



CHELYABINSK ELECTRIC
EQUIPMENT PLANT



PRODUCT CATALOG
16/17

POWER
DISTRIBUTION
TECHNOLOGIES

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About Us

Chelyabinsk Electric Equipment Plant (CEEP) LLC was founded in 2010 and specializes in manufacturing the full range of electric board products.

CEEP LLC is one of the largest high- and low-voltage equipment manufacturers for industrial and administrative facilities: substations, electric energy systems and other structures.

The plant operates since 2010 and specializes in manufacturing electric board products for voltages up to 10 kV. Currently, the company produces more than 30 types of electric equipment.



The up-to-date production base, wide experience of electric installation and start-up and adjustment operations, as well as the highest qualification of employees allow us implementing the most trailblazing projects.

Our company has quickly won recognition and untarnished reputation due to high quality products release and prompt fulfillment of obligations. Thus, the sales geography of our plant covered the whole Russia and the Near Abroad.

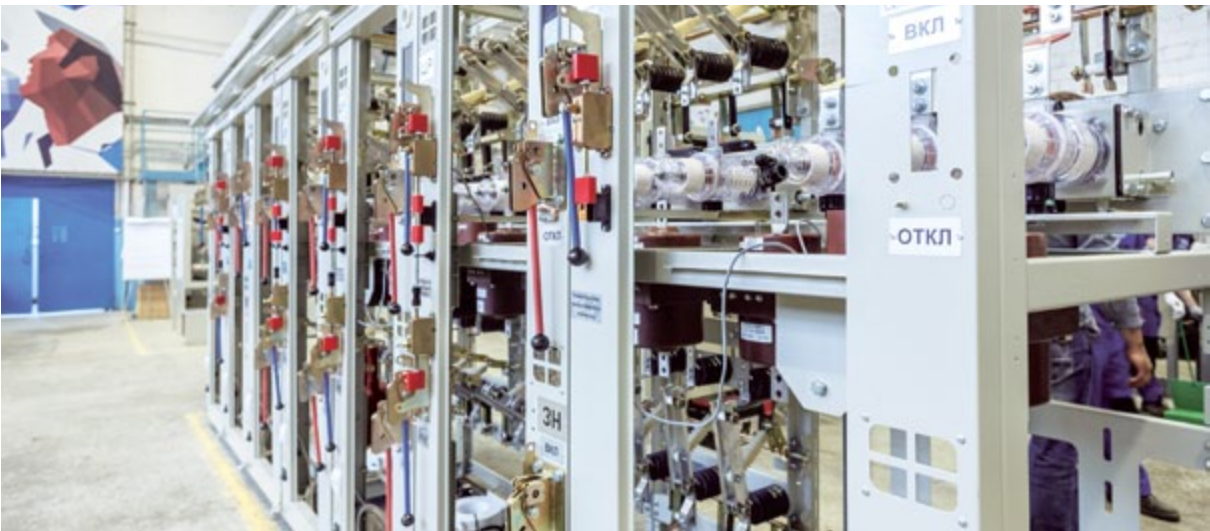


Company Policy

Chelyabinsk Electric Equipment Plant LLC produces more than 30 types of electrical products.

The key activity area of the CEEP LLC is continuous improvement of economic level of the company by means of development, manufacture and sales of electrically-powered equipment with quality level meeting all the requirements and expectations of our Clients.

Strategic aim of our company in the field of quality is to meet and exceed the customer requirements and expectations regarding the quality of our products, as well as compliance with the requirements for reliability and security.



Advantages

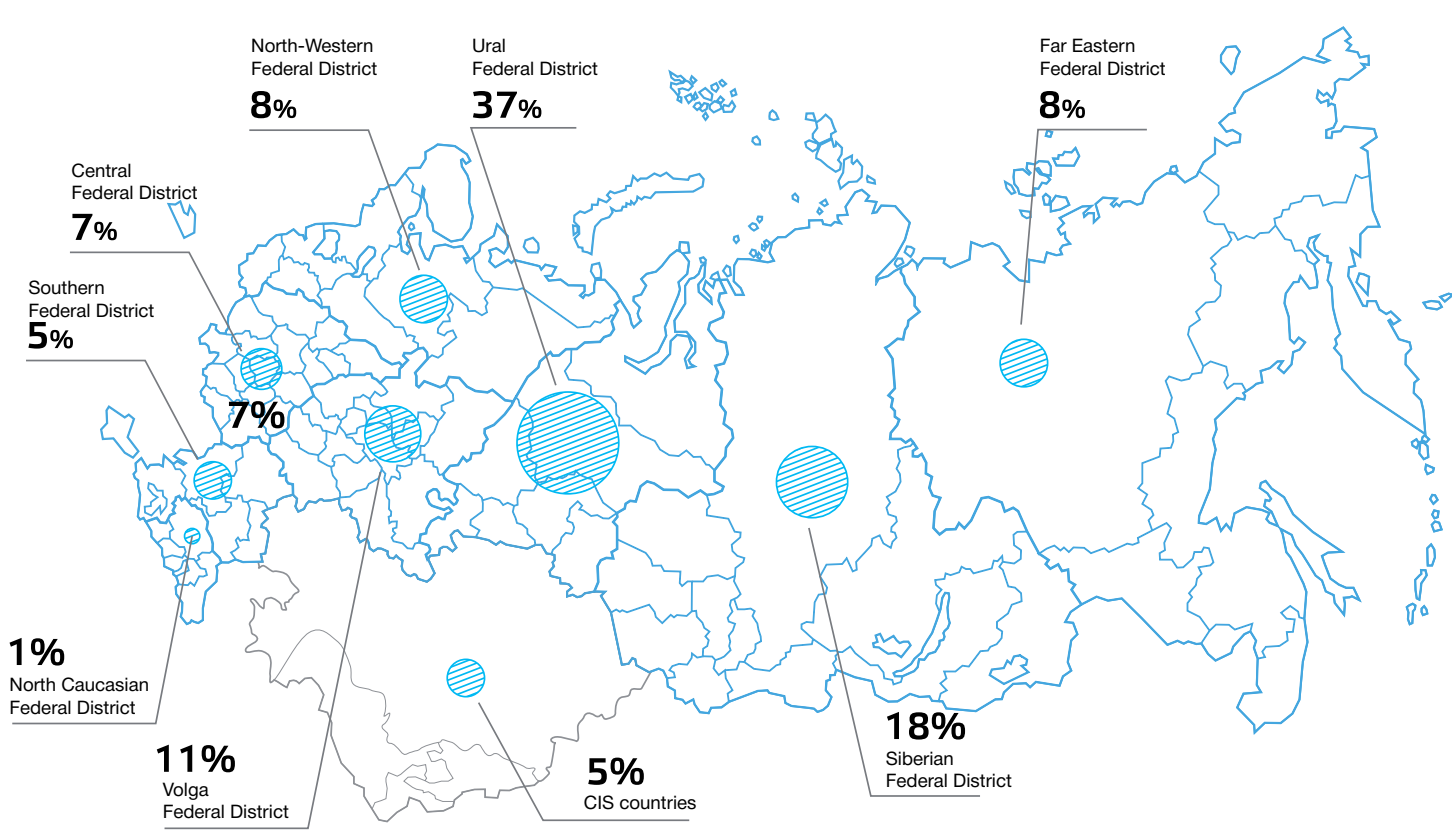
- energy audit of electric power supply systems;
- complete production cycle of electrical products;
- execution of the full range of the design, electric installation and start-up and adjustment operations;
- electric laboratory services;
- electric equipment leasing.

In six years Chelyabinsk Electric Equipment Plant LLC has created a strong dealer network throughout Russia. Representative offices operate in Moscow, St. Petersburg, Novosibirsk, Tyumen, in the Chelyabinsk and Sverdlovsk Regions, Perm and Krasnodar Territories, and in the Republics of Dagestan and Kazakhstan. Since 2015, we have dealers in the Republic of Crimea.

The market changes, our Clients develop and their demands grow. We are also forging ahead. A series of efficient activities has been scheduled for setting-up of new capacities which will substantially enhance our capabilities.

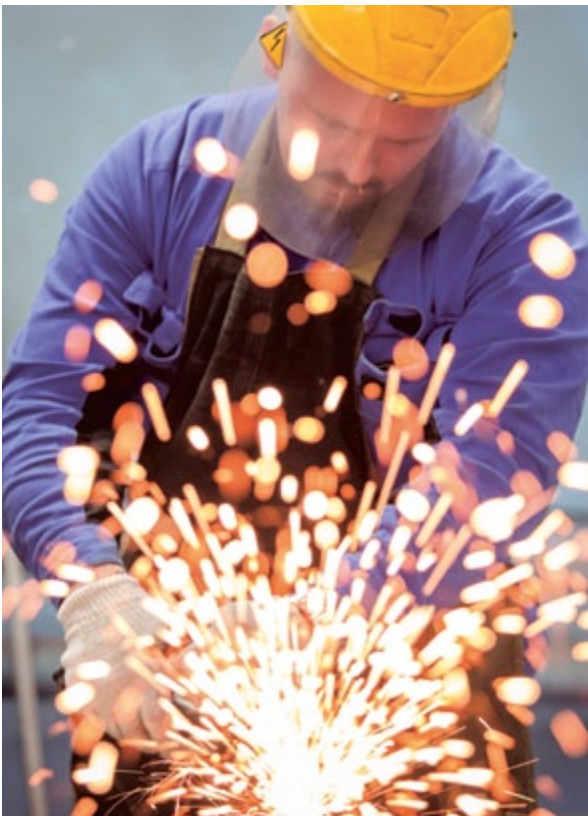


Sales regional distribution



Industries distribution

Electric utility industry	45%
Machine tool building and heavy engineering	11%
Mining industry	9%
Chemical and petrochemical industry	7%
Metallurgic engineering	5%
Construction materials production	4%
Fuel industry	4%
Non-governmental organizations	4%
Ammunition and specialized machinery production	3%
Automobile industry and transport machinery	2%
Food manufacturing industry	2%
Aircraft industry	1%
Light industry	1%
Pharmaceutical and medical industry	1%
Industrial agriculture	1%



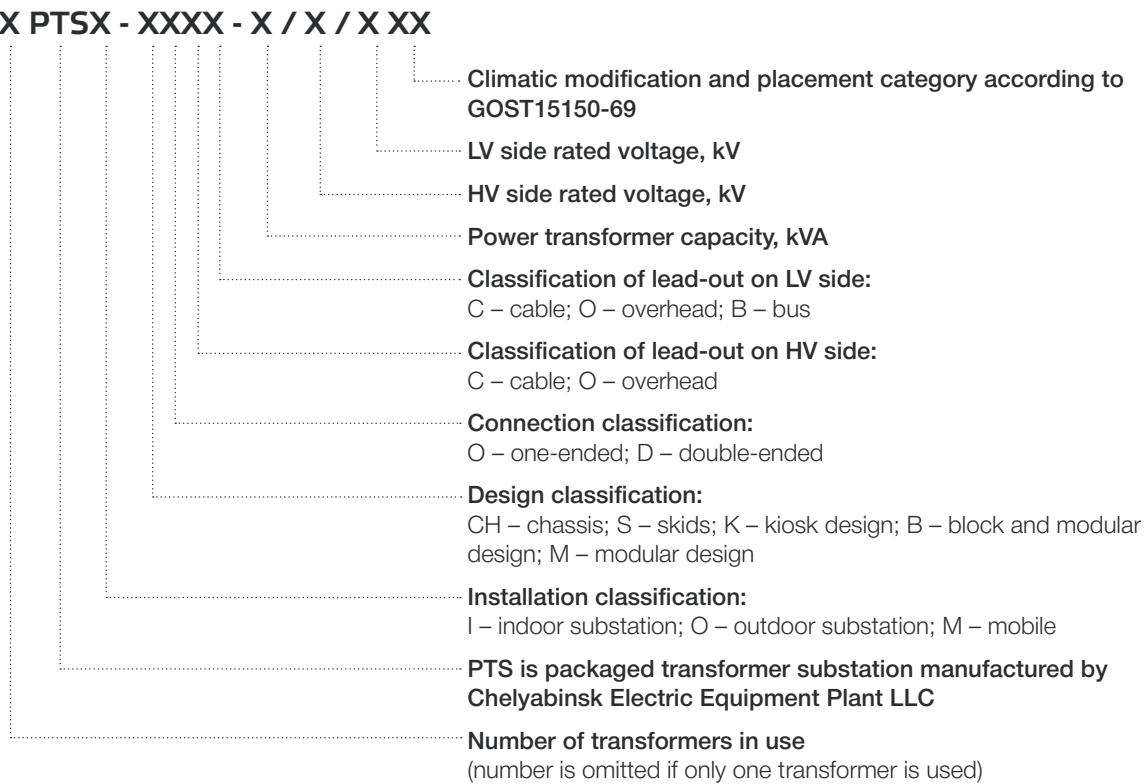
Outdoor Packaged Transformer Substations – OPTS

25 to 2500 kVA, up to 10 kV

Stationary outdoor packaged transformer substations are designed for receipt, conversion and distribution of 3-phase 50 Hz, 6 (10) / 0.4 (0.69) kV alternating current electric power in moderate (N) and moderate cold (NF) climate, placement category 1 according to GOST 15150.



