ELECTRONMASH

COMPANY HISTORY

>>> www.electronmash.ru

1999 — ELECTRONMASH Engineering Company established

2004 — Assol LVS 0.4 kV In-house production started

2008 — Eltema MVS 6 (10) kV PS 6 (10) kV in modular building ISO 9001: 2000

2010 — Eltema+ MVS 35 kV PARNAS-1 Plant started up

2013 — Substations 35 kV ExOnSys DC Systems

2016 — ISO 14001: 2004, OHSAS 18001: 2007 Wind and PV Power plants equipment

2018 — EL Storage Energy Storage System

2019 — Wind power plant Converters localization in Russia PARNAS-2 Plant started up

ELECTRONMASH JSC IS A MODERN INDUSTRIAL COMPANY THAT DESIGNS AND PROVIDES SYSTEM SOLUTIONS FOR POWER SUPPLY AND AUTOMATION SYSTEMS

ELECTRONMASH JSC IS A RUSSIAN-BASED MANUFACTURER
OF RELIABLE ENERGY-EFFICIENT POWER SUPPLY EQUIPMENT

20 years

of successful engineering and production of innovative electrical equipment, development and implementation of integrated power supply solutions

15000 m²
production facilities with modern equipment

over 5000 equipment units
manufactured per year

over 300
skilled professionals

over 400 companies
commended the high level of engineering solutions, modern technologies, and the manufacturing quality

ABOUT COMPANY

>>> www.electronmash.ru

ELECTRONMASH JSC IS A COMPANY AIMED AT DEVELOPING ITS INTELLECTUAL POTENTIAL AND ATTRACTING A NEW GENERATION OF PROFESSIONALS

ELECTRONMASH JSC is an innovative Russian company having a 20-year experience in manufacturing high-tech electrical equipment widely operated both in Russia and abroad.

In the digital industry era, the company's research and engineering potential, its own well-equipped production base, and skilled engineers enable the company to keep up to date by designing and implementing modern products and solutions to be applied as part of intelligent power supply systems.

The company manufactures a wide range of electrical equipment for reliable power supply to production and infrastructure facilities.

Throughout the development and implementation of integrated power supply and automation projects, ELECTRONMASH equipment ensures that all the quality, cost, and timing targets are achieved.

ELECTRONMASH considers individual Customer needs.

This approach allows the Customer to receive technically reliable and cost-effective solutions in a timely manner.

ELECTRONMASH OFFERS ITS CUSTOMERS A FULL RANGE OF SERVICES

MANAGEMENT OF INTEGRATED PROJECTS

- General contractor services
- Turnkey design and construction
- Coordination of the entire project cycle from project approval to commissioning

DESIGN AND ENGINEERING

- Feasibility study and development of basic engineering solutions
- Detailed design documentation for power supply projects up to 110 kV, including automation and dispatch systems

MANUFACTURING AND SUPPLY

- Manufacturing and complete supply of electric equipment and automation
- Development of specialized software
- Check assembly, parameterization and testing of equipment at the factory

DEVELOPMENT AND IMPLEMENTATION OF AUTOMATED PROCESS CONTROL SYSTEM (APCS)

