

2017 TEST & MEASUREMENT EQUIPMENT CATALOG



HIGH VOLTAGE TESTING EQUIPMENT



power arbor Sp. z o.o., Poland deliver in Central Europe and Middle East quality high voltage testing equipment to the utilities, testing service companies, electrical contractors and large industrials worldwide.

The result – is technically advanced, portable Test Van built-in solutions, and easy to use products for high voltage testing, diagnostics, evaluation, and preventive maintenance testing of electrical substation apparatus, power cables, and other objects designed to operate under medium or high voltage conditions.

All equipment is designed and manufactured according to Quality Management System based on ISO 9001 standard, certified by Intertek plc., while the in-house ISO/IEC 17025 standard certified calibration laboratory is ensuring the accuracy of the supplied apparatus.

Keeping in touch with our customers around the world permanently combined with market analysis and quick response to its changes made it possible to develop our most progressive solutions.

Your power arbor Sp. z o.o. team





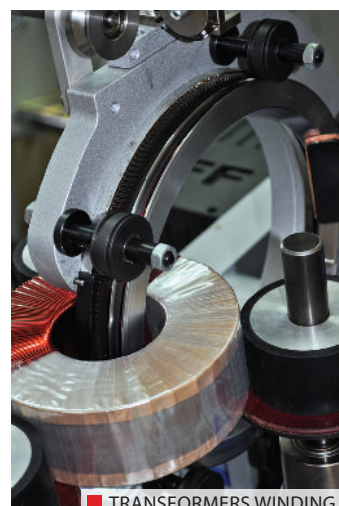
■ TURNING AND MILLING USING CNC



■ CABLE DATA PROCESSING



■ EQUIPMENT CONSTRUCTION



■ TRANSFORMERS WINDING



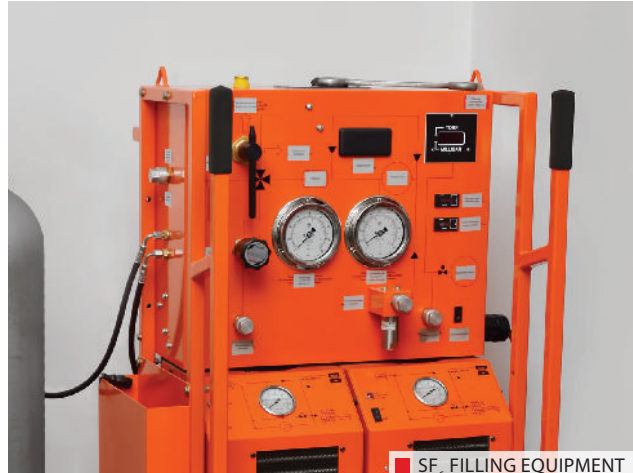
■ STEEL SHEET BENDING



■ TRANSFORMERS WINDING



■ STEEL SHEET CUTTING



■ SF₆ FILLING EQUIPMENT

CABLE FAULT LOCATION

VEHICLE-BASED SYSTEMS

ETL-8VP Compact Vehicle-Based System.....4

ETL-40VP Vehicle-Based System.....6

ETL-80VP Vehicle-Based System.....6

COMPACT SYSTEMS

SWG-12/1100RP Portable Cable Fault Location System 10

STANDALONE EQUIPMENT

RIF-9P Digital Impulse Reflectometer..... 12

LFG-50P Low Frequency Generator 14

LFG-200P Low Frequency Generator 14

LFG-2500P Low Frequency Generator 16

P-900P Ground Microphone 17

HIGH-VOLTAGE TESTING

PORTABLE HIPOTS

VLF-60P Cable Insulation Tester 18

HVTS-70/50P High-Voltage Testing System 20

HVT-70/50P High-Voltage Testing System 20

HVTS-HPP-Series High-Voltage Testing Systems	22
---	----

RUBBER GOODS TESTERS SVS-SERIES

SVS-50MP Rubber Goods Tester.....	24
--	----

SVS-100MP Rubber Goods Tester	24
--	----

SVS-50CP Rubber Goods Tester.....	26
--	----

SVS-100CP Rubber Goods Tester	26
--	----

HIGH CURRENT TESTING AND DIAGNOSTICS

UPA-1P, UPA-3P Automatic Circuit Breaker Testers.....	28
--	----

UPA-6P Automatic Circuit Breaker Tester	28
--	----

UPA-10P Automatic Circuit Breaker Tester	28
---	----

UPA-16P Automatic Circuit Breaker Tester	28
---	----

UPA-20P Automatic Circuit Breaker Tester	28
---	----

INSULATING LIQUIDS TESTING

OLT-80P Oil Tester	30
---------------------------------	----

OLT-100P Oil Tester	30
----------------------------------	----

C-80P, C-100P Oil Tester Calibrators	32
---	----

Tangens-3MP Dissipation Factor Oil Tester	33
--	----



► Application

The ETL-8VP is an compact vehicle-based system, which is used for the following purposes:

- Cable testing up to 8 kV DC
- Cable faulty place burning
- Fault prelocating using Time-Domain Reflectometer RIF-9P working in:
 - TDR mode
 - Arc-Reflection mode
 - Impulse Current Mode
 - Voltage coupling mode
- Precise pinpointing with ground microphone
- Cable route tracing (optional).

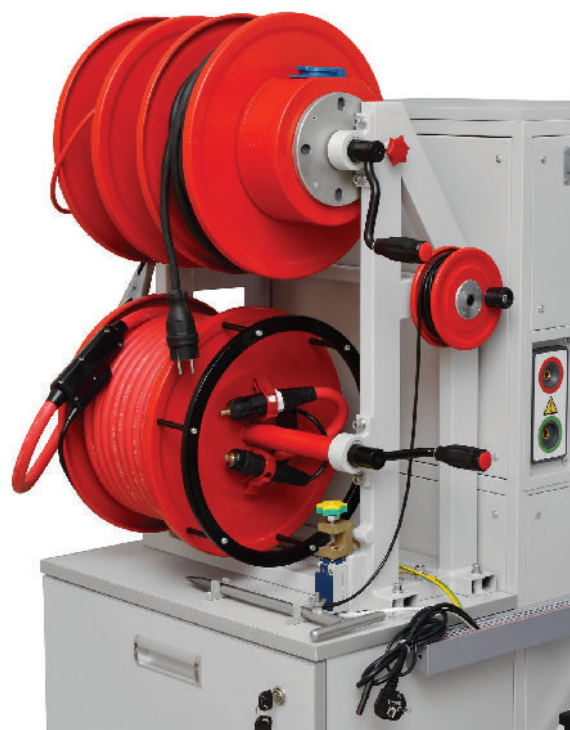


► Technical specifications

Parameter	Value
GENERAL parameter	
Input voltage, V	230 ± 23
Frequency, Hz	50 ± 1
Power consumption, kVA, max	1.0
TEST MODE	
Output DC voltage range, kV	0 – 8
Output DC current range, mA	0 – 10
BURN MODE	
Output DC voltage range, kV	0 – 8
Output DC current range, mA	0 – 100
SURGE MODE	
DC voltage ranges, kV	2 / 4 / 8
Output energy, J, max	1000
Timer set (automatic surge mode)	3 – 15 seconds
Manual single surge	✓
Flexible voltage change during automatic operation	✓
Pinpointing with an acoustic receiver	✓
PRELOCATION MODE ¹	
Methods	TDR / Arc reflection/ Impulse current/ Voltage coupling
Automatic distance measuring	✓
Saving cable parameters into Reflectometer non-volatile memory	✓
Saving reflectograms either to Reflectometer non-volatile memory or USB flash drive	✓
CABLE TRACING MODE ²	
Cable tracing using 50W audio-frequency generator with frequencies 491/ 982/ 8440 Hz with a receiver	✓

¹ - Learn more from KEP RIF-9P page;

² - Learn more from KEP LFG-50P page.



