



## Insulation Resistance Meters (Megohmmeters) Available from intellirent

Manufacturer	Model	Test Voltage	Automatic PI/DAR/DD	Maximum Resistance Range
AEMC	1026	250V, 500V, 1kV		4GΩ
AEMC	1045	250V, 500V, 1kV		2GΩ
AEMC	6522	250V, 500V, 1kV		40GΩ
AEMC	6526	250V, 500V, 1kV	✓	200GΩ
AEMC	1060	50V-1kV	✓	4TΩ
AEMC	6505	50V-5kV	✓	10TΩ
AEMC	5050	50V-5kV	✓	10TΩ
AEMC	5060	50V-5kV	✓	10TΩ
AEMC	6550	50V-10kV	✓	25TΩ
AEMC	6555	50V-15kV	✓	30TΩ
Fluke	1587	50V, 1kV		2GΩ
Fluke	1550C	250V-5kV	✓	1TΩ
High Voltage	PTS-75	0-75kV		1TΩ
High Voltage	PTS-80	0-80kV		1TΩ
High Voltage	PTS-130	0-130kV		1TΩ
High Voltage	PTS-200	0-200kV		1TΩ
Megger	MIT1020/2	50V-10kV	✓	35TΩ
Megger	MIT1025	100V-10kV	✓	20TΩ
Megger	MIT320	250V, 500V, 1kV		1GΩ
Megger	MIT415	10V-1kV		200GΩ
Megger	MIT525	40V-5kV	✓	10TΩ
Megger	S1-1052	50V-10kV	✓	35TΩ
Megger	S1-1568	40V-15kV	✓	35TΩ
Megger	S1-568	40V-5kV	✓	15TΩ



**AEMC 6240**



**AEMC 6255**



**AEMC 6292**



**DV Power RMO-H3**



**HIGHTEST ARES-200D**



**Megger DLRO100-115**



**Megger DLRO600**



**Omicron CPC-100**



**Raytech Micro Centurion II**



**Vanguard DMOM 200 S3**

## Digital Low Resistance Ohmmeters Available from intellirent

Manufacturer	Model	Maximum Output Current	Resistance Range
AEMC	6240	10A	1 $\mu\Omega$ - 400 $\Omega$
AEMC	6255	10A	1 $\mu\Omega$ - 2500 $\Omega$
AEMC	6292	200A	0.1 $\mu\Omega$ - 1 $\Omega$
DV Power	RMO-H3	300A	0.1 $\mu\Omega$ - 3000m $\Omega$
HIGHTEST Technology	ARES-200D	200A	0.1 $\mu\Omega$ - 5 $\Omega$
Megger	DLRO100-115	100A	0.1 $\mu\Omega$ - 1.999 $\Omega$
Megger	DLRO10HD	10A	10 $\mu\Omega$ - 2500 $\Omega$
Megger	DLRO H200	200A	1 $\mu\Omega$ - 1 $\Omega$
Megger	DLRO600	600A	0.1 $\mu\Omega$ - 1 $\Omega$
Metrel	3250	10A	0.1 $\mu\Omega$ - 2000 $\Omega$
Omicron	CPC-100	400A	0.1 $\mu\Omega$ - 10k $\Omega$
Raytech	Micro Centurion II	200A	0.01 $\mu\Omega$ - 5 $\Omega$
Vanguard	DMOM 200 S3	200A	1 $\mu\Omega$ - 5 $\Omega$



## UE Systems UltraProbe 10,000 and UltraProbe 15,000

### Digital Ultrasound Inspection System

- Ideal for Predictive and Condition-Based Maintenance Programs
- Identifies the Presence of Corona and Partial Discharge in Energized Medium and High Voltage Systems
- Perform Condition Analysis, Record Sounds, Store and Manage Data in One System
- Records up to 400 Sound Files Onboard
- Unique "Spin and Click" Control Navigates Onboard Menu Structure Similar to a Mouse
- Accurate and Repeatable Results with Digital Reports
- Comes with License Free Data Management (DMS) & Spectrum Analysis Software to Manage & Report Asset Condition
- Comprehensive UltraTrend DMS PC Software Allows Application Selection for Most Accurate Reporting and Trending: Generic, Valve Leak, Bearings, Electrical and Steam
- Instrument Accepts Inputs from External Devices for Simultaneous Data Storage from Thermometers and Tachometers
- Adjustable Frequency from 20kHz to 100kHz
- Available from intellirent with a Wide Variety of Accessories to Support Specific Requirements: Focusing Cones, Laser Assisted Parabolic Dish, Contact Probe for Metal-Clad Switchgear, and Flexible Head for Reaching into Cabinets

## EA Technologies UltraTEV Plus2

### Handheld Partial Discharge (PD) Detector

- Detect Problems Early by Using the In-Built PD Classification and Interpretation Tools to Avoid Dangerous and Damaging Failures and Minimize Network Outages
- Accurately Measure and Locate PD Activity, Enabling You to Identify Potential Faults Before They Lead to Failures
- Optimize Maintenance Cycles and Asset Life Through a Better Understanding of Asset Condition, Comparing PD Results Over Time to Identify Trends
- Increase On-Site Productivity by Using Survey Mode to Rapidly Collect Key Condition Information in an Accurate and Consistent Manner
- Detect PD in a Wide Range of Plant, Cable and Overhead Line Assets Using a Single Instrument with Dedicated Accessories
- Easy to Use with an Intuitive and User Friendly Interface
- Identify Deteriorating Assets and Trends by Comparing Current Measurements to Previous Results Stored Locally on 'smart' Near Field Communication (NFC) Tags
- Integrate PD Surveys Into Your Asset Management Process by Seamlessly Transferring Data via Zip or CSV File Into Your Corporate System
- Provided by intellirent with UltraDish Parabolic Waveform Concentrator, Flexible Sensor, External Microphone, and Surface Probe



## PMDT PDetector

### Comprehensive Online Partial Discharge (PD) Analyzer

- One Instrument Solution for a Wide Variety of Substation Apparatus and Cables
- Represents the Latest Technology in Both Electromagnetic and Acoustical Sensors to Identify and Find PD in Energized Substations and Switchgear
- Uses Ultra High Frequency (UHF), Transient Earth Voltage (TEV), High Frequency CT (HFCT or RFCT), Acoustical Contact, and Airborne Acoustic Sensors
- Hand Held Instrument is Small, Lightweight and Portable
- Short Learning Curve – Operators Can Become Proficient in Minutes
- Phase Resolved Display Documents PD Over the Sine Wave to Ensure Measured PD is from the Circuit Under Test and Not Background or Nominal Noise
- Wireless Line Synchronization is Accomplished using the Instrument Charger
- Suitable for Use on Power Cables, Transformers, GIS, Switchgear and Other Substation Apparatus
- Provided by intellirent with PDetector Software to Catalog and Trend Results and Produce Professional Reports







## Innovative Utility Products Fault Wizard Complete Fault Location System

- Single Piece High Voltage Thumper, ARC Reflection TDR, DC Hipot and Low Voltage TDR
- Rugged and Reliable Compact Design
- Simplified Transportation Through Common Express Carriers (FedEx and UPS)
- One Man Portable, Weight 50 lbs
- Battery or Line Powered
- Ideal for Testing up to 15kV Shielded Cable
- Quickly Indicates Fault Type and Actual Distance to Fault in Feet
- Simple to Operate and Identify Fault Location for Less Familiar Users
- Sophisticated Circuitry Ignores Transformer Reflection and Locks on Fault Location
- Locates Faults to 10,000 ft (Maximum Capacitance of 7uF)
- Variable Impulse Voltage (Thump) for Minimal Cable Damage
- Variable Velocity of Propagation for Precision Adjustment to Specific Application
- 350 Joule Pulse Can Often be Heard Above Ground
- Included Fault Wizard Software Enables Viewing and Recording of Trace



## VON XF25-1563V2

Combination Arc Reflection TDR and 25kV Thumper/Hipot

- Very High Output Power – 1563 Joules
- 120V Line Powered or Battery Operated with Onboard Battery Charger
- Ideal for Use on 35kV Cables
- Fast Three Step Procedure to Fault Location
- Onboard TDR (Cable Radar) Automatically Marks End of Cable and Fault Location(s) with Distances
- Large Screen Provides Clear Feedback for TDR Trace
- Large Pneumatic Wheels for Ease of Transport Over Rough Terrain and Stability
- A Total Fault Location Solution when Paired with the Aquatronics SDAD Acoustical Detector
- Measures and Pinpoints Sheath and Conductor Faults
- Pinpoints Insulation Faults on Un-Shielded Buried Cables
- Discriminates Between Low and High Resistance Faults
- Visual and Audible Indicators
- Simple Operation for Inexperienced Users



## High Voltage CDS-2010U

20kV Thumper and Arc Reflection TDR

- Full Output Power (1000 Joules) Available at 5kV Limits Risk of Collateral Damage to Cable
- 120V Line Powered
- Arc Reflection and Current Impulse TDR Interface
- Hipot Burn Current of up to 400mA DC for Quick Fault Conditioning
- Ideal for Use on 35kV Cables
- Field Rugged
- Familiar and Simple Controls
- Provided by intellirent with the TDR1669:
  - Seamless Integration
  - Connects to Thumper via Standard BNC Cable
  - Simple Controls and Large Easy-to-Read and Understand Screen
  - Low Voltage TDR Mode Enables Cable End Identification and Velocity Factor Adjustment
  - Onboard Memory of 15 Waveforms
  - Dual-Trace Overlays Previous Results
  - Measures Cable Ends to 48,000 ft
  - Zooms to 4x on 3000' Range
  - Displays Distance, Velocity Factor, Range and Operation Menus
- A Total Fault Location Solution when Paired with the Aquatronics SDAD Acoustical Detector and High Voltage TDR-1669



## Megger EZ-THUMP12

12kV Thumper with Integrated TDR

- Compact, Light, and Rugged Cable Fault Location System
- Onboard TDR Offers Quick, Effective, and Accurate Fault Locating
- Battery and AC Line Operation
- Automatic End-of-Cable and Fault Locating
- 7" HiBrite Color Display for Outdoor Visibility
- Equipped with ARM Fault Prelocation Technology
- Single Stage 500 Joule Surge Generator for Pinpointing High Resistance Faults up to 12kV

## Megger T3090

### Advanced TDR (Time Domain Reflectometer)

- Compact, Portable TDR for Fault Locating on Primary/Secondary Power Cables
- All Essential Components of the Unit are Mounted in a Durable, Compact, Water Protected, Portable Carrying Case
- The AC, Signal and Trigger Cables are Water Protected and Located on the Backside of the Unit
- Using a Radar to Pre-Locate Faults Will Save Time and Reduce Cable Damage
- Designed to be the Most User-Friendly Radar on the Market
- Advanced Features Include One Button Operation, Automatic Gain and a Large Color Screen
- Automatically 'Read' the Cable and Display the Fault Distance with a Single Thump
- Interactive 'Step-by-Step Easy Mode' Will Help Train (or Re-Train) the Occasional User
- 'Sectionalize Mode' Will Quickly Sectionalize Faults in Loops or Radial Systems



## Megger TDR2050

### Advanced Dual Channel TDR (Time Domain Reflectometer)

- State of the Art Dual Channel, Dual Trace Time Domain Reflectometer
- Ideal for Locating Faults on Paired Metallic Cables
- First TDR in its Class to Have 600V CAT IV input Protection Filter Built in, Giving the Ability to Connect to Known Live Lines
- Particularly Useful for Detecting Illegal Taps without Having to Power Down the Line
- Step and Pulse TDR Selections
- Distance Dependent Gain
- Trace tagging
- 2ns Pulse Width
- Designed for Use on All Metallic Paired Cables





## Megger TDR900

### Cable Length Meter and Basic TDR

- Suitable for Some Power, Telephone, CAT5 and LAN Cables
- Identifies Distance to an Open or Short
- Large, Backlit Display
- User Friendly Menu
- Cable Length Calibration Function Adjusts for Ideal Settings
- Measurement Range to 9000 ft
- Internal Library of 39 Standard Cable Types



## Megger CFL535G

### Dual Channel TDR (Time Domain Reflectometer)

- Dual Channel System Measures Two Cables (or Two Conductors) Simultaneously
- Xpert Mode Evaluates Cable under Test and Adjusts to Ideal Settings
- XPert Button Identifies the First Major Event on the Cable
- Second Pulse Function Identifies Near (Test) End Faults
- Manual Control Permits Fine Settings Adjustments and Full User Control
- Large Color Screen for Easy Viewing
- Dual Trace and Dual Cursors Immediately Identify Distances
- Five Output Impedance Settings Available, Plus Auto Impedance Matching
- TraceXpert PC Software Enables Reporting of Results
- Ideal Companion for Offline Partial Discharge Testing of Cables



## UEI CLM100

### Cable Length Meter

- Measures Length of Certain Copper and Aluminum Cables
- Covers Standard Low Voltage Cable Sizes from 26 AWG to 4/0
- Robust and Simple Meter
- Measures from 15 ft to 30,000 ft
- Rugged Kelvin Probes Ensure Proper Connection



## Multi-Tech 760

### AC/DC Ground Fault Locator

- Detects and Locates Ground Faults on Energized Circuits
- Suitable for use on 120V to 600V, AC or DC, Delta or Wye Circuits
- Easy and Safe to Operate
- Fully Automatic Phase/Voltage Selection
- Determines Which Phase is Grounded; Hand-Held Pickup Probe Traces Signal Tone to Exact Point of Fault
- Portable and Suitable for Use Anywhere in the System
- Adjustable Signal Tone Audible with Probe up to 5' from Conduit
- Provided by intellirent with Signal Generator, Exploring Probe, Three Phase Power Cable, Single Phase Line Cord, and a 10' Extension Probe to Trace Overhead Circuits



## Megger 246100B/BGFT

### Battery Ground Fault Tracer

- Identifies and Locates Ground Faults in Ungrounded DC Systems
- Operates in Energized Systems
- Digital Display of Voltage and Current Amplitudes
- Optional Bridge Measurement of Fault Resistance (from 1k $\Omega$  to 399k $\Omega$ )
- Soft-Start Charging System Prevents Sensitive Relay Tripping
- Simplifies Fault Tracing by Identification of Fault Characteristics
- Includes Line Operated Transmitter and Battery Operated Receiver for Remote Tracing



## Eagle Eye GFL-1000

### DC Ground Fault Locator

- Quickly and Simply Detects, Tracks and Locates Grounding Faults for Online and Offline DC Systems
- Measures Current Leakage of DC Systems with High Resistance
- Output Voltage of up to 1kV (Very Low Current) for Locating Faults in Offline Systems
- Adjustable Output Frequency on Signal Receiver Avoids Interference from the DC System
- Additional Signal Receivers Work Simultaneously to Narrow Down Searching Scope to Locate Faults More Quickly
- Provided by intellirent Complete with Signal Generator, Receiver, and Two Current Detectors





