

MOBILE LABORATORY OF CATHODIC PROTECTION LCP

The mobile laboratory of cathodic protection **LCP** is designed for conducting field tests of corrosion control of underground metal networks (gas, oil, water pipes, telephone cables, tanks and storage reservoirs), setting the parameters of cathodic protection systems and carrying out repairs.

A. VEHICLE

1. Chassis

The basic types of chassis used are: Mercedes Sprinter, Iveco Daily, Ford Transit etc.



2. Vehicle Body



The mobile laboratory is designed to be easy to operate and service. It is equipped with high quality insulated wall panelling and an air-conditioning system. The body is divided into technical and operator compartments separated by a partition wall. The technical compartment includes all the necessary tools and equipment for carrying out testing and inspections. Safety is an important feature of the laboratories and hence all equipment is properly mounted and secured for transit. The operator compartment provides a pleasant environment to work in with more room and plenty of storage. It is equipped with cabinetry and workbenches that increase the operators' efficiency and productivity.



B. MAIN EQUIPMENT

1. Testing Supply of Protection Current

Cathodic Protection Device IPE 1,2



The cathodic protection device IPE 1,2 is designed to protect underground metal networks from corrosion by using the polarization current method.

The IPE 1,2 can operate in three modes:

- Constant voltage regulation mode
- Constant load current mode
- Protective potential stabilization mode

2. Location of Insulation Faults, Location and Depth Evaluation of Pipelines

Insulation Fault Locator EPE-95



The insulation fault locator EPE-95 is designed for:

- Trenchless (No-dig) insulation fault location (for insulation that has dielectric properties) of metal pipes
- Identification of the placement of underground pipelines
- Depth evaluation of underground pipelines

Note: The equipment can also be used to determine the location of AC power cables.

3. Measurement of the Polarized Potential of Underground Pipelines and Voltage Gradients Above the Pipelines

Device OKE-1



The device OKE-1 is designed for:

- Identification of the location of anti-corrosion coating faults of underground pipelines
- Precise identification of underground pipeline axis and depth evaluation
- Identification of the location of faults of anode cathodic protection of insulation condition assessment

4. Measurement of the Polarized Potential by the Method of Turning off Of the Current of Polarization of the Auxiliary Electrode

Device of Corrosion Inspection



The device of corrosion inspection PKO is designed for the diagnosis and monitoring of corrosion cathodic protection of underground metal networks.

- The instrument measures the polarization potential by the method of turning off the auxiliary electrode in the range from 0 to -2 V with a simultaneous display of the polarization current and automatic extrapolation of the depolarization curve
- By inspecting the devices of cathode protection the instrument measures the output current of the device of the cathode protection by measuring the voltage drop across the external shunt 75 mV and output DC voltage in the range from 0 to 100 V
- Accuracy of measurement is less than 1%
- The measurements are stored in a non-volatile device memory and can be transferred to a computer for archiving and report preparation

5. Determination of Ground Resistivity and Measurement of Resistance of Grounding Devices

Ground Resistance Tester 1820ER

The ground resistance tester 1820ER is designed for measuring the ground resistance from 20 to 2000 Ohms and the step voltage up to 200 V at frequency 50-60 Hz. Accuracy of measurement does not exceed 2% and the results are displayed on the 3.5-point digital LCD display.



Measurement of step voltage $\sim U$ 0.01...200 V, frequency 50...60 Hz, accuracy $\pm 1\%$, Resistance 0.001 Ohm ...20 k Ohm, measurement by 2-, 3-, 4- wire scheme. Testing signal 2, 10, 50 mA, 128 Hz (allows making measurements without switching off the measuring diagram!)

6. Measurement of the Polarized Potential by the Method of Turning off Of the Current of Polarization

Multimeter MU-68



The multimeter MU-68 is designed for measuring the polarization potential

- Manual and automatic selection of measurement limits
- Large display 3 3/4 digits (max. 3999)
- Test of diodes and transistors
- Conductivity test with beep signal
- Mode "Data hold" (saving data on the display)
- Overload protection on all ranges
- Auto power off

Current Interruptor PT50



The current interruptor PT50 is designed for breaking the cathodic protection current of pipelines for an instant-off potential measurement. The device can be used in conjunction with a cathodic protection station of any type.