► Application

ETL-40VP is a modular diagnostic and test equipment, which is designed for testing and fault location of both LV and MV cables. The key parameters are designed flexible to satisfy customer's specific requirements.

Vehicle-based system ETL-40VP allows:

- DC cable testing up to 40 kV with 300 mA max. current
- Burning up to 20 kV / 1 A
- Surge energy up to 2400 J
- Precise fault prelocating using Time-Domain Reflectometer RIF-9P working in:
 - TDR mode
 - Arc-Reflection mode
 - Impulse Current Mode
 - Voltage coupling mode
 - Automatic test procedure
- Fault location using step voltage mode (optional)



► Safety

Grounding control unit (GCU) monitors a voltage between a grounded bar and safety earthing. Once this voltage level reaches 48 V a high-voltage lead out disconnects from a voltage source automatically. Control panel software will not permit to operate with faulty earthing.

This unit monitors a resistance between operating earth connector and safety earth connector. It automatically switches off the high-voltage if this resistance reaches 8 Ohm.

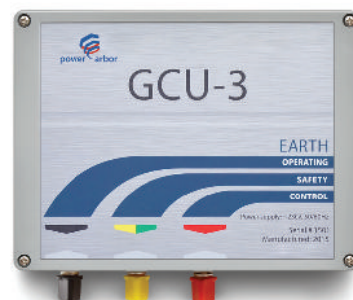
Visible shorting bar makes you sure, that high-voltage lead out is grounded at the end of operation.

Emergency stop button disconnects high-voltage lead out from a voltage source mechanically, independently from a firmware.

Special position of a mechanic mode switch gives a possibility to ground a high-voltage lead out and disconnect it from a voltage source at the end of operation.

Control panel software will not operate if a mode switch is set to ground position.

The equipment is mounted inside the vehicle. Basic vehicle for installation Ford Transit custom van. Auxiliary equipment:



Grounding control unit



Visible shorting bar

► Package contents

Component	Quantity
Silent power generator 7 kVA	1
Air conditioner, mounted on vehicle roof	1
Cable drum set, which includes 50 m of the following cables:	
• HV testing cable	1 set
• Safety grounding cable	1 set
• Control grounding cable	1 set
• Feeding cable	1 set
Operating desk with drawers for tools	1
Additional 230V CEE16 outlets for auxiliary devices connection	2
Van auxiliary LED lighting	1 set
Cable route length meter	1
5 kV insulation tester	1
Discharging stick	1
Warning lamps (red and green) for operating condition indication	1
Isolating transformer 4 kVA	1

► Technical specifications

Parameter	Value ETL-40VP (80VP)
GENERAL parameter	
Input voltage, V	230 ± 10 %
Frequency, Hz	50 ± 1
Power consumption, kVA, max	2.0 (3.0)
[⚡] TEST MODE	
Output DC voltage range, kV	0 – 40 (0 – 80)
Output DC current range, mA	0 – 300 (0 – 580)
[🔥] BURN MODE	
Output DC voltage range, kV	0 – 20
Output DC current range, mA	0 – 1000 (0 – 40)
[⚡] SURGE MODE	
Ranges, kV	4 / 8 / 16 / 32
Output energy, J, max	2000 (2560) at each range
Timer set (automatic surge mode)	5 – 15 seconds (3 – 15 seconds)
Manual single surge	✓
Flexible voltage change during automatic operation	✓
Pinpointing with an acoustic receiver	✓
[?] PRELOCATION MODE	
Methods	TDR / Arc reflection/ Impulse current/ Voltage coupling
Automatic distance measuring	✓
Saving cable parameters into Reflectometer non-volatile memory	✓
Saving reflectograms either to Reflectometer non-volatile memory or USB flash drive	✓
CABLE TRACING MODE	
Cable tracing using 50W audio-frequency generator with frequencies 491/ 982/ 8446 Hz with a receiver	✓

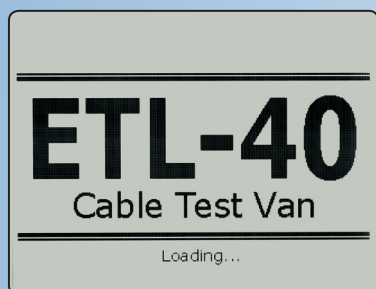
Parameters for a ETL-80VP model are given in parenthesis.



► Application

The ETL-80VP is a modular system, which is used for the following purposes:

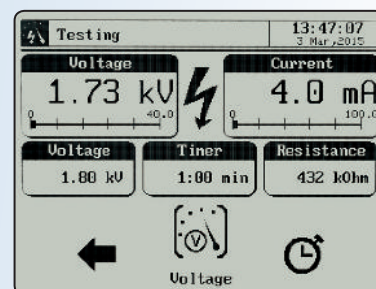
- DC cable testing up to 80 kV.
- Converting high-resistive cable faults into low-resistive with a use of burn generator.
- Prelocating faulty places with a use of Time Domain Reflectometer RIF-9P.
- Cable route tracing with a use of 200 W low-frequency generator and receiver.
- Precise pinpointing using a surge wave generator with a ground microphone.



