



Field Test & Measurement Products

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OC60D / OC90D

60 / 90 kV Liquid Dielectric Test Sets with Manual Control

■ Hipotronics OC Series digital liquid dielectric test sets accurately and reliably test the dielectric strength of insulating liquids used in a wide variety of electric apparatus. The safe and easy operation has made Hipotronics OC series the industry standard for decades.

The OC Series is designed to meet testing specifications in all parts of the world and test cells are available for ASTM D877, ASTM D1816 and IEC 156. The rugged yet lightweight and portable design ensures years of trouble-free operation both in the field and in the laboratory.

The Hipotronics OC series has three pre-programmed rates of voltage rise and automatic termination of voltage upon sample breakdown. A digital memory kilovoltmeter automatically retains the breakdown voltage reading until it is manually reset.



FEATURES

- ✓ Lightweight, portable design
- ✓ Rugged and reliable
- ✓ Output voltages to 60 kV or 90 kV
- ✓ Tests insulating oils per ASTM and IEC specifications
- ✓ Automatic HV shutdown at breakdown
- ✓ Digital memory kilovoltmeter
- ✓ Meter accuracy $\pm 2\%$ F.S.
- ✓ One piece construction with safety interlocked HV section
- ✓ Test cells available for ASTM D877 testing, or ASTM D1816 & IEC 156 testing

BENEFITS

Multi-purpose - because of its compact design it's easily useable in the field as well as in the factory.

Sturdy and Reliable - The OC series of testers have a long and trouble free life; proven by over 40 years of industry wide use.

Safe and Easy - The interlocked HV section and the integrated controller allow your operators to test safely and easily.

APPLICATIONS

Testing of insulating liquids in:

- Transformers
- Bushings
- Switchgear
- Capacitors
- Hydraulics



TECHNICAL SPECIFICATIONS

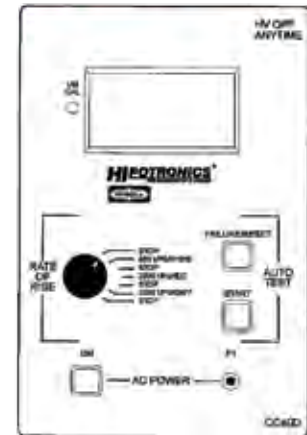
General

Output Voltage	0 – 60/90 kV	Input Voltage - A	120 V, 60 Hz
Meter Accuracy	+ 2% of full scale	Input Voltage - B	220 V, 50/60 Hz

Weights and Dimensions (W x H x D, net weight, ship weight)

OC60D	16" x 13" x 15" (41 x 33 x 38 cm)	69 lbs (31 kg)	74 lbs (86 kg)
OC90D	30" x 12" x 17" (76 x 30 x 43 cm)	122 lbs (55 kg)	190 lbs (86 kg)
TCDE	6" x 4" x 3" (15 x 10 x 8 cm)	2 lbs (1 kg)	5 lbs (2 kg)
TCVDE	6" x 6" x 6" (15 x 15 x 15 cm)	5 lbs (2 kg)	10 lbs (5 kg)
TCCE90	13" x 6" x 6" (33 x 15 x 15 cm)	11 lbs (5 kg)	20 lbs (9 kg)
OCCM-E	6" x 6" x 6" (15 x 15 x 15 cm)	4 lbs (2 kg)	8 lbs (4 kg)

CONTROL PANEL



SCOPE OF SUPPLY

- Qty. 1 OC60D or OC90D Oil Tester
- Qty. 1 Standard Line Cord, 7.5 ft (2.3 m)
- Qty. 1 Operations Manual & Calibration Certificate

TEST CELLS

ORDERING INFORMATION

Oil Tester, Digital 60 kV	OC60D-A, OC60D-B
Oil Tester, Digital 90 kV	OC90D-A, OC90D-B

Accessories

Digital Calibration kV meter and ramp rate meter. A 0.5 inch digital display, molded epoxy case, and 2% accuracy at full scale. An adapter for OC90 is included. **OCCM-E**

The TCDE test cell is equipped with two one-inch diameter flat disc electrodes; one is adjustable to provide the desired gap via a set screw. A standard 0.1 inch gap gauge is supplied. The TCDE is used to test at 3000 v/s rate of rise according to ASTM D877. For use with OC60's. **TCDE**

The TCVDE test cell is equipped with a motor-driven circulating system 0.08 inch and 0.04 inch gap gauges, and two VDE electrodes, one is adjustable to provide the desired gap. The TCVDE is used to test according to ASTM D1816. For use with OC60's. **TCVDE**

The TCIEC test cell is similar to the Model TCVDE cell but without a motor. For use with OC60's. **TCIEC**

The TCCE90 test cell has VDE (mushroom) electrodes and a motor driven circulating system for testing to ASTM D1816. For testing to ASTM D877, disc electrodes (included) with 0.1 inch gap gauge may be substituted. Only for use with OC90's. **TCCE90**

Spare parts kit **SPK1-OC60D / SPK1-OC90D**



TCVDE ASTM D1816



TCCE90 ASTM D1816 and ASTM D877

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5250 Series - High Energy Capacitive Discharge (Thumpers)

Portable Cable Fault Locating Systems

■ The Hipotronics 5250 Systems meet the demanding needs of utilities, industrials, and contractors who require a highly portable, easy to use, complete fault location system. The 5250 system utilizes the most innovative TDR techniques; along with the highest energy, battery operated, portable compact thumper the market has to offer. These systems will reduce your fault location time by up to 80% allowing quick and easy sectionalizing of faulted loop feed URD installations without disconnecting transformers and provide fast fault location in underground cables. Isolation of a cable fault between two transformers is easily identified.

Our 5250 battery powered cable fault locator combines a high voltage filter, digital high voltage TDR and battery charger into one complete, easy to use, cost-effective package. Operation of the entire system is done from the controls of the TDR1150, or manually from the 5250 control panel. Connection to the cable under test is easy with quick clamp connectors on an HV output cable. Once the 5250 is connected to the cable under test, a trained operator will be able to find faults in a matter of minutes. The digital TDR1150 allows built-in storage of waveforms. In addition, the 5250 TDR1150 has a built-in serial port to allow an operator to download waveforms to a computer for evaluation or long-term storage.



FEATURES

- ✓ **Complete Fault** Location System in a Single Package
- ✓ **Highly Portable** Lightweight Package
- ✓ **Output Energy** up to 2000 Joules @ Either Voltage Range
- ✓ **User Friendly** Step by Step Operation
- ✓ **100 MHz** TDR Sampling Rate
- ✓ **Saves** up to **16** Three Phase **Cable Traces** and **16** User Defined **Test Profiles**
- ✓ **Windows™ -based TDR with RS232 Port** to Download Traces to Computer
- ✓ **Dual Mode Operation** Automatic through the TDR and Manual from 5250
- ✓ **Fully Powered** from AC or 12V Battery (Included)
- ✓ **Waterproof** Interlocked Cabinet

BENEFITS

Single Piece Solution - the need to buy and maintain several pieces of equipment goes away

Reduce Damage to Residential Property - this compact lightweight unit mounted on a hand cart with wheels is ideal for field use anywhere

Easier Fault Finding - a fast rise time pulse makes testing of URD cable and locating the fault simpler

Time Saving - fault location time and time spent digging up the cable is reduced with the high resolution TDR (2.5 feet)

Use It Regardless of the Weather - wholly self-contained and waterproof design, minimizes setup hassles

Simple Fault Pinpointing - operators can simply pinpoint faults due to the high energy output of the power supply

TECHNICAL SPECIFICATIONS

General

Model Number	5250-30-*	5250-15-*
TDR Specifications		
TDR Operating System	Windows™	
Measuring Accuracy	2.5 feet (77 cm) - sampling rate of 100 MHz	
Pulse Amplitude / Width	25 V into 50 Ohms / 100 nS to 20µs	
Range - Time / Distance	1.28µs to 0.66 mS / 1 to 196,000 feet (0.3 to 59,740 m)	
Trace Storage	Total of 32, 16 cable traces and 16 user test profiles	
Monitor	LCD Display 7" (18 cm) Diagonal	
Input Protection/Isolation	480 volts AC	
HV Section Specifications		
Power Requirements	Sealed gel, 12 V dc rechargeable battery *Input voltages -A 120 V, 60 Hz -B 220 V, 50/60 Hz	
Pulse Output Voltage	0 – 15 kV or 0 - 30 kV	0 – 7.5 kV or 0 – 15 kV
Controlled Energy	2000 J @ 30 kV or 15 kV	1000 J @ 15 kV or 7.5 kV
Charge Time	10 seconds	10 seconds
DC Proof Test Output	0 – 30 kV	0 – 15 kV

Weights and Dimensions (W x H x D, net weight, ship weight)

5150-30-*	28" x 51" x 22" (71 x 130 x 56 cm)	365 lbs (166 kg)	415 lbs (189 kg)
5150-15-*	28" x 51" x 22" (71 x 130 x 56 cm)	345 lbs (146 kg)	395 lbs (169 kg)

ORDERING INFORMATION

System

30 kV @ 4.45?F / 15 kV @ 17.8µF max 2000 Joules	5250-30-*
15 kV @ 8.9?F / 7.5 kV @ 35.5µF max 1000 Joules	5250-15-*

* Indicate input voltage -A for 120 V, 60 Hz or -B for 220 V, 50/60 Hz

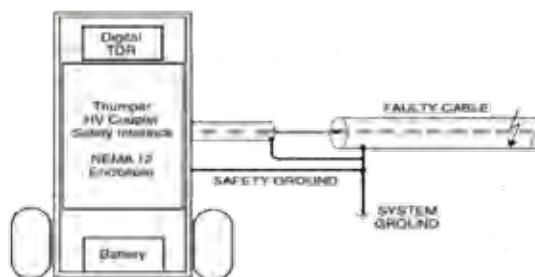
Accessories

Retrofit kit for MC connector installation on HV cable	HH211082
Connects TDR to Hagenuk M 219 filter	HH210945

SCOPE OF SUPPLY

- Qty. 1 CFFR-30 or CFFR-15 Hipot/Thumper
- Qty. 1 TDR1150 and Power Supply
- Qty. 1 50 feet HV Cable, MC connector, vise-grip clamp and grounding clamp
- Qty. 1 25 feet Safety ground with grounding clamp
- Qty. 2 Interconnect Cables, BNC to BNC, 3 feet (0.91 m)
- Qty. 1 Wheeled hand cart
- Qty. 1 Internal 12 V rechargeable battery, charger
- Qty. 1 TDR Software
- Qty. 1 Calibration Certificate
- Qty. 1 User's Manual

CONNECTION DIAGRAM



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CF30-8

30kV High Voltage Cable Fault Locating Power Supply

■ Hipotronics CF Series test systems for fault locating of primary cables consist of a dc proof tester, a burner and a capacitive discharge fault locator (thumper). These self-contained, portable units are rugged, reliable and compact making them ideal for field use. The CF30-8 has a continuously adjustable impulse rate from three to thirty seconds. Test ratings are a 30 kV dc proof test voltage, a 50 mA burn current and a 0-15 kV dc capacitive discharge (thumper) voltage.