- Type of interruption current – d.c. or unipolar pulsing, voltage up to 100V at 50 ... 100 Hz
- RMS current: from 0.2A to 50A
- Period of on / off status seconds: 5/0, 4, 4/1, 8/2, 12/3
- Power Supply: AC 220 V, 50 Hz
- Power consumption: not more than 8 W
- Dimensions: 150 x 180 x 70 mm
- Weight not more than 1.5 kg

7. Measurement of Potentials in the Zones Affected by Stray Currents

Durable Autonomous Logger RAD-256

The durable autonomous logger RAD-256 is designed for the digital recording of cathodic protection parameters of underground pipelines, monitoring the status of cathodic



protection and drainage protection. The RAD-256 operates in two different modes:

1. conducts periodic measurements of slowly changing voltages on two channels, while ensuring that:
2. carries out continuous measurements of voltages, while ensuring that:

Storage time of results is not less than 30 days with the provision of the following number of measurements: 110,000 for a single channel and 55,000 for the 2 channels

- After making a specified number of measurements the logger goes into storage mode automatically
- The results are stored through a standard COM port to a computer
- The software allows to view the results in the form of tables and graphs, provides scaling of the axes "signal amplitude – time"

Megohmmeter E6-24



The Megohmmeter E6-24 is designed for measuring the insulation resistance of electrical circuits that are not energized and to measure AC voltages up to 400 V. The megohmmeter is always in mode of voltage measurement and if the circuit under measurement is energized the device displays the voltage value. Resistance measurement is done by pressing a button and does not require switching modes. When measuring the resistance for more than 1 minute the megohmmeter automatically calculates the absorption coefficient and stores it in memory.

Notebook



The notebook allows to store and manage the measurement data. The supplied software of the equipment is installed on the device in order to process the measurement data in the laboratory. Windows 95/98, Application package for processing of measurement results "RAD" and "POISK".
Display: 15.4" WXGA (1200 x 800).
Processor: Intel® Celeron® M 1.5 GHz.

System of Connection to External Sources

- Drum of power supply cable, 30 meters – 1 unit
- Drum of grounding cable, 30 meters – 1 unit
- Drum of connection cable UKZ to the pipeline, 30 m – 1 unit

C. POWER SUPPLY

Laboratory Power Supply



Input power (mains) for the laboratory equipment is 230V ± 23V, frequency 50Hz. Alternatively, power can be supplied from an independent power supply source installed inside the vehicle i.e.

Petrol generator Eiseman S 6000.

Combined electric generator Eiseman S 6000
power 6.5 / 2.8 kW, 400/230 V,
welding 220A, 29V DC. Current 35%.

D. TOOLS



1. Electric drill with drilling hammer 500W.
2. Hammer 0.5 kg.
3. Set of heads (5, 6, 7, 8, 9, 10, 11, 12, 13 mm)
4. Nippers
5. Pliers
6. Screwdriver bit set
7. Measuring tape 5 m
8. Wrench
9. Knife
10. Drills \varnothing 4, 5, 6, 8, 10 mm
11. Carbide drills \varnothing 4, 5, 6, 8, 10 mm
12. Hacksaw
13. High voltage detector
14. Low voltage detector
15. Set for electric welder
16. Set for electrician
17. Set of entrenching tools
18. Angle grinder
19. Crimping pliers
20. Measuring tape 20 m
21. Folding ladder
22. Thermo mixture
23. Thermo matches
24. Crucible (pan) form
25. Copper sulfate electrodes

26. Spiral electrodes with screw terminals
27. Pins - electrodes, 800 mm.
28. Pins - electrodes, 500 mm.
29. Earthling rode
30. Clamp
31. Cathodic set
32. Dielectric gloves
33. Boots dielectric
34. Dielectric mat
35. First Aid Kit
36. Fire Extinguisher
37. Safety belt with lanyard
38. Set of driver tools

E. DOCUMENTATION

Set of Operating Documentation

- Laboratory Manual
- Operating Manuals for equipment and devices

F. WARRANTY

The laboratory has a limited warranty for the period of 1 year in accordance with the «Declaration of warranty» issued by the manufacturer.

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