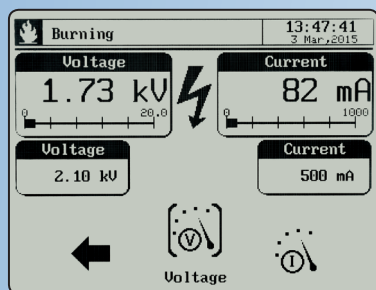
Starting up program



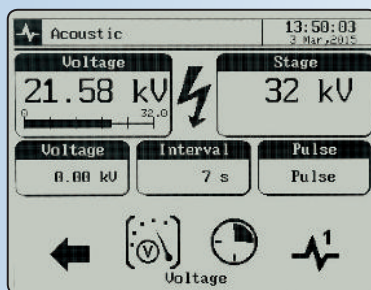
Language selection



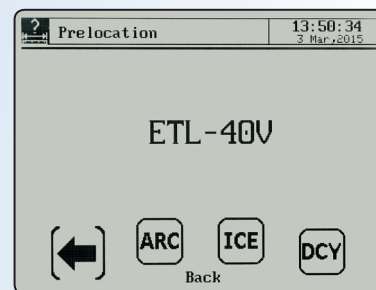
Testing Mode



Burning Mode



Acoustic Mode



Prelocation Mode





► Application

SWG-12/1100RP portable cable fault location system is a complex solution for safe, fast and easy locating a faulty place on low and medium underground voltage cables. It includes a powerful high-voltage unit, which has a test, burn and surge generation modules, and a time-domain reflectometer for locating faults on cables.

► Description

The high-voltage unit of the system provides with high-power up to 1100 Joules surges at 3; 6 and 12 kV ranges. At each range, the output voltage is smoothly adjustable. The rate of surge waves can be smoothly adjusted. The single manual shot option is also included. The DC output mode is provided for quick fault diagnostics. The 100 mA burn mode is available.

Digital impulse reflectometer (TDR) RIF-9P provides you with 10.4-inch bright high-contrast TFT display with touchscreen. The 800 × 600 pixels resolution makes the picture sharp. The touchscreen allows an operator navigate through the menu fast and easy. An alternative way of navigation is included. It is provided with a control knob.



RIF-9P integrates a multiple ways of fault prelocation. It can be used either as a standalone device in TDR mode or in a conjunction with HV-module, working in arc reflection mode.

RIF-9P has USB interface. The package content includes software for PC (optional), which allows working with saved reflectograms. The firmware can be easily updated through USB interface by inserting a flash drive.

► Technical specifications

GENERAL parameter	Value
Input voltage, V	230 ± 23
Frequency, Hz	50 ± 1
Power consumption, kVA, max	2.0
Dimensions (W × H × D), mm	731 x 1120 x 533
Net weight, kg	113

HV-module parameter	
[⚡] TESTING MODE	
Output DC voltage, kV	0 – 12
Output DC current, mA	1 / 10
[🔥] BURNING MODE	
Output DC voltage range, kV	0 – 12
Output DC current range, mA	0 – 100
[⚡] SURGE MODE	
Ranges, kV	3 / 6 / 12
Surge rate, s	3 – 15 or single shot
Max. output energy, J	1100

TDR parameter	Value
Distance measurement ranges, m @ v/2 = 100 m/μs	60/120/ 250/ 500/1000/2000/5000/ 10000/20000/50000/120000
Resolution, m	0.5 @ v/2 = 100 m/μs 0.4 @ v/2 = 80 m/μs
Sampling rate, MHz	200
Gain, dB	– 33 ... + 104
Output impedance (10 Ω steps), Ω	10 – 500
Propagation velocity (v/2), m/μs	50.0 – 150.0
Averaging reflectograms number, max	64
Time domain accuracy, %	0.2 of FS
Pulse amplitude, V	45
Pulse width, ns	10 – 100 000
Operation modes	TDR (reflection measurement) ARC (arc-reflection)
Control	Touchscreen and control knob
Connectivity	RS-485, USB
Internal data storage	4 Gb (not less than 1000 reflectograms with data)
Display	10.4", 800 x 600 TFT, touch-sensitive

► Package contents

Component	Quantity
SWG-12/1100RP	1
Bag for cables	1
User manual	1
Connecting cables set (may vary on customer's demand)	6 m each

► Accessories

Component	Quantity
LFG-50P Audio frequency generator	1
P-900P Surge wave locator set	1





► Application

Battery powered digital impulse reflectometer (TDR) RIF-9P designed for determining the distance to a fault in communication and power cables.

Digital impulse reflectometer RIF-9P allows:

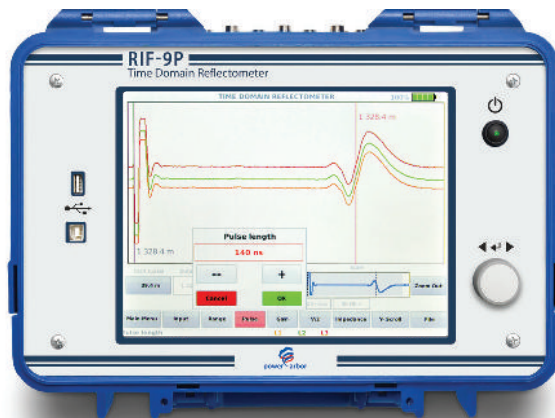
- Determining the distance to a fault or discontinuity in symmetric and asymmetric cables using a location (time domain reflection) method.
- Measuring the length of a cable (including those wound on a drum) or distance to a fault or a short circuit.
- Storing and processing the results of measurements both internally or using a supplied PC software.
- As part of a Cable Test Van, determining the distance to a fault or discontinuity in cables with length of up to 100 km for all possible fault types without the need of preliminary full cable sheath burning.

► Description

RIF-9P provides you with 10.4-inch bright high-contrast TFT display with touchscreen. The 800 x 600 pixels resolution makes the picture sharp. The touchscreen allows an operator navigate through the menu fast and easy. An alternative way of navigation is included. It is provided with a control knob.

RIF-9P integrates a multiple ways of fault prelocation. It can be used either as a standalone device in TDR mode or in a conjunction with HV-module (e.g. Cable test van or Surge wave generator), working in arc reflection (ARC), impulse current (ICE) and decay modes. A high-capacity internal battery allows working up to 8 hours.

RIF-9P has both RS-485 and USB interfaces. The package content includes software for PC (optional), which allows working with saved reflectograms. The firmware is easily updated through USB interface by inserting a flash drive.



► Technical specifications

Parameter	Value
Distance measurement ranges (for velocity of propagation 1.50 or $V/2 = 100 \text{ m}/\mu\text{s}$), m	60 / 120 / 250 / 500 / 1000 / 2000 / 5000 / 10000 / 20000 / 50000 / 120000
Resolution, m:	
• at velocity of propagation of 1.5 ($V/2 = 100 \text{ m}/\mu\text{s}$)	0.5
• at velocity of propagation of 1.87 ($V/2 = 80.2 \text{ m}/\mu\text{s}$)	0.4
Distance measurement accuracy, %	0.2
Sampling rate, MHz	200
Accuracy of time markers, %	up to 0.01
Output impedance range (sampling frequency of 2Ω), Ω	2 – 100
Probe pulse parameters:	
• amplitude, V	45
• duration, ns	10 – 100000
Measurement range of input amplifier gain, dB	– 21 ... +69
Averaging reflectograms number, pcs	1 – 64
Setting range of:	
• velocity of propagation	1.000 – 3.000
• velocity of propagation $V/2$, $\text{m}/\mu\text{s}$	50.0 – 150.0
Setting discreteness of:	
• velocity of propagation	0.001
• velocity of propagation $V/2$, $\text{m}/\mu\text{s}$	0.1
Nonvolatile memory capacity of:	
• reflectograms with parameters	1000
• data on cable velocity of propagation	500
Voltage on measuring inputs, V, max	50
Display resolution, pixel	800 x 600, TFT, touch screen
Power supply and charging:	
• battery voltage, V	12
• continuous running time of rechargeable battery, hours, min	6
• external power source voltage, V	24
• voltage range of external power supply, V	12 – 28
Power consumption, V•A, max	36
Weight, kg, max	8
Dimensions, LxHxD, mm, max	366 x 270 x 178