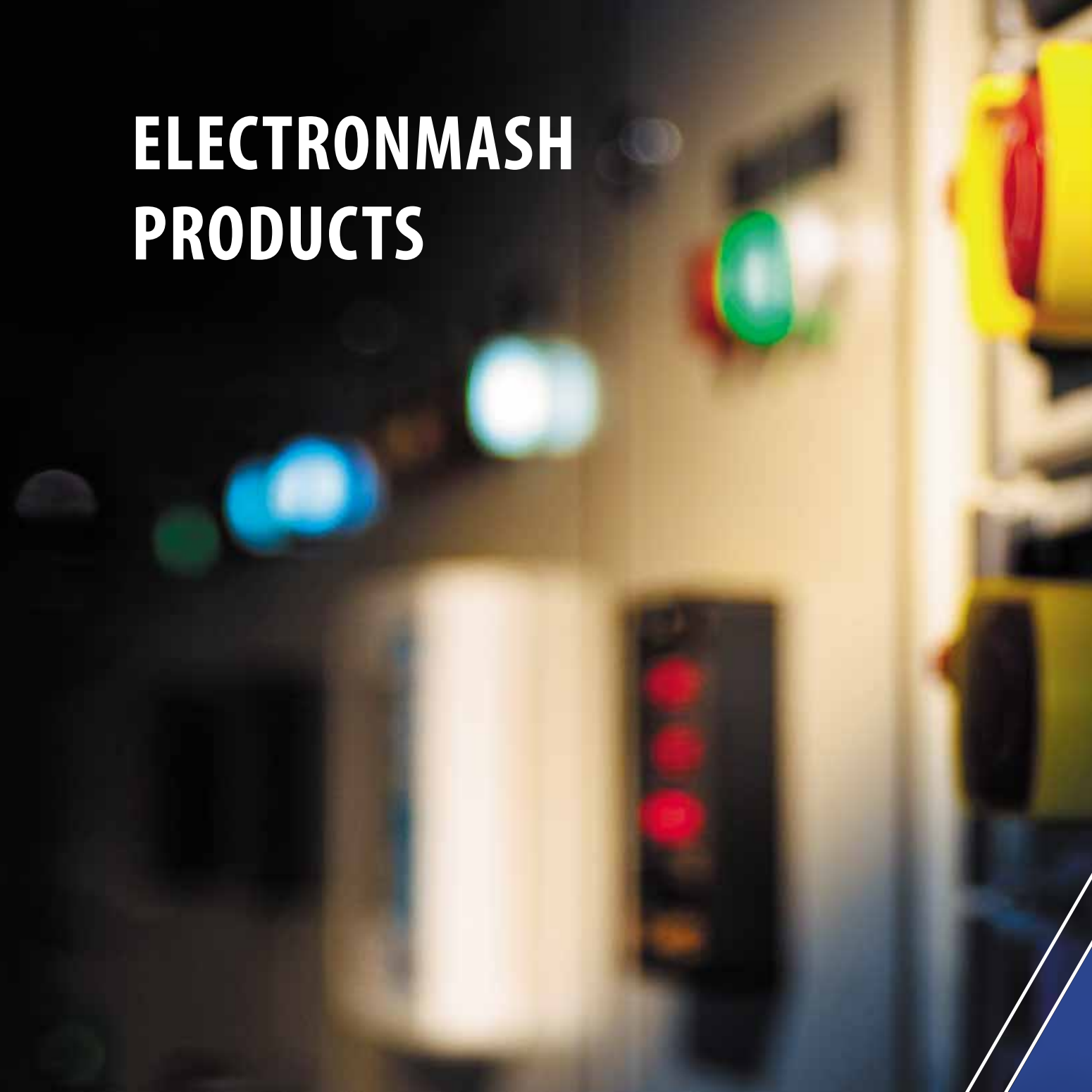
- Development, design and setup of automated control systems
- Built-in monitoring and diagnostic systems
- Design and setup of operational dispatch management systems

COMMISSIONING

- Construction, erection, installation supervision, setup supervision and commissioning
- Customer training
- Commissioning of facility in conjunction with Customer

SERVICE AND WARRANTY MAINTENANCE

- Technical support of Customer
- Equipment management in service
- Preventive maintenance on request
- Regional service and support centers



ELECTRONMASH PRODUCTS

ELM BPS 110/35/10 (6) kV

>>> www.electronmash.ru

BLOCK-TYPE PREFABRICATED SUBSTATIONS 110/35/10 (6) kV

ELM BPS 110/35/10 (6) kV is an integrated solution for power supply to facilities of diverse complexity.

The engineering solutions offered by ELECTRONMASH for 110 kV substation projects are based on a flexible approach, which ensures the Customer's confidence in the reliability and timely completion of the project.

For 110 kV Outdoor Switchgears, the following design options are offered:

- separate 110 kV units
- common rigid structure for entire 110 kV Outdoor Switchgear
- 110 kV Outdoor Switchgear compact modules