The units can be used with a high voltage coupler (4100 Series) and a time domain reflectometer (TDR) to quickly provide a specific distance to the fault in feet or meters. This combination of equipment can greatly reduce the amount of high voltage (number of thumps) the cable resulting in reduced damage or degradation to the cable under test.

For additional pinpointing the HSDAD acoustical detector can be used in conjunction with the CF30-8 to pinpoint the exact underground location. While the CF "thumps" the cable the user "listens" to the thumping using HSDAD and can pinpoint where to start digging to repair the fault.

Hipotronics Inc. has years of experience in cable fault locating the toughest faults. Our line of cable fault locating equipment is designed and manufactured based upon our field expertise. Whether you use the fault locator alone or with other accessories you've got a powerful tool to help restore power to your customers quicker.

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THE MEASURE OF A LEADER

FEATURES

- ✓ **Self-Contained Unit** Features Proof Tester, Burner and Thumper in One
- ✓ Burn Currents to **50 mA**
- ✓ **Internal discharge solenoid**
- ✓ Impulse Energies of up to **900 J**
- ✓ **Automatic and Manual** Thumper Mode
- ✓ **External interlock** provisions
- ✓ Operable from **Line Voltage or Generator**
- ✓ **Single HV Output** for All Modes
- ✓ **Mode Indicator Lights**

BENEFITS

- Accurate Fault Identification and Location**
- One Unit for all URD Cable Maintenance Testing**
- User Safety** - visual verification of grounding status via face panel window
- Repeatable Impulse level**
- Variable Impulse Rate from 3 to 30 Seconds**

APPLICATIONS

- DC Hipot testing of:
- Electric Utilities
 - Test Companies
 - Petrochemical Facilities
 - Facility Maintenance





TECHNICAL SPECIFICATIONS

General

Input Voltage	120 V, 50/60 Hz for -A version 230 V, 50/60 Hz for -B version		
Output	Proof Test 30kV dc (continuously variable)	Burner	50 mA
Capacitor Discharge	0 ... 15kV at 8uF	Energy Delivered to Fault	900 J
Duty Cycle	Continuous (7 pulses per minute)		
Metering	Proof Test Voltage	0 ...30kV dc ±2%	
	Proof Test Current	0 ...1, 10, 20 mA ±2%	
	Burner Current	0 ...50 mA	
Terminations	Input Line	10' (3.1m) cable	
	Return to High Voltage	50' (15.2 m) shielded cable - vise grip term.	
	Ground	10' (3.1m) No. 2 cables with vice grip term.	

Weights and Dimensions (W x H x D, net weight, ship weight)

CF30-A	16" x 30" x 16" (406mm x 762mm x 406mm)	185lbs.	250lbs.
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SCOPE OF SUPPLY

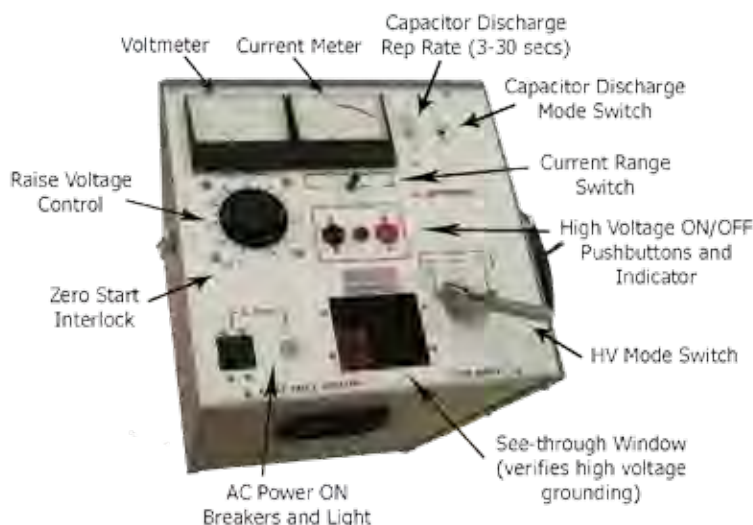
- Qty. 1 CF30-8 with terminations as described above
- Qty. 1 Interlock Plug (PN800661)
- Qty. 1 Operations Manual
- Qty. 1 Calibration Certificate

ORDERING INFORMATION

System

Cable Fault Locator	CF30-8-A CF30-8-B
Cable Fault Locator with only 15 feet of return and HV cable and MC type connector for use with HVC coupler and 8100 cable rack	CF30-8-PT-A CF30-8-PT-B

CONTROL PANEL



Accessories

Spare parts kit for CF30-8	SPK1-CF30-8
Time Domain Reflectometer	TDR1150
HV Coupler to protect TDR from HV of cable fault locator. TDR1150 must be used with a coupling device.	HVC4100 Series
HV Cable Rack with 125 ft of 70 kV cable and 125 ft of safety ground cable.	8100

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Hipotronics Test Equipment - HI



CF70-12/ -24

Primary Cable Fault Locator

■ **Hipotronics CF Series** test systems for fault locating of primary cables consist of a dc proof tester, a burner and a capacitive discharge fault locator (thumper). These self-contained, portable units are rugged, reliable and compact making them ideal for field use. The CF70-12 or -24 has a continuously adjustable impulse rate from three to thirty seconds. Test ratings are a 0-70 kV dc proof test voltage, a 100 mA burn current and a 0-25kV dc capacitive discharge (thumper) voltage.

The units can be used with a high voltage coupler (HVC-4100 Series) and a time domain reflectometer (TDR-1150 or TDR-1170) to quickly provide a specific distance to the fault in feet or meters. This combination of equipment can greatly reduce the amount of high voltage (number of thumps) applied to the cable, resulting in reduced damage or degradation to the cable under test.

Hipotronics Inc. has years of experience in cable fault locating the toughest faults. Our line of cable fault locating equipment is designed and manufactured based upon our field expertise. Whether you use the fault locator alone or with other accessories you've got a powerful tool to help restore power to your customers quickly.



FEATURES

- ✓ **Self-Contained Unit** Features Proof Tester, Burner and Thumper in One
- ✓ **Burn Currents** to 100 mA
- ✓ **Impulse Energies** of up to 7000 J
- ✓ **Automatic and Manual** Thumper Mode
- ✓ **Operable** from Line Voltage or Generator
- ✓ **Single HV Output** for All Modes
- ✓ **Zero Start** Interlock
- ✓ **External** Interlock
- ✓ **Mode Indicator** Lights
- ✓ **Electrically Operated** Shorting Solenoids with Mechanical Ground Assurance

BENEFITS

- Positive Fault** Identification and Location
- Isolated Return** for Increased Operator Safety
- One Unit** for all URD Cable Maintenance Testing
- User Safety** - visual verification of grounding status via face panel window
- Repeatable Impulse** level
- Variable Impulse Rate** from 3 to 30 Seconds

APPLICATIONS

- Electric Utilities
- Test Companies
- Petrochemical Facilities
- Facility Maintenance



TECHNICAL SPECIFICATIONS

General

Input Voltage:	-A 120 V AC, 60 Hz -B 220 V AC, 50/60 Hz		
Output:	Proof tester, 0-70 kV DC	Burner, 100mA	
Capacitor Discharge:	CF70-12, 0-25kV @ 12µF CF70-24, 0-25kV @ 24µF	Energy @ 25kV Energy @ 25kV	3750 joules 7000 joules
Metering:	Proof Test Voltage Proof Test Leakage Current Burner Current	0-70 kV DC ± 2% 0-1/10/100 mA ± 2% 0-100 mA	Standard Polarity Negative Output.
Duty Cycle:	Continuous		
Terminations:	Input Line Return and High Voltage Ground	50 ft. (15.2 m) 100 ft. (30.4m) Ground 25 ft. (7.6 m)	Cable Double Shielded Cable No. 2 Welding Cable
Weight and Dimensions:	16"W x 36"H x 50"D (41 x 91 x 127cm) 675 lb (307 kg) Net 894 lb (352 kg) shipping		

SCOPE OF SUPPLY

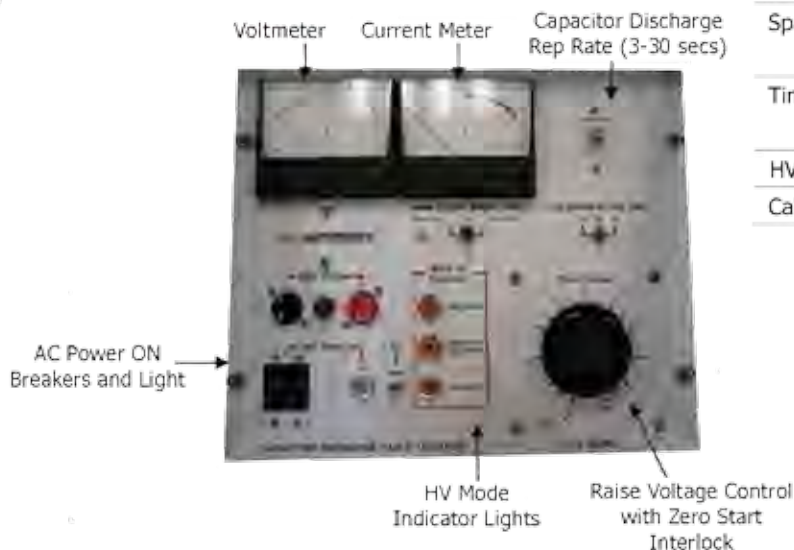
- Qty. 1 CF70-12 or -24 with terminations as described above
- Qty. 1 Interlock Plug
- Qty. 1 Operations Manual
- Qty. 1 Calibration Certificate