### 3M Dynatel 2273

#### Underground Cable and Fault Locator

- Measures and Pinpoints Sheath and Conductor Faults
- Pinpoints Insulation Faults on Un-Shielded Buried Cables
- Locate Underground Cable Path and Depth
- Discriminates between Low and High Resistance Faults
- Visual and Audible Indicators
- Locates Energized or De-Energized Cable
- Included Signal Generator Operates on Four Active Trace Frequencies: Direct Connect or Clamp Induction, Passive RF Detection (Radio) and 50/60Hz Power Signal Detection
- Provided by intellirent with A-Frame Fault Locator



### 3M Dynatel 1420

#### EMS-iD Locator

- Microprocessor Based Locator for Underground Markers
- Quickly and Accurately Locate, Read or Write to 3M iD Markers
- Pinpoints Depth and Location of Existing Models of Passive EMS Markers
- Locates Two Separate Marker Frequencies Independently
- Detects all Seven EMS Marker Frequencies
- Unaffected by Metallic Conduit or Pipes, AC Power or Electronic Markers for Other Utilities
- Provided by intellirent with Locator PC Tools Software



### 3M Dynatel 2220M-U3W

#### Pipe/Cable Locator

- Two User Selected Active Frequencies for Optimized Unit Performance in Varying Conditions
- Graphic Display to Distinguish Between Targeted Cable and Other Cables in Congested Areas
- Single Peak, High Sensitivity Mode for Deep Depths and Long Distances
- Directional Mode Utilizes All-Peak Antenna Design for Improved Left/Right Guidance and Accurate Locating in Challenging Conditions
- Audible Tones and Visual Indicators in the Receiver Make Tracing Much Easier
- Receiver Backlight Allows Operators to Locate Cables in Low Light Environments

## Amprobe AT-3500

### Underground Cable Locator

- Locates Underground Energized and De-Energized Conductors
- Uses Three Modes to Ensure Accuracy – Passive Power, Passive Radio and Active Signal Generation
- Signal Generator Outputs by RF, Induction Clamp or Direction Connection
- Active Depth Indication up to 16'
- Automatic Gain Control Results in Fast Signal Location and Control
- Provided by intellirent Complete with Receiver, Transmitter, Leads, Induction Probe and Ground Stake



## Amprobe AT-7030

### Advanced Wire/Circuit Tracing System

- Comprehensive Kit Includes All Required Components for Tracing Low Voltage Circuits in Walls, Ceilings, Floors and Corners
- Innovative New Antenna Design and Advanced Signal Processor Provides the Exact Location and Orientation of Wires/Circuits
- Effective in Both Energized and De-Energized Applications
- Locates Breakers and Fuses
- Pinpoints Shorts and Opens
- High Resolution Color LCD Displays Active Process and Menu
- Three Output Modes – High for Normal Circuits, Low for Precision Tracing in Difficult or Congested Areas, and Clamp Model for Boosted Induction Signal by the Included Clamp
- Provided by intellirent as Complete Kit with Receiver, Transmitter, Leads, Inductive Clamp, Hanger and Booster Battery



## HV Diagnostics HVA60

### 60kV VLF Hipot

- Designed for Acceptance and Maintenance Testing of Medium Voltage Cables up to 35kV
- Popular, Single Piece Instrument is Widely Used on Long 35kV Cable Systems Found in Electrical Utilities, Wind and Solar Farms, etc.
- By Utilizing VLF AC and DC Outputs, the HVA60 Can Also be Used for Testing Vacuum Bottles, Cable Jackets/Sheaths, Rotating Machines, Transformers, Switchgear, and More
- Single Piece Design that Weights 126 lbs
- Real Time Oscilloscope Display
- Insulation Resistance and Capacitance Measurement
- RMS Metering of Current and Voltage
- Output Frequency Optimization
- VLF Sinewave/Squarewave and DC Outputs
- VLF Mode: 44kV RMS/62kV Peak Output
- DC Mode:  $\pm 60$ kV Output





### Greenlee PE2003

#### Secondary Cable Fault Locator

- Locates Cable Faults Based on the Earth Gradient Principle
- Finds the Precise Location of a Ground Fault in Any Buried Wire or Cable
- Broken Insulation, Severed Cable, and Other Buried Cable Faults with Ground Leakage Can be Easily and Accurately Located with the PE2003-G Ground Fault Locator
- The Transmitter is Powered by a Self-Contained Rechargeable Gel-Cell Type Battery for Extended Battery Life
- Charging the Transmitter Battery is Necessary and Advisable for Maximum Battery Life, when the Beeper Tone Becomes Weak
- Multiple Faults on a Single Wire Can be Identified, Indicating the Need to Replace Instead of Repair
- Extra-Long Test Leads Feature Heavy-Duty Alligator Clips for Use on Multiple Cable Types
- Battery Operated: (1) 12V and (1) 9V Battery Included



### Megger digiPHONE+ NT

#### Surge Wave Receiver and Earth Fault Locator

- Easily finds Flashover Faults in Buried Cable
- Precisely Finds Sheath Faults in Plastic Insulated PE and VPE, Medium Voltage Cables
- Tracks Line with Easy to View Left/Right Indicator on Display
- Outstanding Acoustic Qualities for Locating Faults Quickly and Reliably
- Automatic Synchronization to Signal Generator
- Automatic Sensitivity Adjustment to the Measured Voltage
- Wide Measuring Range (0.01mV ... 200V) Due to High Level of Sensitivity
- Suppression of Interference (50/60Hz, 16 2/3Hz, 100/120Hz)
- Elimination of DC Voltage Interference

## Tech Tip

### Electrical Testing for MV and HV Cables

Before you begin any electrical test for MV and HV cables, it is always best to do a visual and mechanical inspection whenever possible.

The following steps should be performed:

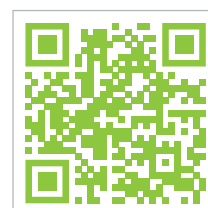
1. Compare cable data with drawings and specifications.
2. Inspect exposed sections of cables for **physical damage**.
3. Inspect bolted electrical connections for high resistance using one or more of the following methods:
  - A. Use of a low-resistance ohmmeter in accordance with NETA or ANSI standards.
  - B. Verify tightness of accessible bolted electrical connections by the calibrated torque-wrench method in accordance with the manufacturer's published data.
  - C. Perform a **thermographic survey**.

**NOTE:** Remove all necessary covers prior to the thermographic inspection. Use appropriate caution, safety devices, and personal protective equipment.)
4. Inspect compression-applied connectors for correct cable match and indentation.
5. Inspect shield grounding, cable supports, and terminations.
6. Verify that visible cable bends meet or exceed ICEA and the manufacturer's minimum published bending radius.
7. Inspect fireproofing in common cable areas.
8. If cables are terminated through window-type current transformers, inspect to verify that neutral and ground conductors are correctly placed and that shields are correctly terminated for operation of protective devices.
9. Inspect for correct identification and arrangements.
10. Inspect the cable jacket and insulation condition.

A good visual and mechanical inspection will increase the chances of a successful electrical test.



View and download equipment manuals  
from the **my intellirent** app



For additional tech tips  
try the **my intellirent**  
app by scanning here





## Hart 475

### Field Communicator

- Universal Support for HART, WirelessHART and FOUNDATION Fieldbus Devices
- Configures, Reads and Performs Diagnostics
- View Device Diagnostics in Charts, Graphs, and Gauges for Easy Readability
- View, Transfer and Print Device Configurations between Instrument and PC by USB or Bluetooth
- Bright and Clear Full Color Touchscreen Graphical Display
- Touchscreen and Membrane Button Interface
- Quick Startup and Operating Times
- Easy Upgrade via Web Ensures Required Device Descriptions are Onboard
- ValveLink Mobile for Diagnostics on Fisher FIELDVUE
- Interface with AMS Suite
- Long-Lasting Li-ion Battery Lasts for Days
- Intrinsically Safety Certifications – CENELC/ATEX, FM, CSA, FISCO, and IECEx
- Available from intellirent with Hand Pumps, Gauges and Calibrators



## Fluke 754

### Multifunction Process Calibrator with Hart Communicator

- Calibrate Temperature, Pressure, Voltage, Resistance and Frequency
- Simple Menu-Driven Interface Guides User Through All Tasks
- Programmable Calibration Routines Enable Automated As-Found/As-Left Procedures
- Automatically Save Results and Test Procedures for Reports, Work Documentation or Regulatory Compliance
- Saves Weeks Worth of Results Onboard for Later Download Through USB
- Works with Popular Instrumentation Software Packages, Including DPC/Track
- Integrated HART Communications Capability:
  - Requires No External Box or Another Unit for Fast HART Communication
  - Complies with Data Link Layer of HART Protocol
  - Simple Updates for New Instrument Descriptions
- Familiar Controls to Users of Other Fluke Process Calibrators
- Field Rugged and Reliable
- Large, Clear, High Resolution and Bright Display
- Permits Measure, Source and Simultaneous Measure/Source
- Soft Keys Permit Access to Task Lists, Automated Procedures, Stepping and Ramping and Review Memory
- Works with 700 and 750 Series Pressure Modules, Both Available from intellirent
- Li-ion Battery Mitigates Switching Out Batteries While Working

## Flir T530

### Infrared Camera

- 180° Rotating Optical Block and Vivid 4" Capacitive Touch Screen
- IR Resolution: 320 x 240 Pixels
- Image Frequency: 30Hz
- Temperature Range: -4°F to 1202°F
- Up to 464 x 348 Pixel Native Resolution (161,472 Points of Measurement)
- Fast and Precise Laser-Assisted Autofocus
- Laser Distance and On-Screen Area Measurement
- Intelligent, Interchangeable AutoCal Lenses



## Flir T640

### Infrared Camera

- Includes 15° Telephoto Lens
- IR Resolution: 640 x 480 Pixels
- Image Frequency: 30Hz
- Temperature Range: -40°F to 3632°F
- MSX Enhancement
- Field of View (FOV) Match
- WiFi Connectivity
- High Temperature Range
- Scalable P-i-P and Thermal Fusion



## Fluke Ti480-PRO

### Infrared Camera

- SuperResolution Technology (with SmartView Software): Get 4x Pixel Data to Capture and Combine Multiple Images to Create 1280 x 960 Image
- IR Resolution: 640 x 480 Pixels
- Image Frequency: 60Hz and 9Hz
- Temperature Range: -4°F to 1832°F
- IFOV with Standard Lens (Spatial Resolution): 0.93 mRad, D:S 1065:1
- Field of View: 34 °H x 24 °V
- See Page 170 for Additional Information



## Fluke TiS-9HZ

### Infrared Camera

- IR Resolution: 120 x 120 Pixels
- Image Frequency: 9Hz
- Temperature Range: -4°F to +212°F
- Thermal Sensitivity of <0.1°C Captures Images Faster and Easier, a Key Feature for Inspection Tools
- Large Display Screen, at 9.3cm (3.7")
- Rugged and Ergonomic Design, Engineered to Work in Tough Work Environments and Can Withstand a 2m Drop
- See Page 173 for Additional Information





**Associated Research 3770**  
AC/DC Hipot and Insulation Tester

- Compact Hipot Tester with a Built-in Insulation Resistance (IR) test
- Enhanced Graphic LCD and can be Used as a Bench-Top Instrument or Remotely Controlled via RS-232
- Provides a Simplified Interface and the Latest in Technology and Safety Features
- Entry Level Solution for AC/DC/IR Hipot Testing Applications
- Manual 5kV AC and 6kV DC Hipot Tester
- Performs AC, DC, and Ground Continuity Testing
- Measures Insulation Resistance to 9999MΩ



**Associated Research 7850**  
AC/DC Hipot and Insulation Tester

- AC/DC Hipot Tester with Insulation Resistance
- 5kV AC at 30mA AC
- 6kV DC at 10mA DC
- Insulation Resistance Readings from 0.10MΩ – 99.9MΩ
- Improves Traceability with Onboard Data Storage
- Automate Testing with a Variety of Communication Interfaces
- Intuitive Touch Screen Interface
- Rackmount and Benchtop Use Capable

Model	AC Ouput	DC Output	Description
Associated Research 3130	30A at 6V AC	N/A	Ground Bond Tester
Associated Research 3770	5kV	6kV	AC/DC Hipot and Insulation Tester
Associated Research 7715	20kV	N/A	AC Hipot Tester
Associated Research 7720	N/A	20kV	DC Hipot Tester
Associated Research 7850	5kV	6kV	AC/DC Hipot and Insulation Tester

## California Instruments CSW5550

### AC/DC Power Supply

- Combination AC and DC Power Source
- 40-5,000Hz Output Frequencies
- Arbitrary and Harmonic Waveform Generation
- Built-in Digital Power Analyzer
- Scope Capture Capability
- Power Programming Software
- Constant Power Mode



## GW Instek GPT-9803

### AC/DC Hipot and Insulation Tester

- 5kV AC/DC Hipot Tester
- 240 x 64 Ice Blue Dot Matrix LCD
- Manual/Auto Mode
- Function Key for Quick Selecting
- High Intensity Flash for Caution and Status Indication
- Safety INTERLOCK function
- Zero Crossing Turn-on Operation
- Controllable Ramp-up Time
- True RMS Current Measurement
- High Resolution: 1uA for Measuring Current, 2V for Setting Voltage
- PWM Amplifier to Enhance the Power Efficiency and Reliable Testing



## Vitrek V74

### AC/DC Hipot

- Hipot Tester with Continuity, 5kV AC/DC/IR/GB
- 4.3 Inch Color Touch Display
- Large, Bright LED Caution Testing Indicator
- Safety Locked HV Terminal for Hipot and IR
- Low Profile High Current Binding Posts for Ground Bond
- Independent LED Pass/Fail Indicators
- Convenient Front Panel Power Switch
- Ultra-High Reliability Start/Stop Switches





**Fluke 9143-A, 9144-A, 9009-B**  
Fluke Dry Block Calibrators

- Lightweight, Portable, and Fast
- Built-in Two-Channel Readout for PRT, RTD, Thermocouple, 4-20mA Current
- True Reference Thermometry with Accuracy to  $\pm 0.01^{\circ}\text{C}$
- Onboard Automation and Documentation
- Metrology Performance in Accuracy, Stability, Uniformity, and Loading
- Multi-Hole Inserts and Any User's Specified Well Size Available from intellirent Upon Request
- Sensor Immersion Depth is 139mm (5.5")