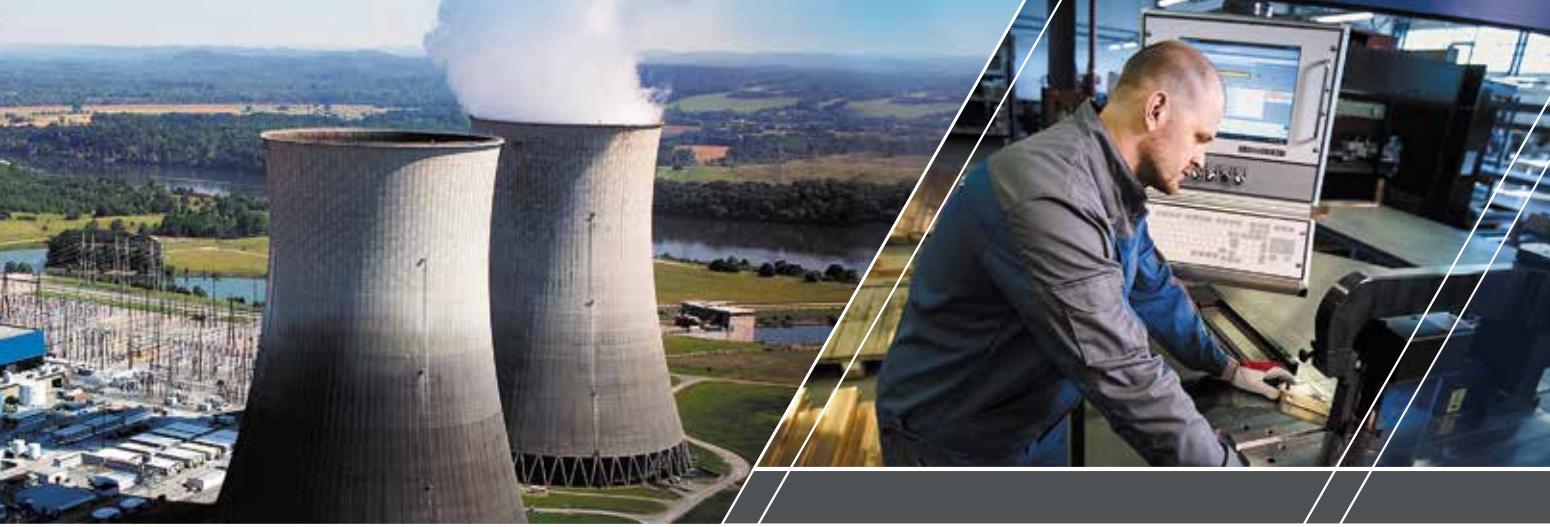
For a Substation Control Room the following design options are offered:

- in a separate modular building
- as a separate room combined with an Indoor Switchgear

A Substation Control Room is equipped with all required secondary and auxiliary systems manufactured by ELECTRONMASH, such as DC control power cabinets, relay panels, TC/APCS panels, fault recorder panels, power quality monitoring devices and auxiliaries switchboards.

This approach ensures that the Customer receives the complete equipment system from a single manufacturer, which warrants the demanded quality and unified design.

The use of a wide range of equipment components enables the Customer to select solutions that are in line with the import substitution plan or use equipment of world leading manufacturers.



SAFETY

- Remote operation, monitoring and control
- Process and security monitoring
- Seismic resistance: up to 9 points

ENGINEERING

- Different construction solutions for Outdoor switchgear-110 kV
- Secondary systems are tailored to individual Customer requirements
- Use of in-house MV Switchgears 6-35 kV and secondary system cabinets

EASY INSTALLATION AND OPERATION

- High prefabrication
- High automation and dispatching degree
- Cable trays and cable racks facilitate and speed up installation of external secondary connections

FLEXIBLE COMPONENT OPTIONS

- Dead- or live-tank circuit breakers, hybrid switching devices
- Gas-insulated or vacuum circuit breakers
- Switching devices, current transformers, voltage transformers and surge arresters manufactured in Russia or abroad
- Relay protection devices, Telecontrol/APCS and communication devices of any manufacturer

TECHNICAL SPECIFICATIONS

Parameter	HV	MV	LV
Rated voltage, kV	110	35	6; 10
Rated current of main circuits and busbars, A	up to 2000	up to 2500	up to 4000
Peak withstand current (amplitude), kA	up to 125	up to 81	up to 102
Short-time withstand current, kA	up to 50	up to 31.5	up to 50
Transformer capacity, kVA	63,000		
Transformer types	oil-immersed		
Seismic resistance	up to 9 points		
Service life	at least 30 years		
GOST 15150 / GOST 15543.1 Climatic version	F1		

ELM PS 35/10 (6) kV

>>> www.electronmash.ru

PREFABRICATED SUBSTATION 35/10 (6) kV

ELM PS 35 kV is a new generation of intelligent prefabricated substations manufactured by ELECTRONMASH.