Conventional designation structure



Design classification

OPTS classification attributes	Design
In terms of power transformer type	Oil, sealed oil, sealed with noncombustible liquid dielectric, dry, with cast insulation
In terms of transformer neutral design method on low-voltage side (LV side)	With solid-earthed neutral;
With insulated neutral	With one transformer; With two transformers
In terms of number of power transformers in use	With one transformer; With two transformers
Presence of buses insulation in switchgear on LV side (LV switchgear)	With non-insulated buses
In terms of high-voltage lead-in design	Cable (C);Overhead (O)
In terms of design of leads using cables in LV switchgear	Cable (C);Overhead (O)
In terms of climatic modifications and placement category	Placement category 1, climatic modification N, NF according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
Power transformer capacity, kVA	25; 40; 63; 100; 160; 250; 400; 630;1000; 1250; 1600; 2000; 2500
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7.2; 12
Low-voltage (LV) side rated voltage, kV	0.23; 0.4; 0.6; 0.69
Main circuits AC frequency, Hz	50
Auxiliary circuits AC frequency, Hz	50
Insulation level according to GOST 1516.3: – with dry transformer – with oil transformer	Reduced Normal, level «b»
Rated voltage of auxiliary circuits, V: – AC and DC protection, control and alarm circuits – voltage transformers circuits – lighting	220 100 36

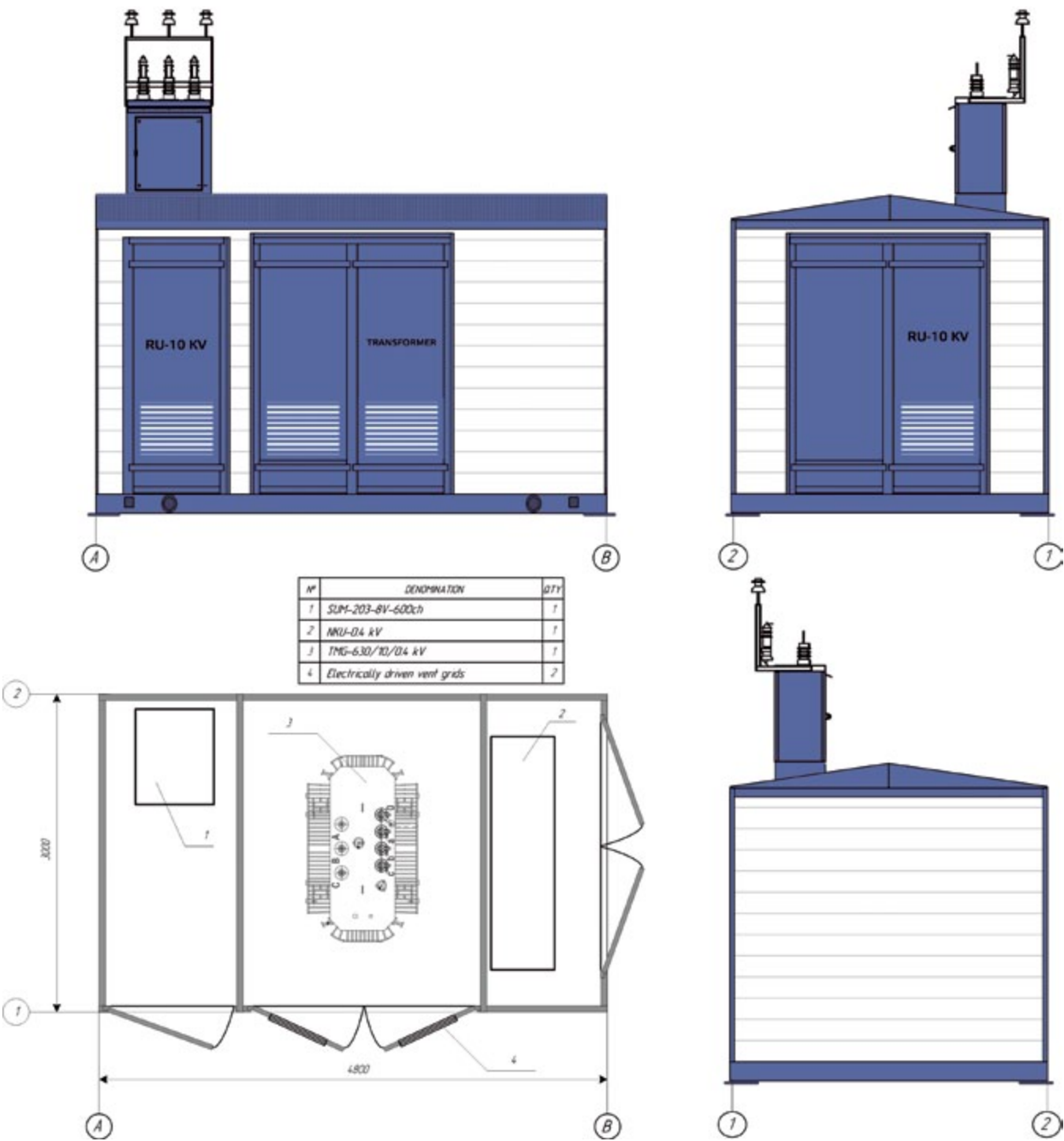
OPTS structural design

OPTS-B consists of several packaged modular facilities (PMF), which form a unified structure after installation with all the necessary equipment installed indoors.



Example. OPTS-KTVK-630/10/0.4 NF1

Overall dimensions and layout of substation



Satka ironworks OJSC

Satka, Chelyabinsk Region

Satka ironworks OJSC is one of the largest Russian high-carbon ferromanganese production enterprises, founded in 1756. Satka ironworks has its unique patented technology, unparalleled in the world, thanks to which production screenings are sintered to coarse ferromanganese.

Performed operations:

- 2OPTS-BPKK-1250/6/0.4 NF1 substation installation and start-up and adjustment operations
- 2.5 km long 10 kV power transmission line laying
- conveyor equipment and breaker machinery installation and start-up and adjustment operations
- conveyors automation system installation
- control rooms installation
- bus duct laying
- input switching devices installation in three warehouses
- lightning protection installation
- lamps installation
- infrared ceiling heaters installation
- cable passages laying
- trolley bus duct installation for overhead crane power supply



A.V. Ivanov
Director of Satka ironworks (SChPZ) JSC

SChPZ JSC cooperation with CEEP LLC started in 2013 with the delivery of outdoor packaged transformer substation (OPTS). Subsequently CEEP LLC and SChPZ JSC signed a contract for performance of the following works:

- lighting installation;
- bus duct laying;
- lightning protection installation;
- cable products laying with the aim of equipment automation installed in the sinter plant, feedstock storage and crushing-and-sorting areas;
- 6 kV power transmission line construction;
- processing equipment installation and start-up and adjustment operations.

Electric installation works and product supply have been performed at high, professional level and right on time. Ease of cooperation with CEEP LLC is that it implements so-called «one stop shop» principle. One company is responsible for production, operations, start-up and adjustment.

That is why I recommend this company for cooperation



Mobile Packaged Transformer Substations – MPTS

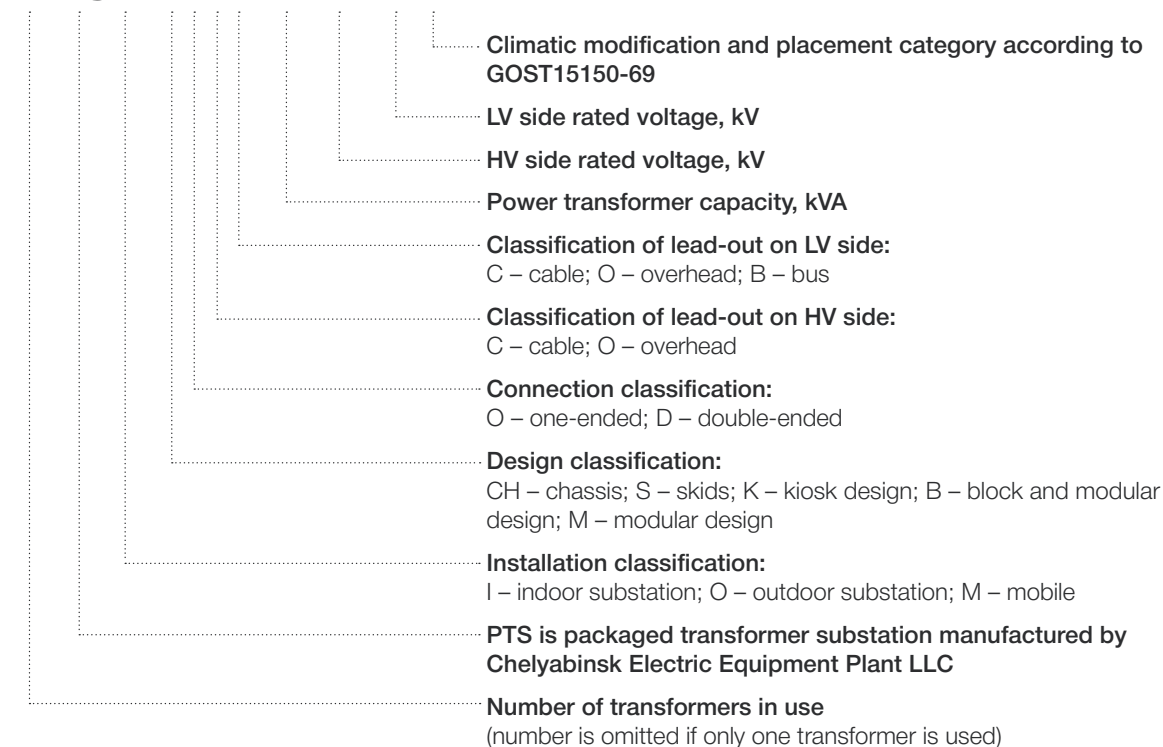
25 to 2500 kVA, up to 10 kV

Mobile packaged transformer substations are designed for prompt delivery of ready-to-operate power engineering equipment mounted on chassis or skids to the operating site, for receipt, conversion and distribution of 3-phase 50 Hz, 6 (10) / 0.4 (0.69) kV alternating current electric power in moderate (N) and moderate cold (NF) climate, placement category 1 according to GOST 15150.



Conventional designation structure

X PTSX - XXXX - X / X / X XX



Design classification

OPTS classification attributes	Design
In terms of power transformer type	Oil, sealed oil, sealed with noncombustible liquid dielectric, dry, with cast insulation
In terms of transformer neutral design method on low-voltage side (LV side)	With solid-earthed neutral;
With insulated neutral	With one transformer; With two transformers
In terms of number of power transformers in use	With one transformer; With two transformers
Presence of buses insulation in switchgear on LV side (LV switchgear)	With non-insulated buses
In terms of high-voltage lead-in design	Cable (C);Overhead (O)
In terms of design of leads using cables in LV switchgear	Cable (C);Overhead (O)
In terms of climatic modifications and placement category	Placement category 1, climatic modification N, NF according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
Power transformer capacity, kVA	25; 40; 63; 100; 160; 250; 400; 630;1000; 1250; 1600; 2000; 2500
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7.2; 12
Low-voltage (LV) side rated voltage, kV	0.23; 0.4; 0.6; 0.69
Main circuits AC frequency, Hz	50
Auxiliary circuits AC frequency, Hz	50
Insulation level according to GOST 1516.3: – with dry transformer – with oil transformer	Reduced Normal, level «b»
Rated voltage of auxiliary circuits, V: – AC and DC protection, control and alarm circuits – voltage transformers circuits – lighting	220 100 36

MPTS structural design

MPTS-CH consists of one facility with all the necessary equipment installed indoors, and tailor-made chassis for PTS installation.



Mobile substation is composed of the following parts:

- MPTS facility;
- transportation skids or chassis;
- high-voltage device (HV switchgear);
- power transformer;
- low-voltage switchgear (LV switchgear);
- external connections device;
- auxiliary facilities

MPTS facility

Facility represents welded metallic module. Its dimensions are determined by manufacturing plant in cooperation with the Customer on the basis of technical specifications and transportation mode.

Facility structural units ensures:

- preservation of specified thermophysical properties of the premises as per SNiP 23-02-2003;
- required technological effectiveness during production and shop assembly, transportation, installation and operation;
- minimum weight of structural units due to new efficient materials utilization;
- optimal reliability and aesthetics of structural units.

PMF substructure frames are made of square tubing according to GOST 26020-83. Hot-rolled steel channels are used as frames auxiliary facilities according to GOST 8240-97. Substructures are covered with steel checkered plate of 4.0 mm thick on the top, and on the bottom - with a steel sheet of 2.0 mm thick according to GOST

19903-90. Maximum 160 mm layer thick mineral wool is placed at the base. Support frame is welded and made of closed-loop square and rectangular fabricated sections according to GOST 30245-2003. Enclosure structures are made of 3 mm thick steel plate. Sandwich panels provided with 60-100 mm thick urethane-foam and mineral wool heat insulator are used for heat insulation. The roof is covered with corrugated sheet laid on the top of the sandwich panels.

Colour scheme of modular facility shall be carried out in accordance with all the customer's requirements. All materials employed are certified. The use of non-certified materials is not allowed.



Chassis

Trailer has a welded frame which consists of four frame girders interconnected by cross members. Turning device lock member located at the front of frame is designed to lock pivoting bogie in case of reverse movement. Pivoting bogie blocking and deblocking are carried out by rotating the lock member handle to one of the end positions. Lateral frame girders are provided with jacks.

Pivoting bogie is connected with the frame by a turn plate; bogie consists of a bogie frame, two sets of reinforced springs (shock absorbers), turn plate, reinforced tow bar, tow bar balancing mechanism (spring), towing eye and axle with wheels and brake chambers. The front chassis suspension consists of two spring assemblies. Middle part of the springs (reinforced shock absorbers) rests against axle support and is attached by two U-bolts. Rubber bumper is installed to limit axle stroke and mitigate impacts to the frame. The rear suspension is structurally similar to the front one. Primary braking system allows for trailer brake system connection to a tractor unit which can be equipped both with one- and two-line brake system. Parking brake system is provided with mechanical rear-wheel drive.

Trailer has reinforced towing coupler (tow bar) – with metal thickness not less than 12 mm. Conical plug used for removable towing eye gapless installation is welded at the front of tow bar. Tow bar has a spring type balancing mechanism to facilitate chassis coupling. Wheels are solid ones, with inflated tubed or tubeless tires. Trailer wheels are covered with protecting casings (wheel arch liners) along with mudguards in accordance with the requirements of Road Traffic Rules (para. 25, 7.5 and 4.7). Spare wheel is mounted on the housing bracket.



MPTS General Description

Requirements for serviceability of high-voltage devices (HVD) and LV switchgears are set out by the substation design. The doors of switchgears of unilateral maintenance (SUM) in HVD are provided with inspection windows used for visual observation of the equipment condition without MPTS main circuits de-energization. Transformers are arranged so as to satisfy the requirements for safe observation of transformer oil level in the tank. Provisions should be made for rotating mirror installation in the power transformer compartment (on the customer's request); its inclination angle is set in case of MPTS commissioning. In terms of mechanical strength, MPTS design ensures normal running and transportation conditions without any residual deformations or damages, which disturb normal operation of MPTS.

LV switchgear and HVD equipment withstand certain number of makes-and-breaks, which is set by relevant standards for switching devices. MPTS design ensures proper functioning of metering and accounting instruments, as well as control and alarm devices in the process of built-in devices operation.

MPTS design enables power transformer replacement without LV switchgear and/or HVD dismantling. Demountable joints of assembly units and all the MPTS bolted connections are provided with screw locking devices. MPTS are supplied fully assembled or in packages (as transport units), ready for assembling at installation site without switching devices disassembly, bolted connections reliability check and/or internal connections validity check. MPTS and single enclosures (cabinets) or transport units are equipped with lifting and movement apparatus. MPTS units lifting diagrams are shown on the facade of facility.

MPTS exterior doors hinges have an opening angle of not less than 95° and have locks and handles. Handles can be removable or combined with the key or latch. One of the MPTS outer gates wings may be complementarily closed by closing devices to avoid unauthorized entry. HV switchgear and LV switchgear door locks are secured by different combination locks and can withstand up to 1000 openings and closings. Substation exterior doors are held in extreme positions.

Provisions are made in HV and LV switchgears of MPTS of climatic modification NF1 for air heating (by means of heating elements) to ensure installed equipment operating conditions in accordance with the requirements of respective standards and technical specifications for such equipment. Heating devices can be switched on and off either automatically or manually.