Set of cables for RIF-9P



RIF-9P bag for cables



LFG-50P



LFG-200P

► Application

LFG Low-Frequency Generators, when operated in conjunction with a receiver, can be used for locating as well as tracing underground metal communications, such as any cables with metal cores as well as metal pipes. In addition, they provide operator with a quick detection of short circuits on cables as well as with an identification of a cable in a bunch.

► Description

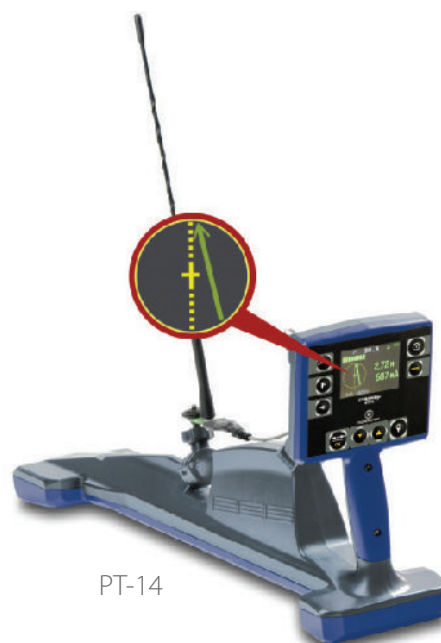
LFG is a 50W (for LFG-50P) and 200W (for LFG-200P) low-frequency generator with ability to inject a signal of three frequencies via direct connection to an object or via internal transmission loop antenna, which is built-in a cover lid. Basic frequencies are 491; 982 and 8440 Hz. There are options of using a singlefrequency or multi-frequency signals at the output.

LFG-200P is a low frequency generator which is used as a built-in device in ETL-series cable fault locators.

A load matching is made automatically. Main parameters, such as output power, load impedance, selected frequency are shown on OLED display. If a load is higher than 1000 Ω LFG automatically switches into output voltage setting mode. The output overload protection will trip, when operating on short-circuit loops (lower than 0.5 Ω).

Fast and accurate search for power cables and other communications, identification of coating defects and the depth, followed by mapping.

Parameter	Value
Operating frequencies, Hz	526 / 1024 / 8928
Bandwidth:	
• RADIO mode, kHz	10 – 36
• ONLINE mode, Hz	48 – 10 000
Sensitivity, μ V	1
Track depth measurement error, %, max	5
Dimensions, mm	700 x 300 x 140
Weight, kg, max	2.4



PT-14

► Specifications

Parameter	Value	
	LFG-50P	LFG-200P
Output frequencies*, Hz	491 / 982 / 8440	
Number of frequencies for multi-frequency operation	1 – 3	
Output power adjustment range, V·A	0 – 50	0 – 200
Increment for manual power adjustment, V·A	2.5	1 – 10
Frequency selection	manual	
Operation modes	continuous, pulsed	
Impedance matching	automatic	
Impedance matching range, Ω	0.5...1000	
Output voltage (RMS), V, max	300	600
Range of measured and indicated parameters:		
• output voltage, V	0.1...300	0.1...600
• current, A	0.01...9.99	0.01...20
• load impedance, Ω	0.5...1000	
• phase angle, °	0...90	
Voltage, current, impedance measurement accuracy, %	5	
Phase angle measurement accuracy, %	10	
Modulation type	amplitude	
Pulse frequency, Hz	1	
Power supply and battery:		
• battery voltage, V	12	–
• time of continuous battery-powered operation, hours, min**,	1	–
• average battery charging time, hours	3	–
• external mains supply voltage, V	230 ± 10 %	
• external mains supply frequency, V	50 ± 1 Hz	–
• external power source voltage, V	10...15	–
Mains power consumption, V·A, max	100	400
Current consumption from external power source (12 V), A, max	8	–
Weight, kg, max	8	15
Dimensions, LxHxD, mm, max	366 x 270 x 178	482 x 133 x 350

* user-specific frequencies on request;

** using lower output power or pulsed mode when the Generator is battery-powered helps to significantly conserve the battery life.

► Application

The generator LFG-2500P in conjunction with the receiver PT-14 is designed for tracing underground metal distribution lines and fault location across all power cable types. In addition, the tracing set LFG-2500P & PT-14 makes it possible to efficiently pinpoint shorts on power cables.

The LFG-2500P is a low frequency generator featuring automatic load impedance matching and smooth adjustment of output current.

The generator operating principle is based on a special method of low frequency modulation of the output signal. Modulation is performed by rectangular pulses with the frequency of 1 Hz in such a way that during the first half-period of the modulating voltage a signal with the frequency of 1024 Hz is generated, and a signal with the frequency of 2048 Hz – during the second half-period. The advantage of this modulation method is that, provided there is a receiver with receiving frequencies of 1024 Hz and 2048 Hz (such as PT-14), the signal of both frequencies can be received while the switch between the two is done on the receiver itself. In the continuous generation mode, the signal with the frequency of 1024 Hz is generated.

► Technical specifications

Parameter	Value
Generation frequency, Hz	1024 / 2048
Modulation type	frequency
Modulation frequency, Hz	1
Maximum output power in the matching mode, W	2500
Maximum output idling voltage, V	320
Maximum output current, A	50
Load resistance range, Ω	0.5 – 150
Impedance matching	automatic
Display parameters	OLED display, 128x64
Power supply voltage, V	230 \pm 10 %
Power supply frequency, Hz	50 \pm 1
Power consumption, kV•A, max	3
Net weight, kg, max	12
Dimensions (WxHxD), mm, max	415 x 178 x 322



► Application

Ground microphone P-900P should be used with an auxiliary frequency generator of 1024 ± 2 Hz / 2048 ± 2 Hz and no less than 200 W of output power at the load range from 0.5 to 200 Ohms (e.g., LFG-50P) when searching using the inductive method.