The company currently manufactures Prefabricated Substations 35/10 (6) kV on a mass scale in two design versions:

- **ELM MPS 35/10 (6)/0.4,** an indoor Modular Prefabricated Substation that seamlessly fits to an urban area
- **ELM BPS 35/10 (6),** a Block-type Prefabricated Substation for production and power network facilities, typically with outdoor power transformer arrangement

Power supply for each specific industry and infrastructure has its own uniqueness that affects the type and configuration of the equipment used.

Our company always considers the Customer's industry-specific requirements, which predetermines effective and successful cooperation during all project phases.

Our flexible use of components, high quality and integrated systematic approach to the manufacture and supply of 35 kV substations have been appreciated by leading companies, such as:

- GAZPROM PJSC
- GAZPROM Neft PJSC
- LUKOIL PJSC
- ROSNEFT Oil Company PJSC
- ROSSETI PJSC
- FORTUM PJSC

SAFETY

- Switchgears 35 & 6 (10) kV are arranged in separate buildings or rooms
- Remote video surveillance, operation and control
- Seismic resistance: up to 9 points

ENGINEERING

- Prototype building modules allow a good flexibility in assembling prefabricated substations, due to which either a single modular prefabricated substation building with built-in transformer rooms, or a complex of standalone switchgear buildings with outdoor transformers can be constructed
- The available switchgear module designs make it possible to implement either overhead or cable input
- Secondary systems are tailored to individual Customer requirements

EASY INSTALLATION AND OPERATION

- Potential for expansion of Indoor Switchgears in the course of operation by installing extra modules
- Secondary circuits are assembled and tested at factory
- No need for mineral oil facilities (in case of dry-type transformers in use)

FLEXIBLE COMPONENT OPTIONS

- Various switching devices manufactured in Russia or abroad
- Use of dry-type or oil-immersed transformers
- Flexible use of secondary system devices

TECHNICAL SPECIFICATIONS

Parameter	HV	LV
Rated voltage, kV	35	6; 10
Rated current of main circuits and busbars, A	up to 2500	up to 4000
Peak withstand current (amplitude), kA	up to 64	up to 102
Short-time withstand current, kA	up to 31.5	up to 50
Transformer capacity, kVA	25,000	
Transformer types	dry-type / oil-immersed	
Seismic resistance	up to 9 points	
Service life	at least 30 years	
GOST 15150 / GOST 15543.1 Climatic version	F1	

ELM PS 35/0.4 kV & 6 (10)/0.4 kV

>>> www.electronmash.ru

PREFABRICATED
SUBSTATIONS
35/0.4 kV
& 6 (10)/0.4 kV

ELM Prefabricated Substations 35/0.4 kV & 6 (10)/0.4 kV manufactured by ELECTRONMASH are successfully operated at big production and infrastructure facilities, including those with higher electrical reliability and safety requirements.

The company manufactures ELM PS 35/0.4 kV and 6 (10)/0.4 kV with oil-immersed or dry-type power transformers:

- **Indoor ELM PS,** up to 6300 kVA
- **ELM BPS in a modular building,** up to 4000 kVA
- **ELM BPS in a concrete enclosure,** up to 2500 kVA

The company manufactures Prefabricated Substations in three different types of modular building:

- Sandwich panel modular building
- Corrugated steel sheet modular building
- Reinforced concrete modular building

The use of in-house switchgears, as well as transformers manufactured by our reliable partners, in Prefabricated Substations enables us to ensure not only proper quality control in all project stages, but also strict adherence to contractual timing.

The project portfolio of prototype solutions accumulated over the years, combined with a modern view on solving nonstandard problems, allow the company to implement ELM PS 35/0.4 kV and 6 (10)/0.4 kV construction projects regardless of complexity level.

SAFETY

- The transformers are installed in separate rooms or enclosed
- Arc localization in case of a short circuit within a single cabinet compartment
- Seismic resistance: up to 9 points

ENGINEERING

- Three prefabricated substation types: indoor, modular building, or concrete enclosure
- Modular building versions: sandwich panel, corrugated steel sheet, or reinforced concrete
- Modular building of higher corrosion resistance

EASY INSTALLATION AND OPERATION

- High prefabrication
- Use of maintenance-free equipment in prefabricated substation
- Maximum availability of internal connections for assembling

FLEXIBLE COMPONENT OPTIONS

- HV switchgears are equipped with circuit breakers or switch-disconnectors
- Use of dry-type or oil-immersed transformers
- LV switchgears are equipped with circuit breakers of various manufacturers, such as: ABB, Schneider Electric, Siemens, KEAZ, etc.