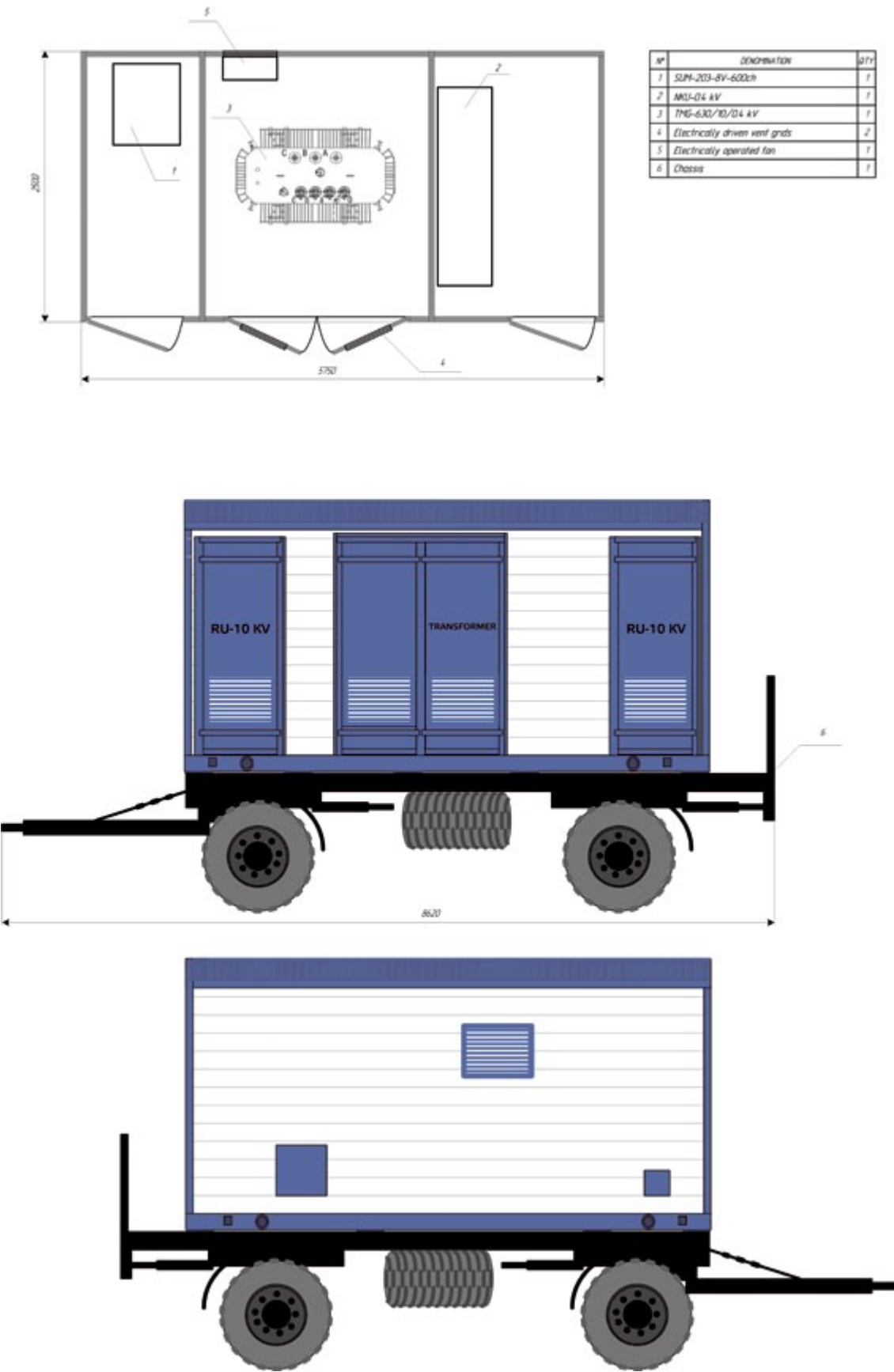
Earthing device (ED) comprising inner earth circuit is installed in the facility for electric shock hazard protection, potential equalization, and lightning-discharge protection. At least two outputs of the inner earth circuit bandwidths are provided at the facility corners to ensure the outer earth circuit connection.

Steel structures are protected against corrosion by means of base coat. Prior to steel surfaces coloring, at first it is cleared out of dirt, dust, oil, and then degreased and cleaned up to reach 2 degree according to GOST 9.402-2004.



Example. MPTS-ShTKK-1000/10/0.4 NF1

Overall dimensions and layout of substation



Surgutneftegas OJSC

Surgut, Russian Federation

Surgutneftegas OJSC is one of the largest Russian oil and gas companies, which is actively developing upstream sectors, gas processing and electrical power generation, as well as downstream operations (oil, petrochemical and gas products sales and marketing).

PhosAgro OJSC

Cherepovets, Russian Federation

PhosAgro OJSC is one of the leading global producers of phosphate fertilizers. The main activity of PhosAgro OJSC is production of phosphate fertilizers, high-grade (with P2O5 content of 39% or more) phosphate stock, such as apatite concentrate and feed phosphates, as well as nitrogen fertilizers and ammonia.



Manufactured equipment

- Packaged transformer substation MPTS-ShTKK-1000/10/0.4/N1
- Packaged transformer substation MPTS-ShTKK-1000/6/0.4/N1



Manufactured equipment

- Packaged transformer substation MPTS-ShTKK-400/6/0.4 NF1 (mobile substation)



A.A. Pakudin
Energy Services Chief Specialist of Directorate of setting-up of new capacities of PhosAgro-Cherepovets JSC

On behalf of our company, I would like to thank you and your staff for timely supply of packaged transformer substations MPTS-ShTKK-1000/10/0.4 N1 and MPTS-ShTKK-1000/6/0.4 N1 suitable to be mounted on chassis (trucks) equipped with modern devices of relay protection and automation, security and fire alarm system, and automatic heating and ventilation system. We appreciate your responsible attitude to work in the common projects. Excellent quality of the equipment and fulfillment in good faith of orders have made a beginning of strong partnership between our companies. Terms of delivery were met. There are no reprimands on operations.

Indoor Packaged Transformer Substations – IPTS

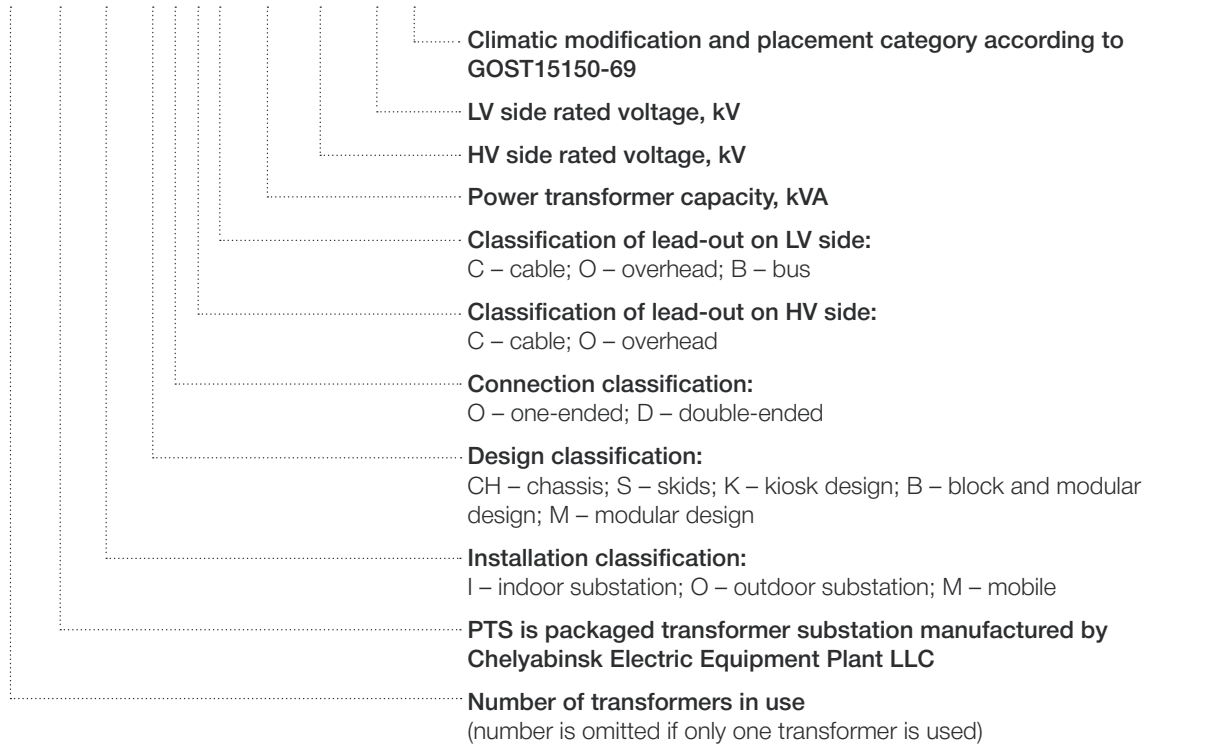
25 to 2500 kVA, up to 10 kV



Indoor packaged transformer substations are designed for receipt, conversion and distribution of 3-phase 50 Hz, 6 (10) / 0.4 (0.69) kV alternating current electric power in moderate (N) climate, placement category 3 according to GOST 15150, within intrashop areas.

Conventional designation structure KТП

X PTSX - XXXX - X / X / X XX



Design classification

OPTS classification attributes	Design
In terms of power transformer type	Oil, sealed oil, sealed with noncombustible liquid dielectric, dry, with cast insulation
In terms of transformer neutral design method on low-voltage side (LV side)	With solid-earthed neutral;
With insulated neutral	With one transformer; With two transformers
In terms of number of power transformers in use	With one transformer; With two transformers
Presence of buses insulation in switchgear on LV side (LV switchgear)	With non-insulated buses
In terms of high-voltage lead-in design	Cable (C);Overhead (O)
In terms of design of leads using cables in LV switchgear	Cable (C);Overhead (O)
In terms of climatic modifications and placement category	Placement category 1, climatic modification N, NF according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
Power transformer capacity, kVA	25; 40; 63; 100; 160; 250; 400; 630;1000; 1250; 1600; 2000; 2500
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7.2; 12
Low-voltage (LV) side rated voltage, kV	0.23; 0.4; 0.6; 0.69
Main circuits AC frequency, Hz	50
Auxiliary circuits AC frequency, Hz	50
Insulation level according to GOST 1516.3: – with dry transformer – with oil transformer	Reduced Normal, level «b»
Rated voltage of auxiliary circuits, V: – AC and DC protection, control and alarm circuits – voltage transformers circuits – lighting	220 100 36

IPTS structural design

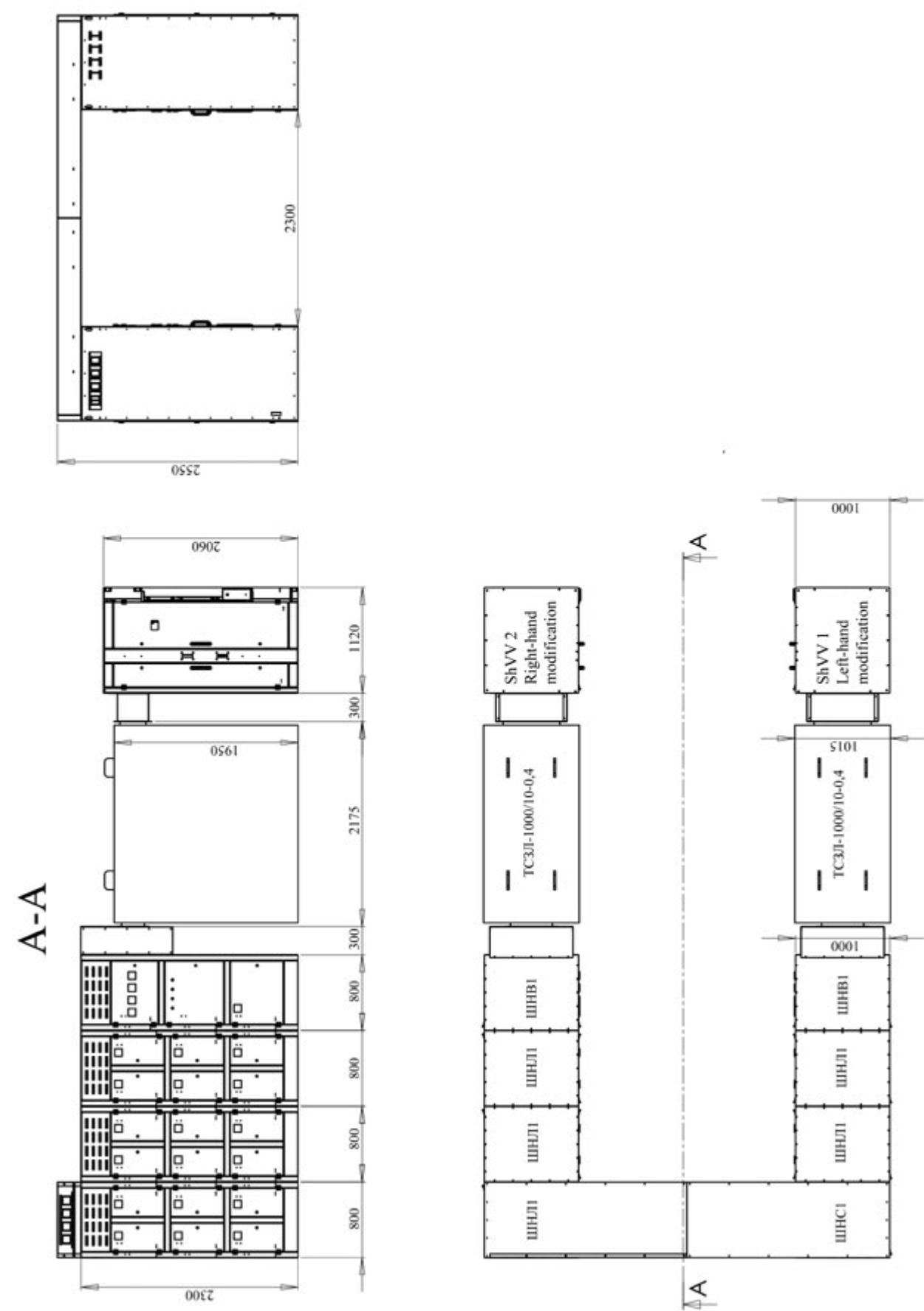
Unilateral maintenance IPTS consists of high-voltage lead-in cabinets as part of chambers SUM, power transformers and modular-type cabinets of unilateral maintenance LV switchgear of SchO-70 type.



Bilateral maintenance IPTS consists of high-voltage lead-in cabinets as part of chambers SUM, power transformers, and modular-type cabinets of bilateral maintenance LV switchgear of ShNV, ShNL, ShNS and ShNA types.