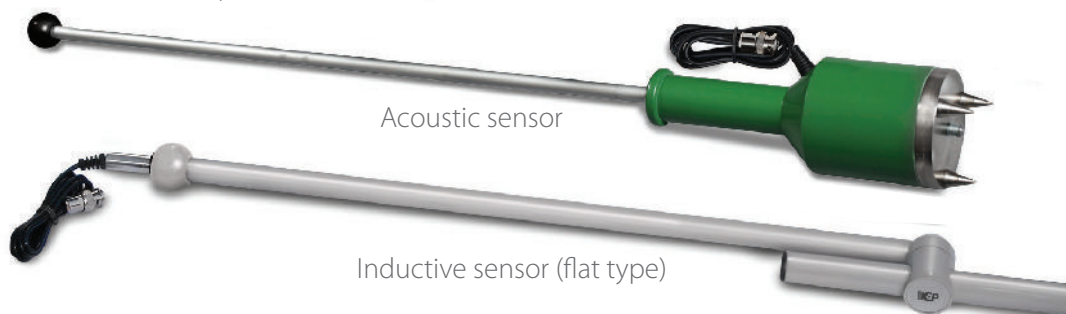
P-900P in the package

► Technical specifications

Parameter	Value
Operating frequency, Hz	1024 / 2048
Sensitivity at highest amplification, μV	20
Sensitivity at lowest amplification, μV	500
Frequency band -3 dB, "1024 Hz" mode, Hz	10
Frequency band -3 dB, "2048 Hz" mode, Hz	12
Bandwidth in the acoustic mode, Hz	20 – 2200
Built-in battery parameters	5x1.2 V 2500 mAh
Continuous operation, hours, min	16
Battery charge time, hours, max	16
Weight with batteries, kg, max	0.65
Dimensions, LxHxD, mm, max	180 x 70 x 120



Headphones



Acoustic sensor

Inductive sensor (flat type)



Inductive sensor (frame type)



► Application

VLF-60P Cable Insulation Tester made by KEP is a very low frequency high potential tester that ensures efficient testing and fault location on medium voltage cables.

Very low frequency (VLF) testing involves applying frequency in the range of 0.01 to 0.1 Hz to the cable

under test, which is non-destructive to insulation of proper quality, but is enough to detect cable faults. Compared to DC cable testing, which can be damaging to good insulation, VLF testing does not have such a detrimental effect on the cable being tested.

► Technical specifications

Parameter	Value
Output Voltage	
• Sinusoidal	0 – 62 kV peak / 0 – 44 kV RMS
• DC	± 0 – 60 kV
• Squarewave	0 – 60 kV
• Accuracy	± 1 %
• Resolution	0.1 kV
Output Current	
• Sinusoidal (RMS)	26 mA
• DC / Squarewave	40 mA
• Accuracy	± 1 %
• Resolution	1 µA
Output Frequency	0.01 – 0.1Hz in steps of 0.01 Hz (default 0.1 Hz) – auto frequency selection
Output Load	1 µF @ 0.1 Hz @ 44 kV RMS 5.0 µF @ 0.01 @ 44 kV RMS 10.0 µF max capacitance (at lower frequency and Voltage)
Output Modes	
• VLF AC Sinewave	✓
• VLF AC Squarewave	✓
• DC (positive or negative polarity)	✓
• Vacuum Bottle Test Mode (DC)	✓
• Cable Jacket / Sheath Testing	✓
• Sheath Fault Location	✓
Breakdown Mode	
• Fault Condition Mode	✓
• Fault Trip Mode	✓
Metering	
• Voltage and Current	True RMS and / or peak
• Capacitance	0.1 nF to 20 µF Range
• Resistance	0.1 MΩ to 20 GΩ
• Waveform	Real time oscilloscope display of actual output voltage waveform
Safety	50 / 60 Hz – 12 kV Feedback Protection / Dual Discharge Device (internal)
Duty Cycle	Continuous
Computer Interfaces	USB, RS-485
Display	Color touchscreen TFT 5.7" (115 x 86 mm)
Input Voltage	(110 to 240) V AC ±10 %, 50 / 60 Hz
Consumption Power	1.2 kVA
Dimensions (H x W x D)	530 x 580 x 410 mm
Weight	60 kg

HVTS-70/50P



HVU-G

Digital control unit

HVT-70/50P



HVU-L

Analog control unit

► Application

High-voltage testing system HVT and HVTS perform DC high-voltage testing of power cables (IEC 60502-2), power cables accessories (IEC 61442) as well as AC high-voltage testing of switchgear, reclosers, dielectric insulators, high-voltage dischargers (arresters), busbars and other dielectric materials with relatively low electric capacitance.

► Technical specifications

Both devices consist of a control unit and a high-voltage unit. High-voltage units of both HVT and HVTS can be supplied with either transformer oil as an insulating material (HVU-L) or with sulfur hexafluoride as an insulating material (HVU-G). Thus, there are four modifications offered: HVTS + HVU-G, HVTS + HVU-L, HVT + HVU-L and HVT + HVU-G. We recommend using either HVTS + HVU-G or HVT + HVU-L.

Parameter	Value			
	HVTS-70/50P		HVT-70/50P	
	DC	AC	DC	AC
Output voltage, kV	0 – 70	0 – 50	0 – 70	0 – 50
Voltage measurement accuracy, %	± 3			
Output current, mA	0 – 25	0 – 40*	0 – 1* / 15	0 – 45**
Current measurement accuracy, %	± 3			
Output voltage protection, kV	1 – 70 (settable)		–	
Output current protection, mA	1 – 40 (settable)		15	45
Consumption current protection, A	10			
Power supply voltage, V	230 ± 10 %			
Power supply frequency, Hz	50 ± 1			
Power consumption, kV•A, max	3.0			
Weight of control unit, kg, max	14			
Weight of high voltage unit (L), kg, max	22			
Dimensions of control unit, LxHxD, mm, max	354 x 266 x 240			
Dimensions of high voltage unit, LxHxD, mm, max	355 x 356 x 322		360 x 500 x 310	

* – In a short duration mode (1 minute ON, 5 minutes OFF).

** – For HVTS-70/50P given size and weight HVU-G, for HVT-70/50P given size and weight HVU-L.
Technical data is an object to change without prior notification.