Model	Range (F)	Range (C)
Fluke 9143-A	91°F to 662°F	33°C to 350°C
Fluke 9144-A	122°F to 1220°F	50°C to 660°C
Fluke 9009-B	5°F to 662°F	-15°C to 350°C

- Multi-Hole Inserts and Any User's Specified Well Size Available from intellirent Upon Request



**Fluke 62**  
Infrared Thermometer

- Measure -30°C to 500°C/-22°F to 932°F
- IP54 Rating for Water Resistance and Dust Allows You to Work in Rain or Shine and Dirty or Dusty Industrial Sites
- Strong Enough to Withstand 3m Drop
- Small and Lightweight; Clips to Tool Belt or Belt Loop, or Easily Fits Into Most Tool Boxes
- 10:1 Distance-to-Spot Ratio
- Precise Laser Technology Makes for More Accurate and Repeatable Measurements
- Large, Backlit Display Makes Data Easier to Read, Even in Dark Areas



## Fluke 725

### Multifunction Process Calibrator

- Simultaneous Input and Output Visible on Split Screen
- Measures and Sources Thermocouple and RTDs
- Calibrates Loops, Voltage, mV, and Frequency
- Measures Resistance and Provides Loop Power
- Optional Pressure Modules Available in all PSIA, PSID, and PSIG Ranges
- Fluke 725EX Model is Intrinsically Safe



## Fluke 771

### Clamp on Loop Calibrator

- Measure 4-20mA Signals Without Breaking Loops
- 1/4" Jaw Opening
- 0.2% Accuracy
- Resolution of 0.01mA



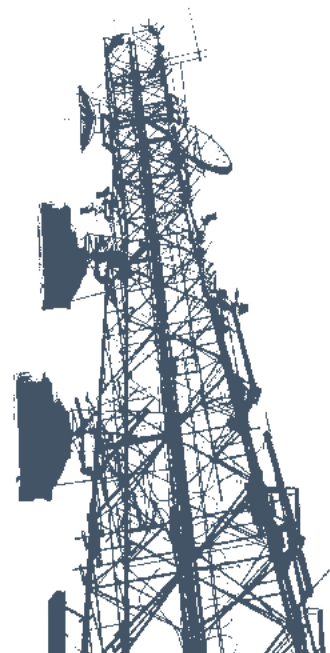
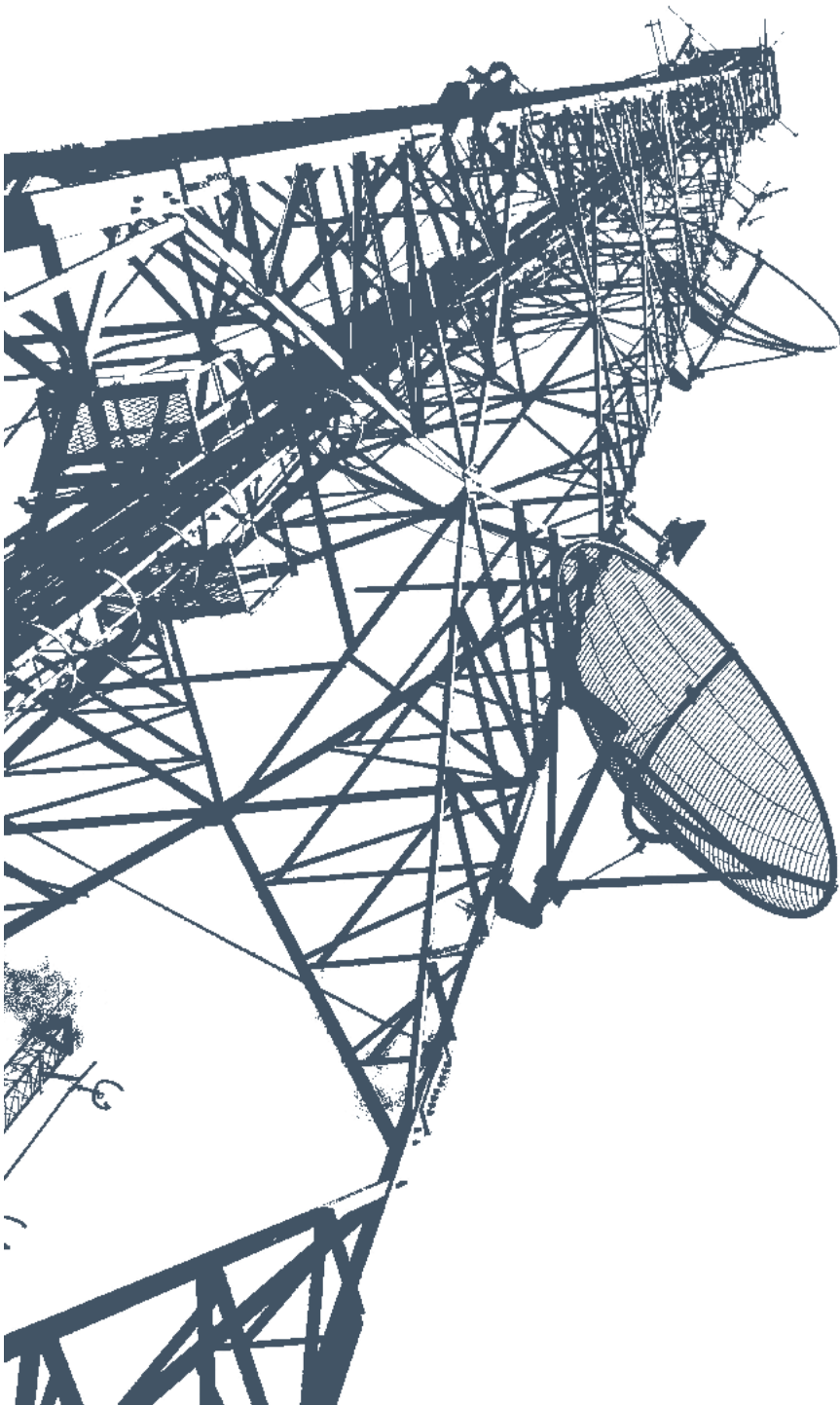
## Fluke 805

### Vibration Meter

- Measures Acceleration, Velocity and Displacement from 10Hz to 1kHz
- Onboard Accelerometer with LED System Indicating Appropriate Contact Pressure
- Innovative Sensor Design Corrects for Device Angle and Contact Pressure
- Crest Factor + Provides Reliable Bearing Assessment Using Direct Sensor Tip Measurements
- External Accelerometer for Hard to Reach Areas
- Temperature Measurement with Spot IR Sensor
- Large, High Resolution Screen Displays All Results
- Data Export to USB Can be Opened in Excel
- Onboard Memory Saves up to 3500 Measurements



# Telecommunications Equipment



# Table of Contents

<b>Copper Certification Test .....</b>	<b>212</b>
Fluke Networks DSX2-5000 .....	212
Fluke Networks DSX2-8000 .....	212
Fluke Networks DSX2-8000QOI .....	212
Viavi Solutions NGC-4500-FA .....	212
Viavi Solutions ONX-620 .....	212
<b>Telecom – Drive Test .....</b>	<b>213</b>
PCTEL IBFlex .....	213
PCTEL GFlex .....	213
PCTEL HBFlex P2 Configuration .....	213
Rohde & Schwarz TSME6 .....	213
Rohde & Schwarz ROMES4 .....	213
<b>Fiber Optic Test – Fusion Splicers .....</b>	<b>214</b>
Fujikura (AFL) 90S+ .....	214
Fujikura (AFL) FSM90R12-K .....	214
Fujikura (AFL) FSM70S-K .....	215
Sumitomo TYPE-QH201e .....	215
<b>Fiber Optic Test – Optical Loss Test Sets .....</b>	<b>216</b>
EXFO PPM-350D/91 .....	216
EXFO MaxTester 945P .....	216
Fluke Networks CFP2-100 .....	216
Viavi Solutions MPOLX .....	216
<b>Fiber Optic Test – OTDRs .....</b>	<b>217</b>
EXFO FTBX-720C-Q1-QUAD-XX .....	217
EXFO FTBX-730C-SM1-XX .....	217
EXFO FTBX-730C-SM3-XX .....	217
Fluke Networks OFP2-100 .....	218
Viavi Solutions E4126MA .....	218
Viavi Solutions E4146QUAD .....	218
Viavi Solutions E41DWDMC-PC .....	218
<b>Fiber Optic Test – Inspection .....</b>	<b>219</b>
EXFO FIP435B .....	219
Viavi Solutions FIT-FCSW-KIT2 .....	219
<b>Ethernet Test .....</b>	<b>220</b>
EXFO FTBX-88460-400GE .....	220
EXFO FTBX-88260 .....	220
EXFO MAX-890-ETH-100 .....	220
Viavi Solutions MTS5800-100GE .....	220
EXFO FTBX-8880 .....	221
Viavi Solutions TB/MTS-5822P .....	221
Anritsu MT1000A .....	221
<b>5G Tower Test .....</b>	<b>222</b>
Viavi Solutions (3Z) RFV2000 .....	222
Anritsu MW82119B .....	222
Anritsu S361E .....	222
Anritsu S362E .....	223
EXFO FTBX-88260-FR1 .....	223
Viavi Solutions SPA06MA .....	223
Anritsu MS2720T-709 .....	223
<b>Best Practices .....</b>	<b>224</b>



### Fluke Networks DSX2-5000

DSX Cable Analyzer V2 with WiFi; 1 GHz Copper Modules

- DSX Cable Analyzer Series Copper Cable Certifiers
- Unmatched Speed for CAT6A, Class FA, I/II and all Current Standards
- Analyze Test Results and Create Professional Test Reports Using LinkWare Management Software



### Fluke Networks DSX2-8000

DSX Cable Analyzer V2 without WiFi; 2 GHz Copper Modules

- Unmatched Speed for CAT6A, 8, Class FA, I/II and All Current Standards
- Modular Design Supports Copper Certification
- Taptive User Interface Simplifies Set-up, and Eliminates Errors
- Intertek Verified to TIA Level 2G
- Copper Cable Certifiers Endorsed by Cabling Vendors Worldwide



### Fluke Networks DSX2-8000QOI

Full Cable Analyzer, OTDR, OLTS Test Kit All in One

- Quad OTDR, Quad OLTS, DSX-8000V2 Cable Analyzer 2 GHz CAT8 with Fiber Inspection Tool and WiFi Integrated
- Unmatched Speed for CAT6A, 8, Class FA, I/II and All Current Standards
- Versiv Modular Design Supports Copper Certification
- ANSI/TIA-1152-A Level 2G



### Viavi Solutions NGC-4500-FA

Certifier 40G NGC-4500 with Class FA Copper Kit

- Test and Certify Copper up to Category 6A
- PC Based Software
- Reporter Also Supports Other Viavi Test Solutions Including the OLTS-85, MPOLx, and OTDR Traces from the Viavi T-BERD/MTS-2000
- Supports P5000I Inspection Tool



### Viavi Solutions ONX-620

OneExpert ONX-620 CATV DOCSIS 3.0 3.1 3.2 Tester

- DOCSIS 3.1 Physical and Service-Level Verification
- 32x8 DOCSIS for Gigabit Speeds
- Connectivity with Built-in Bluetooth and 2.4 and 5GHz WiFi

**PCTEL IBFlex**

Drive Test Scanner; 570 MHz to 3.8 GHz

- 4G/5G Dynamic Spectrum Sharing (DSS) Support
- 2x2 and 4x2 LTE MIMO Measurements
- Connect with Bluetooth or USB
- Blind Scan Simplifies Test Setup by Automatically Detecting Channels
- Spectrum Analysis and Channel Power Measurements for Any Wireless Technology

**PCTEL GFlex**

Scanning Receiver; 10 MHz to 8 GHz

- Measures up to 120 5G Channels
- Ultra-Fast Concurrent 5G/4G Testing
- 20/100 MHz Wide Step IF Filter
- I/Q Streaming Ready Hardware
- 5G Mobile Blind Scan
- Dual Polarization Beamforming Measurements
- 4G / 5G Dynamic Spectrum Sharing (DSS)
- 4 x 2 MIMO Measurements
- Upgradable to mmWave FR2 Bands

**PCTEL HBFlex P2 Configuration**

5G Drive Test Scanner

- Includes All FR1 Bands and All FR2 Band Licenses, All E-UTRA Bands in the 10 MHz to 6 GHz Range and:
- GSM, WCDMA, CDMA, EV-DO, TD-LTE, FD-LTE, Wi-Fi, NB-IoT, LTE-LAA, Wi-Fi, 3GPP 5G NR, with CDMA and EVDO Holdover (Software Licenses Required)
- mmWave Measurements 26 GHz to 40 GHz in FR2 bands
- All Existing 2G, 3G, and 4G Bands
- Multi-Application Spectrum Clearing Interference Management
- Baseline Testing
- Integration Testing, Optimization Testing, Operational Troubleshooting

**Rohde & Schwarz TSME6**

Ultracompact Drive Test Scanner; 350 MHz to 6 GHz

- Different Multiband and Multi-Technology Scanners
- Ideal for Verifying the Coverage of All Networks at Once
- Decodes Channels in Multiple Technologies
- Frequency Coverage up to 6 GHz (24-44 GHz with TSME30DC / TSME44DC Downconverter)
- Support for up to 4 x 4 MIMO Measurements

**Rohde & Schwarz ROMES4**

Drive Test Software

- ROMES4 is the Universal Software Platform for Network Engineering, Network Optimization and Troubleshooting. In Combination with Test Mobile Phones and Drive Test Scanners it Provides Solutions for All Essential Tasks Involved in Coverage Measurements, Interference Identification and QoS.
- Supports Rohde & Schwarz TSME6 and TSMA6 Scanners
- Supports Latest Technologies, Such as 5G, Nb-IoT and Cat-M1
- Supports Test Smartphones, with On-Device Test Capabilities
- 5G NR, GSM, WCDMA, CDMA2000®, 1xEV-DO, WiMAX™, LTE, NB IoT, Cat-M1 and TETRA
- ACD, Sector and BTS Position Estimation, NB-IoT/LTE-M, Dynamic Spectrum Sharing, Time of Arrival Measurements







### **Fujikura (AFL) 90S+** Core Alignment Fusion Splicer

- Core Alignment Technology Achieves Consistent Lower Splice Loss
- Average Splice Loss of 0.01 to 0.04dB
- Tool-Less Replaceable Electrodes
- Ships with CT-50 Cleaver, Carry Case, and 90S Standard Package Accessories
- Cleaver Tracking and Upkeep with Wireless Communication
- Improved Real-Time Arc Control for Fibers with Poor Cleave Angles
- Distribution Fiber Repair
- Long-Haul Network Installation
- OSP Cable Installation and Repair