ORDERING INFORMATION

System

Cable Fault Locator	CF70-12-A or B CF70-24-A or B
Cable Fault Locator with only 15 feet of return and HV cable and MC type connector for use with HVC series coupler and 8100 cable rack.	CF70-12-PT-A or B CF70-24-PT-A or B

CONTROL PANEL



Accessories

Spare parts kit for CF70	SPK1-CF70-12 SPK1-CF70-12
Time Domain Reflectometer	TDR1150 TDR1170
HV Coupler for use with the TDR	HVC4170
Cable Reels	8100

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Hipotronics Test Equipment - HI



HVC4000 Series

High Voltage TDR Couplers

■ **The 4000 Series** of high voltage couplers allow modern cable fault locators (thumpers) to be used in conjunction with advanced TDR's. The HVC series is uniquely suitable for use with cable fault locators with voltage ratings up to 70kV. When connected to a cable fault locator and a TDR, the coupler enables the operator to reduce his "thumping" and reduce the chances of potential damage by extended duration "thumping". The HVC series allow for the use of the latest methods of fault location and also allow the operator to use a TDR mode that is most suitable for the cable that has failed. The HVC series also allows for quick connection of a low voltage TDR.

FEATURES

- ✓ **Compact** High Voltage Coupler
- ✓ **Compatible** with Virtually all Cable Fault Locators
- ✓ **Interlock Safety** on Mode Selector Switch
- ✓ **Front Mounted** Mode Selector Switch
- ✓ **Female MC** High Voltage Input Connector
- ✓ **Male MC** High Voltage Output Connector
- ✓ **Available** for Use with Thumpers up to 70kV



BENEFITS

- Female MC Connector** – for easy connection of thumpers
- HV Output Cable** – rated for voltages of 70kV DC
- Couple Advanced TDR's** – to Standard Thumpers
- Compact** – User Friendly Design
- Low Voltage** – TDR Compatible



TECHNICAL SPECIFICATIONS

General	HVC 4100 CR-*	HVC 4170V-*
Cabinet Configuration	Rack Mounted (cabinet)	Rack Mounted (cabinet)
TDR Mounting Configuration	Internal	Internal
Main Input	*A 120V AC, 50/60Hz *B 220V AC, 50/60Hz	
High Voltage Range	0-50kV DC	0-70kV DC
Arc Reflection Voltage Range	0-40kV DC	0-40kV DC
Surge Voltage Range	0-50kV DC	0-50kV DC
Maximum Burn Current	100 Amps	100 Amps
Maximum Impulse Energy	3000 Joules	8000 Joules
Temperature Range	-4°F to 122°F (-20°C to 50°C)	-4°F to 122°F (-20°C to 50°C)
Dimensions	31"H x 26"W x 31"D (79cm x 66cm x 31cm)	54"H x 26"W x 31"D (79cm x 66cm x 31cm)
Weights	100lbs (45kg)	250lbs (114kg)

ACCESSORIES

TDR 1170, Time Domain Reflectometer
 TDR 1150, Time Domain Reflectometer
 CET 2000-* Controlled Energy 2000J Thumper
 CF30-8-*, 0-15kV, 900J Hipot/Thumper
 CF70-12-*, 0-25kV, 3750J Hipot/Thumper
 CF70-24-*, 0-25kV, 7000J Hipot/Thumper

ORDERING INFORMATION

System

0-70kV coupler	HVC 4100-A or -B
0-50kV coupler	HVC 4170CR-A or -B

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 sales representative at
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TDR 1150

Time Domain Reflectometer

■ Hipotronics Model TDR1150 is the most advanced and powerful cable fault-locating tool on the market. Used together with a suitable high voltage coupling device, the TDR1150 accurately pre-locates high voltage cable faults in underground transmission and distribution cable systems.

Basic Mode Operation

Basic mode provides the simplest means of operation for pre-locating most cable faults. The TDR provides step-by-step operation instructions, automatically sets the cable end points, displays the cable length in feet or meters and displays the distance to the cable fault from the hook-up point. The auto range feature fits the cable trace on the screen, regardless of the cable length.

The operator is then prompted to send a single, high voltage pulse down the cable. The TDR displays the high voltage trace, places a fault cursor at the point of the fault, and displays the distance to the fault. There is no need to interpret traces or move cursors. The entire process can be completed within minutes.

Advanced Mode Operation

Advanced Mode operation provides the operator with complete control and setup access of the TDR functions and settings. Typically this is used in cases where the cable type may be unknown, the cable system has a complex system configuration (loop and network systems) or where the fault may be intermittent. It is password protected to prevent unauthorized use. This mode provides more experienced operators with the diagnostic tools they need to find more difficult faults.



TDR functions that can be adjusted include: propagation velocity, pulse width, gain, 3-phase or single-phase display, and trigger delay. Zoom and cursor features are also fully available to the user in Advanced Mode. In addition alternate languages, memory functions, selectable measurement systems and much more are accessible.

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FEATURES

- ✓ **Automatic Identification** of Key Cable Parameters (cable length and distance to fault)
- ✓ **Quick Location of Faults**
- ✓ **32 Accessible Memory Locations** for Internal Trace Storage
- ✓ **Large 10.4" VGA** Color Display
- ✓ **Automatic Setup** of sampling rate, gain and pulse width
- ✓ **Step-by-Step Instructions** of System Operation Guides User Through Test
- ✓ **Large, Easy-to-Use** Buttons

BENEFITS

Multi-Purpose Device - has ability to pre-locate, locate and diagnose cable faults

Easy to Use - device walks user through test procedure; in 5 easy steps you've located the fault

Compatibility - TDR1150 can be used with most other High Voltage Couplers

PC Software and Serial Port - included with standard unit provides long-term storage, evaluation of test results, defining of test protocols and simple software upgrading

Reduce Outage Time - by quickly locating cable faults you reduce outage time and get power back to your customers sooner

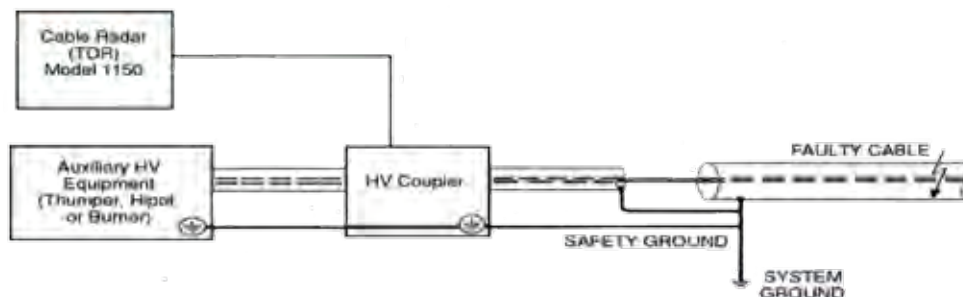
Reduce Cable Damage - using a TDR reduces thumping and therefore damage to the cable

APPLICATIONS

These devices are generally used by:

- Electric Utilities
- Test Companies
- Petrochemical Facilities
- Facility Maintenance

MEASURING SETUP DIAGRAM



TECHNICAL SPECIFICATIONS

General

Power Supply	Battery operated	Charger input	120 V, 50/60 Hz 230 V, 50/60 Hz	for -A version for -B version
Pulse Characteristics	Pulse Amplitude	25V into 50 Ω	Pulse Width	100ns to 20µSec
Input Protection	480 V AC			
Range	Time	1.28 µSec to 0.66 mSec	Distance	1 foot to 196,000 feet
Measurement Accuracy	Sample Rate	100MHz	Resolution	2.5 feet (10nSec)
Operational Modes	Arc Reflection, TDR Direct, current Pulse			
Storage	Stores 16 sets of 3 traces	or	6 pre-recorded setups with information and 10 sets of 3 trace signatures	
Monitor	LCD Display 7.0 inch			
Environment	Operating Temperature	10°F to 122°F (-12°C to 50°C)		
	Storage Temperature	-40°F to 140°F (-40°C to 60°C)		

Weights and Dimensions (W x H x D, net weight, ship weight)

TDR1150	14" x 9.5" x 6" (360 x 240 x 150 mm)	15 lbs (7 kg)	25 lbs (11.3kg)
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SCOPE OF SUPPLY

- Qty. 1 TDR1150 in portable, water resistant case
- Qty. 1 100/240 V, 12 Vdc power supply (PN211212), with 6 ft (1.8 m) cord
- Qty. 1 RG58/U BNC-BNC cable (PN20097), 15 ft (4.6 m)
- Qty. 1 BNC/clip cable (PN210946), 2.5 ft (0.76 m)
- Qty. 1 Serial interface cable (PN210947), 6.5 ft (2 m)
- Qty. 1 Operations Manual and TDR-PC interface software
- Qty. 1 Calibration Certificate

ORDERING INFORMATION

System	
Time Domain Reflectometer	TDR1150-A TDR1150-B
TDR Retrofit Kit to upgrade existing with TDR1150	TDR-1150-RTRFT
Accessories	
Power supply for TDR-1150	1150-PS
HV Coupler to protect TDR from HV of cable fault locator	HVC4100 Series
Cable Fault Locaters (Thumper) 30 (8µf) and 70 kV (12 or 24 µf)	CF Series
Controlled Energy Thumpers 1500 J or 2000 J and 8/16/32 kV output	CET Series
HV Cable Rack with 125 ft of 70 kV cable and 125 ft of safety ground	8100

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Time Domain Reflectometer

TDR 1170

■ **Hipotronics TDR1170** — The unique features and new technology used in the TDR 1170 make it the most flexible and easiest to use instrument available for advanced cable fault location. The TDR 1170 features an automatic configuration, which can be modified as necessary. All cable fault data can be stored and retrieved at any time, ensuring time savings, consistency and accuracy from one crew to the next.