Example. 2IPTS - MTKK-1000/10/0.4 N3



CHKZ LLC

Chelyabinsk, Russian Federation

Chelyabinsk compressor plant LLC is the largest manufacturer of electric- and diesel-driven screw compressors.



Manufactured equipment

- 10 kV switchgear based on chambers SUM-203, power transformers of 1000 kVA.
- 0.4 kV switchgear based on ShVV, ShNL, ShNS cabinets, power factor corrections.



S.A. Bulatov
Deputy Director of CHKZ LLC Energy Service

CEEP LLC remains our reliable partner for several years. We would like to express our gratitude to personnel of Chelyabinsk Electric Equipment Plant LLC for joint productive work. More than 30 projects are implemented every year through joint efforts, thanks to high professionalism of the Chelyabinsk Electric Equipment Plant personnel, that allows us to accomplish all the goals and to implement the most complex and daunting tasks.

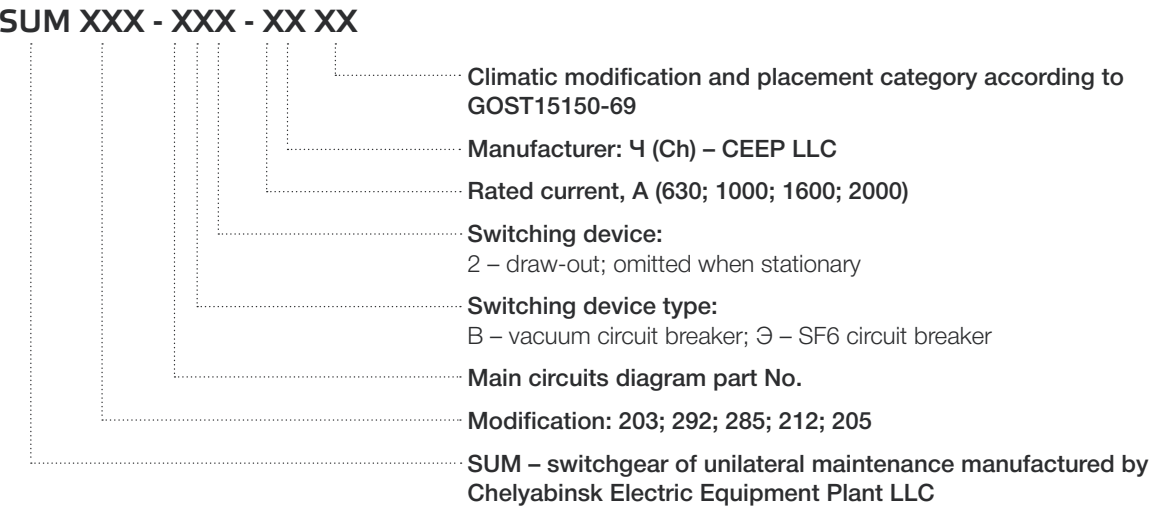
Switchgears of Unilateral Maintenance – SUM

Series 203, 292, 285, 212, 205, up to 10 kV

Chambers SUM of Series 200 are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage electric installations for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) climate, placement category 3 according to GOST 15150. Switchgears (SG) used for electric power receipt and distribution are assembled from the chambers SUM. Their operation principle is determined by acircuitryof the main and auxiliary chamber circuits.



Conventional designation structure



Design classification

SUM classification attributes	Design
Insulation level according to GOST 1516.1	chambers SUM with normal (standard) insulation
Insulation type	Air insulation
Busbar insulation	With non-insulated buses;With insulated buses
Design of high-voltage lead-in lines	with cable connection(s);With bussed connection
Servicing conditions	With unilateral maintenance
In terms of climatic modifications and placement category	Placement category 3, climatic modification N according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7.2; 12
Rated current of main circuits, A	400; 630; 1000; 1600; 2000
Rated breaking current of the chamber SUM with vacuum circuit breaker, kA	20; 31.5
Rated breaking current of the chamber SUM with load-break switch, A	630
Short-time thermal current (3 s)	20; 31.5
Rated voltage of auxiliary circuits, V: – AC and DC protection, control and alarm circuits – voltage measuring transformers circuits – lighting	220 100 36

Structural design

The chamber SUM is a metal structure made of sheet roll-formed sections. The housing components manufacturing process starts in the design engineering department, then the drawings are sent to the laser machine shop where future housing parts are being cut from sheet metal. Upon completion of the cutting process, fabricated materials are sent to the bending machine, and then welding and surface preparation for powder coating occur. Metal thickness of the housing parts varies from 1 to 5 mm. Equipment of the chamber SUM main and auxiliary circuits is located inside the chamber. Handles of driving units and control switches are arranged at the front. Protection, control and alarm relays, metering and accounting instruments can be installed both in the relay protection and automation (RPA) compartment and on the front side/inside of the door of the chamber SUM. Doors located on the SUM chamber front side, provide access to the main equipment. The number of doors depends on the SUM design features and its modification. Provisions are made in the chamber SUM design for separation of the compartment with auxiliary circuits devices from high-voltage equipment. Also the chamber SUM provides the possibility of cable assembly compartment separation from the vacuum circuit breaker compartment by means of a fixed metal partition. Depending on the modification and design version, the partition used for collecting buses compartment separation from the vacuum circuit breaker compartment can be made as follows: fixed,demountable (made of non-conducting material) or be absent. Interior lighting of 36 V is provided in the chambers SUM.



All the devices and instruments installed in the chamber SUM which shall be earthed, are connected to earth. In the event of auxiliary circuits devices installation, top door shall be earthed by a flexible wire. Two earthing points intended for the chamber SUM housing connection to earthing device and for temporary earth arrangement, are located at the bottom of the chamber SUM front side. The chamber SUM frame is welded directly to earthed metal structures. Metal-on-metal connection of all the chamber SUM parts is accomplished through the use of cut-in washers in bolted connections.

Duct, located in the middle or upper part of the chamber SUM (depending on modification), acts as a channel for backbone buses of the closing solenoids operative power supply circuits, control and alarm circuits.

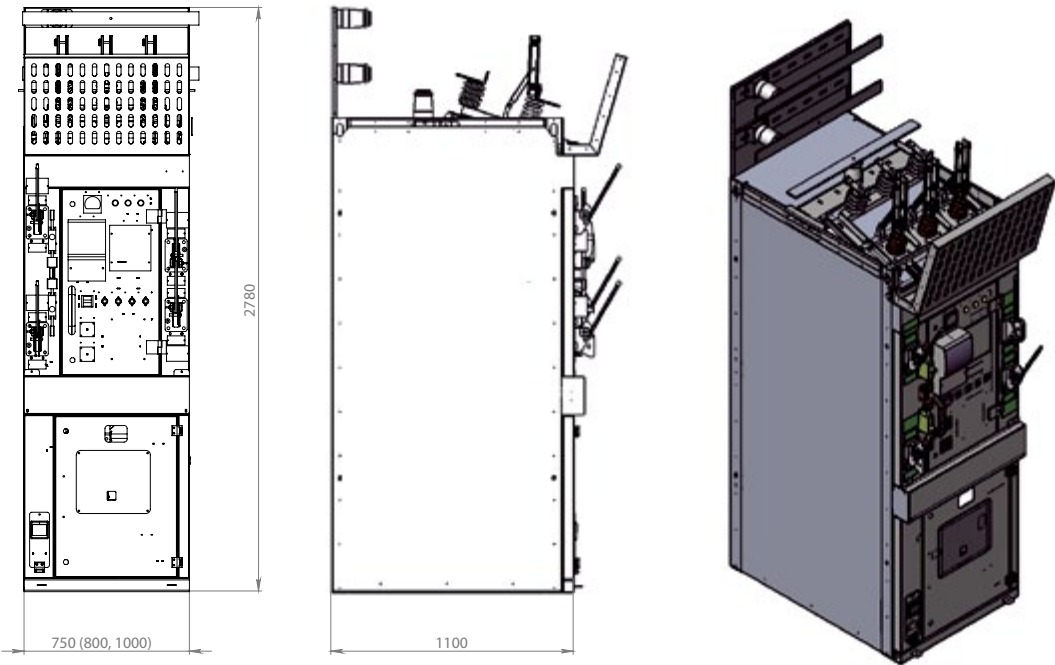


The following locks are activated to avoid erroneous actions during routine switching, maintenance and repair in the chambers SUM:

- lock preventing line- and bus-isolating switches switching on and off when the high-voltage circuit breaker is activated;
- lock preventing earthing blades switching on when the disconnecting switch operating blades are activated;
- lock preventing disconnecting switches switching on when earthing blades are activated;
- lock preventing bus-isolating switches switching on and off when the circuit breaker is activated;
- access lock to the high-voltage equipment compartment when the line- or bus-isolating switches operating blades are activated;
- electromagnetic or mechanical lock of the disconnecting switches actuators, ensuring correct operating sequence of the switchgear.



Example. SUM-203



Switchgears of Unilateral Maintenance – SUM

Series 366, 386, 393, 313, up to 10 kV

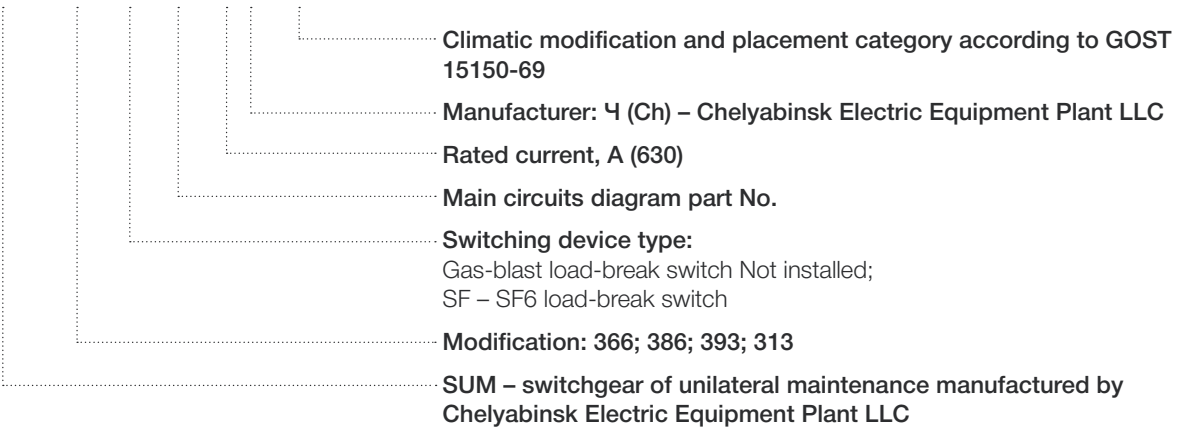
The chambers SUM of Series 300 are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage electric installations for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) climate, placement category 3 according to GOST 15150.

Switchgears (SG) used for electric power receipt and distribution are assembled from the chambers SUM. Their operation principle is determined by an aggregate of circuitry of the main and auxiliary chamber circuits.



Conventional designation structure

SUM XXX X - X - XX XX



Design classification

SUM classification attributes	Design
Insulation level according to GOST 1516.1	chambers SUM with normal (standard) insulation
Insulation type	Air insulation
Busbar insulation	With non-insulated buses; With insulated buses
Design of high-voltage lead-in lines	with cable connection(s); With bussed connection
Servicing conditions	With unilateral maintenance
In terms of climatic modifications and placement category	Placement category 3, climatic modification N according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7,2; 12
Rated current of main circuits, A	400; 630; 1000
Rated breaking current of the chamber SUM with vacuum circuit breaker, kA	20; 31,5
Rated breaking current of the chamber SUM with load-break switch, A	630
Short-time thermal current (3 s)	20; 31,5
Rated voltage of auxiliary circuits, V: <ul style="list-style-type: none">– AC and DC protection, control and alarm circuits– voltage measuring transformers circuits– lighting	220 100 36

Structural design

The chamber SUM is a metal structure made of sheet roll-formed sections. The housing components manufacturing process starts in the design engineering department, then the drawings are sent to the laser machine shop where future housing parts are being cut from sheet metal. Upon completion of the cutting process, fabricated materials are sent to the bending machine, and then welding and surface preparation for powder coating occur. Metal thickness of the housing parts varies from 1 to 5 mm.

Equipment of the chamber SUM main and auxiliary circuits is located inside the chamber. Handles of driving units and control switches are arranged at the front. Protection, control and alarm relays, metering and accounting instruments are installed both on the front side and inside of the door of the chamber SUM. Doors located on the chamber SUM front side, provide access to the main equipment. The number of doors depends on the SUM design features and its modification.

Provisions are made in the chamber SUM design for separation of the compartment with auxiliary circuits devices from high-voltage equipment. Interior lighting of 36 V is provided in the chambers SUM.

All the devices and instruments installed in the chamber SUM which shall be earthed, are connected to earth. In the event of auxiliary circuits devices installation, top door shall be earthed by a flexible wire. Two earthing points, intended for the chamber SUM housing connection to the earthing device and for temporary earth arrangement, are located at the bottom of the chamber SUM front side.

The chamber SUM frame is welded directly to earthed metal structures.

Metal-on-metal connection of all the chamber SUM parts is accomplished through the use of cut-in washers in bolted connections.



Agrofirma Ariant LLC

Chelyabinsk, Russian Federation

Agrofirma Ariant LLC is the largest agricultural holding in the Urals Federal District, which is the leader in the production of meat and meat products. The uniqueness of this holding is that complete production cycle is set up there: from formation of its own raw material base to sales of finished meat products to end customers.



Manufactured equipment

- outdoor packaged transformer substation 2 OPTS-MTKK-1000/10/0.4 NF1, switchgear RU-10 kV based on SUM-203 cells



Chelyabinsk City Dairy Plant No. 1 OJSC

Chelyabinsk, Russian Federation

Chelyabinsk City Dairy Plant No. 1 OJSC is the leading dairy industry enterprise in Chelyabinsk.



Manufactured equipment

- Project documentation development for rebuilding operations of RU-6kV.
- Reconstruction of RU-6kV based on SUM-203 cells.



Module LLC

Ekaterinburg, Russian Federation

Module LLC is the leading manufacturer of modular packaged transformer substations, distribution points, and supplier of equipment designed for integrated transformer substations (TS) and distribution points (DP).