### **Fujikura (AFL) FSM90R12-K** Fusion Splicer Kit with CT50

- Prepare and Fuse up to 12 Fibers at a Time
- Same Core Alignment Technology Expanded to 12 Fibers
- Tool-Less Replaceable Electrodes
- Automated Wind Protector, Tube Heater and Splice Operation
- Ships with CT-50 Cleaver, Carry Case, and FSM90R Standard Package Accessories
- Data Center Cable Installation
- Trunk Cable Repair with Splice-on MPOs

## Fujikura (AFL) FSM70S-K

### Fusion Splicer Kit

- Fast Single Fiber Fusion Splicer
- Fixed V-Groove Alignment Technology
- Ships with CT-30 Cleaver, Carry Case, and FSM70S Standard Package Accessories
- Motorized Wind Protector and Tube Heater with the World's Fastest Heating Times
- Dust and Rain Proof Design Provides Superior Protection



## Sumitomo TYPE-QH201e

### Quantum Handheld Fusion Splicer

- Smallest Handheld Fusion Splicer with Fast Splice Times
- Built-in Help and Maintenance Videos
- Automatic Splice Start, Arc Calibration and Heater Start
- Fixed V-Groove Alignment Method
- Lynx CustomFit® 2 Splice-On Connector Compatible
- Micro-SD Ports for Virtually Unlimited Data Storage





### EXFO PPM-350D/91

#### Intelligent PON Power Meter

- Unique PON-aware™ Capability Automatically Detects PON Technology in Use
- Compatible with GPON and EPON Networks
- Supports 10G-Capable PON Networks
- Pass-Through Mode for ONT/ONU Verification



### EXFO MaxTester 945P

#### Fiber Certifier Optical Loss Test Set

- Optimized for Data Center and Enterprise Tier-1 Fiber Certification
- FastTest Performance Certifies Two Fibers at Two Wavelengths in 2.6 Seconds
- Instrument Pairs or Singles Available
- Automated Fiber Inspection with Pass/Fail Results on Both Fiber End-Faces
- Onboard PDF Reporting



### Fluke Networks CFP2-100

#### Certifier Pro V2, with WiFi (OLTS)

- Tier-1 Certification of Fiber Cables
- Single Mode, Multimode and Quadmode OLTS with 850, 1300, 1310, 1550nm Wavelengths
- Power range: 0dBm to -65dBm (850nm) 0dBm to -70dBm (All Other Wavelengths)
- Compact Fluke Networks Versiv V2 mainframe
- Integrated USB and WiFi for reporting and project management
- Models Available with Included Inspection Probes



### Viavi Solutions MPOLX

#### SmartClass Fiber MPO Optical Loss Test Set

- Measures Optical Loss on MPO Type Fiber Connections
- Quadmode OLTS with 850, 1300, 1310, 1550nm Wavelengths
- Certifies All Fibers in MPO Connection and Checks MPO Polarity
- Includes Two P5000i Fiber Inspection Probes
- Integrated USB and WiFi for Reporting and Project Management

**EXFO FTBX-720C-Q1-QUAD-XX**

QUAD OTDR Module 850/1300nm, 1310/1550nm

- Quad OTDR with Singlemode and Multimode Testing
- iOLM for Guided One-Touch Multiple Acquisitions and clear GO/NO GO Results
- Dynamic Range of 36dB in Singlemode
- Good for Both Fronthaul and Backhaul Applications Including FTTA, DAS and Small Cells
- Packaged with FTB-1v2-Pro Mainframe
- Carrier Approved

**EXFO FTBX-730C-SM1-XX**

Singlemode OTDR 1310nm/1550nm, 39/38dB

- Best OTDR Tool for Through Splitters in PON Networks
- Up to 1 x 128
- Singlemode 1310nm/1550nm
- SM3 Models Available with 1625nm Live Fiber Access
- iOLM for Guided One-Touch Multiple Acquisitions and Clear GO/NO GO Results
- Dynamic Range of 39dB for 82-Mile Point-to-Point Distance
- Packaged with FTB-1v2-Pro Mainframe
- Carrier Approved

**EXFO FTBX-730C-SM3-XX**

Singlemode OTDR Module, 1310/1550/1625nm, 39/38/39dB

- Best OTDR Tool for Through Splitters in PON Networks
- Up to 1 x 128
- Singlemode 1310nm/1550nm /1625nm
- SM3 Models Available with 1625nm Live Fiber Access
- iOLM for Guided One-Touch Multiple Acquisitions and Clear GO/NO GO Results
- Dynamic Range of 39dB for 82-Mile Point-to-Point Distance
- Packaged with FTB-1v2-Pro Mainframe
- Carrier Approved





## Fluke Networks OFP2-100

Optifiber Pro OTDR V2 with Built in WiFi

- Good for Both Enterprise, Data Centers, Outside Plant, or FTTx Applications
- Single Mode, Multimode and Quadmode OTDR with 850, 1300, 1310, 155nm Wavelengths
- Compact Fluke Networks Versiv V2 mainframe
- Integrated USB and WiFi for Reporting and Project Management



## Viavi Solutions E4126MA

OTDR 1310nm/1550nm Metro Access Range

- For Maintenance of Both Metro Access, Access FTTx and PON Networks
- Singlemode 1310 /1550nm
- Smart Link Mapper (SLM) for Instant Pass/Fail Results Analysis
- Dynamic Range of 37dB



## Viavi Solutions E4146QUAD

Multimode/Singlemode 850/1300/1310/1550nm Quad OTDR

- Ideal Test Tool for Contractors/Installers that Need Both Singlemode and Multimode
- Serves Enterprise, Access, Metro and Support of Wireless Fronthaul/ Backhaul Networks
- Smart Link Mapper (SLM) for Instant Pass/Fail Results Analysis
- Dynamic Range of 37dB in Singlemode, 27dB for Multimode
- Packaged in T-Berd 2000 Portable Mainframe



## Viavi Solutions E41DWDMC-PC

Tunable DWDM PC OTDR - C-BAND

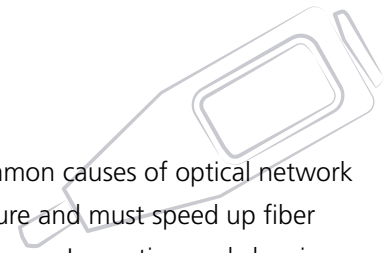
- Packaged with OneAdvisor ONA-800A
- End-to-End Link Characterization
- OTDR Trace interpretation is also simplified with the Smart Link Mapper (SLM)
- Validating New WDM routes for New Customers or Capacity Increases
- Verifying End-to-End Continuity Prior to Service Turn-up



## Tech Tip

### Clean and Inspect Before You Connect

Dirty and/or damaged fiber connectors are one of the most common causes of optical network problems. When operators operate under amplified OPEX pressure and must speed up fiber deployments, preventing any network failures can make a difference. Inspection and cleaning are essential to successful fiber installation. We have the tools you need to get the job done right.



#### EXFO FIP435B

##### Wireless Analysis Digital Video Inspection Probe

- Complete Connectivity and Workflow Aided by Android or iOS Wireless Devices
- 100% Automated, One-Step Inspection Process
- High-Resolution 5 Megapixel CMOS Imager to Capture Every End-Face Detail
- Full Reporting Capabilities on Mobile Devices
- Onboard Rechargeable Battery Supporting a Full Day of Inspection and Preventing Your Smart Device to Drain its Charge
- Ideal Inspection Solution for Fiber-to-the-Antenna (FTTA) and Remote Radio Head (RRH) Applications Where Tower Climbers



#### Viavi Solutions FIT-FCSW-KIT2

##### FiberCheck Sidewinder Probe Kit with WiFi and Adapters

- Fast and easy MPO inspection solution. Check 12 MPO Fibers in 12 Seconds
- 100% Automated, One-Step Inspection Process for All Skill-Levels
- Built-in Fiber End-Face Analysis
- Integrated Touch Screen
- Live Fiber Viewing
- WiFi, and USB Connection to a PC and Mobile Device
- Built in Acceptance Criteria to Industry Standards (IEC-61300-3-35)
- Audible Sounds for Pass/Fail Results
- Auto-Pan/Scroll





### **EXFO FTBX-88460-400GE** 400G Multi-Service Power Blazer

- 400GE Portable System
- Windows Based OS
- Supports QSFP-DD Transceiver
- Packaged with FTB-4-PRO Base Mainframe
- FEC Testing
- BER Monitoring



### **EXFO FTBX-88260** 10M-to-100G Multi-Service Power Blazer

- 100GE Down to 10M Capable
- RFC2544 Supported
- Packaged with FTB-1v2-PRO-DC Base Mainframe
- EXFO's Open Transceiver System (OTS)
- iOptics Test Application
- Battery Operated



### **EXFO MAX-890-ETH-100** MAXTester 890: 10M-to-100G Multi-Service Unit

- 100GE Package with Multiple Data Speeds Available
- Supports Multiple Transceivers
- Industries Fastest RFC 2544
- QSFP+/QSFP28 and CFP4 Modules Run Error-Free



### **Viavi Solutions MTS5800-100GE** TB 5800-100G Base 100GE Package Supports LR4 QSFP28

- 100GE Portable Test Unit
- Windows 10
- RFC2544
- Smart Loop Test
- Supports VIAVIs 4100-Series OTDR and COSA Modules

## EXFO FTBX-8880

### 10G Power Blazer Multi-Service Set

- 10GE Module and Mainframe System
- Fibre Channel from 1-10
- LAN/WAN Capable Test
- Packaged with FTB-1v2-Pro Mainframe
- Carrier Approved



## Viavi Solutions TB/MTS-5822P

### 10Mbps to 10G Handheld Network Tester, TB/MTS-5822P

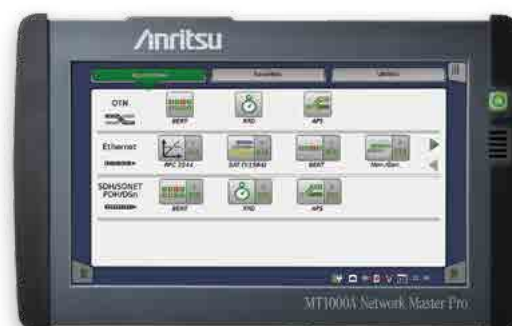
- 10Mbps to 10GE Capable Dual Port Handheld Network Tester
- Dual 10Mbps to 10Gbps Interfaces
- RFC2544
- SONET/SDH Capable
- Battery Operated
- Carrier Approved



## Anritsu MT1000A

### Network Master Pro Mainframe

- 10GE Module and Mainframe System
- Fibre Channel from 1-10
- OTDR and 10G Transport/CPRI Module Can be Simultaneously Installed
- CPRI/OBSAI (1-8)
- Battery Operated
- Carrier Approved





### Viavi Solutions (3Z) RFV2000

Vision Antenna Alignment Tool

- Industry Leading Performance
- Built-in Camera
- Easy File Export
- Augmented Reality Displays a Bullseye Target in the 5-inch LCD Touch Screen Display
- Carrier Approved



### Anritsu MW82119B

PIM Analyzer; 40W, Battery Operation

- Multiple Bands Available 600MHz, 700MHz, 850MHz, 1900/2100MHz
- 40W Output Power
- Battery Operated
- Calibration Kits Available in Backpack and Hardcase Form



### Anritsu S361E

Site Master Handheld Cable and Antenna Analyzer; 2 MHz to 6 GHz

- Battery Operated
- Carrier Approved
- 4GHz and 6GHz available
- Touch Screen
- Easy USB Data Transfer
- Onboard Reporting

## Anritsu S362E

Site Master Handheld Cable and Antenna Analyzer; 2 MHz to 6 GHz

- Dual Port Capable with Option 21
- 4 hour Battery Life
- Easy Reporting
- With 100 kHz to 6 GHz Spectrum Analysis



## EXFO FTBX-88260-FR1

RF Spectrum Analyzer; 450 MHz to 6 GHz with RTSA

- Spectrum Analyzer, and TDD Gated Sweep, With TA-FR1 and FTBX-88260 System
- 5G FR1 Enabled Real Time Spectrum Analyzer
- FR2 Module Available Separately



## Viavi Solutions SPA06MA

RF Spectrum Analyzer; 9 kHz to 6 GHz

- Bundled with ONA-800
- DANL to +25dBm
- 100 MHz Real-time Bandwidth
- Carrier Approved



## Anritsu MS2720T-709

Spectrum Master Spectrum and Interference Analyzer; 9 kHz to 9 GHz

- High Performance Spectrum Analysis
- FirstNet Approved
- Portable and Battery Operated





# Best Practices for Fiber Testing and Essential Tools

## Testing of Connectors and Connections

Fiber connectors are key components in the network and can be a source of loss, particularly if they become contaminated, causing their optical loss to exceed budget. Contaminants can arise from several sources, including dust, oil from hands and mineral oils. A dust particle on the fiber core surface will block the light, leading to unacceptable insertion loss and back reflection (return loss). Dust particles can also cause permanent damage to the glass interface, digging into the glass and leaving pits that create back reflection if mated.

It is therefore extremely important to inspect fiber connectors during installation to ensure cleanliness. Because of their small size, proper inspection requires a microscope specifically designed for the fiber-optic end face. A video microscope can magnify the connector end face image for viewing on either a laptop or portable display, depending on the product used. These fiber inspection tools can also assist in generating required reports before fiber certification is completed.

## Testing Using an OTDR (Optical Time Domain Reflectometer)

OTDRs work by injecting optical pulses into the fiber under test and measuring the light that is reflected from various points along the fiber. The reflected light is used to characterize the fiber under test with the strength of the return pulses being integrated against time and plotted as a function of fiber length. By using an OTDR at various points in the network, the feeder and distribution sections of the network can be tested independently. The OTDR can identify and locate each network component and can measure splice loss, connector loss and reflectance along with total end-to-end loss and optical return loss (ORL). The tests must be performed using two wavelengths, enabling detection of bends on the link, which give higher losses at 1550 nm than at 1310 nm.

In addition to using the OTDR as a qualification tool, it can also be used as a troubleshooting tool to pinpoint issues along the link. OTDR features like accuracy, resolution, measurement range and measurement speed vary according to their cost and there is a wide range of OTDR models on the market, each addressing different test and measurement needs. The suitability of an OTDR for a specific test scenario depends on several factors, including type of network, type of fiber (singlemode or multimode), maximum test distance and test types. Other factors to consider include size and weight, display size, battery life, data storage, connectivity, post-processing software and available upgrade modules.

