ELECTROSHIELD SAMARA
electroshield.ru

AKRON HOLDING
akron-holding.ru

GENERAL PRODUCT RANGE

SCOPE OF APPLICATION OF EQUIPMENT

Oil and gas production and processing

Power generation

Industrial enterprises

Grid companies, urban networks

Russian Railways

Renewable energy sector

The products contained in this catalogue are manufactured as per ISO 9001 certified management system.
The certificate is issued by Bureau Veritas Certification Holding SAS – UK Branch

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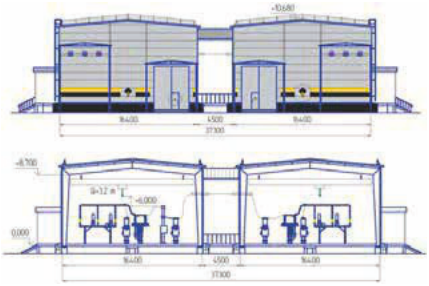
KTP SESH B(M) 220/110/35 kV



Indoor Distribution device ZRU-SESH 110 kV

Indoor Distribution device with KRUE-110 kV

Electroshield Samara is one of the leaders in production of complete transformer substations for voltage of 35, 110 and 220 kV.

Electroshield Samara manufactures modernized packaged modular transformer substations KTP SESH B(M) of voltage classes 35, 110 and 220 kV. Since 2005, the enterprise performs engineering, production and supply of indoor distribution substations for voltage of 35, 110 and 220 kV.

The substations produced in Electroshield Samara reliably operate in all regions of the Russian Federation, near and far abroad. The substations are designed for all typical electric wiring diagrams applicable in the country. Substations for non-typical diagrams can be developed as well. Working, engineering and process flow documentation is developed taking into account the comments and proposals of design institutes and operating organizations. All steel structures for the equipment are hot zinc coated. Assembly on the installation site is made without welding as the bolted connections are used.

The design of the substations allows future step-by-step expansion without additional reconstruction work. Substation delivery as factory-assembled units allows reducing significantly the installation time, improving product quality, and increasing performance reliability of the equipment. The main part of high voltage apparatus is manufactured in production sites of Electroshield Samara and the equipment of Russian and foreign manufacturers is used. Standard and non-standard units of steel structures ensure the guaranteed compatibility of the equipment used. They are provided with rigid busbar, which has improved resistance to wind, ice, seismic loads.

The rigid busbar can be delivered either within the substation or separately. The substation can be fully equipped with systems of Relay Protection and Automation, Process Automation, Automated Measuring and Information System for Electric Power Fiscal Accounting. Most of the substation elements are integrated into the digital substation concept and meet the requirements of IEC 61850.

Indoor Distribution device ZRU-SESH of 35/6 kV

Indoor Substation 35/20 (10-6) kV

Indoor Distribution device ZRU-SESH 20/6 (6/20) kV

Block-modular complete transformer substation, modernized KTP SESH B(M) 220/110/35 kV, 220/110/10 kV, 110/35/10 kV

Product type	Principal wiring diagrams	Rated voltage at HV/MV/LV side, kV	Rated busbar current, A	Transformer capacity, kVA
KTP SESH B(M) 220 kV	1, 3H, 4H, 5H, 5AH, 6, 6H, 7, 8, 9, 9H, 9AH, 12, 12H, 13, 13H, 14, 16, 17	220/110 (35; 20)/ 35 (10; 6)	up to 2000	6300-125,000
KTP SESH B(M) 110 kV	1, 3H, 4H, 5H, 5AH, 6, 6H, 8, 9, 9H, 9AH	110/35 (20)/ 35 (10; 6)	up to 2000	6300-63,000
KRUB-SESH 110 kV	12, 12H, 13, 13H, 14	110/35 (20)/ (10; 6)	up to 2000	6300-63,000
KTP SESH B(M) 35 kV	1, 3H, 4H, 5A, 5Б, 5AH, 9	35/-/10 (6)	up to 1250	1000-16,000
Mobile KTP SESH P(M) B 35 kV	3H, 4H, 5A, 5Б, 5H, 5AH	35/-/10(6)	up to 630	1000-10,000

Climatic version and placement category is UHL1 as per GOST 15150: from -60 up to +40 °C.
Creepage distance of external insulation of the outdoor equipment is up to 3.1 cm/kV.

Rigid busbar OZH-SESH is manufactured with the following technical parameters

Product type	Rated voltage, kV	Rated current, A	Busbar short-time electrodynamic current (impact value, less than 0.1 s)	Busbar short-time withstand current for 3 s, kA
OZH-SESH 35	35	1000; 2000; 3150	64; 81; 128	25; 31.5; 40
OZH-SESH 110	110	1000; 2000; 3150	81; 102; 128	31.5; 40; 50
OZH-SESH 150	150	1000; 2000; 3150	81; 102; 128	31.5; 40; 50
OZH-SESH 220	220	1000; 2000; 3150	81; 102; 128	31.5; 40; 50

Indoor Distribution device ZRU-SESH 110 kV

Product advantages:

- The equipment is placed indoors without exposure to atmospheric precipitation or large temperature differences, that ensures its reliable operation.
- The equipment is maintained at a comfortable above-zero temperature.
- Aesthetic appearance.

Description

- Principal wiring diagram number: any.
- Rated current: 1000, 2000, 3150 A.
- Short-time withstand current for 3 s: 40, 50 kA.
- Capacity of power transformer: up to 63,000 kVA.
- Technical parameters of the building:
  - ambient temperature: from -65 to +50 °C;
  - design temperature inside the building in winter: from +5 to 25 °C;
  - height from the floor to underside of load-bearing roof truss structures: from 8.48 to 8.7 m;
  - building length and width shall be selected depending on the circuit diagram used.
- Earthquake resistance: from 6 to 9 points.

Scope of application

- Far North conditions.
- Metallurgical and chemical enterprises, industries where substations are located in polluted environment conditions.
- Urban substations with special requirements to their appearance.
- Chemical enterprises.
- Oil and gas sector.

Indoor Distribution device ZRU-SESH 35/6 kV

Product advantages:

- Optimum performance and economic characteristics.
- High reliability of power supply.
- Ease of maintenance.

Description

The ZRU 35/6(10) kV versions are developed for various segments of electric systems. The 35-kV substation equipment is accommodated in KRU-SESH-65 cabinets of enclosed type. KRU-SESH-63, KRU-SESH-70 cubicles in module or KRU-SESH-59 cubicles are installed on the 6-kV side.

- Principal wiring diagram number: 5H, 5AH.
- Transformer capacity: up to 25,000 kVA.
- Earthquake resistance: up to 9 points.
- Temperature range: from -60 °C to +40 °C.
- Power supply to oil well cluster.

Scope of application

- Oil fields.

Indoor Substation 35/20 (10-6) kV

Product advantages:

- The equipment is placed indoors without exposure to atmospheric precipitation or large temperature differences, that ensures its reliable operation.
- The equipment is maintained at a comfortable above-zero temperature.
- Aesthetic appearance.

Description

Equipment of the 35/6 kV-substation is accommodated in a block-module. KRU-SESH-65 cubicles are installed on the 35 kV side. KRU-SESH-63 or KRU-SESH-70 6(10) cubicles can be installed on the 6 and 10 kV side.

- Transformer capacity: up to 16,000 kVA.
- Earthquake resistance: up to 9 points.
- Temperature range: from -65 °C to +40 °C.

Scope of application

- Far North conditions.
- Metallurgical and chemical enterprises, where substations are located in polluted environment conditions.
- Urban substations with special requirements to their appearance.
- Oil and gas fields.

Indoor Distribution device ZRU-SESH 20/6 (6/20) kV

Product advantages:

- Standardized substation: the same equipment in step-up 6/20 and step-down 20/6 substations that simplifies maintenance.
- The equipment is placed indoors without exposure to atmospheric precipitation or large temperature differences, that ensures its reliable operation.
- The equipment is maintained at a comfortable above-zero temperature.
- Aesthetic appearance of the substation.