Manufactured equipment

- Tyumen, the village of Antipino, ZhBI-3, distribution point RP-10kV based on 10 cells of SUM-203
- Substation «Shirokaya rechka» - feeder line Medniy, switchgear RU-10kV based on 16 chambers SUM-203
- Yekaterinburg, ul. Latviyskaya, switchgear RU-10kV based on 16 chambers SUM-203
- Perm, ul. Polazenskaya, distribution point RP-10kV based on 8 chambers SUM-366
- Yekaterinburg, ul. Tavatuyskaya – ul. Manevrovaya, switchgear RU-10kV based on 24 chambers SUM-203



V.V. Kurbanov
Director of Module LLC

We would like to express our gratitude to personnel of Chelyabinsk Electric Equipment Plant LLC for joint work. Many joint cooperation projects have been implemented during the last few years; the largest of them are as follows:

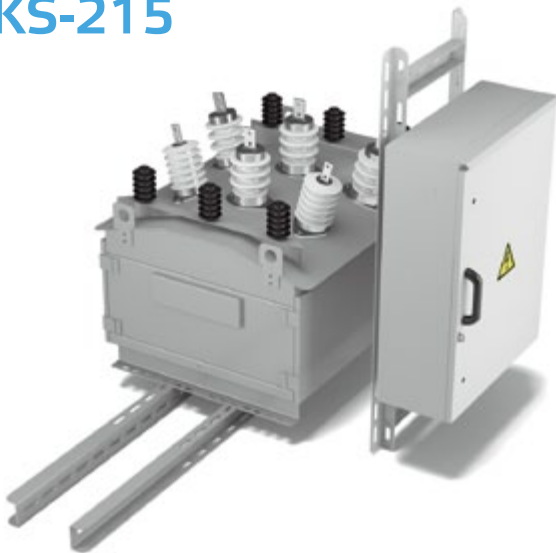
- Distribution point for electric power supply of «Kvartet» Residential complex, Yekaterinburg.
- Distribution point for electric power supply of «Svetly» Residential complex, Yekaterinburg.
- Distribution point for electric power supply of «Tikhy Bereg» Residential complex, Yekaterinburg.
- Distribution point for «Industrialny park» facility, Ufa.
- Distribution point for electric power supply of «Rassvetny» Residential complex, Yekaterinburg.
- Distribution point for «Tsentrally» residential area, Yekaterinburg.

In total, Chelyabinsk Electric Equipment Plant LLC supplied to us more than two hundred cells of various types and configurations during the period of our collaboration. We recommend Chelyabinsk Electric Equipment Plant LLC as a reliable manufacturer of electrical products.

Outdoor Pole Switchgear KS-215

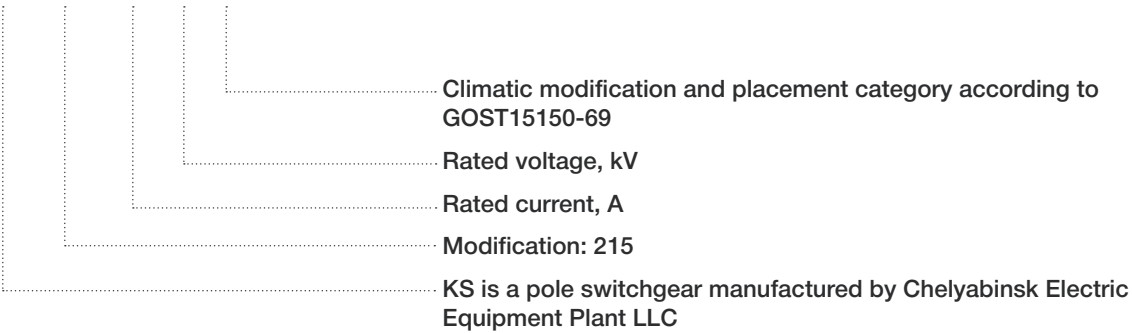
up to 10 kV

Pole switchgears (KS) are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage overhead systems electric networks for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) climate, placement category 1 according to GOST 15150.



Conventional designation structure

KS -215-X / X XX



Design classification

SCG classification attributes	Design
Insulation level according to GOST 1516.3	Normal, level "b"
Insulation type	Air insulation
Busbar insulation	With non-insulated buses; With insulated buses
In terms of climatic modifications and placement category	Placement category 1, climatic modifications - moderate (N) and moderate cold (NF) climate according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7,2; 12
Rated current of main circuits, A	630; 1000
Rated breaking current of cells with vacuum circuit breaker, kA	20; 31,5
Peak withstand current of cells with vacuum circuit breaker, kA	32; 51
Rated voltage of auxiliary circuits, V:	
– AC and DC protection, control and alarm circuits	220
– voltage measuring transformers circuits	100
– lighting	36

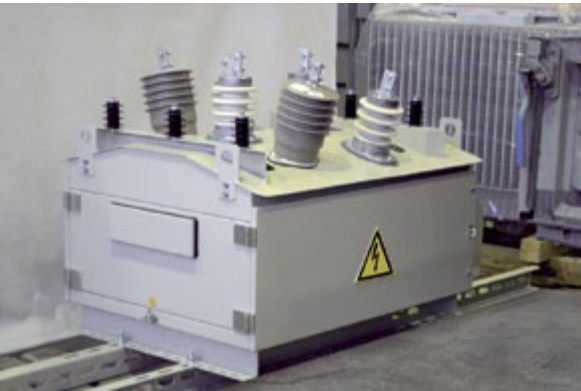
Structural design

Pole switchgear KS-215 consists of two modules: 1 - power equipment cabinet, 2 - control and protection cabinet.

Power equipment cabinet is a welded housing made of bent panels from 1 to 5 mm thick. Two doors located on the cabinet side faces are used to provide access to the power equipment. Vacuum circuit breaker, auxiliary transformer (AT), mating parts of feedthrough insulators and current transformers, as well as mechanical shutdown and vacuum circuit breaker position indication elements are arranged inside the cabinet. Auxiliary transformer may be installed out of the bounds of the cabinet if required. Slip-over current transformers, insulators and excess-voltage suppressors are located on the housing roof.

The housing design provides special load-lifting rings for KS-215 assembly. Cased socket is provided at the end surface for the control cabinet connection. Besides, valve designed for excessive pressure release is provided at the housing end surface. KS-215 mechanical shutdown is carried out by pulling the special ring located at the base of the cabinet using the hookswitch.

Low-voltage control cabinet is made of bent panels not less than 2 mm thick. Doubled-up door located at the front is used to provide access to the cabinet inner space. The cabinet accommodates relay protection and automation devices. If required the cabinet can be equipped with current DC circuits self-contained power supply unit and chamber (switchgear) GSM control.



Environmental durability requirements

Pole switchgears (KS) are operated in the open air at any time in a 24-hour period in all weather and seasons, and have the following resistance characteristics against environmental factors:

- ambient air temperature:
 - for modification N1 – from -45 to +40°C;
 - for modification NF1 – from -60 to +40°C;
- elevation above the sea level – 1000 m, max.;
- relative air humidity – 75 % at temperature of +15°C;
- atmospheric pressure – from 86.6 to 106.7 kPa;
- atmosphere type as per GOST 15150 – II (industrial);
- environment – non-explosive, free of explosive dust and aggressive gases which concentrations can destroy metals and insulation;
- seismic impact resistance as per GOST 17516.1 – up to 9 points on MSK-64 scale.



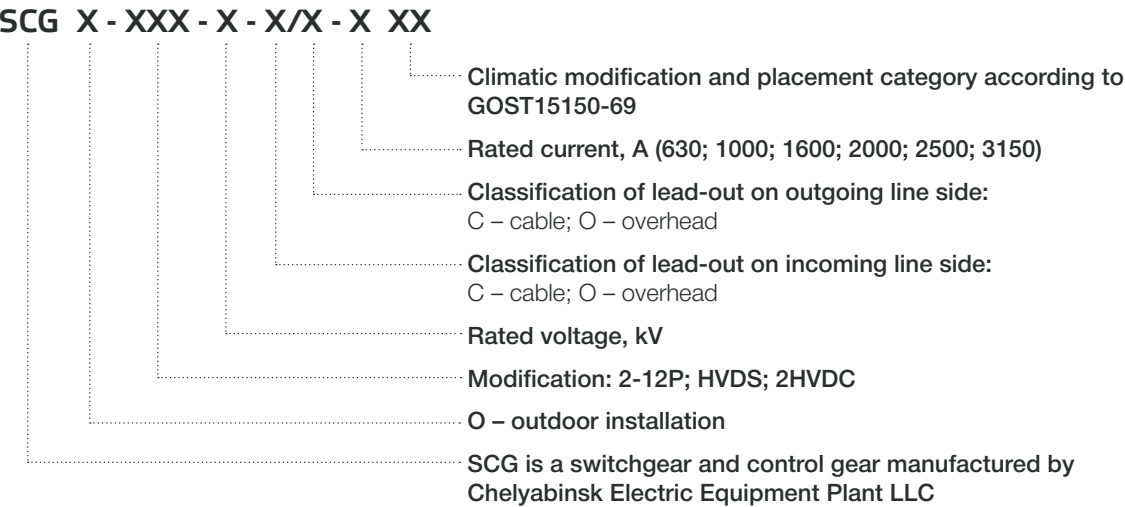
Switchgear and control gear – SCG

Series SCG 2-12P up to 10 kV with lower draw-out element

Switchgear and control gear (SCG) of Series SCG 2-12P are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage electric installations for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) climate, placement category 3 according to GOST 15150. Switchgears (SG) used for electric power receipt and distribution are assembled from the SCG. Their operation principle is determined by an aggregate of circuitry of the main and auxiliary circuits.



Conventional designation structure



Design classification

SCG classification attributes	Design
Insulation level according to GOST 1516.3	Normal, level "b"
Insulation type	Air insulation
Busbar insulation	With non-insulated buses With insulated buses
In term of presence of draw-out elements	With draw-out elements; Without draw-out elements
In terms of servicing conditions	With bilateral maintenance; With unilateral maintenance
In terms of arrangement of draw-out element	Low; Middle
In terms of installation method	For indoor installation in electrical equipment rooms; For outdoor installation
In terms of climatic modifications and placement category	Placement category 3, climatic modification N according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7,2; 12
Rated current of main circuits, A	630; 1000; 1600; 2000; 2500; 3150
Rated breaking current of cells with vacuum circuit breaker, kA	20; 31,5
Peak withstand current of cells with vacuum circuit breaker, kA	32; 51, 64
Rated voltage of auxiliary circuits, V: — AC and DC protection, control and alarm circuits — voltage measuring transformers circuits — lighting	220 100 36

Structural design

- Main elements of SCG:
- housing;
 - draw-out element;
 - earthing lead;
 - shutter mechanism;
 - arc flash protection devices;
 - circuits of relay protection and emergency control, feed-line consideration and telemechanics.



SCG housing

SCG housing is a metal structure made of sheet roll-formed sections. The housing components manufacturing process starts in the design engineering department, then the drawings are sent to the laser machine shop where future housing parts are being cut from sheet metal. Upon completion of the cutting process, fabricated materials are sent to the bending machine, and then welding and surface preparation for powder coating occur. Metal thickness of the housing parts varies from 1 to 5 mm. Provisions are made in the SCG housing design for separation of compartments into collecting buses compartment, vacuum circuit breaker compartment, cable connection compartment and RPA compartment.



Switchgear and control gear – SCG

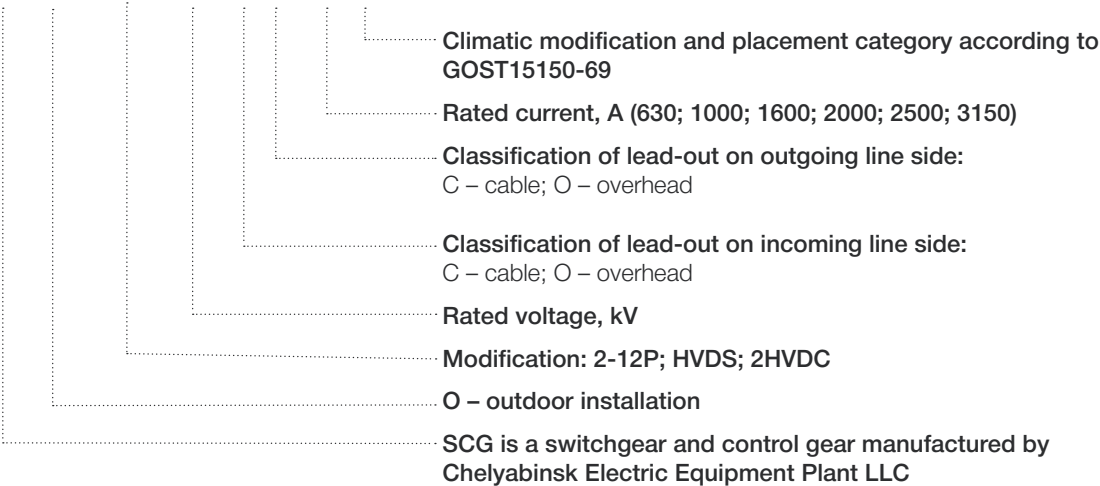
of Series SCG 2-12P up to 10 kV with middle draw-out element

Switchgear and control gear (SCG) of Series SCG 2-12P are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage electric installations for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) climate, placement category 3 according to GOST 15150. Switchgears (SG) used for electric power receipt and distribution are assembled from the SCG. Their operation principle is determined by an aggregate of circuitry of the main and auxiliary circuits.



SCG conventional designation structure

SCG X - XXX - X - X/X - X XX



Design classification

SCG classification attributes	Design
Insulation level according to GOST 1516.3	Normal, level "b"
Insulation type	Air insulation
Busbar insulation	With non-insulated buses; With insulated buses
In term of presence of draw-out elements	With draw-out elements; Without draw-out elements
In terms of servicing conditions	With Bilateral maintenance; With unilateral maintenance
In terms of arrangement of draw-out element	Low; Middle
In terms of installation method	For indoor installation in electrical equipment rooms; For outdoor installation
In terms of climatic modifications and placement category	Placement category 3, climatic modification N according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7,2; 12
Rated current of main circuits, A	630; 1000; 1600; 2000; 2500; 3150
Rated breaking current of cells with vacuum circuit breaker, kA	20; 31,5
Peak withstand current of cells with vacuum circuit breaker, kA	32; 51, 64
Rated voltage of auxiliary circuits, V: — AC and DC protection, control and alarm circuits — voltage measuring transformers circuits — lighting	220 100 36

Structural design

Main elements of SCG:

- housing;
- earthing lead;
- draw-out element;
- shutter mechanism;
- arc flash protection devices;
- circuits of relay protection and emergency control, feed-line consideration and telemechanics.

SCG housing

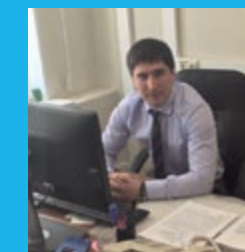
SCG housing is a metal structure made of sheet roll-formed sections. The housing components manufacturing process starts in the design engineering department, then the drawings are sent to the laser machine shop where future housing parts are being cut from sheet metal. Upon completion of the cutting process, fabricated materials are sent to the bending machine, and then welding and surface preparation for powder coating occur. Metal thickness of the housing parts varies from 1 to 5 mm. Provisions are made in the SCG housing design for separation of compartments into collecting buses compartment, vacuum circuit breaker compartment, cable connection compartment and RPA compartment.