► Functional features

Control unit features	HVTS	HVT
High resistance to external environmental influences. Casing with firmly closing cover which prevents penetration of dust and moisture during the transportation and storage	✓	✓
Mobility. Supplied with a belt for easy transportation by a single person	✓	✓
Advanced protection and safety features. Emergency Stop button and grounding terminal on a front panel. Indication of the actual voltage on the output HV terminal	✓	✓
Analog indicators. Control panel with two analog indicators for voltage and current measurement	✓*	✓
Overcurrent protection. Blocks output circuit if current exceeds the limit	✓	✓
Overvoltage protection. Blocks output circuit if voltage exceeds the limit	✓	✗
CE Compliant. Conforms to the EU Directives 2006/95/EC (LVD) and 2004/108/EC (EMC), which is proven by independent tests at TRaC laboratories, UK	✓	✗
Improved precision. Ability to measure RMS values of both AC voltage and current irrespectively to the crest-factor (True-RMS) thus greatly reducing the crest factor errors	✓	✗
High-contrast graphical display. Ability to control and adjust the unit using a context menu which an operator can navigate by pressing keys located on both sides of display and reading the results on the display. Display indicates measurement and auxiliary information during test procedure	✓	✗
Automatic testing mode. Automatic and manual testing modes. In AUTO mode the unit raises the voltage at a pre-set rate to a pre-set voltage value, keeps the voltage on an object under test (OUT) for a certain time and then drops the voltage slowly down to zero	✓	✗
Internal memory for test results storage. Ability to save up to eight presets for the most frequently used test procedures. Ability to save measurement data history	✓	✗
Auxiliary protection. Blocking HVU-G output if insulating gas pressure is low or its temperature is high	✓	✗
High-Voltage unit features	HVU-G	HVU-L
External automatic. External shorting rod with a visible shorting indication. Ability to discharge OUT after voltage has been dropped down to zero by an operator without touching the High Voltage Unit.	✓	✓
Auxiliary protection. Built-in pressure and temperature sensors	✓	✗
Reduced weight and dimensions	✓	✗

* - graphic display shows two analog bars which are an emulation of an analog indicating scales.



HVTS-70/50P control panel



HVT-70/50P control panel



HVTS-70/50P conveyance carriage (optional)



► Application

The High Voltage Test System HVTS-HPP-series perform 50 Hz AC and DC high-voltage testing up to 140 kV of objects with low to medium electric capacitance, including power cables, power cable accessories, switchgear, reclosers, dielectric insulators, high-voltage dischargers (arresters), bus-bars and other dielectric materials.

► Technical specifications

Parameter	HVTS-HPP 70/55-7.5 (17.5)	HVTS-HPP 70/100-7.5 (17.5)	HVTS-HPP 100/100-7.5 (17.5)	HVTS-HPP 140/100-7,5 (17.5)
Output AC voltage, kV	3 – 55	3 – 100		
Output DC voltage, kV	3 – 70		3 – 100	3 – 140
Output AC current, mA	1 – 130* (1 – 300*)	1 – 75* (1 – 175*)		
Output DC current, mA	1 – 90 (1 – 200)	1 – 30 (1 – 65)	1 – 40 (1 – 90)	1 – 55 (1 – 125)
Output AC voltage protection, kV	3 – 55	3 – 100		
Output DC voltage protection, kV	3 – 70		3 – 100	3 – 140
Output current protection, mA	1 – 300	1 – 175		
Consumption current protection, A	40 (80)			
Current measurement accuracy, %	± 3			
Interface languages	Russian, English (Turkish, Polish, French, etc. on request)			
Input voltage, V	230 ± 10 %			
Frequency, Hz	50 ± 1 (60 – on request)			
Output power, kVA, max	7.5 (17.5)			

Parameters for a 17.5 kVA model of HVTS-HPP are given in parenthesis.



HVTS-HPP control panel



HVTS-HPP high voltage unit



HVTS-HPP control unit



AC testing mode



DC testing mode

► Application

High voltage stationary installation systems SVS-50MP and SVS-100MP are designed for acceptance and maintenance testing of the electrical insulation properties of personal protection tools and accessories.

Installation systems allow for testing of the following:

- Rubber insulating gloves;
- Dielectric rubber boots and galoshes;

- Handheld tools with insulated handles (screwdrivers, nippers, pliers, etc.).
- Voltage probes;
- Dielectric rods.

The installation systems' equipment can also be used as high voltage testers for testing insulation properties of cables, insulators, etc. with an AC current.



Test basin

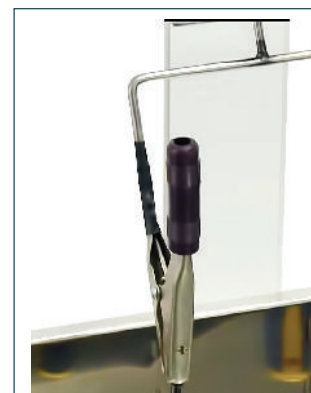
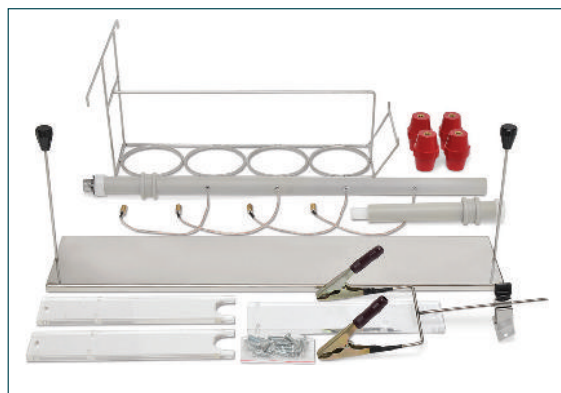


Control unit

SVS-50MP
(SVS-100MP*)



High voltage unit



* – The SVS-100MP system features an additional high-voltage unit.

► Technical specifications

Parameter		Value	
		SVS-50MP	SVS-100MP
Output test AC voltage ranges, kV		0.1; 3; 15; 50	0.1; 3; 15; 100
Leakage current measuring range, mA		0.3 – 10 (1 channel)	
Test basin specifications:			
• Maximum voltage, kV		15	
• Range of measurements of leakage currents, mA		0.3 – 7.5 (4 channels)	
High-voltage sources count		1	2
Testing bath type		stainless steel, manually controlled	stainless steel, manually controlled
Leakage current measuring channels count		4 + 1	4 + 1
Output test AC voltage measuring range, kV	“100 V”	0.01 – 0.999	
	“3 kV”	0.3 – 3	
	“10 kV”	–	–
	“15 kV”	1.5 – 15	
	“50 kV”	5 – 50	–
	“100 kV”	–	10 – 99.9
Accuracy, max		3 % of full scale	
Power consumption, kVA, max		0.8	
Supply voltage, V		220 ± 22	
Frequency, Hz		50 ± 1	
Control unit net weight, kg, max		14	
Testing bath net weight, kg, max		10	
High-voltage unit net weight, kg, max		25	25
Measuring unit net weight, kg, max		–	–
Control unit dimensions, mm		390 x 320 x 200	390x320x200
Testing bath dimensions, mm		390 x 820 x 390	
High-voltage unit dimensions, mm		390 x 370 x 330	
Measuring unit dimensions, mm		–	–

► Functional features

Features	50 (100) M
Automatic filling gloves with water	✗
Automatic testing voltage application/cutting off	✗
Breakdown voltage value holding after test is done	✗
Glove holders with a lever	✗
Less gloves than measuring channels count can be tested	✓
Testing bath with a drain pump	✗
Graphic display with indication of test mode/voltage applied/time	✗
Testing of Overshoes and high-voltage testers	✓

► Application

High voltage stationary installation systems SVS-50CP and SVS-100CP are designed for acceptance and maintenance testing of the electrical insulation properties of personal protection tools and accessories.

