



Microscope POLAM L-213M

Technical characteristics:

Microscopes magnification is 30-1920

Objectives magnification is 30-720

Eyepiece magnification is 10 and 16



Microscope for studying mineral raw materials POLAM P-312

Technical characteristics:

Microscope for studying mineral raw materials POLAM P-312 designed for studying opaque objects in reflected light, ordinary and polarized, as well as transparent objects in transmitted light with small magnification.

Magnification is 65x to 1140x



Luminescent set (Luminoscope LRV-1) used for determining the presence and the character of bituminous matter distribution in mining rocks (core, slime) and in capillary infusions.

Technical characteristics:

Spectral range UV radiation is 315...410 nm

Wavelength of the main UV radiation is 365 nm



Roentgen (X-ray) fluorescent spectrometer SRV-1V
is designed for the express quality and quantity determining the content (mass fractions) of chemical elements in solid, liquid and powder-type objects of natural and artificial origin.



Dosimeter of X-ray- and gamma-radiation DCS-AT1121
Designed for controlling radiation situation in using nuclear-power, radioisotope and X-ray continuous, short-action and pulse sets in scientific studies, medicine, industry and other fields.



Clamping tensometer DM12

Consists of movable units designated for measuring longitudinal and transverse deformations on cylindrical models of different materials (mining rock, metals, plastics, cement, concrete, etc) with the aim to determine their deformation characteristics, such as: modulus of elasticity, Poisson ratio in accordance to SS 28985-91 “Mining rocks. Method of determining deformation characteristics in one-axis compression” in the laboratory conditions, without gluing tensors on the model.



Test device ISM 190

It is a mechanical load measuring unit with a hand drive designed for the complex determining strength and strain characteristics of mining rocks in the laboratory and field conditions on the models of arbitrary, including irregular, shape in accordance to SS 24941-81



Standard dynamometer DOSE-3-20U

is designed for measuring static compression and tension force in the periodical checking of testing machines and stands with information output to the external computer.

Measuring limits, kN:

- the least one is 1.
- the largest one is 20

The value of the digital code unit in the conditional units is 0.001.



Standard dynamometer DORE-3-10U

is designed for measuring static compression and tension force in the periodical checking of testing machines and stands with information output to the external computer.

Measuring limits:

- the largest one is 10
- the least one is 1.

The value of the digital code unit in conditional units is 0.001.



Electronic tomograph-geoscanning system is designed for carrying out geodesic, topographic, land-surveying and prospecting operations, as well as for carrying out different types of monitoring and scientific studies, such as quality studying the earth surface.
Antenna bandwidth – 50 MHz;
Average depth of scanning – 5-20 m;
Maximum depth of scanning – 20-30 m.



Electronic laser 3D scanner is designed for forming and supporting digital models of open pits and mines, determining the volumes of mining workings, storehouses, dumps, controlling mining operations, etc.
Integrated camera - digital high resolution camera;
Scan speed - the maximum instantaneous speed: up to 50000 points / sec.;
Power - 36V.



Electronic tachometer combined with GPS system 1200 is designed to measure distances, horizontal and vertical angles and exceeding in the implementation of topographic surveying, tachometric constructions, construction, layout and monitoring, as well as for applications of geodetic problems.
Accuracy - 2 sec.; Range on one prism - 3000 m;
Increase - 30x; Minimum distance - 1,5 mm.



GPS System 1200 is designed to measure distances, horizontal and vertical angles and exceeding in the implementation of topographic and geodetic works tachometric surveys, construction, layout, monitoring, and for applications of geodetic problems.
Accuracy - 2 sec.; Range on one perspective - 3000 m;
Magnification - 30x; Minimum distance - 1,5 mm.



Spectrophotometer with applied computer control is designed for determining the quantity of adsorbed reagents, flotation reagents concentration on the mineral surface with a certain wavelength; ions presence forms identification. By the spectra of absorption it's possible to determine pulp water part anion composition, reused and sewage water, the degree of flotation agents sorption on polymetal ores. This unit can be used for identification the matters formed in the processes of mineral dressing, as well as in extracting and processing petroleum products, in new matters synthesis. Spectral range is 190 to 1100 nm. Scanning speed is 30, 60, 120, 300, 600, 1200, 3000, 6000 nm/min.



Vibration attritor 75T-DRM

is designed for samples mechanical attrition (dry and in the form of suspensions) for chemical and X-ray spectral analysis. The attrited sample weigh in one beak is no more than 50 u. Starting product size is no more than 3 mm. Ready product size is 10 to 50 mkm.



Crusher DSHCH 100x200

designed for small crushing of brittle materials with different strength except radioactive and explosive materials.

Reception opening - width 100 mm, length 200 mm;
Size of source supply 90 mm;
The size of the discharging gap to 15 mm;
Size of the finished product with a minimum gap of 3 mm, with maximum of 20 mm.



Vibration ball mill MM301

designed both for dry sample milling (for X-ray fluorescent analysis), wet and cryogenic milling. The milling process of the laboratory mill is carried out due to the effect of milling balls impact with the material milled and the friction between the milling balls and the milling beak walls. Particles starting size is up to 8 mm.

Final fineness is 5 mkm. Duration of milling and mixing is from 10 sec. to 99 minutes.