## Testing Using an OLTS (Optical Loss Test Set)

Optical Loss Test Sets, (OLTS), can be used in pairs, to measure insertion loss, (IL), and optical return loss (ORL). Once the pair of units have been referenced and calibrated, they can be used to take end-to-end measurements on any section of installed fiber. These tests enable verification of the IL and ORL variables and can identify any transposed fibers. Identification of mis-matched fibers is especially important when testing MPO fibers and connectors. Testing using an OLTS is simpler than with an OTDR, but two technicians are required, at different physical locations and if any problems are identified, an OTDR may be required for more detailed analysis.

Manufacturer	Model	Description	Page
3M Dynatel	1420	EMS-iD Locator	126, 151, 200
3M Dynatel	2273	Underground Cable and Fault Locator	126, 151, 200
3M Dynatel	2220M-U3W	Pipe/Cable Locator	200
ABB	504	Power Shield Trip Units (ITE)	54, 63
ABB	505	Power Shield Trip Units	54, 63
ABB	606	MPS Trip Units	54, 63
ABB	607	MPSC Trip Units	54, 63
ABB	1164046	10 Position Test Jack	33
ABB	1355D32G04	14 Position Test Jack	33
ABB	560D16101	Travel Recorder Kit	86
ABB	BTSB	MPS, MPSC and MPSC 2000 Trip Units	54, 63
ABB	Ekip T and P	Accessories for Emax 2 and Tmax XT	54, 63
ABB	PR010/T	EMax/SACE Trip Units	54, 63
ABB	TT1	EMax/SACE PR Trip Units	54, 63
ABB	CB-2000	Portable Capacitance Meter	85
Advanced Geosciences	SuperSting R1	Multifunction Ground Test System	139
AEMC	1026	1kV Insulation Resistance Meter (Megohmmeter)	189
AEMC	1045	1kV Insulation Resistance Meter (Megohmmeter)	189
AEMC	1060	1kV Insulation Resistance Meter (Megohmmeter)	189
AEMC	1954	Infrared Camera	170
AEMC	2137.77	Power Cord Eliminator for PEL-102/PEL-103	7
AEMC	2620	Low Range 6" Rigid Current Probe	159
AEMC	5050	5kV Insulation Resistance Meter (Megohmmeter)	52, 98, 188, 189
AEMC	5060	5kV Insulation Resistance Meter (Megohmmeter)	52, 98, 188, 189
AEMC	6240	10A Low Resistance Ohmmeter (DLRO)	50, 190, 191
AEMC	6250	10A Low Resistance Ohmmeter (DLRO)	50, 190, 191
AEMC	6255	10A Low Resistance Ohmmeter (DLRO)	52, 190, 191
AEMC	6292	200A Low Resistance Ohmmeter (DLRO)	51, 190, 191
AEMC	6416	Clamp On Ground Tester	139
AEMC	6417	Clamp On Ground Tester	139
AEMC	6472	Multifunction Ground Tester w/Tower Ground Attachment	141
AEMC	6474	Multifunction Ground Tester w/Tower Ground Attachment	23, 141
AEMC	6505	5kV Insulation Resistance Meter (Megohmmeter)	52, 188, 189
AEMC	6522	1kV Insulation Resistance Meter (Megohmmeter)	189
AEMC	6526	1kV Insulation Resistance Meter (Megohmmeter)	188, 189
AEMC	6550	10kV Insulation Resistance Meter (Megohmmeter)	53, 98, 165, 189
AEMC	6555	15kV Insulation Resistance Meter (Megohmmeter)	53, 98, 165, 189
AEMC	6608	Phase Sequence/Motor Rotation Indicator	155
AEMC	6609	Phase Sequence/Motor Rotation Indicator	155
AEMC	8336	Power Quality Analyzer	14
AEMC	275HVD	Non-Contact Voltage Detector	179
AEMC	3000-24-2-1	3000A Flexible Current Probe	159
AEMC	30000-24-1-0.1	30,000A Flexible Current Probe	159
AEMC	6000-36-2-0.1	6000A Flexible Current Probe	159
AEMC	6470-B	Multifunction Ground Tester	141
AEMC	AmpFlex 193-24-BK	10,000A Flexible Current Probe	7

Manufacturer	Model	Description	Page
AEMC	AmpFlex 193-36-BK	10,000A Flexible Current Probe	7
AEMC	CA811	Lightmeter	157
AEMC	DTR8510	Single Phase TTR	99
AEMC	J93	5000A DC Current Probe	7
AEMC	MF3000-10-2-1	3000A Flexible Current Probe	159
AEMC	MiniFlex MA193	3000A Flexible Current Probe	7
AEMC	MN02	100A Rigid Current Probe	159
AEMC	MN05	100A Rigid Current Probe	159
AEMC	MN193	6A Rigid Current Probe	7
AEMC	MN93	240A Rigid Current Probe	7
AEMC	MR193	1000A Rigid Current Probe	7
AEMC	MR521	1500A AC/DC Current Probe	159
AEMC	OX5042 Oscilloscope	Two Channel Oscilloscope	15
AEMC	PEL 102	Power and Energy Datalogger	6
AEMC	PEL 103	Power and Energy Datalogger	6, 23
AEMC	PEL 105	Weatherproof Power and Energy Datalogger	7
AEMC	PowerPad 8435	Power Quality Analyzer	15
AEMC	SL206	80A AC/DC Current Probe	159
AEMC	SL261	10/100A AC/DC Current Probe	7, 159
AEMC	SR193	1200A Rigid Current Probe	7
AEMC	K100	100A AC/DC Current Probe	159
Agilent	1732B	Handheld Capacitance/LCR Meter	153
Agilent	34401A	Benchtop Precision Multimeter	158
Airflow	TH3631	Thermohygrometer	149
Altek	942	Frequency Calibrator	33
Alber	CRT-400	Battery Analyzer	47
Alber	DMA35-CRT	Datalogging Battery Hydrometer/Density Meter	47
Alber	DMA35N	Datalogging Battery Hydrometer/Density Meter	47
All-Test Pro	AT5	Offline Motor Analyzer	161
All-Test Pro	ATPOL II	Online Motor Analyzer	161
Allen Bradley	140G-ELTT	AB/Rockwell Automation 140G and 140MG Circuit Breakers	55, 63
Allen Bradley	193-DNCT	DeviceNet Configuration Terminal	55, 63
Amprobe	AT-3500	Underground Cable Locator	126, 151, 201
Amprobe	AT-4005	Wire/Circuit Tracing System	127, 150
Amprobe	AT-7030	Advanced Wire/Circuit Tracing System	125, 150, 177, 201
Amprobe	CR50A	Capacitance and Resistance Meter	155
Amprobe	CT-600	600A AC/DC Current Probe	159
Amprobe	DM-III MultiTest	Power Quality Analyzer	14
Amprobe	INSP-3	Wiring Inspector Circuit Tester	174
Amprobe	PRM2	Phase Sequence Indicator	155
Amprobe	TIC300 PRO	Low, Medium and High Voltage Tic Tracer	146, 179
Amprobe	TIC-410A	Adjustable Hotstick	147
Aquatronics	SDAD	Acoustical Detector	123
Arbiter	921A	Combustible Gas Analyzer	108
Arbiter	928A	Power System Multimeter	16, 142, 158
Arbiter	929A	Power System Analyzer	16, 142, 158

Manufacturer	Model	Description	Page
Arbiter	931A	Power System Analyzer	16, 142, 158
ASCO	Avtron 2500	Portable Suitcase AC Load Bank	43
Associated Research	3130	Ground Bond Tester	206
Associated Research	3770	AC/DC Hipot and Insulation Tester	185, 206
Associated Research	7715	AC Hipot Tester	206
Associated Research	7720	DC Hipot Tester	206
Associated Research	7850	AC/DC Hipot and Insulation Tester	185, 206
Astromed	IHVM-6	High Voltage Module for TMX	19
Astromed	TMX	18 Channel Data Acquisition System	19
Astromed	TMX-IR	GPS Module for TMX	19
Astromed	UNIV-6	Low Voltage Module for TMX	19
AYA	H3C-4000-2	4000A DC Current Probe	159
AYA	P3C-4000-2	4000A Flexible Current Probe	159
AYA	P3C-7500-C	7500A DC Current Probe	159
Baker	AWA-IV/12 HO PP30	Static Motor Analyzer/Surge Tester, 30kV, High Output	166
Baker	DX12 HO	Static Motor Analyzer/Surge Tester, 12kV, High Output	166
Bender	LT-3000	Line Isolation Monitor Tester	174
Bierer	GT400	Safety Ground Integrity Tester	157
Bierer	PD25	25kV Phasing Kit	146
Bierer	PD800W	800kV Wireless Phasing Kit	146
Bierer	PR1Comp	GPS Enabled Phasing Kit	146
Bionix Safety Technologies	R7000	Biomedical Electrical Safety Analyzer (NFPA 99)	175
Brenco	GR1/0-15X15CL	Yellow Ground Cluster 1/0 - 15' Legs	178
Brenco	GR1/0-20	Yellow Ground 1/0 15' with C600-2276 Clamps	178
California Instruments	CSW5550	AC/DC Power Supply	207
Camlin	Profile P3	Circuit Breaker Analyzer	81
Cannon	L-10T	DC Load Bank	43
Cannon	L-121-250	DC Load Bank	43
Cannon	L-121-500	DC Load Bank	43
Cannon	L-48-500	DC Load Bank	43
Cannon	L-63	Three Phase Load Bank	43
Cannon	L-69-80	Three Phase Load Bank	43
Cannon	L-69-80D	Three Phase Load Bank	43
CHK Miro	PQ45	Power Quality Analyzer (600V or 1000V)	3, 18, 23
Commtest	VB7	Vibration Analyzer	167
Cooper Power Systems (Eaton)	DC Nova	14 Pin to 19 Pin Adaptor	32, 55, 63
Cooper Power Systems (Eaton)	KMET45811	KMET Triple/Single Adaptor	32, 55, 63
Cooper Power Systems (Eaton)	KVFI	Cooper/Eaton Pad Mounted VFI Switchgear	32, 55, 63
Cooper Power Systems (Eaton)	METK1	MET Recloser Controller Tester	32, 55, 63
Current Technologies	DTS-2	Surge Suppression Filter System Analyzer	85
Cutler Hammer	1232C50G05	Seltronic and Series C Circuit Breakers	55, 63
Cutler Hammer	1232C50G06	Seltronic and Series C Circuit Breakers	55, 63
Cutler Hammer	1232C50G10	Seltronic and Series C Circuit Breakers	56, 63
Cutler Hammer	1255C48G01	SPB Breakers (Certain Trip Units)	56, 63
Cutler Hammer	140D481G02	Amptector Trip Units	56, 63
Cutler Hammer	140D481G03	Amptector and Digitrip Trip Units	56, 63

Manufacturer	Model	Description	Page
Cutler Hammer	5720B69G01	Magnum DS Ground Fault Defeat Jumper	56, 63
Cutler Hammer	70C1056	Digitrip Trip Units (+ Style)	56, 63
Cutler Hammer	7801C57	OPTIM Series Trip Units	56, 63
Cutler Hammer	8312A63H01	MPCV Controller	56, 63
Cutler Hammer	8779C02G01	Adaptor for DS/DSII Circuit Breakers	57, 63
Cutler Hammer	8779C02G03	Adaptor for DS/DSII Circuit Breakers	57, 63
Cutler Hammer	8779C02G04	Adaptor for Magnum DS Circuit Breakers	57, 63
Cutler Hammer	MTK2000	Magnum DS Circuit Breakers	57, 63
Cutler Hammer	PRTBAPMDV	Power Supply for Digitrip Trip Units	57, 63
Cutler Hammer	S140D481G02	Amptector Trip Units	57, 63
Cutler Hammer	SPBPTK	Pow-R-Trip Units	57, 63
DESCO	19787	Surface Resistance Meter Kit	152
Dilo	3-033-R002	SF <sub>6</sub> Detector	90
Dilo	3-038R-032 NP	SF <sub>6</sub> and CF4 Analyzer	89
Dilo	3-038R-R303	SF <sub>6</sub> Analyzer with Recirculation	89
Dilo	AAK	Regulator, Fitting and Adaptor Kit for SF <sub>6</sub> Analysis	89
Doble	03B-0706-01	TTR Capacitor	95
Doble	F2010	Minicontroller for F2000 Series	33
Doble	F6051	IRIG-B Protocol Converter for Doble F6150	25, 33
Doble	F6150SV	Three Phase Relay Test Set	24
Doble	F6300	Amplifier/Booster for F6150 Instruments	33
Doble	F6895	GPS Antenna for Doble F6150	25, 33
Doble	F8300	Multi-Phase Modular Relay Test System	28
Doble	M7100	Multifunction Transformer Tester	95
Doble	M4000	12kV Power Factor Test Set	74, 94, 165
Doble	M4100	12kV Power Factor Test Set	74, 94, 165
Doble	M4110	Leakage Reactance Module	95
Doble	M4140	Capacitor Bank Test Accessories for Doble M4000	85
Doble	M5400	Sweep Frequency Response Analyzer	105
Doble	M5500	Sweep Frequency Response Analyzer	105
Doble	RTS7	Dongle for Relay Test Software	25
Doble	Spark P3	Offline Partial Discharge Analyzer	137
Doble	TDR9100	Circuit Breaker Timer and Travel Analyzer	78
Doble	TR-3170	Gold Rotary Transducer	78
Doble	TR-3171	Transducer For AHMA 4/8 Mechanisms	78
Doble	TR-3173	GE Air Magnetic Adapter (specify 13-kv or 4-kv)	78
Doble	TR-3174	GE Air Magnetic Adapter (2000+ amperes)	78
Doble	TR-3175	HVB-IPO Adapter with Spacer	78
Doble	TR-3176	HVB Ganged Operator Adapter	78
Doble	TR-3177	General Purpose Tank Adapter	78
Doble	TR-3178	HVB-IPO Spacer	78
Doble	TR-3179	GE VB-1	78
Doble	TR-3180	ABB HPL Insulator Column	78
Doble	TR-3181	ABB HPL Mechanism Cabinet	78
Doble	TR-3184	ravel Transducer Adapter, Westinghouse SF <sub>6</sub> Breakers	78
Doble	TR-3185	Universal Mechanical Transducer Mounting	78