TECHNICAL SPECIFICATIONS

Parameter	Value
Rated capacity of power transformer, kVA	up to 6300
Rated voltage, kV	
HV side	6; 10; 35
LV side	0.4; 0.69
Rated current of busbars, A	
HV side	10-630
LV side	160-6300
Peak withstand current (amplitude), kA	
HV side	20-51
LV side	32-220
Short-time withstand current, (1s) kA	
HV side	12.5-31.5
LV side	16-100
HV side input	cable / busbar / overhead
LV side connection	cable / busbar
GOST 15150 Climatic version and placement category	
Indoor PS	NF3.1, N3 T3, MU4
Modular building PS	NF1, N1, M1
Seismic resistance by MSK-64 scale, point, max	9
Service life, years	25

ELTEMA MV SWITCHGEAR

>>> www.electronmash.ru

ELTEMA
SWITCHGEARS 6 (10) kV
& ELTEMA+
SWITCHGEARS 35 kV

ЭЛТИМА

Product designed for power engineers by power engineers

Eltema 6–35 kV is a range of state-of-art air-insulated switchgears equipped with withdrawable circuit breakers:

- **Eltema Switchgear 6 (10) kV:** maximum compartment separation
- **Eltema Pro Switchgear 6 (10) kV:** integrated service truck with circuit breaker
- **Eltema Light Switchgear 6 (10) kV:** minimized cabinet dimensions (1100+ mm depth)
- **Eltema+ Switchgear 35 kV:** minimized 35kV Switchgear cabinet dimensions, air insulated

ELECTRONMASH JSC keeps abreast of the modern industry trends and considers all the customers' demands for equipment functionality.

The entire range of Eltema 6-35 kV MVS cabinets are equipped with Automated Monitoring and Diagnostic Systems which allows the Customer to provide maintenance services with full and timely reporting on the electrical equipment technical conditions.

Eltema Switchgears 6-35 kV provide for seamless integration into the Customer's Adaptive Distribution Management Systems and Supervisory Process Control System.

SAFETY

- All compartments are divided by grounded metal barriers
- Short circuit localization within one compartment
- Electromagnetic and mechanical interlocking
- Seismic resistance: up to 9 points

ENERGY EFFICIENCY

- Energy-efficient components
- Power factor correction units in MV Switchgears
- LED lamps

EASY INSTALLATION AND OPERATION

- Availability of cabinets designed with a cassette-type withdrawable circuit-breaker or an integrated service truck type circuit breaker
- Maintenance-free bolt connections in main circuits
- Operation in corrosive environments. Corrosion resistance
- Removable plates facilitate access to cable connection points, busbars, and current transformers
- Interlock release during assembling to prevent damages

FLEXIBLE COMPONENT OPTIONS

- Use of vacuum circuit breakers (BB/Tel, VD4, HVX, EasyPact EXE, Sion, etc.)
- Use of gas-insulated circuit breakers (LF, HD4)

MONITORING AND CONTROL*

- Local automation
- Online monitoring and diagnostics of MV Switchgear technical conditions (busbar temperature phase-wise monitoring)
- Motorized drive control for circuit breaker, cassette, earthing switch
- Collection and transmission of MV Switchgear technical condition data to the predictive maintenance system

*For more details on the Automated Monitoring and Diagnostic System functionality, see the Eltema Switchgear product catalogue.

TECHNICAL SPECIFICATIONS

Parameter	Value			
	Eltema	Eltema Light	Eltema Pro	Eltema+
Rated voltage, kV	6 (10)	6 (10)	6 (10)	35
Rated current of main circuits and busbars, A	630-4000	630-1600	630-3150	630-2500
Short-time withstand current, kA	20-50	20-31.5	20-40	20-31.5
Insulation type	air and composite			
Busbar material	copper			
Insulation of current-carrying busbars in main circuits	- w/o busbar insulation - w/ busbar insulation			w/ busbar insulation
GOST 14254-96 IP rating	IP40, IP41			
Seismic resistance	up to 9 points			
Maintenance	front access or front-and-rear access			
Service life	at least 30 years			
GOST 15150 / GOST 15543.1 Climatic version	N3			
Motorized earthing switch operating mechanism, motorized withdrawable circuit breaker	full range of Eltema Switchgear 6-35 kV cabinets			

ASSOL LVS

>>> www.electronmash.ru

ASSOL LV
SWITCHGEARS
0.4 (0.69) kV

Ассоль
Innovative LV Switchgears

Assol LV Switchgear is the next generation of products based on the modern design concepts for electric power distribution and equipment management for production and electric power facilities.