The main advantage of SVS-50CP and SVS-100CP compared to SVS-MP series is their full-automatic testing mode.

The testing bath has a built-in pump, which fills gloves or other objects under the test with water.

The tester automatically disconnects the test voltage from objects where a leakage current has exceeded a preset threshold. After the test is concluded the device displays a test report.

After the gloves had been tested it is necessary to dry them up.

SVS-50CP (SVS-100CP*)



Test basin



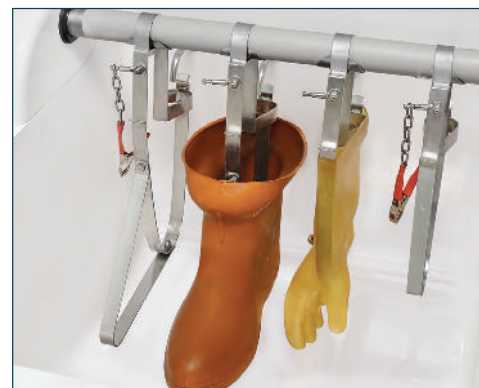
Measuring unit



Control unit



High voltage unit



* – The SVS-100CP system features an additional high-voltage unit.

► Technical specifications

Parameter		Value	
		SVS-50CP	SVS-100CP
Output test AC voltage ranges, kV		0.1; 3; 15; 50	0.1; 3; 15; 50; 100
Leakage current measuring range, mA		0.3 – 10 (1 channel)	
Test basin specifications:			
• Maximum voltage, kV		15	
• Range of measurements of leakage currents, mA		0.3-7.5 (4 channels)	
High-voltage sources count		1	2
Testing bath type		plastic, automatically controlled	plastic, automatically controlled
Leakage current measuring channels count		4 + 1	4 + 1
Output test AC voltage measuring range, kV	“100 V”	0.02 – 0.1	
	“3 kV”	1.0 – 3	
	“10 kV”	–	–
	“15 kV”	1.0 – 15	
	“50 kV”	10 – 50	
	“100 kV”	–	10 – 100
Accuracy, max		3 % of full scale	
Power consumption, kVA, max		0.9	
Supply voltage, V		220 ± 22	
Frequency, Hz		50 ± 1	
Control unit net weight, kg, max		3	
Testing bath net weight, kg, max		20	
High-voltage unit net weight, kg, max		25	25
Measuring unit net weight, kg, max		27	27
Control unit dimensions, mm		316 x 187 x 132	
Testing bath dimensions, mm		700 x 795 x 865	
High-voltage unit dimensions, mm		390 x 370 x 330	
Measuring unit dimensions, mm		330 x 500 x 380	

► Functional features

Features	50 (100) C
Automatic filling gloves with water	✓
Automatic testing voltage application/cutting off	✓
Breakdown voltage value holding after test is done	✓
Glove holders with a lever	✓
Less gloves than measuring channels count can be tested	✓
Testing bath with a drain pump	✓
Graphic display with indication of test mode/voltage applied/time	✓
Testing of Overshoes and high-voltage testers	✓

► Application

Automatic circuit breaker testers UPA are intended for automatic AC current circuit breakers testing. The devices allow registering the values of the supplied current and timing the automatic circuit breaker switching interval.

UPA operate on the principle of varying the power in the primary circuit of the matching power transformer and, respectively, varying the output current, flowing through the

automatic circuit breaker under the test. Power regulation could be done either through an external voltage regulator (RNO or VR) or through a built-in thyristor controller.

⚠ All metrological characteristics (current and time measurement) are valid if RNO is used, i.e. if the exit signal waveform is stable (just as in other analogs).

UPA-3P (UPA-1P)



Current source 3 kA
(1 kA)

AC voltage regulators from 4 A to 160 A are available upon request

- TDGC2-1 4A
- TDGC2-2 8A
- TDGC2-3 12A
- TDGC2-5 20A
- TDGC2-10 40A
- TDGC2-20 80A
- TDGC2-30 120A
- TDGC2-40 160A

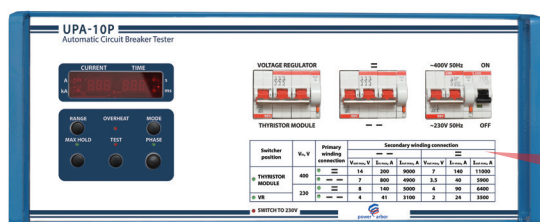


TDGC2-5



TDGC2-20

UPA-10P (UPA-6P)



UPA-6P

V _{in} , V	Primary winding connection	Secondary winding connection					
		— —			=		
		V _{out max} , V	I _{in max} , A	I _{out max} , A	V _{out max} , V	I _{in max} , A	I _{out max} , A
230	=	8	140	5000	4	90	6400
	— —	4	41	3100	2	24	3500

UPA-10P

Switcher position	V _{in} , V	Primary winding connection	Secondary winding connection					
			— —			=		
			V _{out max} , V	I _{in max} , A	I _{out max} , A	V _{out max} , V	I _{in max} , A	I _{out max} , A
● THYRISTOR MODULE	400	=	14	200	9000	7	140	11000
		— —	7	800	4900	3.5	40	5900
● VR	230	=	8	140	5000	4	90	6400
		— —	4	41	3100	2	24	3500

► Technical specifications

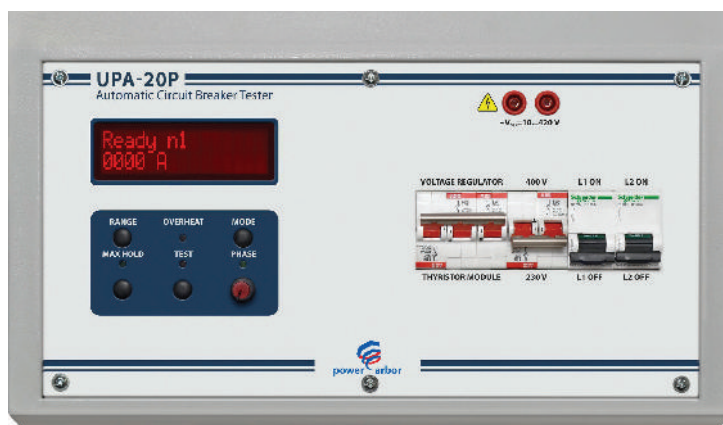
Parameter		Value					
		UPA-1P	UPA-3P	UPA-6P	UPA-10P	UPA-16P	UPA-20P
Output current measuring range in mode “kA” (RMS), kA	one turn	0.1 – 1	1 – 3	1 – 6	1 – 9.99	3 – 16	3 – 20
	two turns	0.05 – 0.5	0.5 – 1.5	–	–	1.5 – 8	1.5 – 10
	three turns	0.03 – 0.33	0.33 – 1	–	–	1 – 5.33	1 – 6.67
	four turns	0.025 – 0.25	0.25 – 0.75	–	–	0.75 – 4	0.75 – 5
	five turns	0.02 – 0.2	0.2 – 0.6	–	–	0.6 – 3.2	0.6 – 4
Output current measuring range in mode “A” (RMS), A	one turn	10 – 100	100 – 1000	100 – 999		200 – 4000	
	two turns	5 – 50	50 – 500	–	–	100 – 2000	
	three turns	3.3 – 33	33 – 330	–	–	66.7 – 1333	
	four turns	2.5 – 25	25 – 250	–	–	50 – 1000	
	five turns	2 – 20	20 – 200	–	–	40 – 800	
Measurement uncertainty (for A and kA), %		3 of FS					
Circuit breaker switch off time measuring uncertainty*:	50 ms – 990 ms, ms	± 20					
	1 s – 7200 s**, %	3 of reading					
Max. time of uninterrupted work at max. current, s		30					
Input voltage, V		230 ± 10 %			230 / 400 ± 10 %		
Frequency, Hz		50 ± 1					
Power consumption, kVA, max		5.5		33	76	60	80
Control unit dimensions (W × H × D), mm		347 × 140 × 210		542 × 360 × 200		680 × 985 × 480	
Current source dimensions (W × H × D), mm		115 × 220 × 153				185 × 305 × 360	
Control unit net weight, kg		3		47		110	
Current source net weight, kg		13				57	