Manufacturer	Model	Description	Page
Doble	TR-3186	Transducer For HMB 4/8 Mechanisms	78
Doble	TR-3187	Bell Crank Translator	78
Doble	TR-3188	Alstom T155/2 GIS Breaker	78
Doble	TR-3189	Transducer for HMB 4/8/11 Mechanisms	78
Doble	TR-3190	Combination Rotary and Linear Transducer	78
Doble	Type C	Resonating Inductor	95, 165
Dranetz	3000XL24	3000A Flexible Current Probe	5
Dranetz	3000XL36	3000A Flexible Current Probe	5
Dranetz	3000XL48	3000A Flexible Current Probe	5
Dranetz	6000XL24	6000A Flexible Current Probe	5
Dranetz	6000XL36	6000A Flexible Current Probe	5
Dranetz	6000XL48	6000A Flexible Current Probe	5
Dranetz	Dranview Enterprise	Power Quality Analysis Software	5
Dranetz	Dranview Professional	Power Quality Analysis Software	5
Dranetz	HDPQ	Power Quality Analyzer	4
Dranetz	PR1500B	1500A Rigid Current Probe	5
Dranetz	PR150	150A Rigid Current Probe	5
Dranetz	PX5	Power Quality Analyzer	4
Dranetz	TR-2500	500A Rigid Current Probe	5
Dranetz	TR-2510	10A Rigid Current Probe	5
Dranetz	TR-2520	3000A Rigid Current Probe	5
DV Power	BLU360V	BLU Series Battery Load Unit	42
DV Power	BVS	Individual Battery Voltage Dataloggers	42
DV Power	BXL-V	Extra Battery Load Unit for BLU Series	42
DV Power	RMO-H3	200A Low Resistance Ohmmeter (DLRO)	190, 191
EA Technologies	UltraTEV Plus2	Handheld Partial Discharge (PD) Detector	127, 193
EA Technologies	UltraTEV Plus	Multifunction Partial Discharge Analyzer	137
Eagle Eye	GFL-1000	DC Ground Fault Locator	46, 199
Eagle Eye	IBEX Ultra	Battery Analyzer	48
Eagle Eye	SG Ultra Max	Datalogging Digital Battery Hydrometer/Density Meter	48
Eagle Eye	SG-1000	Digital Hydrometer	48
Elastimold	650-15/25kV	15/25kV Dead Break KIT	119
Elastimold	750-35kV	35kV Dead Break KIT	119
Elastimold	160-15kV	15kV Load Break KIT	119
Elastimold	270-25kV	25kV Load Break KIT	119
Elastimold	370-35kV	35kV Load Break KIT	119
Electrical Test Instruments	AT-10B	480V-240V Step Down Transformer	68
Electrical Test Instruments	OP-114/124	Universal Adjustable Stab Kit	67
Electrical Test Instruments	PI-1600	16000A High Current Test Set	68, 70
Electrical Test Instruments	PI-250	500A High Current Test Set	70
Electrical Test Instruments	PI-2500	25000A High Current Test Set	70
Electrical Test Instruments	PI-4000	40000A High Current Test Set	66, 70
Electrical Test Instruments	PI-4000B	40000A High Current Test Set	70
Electrical Test Instruments	PI-5000	50000A High Current Test Set	70
Electrical Test Instruments	PI-6000	60000A High Current Test Set	66, 70
Electrical Test Instruments	PI-800	8,000A High Current Test Set	70

Manufacturer	Model	Description	Page
EMT	ADT-KIT	Adapter and Fitting Kit with Regulator for SF <sub>6</sub>	91
EMT	ZW-3-R	SF <sub>6</sub> Analyzer with Recirculation	91
ETI	616001	Automatic Network Protector Test Set	34
ETI	616004	Variable Transformer	34
EXFO	MAX-715B-M1 OTDR	Hand-Held Optical Loss Testing and Visual Fault Locator	128
Extech	EX830	1000A Current Probe	159
Flex-Core	3PT3	Three Phase 5kV PT	17
Flex-Core	PTG5	Single Phase 15kV PT	17
Flir	E95	Infrared Camera	169
Flir	T420	Infrared Camera	168
Flir	T530	Infrared Camera	168, 205
Flir	T640	Infrared Camera	169, 205
Fluke	28	Intrinsically Safe Basic Multimeter	158
Fluke	62	Infrared Thermometer	209
Fluke	87	True RMS Multimeter	143
Fluke	123	Dual Input 40MHz Oscilloscope	10
Fluke	124	Dual Input 40MHz Oscilloscope	10
Fluke	125	Dual Input 40MHz Oscilloscope	10, 158
Fluke	196	Two Channel, 100MHz Oscilloscope	10
Fluke	233	Multimeter with Detachable Meter Face	158
Fluke	289	Multimeter with Datalogger	158
Fluke	336	600A Current Probe	159
Fluke	345	Single Phase Power Quality Clamp On	9
Fluke	365	1000A Current Probe	159
Fluke	375	1000A Current Probe	159
Fluke	376	1000A Current Probe	159
Fluke	381	1000A Current Probe	159
Fluke	435	Power Quality Analyzer	158
Fluke	725	Multifunction Process Calibrator	162, 209
Fluke	754	Multifunction Process Calibrator with Hart Communicator	204
Fluke	771	Clamp on Loop Calibrator	209
Fluke	773	Milliamp Clamp Meter	149
Fluke	789	True RMS Mutimeter	143, 158
Fluke	805	Vibration Meter	162,209
Fluke	810	Full Function Vibration Analyzer	162
Fluke	922	Airflow Meter/Micromanometer	157
Fluke	971	Temperature and Humidity Meter (Thermohygrometer)	156
Fluke	1550C	5kV Insulation Resistance Meter (Megohmmeter)	189
Fluke	1587	1kV Insulation Resistance Meter (Megohmmeter)	23, 53, 158, 188, 189
Fluke	1623	Multifunction Geo Earth Ground Test Systems	140
Fluke	1625	Multifunction Geo Earth Ground Test Systems	140
Fluke	1735	Power Quality Logger	11
Fluke	1736	Power Quality Logger	11
Fluke	1738	Power Quality Logger	11
Fluke	1748	Three Phase Power Quality Logger	11
Fluke	1750	Power Quality Analyzer	2

Manufacturer	Model	Description	Page
Fluke	1777	Power Quality Analyzer	2
Fluke	3005	5A Rigid Current Probe	2
Fluke	3014	40A Rigid Current Probe	2
Fluke	3110	100A Flexible Current Probe	2
Fluke	3210	1000A Flexible Current Probe	2
Fluke	3310	5000A Flexible Current Probe	2
Fluke	3312	5000A Flexible Current Probe	2
Fluke	1664FC	Multifunction Installation Tester	153
Fluke	190-204	Four Channel, 200MHz Oscilloscope	10, 158
Fluke	3100R	1000A Rigid Current Probe	2
Fluke	376 2500A	1000A/2500A Current Probe	159
Fluke	435 SII	Power Quality Analyzer	9
Fluke	437 SII	Power Quality Analyzer	8
Fluke	438 SII	Power Quality Analyzer with Motor Analysis Capability	8
Fluke	43B	Single Phase Power Quality Analyzer	9, 158
Fluke	87V	Multimeter	158
Fluke	8845A	Benchtop Precision Multimeter	158
Fluke	89V	Multimeter with Memory	158
Fluke	9009-B	Fluke Dry Block Calibrator	208
Fluke	9143-A	Fluke Dry Block Calibrator	208
Fluke	9144-A	Fluke Dry Block Calibrator	208
Fluke	BT521	Battery Analyzer	47
Fluke	CNX3000	Multimeter with Wireless Interface	158
Fluke	DSX-8000	Fiber Optic Inspection Kit	153
Fluke	FOM	Fiber Optic Power Meter	128
Fluke	FOS	Fiber Optic Light Source	128
Fluke	i-200	200A Rigid Current Probe	159
Fluke	i-2000	2000A Flexible Current Probe	159
Fluke	i-410	400A Rigid Current Probe	159
Fluke	i1010	1000A AC/DC Current Probe	159
Fluke	i200S	200A Rigid Current Probe	9
Fluke	i2500-18	2500A Flexible Current Probe	159
Fluke	i30	30A AC/DC Current Probe	159
Fluke	i3000s	3000A Flexible Current Probe	159
Fluke	i30S	30A Rigid Current Probe	9
Fluke	i400	400A Rigid Current Probe	159
Fluke	i400S	400A Rigid Current Probe	9
Fluke	i5S	5A Rigid Current Probe	9
Fluke	i5s-PR	5A Rigid Current Probe	2
Fluke	i5SPQ3	5A Rigid Current Probe	9
Fluke	i6000S	6000A Rigid Current Probe	9
Fluke	ii900	Sonic Industrial Imager	90, 154
Fluke	ii910	Acoustical Imager	90, 154
Fluke	MDA-550	Motor Drive Power Quality Analyzer	167
Fluke	Ti32	Infrared Camera	172
Fluke	Ti400	Infrared Camera	172

Manufacturer	Model	Description	Page
Fluke	Ti450-SF <sub>6</sub>	SF <sub>6</sub> Gas/Infrared Camera	91
Fluke	Ti480-PRO	Infrared Camera	170, 205
Fluke	TiS-9HZ	Infrared Camera	173, 205
Fluke	TiX580	Infrared Camera	173
Fluke	Versiv OFP-100QJ	OptiFiber Pro OTDR	128
Fluke Biomedical	ESA609	Biomedical Electrical Safety Analyzer (NFPA 99)	175
FPE	DDT-TLR	Federal Pioneer (FPE) TLR and ILR Trip Units	57, 63
GE	12XLA12A1	10 Position Test Jack	33
GE	12XLA13A1	10 Position Test Jack	33
GE	Entellisys Test Kit	Secondary Injection for Low Voltage Switchgear	58, 63
GE	F485	Communications Converter	33
GE	GTUTK20	Entelliguard Trip Units	58, 63
GE	PST1-1	Power Sensor Trip Units	58, 63
GE	SST GFD	Ground Fault Defeat Cable for SST Trip Units	58, 63
GE	TAKTS1	ECS/SST and VersaTrip Trip Units	58, 63
GE	TAKTS2	ECS/SST and VersaTrip Trip Units	58, 63
GE	TTS-1	VersaTrip Trip Units	58, 63
GE	TVRMS2	MicroVersa Trip, MVT+, MVT PM Trip Units	58, 63
GE	TVTGD9	Ground Fault Cable for Original MicroVersaTrip Trip Units	59, 63
GE	TVTS1	MicroVersaTrip Trip Units	59, 63
Greenlee	PE2003	Secondary Cable Fault Locator	202
Gw Instek	GPT-9803	AC/DC Hipot and Insulation Tester	185, 207
Hampden Engineering	MVO-1-PB	Ground Integrity Test Kit	174
Hampden Engineering	MVO-60Hz-IT	Attachment for MVO-1-PB	174
Hart	475	Field Communicator	204
Hastings	HV-230	Insulated Hot-Stick, 30' (Telescopic)	179
HD Electric	Mark V	50kV Phasing Kit	147
HD Electric	PRM-100	High Voltage Phase Rotation Meter	147
HD Electric	TAG-5000	Wireless Phasing Kit	147
High Voltage	ALT-60/120	60kV/120kV AC Hipot with 7kVA Output	82, 114, 133, 186, 187
High Voltage	CDS-2010U	20kV Thumper and Arc Reflection TDR	122, 187, 196
High Voltage	DTS-60A	60kV Oil Dielectric Test Set	109
High Voltage	DTS-60D	60kV Oil Dielectric Test Set	109
High Voltage	Ohm Check	Neutral Resistance Tester	105
High Voltage	PFT-301CM	30kV AC Hipot	187
High Voltage	PFT-303CM	30kV AC Hipot	71, 187
High Voltage	PFT-503CM	50kV AC Hipot	71, 187
High Voltage	PFT-652CM	65kV AC Hipot	71, 187
High Voltage	PTS-130	130kV DC Hipot	114, 187, 189
High Voltage	PTS-200	200kV DC Hipot	114, 187, 189
High Voltage	PTS-300	300kV DC Hipot	114, 184
High Voltage	PTS-37.5	37.5kV DC Hipot	187
High Voltage	PTS-75	75kV DC Hipot	114, 187, 189
High Voltage	PTS-80	80kV DC Hipot	114, 186, 187, 188, 189
High Voltage	TDR-1669	Time Domain Reflectometer (TDR)	124
High Voltage	VLF-12011CMF	VLF Hipot, 120kV Peak (85kV RMS)	115, 184

Manufacturer	Model	Description	Page
High Voltage	VLF-34E	34kV VLF Hipot	187
High Voltage	VLF-6022CM	VLF Hipot, 62kV Peak (44kV RMS)	115, 187
HIGHTEST TECHNOLOGY	ARES-200D	200A Low Resistance Ohmmeter (DLRO)	79, 190, 191
HIGHTEST TECHNOLOGY	TURA-03	Three Phase TTR	101
HIGHTEST TECHNOLOGY	WINRES-20B	Winding Resistance Test Set	103
Hioki	3169	Power Quality Analyzer	12
Hioki	3196	Power Quality Analyzer	12
Hioki	3197	Power Quality Analyzer	13
Hioki	PW3198	Power Quality Analyzer	13
Hipotronics	880PL	80kV DC Hipot	186, 187
HT Instruments	I-V500w	I-V Curve Tracer	22
HV Diagnostics	EZ-Cable ID	Single and Three Phase Cable and Phase ID System	125, 150
HV Diagnostics	HVA28-TD	28kV VLF Hipot and Tan Delta Measurement System	118, 180, 186, 187
HV Diagnostics	HVA30	30kV VLF Hipot	187
HV Diagnostics	HVA30-7	34kV Peak (24kV RMS), High Output (7kVA) VLF Hipot	118, 180
HV Diagnostics	HVA34	34kV VLF Hipot	116, 133, 181, 187
HV Diagnostics	HVA34-TD	34kV VLF Hipot and Tan Delta Measurement System	118
HV Diagnostics	HVA45-TD	45kV VLF Hipot and Tan Delta Measurement System	118, 181
HV Diagnostics	HVA60	60kV VLF Hipot	116, 133, 182, 186, 187, 201
HV Diagnostics	HVA90	90kV VLF Hipot	116, 133, 182, 187
HV Diagnostics	PD30-E	Offline Partial Discharge Analyzer	131
HV Diagnostics	PD60-2/TD	Partial Discharge and Tan Delta Analyzers	130
HV Diagnostics	PD90-2/TD	Partial Discharge and Tan Delta Analyzers	130
HV Diagnostics	TD-30	30kV Tan Delta (Dissipation Factor) Test System	117
HV Diagnostics	TD-34	34kV Tan Delta (Dissipation Factor) Test System	117
HV Diagnostics	TD-60	60kV Tan Delta (Dissipation Factor) Test System	117
HV Diagnostics	TD-60-MC	60kV Tan Delta (Dissipation Factor) Test System	117
HV Diagnostics	TD-90	90kV Tan Delta (Dissipation Factor) Test System	117
HV Diagnostics	TD-90-MC	90kV Tan Delta (Dissipation Factor) Test System	117
HV Technologies	2293	Automatic Transformer Winding Analyzer	102
IET Labs	RS-200	Wide Range Decade Box	33
Innovative Utility Products	Fault Wizard	Complete Fault Location System	123, 186, 187, 194
intellirent	Ground Cluster	Multiple Configurations	86, 178
intellirent GQ		Regulator, Fitting and Adaptor Kit for SF <sub>6</sub> Analysis	88
Keysight	U1732C	100Hz/120Hz/1kHz/10kHz Handheld LCR Meter	143
Macron Safety	MS-USTS-25	Insulated Hot-Stick, 17' to 25' (Telescopic)	179
MadTest Instruments	DSM4i1	140D481G03 Adaptor for DS/DSII/ Magnum DS Circuit Breakers	59
Manta	MTS-1030	Three Phase Power meter	158
Manta	MTS-5000	Three Phase Relay Test System	28
Manta	MTS-5100	Three Phase Relay Test System	28
Megger	230425	4kV AC/5kV DC Hipot	187
Megger	246100B/BGFT	Battery Ground Fault Tracer	45, 199
Megger	B10E	AC/DC Power Supply	44
Megger	BITE 3	Battery Impedence Test Set	45
Megger	BVM-300	Individual Battery Voltage Dataloggers	41
Megger	BVM-600	Individual Battery Voltage Dataloggers	41