Assol LV Switchgears are successfully operated at our Customers' production facilities, ensuring reliable power supply to continuous-type production plants and large-scale power facilities.

The flexible construction design of Assol LV Switchgear allows manufacturing various cabinet modifications based on fixed or withdrawable units:

LV switchgear, distribution switchboard, MCC, auxiliary switchboard, control panel.

In terms of its functionality and workmanship, Assol LV Switchgear is fully compliant with applicable Russian and international standards, as well as strict industry-specific regulations:

- ROSSETI PJSC
- GAZPROM PJSC
- ROSNEFT Oil Company PJSC
- TRANSNEFT PJSC
- Rosatom PJSC
- Russian Maritime Registry of Shipping

ELECTRONMASH constantly improves both the construction and the functionality of LV Switchgears, which enables us to implement effective solutions for the most complex and non-standard engineering objectives posed by a Customer.

SAFETY

- All compartments are sectioned and divided by grounded metal barriers
- Arc localization in case of a short circuit within a single cabinet compartment
- Mechanical and electrical interlocks
- Form of internal separation up to 4b

ENERGY EFFICIENCY

- Energy-efficient components
- Use of power factor correction units, soft starters, and VFD integrated into LV cabinets
- Power supply parameter control
- Energy efficiency analysis

EASY INSTALLATION AND OPERATION

- Availability of output lines with withdrawable units
- Hot swap of withdrawable units
- Flexible modification of automation algorithms
- Location of mimic diagram on the LV Switchgear front side
- Cable connection without lugs

FLEXIBLE COMPONENT OPTIONS

- Use of plug-in or withdrawable circuit breakers
- Use of circuit breakers of various manufacturers:
  ABB, Schneider Electric, Siemens, or domestic manufacturers

MONITORING AND CONTROL

- Position monitoring and control for all circuit breakers
- Monitoring of circuit breaker switching resource
- Monitoring of withdrawable unit position
- Online diagnostics of intelligent devices and their interconnections
- Collection and transmission of LV Switchgear technical condition data to the predictive maintenance system

TECHNICAL SPECIFICATIONS

Parameter	Value
Rated voltage, V	400; 690
Rated current of busbars, A	up to 7100
Peak withstand current, kA	up to 220
Short-time withstand current, kA	up to 100
Short-time withstand current duration, s	1
GOST 14254 IP rating	up to IP55
GOST R 51321.1 Form of internal separation	up to 4b
GOST 15150 Climatic version	NF3.1 (–10…+40 °C) T3 (–10…+50 °C)
Position of busbars	rear / top / bottom
Insulation of current-carrying busbars	- w/o busbar insulation - w/ busbar insulation
Input type	cable / busbar
Device installation	- stationary - plug-in - withdrawable
Construction modification	- w/ fixed units - w/ plug-in modules - w/ withdrawable units
Type of maintenance	front access / front and rear access

ExOnSys DC SYSTEM

>>> www.electronmash.ru

ExOnSys
OPERATIVE
DC SYSTEMS

ExOnSys DC System is a reliable DC source for uninterruptable loads at 35-750 kV power supplies.

ELECTRONMASH has developed a range of DC System products to be applied at substations of all voltage ratings:

- **S Series (ExOn DC cabinet),** for 35 kV or less substations
- **M Series,** for small 110 kV substations (3 or fewer circuit breakers per substation)
- **L Series,** for large 110 kV substations (4 or more circuit breakers per substation)
- **XL Series,** for 220-750 kV substations

As we understand our Customers' needs, we have chosen the pathway of continious development efforts aimed at improving and expanding the DC System functionality and equipping it with advanced monitoring, control and diagnostic systems capable of collecting and transmitting technical condition data to the Customer's predictive maintenance system.

The ExOnSys DC System implements all the required functions that ensure the safe and trouble-free operation of power facilities, such as rectifier-charger monitoring, outgoing lines insulation monitoring, online monitoring of DC system components and their interconnections and battery elements monitoring.

ELECTRONMASH DC System is an innovative product that ensures proper operability of all essential consumers of DC.