Kopeysk Machine-Building plant JSC

Kopeysk, Russian Federation

Kopeysk Machine-Building plant JSC is the largest Russian manufacturing enterprise of the mining equipment for underground mining of coal, potash and rock salt. It designs, manufactures and supplies to the customers more than 50 types of mining and processing equipment, such as: shaft-sinking and tunnelling machines (combine systems), mucking, drill-loading and cutting machines, heading-and-winning machines, self-propelled drills, mineral-processing equipment and general machinery products.



M.A. Anokhin
Director of EnergotermK LLC
(contracting organization)

We would like to express our gratitude to personnel of CEEP LLC for fluid delivery of switchgears and control gears required for implementation of remedial operations at the redipping site with horizontal autoclaves of DonkarbGrafit LLC branch. SCG-2-12 supplied on site have been manufactured within contractual terms. Supplied equipment meets all the up-to-date operation safety requirements and has aesthetic appearance. CEEP LLC specialists conducted full range of installation, hook-up and start-up operations in a competent manner, that allowed to carry out commissioning of Tenova Core furnaces in the shortest possible time. We'll recommend the equipment manufactured by CEEP LLC for instrumentation of similar sites.



Manufactured equipment

- Switchgear and control gear based on five cells of SCG 2-12P.

Switchgear and control gear – SCG

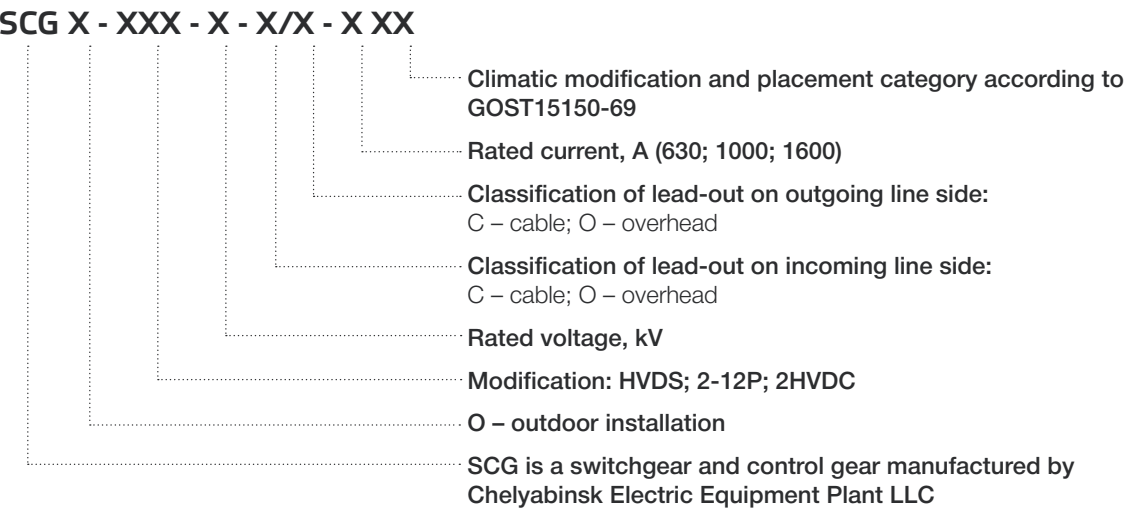
of Series HVDS up to 10 kV

Switchgear and control gear (SCG) of Series HVDS (high-voltage distribution switch) are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage electric installations for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) climate, placement category 1 according to GOST 15150.

SCG are used for power supply connection and protection of high power mining electrical consumers' electric equipment. Their operation principle is determined by an aggregate of circuitry of the main and auxiliary circuits.



SCG conventional designation structure



Design classification

SCG classification attributes	Design
Insulation level according to GOST 1516.3	Normal, level «b»
Insulation type	Air insulation
Busbar insulation	With non-insulated buses; With insulated buses
In terms of type of high-voltage line connections	Cable; Overhead
In terms of servicing conditions	With Bilateral maintenance; With unilateral maintenance
In terms of installation method	For outdoor installation
In terms of climatic modifications and placement category	Placement category 1, climatic modification N according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7,2; 12
Rated current of main circuits, A	630; 1000; 1600
Rated breaking current of cells with vacuum circuit breaker, kA	20; 31,5
Peak withstand current of cells with vacuum circuit breaker, kA	32; 51
Rated voltage of auxiliary circuits, V: — AC and DC protection, control and alarm circuits — voltage measuring transformers circuits — lighting	220 100 36

Structural design

The high-voltage distribution switch is a metal structure made of sheet roll-formed sections. The housing components manufacturing process starts in the design engineering department, then the drawings are sent to the laser machine shop where future housing parts are being cut from sheet metal. Upon completion of the cutting process, fabricated materials are sent to the bending machine, and then welding and surface preparation for powder coating occur. Metal thickness of the housing parts varies from 1 to 5 mm.



Equipment of the main and auxiliary circuits is located inside HVDS. Handles of driving units and control switches, protection and alarm relays, metering and accounting instruments are installed in the relay protection and automation (RPA) compartment at the front of HVDS. Doors located at the front and rear side of HVDS provide access to the equipment. The number of doors depends on HVDS design features.

Provisions are made in the HVDS design for separation of the compartment with auxiliary circuits devices from high-voltage equipment. HVDS also provides the possibility of cable assembly compartment separation from the vacuum circuit breaker compartment by means of the fixed metal partition. Interior lighting of 36 V is provided in the high-voltage distribution switches.

All the devices and instruments installed in HVDS which shall be earthed, are connected to earth. Special earthing points intended for HVDS housing connection to the earthing device and for temporary earth arrangement, are located at the HVDS housing. Metal-on-metal connection of all the HVDS parts is accomplished through the use of cut-in washers in bolted connections.

The following locks are activated to avoid erroneous actions in case of routine switching during maintenance and repair in the HVDS:

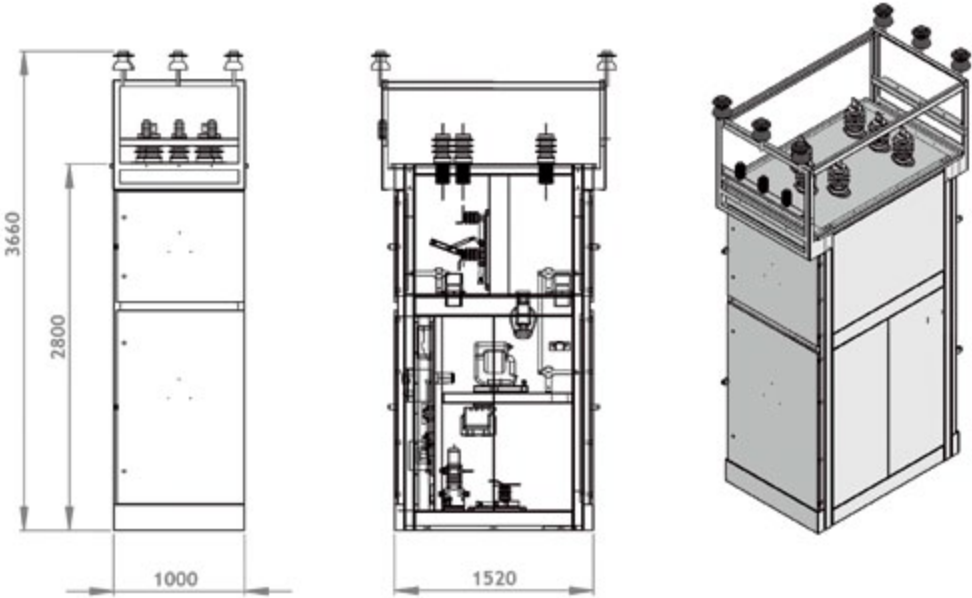
- lock preventing line- and bus-isolating switches switching on and off when the high-voltage circuit breaker is activated;
- lock preventing earthing blades switching on when the disconnecting switch operating blades are activated;
- lock preventing disconnecting switches switching on when earthing blades are activated;
- access lock to the high-voltage equipment compartment when the incoming breaker operating blades are activated.

The possibility of block locks and earthing switch position arresters installation for implementation of other types of locks (operational security, etc.) according to the auxiliary circuits schemes is provided on request.

HVDS design allows for its mounting on skids. Skids are produced and supplied separately.



Example. HVDS-6(10)-VV-630 N3 overall dimension 1



Glim LLC

Mongolia, Ulaanbaatar

Glim LLC is one of the leading suppliers of compressor equipment and packaged transformer substations within the territory of Mongolia.



Manufactured equipment

- High voltage distribution switch OSWG-HVDS-6-O/K-630 N1



Baatarjav Batbold
Director of Glim LLC

On behalf of the company Glim LLC, I enclose gratitude for qualitative performance of works and timely delivery of the high voltage distribution switch, as well as for scrupulous approach to the assigned task.

Over the period of our joint operation, Chelyabinsk Electric Equipment Plant LLC has proved itself as the reliable supplier, who is capable of performing complex tasks at the high professional level.



Switchgear and control gear – SCG

of Series 2HVDC up to 10 kV

Switchgear and control gear (SCG) of Series 2HVDC (complete retrofitted high-voltage excavator cabinet) are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage electric installations for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) climate, placement category 3 according to GOST 15150.

SCG of Series 2HVDC is designed for installation on the mining excavators rotary platform.



SCG conventional designation structure

SCG X - XXX - X - X/X - X XX

- Climatic modification and placement category according to GOST15150-69
- Rated current, A (630; 1000)
- Classification of lead-out on outgoing line side:
C – cable; O – overhead
- Classification of lead-out on incoming line side:
C – cable; O – overhead
- Rated voltage, kV
- Modification: 2HVDC; HVDS; 2-12P
- O – outdoor installation
- SCG is the switchgear and control gear manufactured by Chelyabinsk Electric Equipment Plant LLC

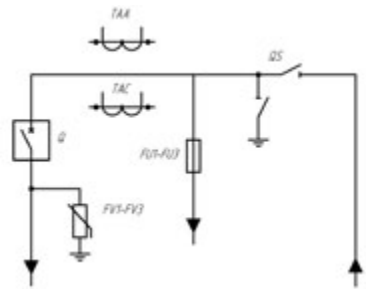
Design classification

SCG classification attributes	Design
Insulation level according to GOST 1516.3	Normal, level "b"
Insulation type	Air insulation
Busbar insulation	With non-insulated buses; With insulated buses
In terms of servicing conditions	With Bilateral maintenance; With unilateral maintenance
In terms of installation method	For indoor installation
In terms of climatic modifications and placement category	Placement category 3, climatic modification N according to GOST 15150, GOST 15543.1

Specifications

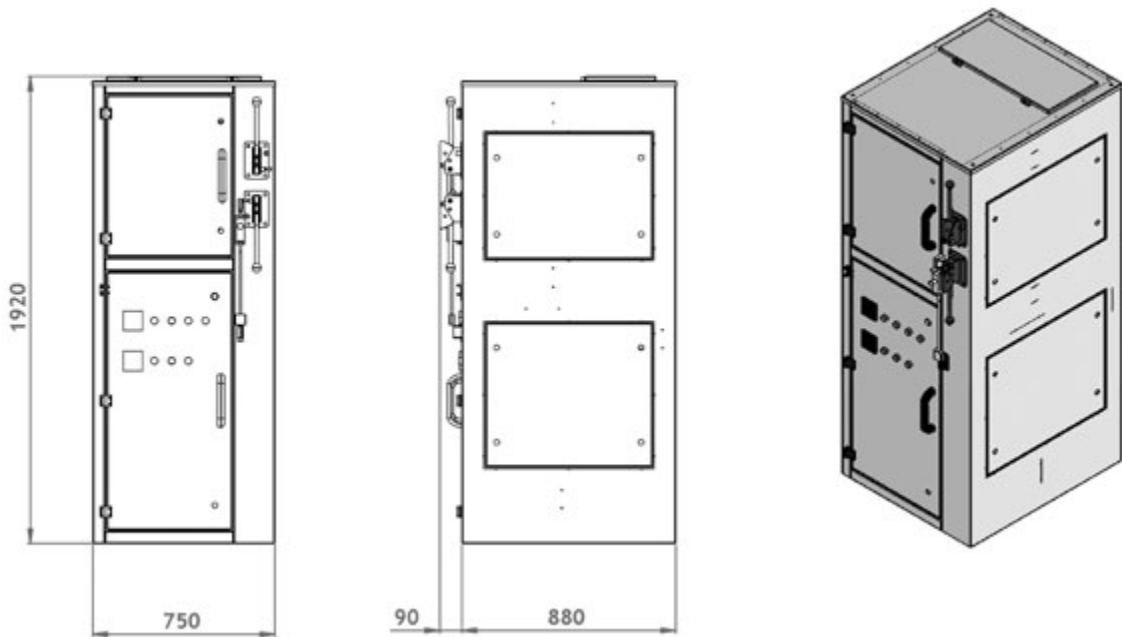
Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7,2; 12
Rated current of main circuits, A	630; 1000
Rated breaking current of cells with vacuum circuit breaker, kA	20; 31,5
Peak withstand current of cells with vacuum circuit breaker, kA	32; 51
Rated voltage of auxiliary circuits, V: — AC and DC protection, control and alarm circuits — lighting	220 36

Electric schematic diagram of 2HVDC



- Q Vacuum circuit breaker BB/TEL-10-20/1000
- QS Disconnecting switch RVFZ-630
- TAA, TAC Current transformer TOL-10-1-2-150/5 0.5/10R
- FV1-FV3 Excess-voltage suppressors OPNp-6/6.9
- FU1-FU3 PKE fuses

Overall dimensions of 2HVDC



Vtorresurs- Pererabotka LLC

Novokuznetsk, Russian Federation

Vtorresurs-Pererabotka LLC provides a range of services associated with scrap supply and recycling for EVRAZ Consolidated West-Siberian Metallurgical Plant (EVRAZ ZSMK) OJSC; it is engaged in manufacturing of granulated blast-furnace slag and gravel fraction from blast-furnace slag.

Vtorresurs-Pererabotka LLC comprises as follows:

- scrap recycling department No. 1;
- scrap recycling department No. 2;
- slag processing department.



E.S. Makarova

Head of the Sales and Purchase
Coordination Department of
Vtorresurs-Pererabotka LLC

One of the conditions of the successful business is interaction with the reliable partners, who help to solve difficult tasks and to accomplish identified goals thanks to their professional competence and aiming for high performance. We know positively that we'll be able to increase the achieved joint operation results by continuing our cooperation.



Manufactured equipment

- SCG 2HVDC-6-KK-630 N1

Outdoor switchgear and control gear – SCG

up to 10 kV

Outdoor switchgear and control gear (SCG) are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage electric installations for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) and moderate cold (NF) climate, placement category 1 according to GOST 15150.