The digital TDR 1170 will locate and identify short circuit (bolted) faults, low resistance shunt faults, open circuits, high resistance series faults, wet sections, splices, transformers, cable transitions, and concentric neutral corrosion. To locate high resistance, intermittent and flash-over faults, the TDR 1170 is designed to measure in the digital arc reflection, current impulse, voltage decay, and all differential fault locating modes. The selection of fault location method allows the operator to select the method which they are most familiar with or the method that is most appropriate for the type of cable and type of fault that is encountered.

The TDR 1170 requires a high voltage coupler to interface to a cable fault locator (thumper). The cable fault locator then provides the voltage and current to enable the TDR 1170 to quickly and definitively locate cable faults.

Included with the TDR 1170 is a software package to allow the stored data to be viewed on a PC and also be printed and analyzed by office personnel or training teams.



FEATURES

- ✓ **Digital High Voltage TDR**
- ✓ **5 Methods of Fault Location**
 - ✓ **Arc Reflection**
 - ✓ **Impulse Current**
 - ✓ **Voltage Decay**
 - ✓ **Differential Methods**
 - ✓ **Low Voltage**
- ✓ **Color LCD Screen**
- ✓ **PC Software**
- ✓ **SVGA Output** for External Monitor

BENEFITS

- Pre-Locate Faults**
- Diagnose Cable Faults**
- Easy to Use**
- Compatible with** Common "Thumpers"
- Provides Long-Term** Storage and Evaluation
- Cable System** Signature Mapping
- Reduce Outage** Time
- Reduce Cable** Damage
- Simplified Operator** Training



TECHNICAL SPECIFICATIONS

General

Input Voltage:	90 to 250 V AC, 50/60Hz	VP Range:	98ft./μs to 492ft./μs
Accuracy:	< + 1% of cable length	Pulse Amplitude:	25 V into 50W
Measuring Range:	1 ft. to 160,000 ft.	Pulse Width:	50ns to 10μs
Units of Measure:	Feet, Yards, Meters	Sample Rate:	12.5 to 30ms
Trigger Delay:	1 to 30ms	Memory Modes:	32 sets of 1 or 3 phase
Setup:	16 setup options	RS232 Port:	Download traces to PC
Monitor: LCD Display 10 inch diag.			

Weights and Dimensions (W x H x D, net weight, ship weight)

Standard 19" rack	19" x 10.5" x 7" (48 x 26 x 18 cm)	18 lbs (8.2 kg)	lbs (kg)
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SCOPE OF SUPPLY

- Qty.1 TDR1170 in standard 19" rack mount cabinet
- Qty.4 RG58/U BNC-BNC cable
- Qty.1 Serial interface cable and input line cord
- Qty.1 Operations Manual and TDR-PC interface software

SYSTEM DISPLAY



ORDERING INFORMATION

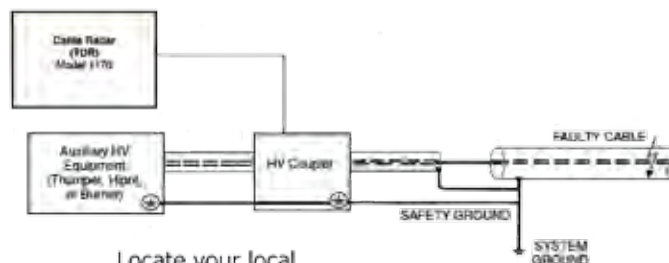
System

Time Domain Reflectometer	TDR1170-A
	TDR1170-B

Accessories

HV Coupler	HVC4100 series
Cable Fault Locating (Thumper)	CF or CET series
Cable Reels	8100
Accessory Connectors	

MEASURING SETUP DIAGRAM



Locate your local sales representative at www.hipotronics.com



Hipotronics Test Equipment - HI



FlashPhone

Digital Acoustic/Ballistic Cable Fault Locator

■ **The FlashPhone** acoustic/ballistic detector is designed to pinpoint the exact location of primary cable fault location when combined with a capacitor impulse discharge unit (thumper). During the flashover at the fault both a magnetic and acoustic signal is generated. There is a time delay between these two signals and the FlashPhone displays this signal as a number. The closer you get to the fault will show a decrease in the number that is displayed. The magnetic signal bar graph shows the intensity (magnitude) of the magnetic field, generated by the thumper into the cable fault. It also can be used to locate the correct cable route when the maximum bar deflection (magnitude) is indicated. The microphone is designed to be used with an earth probe for soft ground conditions and the flat ground contact can be used on concrete or asphalt.

The unique combination design of seismic and electronic sensor technology, plus microcomputer technology and digital signal processing is the key to its superior performance and high sensitivity. It is well suited for use with impulse discharge units (thumpers) with low joule energy capabilities.



FEATURES

- ✓ **Seismic/Electronic** combination sensors
- ✓ **Large LCD** display with backlight
- ✓ **Re-chargeable** lithium batteries
- ✓ **Battery** monitor on LCD display
- ✓ **Ballistic** bar graph LCD display
- ✓ **External** automatic battery charger
- ✓ **Watertight** enclosure
- ✓ **Rugged** foam-lined carrying case

BENEFITS

Simple Operation – only a minimal amount of user training is needed to locate faults

Locates Faults Quickly – faults are located with a minimal amount of time and effort

Smart Device – is able to discriminate between audible “thumps” and background noise

APPLICATIONS

These devices are generally used by:

- **Electrical Utilities**
- **Test Companies**
- **Petrochemical Facilities**
- **Facility Maintenance**

TECHNICAL SPECIFICATIONS

General		Sensor (magnetic/acoustic)	
Operating Temperature	-10°F - + 100°F	Acoustic Detection	Seismic
Humidity	85%	Input Range (g)	±100g
Power Source	7.4VDC Li-Ion Battery	Sensitivity (PC/g)	1100 ±10%
Amplification Acoustic	75dB Maximum	Resonance Frequency (Hz)	80
Amplification Magnetic	65dB Maximum	Frequency Response (±3dB)	DC - 2kHz
Headset Maximum Output Power	700mW	Frequency Range Acoustic	1kHz - 32kHz (High Filter) <=270Hz (Low Filter)

Weights and Dimensions

Case Dimensions	16.00" x 13.00" x 6.87" (40.6 x 33 x 17.4 cm)
System Weight	31 lbs

SCOPE OF SUPPLY

- Controller
- Acoustic/Magnetic Pick-up
- External Battery Charger
- Head Phones
- Foam Padded Carrying Case

ORDERING INFORMATION

System
Part Number: H-FLASH

CONTROL PANEL



Locate your local sales representative at www.hipotronics.com



800PL Series

DC Hipot Testers

■ The 800PL Series DC hipot testers are an economical solution to DC field testing of cables, terminations, motors, generators and other electrical apparatus. Models 815PL and 880PL10-MA offer 15kV or 80kV respectively. All models are self-contained in a single, rugged and durable enclosure, which is complete from input line cord to high voltage output cable. Cable storage space is conveniently located inside.

The 800 Series testers feature accurate kV meter readings regardless of load current. Accurate voltage and current measurements are assured via voltage readings that are taken directly at the output of the high voltage transformer and current measurements are taken in the return leg. Safe discharging of both the test object and the high voltage transformer occur whenever the high voltage is turned off. Output power is provided by means of a full-wave voltage doubling rectifier circuit with silicon rectifiers.



FEATURES

- ✓ **Rugged, portable** single-piece construction
- ✓ **Shielded output** cable
- ✓ **Full-wave voltage** doubling rectifier circuit
- ✓ **Zero start interlock** and **guard circuit**
- ✓ **Internal discharge solenoid**
- ✓ **Meter accuracy** $\pm 2\%$ full scale
- ✓ **10 mA current rating** for cable charging
- ✓ **External interlock** provisions
- ✓ **Three range** voltmeter
- ✓ **Four range** current meter
- ✓ **No internal leakage** at full load
- ✓ **Instantaneous** overload relay
- ✓ **Surge-limiting resistors** in HV output

BENEFITS

Ideal for field testing – compact, lightweight and rugged makes it suitable for field orientated applications

Operator Safety – the power supply and test object are automatically grounded when high voltage is turned off and there is no exposed high voltage

Simple to Use - a minimal amount of setup time and a simple control panel allows simple testing every time

Accurate Leakage Current Measurement - while guard circuit eliminates stray leakage currents

APPLICATIONS

DC Hipot testing of:

- Cable
- Transformers
- Electrical Switchgear
- Motors
- Generators
- Other Electrical Apparatus



TECHNICAL SPECIFICATIONS

General	815PL	880PL-10MA
Input Voltage	120 V, 50/60 Hz 230 V, 50/60 Hz	for -A version for -B version
Output Voltage	0 - 15 kV	0 - 80 kV
Output Current	5mA	10mA
Polarity	Negative output, positive ground	
Metering	± 2% full scale accuracy	
Ripple	0.5% per mA with rated resistance	

Weights and Dimensions (W x H x D, net weight, ship weight)

815PL	16.5"W x 9"D x 18"H (42 x 23 x 46 cm)	49 lbs (22 kg)	64 lbs (29 kg)
880PL-10MA	16.5"W x 9"D x 18"H (42 x 23 x 46 cm)	78 lbs (35 kg)	90 lbs (41 kg)