Description

Step-up 6/20 kV and step-down 20/6 kV indoor substations have been designed for distributed generation, gas turbine and reciprocating power plants.
The substation equipment is accommodated in a block-module. KRU-SESH-70 cubicles are installed on the 20 kV and 6 kV side.

- Transformer capacity: up to 4000 kVA.
- Earthquake resistance: up to 9 points.
- Temperature range: from -65 °C to +40 °C.

Scope of application

- Gas turbine and gas reciprocating power plants of low power at oil fields.
- Distributed generation, where the consumer is located near the generation site.
- Mining and concentrating companies.

DISTRIBUTION DEVICES AND CONTROL DISTRIBUTION DEVICES

DISTRIBUTION DEVICES AND CONTROL DISTRIBUTION DEVICES

The main advantage of Electroshield Samara as a distribution device and control gear manufacturer is the ability to combine custom-tailored approach with the rate of mass production. The enterprise is capable of producing over 1000 of distribution devices and control gears monthly, with a significant portion being tailor-made according to individual customer requests.

Product advantages:

- Home-made key components.
- Painted metal parts are processed by electrophoretic prime coating method, that improves corrosion resistance.
- Earthing switches with spring closers.
- Moving plug contacts of switches and their counterparts in the cabinets are made of copper with additional silver coating.

Scope of application

- Oil, gas, coal and steel-making industry.
- Railway power supply.
- Agriculture.
- Urban, municipal and inter-regional power distribution networks.
- Auxiliary systems of power plants, including NPPs.

Equipment certification

GOST certificates and declarations of conformity for the equipment.
The equipment is certified by Rosseti, PJSC and Transneft, PJSC.

For more details of equipment arrangement options in block-modules, please refer to page 35 in «Modular Solutions» section of this Catalogue or visit our website at http://electroshield.ru

Series	Voltage class, kV	Rated current of main circuits at a frequency of 50 Hz, A	Rated breaking current of circuit-breaker, kA	Service conditions	Climatic version	Dimensions WxDxH, mm
KSO-SESH-298M	6; 10	630; 1000; 1600	20	single-sided	U3	750 (1000) x 1100 x 2366
KRU-SESH-59	6; 10	630; 1000; 1600; 2000; 3150	20; 31.5	double-sided	HL1, U1	750 (1060) x 3240 x 2780
KRU-SESH-61M	6; 10	630; 1000; 1600; 2000; 2500; 3150; 4000	25; 31.5; 40	double-sided	U3	750 (1125) x 1340 (1715) x 2268
KRU-SESH-63	6; 10	630; 1000; 1600; 2000	20; 25; 31.5	double-sided	U3	750 x 1165 (1365) x 2268
KRU-SESH-65	35	1000; 1600	16; 20; 25	single-sided	UHL1	1500 (2250) x 3399 (4550) x 3903
KRU-SESH-70-10	6; 10	630; 1000; 1250; 1600; 2000; 2500; 3150; 4000	20; 25; 31.5; 40; 50	single-sided double-sided	U3	650 (750) (1000) x 1400 (1500) x 2415 (2630)
KRU-SESH-70-20	20	630; 1000; 1250; 2000; 2500	20; 25; 31.5	single-sided double-sided	U3	750 (1000) x 1599 x 2400 (2630)
KRU-SESH-70-35	35	630; 1000; 1250; 1600; 2000; 2500	25; 31.5	double-sided	U3	1200 x 2955 x 2400
KRU-SESH-80N	6; 10	630; 1000; 1250; 1600; 2000; 2500; 3150; 4000	20; 25; 31.5; 40	double-sided	UHL4; U3; T3	600 (750) (1000) x 1650 x 2715
KRU-SESH-80S	6; 10	630; 800; 1000; 1250; 1600; 2000	25; 31.5	single-sided	UHL4; U3	600 (750) (1000) x 1400 x 2800
KRU-SESH-85	6; 10	630; 1000; 1600	25; 31.5	single-sided	UHL4; U3	750 x 1100 x 2100

KRU-SESH-70-35

KRU-SESH-80N

KRU-SESH-80S

KRU-SESH-85

For more details of KRU-SESH, please visit our website at http://electroshield.ru, «Products» section.

Block-modular distribution device

Product advantages:

- Optimum operating conditions for maintenance personnel and equipment are ensured inside the block-modular distribution device.
- Block-modular distribution device modifications implement the connection of complete transformer substations, high-voltage motor, dredger and ice-melting machine.
- The amount of installation works for distribution device connection to the grid is reduced, because the block-modular distribution devices are delivered ready-to-use.
- Power lines can be fed from any side and at any angle, regardless of the block-modular distribution device position.

Description

Block-modular distribution device is intended for sectioning of overhead and cable lines with a voltage of 6(10) kV with single side and double-side feed, ensuring the function of automatic reclosing (AR), automatic load transfer (ALT), automatic restoration of normal mode (ARNM) and overhead lines section division (OLSD).

- Rated voltage: 6, 10 kV.
- Rated current of main circuits: 630, 1000 A.
- Rated breaking current of vacuum circuit-breaker: 20 kA.
- Short-time withstand current for 3 s: 20 kA.
- Short-time electrodynamic current: 51 kA.
- Ambient temperature: from -60 to +40 °C.

Scope of application

- Oil fields.
- Transmission networks.

Distribution device and control gear in a block-module

Product advantages:

- Short terms of substation installation.
- Easy to transport.
- Wide range of building dimensions.
- Equipment is pre-installed within each transport unit.
- High levels of thermal and sound insulation.
- Earthquake resistance: up to 9 points of MSK-64 scale.
- Price is lower than that of similar permanent and concrete substations.

Description

Distribution device and control gear accommodated in a block-module consists of separate modular units with built-in distribution device and control gear cabinets in accordance with the wiring diagram of the order. In general, the distribution device has a dual line arrangement of cubicles and consists of two busbar sections. The block-module consists of separate transport units installed in the substation building.

- Rated voltage: 6; 10; 20; 27.5; 35 kV.
- Rated current of main circuits: up to 4000 A.
- Rated breaking current of vacuum circuit-breaker: up to 50 kA.
- Short-time withstand current for 3 s: up to 50 kA.
- Short-time electrodynamic current: up to 128 kA.
- Ambient temperature: from -60 to +40 °C.

Scope of application

- Mobile power supply systems in oil and gas industry.
- Operational power supply without construction of permanent buildings in civil and industrial construction industry.

For more details of equipment arrangement options in block-modules, please refer to page 35 in «Modular Solutions» section of this Catalogue or visit our website at http://electroshield.ru

COMPLETE TRANSFORMER SUBSTATIONS

COMPLETE TRANSFORMER SUBSTATIONS

Manufacturing of LV transformer substations of different types is one of the main production areas of Electroshield Samara. KTP-SESH in block-module is equipped with home-made LV distribution devices, power transformers and HV equipment.

Product advantages:

- High quality and strength of the frame.
- Special painting technology.
- Mechanical interlocks of switching devices during the performance of preventive and predictive maintenance.
- Protection against unauthorized access.
- Painting in corporate colors of the customer.
- Wide power range of complete transformer substations.
- Full operational readiness.

Scope of application

- Power supply for the facilities in oil and power industries, agricultural, urban, settlement, industrial and other facilities.

Equipment certification

GOST certificates and declarations of conformity for the equipment.

Complete transformer substations KTP-SESH-P in block-modules

Description

Complete transformer substations in block-modules are designed to receive, transform and distribute three-phase AC power with frequencies of 50 or 60 Hz, voltage of 6(10)/0.4; 0.44*; 0.69* kV. Block-modules have different overall dimensions and a combination of several modules with each other allows implementing any design solutions and customer requirements. Transformer substations in block-modules are equipped with all required utility systems that allow full-rate operation, solution – ventilation system (microclimate), heating, lighting, security and fire alarm system and other solutions for specific project requirements.

Product advantages:

- Easy to install.
- Easy to transport.
- Short terms of substation installation.
- Wide range of block-modules dimensions.
- Wide range of operating temperatures.
- Earthquake resistance: up to 9 points of MSK-64 scale.
- High degree of operational readiness.