SCG conventional designation structure

SCGX - XXX - X - X/X - XXX

- Climatic modification and placement category according to GOST15150-69
- Rated current, A (630; 1000; 1600; 2000; 2500; 3150)
- Classification of lead-out on outgoing line side:
C – cable; O – overhead
- Classification of lead-out on incoming line side:
C – cable; O – overhead
- Rated voltage, kV
- Modification: Not specified as per data sheet; Irtyash
- O – outdoor installation
- SCG is a switchgear and control gear manufactured by Chelyabinsk Electric Equipment Plant LLC

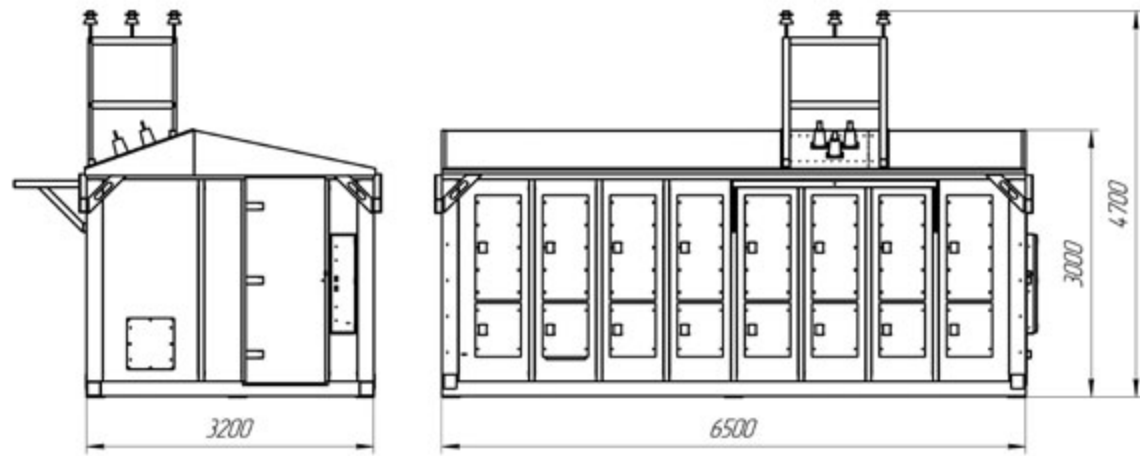
Design classification

SCG classification attributes	Design
Insulation level according to GOST 1516.3	Normal, level "b"
Insulation type	Air insulation
Busbar insulation	With non-insulated buses; With insulated buses
In term of presence of draw-out elements	With draw-out elements; Without draw-out elements
In terms of servicing conditions	With Bilateral maintenance; With unilateral maintenance
In terms of installation method	For indoor installation in electrical equipment rooms; For outdoor installation
In terms of climatic modifications and placement category	Placement category 1, climatic modifications - moderate (N) and moderate cold (NF) climate according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7,2; 12
Rated current of main circuits, A	630; 1000; 1600; 2000; 2500; 3150
Rated breaking current of cubicles with vacuum circuit breaker,kA	20; 31,5
Peak withstand current of cells with vacuum circuit breaker, kA	32; 51, 64
Rated voltage of auxiliary circuits, V:	
— AC and DC protection, control and alarm circuits	220
— voltage measuring transformers circuits	100
— lighting	36

Overall dimensions of OSWG fabricated by NAFTAGAZ-BURENIE LLC



1P Interruption data								
1 Chamber Serial No								
2 Voltage, kV	6							
3 Current of collecting buses, A	8000							
4 Collecting buses grade and cross-sect	ALHT 60x4							
5 Auxiliary supply voltage, V	220 V 50 Hz							
6 Main circuits arrangement								
7 Chamber purpose	Cell No 1 AT	Cell No 2 VT	Cell No 3 Input	Cell No 4 T-1	Cell No 5 T-2	Cell No 6 VP	Cell No 7 BAT	Cell No 8 BAT reverse
8 Chamber width by front elevation, mm	750	750	750	750	750	750	750	750
9 Chamber height, mm	2200	2200	2200	2200	2200	2200	2200	2200
10 Chamber depth, mm	1250	1250	1250	1250	1250	1250	1250	1250
11 Vacuum circuit breaker type and rated current, A			BB/10-10-20/1000	BB/10-10-20/1000	BB/10-10-20/1000	BB/10-10-20/1000		
12 Vacuum circuit breaker control unit type			TRC/CM, RL, 2	TRC/CM, RL, 1	TRC/CM, RL, 1	TRC/CM, RL, 1		
13 Vacuum contactor type							KB7-10/400	KB7-10/400
14 Auxiliary transformer type, power and voltage			3x0.1/11-125/5					
15 Excess-voltage suppressors type			OPN-PS-6/7.5					
16 Current transformers type	TO1-10-2		TO1-10-2	TO1-10-2	TO1-10-2	TO1-10-2	TO1-10-2	
17 Current transformers transformation ratio	50/5		600/5	400/5	200/5	200/5	80/5	
18 Voltage transformer type		3xMGPS-6						
19 Earthing switch type	3PA-1000		3PA-1000	3PA-1000	3PA-1000	3PA-1000	3PA-1000	
20 Fuses type, fuse link current, A	OK7-10-6-80-115							
21 Ammeter		3A5700	3A5700	3A5700	3A5700	3A5700	3A5700	
22 Voltmeter		3A5700						
23 Microprocessor protection unit		6MP3-100	6MP3-100	6MP3-100	6MP3-100	6MP3-100	6MP3-100	
24 Electromagnetic lock								

SGK Burenie LLC

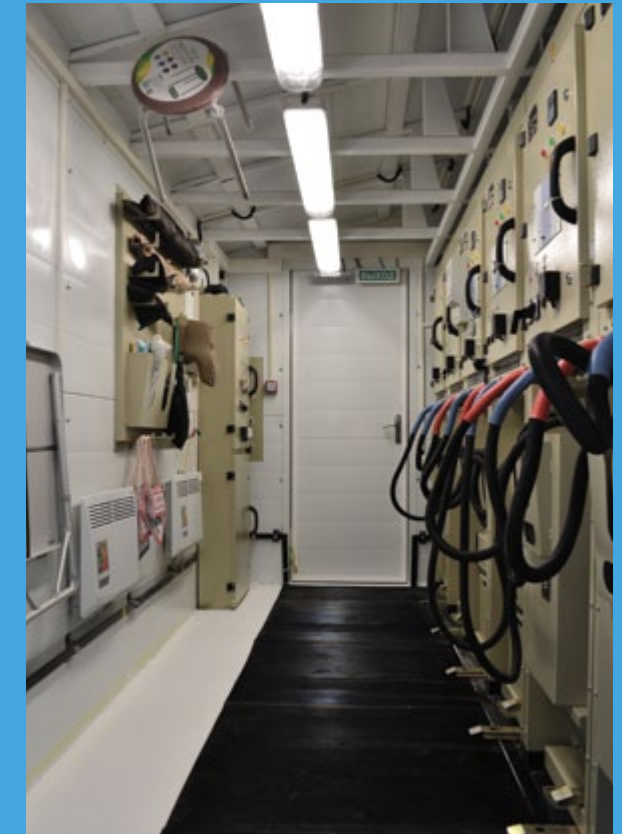
Nefteyugansk, Russian Federation

SGK Burenie LLC is a strong and competitive service provider of directional and lateral drilling for oil and gas, who is using the best practices and up to the minute equipment. SGK Burenie LLC was founded in July 2001. The company consolidated the following well-known industrial enterprises: Tomskneftegeofizika OJSC, Salymburneft LLC, which employees have an extensive experience in the oil field services and thousands of constructed and explored wells under their belts.



Manufactured equipment

- Switchgear and control gear in the packaged modular facility BKRU-VK-6/630 NF1



A.M. Khusniyarov
Chief Power Engineer of
the Nefteyugansk
acquisition company

We extend our thanks to all the personnel of Chelyabinsk Electric Equipment Plant LLC for their operational excellence in the development and production of such nonstock product as Switchgear and control gear in the packaged modular facility of BKRU type for BU upgrading.

CEEP LLC successfully integrated and implemented such requirements for BKRU as:

- additional structural reinforcement by means of cross supports;
- sandwich construction lining with extra metal sheet to avoid the housing damage during its interchanging and transportation;
- presence of draw-out elements on fabricated SCG-6kV, as well as interchangeable hardware components between SCG-6kV of production plants, that are used in operation up to now;
- production of doors, doorways, lead-ins, ventilation, lighting, slinging, floors and compliance with many other requirements that were not representative for such type of products.

Chelyabinsk Electric Equipment Plant LLC was very scrupulous and interested in the complicated design-engineering task solution, and completed the job just in time.

Outdoor switchgear and control gear – SCG

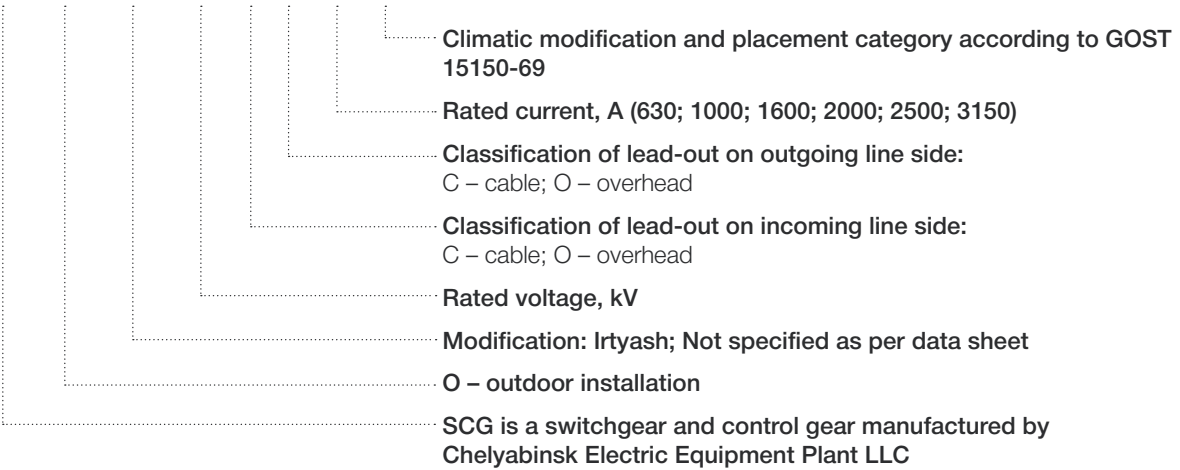
of Series «Irtyash» up to 10 kV

Outdoor switchgear and control gear (SCG) are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage electric installations for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) and moderate cold (NF) climate and placement category 1 according to GOST 15150. MSCG-Irtyash is designed for electric power supply of consumers of oil (gas) fields well pads with automatic load transfer function.



SCG conventional designation structure

SCG X - XXX - X - X/X - X XX



Design classification

SCG classification attributes	Design
Insulation level according to GOST 1516.3	Normal, level "b"
Insulation type	Air insulation
Busbar insulation	With non-insulated buses; With insulated buses
In term of presence of draw-out elements	With draw-out elements; Without draw-out elements
In terms of servicing conditions	With Bilateral maintenance; With unilateral maintenance
In terms of installation method	For indoor installation in electrical equipment rooms; For outdoor installation
In terms of climatic modifications and placement category	Placement category 1, climatic modifications - moderate (N) and moderate cold (NF) climate according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV 6; 10	6; 10
High-voltage (HV) side maximum operating voltage, kV7.2; 12	7,2; 12
Rated current of main circuits, A 630; 1000	630; 1000
Rated breaking current of cells with vacuum circuit breaker, kA 20; 31.5	20; 31,5
Peak withstand current of cells with vacuum circuit breaker, kA32; 51	32; 51
Rated voltage of auxiliary circuits, V: — AC and DC protection, control and alarm circuits — voltage measuring transformers circuits — lighting	220 100 36



Raduzhny Town Mains OJSC (RGES OJSC)

Raduzhnyy, Russian Federation

Raduzhny Town Mains OJSC provides electric power transmission services and carries out utility connection of power receivers of entities and persons to enterprise electric networks.



A.P. Krot
Chief Engineer of
Raduzhny Town Mains
OJSC

Manufactured equipment

- Modular switchgear and control gear MSCG-BPVK-6 NF1
- Modular switchgear and control gear MSCG-BPVK-10 NF1

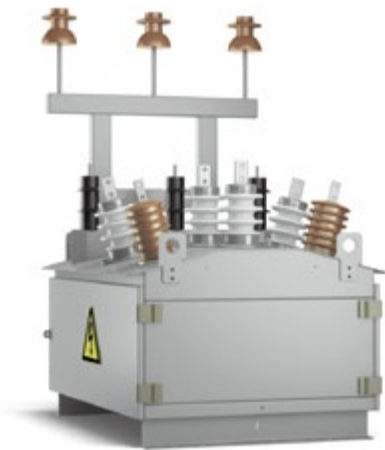


Raduzhny Town Mains OJSC has successfully cooperated with Chelyabinsk Electric Equipment Plant LLC for years. During this period CEEP LLC has proved itself as a reliable and faithful manufacturer of electric equipment. Its professional staff is always ready to give advice on any technical issue. RGES OJSC recommends CEEP LLC as a reliable manufacturer and supplier of electric equipment.

Revenue Metering Points – RMP

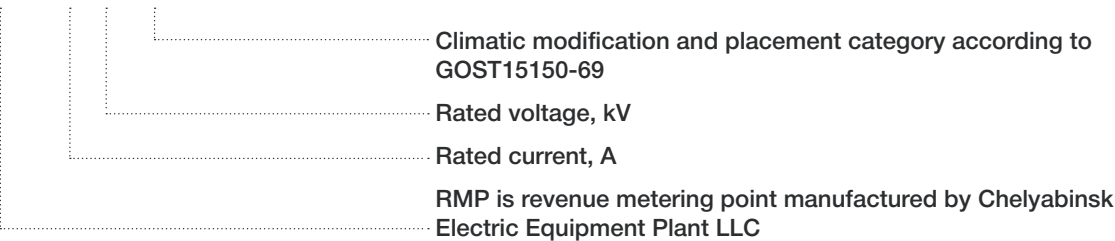
up to 10 kV

Revenue metering points (RMP) are designed for operation in 3-phase 50 Hz and 60 Hz, 6 kV and 10 kV rated AC voltage electric installations for a system with a neutral insulated or earthed via arc suppression coil, in moderate (N) climate and placement category 1 according to GOST 15150. RMP are used for transmission of an electrical network measured and calculated parameters to the control center, as well as for operation as a part of electric power automated control and metering systems.