* The given measurement uncertainty are true when operating a UPA with VR.

** The measurement of current feed duration over 10 s should be done at the current of not more than 1000 A. UPA-6P, UPA-10P have 1 s - 990 s range.



**UPA-20P
(UPA-16P)**
RNO-VT-120*



► Application

The oil testers OLT-80P and OLT-100P provide highly accurate breakdown voltage measurement. Fast high-voltage switch off time makes it possible to test dielectric liquids that are easily destroyed under such influences.

The design of OLT testers combined with the use of automatic high voltage breakers, cutting off the voltage supply if the tester lid has been opened during the test, provide the operator with a high level of safety.

Testers are fully equipped and are ready for operation right after unpacking. They come with a test vessel (IEC 60156 – basic configuration) with VDE 0370 mushroom-shape electrodes. The gap between electrodes is easily regulated with a pass-no pass gauge, which comes in pack.

The oil testers ensure fully automatic test procedure according to the selected standard and have a built-in printer which is able to print a test report after procedure is done. Test results are saved into non-volatile memory of the tester. PC-connectivity makes it easy to collect data from the tester, save and store them as well as print a test report. Test voltage is measured directly on electrodes. This fact combined with true sine voltage shape (independent of supply voltage shape), increases repeatability and accuracy of measurements.

The test vessel goes with a magnetic stirrer, which stirs the liquid being tested between consecutive measurements.



► Safety and EMC compliance

Designed in accordance with IEC 61010 safety requirements.
Meets light industrial IEC 61326-1 Class B, CISPR 16-1, CISPR 16-2 and CISPR 22.

► Technical specifications

Parameter	Value	
	OLT-80P	OLT-100P
Output AC voltage, kV	symmetrical 20 ... 80	symmetrical 20 ... 100
Accuracy, kV	± 1	
Resolution, kV	0.1	
Power supply frequency, Hz	50 / 60 ± 1	
Output voltage rise rate, kV/sec	0.5 ... 10.0	
Switch-off time at flash over, µs	< 5	
Oil temperature measurement range, °C	– 10 ... + 99	
Standards	IEC 60156 FOCT 6581 ASTM D877 ASTM D1816 IP 295 other standards – on request	
Electrodes	"mushroom" IEC 60156 ("sphere" IEC 60156; "plane" ASTM D877, ASTM D1816 – on request)	
Display	monochrome, 128x64	
Interface language	Russian, English	
Nonvolatile memory capacity, test reports	512	
PC connectivity	USB type-B	
Printer	thermal printer, 57 mm standard paper	
Power supply voltage, V	190 ... 245 (47 Hz ... 63 Hz)	
Power consumption, kV·A, max	< 100	
Weight, kg, max	21	30
Dimensions, LxHxD, mm, max	461 x 280 x 271	530 x 315 x 320

► Application

The reference measuring cell C-80P (C-100P) is intended for AC voltage measurement on the balanced transformers with the grounded midpoint high-voltage terminals, which are used in OLT-series oil testers.

The sell made as a mobile device with a built-in battery.



► Technical specifications

Parameter	Value	
	C-80P	C-100P
Measured voltage, kV, RMS	10 to 80	10 to 100
Measurement uncertainty, %	1.0 of reading	
Measured frequency, Hz	45 – 65	
Voltage resolution, kV	0.01	
Peak factor resolution, kV	0.01	
Frequency resolution, Hz	0.01	
Inter-electrode gap, mm	221	273
Input resistance, MΩ, min	600	700
Internal battery	LiPO 3.7V	
Charging supply voltage, V	9 – 12	
Continuous run time on full charge, hours	4	
Consumption supply current, mA, max	50	
Dimensions (W × H × D), mm, max	280 x 90 x 50	327 x 91 x 80
Net weight, kg, max	1.5	





► Application

A digital automatic dissipation factor measurement apparatus Tangens-3MP is intended for taking measurements of the transformer oil dielectric dissipation factor according to IEC 60247 at 50 Hz frequency.

► Technical specifications

Parameter	Value
Dissipation factor (DF) measuring range	0.0001 – 1.0000 (0.01% – 100 %)
DF measuring accuracy	± (0.03 DF + 0.0002)
Resolution	0.00001
Output AC voltage, V RMS	1940 – 2060
Measuring uncertainty, %	2.5 of reading
Capacitance measuring range, pF	5 – 30
Testing temperature, °C	90
Temperature measuring accuracy, °C	± 1
Measuring time for "Program 1" (measuring at 70 °C and 90 °C), minutes	35
Measuring time for "Program 2" (measuring at 70 °C, 80 °C and 90 °C on increasing temperature and measuring at 90 °C, 80 °C and 70 °C on decreasing temperature), minutes	85
Input voltage, V	230 ± 10 %
Frequency, Hz	50 ± 1
Power consumption, kVA, max	0.3
Weight (incl. package), kg, max	5
Dimensions (W × H × D), mm	405 × 90 × 260



YAPI-3P

The system measures:

- dissipation factor $\text{tg}\delta$;
- dielectric capacitivity ϵ ;
- capacitance C ;
- voltage applied to a measurement cell;
- a transformer oil sample temperature.

► YAPI-3 test cell specifications

Terminals count	3
Volume, cm ³	11 – 13
AC voltage corresponding to electric field strength of 1 MV/m, kV RMS	2





Poland, Warsaw, Ul. Ciasna 6, 00-232



+(48) 693-491-444



info@power-arbor.pl



www.power-arbor.pl