SAFETY

- EMC compliance with GOST requirements
- Galvanic isolation of power circuit
- Seismic resistance: up to 9 points

ENERGY EFFICIENCY

- Energy-efficient components
- Rectifier Charger efficiency is at least 95%
- Energy efficiency analysis
- LED lamps

EASY INSTALLATION AND OPERATION

- Maintenance-free bolt connections
- Front access / front and rear access maintenance
- Location of mimic diagram on the DC System front
- Top and bottom cable input arrangement

FLEXIBLE COMPONENT OPTIONS

- No restrictions in component base
- Availability of microprocessor, power and switching devices manufactured in Russia or abroad

MONITORING AND CONTROL

- Unified microprocessor-based DC System monitoring system
- Monitoring of mains, rectifier charger and storage battery parameters
- Monitoring and control of switching and protection devices
- Support of industrial data communication protocols such as IEC 61850, 60870-5-104 and Modbus TCP (RTU)

TECHNICAL SPECIFICATIONS

Parameter	Parameter
Input	
Rated input voltage, V	380, 220
Number of inputs	1...4
Frequency, Hz	45-65
Output	
Rated output voltage, V	220, 110, 48
Rated current of busbars, A	630 for XL
	250 for L
	160 for M
	80 for S
Equipment	
Rectifier chargers used*	ExOnChar (ELM), APS, Benning
Batteries used*	Hoppecke, Hawker, Fiamm, Enersys, Delta
Switching devices used*	ABB, Schneider Electric, Jean Muller, OEZ, Socomec

*Customer selects the device manufacturer and type when completing the configuration data sheet.

ExOnSys CONFIGURATIONS

S SERIES (ExOn DC CABINET)

M SERIES

L & XL SERIES

ExOnChar RECTIFIER CHARGER

>>> www.electronmash.ru

ExOnChar
RECTIFIER
CHARGERS
up to 400 A

ExOnChar Rectifier Charger is a transistor charger provided with an up-to-date element base and design solutions, which has a low voltage ripple level and high voltage stabilization accuracy for long-term battery life.

ExOnChar

SAFETY

- High EMC performance
- Galvanic isolation from mains
- Availability of N+1 redundancy

ENERGY EFFICIENCY

- Rectifier Charger efficiency is at least 95%
- Reduced power consumption due to natural cooling

EASY INSTALLATION AND OPERATION

- Hot swap of rectifying module
- Natural / forced cooling
- Front access / front and rear access maintenance

MONITORING AND CONTROL

- Online monitoring and control of Rectifier Charger
- Automatic monitoring of busbar insulation
- Supports IEC 61850, 60870-5-104, Modbus TCP/RTU, Profibus, Profinet

TECHNICAL SPECIFICATIONS

Parameter		Value
Input		
Rated input voltage, V		380±15%, 220±15%
Mains frequency, Hz		50±2%
Efficiency ratio, %		≥95
Power ratio		≥0.9
Output		
Rated input voltage, V		
	channel 1	220, 110
	channel 2	48, 24
Output voltage range, V		
	channel 1	176-300, 95-150
	channel 2	28-60; 9-30
Rated output current, A		
	single-channel RC	20-400
	double-channel RC	
	channel 1	80-200
	channel 2	40-100
Static stabilization, U_{out}, %		≤0.5
Voltage ripple, U_{out}, %		≤0.2
Environmental conditions		
Operating temperature, °C		–20 to +40
Humidity, %		≤90
Construction parameters		
Dimensions, WxDxH, mm		at least 650x650x2125
Entry direction orientation		bottom or top
IP rating*		IP31
Climate version and placement category		NF4

*A customer selects the Rectifier Charger parameter when completing the configuration data sheet.

T3R TRANSFORMER

>>> www.electronmash.ru

DRY-TYPE POWER TRANSFORMERS UP TO 35 kV

T3R power transformers with cast epoxy insulation, 50-30,000 kVA, are designed for all voltage ratings up to (inclusive) 35 kV. These transformers have a high reliability level due to application of a high-tech manufacturing process.

T3R transformers are perfect for installation where an extreme safety level and higher environmental protection are required.

ELECTRONMASH also uses transformers manufactured by its reliable partners.