SCOPE OF SUPPLY

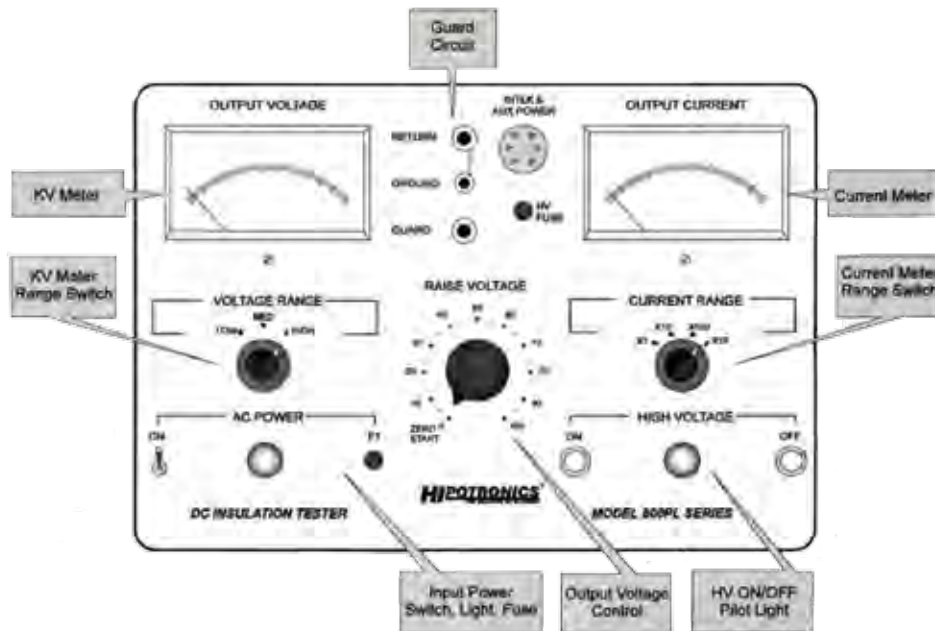
- Qty. 1 DC Power Supply (815PL or 880PL-10MA)
- Qty. 1 Input Line Cord, wire & plug, grounded type 6 feet (1.8 m)
- Qty. 1 Return Cable, 25 feet (7.6 m)
- Qty. 1 High Voltage Output cable, shielded RG34/U with alligator clip and rubber insulated boot, 25 feet (7.6 m)
- Qty. 1 Interlock Plug
- Qty. 1 Calibration Certificate
- Qty. 1 User's Manual

ORDERING INFORMATION

System	
15 kV, 5 mA DC Hipot	815PL-A or 815PL-B
80 kV, 10 mA DC Hipot	880PL-10MA-A or 880PL-10MA-B

Accessories	
Spare Parts Kits	SPK1-815PL or SPK1-880PL-10MA

CONTROL PANEL



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800PL Series

Two Piece DC Hipot Testers

■ The 800PL Series DC hipot testers provide an economical solution to DC field testing of power cables, terminations, motors, generators and other electrical apparatus. Models 8120-5PL and 8170-5PL offer 120kV and 170kV respectively. Both models feature two-piece construction complete with input line cord, interconnect cable and high voltage output cable. Convenient cable storage space is provided in the control box.

The 800 Series testers feature accurate kV meter readings regardless of load current. Accurate voltage and current measurements are assured since voltage readings are taken directly at the output of the high voltage transformer and current measurements are taken in the return leg. Safe discharging of both the test object and the high voltage transformer occur whenever the high voltage is turned off. Output power is provided by means of a full-wave voltage doubling rectifier circuit with silicon rectifiers.

FEATURES

- ✓ Rugged and portable construction
- ✓ Shielded output cable
- ✓ Full-wave voltage doubling rectifier circuit
- ✓ Zero start interlock and guard circuit
- ✓ Internal discharge solenoid
- ✓ Meter accuracy $\pm 2\%$ full scale
- ✓ 5 mA current rating for cable charging
- ✓ External interlock provisions
- ✓ Three range voltmeter
- ✓ Four range current meter
- ✓ No internal leakage at full load
- ✓ Instantaneous overload relay
- ✓ Surge-limiting resistors in HV output

BENEFITS

Ideal for field testing – compact, lightweight and rugged makes it suitable for field orientated applications

Operator Safety – the power supply and test object are automatically grounded when high voltage is turned off and there is no exposed high voltage

Simple to Use - a minimal amount of setup time and a simple control panel allows simple testing every time

Accurate Leakage Current Measurement - while guard circuit eliminates stray leakage currents

APPLICATIONS

DC Hipot testing of:

- Cable
- Transformers
- Electrical Switchgear
- Motors
- Generators
- Other Electrical Apparatus





TECHNICAL SPECIFICATIONS

General	8120-5PL	8170-5PL
Input Voltage	120 V, 50/60 Hz 230 V, 50/60 Hz	for -A version for -B version
Output Voltage	0 -120 kV	0 - 170 kV
Output Current	5mA	5mA
Polarity	Negative output, positive ground	
Metering	± 2% full scale accuracy	
Ripple	0.5% per mA with rated resistance	

Weights and Dimensions (W x H x D, net weight, ship weight)

8120-5PL	12" x 10" x 19"	(30 x 25 x 48 cm)	102 lbs (46 kg)	122 lbs (55 kg)
8170-5PL	12" x 10" x 30"	(30 x 25 x 75 cm)	145 lbs (66 kg)	165 lbs (75 kg)
Controller	17" x 14" x 15"	(43 x 36 x 38 cm)	25 lbs (11 kg)	35 lbs (16 kg)

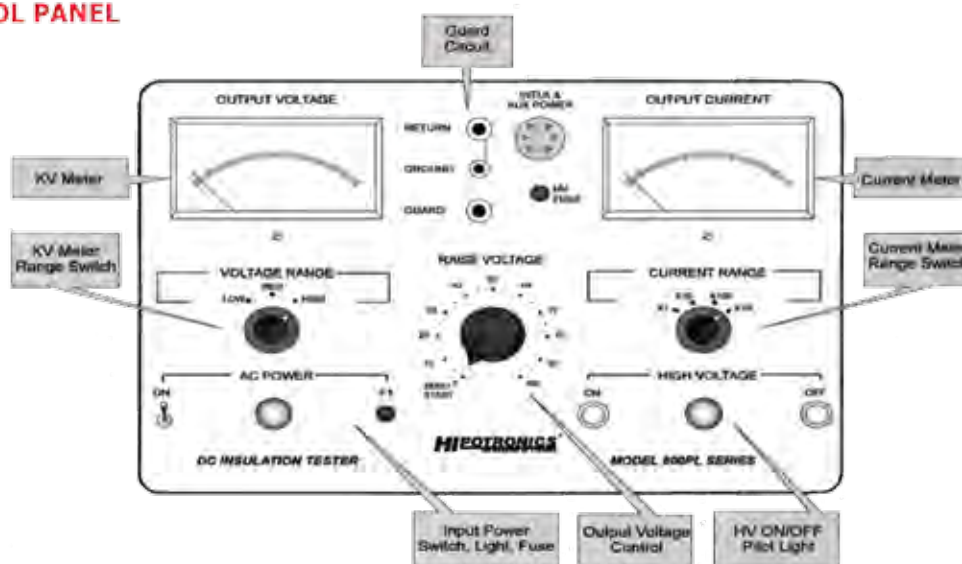
SCOPE OF SUPPLY

- Qty. 1 DC Power Supply (8120PL or 8170) with controller and HV section
- Qty. 1 Input Line Cord, wire & plug, grounded type 6 feet (1.8 m)
- Qty. 1 Return Cable, 25 feet (7.6 m)
- Qty. 1 High Voltage Output cable, shielded RG34/U with alligator clip and rubber insulated boot, 25 feet (7.6 m)
- Qty. 1 Interconnect Cable, 25 feet (7.6 m)
- Qty. 1 Interlock Plug
- Qty. 1 Calibration Certificate
- Qty. 1 User's Manual

ORDERING INFORMATION

System	
120 kV, 5 mA DC Hipot	8120-5PL-A 8120-5PL-B
170 kV, 5 mA DC Hipot	8170-5PL-A 8170-5PL-B
Accessories	
Spare Parts Kits	SPK1-8120-5PL SPK1-8170-5PL

CONTROL PANEL



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Hipotronics Test Equipment - HI





8000PL Series

60 kV Module Portable DC Hipot Testers

■ The 8000PL Series DC Hipot Testers offer a 60 to 300 kV range in a convenient cascade design. These systems are air insulated, with each module individually capable of producing 60 kV at 16 mA. The standard power rating is 2 kW. Low leakage measurement, even with fluctuating line voltage, is possible with the 1% line regulator. The design also offers reversible polarity.

This modular (expandable) construction favors the use of these portable testers in situations formerly requiring large mobile units. For example, when field-testing, each technician can be equipped with one controller and as many modules as routine tests require. Then, for any non-routine higher voltage tests, additional modules may be assembled at the test site. For example, a 240 kV test requires one controller and four modules. Each unit consists of a control case and one or several 60 kV modules up to the required voltage. For expansion above three modules, a HV expansion kit is required. This kit contains an anti-corona toroid rated for up to 300 kV, plus base extension legs and guy straps for support. The lightweight fiberglass control case includes all operating controls and meters, plus storage area for the base grounding probe, output resistor, and interconnecting cables.