Generally, a complete transformer substation in block-module consists of:

- equipment of complete transformer substation according to the questionnaire (HV, LV, power transformers, etc.);
- block-module delivered according to the configuration and questionnaire;
- stairs and platforms for taking the transformer out of service for repair;
- additional equipment for installation in a block-module according to the questionnaire;
- utility systems of the block-module.

Scope of application

- Auxiliary system for all types of power plants.
- Electrical networks.
- Power supply of industrial enterprises and civil buildings.
- Outfit of transmission gas pipelines, oil pipelines.

** Under special request*

Complete substation in electrical monoblock unit 2KTP-MB10-SESH

10-m and 12-m long monoblock complete transformer substation.

The 10-meter long building has been designed in accordance with the requirements of Gazpromneft – Noyabrskneftegaz, while the 12-meter long version has been made under request of Rosneft, Yugansknefteгaz. Width of each substation is 3 m, while its height is 3.3 m. The external installation method of sandwich panels was applied in the substation that makes it possible to use effectively the room space.

Product advantages:

- No additional installation is required.
- Delivered in a single block-module.
- Ready-to-operate immediately after installation.
- Heating, lighting, ventilation, security and fire alarm are provided inside the building.
- The floor is covered with a non-skid coating.

Scope of application

- Auxiliary system for all types of power plants.
- Electrical networks.
- Power supply of industrial enterprises and civil buildings.
- Outfit of transmission gas pipelines, oil pipelines.

Complete transformer substations for indoor installation KTP-SESH-P 250; 400; 630; 1000; 1600; 2500; 3150

Product advantages:

- Full operational readiness.
- Quality of manufacture and assembly at the factory with mandatory control.
- Certification and approval of declared characteristics.
- Full cycle of production at the factory.
- Complex projects.

Description

KTPP is an electrical installation designed to receive, transform and distribute three-phase AC power with frequencies of 50 or 60 Hz, voltage of 6-10/0.4; 0.44*; 0.69* kV.

KTPP consists of one or several transformers, a high voltage device (HVD) with switching apparatus, a complete distribution device on the low voltage side (LVSW). It is intended for electric power distribution between separate power consumers or groups of power consumers. Cabinets of different design and functionality depending on customer requirements can be implemented as LVSW.

Scope of application

- Power supply for auxiliary systems of all types of power plants, in oil and gas industry, for production and transit of fossils, in industrial shop substations, in the infrastructure for powering various consumers, including those with motor load.

** Under special request*

Complete transformer substation KTP Pilot

Product advantages:

- Complies with Electrical Installation Regulations, GOST 14695.
- All parts of indoor complete transformer substation are made of zinc-plated metal.
- Also, zinc-plated powder-coated case can be manufactured.
- No welding is used in the KTP Pilot assembling.
- Metering in outgoing lines.
- Fire and security alarm arrangement.
- The list of required factory tests with test reports preparation.
- Availability of localization ability report.

Description

Complete transformer substation KTP Pilot is designed to receive, transform and distribute three-phase AC power with a frequency of 50 Hz.
KTP Pilot consists of three sections, enclosed in a single metal case:

- a power transformer section with double-sided maintenance;
- a HVD section:
  - with a circuit-breaker of VNA-SESH type of 25-1000 kVA;
  - combined with a power transformer section of 25-400 kVA without load switch;
- LV distribution device section without maintenance corridor;
- high-voltage bushing;
- line disconnector installation assembly on a free-standing support.

Scope of application

- KTP Pilot is used for power supply of agricultural and manufacturing facilities, oil and gas fields facilities, residential areas and infrastructure facilities of companies.

Complete transformer substation of outdoor installation KTP-SESH-N 100; 160; 250; 400; 630

Product advantages:

- Full operational readiness.
- Quality of manufacture and assembly at the factory with mandatory control.
- Certification and approval of declared characteristics.
- Full cycle of production at the factory.

Description

KTPN is an outdoor complete transformer substation with a maintenance corridor, that is designed to receive, transform and distribute three-phase AC power with frequencies of 50 and 60 Hz, voltage of 6-10/0.4 kV.
It consists of a metal enclosure where a transformer compartment combined with a high voltage and a LV distribution device compartments with a maintenance corridor are accommodated. The LV distribution device is installed inside the low voltage compartment and, if necessary, a capacitor unit can be installed in this compartment for reactive power compensation.

Scope of application

- Power supply for agricultural facilities, oil and gas fields, separate settlements and industrial facilities.

LOW VOLTAGE DISTRIBUTION DEVICES

LOW VOLTAGE DISTRIBUTION DEVICES

NKU-SESH is designed for primary and secondary electrical energy distribution, monitoring and control of electrically driven equipment. NKU-SESH provides high reliability of power supply using LV protection and switching apparatus.

The possibility of combining cabinets for power distribution and control cabinets of electric drives allows implementing flexible approach to solve the power supply issues. The separation system as per form 4b is used in NKU-SESH, that provides maximum safety during maintenance and repair.

Product advantages:

- Modular system built-up.
- The possibility of combining cabinets of the same type (lead-in cabinets with distribution, control and protection).
- The possibility of expanding the existing distribution device for increased number of consumers.
- The possibility of connecting a large number of low-power consumers with small overall dimensions.

Scope of application

- Electric power supply for auxiliary systems of all types of power plants.
- Completing of substations of gas and oil pipeline pump stations.
- Systems of power supply and automation of industrial enterprises, utility infrastructure and substations of electrical networks.

Equipment certification

Required GOST R, IEC certificates, declarations of conformity are available.

Product type		Brief description	Rated busbar current, A	Rated current of distribution buses, A	Version of functional units	Protection level
	**NKU-SESH-M**	These distribution devices are intended for electric power distribution, electric equipment control	up to 5000	up to 3200	Stationary	up to IP54
	**NKU-SESH-MV**	These distribution devices are intended for electric power distribution and driven equipment control	up to 6300	up to 3200	Stationary, draw-out	up to IP54
	**SOPT-SESH**	These distribution devices are designed to provide uninterrupted power supply via input, transformation, accumulation and distribution of DC power supply	–	–	Stationary	up to IP54

For more details, please visit our website at http://electroshield.ru, «Products» section.

ELECTRICAL APPARATUS

ELECTRICAL APPARATUS

The electrical apparatus of Electroshield Samara is a range of products resulted from the complete production and manufacturing process of main assemblies and parts with components from world-leading suppliers, 100% quality control at all stages of production, dozens of inventions and continuous improvement of technologies and designs of electrical apparatus.

Currently, the electrical apparatus of Electroshield Samara are installed at the most important facilities in Russia as well as in dozens of countries worldwide.

Equipment certification

- RGP-SESH, RN-SESH, ZON-SESH are provided with declarations of conformity.
- RGP-SESH, RN-SESH are provided with certificates of conformity with technical requirements of Rosseti, PJSC.

Description	Drive type	Climatic version	Rated voltage, kV
Disconnectors			
 **RGP-SESH**	Manual, motorized, digital*	UHL1	35
 **RN (P, K, SK)-SESH**	Manual, motorized, digital*	UHL1	110
 **RN(P)-SESH**	Manual, motorized, digital*	UHL1	220
Earthing switch			
 **ZON-SESH**	Manual, motorized, digital*	UHL1	110

** For more details of digital solutions for PDZ-SESH drive, please refer to page 47 in «Digital Solutions» section of this Catalogue or visit our website at http://electroshield.ru*

DISCONNECTORS

Disconnectors manufactured by Electroshield Samara represent a wide range in rated current for voltage of 35 220 kV, providing reliable operation of the power grid in Russia.

The diversity of structural designs allows using the disconnectors of Electroshield Samara in any layout diagram of complete transformer substations and modular complete transformer substations:

- Horizontal, vertical, fin, stepped and many others.
- Reliable anti-corroфsive coating, high switching capacity.
- Great choice of options and layout arrangements.
- Manual and motor drives, remote control.

Maintenance-free contacts of the main and grounding blades improve reliability and reduce apparatus maintenance costs.

