

REM 2
 Design


APPLICATION

- Basic equipment of high-voltage substations (100 kV, 220 kV and 400 kV);
- control of circuits and apparatus: relay, protection, communication, self-needs, measurement;
- protection of secondary circuits of the station (disconnectors, switches);
- measurement of substation parameters and data transmission;
- protection of electrical equipment against the effects of short circuits and overloads.

TYPES OF CABINETS

- **Protection (relay)** - protection of 110 kV, 220 kV, 400 kV lines, transformers and couplings, equipped with ground fault, differential, overcurrent, autonomous protection, bay controllers, analyzers and other devices depending on the configuration of the station;
- **Metering** - measurement of energy consumption of individual substation circuits. Equipped with a fixed or tilted meter mounting plate, energy meters, measuring strips and other necessary equipment and strip connectors;
- **Auxiliary needs 400/230 VAC** - power supply of the station's own needs circuits, equipped with ATS automation system, contactors, power switches, miniature circuit breakers, current and voltage measuring equipment, central signalling, other other equipment led to strip connectors;
- **Auxiliary 110/220 VDC** - power supply for DC circuits, equipped with a rectifier with current measurement and an external battery set;
- **Guaranteed voltages 230 VAC, 24-48 VDC** - power supply of secondary circuits of emergency signalling and control protection, equipped with inverters and power supplies, disconnectors, miniature circuit breakers, current and voltage measuring equipment, central signalling, other equipment led to strip connectors;
- **Telecommunications** - collecting and transmitting information from the station to the operator. Equipped with communication and communication equipment, adapted to the configuration of the station.

The configuration and equipment of the cabinets is prepared individually each time.

EQUIPMENT

Enclosure

Steel OU-1/OU-2 or Aluminum OU-1/OU-2

- indoor, free-standing or wall-mounted on a plinth;
- skeletal frame, made of a steel frame covered with steel or aluminum sheet (joining by welding and screw connections);
- powder coated in any colour (RAL) and pavement structure with high resistance to deterioration;
- connected to the plinth;
- polyurethane foam gaskets;
- made in protection class I or II;
- degree of protection up to IP 55;
- mechanical resistance: up to IK 8-10.

Mounting elements

- vertical mounting profiles - steel, perforated, mounted to the frame;
- mounting plate - galvanized, mounted on vertical mounting profiles made of galvanized sheet metal for the insulation of current circuits;
- comb trays - with a cross-section adapted to the type and amount of cabling;
- cable clips with mounting beam;
- masking plates - made of plastic or metal sheets, mounted to the enclosure structure or internal frame, by means of masking plate holders;

- control panel with a synoptic board - made in a unique way, by applying offset printed sheets glued to the entire surface of the plate, with the possibility of printing any graphics. Mounted in the inner frame;
- lighting - two fluorescent lamps, mounted in the upper part, thanks to which we obtain an even intensity of illumination over the entire width. The cabinet is equipped with limit switches and a panel switch (it is possible to mount the device anywhere, according to the customer's requirements);
- ventilation - enabling constant air flow through the use of a valve and proper opening of the housing.

Frame – steel frame

- made of steel profiles joined by welding;
- it has holes for attaching a mounting plate or vertical mounting profiles.

Side covers

- mounted to the frame by means of screw connections with an Allen key;
- sheet thickness adapted to the dimensions;
- when the side covers are installed, the width dimension of the enclosure does not change.

Door

- full or transparent;
- single-sided or double-sided (rear cover), for better access to the apparatus;
- single-leaf or double-leaf;
- lockable with a cylinder lock (any shape) or a basque lock closed with a system cylinder and an additional padlock;
- three-point locking;
- internal hinges;
- opening angle 120 degrees;
- grounding pins with wiring.

Roof

- made of a height-adjustable cover to provide additional ventilation;
- the sheath has additional openings, with grommets, allowing the introduction of wiring from cable routes;
- transport handles.

Base

- has a hole for the introduction of cables from the cable duct;
- prepared for the fire bulkhead, by means of screw connections.

Dimensions

The size is adapted to the type, number of equipment and individual needs of the customer.

Typical executions:

- height: 1800/2000/2200 mm;
- width: 400/600/800/850/1000/1050/1250/1400mm;
- depth: 250/300/400/600/800 mm.

Accessories

- The plinth is made in a full or ventilated version of any height.

Wiring

- The wiring of the cabinets is made with insulated wire or wire with cross-sections selected for the type of circuit and apparatus.

Signs

- The external marking of the cabinets is made in the laser engraving technique on metal or plastic plates of any color. Equipment and wiring are marked on the basis of the PN-EN 61082-1 standard. Electrical apparatus is described in accordance with the diagram of internal connections and according to design guidelines. Synoptic boards made in a unique way, by applying offset printed sheets on the entire surface of the mounting plate, with the possibility of printing any graphics.

STANDARDS COMPLIANCE

- **PN-EN 61439-1**

"Low-voltage switchgear and controlgear
Part 1: General Provisions";

- **IEC/EN 60529**

"Degrees of protection provided by enclosures (IP code)";

- **PN-EN ISO 4628**

"Paints and varnishes - Assessment of the deterioration of coatings - Determination of the amount and extent of damage and the intensity of uniform changes in appearance
Part 6: Assessment of the degree of chalking by the tape method";

- **PN-EN ISO 2409**

"Paints and varnishes - Examination by means of a grid of incisions".



RATED PARAMETERS

Rated switching voltage:	24-48V/110V/220V/230V/400V
Rated insulation voltage:	500 V
Rated frequency:	AC/DC
Degree of protection:	IP: 44 - 55 / IK: 08 - 10
Protection class:	I/II