FEATURES

- ✓ **Expandable** from 60 kV to 300 kV
- ✓ **Rugged, portable and modular** construction
- ✓ **High current** output for testing large loads
- ✓ **Reversible polarity**
- ✓ **Ripple <0.2% per mA**
- ✓ Analog kilovolt and current meters
- ✓ **Zero start interlock** and external interlock provisions for safety during operation
- ✓ **Anti-corona** toroid
- ✓ **Compact control** unit allows remote positioning ideal for field use
- ✓ **Momentary current reversal switch**
- ✓ **Optional high voltage shorting solenoid**

BENEFITS

Ideal for field testing - lightweight, compact, and rugged make it suitable for field testing

Quick and Easy - a modular system limits the setup time and user-friendly controls make it simple to use

Modular Construction - bring only the number of modules necessary for the required voltage

Easily Transportable - Air-insulated modules make it light weight and simple to transport in a van or pickup truck

Accurate Leakage Current Measurements - while guard circuit eliminates stray leakage currents

APPLICATIONS

DC Hipot testing of:

- **Cable**
- **Electrical Switchgear**
- **Motors**
- **Generators**
- **Other Electrical Apparatus**



TECHNICAL SPECIFICATIONS

General

Model Number	8060PL	8120PL	8180PL	8240PL	8300PL
Input Voltage / Frequency					
Number of Modules	1	2	3	4	5
Output Voltage (kV DC)	60	120	180	240	300
Output Current (mA)	16	8	5.5	4.1	3.3
Duty Cycle	Continuous				
Output Polarity	Reversible				
Output Ripple	< 0.2% per mA				
Metering	± 2% Full Scale Accuracy				

Weights and Dimensions (W x H x D, net weight, ship weight)

Controller	22" x 22" x 12" (560 x 560 x 310 mm)	69 lbs (31 kg)	79 lbs (36 kg)
Module	9¼" x 16¼" x 10½" (240 x 410 x 270 cm)	58 lbs (26 kg)	68 lbs (31 kg)

SCOPE OF SUPPLY

- Qty. X 8KPL-MOD 60 kV Module (quantity depends upon model number)
- Qty. 1 8KPL-CONT Controller
- Qty. 1 DA13-280 Ground stick, 120 kV max
- Qty. 1 8KPL-EXT-HV HV expansion Kit#
- Qty. 1 Epoxy Resistor Qty. 1 Input Line Cord, 10 feet (3 m)
- Qty. 2 Ground Cable, 15 feet (4.6 m)
- Qty. 1 Interconnection Cable, 30 feet (9.1 m)
- Qty. 1 Calibration Certificate
- Qty. 1 User's Manual

Supplied ONLY with 8180PL, 8240PL and 8300PL

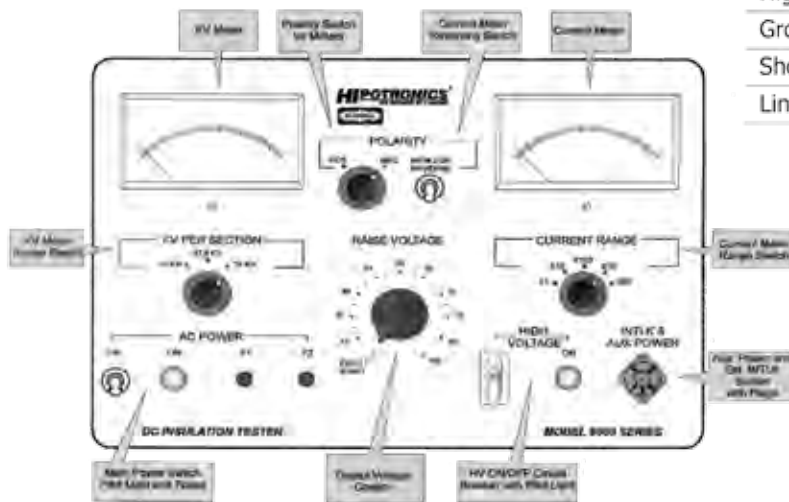
ORDERING INFORMATION

System

60 kV, 16 mA DC Hipot	8060PL-*
120 kV, 8 mA DC Hipot	8120PL-*
180 kV, 5.5 mA DC Hipot	8180PL-*
240 kV, 4.1 mA DC Hipot	8240PL-*
300 kV, 3.1 mA DC Hipot	8300PL-*

Accessories

DC Hipot Controller, 8000PL Series	8KPL-CONT
60 kV Module Kit	8KPL-MOD
High Voltage Expansion Kit	8KPL-EXT-HV
Ground stick, 120 kV max.	DA13-280
Shorting Switch, 175 kV - 1 MV	8175-SS
Line Regulator, 1%, 2 kW	8KPL-LR2



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Hipotronics Test Equipment - HI



30/60 HVT Series

AC Hipot Testers

■ **The HVT Series** AC hipot testers are an economical solution to AC field-testing of vacuum interrupters, breakers, switchgear, and other electrical apparatus. Models 30HVT and 60HVT offer 30kV or 60kV respectively. Both models are handcart mounted for portability and come complete with input line cord, interconnecting cable and ground leads.

The 30HVT and 60HVT series test sets are specifically designed to perform quick and accurate AC dielectric tests. The HVT series assures accurate voltage measurements using an internal high voltage divider, rather than less accurate primary metering. The HVT series also features a triple range current meter in the return leg of the high voltage transformer for accurate current measurements. A guard circuit prevents stray or surface leakage from being measured by the current meter. To ensure safe operation the unit is equipped with a fast acting circuit breaker, zero start interlock and provision for an external interlock.



FEATURES

- ✓ **Compact portable** hand cart design
- ✓ **Zero start** interlock
- ✓ **Single end grounded** high voltage test transformer
- ✓ **Separate guard and return**
- ✓ **Metering accuracy** $\pm 2\%$ full scale
- ✓ **Internal** high voltage divider
- ✓ **Triple range** voltmeter
- ✓ **Triple range** current meter
- ✓ **Fast acting** overload circuit breaker
- ✓ **External** interlock provision

BENEFITS

Ideal for field testing – compact, lightweight and rugged makes it suitable for field orientated applications

Operator Safety – zero start and external interlock prevents high voltage from being energized until operator is ready

Simple to Use - a minimal amount of setup time and a simple control panel allows simple testing every time

Accurate Leakage Current Measurement - while guard circuit eliminates stray leakage currents

APPLICATIONS

AC Hipot testing of:

- Vacuum bottles
- Vacuum interrupters
- Switchgear
- Hot Sticks
- Blankets
- Ropes
- Gloves
- Hydraulic hose

TECHNICAL SPECIFICATIONS

General	30HVT	60HVT
Input Voltage	120 V, 50/60 Hz 230 V, 50/60 Hz	for -A version for -B version
Output Voltage	0 -30 kV	0 - 60 kV
Output Current	10mA	10mA
Voltmeter	0-6/12/30kV	0-12/30/60kV
Current Meter	0-.250/1/10mA	0-.250/1/10mA
Meter Accuracy	± 2% full scale accuracy	

Weights and Dimensions

30HVT: 17.4"W x 14.5"D x 31.9"H (441 x 368 x 810mm)	Unit weight, 82lbs (37kg), Shipping weight, 175lbs (80kg)
60HVT: 17.4"W x 14.5"D x 31.9"H (441 x 368 x 810mm)	Unit weight, 97lbs (44kg), Shipping weight, 196lbs (89kg)

SCOPE OF SUPPLY

- Qty. 1 AC HV Tank with 25 feet (7.6m) interconnecting cable
- Qty. 1 Input Line Cord, wire & plug, grounded type 6 feet (1.8 m)
- Qty. 2 Return/ground lead, 25 feet (7.6 m)
- Qty. 2 Shielded interconnecting cable for output current and volt metering 25 feet (7.6m)
- Qty. 1 Interlock Plug
- Qty. 1 Calibration Certificate
- Qty. 1 User's Manual

ORDERING INFORMATION

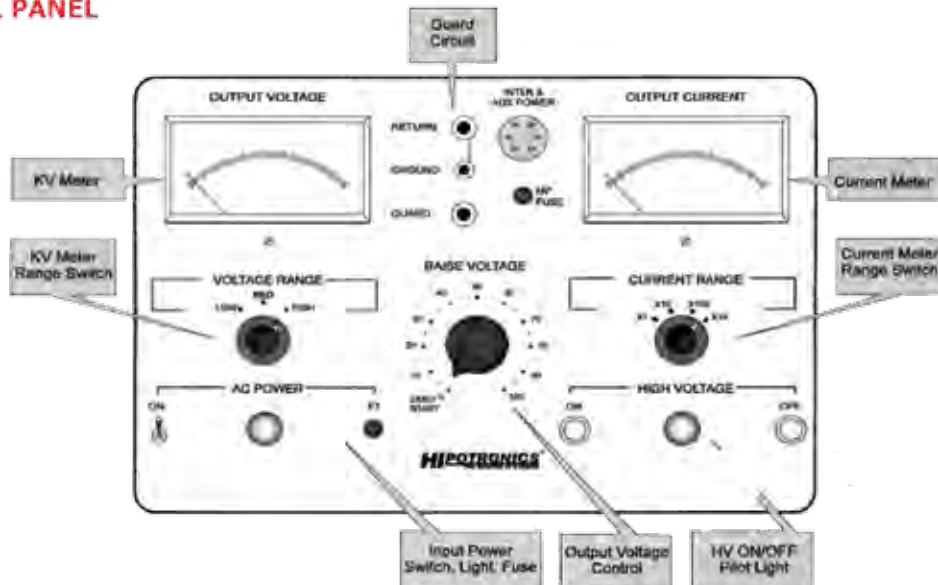
System

30kV, 10mA	30HVT-A or 30HVT-B
60kV, 10mA	60HVT-A or 60HVT-B

Accessories

Spare Parts Kits	SPK1-30HVT or SPK1-60HVT
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CONTROL PANEL



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100/120 HVT Series

AC Hipot Testers

■ **The HVT Series** AC hipot testers are an economical solution to AC field-testing of bucket trucks, aerial platforms, vacuum interrupters, breakers, switchgear, and other electrical apparatus. Models 100HVT and 120HVT offer 100kV or 120kV respectively. Both models are handcart mounted for portability and come complete with input line cord, interconnecting cable and ground leads.

The 100HVT and 120HVT series test sets are specifically designed in meeting test procedures of the ANSI/SIA A92.2 1990 specification applied to the insulating boom of work platforms and bucket trucks. The HVT series assures accurate voltage measurements using an external high voltage divider, rather than less accurate primary metering. The HVT series also features a triple range current meter in the return leg of the high voltage transformer for accurate current measurements. A guard circuit prevents stray or surface leakage from being measured by the current meter. To ensure safe operation the unit is equipped with a fast acting circuit breaker, zero start interlock and provision for an external interlock.