Rated current, A	Short-time withstand current, kA	Short-time electrodynamic current, kA	Mechanical durability, number of on-off cycles	Insulation type
630; 1000; 2000	12.5; 20; 31.5	31.5; 50; 80	10,000	Porcelain/ Polymeric material
1000; 1250; 2000	31.5; 40	80; 100	10,000	Porcelain/ Polymeric material
1250; 2000	31.5; 40	80; 100	10,000	Porcelain/ Polymeric material
400	6.3	15.75	10,000	Porcelain/ Polymeric material

VACUUM CIRCUIT-BREAKERS

Currently, vacuum circuit-breakers of Electroshield Samara include more than 100 standard designs that meet any requirements of complete transformer substations' manufacturers.

Scope of application

Vacuum circuit-breakers of Electroshield Samara are used in three-phase AC networks with a frequency of 50 Hz and a rated voltage of 6-35 kV, in newly developed distribution devices and control gears and for reconstruction of obsolete distribution devices which are in operation.

Product advantages:

- Circuit-breakers of Electroshield Samara provide reliable switching of motors, transformers, capacitors, overhead and cable power lines.
- The whole range of drives (spring-motor, electromagnetic, magnetic latch) with extensive functionalities.
- Wide choice of additional options: operational power supply, interlocks, current release devices and tripping coil from independent source of power.
- High switching capacity, maintenance-free.
- Stationary and draw-out versions.
- Terminal row and control wiring harnesses with various types of plug connectors: 2RTT, SSHR, HARTING, ILME.

Equipment certification

VVU-SESH, VVM-SESH, VVN-SESH are provided with certificates of conformity with technical requirements of Rosseti PJSC.

For more details of vacuum circuit-breakers, please visit our website at http://electroshield.ru

TECHNICAL SPECIFICATIONS

Description	Drive type	Climatic version	Rated voltage, kV	Rated current, A	Short-time withstand current, kA	Short-time electrodynamic current, kA	Insulation type
 **VVU-SESH**	Spring-motor, electro-magnetic	U2	10	1000; 1600; 2000; 2500; 3150; 4000	20; 31.5; 40; 50	51; 64; 81; 102; 128	Glass-filled polycarbonate, silicone
 **VVU-SESH**	Spring-motor, electro-magnetic	U2	27.5; 35	1000; 1600; 2000	20; 25	51; 64	Air insulation
 **VVN-SESH**	Spring-motor, electro-magnetic	UHL1	27.5; 35	1000; 1600	25; 31.5	64; 81	Epoxy resin, organic silicone insulation
 **VVM-SESH**	Magnet latch	U2	10	1000; 1600	20; 31.5	51; 81	Glass-filled polycarbonate
 **BAVR-SESH**	Magnet latch	U2	10	1600	31.5	81	Glass-filled polycarbonate

POWER DISTRIBUTION TRANSFORMERS

POWER DISTRIBUTION TRANSFORMERS

Electroshield Samara pays great attention to improvement of technical specifications and design of products, processes of product manufacture.
The enterprise manufactures oil-filled and dry-type power transformers, as well as low-power transformers.

Product advantages:

- The company has a great experience in manufacturing transformers with copper or aluminum windings of wide range of capacity and voltage.
- The enterprise produces energy-saving transformers with reduced no-load losses and short-circuit losses.

Scope of application

- Gas and oil production industries.
- Transport and power industry.
- Metallurgical complexes and industrial enterprises.

Production facilities

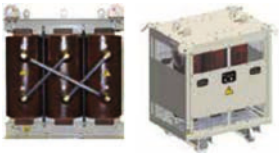
- Only high-quality materials and components that have undergone strict incoming inspection are used.
- The production of magnetic cores employs the modern cross-cutting lines equipped with automatic core plate pickup.
- In blanking and welding operations, automatic cutting and welding equipment is used.
- In winding production, high-performance equipment is used, which allows producing high-quality windings with special attention paid to the density of winding.
- Cases and covers are painted in modern powder painting lines with preliminary surface treatment.
- Transformer oil passes through several processing steps, including drying, degassing, filtration in oil storage and filling automated line.

Equipment certification:

Power transformers are provided with declarations of conformity.
Transformers TMG-SESH 25...2500 kVA 10 kV are provided with the conclusion of the certification commission (ZAK document) of Rosseti, PJSC.

Name/Version/Brief description		Capacity, kVA	Voltage class, kV	Climatic version	Connection diagram
Power distribution transformers 6-35 kV, with oil insulation					
	**TM(G)(F)*-SESH Standard series 11. Energy-efficient series 12.** The level of no-load losses and short-circuit losses meets the requirements of STO 34.01-3.2-001-2021 of Rosseti, PJSC and Regulations of the RF Government No. 600, No. 1006	25-3150	10	Y/Yn-0, Δ/Yn-11, Y/Zn-11	U1, UHL1, T1
	TMG-SESH Matching series (15) Voltage (HV/LV): 10/10; 6/6; 10/6; 6/10 kV	400-2500	10	Y/Yn-0, Δ/Yn-11, Y/Δ-11, Δ/Δ-0	U1, UHL1

POWER DISTRIBUTION TRANSFORMERS 6-35 KV WITH OIL INSULATION

Name/Version/Brief description		Capacity, kVA	Voltage class, kV	Connection diagram	Climatic version and placement category
	**TMG-SESH** Transformer series for voltage class 15, 20 and 35 kV (11 and 01)	100-3150	15; 20; 35	Y/Yn-0, Δ/Yn-11	U1, UHL1
	**TMG(MSH)-SESH** Low-noise version, sound pressure level is 20% lower than that of GOST requirements	400-2500	6; 10	Y/Yn-0, Δ/Yn-11	UHL1
	**TMPNG-SESH** Transformers for power supply pf submersible pumps. Standard series 11. Energy-efficient series 12.	63-1200	3; 6	Yn/Yn-0	UHL1, T1
	**TMN-SESH** With on-load voltage regulation TM-SESH with no-load tap changer	2500-6300	35	Y/Δ-11	UHL1
	**TLS(Z)-SESH** Cast resin transformer (epoxy compound) series Version – open or in a protective casing	25-100	10	Y/Yn-0, Δ/Yn-11	U3

LOW-POWER TRANSFORMERS WITH DRY INSULATION

Description		Capacity, kVA	Voltage class, kV	Connection diagram	Climatic version
	**OLZ-SESH** for outdoor installation	0.63-2.5	27.5	1/1-0	UHL1
	**OLS-SESH** for indoor installation, with or without safety device	0.63-4	10	1/1-0	U2, UHL2, T2
	**OLS-SESH** for indoor installation	0.63; 1.25	35	1/1-0	U2, UHL2, T2
	**OL-SESH** for outdoor installation	0.63; 1.25	10	1/1-0	UHL1

INSTRUMENT TRANSFORMERS

INSTRUMENT TRANSFORMERS

Electroshield Samara produces a full range of instrument current and voltage transformers for indoor and outdoor installation.

The major focus in the production process is put on the quality of components. They are subject to thorough incoming inspection before release to the production.

The professional competence personnel and well-established design and production process make it possible to manufacture transformers meeting individual specifications in the shortest possible time.

Equipment certification
Instrument transformers are provided with declaration of conformity.
Transformers have certificates of conformity with technical requirements of Rosseti, PJSC.

Scope of application

- Industrial enterprises.
- Distribution device and control distribution device manufacturers, installation organizations.
- Transport organizations.
- Companies working in oil and gas production, electric-power industry.

The company constantly improves products, expands the range of current transformers. Instrument transformers can be manufactured with insulation level «a» or «b» as per GOST 1516.3-96.

Outdoor transformers can be operated at the environmental pollution rate (PR) of 4PR as specified by «Electrical Installations Code» for transformers with creepage distance category IV as per GOST 9920-89.

Product advantages:

- Wide range of current transformers in terms of rated primary current and accuracy class.
- Wide range of voltage transformers in terms of primary voltage and accuracy class.
- Possibility of transformer installation in any position.
- High reliability and measurement accuracy.
- Possibility of manufacturing transformers of any configuration.
- Easy maintenance and convenient installation.
- Thorough product quality control, including insulation test for compliance with the standards for the level of partial discharge.