Manufacturer	Model	Description	Page
Megger	CB-100	Low Voltage Capacitance and Insulation Power Factor Test Set	97
Megger	CB-120DC	24000A DC High Current Test Set	70
Megger	CB-8160/MAC	60000A High Current Test Set	70
Megger	CB-832	2000A High Current Test Set	64, 70
Megger	CB-845	4500A High Current Test Set	64, 70
Megger	CFL535G	Dual Channel TDR (Time Domain Reflectometer)	124, 198
Megger	DDA-1600	16,000A High Current Test Set	68, 70
Megger	DDA-3000	30000A High Current Test Set	70
Megger	DDA-6000	60,000A High Current Test Set	67
Megger	DET2/2	High Output Multifunction Ground Tester	141
Megger	DET3TC	Multifunction ART Ground Tester	140
Megger	digiPHONE+ NT	Surge Wave Receiver and Earth Fault Locator	202
Megger	DLRO H200	200A DLRO	191
Megger	DLRO100-115	100A DLRO	190, 191
Megger	DLRO10HD	10A DLRO	191
Megger	DLRO600	600A Low Resistance Ohmmeter (DLRO)	50, 80, 190, 191
Megger	EZ-THUMP12	12kV Thumper with Integrated TDR	196
Megger	Iclamp	Clamp on for DET3TC	140
Megger	IDAX 300S	Dielectric Response Analyzer	105
Megger	MIT1020/2	10kV Insulation Resistance Meter (Megohmmeter)	189
Megger	MIT1025	10kV Insulation Resistance Meter (Megohmmeter)	189
Megger	MIT320	500V Insulation Resistance Meter (Megohmmeter)	189
Megger	MIT415	1kV Insulation Resistance Meter (Megohmmeter)	188, 189
Megger	MIT525	5kV Insulation Resistance Meter (Megohmmeter)	189
Megger	MS-2	500A High Current Test Set	65, 70
Megger	NTS-300	Network Protector Test Set	35
Megger	PMM-1	Power System Multimeter	142, 158
Megger	S1-1052	10kV Insulation Resistance Meter (Megohmmeter)	188, 189
Megger	S1-1052/2	10kV Insulation Resistance Meter (Megohmmeter)	98
Megger	S1-1568	15kV Insulation Resistance Meter (Megohmmeter)	188, 189
Megger	S1-552/2	5kV Insulation Resistance Meter (Megohmmeter)	98, 189
Megger	S1-568	5kV Insulation Resistance Meter (Megohmmeter)	188, 189
Megger	SMRT36	Three Phase Relay Test System	30
Megger	SMRT410	Multi-Phase Relay Test System	30
Megger	SMRT46D	Multi-Phase Relay Test System	29
Megger	SPI225	2000A High Current Test Set	65
Megger	T3090	Advanced TDR (Time Domain Reflectometer)	197
Megger	TDR2050	Advanced Dual Channel TDR (Time Domain Reflectometer)	197
Megger	TDR900	Cable Length Meter and Basic TDR	198
Megger	Torkel 860	Variable DC Voltage Load Bank	39
Megger	Torkel 930	Variable DC Voltage Load Bank	39
Megger	Torkel 950	Variable DC Voltage Load Bank	38
Megger	TRAX	Multifunction Transformer and Substation Test System	96
Megger	XA-12990	Current Probe for Torkel System	41
Megger	TXL 870	Auxiliary Load for Torkel Series	40
Megger	TXL 890	Auxiliary Load for Torkel Series	40



Manufacturer	Model	Description	Page
Merlin Gerin	34547	MicroLogic and STR Trip Units	59, 63
Metrel	3250	10A DLRO	191
Midtronics	CAD-5500	Battery Management Tool	49
Midtronics	CTE-1000	Stationary Battery String Analyzer	49
MTE HYDROCAL	1011 genX P	Portable Dissolved Gas Analyzer	112
Multi-Tech	760	AC/DC Ground Fault Locator	46, 199
Noyes	Fiber CKSM2	Multimode and Singlemode Test Kit and Set Reference	129
OFS	P10188-04	ST Insertion Loss Test Kit	129
Omicron	Arco 400	Universal Recloser Test Set	31
Omicron	CAL540	PD Charge Calibrator for Omicron PD Analyzers	135
Omicron	CB MC2	Contact Module for CIBANO 500	80
Omicron	CB TN3	Transducer Node for CIBANO 500	80
Omicron	CIBANO 500	Circuit Breaker Analyzer	80
Omicron	CMA-156	Six Phase Current Amplifier	33
Omicron	CMC-310	Three Phase Relay Test Set	27
Omicron	CMC-356	Three Phase Relay Test Set	26
Omicron	CMGPS	GPS Antenna for Omicron CMC Instruments	27, 33
Omicron	CMIRIG-B	IRIG-B Protocol Converter	27, 33
Omicron	CMS-156	Three Phase Voltage and Current Amplifier	33
Omicron	CP SB1	Switch Box for Automated Testing of Transformers	93
Omicron	CPC-100	12kV Multifunction Power Factor Test Set	75, 92, 138, 163, 190, 191
Omicron	CPC-100/CB2	2000A AC High Current Test Set	70
Omicron	CR500	Compensating Reactor for CPC-100/TD-1	93, 163
Omicron	CT Analyzer	Automatic Current Transformer Analyzer	107
Omicron	CT SB2	Multi-Tap Adaptor for CT Analyzer	107
Omicron	CU-1	Impedance Measurement System	138
Omicron	DIRANA	Dielectric Response Analyzer	107
Omicron	FRANEO 800	Sweep Frequency Response Analyzer	106
Omicron	MCC200	Coupling Capacitor	135
Omicron	MCC205	Coupling Capacitor	135
Omicron	MCT200	High Frequency CT	135
Omicron	MONTESTO 200	Portable Online Partial Discharge Monitoring System	135
Omicron	MPD 600	Partial Discharge Analyzer	134
Omicron	MPD 800	Partial Discharge Analyzer	134
Omicron	TD-1	Power Factor Attachment for CPC-100	75, 92, 163
Omicron	TESTRANO 600	Three Phase Multifunction Transformer Test System	106
Omicron	UHF620	Expansion Unit for PD Range	135
Omicron	CPC-100	400A DC/800A AC High Current Test Set	70
PdMA	MCEMax	5kV Motor Analyzer	160
Phenix	440-20	40kV Portable DC Hipot	121, 183
Phenix	6CP-200/100-10	100kV/200kV AC Hipot	133, 186, 187
Phenix	6CP-50/100-10	50kV/100kV AC Hipot	83, 121, 133, 187
Phenix	6CP-50/100-7.5	50kV/100kV AC Hipot	83, 133, 187
Phenix	6CP-50/100-7.5 (240V)	50kV/100kV AC Hipot	133, 187
Phenix	BK130/36	36kV/130kV AC Hipot with 6.5kV Output Capacity	82, 121, 133, 187
Phenix	HC-1	1000A High Current Test Set	69, 70

Manufacturer	Model	Description	Page
Phenix	HC-2	2000A High Current Test Set	69, 70
Phenix	HC-3	3000A High Current Test Set	69, 70
Phenix	HC-5	5000A High Current Test Set	69, 70
PMDT	Pdetector	Comprehensive Online Partial Discharge (PD) Analyzer	84, 136, 193
PMDT	PDiagnostic-M	Online Partial Discharge Monitoring System	132
PowerComm	470	Coax Adaptor and Connector Kit	36
PowerComm	560	Power Line Carrier Application Simulator	36
PowerComm	630	Power Line Carrier Line Simulator	36
PowerComm	PCA-4125	Power Communications Analyzer	36
Prime Technology	7010T	RTD Substitution Box	33, 37
Proflex	ACF-5000_3/24	5000A Flexible Current Probe	2
Proflex	ACF-5000_3/36	5000A Flexible Current Probe	2
Proflex	ACP 3003_3/24	Three Phase 3000A Flexible Current Probe	5
Proflex	ACP 3003_3/36	Three Phase 3000A Flexible Current Probe	5
Proflex	ACP 6003_3/24	Three Phase 6000A Flexible Current Probe	5
Proflex	ACP 6003_3/36	Three Phase 6000A Flexible Current Probe	5
Programma (Megger)	TM-200	Digital Event Timer	33, 37, 73
Programma (Megger)	B10E	AC/DC Power Supply	81
ProStat	PRS-812	Surface Resistance Meter Kit	152
ProStat	PRS-812RM	Surface Resistance Meter Standard	152
Qualitrol	KIT-013-1	Sudden Pressure Relay Test Kit	108
Qualitrol	KIT-057-1	Portable Fiber Optic Thermomete	129
Qualitrol	KIT-930	Sudden Pressure Relay Test Kit	108
Radian	RD20	Watthour Standard	144
Radian	RD21	Watthour Standard	144
Radian	RM-111	Automated Comparator	144
Radian	RM-1Hv	Optical Pickup for Visible LED	144
Radian	RM-1S	Remote Reset Switch	144
Radian	RM-KYZ	Pulse Input (KYZ) Adapter, Form C Only	144
Radian	RR-1H	Optical Pickup for Infrared LED	144
Radian	RR-DS/F	Meter Disk Sensor with 4-pin Plug, Field Mount	144
Radian	RR-DS/SM	Meter Disk Sensor with 4-pin Plug, Suction Mount	144
Radian	RR-KYZ	Pulse Input (KYZ) Adapter, Form A and Form C	144
Radian	RX-30-PQ-A	Three Phase Reference Standard	144
Raytech	CAPO 12	12kV Power Factor Test Set	97
Raytech	CAPO 2.5	2.5kV Power Factor Test Set	97
Raytech	CT-11	Full Function Multi-Tap CT Tester	111
Raytech	Micro Centurion II	200A Low Resistance Ohmmeter (DLRO)	51, 79, 190, 191
Raytech	Micro Junior II	10A Low Resistance Ohmmeter (DLRO)	50
Raytech	T-Rex	Three Phase Voltage Option	100
Raytech	TR-1	Single Phase TTR	99
Raytech	TR-SPY Mark III	Three Phase TTR	100
Raytech	WR-14	Winding Resistance Test Set with Demagnetization	102, 164
Raytech	WR-50-12	Winding Resistance Test Set with Demagnetization	102, 164
RF Systems	VJ-ADV-3.9-3	Video Boroscope Kit	113
RH Systems	RHS973	SF <sub>6</sub> Analyzer with Recirculation	88

Manufacturer	Model	Description	Page
RKI	Eagle 2	Six Gas Monitor with Sample Draw	176
RKI	GX-2009	Safety Four Gas Analyzer	149, 176
Satin American	ETC-PTS	ETC Trip Units	59, 63
Satin American	ETC-PTS2	ETC12 Trip Units	59, 63
SBS	2003	Digital Hydrometer	48
SBS	3500	Battery Systems Storage Hydrometer	49
SBS	6500	Datalogging Digital Battery Resistance Tester	49
Schneider Electric	LV485500	Pact Series Breakers	59, 63
Schweitzer	SEL-4388	Mirrored Bits Tester	33, 37
Schweitzer	SEL-4520	Arc-Flash Simulator	33, 37
Seaward	PV210-Kit	I-V Curve Tracer	22
Seaward	Solar Utility Pro	PV String Checker	21
Sensorlink	6-920	High Voltage Recording Ammeter	148
Sensorlink	Amp LiteWire	Fiber Optic Coupled Ammeter	148
Sensorlink	Volt LiteWire	Fiber Optic Coupled Voltmeter	148
Siemens	BDA Plus	Breaker Data Adaptor for WL Circuit Breakers	59, 63
Siemens	EPSP18V	Power Supply for VL Circuit Breakers	60, 63
Siemens	PTS-4	Static Trip, Static Trip II and Static Trip III Trip Units	60, 63
Siemens	SBAPM	Power Supply for SB Circuit Breakers	60, 63
Siemens	TD500	Secondary Injection Test Set for Siemens 3VA Circuit Breakers	60, 63
Siemens	TS-31	SB Circuit Breakers	60, 63
Siemens	VLTS (ELTPHB)	VL Circuit Breakers	60, 63
Siemens	WLTS	WL Circuit Breakers	60, 63
Simpson Electric	260	Analog Multimeter	158
SMC	LET-400-RD	Primary Injection and Ground Fault Test Set	60, 63
SMC	PTE-30-CH	Portable Relay Trip Timer	61, 63
Solmetric	PVA-1000	I-V Curve Tracer	20
Solmetric	PVA-1500	I-V Curve Tracer	20
Square D	CBTM3	Adaptor for UTS-3	61, 63
Square D	CBTM4A	Adaptor for UTS-3	61, 63
Square D	RP Adaptors	MicroLogic Rating Plug Adaptors	61, 63
Square D	S33594	MicroLogic, ET and STR Trip Units	61, 63
Square D	S33595	MicroLogic, ET and STR Trip Units	61, 63
Square D	S434206	Power Supply for MicroLogic	61, 63
Square D	STRV00910	Micrologic Trip Unit Test Kit (UTA Tester)	61, 63
Square D	UTS-3	MicroLogic Trip Units	61, 63
Staco	1020B-3-CT	Single Phase Variac	145
Staco	1020B-CT	Single Phase Variac	145
Staco	1520-3-CT	Three Phase Variac	145
Staco	1520-CT	Single Phase Variac	145
Staco	2520-CT	Single Phase Variac	145
Staco	6020-3Y-E	Three Phase Variac	145
States	150LF	Current Duckbill/Current Thief	33
States	FTP14	14 Position Test Jack	33
States	V1TP10	10 Position Test Jack	33
Suretrip	CON1111	Adaptor for SureTrip/WestTrip Trip Units	62, 63