FEATURES

- ✓ **Compact portable** hand cart design
- ✓ **Zero start** interlock
- ✓ **Single end grounded** high voltage test transformer
- ✓ **Separate guard and return**
- ✓ **Metering accuracy** $\pm 2\%$ full scale
- ✓ **External** high voltage divider
- ✓ **Triple range** voltmeter
- ✓ **Triple range** current meter
- ✓ **Fast acting** overload circuit breaker
- ✓ **External** interlock provision

BENEFITS

Ideal for field testing – compact, lightweight and rugged makes it suitable for field orientated applications

Operator Safety – zero start and external interlock prevents high voltage to be energized until operator is ready

Simple to Use - a minimal amount of setup time and a simple control panel allows simple testing every time

Accurate Leakage Current Measurement - while guard circuit eliminates stray leakage currents

Meets ANSI/SIA A92.2 1990 - test specifications

APPLICATIONS

AC Hipot testing of:

- **Aerial platform**
- **Bucket truck**
- **Vacuum bottles**
- **Vacuum interrupters**
- **Switchgear**
- **Hot sticks**
- **Any high voltage AC test requirement**
(within current limitations)



TECHNICAL SPECIFICATIONS

General	100HVT	120HVT
Input Voltage	120V, 50/60Hz (catalog suffix -A) 220V, 50/60Hz (catalog suffix -B)	120V, 50/60Hz (-A suffix only)
Output Voltage	0-50kV or 0-100kV	0 - 120kV
Output Current	50mA (100kV tap) 100mA (50kV tap)	10mA
Voltmeter	0-25/50/100 kV AC	0-30/60/120 kV AC
Current Meter	0-1/10/100 mA	0-.250/1/10 mA
Meter Accuracy	± 2% full scale accuracy	

Weights and Dimensions

100HVT	17.4"W x 14.5"D x 31.9"H (441 x 368 x 810mm)	Unit weight: 240lbs, Shipping weight: 306lbs
120HVT	17.4"W x 14.5"D x 31.9"H (441 x 368 x 810mm)	Unit weight: 240lbs, Shipping weight: 306lbs

SCOPE OF SUPPLY

- Qty. 1 AC HV Tank with 25 feet (7.6m) interconnecting cable
- Qty. 1 Input line cord, grounded type 10 feet (3 m)
- Qty. 2 Return /ground leads, 25 feet (7.6 m)
- Qty. 2 Shielded interconnecting cable for output current and volt metering 25 feet (7.6m)
- Qty. 1 Interlock plug
- Qty. 1 Calibration certificate
- Qty. 1 User's Manual

ORDERING INFORMATION

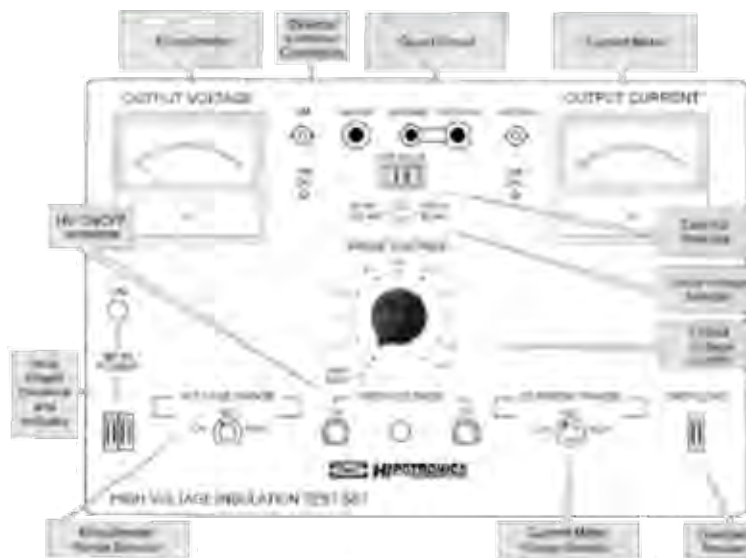
System

120kV @ 1.2kVA	120HVT-A
50/100kV @ 5kVA	100HVT-A or 100HVT-B

Accessories

Spare Parts Kits	SPK1-100HVT or SPK1-120HVT
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CONTROL PANEL



Locate your local sales representative at www.hipotronics.com



Hipotronics Test Equipment - HI



7BT60

Vacuum Interrupter Test Set

■ The Hipotronics Model 7BT60 is a portable 60 kV AC (center tapped) test system designed to test the integrity of vacuum interrupters in switchgear. The output (current limited to 10 mA) is programmed to raise voltage at a preset rate to the desired test level. Once the unit reaches the preset voltage a dwell timer will hold the voltage at that level for the preset time duration. After the dwell time has elapsed, the unit will return to zero. Any failure during the test will be indicated on a "failure" lamp located on the front panel, and the breakdown voltage will be indicated on the Memory kV meter.



FEATURES

- ✓ **Automatic Testing**
- ✓ **0 ... 60kV AC Output**
- ✓ **Dwell Timer**
- ✓ **Memory Kilovoltmeter**
- ✓ **Pre-settable Output Kilovoltmeter**
- ✓ **Failure Indicator Lamp**
- ✓ **500 and 3000 V/sec Rise Time**
- ✓ **Removable High Voltage Section for operator safety**
- ✓ **Rugged Field Case**
- ✓ **Field Proven Reliability**

BENEFITS

Go, No-Go Test - a pass / fail indicator lamp provides immediate, visual indication of test results

Easy to Use - with a minimum amount of set up time and user training means testing can start right away

Field Portable - this self-contained, single piece unit is suitable for field use

One Step Testing - the user sets the desired test parameters and the sequence is automatically run

APPLICATIONS

Used to test vacuum interrupters in switchgear. Typically used by:

- **Electric Utilities**
- **Test Companies**
- **Petrochemical Utilities**
- **Facility Maintenance**



TECHNICAL SPECIFICATIONS

General

Input Voltage	120 V, 50/60 Hz	for -A version
	230 V, 50/60 Hz	for -B version
Output Voltage	0 -60 kV (center tapped)	
Output Current	20mA	
Rise Times	500 volts per second or 3000 volts per second	
Metering	0 ... 60kV / pre-settable, memory meter	

Weights and Dimensions (W x H x D, net weight, ship weight)

7BT60A	12" x 34" x 12" (30.4 x 86.4 x 30.4 cm)	96 lbs (45 kg)	125 lbs (57 kg)
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SCOPE OF SUPPLY

- Qty. 1 7BT60 Vacuum Interrupter Tester with 60 kV center tapped transformer
- Qty. 1 Interconnect Cable, between control section and base, 25 feet (7.6 m)
- Qty. 2 Test Leads, 10 feet (3 m)
- Qty. 1 Power Line Cord, 6 feet (1.8 m)
- Qty. 1 Calibration Certificate
- Qty. 1 User's Manual

ORDERING INFORMATION

System	60 kV, 20mA AC Hipot	7BT60-A or 7BT60-B
Accessories	Spare Parts Kits	SPK1-7BT60

CONTROL PANEL



Locate your local sales representative at www.hipotronics.com



Hipotronics Test Equipment - HI



MIDAS

Mobile Insulation Diagnosis & Analysing System

■ Periodic maintenance and inspection of high voltage insulation losses is performed on power transformers, bushings, motors, generators, etc. The MIDAS is a valuable tool for such measurements especially in the harsh electrical environments experienced in substations and other field locations.

Designed for testing at local power-line frequency (50Hz or 60Hz), MIDAS automatically measures and records dissipation factor ($\tan \delta$), power factor ($\cos \phi$) and all other relevant values of impedances (capacitive, inductive and resistive). Damage or changes in the insulation material are detected rapidly and reliably.

Furthermore the optional built-in 3 phase Transformer Turns Ratio Meter and/or Frequency Response Analyser help to detect faulty transformer windings as well as defective tap positions. The rugged construction and large pneumatic wheels make transportation to and access of remote locations easy.

A large touch sensitive, sunlight readable colour display and the graphical user interface create a highly visual environment with clear illustration of the instrument's advanced measuring and analysing features.

Predefined test sequences linked with limiting values (ex. previous measurements) guide the user automatically through the test sequence and allow a first assessment on-site.

Built-in standard interfaces (USB, Ethernet) enable easy data exchange with a host computer for data collecting, reporting, printouts, statistics and advanced analysis.



FEATURES

To analyze the condition and quality of high voltage insulation, the system performs automated measurement of:

- ✓ **Dissipation Factor ($\tan \delta$) and Power Factor ($\cos \phi$)**
- ✓ **Short Circuit Impedance and Excitation Current**
- ✓ **Additional measuring capabilities** like Capacitance, Quality Factor, Frequency, Voltage, Current, Power, Losses, Impedance, Inductance, Reactance, Spectrum Analyzer, Digital Scope and Data Logger
- ✓ **Frequency Response Analysis** (optional; built-in or external remote controlled unit)
- ✓ **Turns ratio, voltage ratio, phase displacement** (optional; built-in or external remote controlled unit)
- ✓ **Trending Analysis** function – get a first graphical on-site assessment
- ✓ **Manual and Automatic** (Sequencer) test operation.
- ✓ Built-in high voltage supply up to **15kV, 4kVA**
- ✓ Built-in, long-term stable **standard capacitor**
- ✓ **Rugged, reliable and safe** construction
- ✓ **State-of-the-art** integrated PC running actual Windows platform with advanced user interface

BENEFITS

Shortest Measuring Time

Shortest equipment set-up and measuring time by an "all in one" unit. High output power allows testing of biggest class power transformers in shortest time.

Easy to operate

Self-explanatory user interface with a large graphical colour TFT touch screen. Manual and Automatic test operation. Software assisted test planning, preparation, execution and first assessment.

Highest Accuracy

Highest accuracy in field-testing using the latest measuring techniques as well as the highest long-term stability of system accuracy by using a gas-insulated standard capacitor as internal reference arm and self-calibrating measurement sensors.