3-phase groups of instrument voltage transformers

Description/Version		Voltage class, kV	Rated accuracy class of main secondary windings	Rated accuracy class of winding insulation test	Climatic version and placement category
	**3xZNOL-SESH** For indoor installation. With or without safety device	6; 10	0.2; 0.5; 1; 3	3; 3P; 6P	U2, UHL2, T2
	**NALI-SESH** For indoor installation. With or without safety device	6; 10	0.2; 0.5; 1; 3	3; 3P; 6P	U2, UHL2, T2
	**NALI-SESH** For indoor installation	35	0.2; 0.5; 1; 3	3; 3P; 6P	U2, UHL2, T2
	**NALI-SESH** For outdoor installation	35	0.2; 0.5; 1; 3	3; 3P; 6P	UHL1

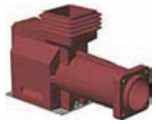
3-phase groups of instrument voltage transformers

Description/Version		Rated voltage, kV	Design versions	Climatic version and placement category
	**TZLK-SESH** For indoor installation	0.66	1; 2; 3; 4	U2, T2
	**TZLKR-SESH** Split-core transformer for indoor installation	0.66	1; 2; 3; 4	U2

Instrument voltage transformers

Description/Version		Voltage class, kV	Rated accuracy class of main secondary winding	Number of secondary windings	Climatic version and placement category
	**NOL-SESH** Support-type transformer for indoor installation. With or without safety device	6; 10; 20	0.2; 0.5; 1; 3	up to 2	U2, UHL2, T2
	**NOL-SESH** Support-type transformer for indoor installation	35	0.2; 0.5; 1; 3	up to 2	U2, UHL2, T2
	**NOL-SESH** Support-type transformer for outdoor installation	35	0.2; 0.5; 1; 3	up to 2	UHL1, T1
	**NOL-SESH** Support-type transformer for outdoor installation	10	0.2; 0.5; 1; 3	up to 2	UHL1, T1
	**ZNOL-SESH** Grounded, support-type transformer for indoor installation	6; 10; 15; 20	0.2; 0.5; 1; 3	up to 3	U2, UHL2, T2
	**ZNOL-SESH** Grounded, support-type transformer for indoor installation	27; 35	0.2; 0.5; 1; 3	up to 3	U2, UHL2, T2
	**ZNOL-SESH** Grounded, support-type transformer for outdoor installation	27; 35	0.2; 0.5; 1; 3	up to 3	UHL1, T1
	**ZNOL-SESH** Compact, support-type transformer for indoor installation. With safety device.	6; 10	0.2; 0.5; 1; 3	up to 2	U2, UHL2, T2

Instrument current transformers

Description/ Version		Rated voltage, kV	Rated accuracy class for measurements and metering	Rated accuracy class for protection	Rated primary current, A	Rated secondary current, A	Number of secondary windings	Climatic version and placement category
	**TOL-SESH** Support-type transformer for indoor installation	10	0.2; 0.2S; 0.5; 0.5S; 1; 3; 5; 10	5P; 10P	5-3000	1; 5	up to 5	U2, UHL2, T2
	**TOL-SESH** Small-size, support-type transformer for indoor installation	10	0.2; 0.2S; 0.5; 0.5S; 1; 3; 5; 10	5P; 10P	5-2000	1; 5	up to 2	U2, UHL2, T2
	**TOL-SESH** Support-type transformer for indoor installation	20	0.2; 0.2S; 0.5; 0.5S; 1; 3; 5; 10	5P; 10P	5-2500	1; 5	up to 5	U2, UHL2, T2
	**TOL-SESH** Support-type transformer for indoor installation	35	0.2; 0.2S; 0.5; 0.5S; 1; 3; 5; 10	5P; 10P	5-2500	1; 5	up to 5	U2, UHL2, T2
	**TOL-SESH** Support-type transformer for indoor installation	35	0.2; 0.2S; 0.5; 0.5S; 1; 3; 5; 10	5P; 10P	5-2500	1; 5	up to 4	U2, UHL2, T2
	**TOL-SESH** Support-type transformer for outdoor installation	35	0.2; 0.2S; 0.5; 0.5S; 1; 3; 5; 10	5P; 10P	5-1200	1; 5	up to 4	UHL1, T1
	**TOL-SESH** Support-type transformer for outdoor installation	35	0.2; 0.2S; 0.5; 0.5S; 1; 3; 5; 10	5P; 10P	600-3000	1; 5	up to 4	UHL1, T1
	**TOL-SESH** Support-type transformer for outdoor installation	10	0.2; 0.2S; 0.5; 0.5S; 1; 3; 5; 10	5P; 10P	5-2000	1; 5	up to 3	UHL1, T1

Instrument current transformers

Description/ Version		Rated voltage, kV	Rated accuracy class for measurements and metering	Rated accuracy class for protection	Rated primary current, A	Rated secondary current, A	Number of secondary windings	Climatic version and placement category
	**TSHL-SESH** Busbar transformer for indoor installation	0.66	0.2; 0.2S; 0.5; 0.5S; 1	5P; 10P	150-5000	1; 5	1	U2, T2
	**TSHL-SESH** Busbar transformer for indoor installation	10	0.2; 0.2S; 0.5; 0.5S	5P; 10P	1000-6000	1; 5	up to 5	U2, T2
	**TPL-SESH** Through-type transformer for indoor installation	10	0.2; 0.2S; 0.5; 0.5S	5P; 10P	300-2000	1; 5	up to 4	U2, T2
	**TV-SESH** Built-in	10; 20;	0.2; 0.2S; 0.5; 0.5S; 1; 3; 10	1; 3; 10; 5P; 10P	50-6000	1; 5	1	04, UHL1, T1

Current sensors

Description/Version		Rated voltage, kV	Primary current of single phase-to-earth fault, max, A	Secondary current of single phase-to-earth fault, max, A	Climatic version and placement category
	**TZLV-SESH** For indoor installation	10	500	1.25	U2, T2

MODULAR SOLUTIONS

E-HOUSE – MODULAR SOLUTIONS

Electroshield Samara presents – E-House (Electrical House or Electrical Module) – a modern concept of prefabricated products in the electrical industry where all the required equipment is installed by the manufacturer in specially designed modules and represents a comprehensive solution for a specific task.

E-House can be composed of one or several equipped modules with pre-installed high-quality equipment and components inside them, including distribution devices and control gears (SWCG), low voltage distribution devices (LVSW), control and protection systems, transformers and other equipment, as required. Being fully developed, manufactured, assembled and tested at the manufacturer's site or at fit-up assembly site before shipment to the customer, an E-House only requires installation at the customer's site and connection to the operating network.

Solutions based on the classic construction approach

Solutions based on E-House

Choice preference of prefabricated electrical modules: accommodating the equipment required for power supply, monitoring and automation in the module allows reducing the time needed for project implementation and improving product quality and safety.

BENEFITS AT A GLANCE

High-quality manufacturing
All production standards are met and controlled in the process of module production, that is approved by certificates of product conformity.

Completion in time
Products are manufactured in the shortest possible time regardless of weather and geographic conditions. Full operational readiness allows the modules to be assembled quickly at the customer's site.

Comprehensive solutions
Fully equipped E-House eliminates installation errors and provides the possibility of quick putting into service with reduced commissioning costs.

Safety
Electrical modules minimize risks of injury during production and commissioning, have a minimal impact on the environment and are certified in the field of fire safety.

The E-House concept is developed in such a way as to provide an individual approach to solve each specific problem.
Based on our long-term experience, we can offer a wide range of off-the-shelf solutions.

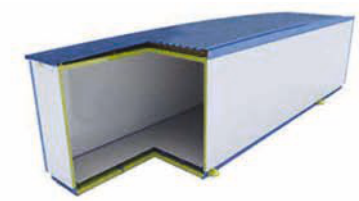
Complete transformer substations, distribution devices, control centers, inverter installations – all these and many other products are offered by Electroshield Samara on the basis of the E-House concept.