Induction melting set UPI-120-2
designed for induction heating and melting non-ferrous and precious metals placed in the graphite crucible.
Working temperature in the crucible is 500 to 1400°C.
Crucible capacity is 120 cm³. Maximal temperature is 1600°C. Crucible heating to 1300°C time is 15 minutes. Power is 2 kW. Nominal voltage is 220 V



**Compact orbital shaker orbital shaker
Vibramax type 100/110**
designed for shaking stands with testing tubes with small working amplitude. Shaking frequency is 150 to 2500 r/min. Step is 1.5 mm. Maximal loading is 2 kg. Timer: 0 to 120 min.



Press HYDROPRESS 50
(as a unit of 4 press forms) designed for obtaining molded powder materials and metal products.
Press fitting diameter is 25 to 55 mm.
Press tonnage is;
210 bar for 50 mm diameter 270 bar for 30 mm diameter
240 bar for 40 mm diameter Temperature is 240°C.
Working time is 59 minutes



Mining ferritometer of MK-4F type
designed for measuring mass content of magnetite iron in ore samples of different size. Field of application: mining, processing industry, etc. Range of measuring magnetite iron is from 0 to 60 %. Working mode establishing time is no more than 1 min. Allowable referred error is no more than 7 %. Continuous operation is 8 hours.



Automatic magnetic set of MK-3E type
is designated for automatic measuring magnetic characteristics of ring-type samples of magnetic-soft materials according to the methodology of SS 8.377 and long samples in solenoid. Samples material is magnetic-soft alloys and electric engineering steels. Current establishing error in measuring is no more than ±0.2 %. Ring-type samples dimensions, mm: Inner diameter is 10 to 40; Outer diameter is 12 to 50; Height is 4 to 20.; Long samples dimensions, mm: Package of strips of the length 100 to 400 mm; Square section 1 to 10 mm



Laboratory complex for the preparation of samples for metallographic analysis
is designed to produce thin sections to study them in light and electron microscopy.
Disc diameter 200 - 230 mm;
Speed Disk 50 - 500 s/m.;
Speed of the sample holder 8 s/m.



Emission spectrometer DFS-71
is an atomic-emission optical multi-channel spectrometer and is designated for determining concentrations (mass fractions) of elements in steels and irons based on calibrating characteristics built by the standard models and methods chemical composition emission spectral analysis.
Measuring time from 10 to 40 sec.
Output channels number 24 p.



**Scanning Electron Microscope Tescan Vega \ **
designed to study the surface structure of materials in a range of magnifications $4 \times - 500\,000 \times$, for spatial visualization and study the structure of thin fractures metals, determination of particle size, to determine the causes of deterioration of materials, forecasting the strength and performance characteristics of various materials.
Resolution of 3.0 nm (at 30 kV);
Increase from $12 \times$ to $1,000,000 \times$;
Diameter of chamber samples of 230 mm.



Hardness Vickers ISOSSAN OD
designed to test for Vickers hardness of metallic materials in accordance with ISO 6507 as well as Knupp (using a special indenter) in accordance with ISO 4545.
Methods for measuring Vickers, to Knupp;
Increase of $100 \times, 400 \times$;
The load from 10 to 1000 g / s;
The limits of the measured hardness of 20 to 70 HRC.



Testing hardware-software complex for the systems of pre-and post-accident controlling technology environment and dangerous explosive electrical industries

Includes sensors for physical quantities needed to develop an autonomous system of pre-and post-accident control a computer system for control of the mine atmosphere and protective equipment, given that they are the main sources of information about the processes taking place in a controlled space.



Methane thermo-catalytic sensor 0 ... 5% SH4;
output 4-20 mA / 0,4-2V;

Digital outputs: relay, opto-symistor.

Methane infrared sensor IR sensor 0 ... 5 ... 100% SH4, 4-20 mA output-0, 4-2V;

Digital outputs: relay, opto-symistor.

Carbon monoxide sensor 0,00-500rr CO el.chem. sensor, 4-20 mA output-0, 4-2V, digital outputs: relay, opto-symistor.

Hydrogen sensor 0,00-1000rr H4, el.him. sensor; output 4-20 mA / 0,4-2V;

Digital outputs: relay, opto-symistor.

Oxygen sensor 0,00-30rr O2 el.him. sensor; 4-20 mA output-0, 4-2V;

Digital outputs: relay, opto-symistor.

Air Speed Sensor 0,15-12 m/s...0,005-1800 m³ / s, el.chem. sensor;

4-20 mA output-0, 4-2V;

Digital outputs: relay, opto-symistor.

Temperature sensor T =- 20 ... 60 C3, platinum sensor, 4-20 mA output-0, 4-2V;

Digital outputs: relay, opto-symistor.





Complex of communication, data preparing and displaying information

Allows the creation of scientific-technical and technological prerequisites for monitoring and prediction of mineral resource developments, technologies and accelerated evaluation of the integrated development of mineral resources, mineral solution problems of geopolitics and geoeconomics;

- work in radio radial structure;
- centralized and personalized mailing and collecting information from subscribers;
- possibility of automatic retransmission of information.

Batch Controller VIP-M in the "CBS" regime provides:

- job running the computer installed in the "Centre";
- maintenance of databases adopted / transferred information;

Batch Controller VIP-M in the "CSS" regime provides:

- work on the principle of "subscriber-subscriber", "subscriber-Center";
- addressing up to 256 subscribers;
- preparation, storage, reception and transmission of textual information;
- printout of information on the printer.