Advanced interference suppression

Advanced interference suppression allows measurement at local power-line frequency as recommended in the related standard IEEE/ANSI 57.12.90

APPLICATIONS

- | | |
|-----------------------------|--------------------|
| → Power Transformers | → Bushings |
| → Distribution Transformers | → Cables |
| → Instrument Transformers | → Capacitors |
| → Rotating Machines | → Circuit Breakers |
| → Liquid Insulation | → Surge Arrestors |



TECHNICAL SPECIFICATIONS

Measuring Unit	Range	Resolution	Accuracy
Dissipation Factor tan δ	0 .. 100 (0 .. 10'000%)	0.0001 (0.01%)	±0.5 % rdg ± 0.0001 (±0.5 % rdg ± 0.01%) 1
Power Factor cos φ	0 .. 1 (0 .. 100%)	0.0001 (0.01%)	±0.5 % rdg ± 0.0001 (±0.5 % rdg ± 0.01%) 1
Quality Factor	0.01 .. 10000	0.0001	± 0.5% rdg ± 0.0001 1
Capacitance Range 3 @ 50Hz	6.5 pF .. 56 nF @ 15kV 8.1 pF .. 88 nF @ 12kV 1.2 nF .. 13 uF @ 80V	0.01 pF	±0.3 % rdg ± 0.3 pF
Capacitance Range 3 @ 60Hz	5.4 pF .. 47 nF @ 15kV 6.8 pF .. 73 nF @ 12kV 1.0 nF .. 10.8uF @ 80V	0.01 pF	±0.3 % rdg ± 0.3 pF
Inductance Range 4 @ 50Hz	140 H .. 1600 kH @ 15kV 112 H .. 1280 kH @ 12kV 0.75 H .. 8.5 kH @ 80V	0.1 mH	±0.5 % rdg ± 0.5 mH
Inductance Range 4 @ 60Hz	117 H .. 1334 kH @ 15kV 93 H .. 1067 kH @ 12kV 0.62 H .. 7 kH @ 80V	0.1 mH	±0.5 % rdg ± 0.5 mH
Test Voltage	≤ 15 kV (12 kV)	1 V	±0.3 % rdg±1 V 2
Test Current Input A & B	30uA .. 15 A	0,1 uA	±0.3 % rdg± 1 uA
Ref Current Input Cn ext	30uA .. 300 mA	0,1 uA	±0.3 % rdg± 1 uA
Test Frequency	15 .. 400 Hz	0.01 Hz	±0.1 % rdg± 0.1 Hz
Apparent Power S	≤ 4000 VA	0.1 mVA	±0.8 % rdg± 1 mVA
Real Power P	≤ 1100 W	0.1 mW	±0.8 % rdg± 1 mW
Reactive Power Q	≤ 4000 var	0.1 mvar	±0.8 % rdg± 1 mvar
Output Voltage	80 V .. 15 kV MIDAS 288x G	80 V .. 12 kV MIDAS 288x	
Output Frequency	15 .. 400 Hz	Output power derating beyond 40..70Hz	
Output Current	150 mA continuous , 450 mA max 5min.		
Output Power max	4000 VA		
	≤ 1500VA	1501 .. 2000VA	2001 .. 3000VA 3001 .. 4000VA
Output Power duration	continuous 30 min. ON / 1h OFF	5 min. ON / 1h OFF	1 min. ON / 1h OFF
Output PD level max	≤ 500 pC total value, together with connected resonating inductor 5289 or 5288A		
Internal Cn (Reference)	100 pF, tan δ 0.00002, Capacitance constancy < 0.01% / year Temperature coefficient < 0.01% / K		
Input Power	100 .. 240 VAC, 50 / 60 Hz, 1kW, active PFC (IEC61000-3-2)		
Operating Temperature	-10 .. 50°C		
Storage Temperature	-20 .. 70°C		
Relative Humidity	5 .. 95 % r.h.		
Protection classes	IP22, IEC 61010, CE mark, general IEC 61326-1, IEC 61000-4-X, 61000-3-X, EN 55011, ANSI/IEEE C37.90		
Weight & Dimensions	Instrument box 58 kg(174 lbs)	34 x 47 x 104 cm (13.5" x 18.5" x 41")	
	PC head 7.5kg(17 lbs)	30 x 42 x 26 cm (12" x 16.5" x 10")	
	Trolley 11kg (25 lbs)	33 x 68 x 112 cm (13" x 26.8" x 44")	
Recorded Values	DF(tanδ), DF(tanδ)@20°C , DF%(tanδ), DF%(tanδ)@20°C , PF(cosφ), PF(cosφ)@20°C , PF%(cosφ), PF%(cosφ)@20°C, QF (quality factor) @20°C Cp(Zx= Cp Rp), Rp(Zx= Cp Rp), Cs(Zx= Cs+ Rs), Rs(Zx= Cs+ Rs) , Ls(Zx= Ls+ Rl), Rl(Zx= Ls+ Rl), Lp(Zx= Lp Rp), Rp(Zx= Lp Rp), Standard capacitor Cn, URMS, URMS√3, ITest eff, IRef eff, Im, Ire, Impedance Zx, Phase-angleφ(Zx), Admittance Yx, Frequencytest, Frequencyline, App. Power S, Real Power P, Reactive Power Q, Real Power @2.5kV, Real Power @10kV, TemperatureAmbient s, TemperatureInsulation s, Rel.Humidity s, Temp.Corr.Factor K, Connection mode, Settings, all Notes and Comments, Time, Date		
Interfaces (PC head 2880)	USB, Ethernet, RS232, Mouse, Keyboard, Thermal printer		
Data format	XML, CSV		
Calibration Interval	2 years recommended		
Safety Specification	VDE 0411/part 1a , IEC/EN 61010-1:2002		

1 Accuracy valid @ 50..60Hz 2 Accuracy valid for voltage > 1000 V 3 Can be expanded with optional Resonating Inductor
4 Min. value can be lowered with optional Current Booster 5 measured by external temperature/humidity probe



Hipotronics Test Equipment - HI



TTR 2795

Fully automated three phase Transformer Turns Ratio Meter

■ **On-site testing of turns ratio is an important basic measurement for power transformer diagnosis.**

It helps to detect faulty transformer windings as well as defective tap changer positions. The simple ratio of turns or voltage and the related ratio error is not sufficient to detect all possible failures of a power transformer winding. The excitation current and the phase angle between primary and secondary windings give additional information about the winding condition. The TTR 2795 provides all these measurements in one compact instrument.

Transformer Turns Ratio Meter TTR 2795 is the next generation of the very successful Tettex transformer turns ratio meter line. The result of our close collaboration with worldwide TTR users and industry specialists in current and voltage transformers is this advanced instrument with its unbeaten performance. The TTR 2795 measures turns ratio with the highest accuracy in the industry and has one of the largest turns ratio ranges commercially available.

This advanced instrument automatically recognizes winding connections and vector group numbers of transformer windings. Just connect the measuring cables and press the start button and get the test results.

For an easy and fast detection of faulty tap positions, the measured turns ratios vs. tap changer position is displayed graphically.

The TTR 2795 provides a wide ratio range, which allows the user to determine the no load accuracy of CT's and PT's.

In addition, the selectable test voltages of 100V, 40V, 10V and 1V avoid any saturation effects on current transformers.

FEATURES AND BENEFITS

Fully automated measurement of **turns ratio, voltage ratio, phase displacement** and **excitation current**.

Highest measurement accuracy in the industry of up to 0.03% makes the 2795 the perfect tool for preventive maintenance measurement.

Automatic winding connection identification AWCI and **automatic vector group detection** supports the quick and easy operation.

Safety connection control feature proofs test setup before applying test voltage to avoid any damage of personnel, test equipment and instrument.

Build-in printer for quick test report generation and total prevention of data loss.

User friendly self-explaining interface with one rotary-push-button for easy access to the menu structure.

Large graphic display shows all data at a glance and displays tap changer results in a clear graphic diagram.

Lightweight, compact and rugged design for use in harsh environments. Closed case is IP65 waterproof, open case is splash proof.

Remote control software to operate the unit from a laptop PC and for easy gathering exchanging and analyzing of measurement data.

APPLICATIONS

Turns Ratio, Voltage Ratio, Phase Displacement and Excitation Current measurements according to ANSI, IEC and AS standards on:

- Power and Distribution Transformers
- Current and Voltage Instrument Transformers





REPORTING

Full reports are automatically generated in XML-, HTML- and CSV- format.

The graphs itself are also separately stored in jpg-format to make the easy handling complete.

The XML- and HTML-files can be opened in e.g. Internet Explorer and from there directly printed or copied into a Microsoft Word document.

To further expand the powerful analysis functionality of the APSW2795 the automatic generated CSV-file can be directly opened in Microsoft EXCEL where customer specific data processing and calculations are possible.

Example of XML-report printout

TECHNICAL SPECIFICATIONS

General

Excitation voltage	1 V, 10 V, 40 V and 100 V; automatic or manual selectable
Excitation current	max. 1 A (10 mA at 1 V)
Display	5.2" dot matrix LCD 240x128 module with backlight
Memory	Stores up to 100 complete test results/test setups
Printer	Thermal strip printer, paper width 58mm
Interfaces	Computer: RS 232C, 19200 baud, 9 pole Tap changer: 3 pole contact in/out (potential free)
Operating temperature	- 10°C* ... 55°C * - 10°C typical, - 5°C guaranteed
Storage temperature	- 20°C ... 70°C
Mains	95 .. 240 V AC, 50/60 Hz, max. 1.3 A
Dimension (L x W x D)	41 cm x 31 cm x 17 cm (16" x 12.2" x 7")
Weight	8.8 kg (19 lbs) excl. cables

Measurement Ranges and Accuracy

Ratio	Accuracy (@ Excitation voltage) <small>Excitation voltage, values valid after a warmup-time of:</small>			
	@ 1 V	@ 10 V	@ 40 V	@ 100 V
0.8 .. 100	± 0.10 %	± 0.05 %	± 0.05 %	± 0.03%
101 .. 1000	± 0.20 %	± 0.05 %	± 0.05 %	± 0.05 %
1001 .. 1500	n/a	± 0.05 %	± 0.05 %	± 0.05 %
1501 .. 2000	n/a	± 0.10 %	± 0.05 %	± 0.05 %
2001 .. 4000	n/a	± 0.20 %	± 0.05 %	± 0.05 %
4001 .. 13000	n/a	n/a	± 0.25 %	± 0.15 %
13001 .. 20000	n/a	n/a	n/a	± 0.20 %

Excitation Current	Range	Resolution	Accuracy
Range and Accuracy	0 ... 1 A	0.1 mA	± 1 mA

Phase Angle	Range	Resolution	Accuracy
Range and Accuracy	± 180°	0.01°	± 0.05°



Hipotronics Test Equipment - HI