DESIGN VERSIONS

Basically, all E-House products can be divided into two types – monoblock unit and composite modules.

Monoblock unit

Stand-alone, integral electrical modules with a wide range of overall dimensions. Heat-insulated with mineral wool in the module's base, with mandatory layers of vapor-moisture-proof materials, these modules are lined with 80- or 120-mm thick sandwich wall panels around their perimeters.
A monoblock E-House can be implemented in three basic designs:



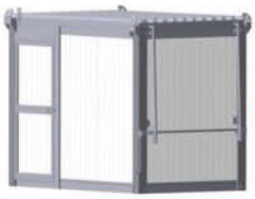
Multipurpose module

This module features large overall dimensions (up to 12 m in length and 3.5 m in width) combined with a reinforced base frame that allows transporting the unit with equipment installed inside it. Specially designed radial roof has combined the following:

- compliance with regulatory requirements to roof slope;
- the possibility to transport modules of this type by any kind of transport.

Standard module

The lightweight structure of the module is designed to accommodate medium-weight equipment and has a lifting or removable roof to reduce the module's height. It is suitable for small complete transformer substations (CTS), low voltage distribution devices (LVSW), substation control houses (SCH).



Small-size module

It is a solution for low-power substations, that are to be placed within minimum areas (from 2 x 3.5 m). This E-House is equipped with a lifting roof, that allows you to additionally control the module's ventilation and, if necessary, increase the working size inside the module.

Composite modules

Composite modules are composed of two or more block-modules from which electric rooms are made up without any size limits.

In this case each module represents a metal frame lined with heat-insulating material, which thickness shall be agreed when ordering the module.

Composite modules of E-House can be selected without any restrictions regarding the layout of new projects.

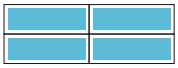
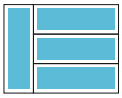
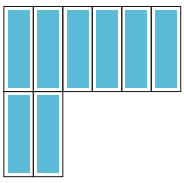
The long-term experience of Electroshield Samara allows the company to offer a variety of off-the-shelf layout solutions.

If necessary, modules of electrical units can be manufactured with a double-pitch roof without fronton. Roof for these modules is delivered as a separate cargo item to be mounted during the installation of the unit.

Key technical specifications of modules

Parameter	Standard module	Multipurpose module	Small-size module
Width, mm	1750-3500	3000	2070 (2460)
Height, mm	3980 (3150 – along the rack without a roof)	3290	2690
Length, mm	4500-7500	9000-12,000	3320 (5225)
Climatic version	UHL1		
Ambient temperature	from -60 °C to +40 °C		
Temperature inside the module, minimum	+5 °C		
Environment	non-aggressive or slightly aggressive		
High earthquake resistance	up to 9 points of MSK-64 scale		

Options for module arrangement

Linear arrangement	
Double-row arrangement	
Serial arrangement	
Mixed arrangement	
L-shaped arrangement	

Options upon customer request:

- antistatic linoleum;
- antiskid aluminum sheet;
- additional anticorrosion treatment of steel structures.

NEW PRODUCT
MEB 2.0 – TWO-LEVEL MODULES OF ELECTRICAL UNITS

Two-level solutions are ideal for facilities that face the problem of lack of free space and the high cost of preparing sites for new construction:

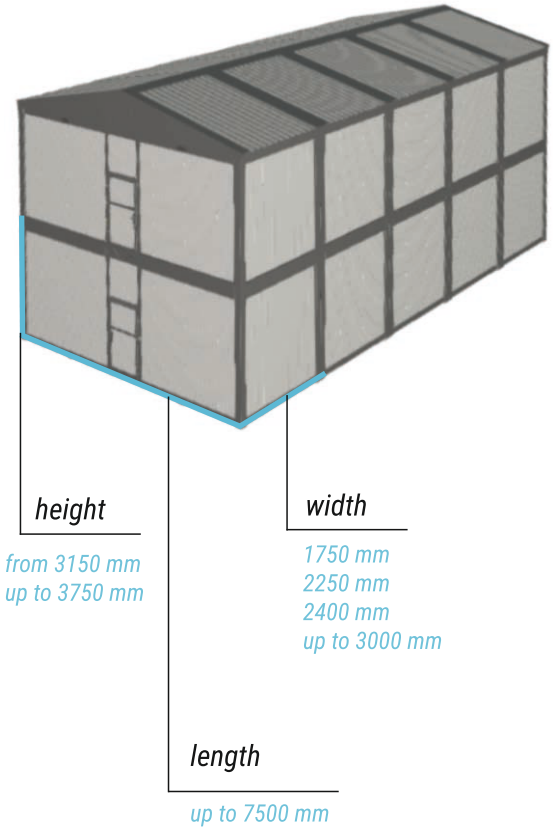
- oil and gas industry;
- urban networks;
- sea ports.

Full operational readiness of MEB 2.0, with the required electrical equipment installed inside, will allow quick and safe on-site mounting the modules, which will significantly reduce the commissioning time, eliminating the risk of installation errors.

Two-level module

Key technical specifications of MEB 2.0

Parameter	Value
Earthquake resistance as per MSK-64	9 points
Fire resistance as per FZ-123	degree II
Snow zone	V (2.5 kPa)
Wind zone	IV (0.48 kPa)
Bearing capacity of 1 module	1-st level – 12 t 2-nd level – 6 t
Interunit electrical	quick-disconnect connections
Roof	double pitch15°



Possible dimensions of two-level module

DIGITAL SOLUTIONS

DIGITAL SOLUTIONS FOR SWCGS

TEMPERATURE CONTROL SYSTEM OF CONTACT JOINTS

- Overheating alarm
- Data collection from the whole
- Distribution device MODBUS-TCP support, IEC-60870, IEC-61850 compliance

WIRELESS TEMPERATURE SENSORS

- Wireless data transfer
- Continuous temperature monitoring
- No additional power supply is required

ELECTRIC DRIVE OF DRAW-OUT ELEMENT AND GROUNDING BLADES

- Remote control
- Safe operation

DIGITAL TWIN

- Maximum personnel safety
- Cubicle status monitoring
- Remote operational service

VIDEO MONITORING

- Maintenance and repair when required
- Real assessment of service life time of the distribution device cubicle