Manufacturer	Model	Description	Page
Tasco	CMT42S	Circuit Mapper System	125, 151
TESTO	350-P4	Portable Emission Analyzer	156
TriState	TSW-45	5kV Phase Sequence Indicator	86
Trojan Dry-Out Systems	TDOS 1000 HV	Transformer Dry Out System	112
UE Systems	UltraProbe 10000	Digital Ultrasound Inspection System	84, 192
UE Systems	UltraProbe 15000	Digital Ultrasound Inspection System	192
UEI	CLM100	Cable Length Meter	198
UNIRCO	CoroCam 7	Corona Effects Camera	171
Utility Relay	1-AC-PRO-MP-TS	AC-PRO-MP Trip Units for MasterPact Breakers	62, 63
Utility Relay	1-AC-PRO-TS	AC-PRO Trip Units	62, 63
Utility Relay	1-AC2-PRO-TS	AC-PRO Trip Units	62, 63
Utility Relay	1-Zero-Hertz-TS	AC-PRO DC Trip Units	62, 63
Vacuum Interrupters	MAC-TS4	Magnetron Atmospheric Condition Vacuum Bottle Test System	72
Vacuum Interrupters	PowerVAC V1	Rigid Magnetic Coil for GE PowerVac Circuit Breakers	72
Vaisala	DM70	Dewpoint Analyzer	90
Vaisala	MM70	Moisture and Temperature Meter for Oil Filled Transformers	109
Vanguard	ATRT-01 S3	Single Phase TTR	99
Vanguard	ATRT-03A S2	Three Phase TTR	101
Vanguard	Auto Ohm 200 S3	200A Low Resistance Ohmmeter (DLRO)	51, 77
Vanguard	CT-7000 S3	Circuit Breaker Timer and Travel Analyzer	76
Vanguard	CT-8000 S3	Circuit Breaker Timer and Travel Analyzer	76
Vanguard	CVT-765	Coupling Capacitor Voltage Transformer Tester	84, 104
Vanguard	DigiTMR S2	Circuit Breaker Timer and Travel Analyzer	73
Vanguard	DigiTMR S2-PC	Circuit Breaker Timer and Travel Analyzer	73
Vanguard	DMOM 200 S3	200A DLRO	190, 191
Vanguard	Doble Adaptor	Doble Transducer for Vanguard Timers	77
Vanguard	EZCT-2000C+	Full Function Multi-Tap CT Tester	110
Vanguard	EZCT-2KA	Automated Multi-Tap CT Test Set	110
Vanguard	EZCT-S2A	Automated CT Test Set	111
Vanguard	LT-10	Linear Transducer	77
Vanguard	LT-24	Linear Transducer	77
Vanguard	LT-HMA	HMA Mechanism Transducer	77
Vanguard	LTCA-10	10A Load Tap Changer Analyzer	104
Vanguard	LTCA-40	40A Load Tap Changer Analyzer	104
Vanguard	MCCB-250	500A High Current Test Set	70
Vanguard	MCCB-500	2500A High Current Test Set	65, 70
Vanguard	MCCB-500 (2 pc)	2500A High Current Test Set	65, 70
Vanguard	PCI-600	600A High Current Test Set	64, 70
Vanguard	Resistor Adaptor	Resistor Transducer	77
Vanguard	RT-HMB	HMB Mechanism Transducer	77
Vanguard	RT-MAG	Rotary Transducer	77
Vanguard	RT-PM	Rotary Transducer	77
Vanguard	SGT-200	Safety Ground Tester	177
Vanguard	SGT-600	Safety Ground Integrity Tester	157, 177
Vanguard	TR-String	String Transducer	77
Vanguard	Tri-Phase	True Three Phase TTR	101

Manufacturer	Model	Description	Page
Vanguard	TRM-20	20A Winding Resistance Test Set	103
Vanguard	TRM-203	20A Winding Resistance Test Set	103
Vanguard	TRM-40	40A Winding Resistance Test Set	103
Vanguard	TRM-403	40A Winding Resistance Test Set	103
Vanguard	UPS S2	AC/DC Power Supply	44, 81
Vanguard	VBT-60	60kV Vacuum Bottle Test Set	71, 187
Vanguard	VBT-75	75kV Vacuum Bottle Test Set	71, 187
Vanguard	VBT-80	80kV Vacuum Bottle Test Set	71, 186, 187
Vitretek	V61	5kV AC/6kV DC Hipot	186, 187
Vitretek	V74	AC/DC Hipot	207
VON	XF25-1563	Combination Thumper and TDR	186, 187
VON	XF25-1563V2	Combination Arc Reflection TDR and 25kV Thumper/Hipot	122, 195
Westinghouse	1255C48G02	Seltronic and Series C Circuit Breakers	62, 63
Westinghouse	Breaker Calibration Unit	Seltronic and Series C Circuit Breakers	62, 63
Westinghouse	PI-161	Analog Synch Scope	158
Westinghouse	SCBII	Seltronic and Series C Circuit Breakers	62, 63
Yokogawa	WT500	Precision Power Analyzer	16, 158

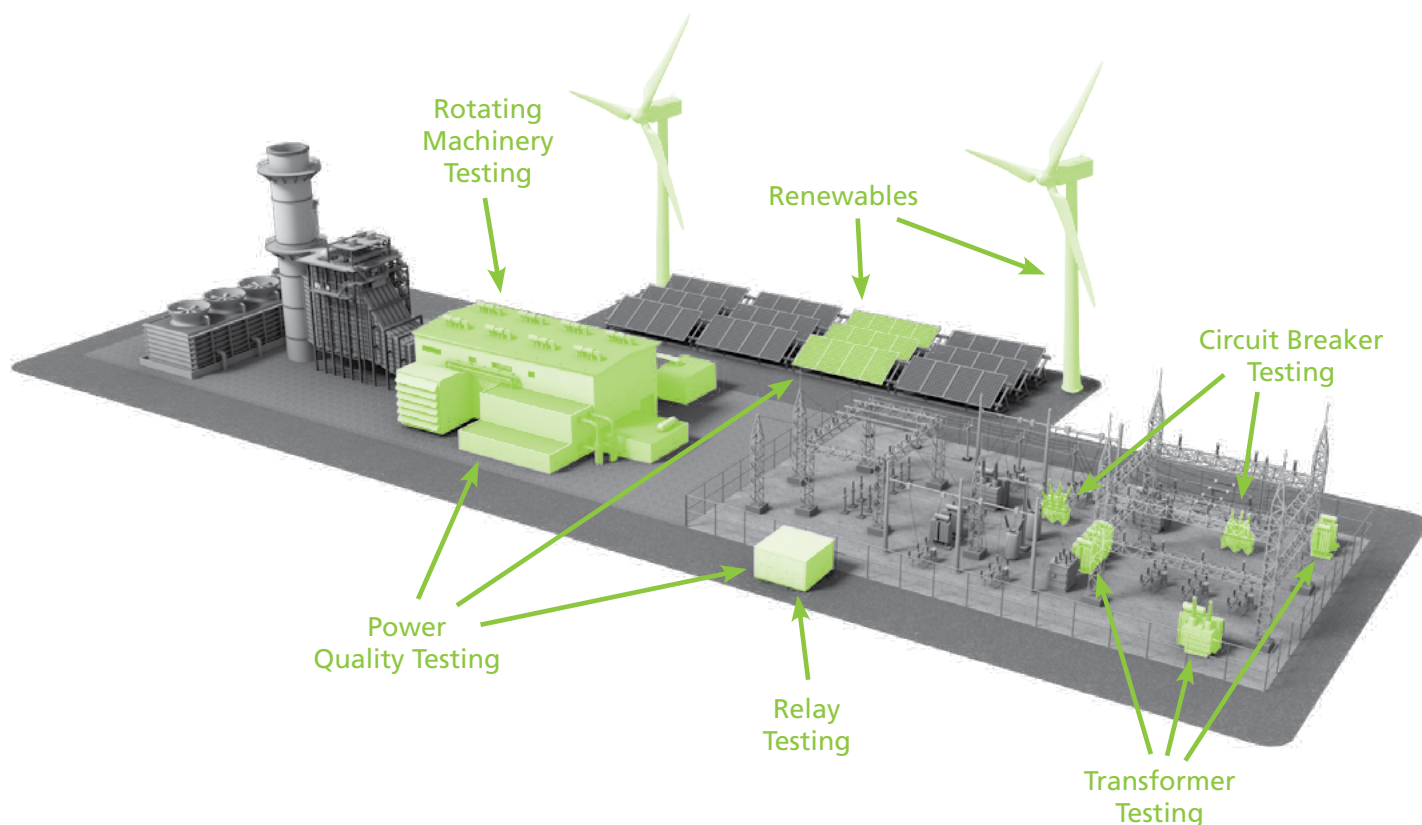
## Tech Tips

	Page
Battery Test Interval Guidelines	45
Causes of Transients	18
Clean and Inspect Before You Connect	219
Electrical Testing for MV and HV Cables	203
First Trip Testing Method for Circuit Breakers	73
Loose Connections	12
Maintaining Medium-Voltage Circuit Breakers	53
Operator Checklist for Hipot Testing	183
Power Factor Variables	113
Safety First At intellirent	83
Testing Multi-Phase Relays	29
Testing SF <sub>6</sub> Gas Quality	87
The Need for an Electronic Electric Meters	154
What is I-V Curve Tracing?	23

Manufacturer	Model	Description	Page
Anritsu	MS2720T-709	Spectrum Master Spectrum and Interference Analyzer; 9 kHz to 9 GHz	223
Anritsu	MT1000A	Network Master Pro Mainframe	221
Anritsu	MW82119B	PIM Analyzer; 40W, Battery Operation	222
Anritsu	S361E	Site Master Handheld Cable and Antenna Analyzer; 2 MHz to 6 GHz	222
Anritsu	S362E	Site Master Handheld Cable and Antenna Analyzer; 2 MHz to 6 GHz	223
EXFO	FIP435B	Wireless Analysis Digital Video Inspection Probe	219
EXFO	FTBX-720C-Q1-QUAD-XX	QUAD OTDR Module 850/1300nm, 1310/1550nm	217
EXFO	FTBX-730C-SM1-XX	Singlemode OTDR 1310nm/1550nm, 39/38dB	217
EXFO	FTBX-730C-SM3-XX	Singlemode OTDR Module, 1310/1550/1625nm, 39/38/39dB	217
EXFO	FTBX-88260	10M-to-100G Multi-Service Power Blazer	220
EXFO	FTBX-88260-FR1	RF Spectrum Analyzer; 450 MHz to 6 GHz with RTSA	223
EXFO	FTBX-88460-400GE	400G Multi-Service Power Blazer	220
EXFO	FTBX-8880	10G Power Blazer Multi-Service Set	221
EXFO	MAX-890-ETH-100	MAXTester 890: 10M-to-100G Multi-Service Unit	220
EXFO	MaxTester 945P	Fiber Certifier Optical Loss Test Set	216
EXFO	PPM-350D/91	Intelligent PON Power Meter	216
Fluke Networks	DSX2-5000	DSX Cable Analyzer V2 with WiFi; 1 GHz Copper Modules	212
Fluke Networks	DSX2-8000	DSX Cable Analyzer V2 without WiFi; 2 GHz Copper Modules	212
Fluke Networks	CFP2-100	Certifiber Pro V2, with WiFi (OLTS)	216
Fluke Networks	DSX2-8000QOI	Full Cable Analyzer, OTDR, OLTS Test Kit All in One	212
Fluke Networks	OPF2-100	Optifiber Pro OTDR V2 with Built in WiFi	218
Fujikura (AFL)	90S+	Core Alignment Fusion Splicer	214
Fujikura (AFL)	FSM70S-K	Fusion Splicer Kit	215
Fujikura (AFL)	FSM90R12-K	Fusion Splicer Kit with CT50	214
PCTEL	Gflex	Scanning Receiver; 10 MHz to 8 GHz	213
PCTEL	HBFlex P2 Configuration	5G Drive Test Scanner	213
PCTEL	IBFlex	Drive Test Scanner; 570 MHz to 3.8 GHz	213
Rohde & Schwarz	ROMES4	Drive Test Software	213
Rohde & Schwarz	TSME6	Ultracompact Drive Test Scanner; 350 MHz to 6 GHz	213
Sumitomo	TYPE-QH201e	Quantum Handheld Fusion Splicer	215
Viavi Solutions	(3Z) RFV2000	Vision Antenna Alignment Tool	222
Viavi Solutions	E4126MA	OTDR 1310nm/1550nm Metro Access Range	218
Viavi Solutions	E4146QUAD	Multimode/Singlemode 850/1300/1310/1550nm Quad OTDR	218
Viavi Solutions	E41DWDMC-PC	Tunable DWDM PC OTDR - C-BAND	218
Viavi Solutions	FIT-FCSW-KIT2	FiberCheck Sidewinder Probe Kit with WiFi and Adapters	219
Viavi Solutions	MPOLX	SmartClass Fiber MPO Optical Loss Test Set	216
Viavi Solutions	MTS5800-100GE	TB 5800-100G Base 100GE Package Supports LR4 QSFP28	220
Viavi Solutions	NGC-4500-FA	Certifier 40G NGC-4500 with Class FA Copper Kit	212
Viavi Solutions	ONX-620	OneExpert ONX-620 CATV DOCSIS 3.0 3.1 3.2 Tester	212
Viavi Solutions	SPA06MA	RF Spectrum Analyzer; 9 kHz to 6 GHz	223
Viavi Solutions	TB/MTS-5822P	10Mbps to 10G Handheld Network Tester, TB/MTS-5822P	221



## Substation Equipment Applications



### Rotating Machinery

Partial Discharge  
Motors/Generators  
Insulation

### Renewables

PV & EV Testing  
Power Quality  
Grounding Systems

### Circuit Breaker Testing

Motion/Travel  
DLRO  
SF<sub>6</sub>

### Power Quality Testing

Analysis  
Record  
Trending

### Relay Testing

Automated  
Manual  
RTS

### Transformer Testing

Insulation  
Moisture  
DGA

**intellirent**  
division of **ElectroRent** Corp

604 Henrietta Creek, Ste 400

Roanoke, Texas 76262

T 888.902.6111

T 972.317.0479

F 817.491.0068

[intellirentco.com](http://intellirentco.com)

[info@intellirentco.com](mailto:info@intellirentco.com)