RMP conventional designation structure

RMP - X/X XX



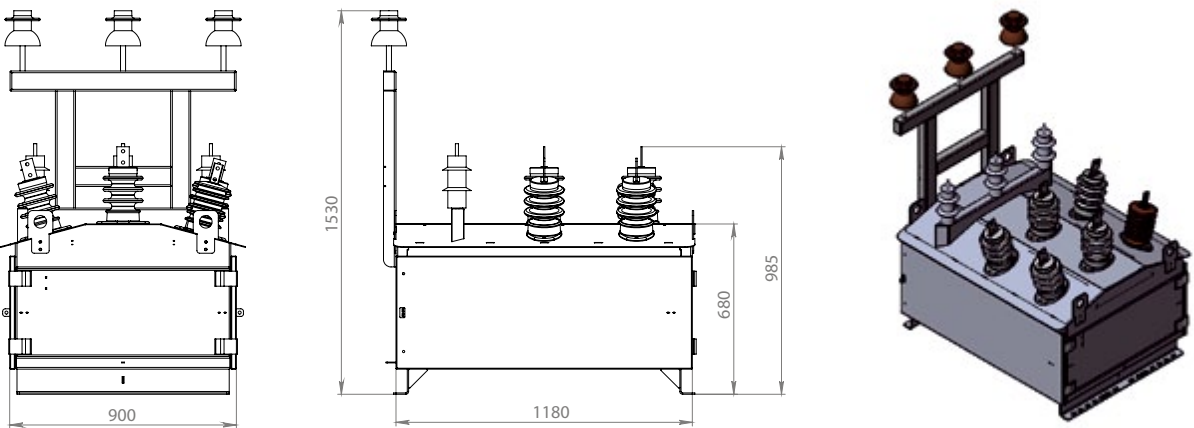
Design classification

RMP classification attributes	Design
Insulation level according to GOST 1516.3	Normal, level "b"
Insulation type	Air insulation
Busbar insulation	With non-insulated buses; With insulated buses
In terms of type of high-voltage line connections	Cable; Overhead
In terms of installation method	For outdoor installation
In terms of climatic modifications and placement category	Placement category 1, climatic modification N according to GOST 15150, GOST 15543.1

Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	6; 10
High-voltage (HV) side maximum operating voltage, kV	7,2; 12
Rated current of main circuits, A	630
Rated voltage of voltage measuring transformers circuit	100

Overall dimensions of RMP



Low-Voltage Cabinets – LVC

Low-voltage cabinets (hereinafter referred to as LVC) are designed for completing switchgears of indoor substations up to 1000 V AC with a frequency of 50 Hz, which are used for receipt and distribution of electric energy, protection against overloads and short-circuit currents, as well as for electric energy metering and accounting.



LVC conventional designation structure

LVDS XXX - X - X - X/X XX

- Climatic modification and placement category according to GOST15150-69
- Rated current, A
- Rated voltage, kV
- Automatic circuit breakers design:
1 – unit-mounted; 2 – carriage-type
- Servicing condition:
2 – bilateral maintenance; omitted when unilateral
- Low-voltage control cabinet function:
LVIC – low-voltage lead-in cabinet; LVOC – low-voltage outgoing cabinet;
TCC – transversal coupling cabinet;
EBC – emergency lead-in cabinet;
- LVDS – low-voltage distribution switchboards

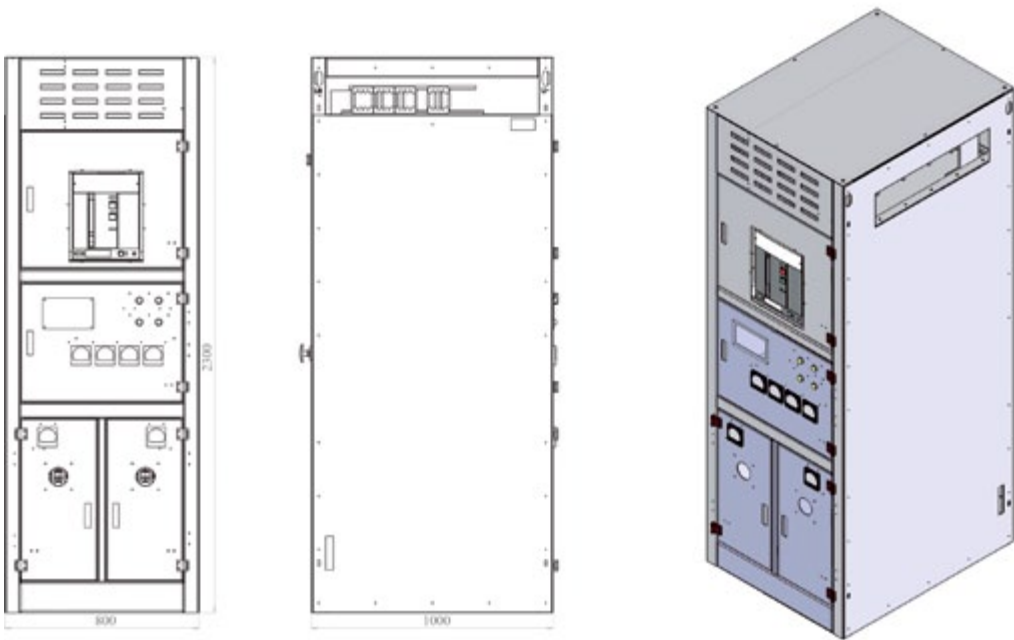
Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	0,4; 0,69
Rated current of main circuits, A	630; 1000; 1600 2500; 3200; 4000
Rated voltage of AC protection, control and alarm circuits, V	220

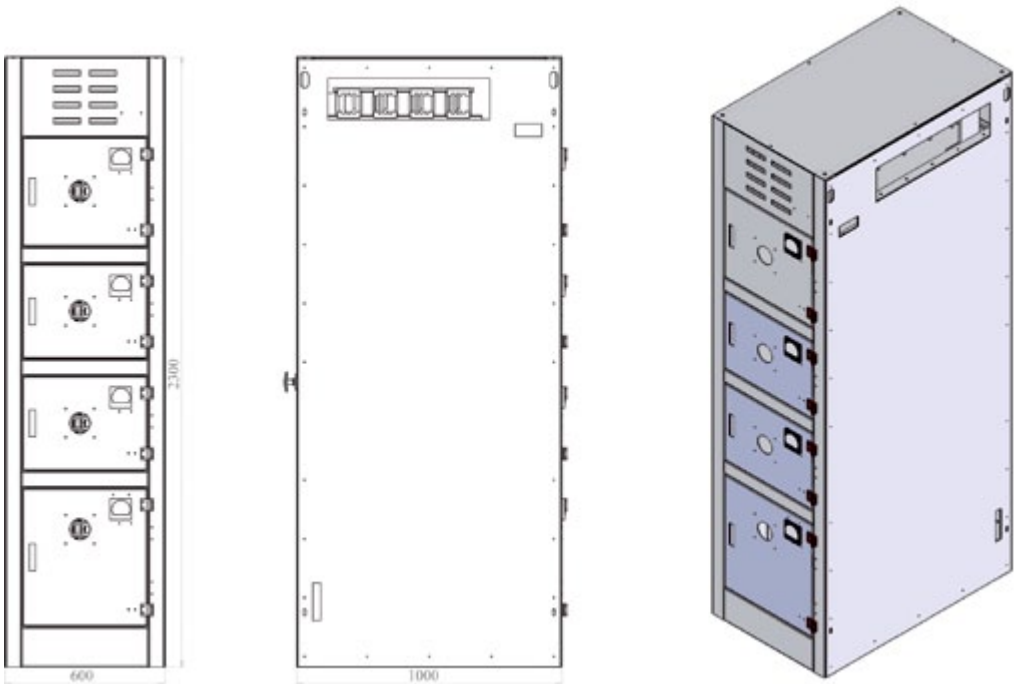
Structural design

LVC housing is a metal structure made of sheet roll-formed sections. The housing components manufacturing process starts in the design engineering department, then the drawings are sent to the laser machine shop where future housing parts are being cut from sheet metal. Upon completion of the cutting process, fabricated materials are sent to the bending machine, and then welding and surface preparation for powder coating occur. Metal thickness of the housing parts varies from 1 to 5 mm.
LVC housing design provides the possibility for the cabinet separation into switching devices compartment, collecting buses compartment and outgoing lines connection compartment. Depending on the customer's preferences, LVC provides for connection of incoming and outgoing lines via cable, busbar bridge or bus duct.

Example 1



Example 2

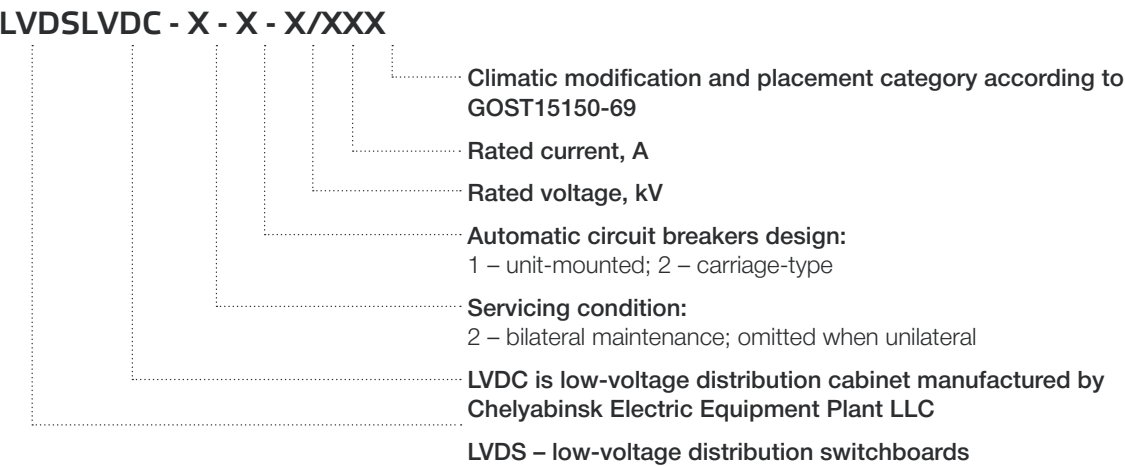


Low-Voltage Distribution Cabinets – LVDC

Low-voltage distribution cabinets (hereinafter referred to as LVDC) are designed for completing switchgears of up to 1000 V,AC with a frequency of 50 Hz, which are used for receipt and distribution of electric energy, protection against overloads and short-circuit currents, as well as for electric energy metering and accounting.



LVDC conventional designation structure



Specifications

Parameter designation	Parameter value
High-voltage (HV) side rated voltage, kV	0,4; 0,69
Rated current of main circuits, A	630; 1000; 1600; 2500; 3200; 4000
Rated voltage of AC protection, control and alarm circuits, V	220

Structural design

LVDC housing is a metal structure made of sheet roll-formed sections. The housing components manufacturing process starts in the design engineering department, then the drawings are sent to the laser machine shop where future housing parts are being cut from sheet metal. Upon completion of the cutting process, fabricated materials are sent to the bending machine, and then welding and surface preparation for powder coating occur. Metal thickness of the housing parts varies from 1 to 5 mm. LVDC housing design provides the possibility of the cabinet conventional separation into local switch compartment, transversal coupling compartment, relay protection and automation (RPA) compartment and outgoing switching devices compartment. Automatic circuit breakers and unit-mount/withdrawable load-break switches can be installed as leading-in and sectional devices. Outgoing lines are provided with automatic circuit-breakers or disconnecting switches with fuses. LVDC are made as for unilateral maintenance and consists of two cabinets (each cabinet is a separate section). LVDC cabinets can be installed by sections in one or two adjacent rooms. If LVDC cabinets are located in different rooms, sections are interconnected by the busbar bridge or cable, depending on the customer's preferences. The busbar bridge dimensions and cable length are determined by the equipment layout in the room.



Environmental durability requirements

LVDC are operated in the electrical equipment rooms at any time in a 24-hour period in all weather and seasons, and have the following resistance characteristics against environmental factors:

- ambient air temperature – from -25 to +40°C;
- elevation above the sea level – 1000 m, max.;
- relative air humidity – 75 % at temperature of +15°C;
- atmospheric pressure – from 86.6 to 106.7 kPa;
- atmosphere type as per GOST 15150 – II (industrial);
- environment – non-explosive, free of explosive dust and aggressive gases which concentrations can destroy metals and insulation;
- seismic impact resistance as per GOST 17516.1 – up to 9 points on MSK-64 scale.

Transportation of equipment

By default, LVDC are packed into bubble wrap. Special heat-shrink tape is used if required. LVDC are transported as a separate cabinets or transport blocks.

- LVDC are transported:**
- by railroad transport;
 - by vehicular transport;
 - by river transport.

Design department of CEEP LLC

Types of Design Works

- Preparatory works of land plot layout diagram (organizational planning diagram of the linear structure right-of-way);
- Preparatory works of architectural solutions (including sketch plans of foresides and entry elements);
- Preparatory works of construction solutions;
- Preparatory works of projects of the in-house engineering heating, ventilation, air conditioning, smoke ventilation, heat/cold/water supply, drainage, electric lighting and electric equipment systems;
- Preparatory works of projects of the external heat supply networks and its facilities, water supply networks, drainage and its facilities, electrical supply networks (up to 110 kV inclusive), external supply lines of low current systems;
- Preparatory works of process solutions for accommodation buildings, public facilities, industrial buildings and structures and their complexes; facilities of agricultural purpose, military infrastructure, disposal facilities and their complexes; facilities of collection, processing, storage, recycling and disposal of wastes and their complexes;
- Development works of the following special sections of the project documentation: engineering and technical civil defense measures, prevention of natural and man-made emergencies, development of the hazardous industrial facilities safety declaration;
- Preparatory works of the projects of environment protection measures, fire safety and provision of access for people with limited mobility;
- Preparatory works of the construction organization plan;
- Works on inspection of the structures of buildings and facilities;
- General Designer functions execution.



Services and Package Approach



Producer Leasing Program

Chelyabinsk Electric Equipment Plant LLC is operating on individual leasing programs, which enables electric equipment lease purchase on favorable terms.



Warranty and Servicing Responsibilities

We guarantee the excellent quality of execution of an order and delivery within the prescribed time limits, with individual escort of each order.

Mutually beneficial operation in compliance with the customer's requirements and wishes is the main principle of our work!

Produced equipment warranty is 12 months (1 year), but not greater than 18 months from the product shipment date. In certain cases warranty responsibilities of the manufacturing plant are increased up to 48 months (4 years).



Delivery

Chelyabinsk Electric Equipment Plant LLC has its own Assets Logistics. Our specialists can arrange and follow-up the delivery of produced products to the place of destination worldwide. Now our customers do not need to worry about transportation of stock on order.

We are responsible for the safety condition of cargo during its transportation up to the moment of its receipt.



Products Packing

In case of long-distance haulage of goods, specialists of Chelyabinsk Electric Equipment Plant LLC carry out quality packaging of products, excluding mechanical damage and exposure to atmospheric precipitation.



Cutting, Bending, Welding, Painting and Assembly of Products

Chelyabinsk Electric Equipment Plant LLC provides services of laser and plasma-arc cutting, bending, welding, polymer powder coating and assembly of products of any complexity both according to the customer's drawings and in compliance with their own project designs.



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Notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



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