DIGITAL PASSPORT

- Online access to documentation via QR code
- Excludes the documentation loss

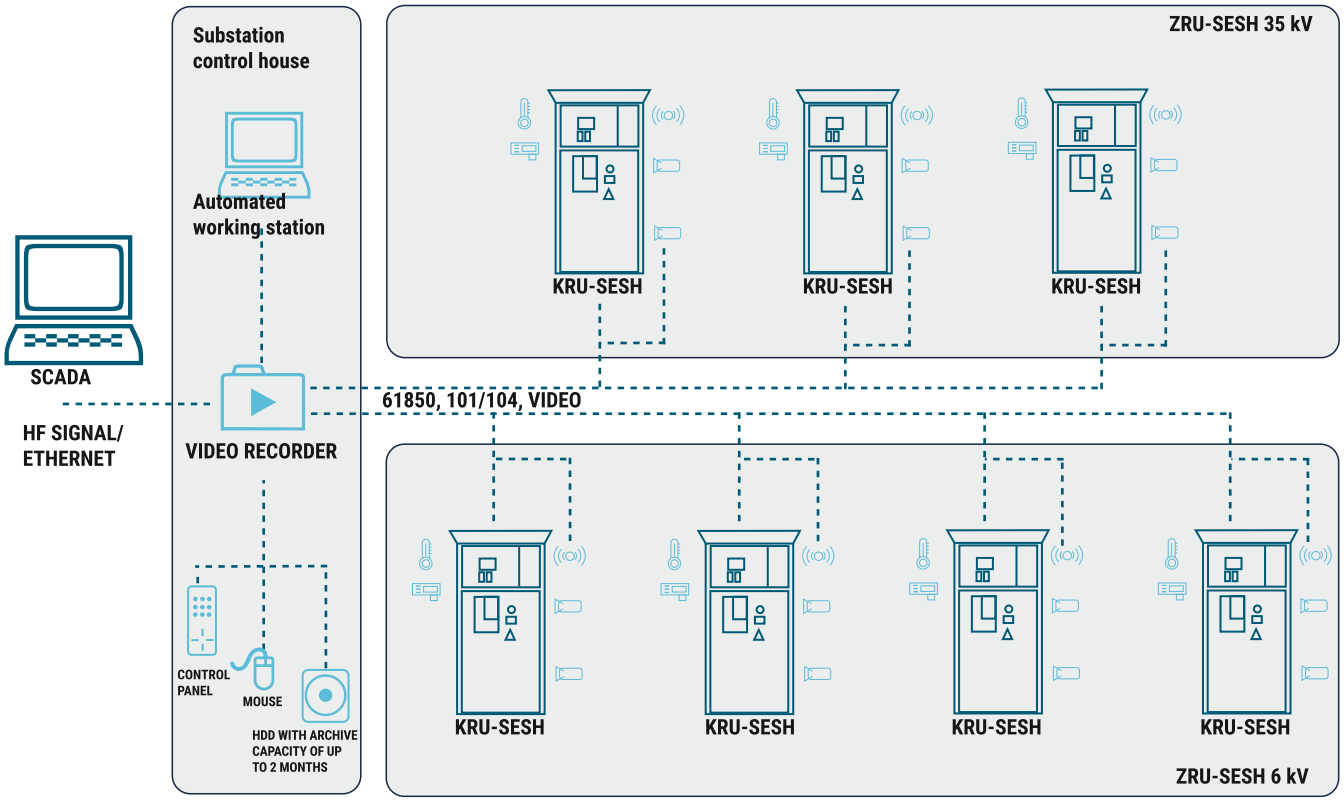
Distribution device and control gear KRU-SESH-85

DIGITAL COMPREHENSIVE MONITORING

CCTV system is an option for KRU-SESH-70 10, 20, 35 kV and KRU-SESH-80 cubicles.
This option allows remote monitoring of draw-out elements and grounding blades movement in cubicles located in the indoor distribution device.

Product advantages:

- Improvement of observability and controllability of distribution device cubicles.
- Cabinet for CCTV system data collection, storage and transfer.



Video cameras

- Video monitoring 24/7 or by motion sensor;
- Draw-out element and earthing switch monitoring.

Temperature sensors

- Continuous temperature monitoring;
- Overheating alarm.

Limit switch

- Draw-out element and earthing switch position.

Smart relay protection

- Vacuum circuit-breaker service time metering.

TEMPERATURE MONITORING CABINET STM-SESH

Data collection from wireless sensors

- Supported protocol:
  Bluetooth Low Energy.

Visualization tools

- HMI panel displaying temperature and distribution device events.
- Lamps – «Temperature OK», «Overheating», «Alarm».

Data transfer to the upper level of the automated control system

- Interface: Ethernet.
- Protocol: Modbus-RTU.

Interaction with the site alarm system

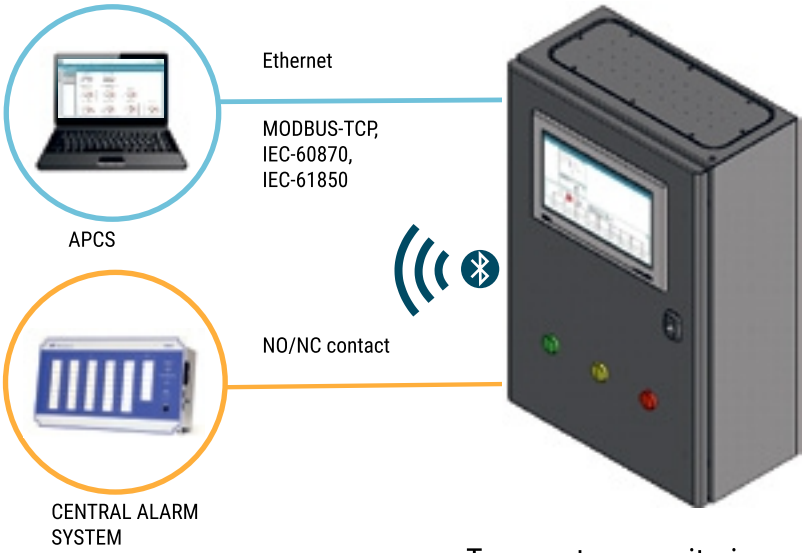
- «Dry contacts» for the central alarm system.
- «Temperature OK», «Overheating», «Alarm», «Fault».

Power supply redundancy

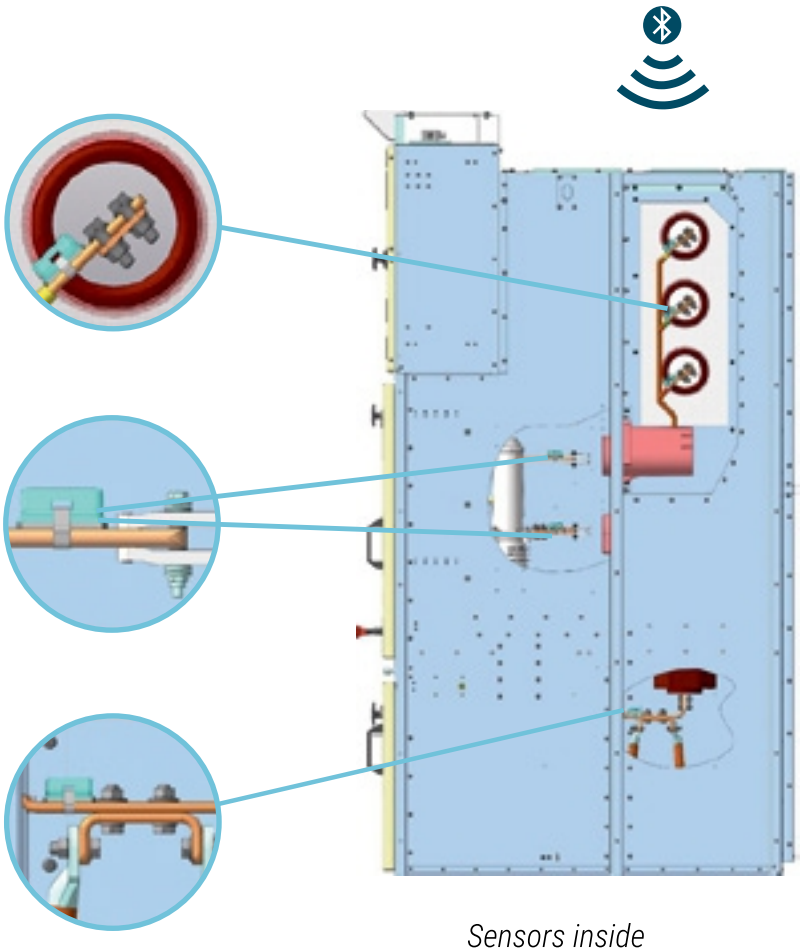
- The circuit is powered by two power supply units with universal input voltage.
  The equipment can be powered by DC or AC power supply systems.

Compact design

- Cabinet type: wall hanging.
- Overall dimensions
  (W x D x H), mm:
  400 x 250 x 600.



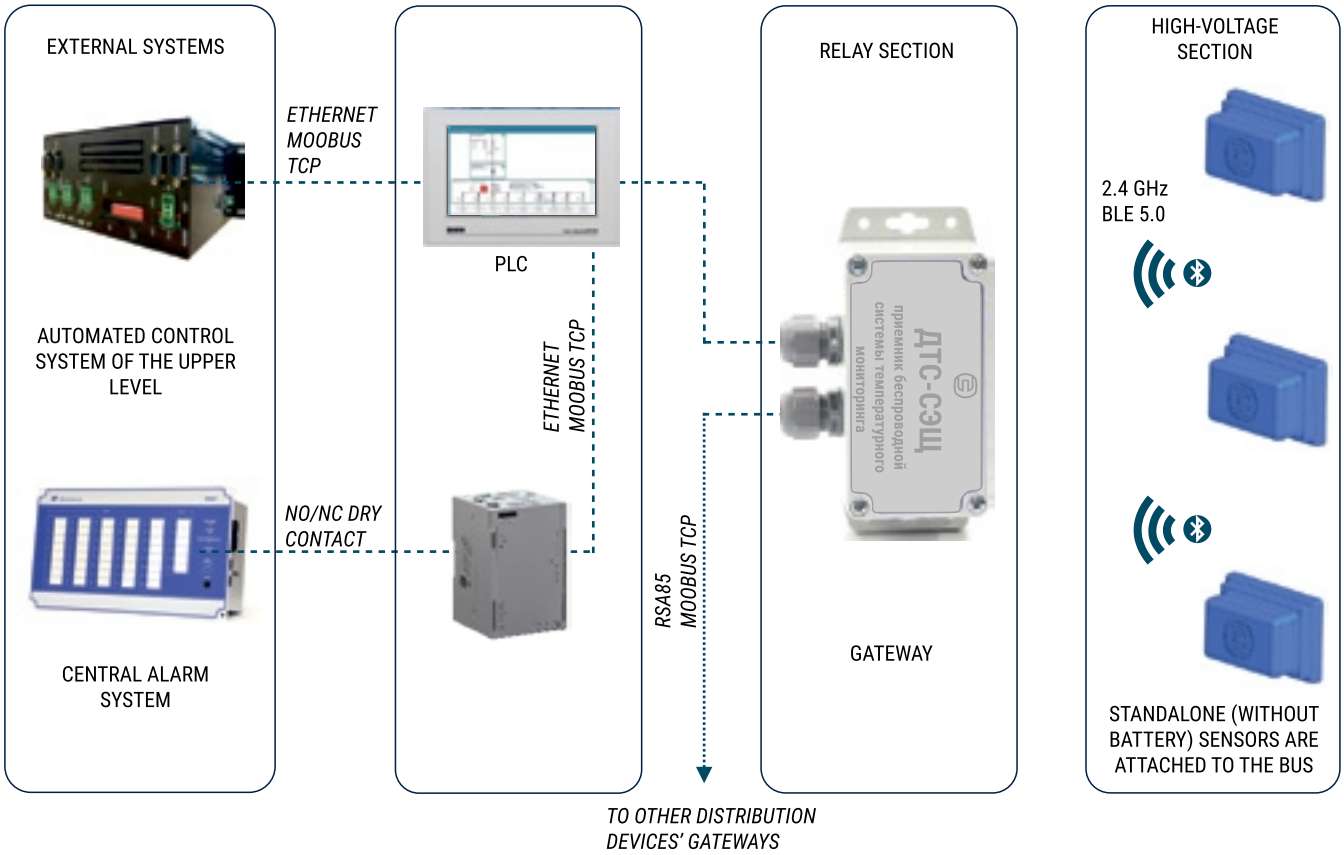
Temperature monitoring cabinet SESH



Sensors inside distribution device cubicles

CENTRALIZED SOLUTION FOR MV DISTRIBUTION DEVICES

Structural diagram of wireless thermal monitoring with HMI



DIGITAL PASSPORT

Cloud storage of accompanying documentation for complete distribution devices and low-voltage distribution devices

- Installation diagrams;
- Drawings;
- Certificates;
- Schematic diagrams;
- Operation manual;
- Layouts, reports;
- Passports (labels, logbooks) for the purchased equipment;
- Operational documentation;
- Passports for SESH equipment.

ЭЛЕКТРОЩИТ САМАРА

The set of hard copies of the documentation is delivered with the order and a duplicate of the electronic version is made as well, that is placed in the cloud storage

DIGITAL SOLUTIONS FOR LOW-VOLTAGE DISTRIBUTION DEVICES

TEMPERATURE CONTROL SYSTEM OF CONTACT JOINTS

- Overheating alarm
- Data collection from the whole device
- MODBUS-TCP support, IEC-60870, IEC-61850 compliance

WIRELESS TEMPERATURE SENSORS

- Wireless data transfer
- Continuous temperature monitoring
- No additional power supply is required

HIGH DEGREE OF AUTOMATION

- Online access to documentation via QR-code
- Excludes the documentation loss

DIGITAL PASSPORT

- Local and remote control
- Flexible approach to the implementation of automatic load transfer algorithms
- Advanced data visualization system

Low-voltage distribution device NKU-SESH-MV

DIGITAL DRIVE PDZ-SESH

PDZ-SESH is an integral part of the digital substation as per IEC 61850 and intended to control operating units of disconnectors in outdoor distribution devices with voltages of 35/110/220 kV.

Options:

- Switch control as per IEC 61850.
- Measurement using current and voltage transformers as per IEC 61850.

Key technical specifications:

- Climatic version and placement category as per GOST 15150 is UHL1.
- Power supply voltage ~380, ~230, =220 kV.
- Protection degree of the drive enclosure as per GOST 14254 is IP55.

Key functionality of digital drive:

- Data collection on switching device drive condition using fiber-optic system of limit positions' monitoring. Maximum distance between the drive and the control cabinet is up to 50 meters.
- The control cabinet allows operating up to 8 actuators or 3 switching devices.
- Hard operating logic of a switching device and flexible operating logic between devices.
- 3 control modes: remote, local and service.
- Data receiving and transfer over the following digital communication channels:
  - Optical or electrical Ethernet communication channels as per IEC 61850-8-1 (GOOSE, MMS).
  - RS-422/485 serial data transfer channels.
  - Integration over the Ethernet network using IEC 60870-5-104 protocol.
- Control of the power switch.
- Self-diagnostics of the microprocessor unit.
- Continuous diagnostics of actuators.
- Recording of all operations in the event and fault log.
- Recording of operating cycles, monitoring of mechanical service time.
- Operating protection against exceeding actuation and stagnation time limits.

Advantages of prompt interlocking with digital control of high voltage disconnectors in KTPB SESH 110/220 kV

- Data transfer over fiber-optical channel.
- Reduced cabling.
- Integration into a digital substation as per IEC 61850.
- Condition-based maintenance.

DIGITAL SUBSTATION AS PER IEC 61850

Innovative self-diagnostic compact substation of 100% operational readiness with full automation in accordance with IEC 61850

Turnkey solution:
- Pre-design inspection
- Audit
- Design
- Delivery
- Installation
- Commissioning

Product advantages:
- Reduced costs for cable products and cable structures (migration to digital network).
- Increased life cycle of power equipment (on-line diagnostics).
- Improved reliability and safety of substation operation.
- Reduced costs for design engineering, installation and commissioning (reduced number of wired connections, interfaces unification, equipment interchangeability).
- Reduced costs for equipment operation (equipment status monitoring and remote control).

SERVICE SOLUTIONS

SERVICE SOLUTIONS

Electroshield Samara is your reliable partner in modernization, renovation, increasing the reliability and safety of your equipment.

The aim of the service team is to provide a comprehensive approach to solve any problems during the life time of the equipment.

Electroshield Samara provides the following services:

- **Installation supervision and commissioning works**
  The specialists of Electroshield Samara make their best efforts to implement projects as efficiently as possible and deliver them on time.

- **Inspection and modernization of equipment**
  At the stage of reconstruction of distribution devices, the specialists of Electroshield Samara are ready to inspect, develop recommendations and implement a project for modernization (replacement) of obsolete equipment based on the equipment solutions by Electroshield Samara.

- **Restoring to working conditions**
  The specialists of Electroshield Samara provide the required measures to restore the equipment efficiency to the specified performance characteristics.

- **Personnel training**
  Highly qualified personnel is one of the key factors of reliable equipment operation. The list of training programs and their practical orientation will help the personnel to operate the equipment correctly and safely.

- **Spare parts supply**
  Availability of spare parts is of great importance for repair and quick recovery of equipment operation. The specialists of Electroshield Samara have developed extended SPTA sets. These sets can be ordered together with the equipment or separately.

- **Equipment repair**
  A service engineer can promptly visit the site for inspection and repair of the equipment.

For further details, please visit our website at:
http://electroshield.ru

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