TECHNICAL SPECIFICATIONS

Parameter	Value
Rated capacity, kVA	50 to 30,000
Type	double winding, triple winding
Rated voltage of winding, kV	0.4; 0.69; 6; 10; 15; 20; 35
Maximum operating voltage, kV	7.2; 12; 17.5; 24; 40.5
Test voltage (50 Hz, 1 minute), kV	20; 28; 38; 50; 80
Test voltage (full lightning impulse), kV	60; 75; 95; 125; 190
Impedance voltage, %	4 to 8
Partial discharge, pC	<10
High voltage regulation (changer type, range and number of tapping steps)	OLTC±2x2.5%, NLTC±4x1.5%
Diagram and group of winding connection	D/Yn – 1, Y/Yn – 0, others
Winding conductor material	aluminum or copper
GOST 8865-93 Heat resistance class	F
GOST R 52719-2007 Cooling type	AN, ANAN, ANAF
Climatic version	any
IP rating	IP00 to IP55
Acoustic pressure, dB	65
Environmental resistance class	E3
Flammability rating	F1
Climate class	C4
Seismic resistance by MSK-64 scale	6 to 9 points
Warranty period	at least 3 years
Service life	at least 30 years

MOTOR CONTROL CENTER

>>> www.electronmash.ru

MOTOR
CONTROL
CENTERS
0.4 (0.69) kV
& 6 (10) kV

ELECTRONMASH Motor Control Center is an effective flexible solution to different complex objectives such as optimization of production process cycles ensuring high performance of motor regulation and protection.

The company currently manufactures the following products on a mass scale:

- Variable-frequency drive (VFD) cabinets, up to or above 1000 V
- Soft starter cabinets, up to or above 1000 V
- Control station boards based on withdrawable units and using VFD or soft starter
- VFD and soft starter packages in modular buildings

In its Motor Control Center projects, ELECTRONMASH uses VFD and soft starters of world leading manufacturers the reliability and quality of which have been proven for years. These manufacturers include: ABB, Schneider Electric, Siemens, Danfoss.

Based on the company's twenty-year successful experience in the development, implementation and commissioning of reliable MCC rated for up to 1000 V and for above 1000 V, we offer our Customers unique nonstandard solutions to improve energy efficiency and reduce the cost of process equipment operation.

ELECTRONMASH provides its Customers with a full range of services for the development, production, implementation and service support of LV and MV variable frequency drives.

SAFETY

- Remote operation, monitoring and control
- Mechanical and electrical interlocks

ENERGY EFFICIENCY

- Energy-efficient components
- The efficiency of VFD and soft starters reaches as high as 98%
- Energy efficiency analysis

EASY INSTALLATION AND OPERATION

- Integrability of VFD and soft starters into withdrawable units of LV devices
- Hot swap of withdrawable units
- Modular design and withdrawable phase modules allow easy inspection and maintenance

FLEXIBLE COMPONENT OPTIONS

- Use of soft starters and VFD of world leading manufacturers: ABB, Schneider Electric, Siemens, Danfoss

MONITORING AND CONTROL

- Monitoring of mains, drive and loads parameters
- Technical metering of power consumption
- Local/remote motor control (including via the interface channel)
- Stepped/smooth speed variation (PID control)
- Event and alarm archives

TECHNICAL SPECIFICATIONS

Parameter	Value			
Equipment	VFD cabinets	soft starter cabinets	VFD in a modular building	soft starter in a modular building
Voltage, kV	0.23-0.69	0.23-0.69	2.3-13.8	2.3-13.8
Power range, kW	0.12-2900	1.5-1200	250-72000	250-72000
Start mode	- soft - quick (kick) - direct-on-line (bypass)	- soft (150-700% In) - quick (kick) - direct-on-line (bypass)	- soft start by under-frequency relay - synchronous (bypass)	- soft (150-700% In) - quick (kick) - direct-on-line (bypass)
Motor control method	- direct torque control - u/f control - vector control	low voltage	- direct torque control - u/f control - vector control	low voltage
Starting torque, %	up to 220	150	up to 220	150
Type of control	local/remote, PID controller			
Supported protocols	Modbus RTU / TCP, Profibus DP, DeviceNet, CANopen			
IP rating	up to IP54			
Cooling type	forced air	- natural air - forced	forced liquid	- natural air - forced

AUTOMATED MONITORING AND DIAGNOSTIC SYSTEMS

>>> www.electronmash.ru

AUTOMATED MONITORING AND DIAGNOSTIC SYSTEMS, IEC 61850 SUPPORT

Automated Monitoring and Diagnostic System is an innovative solution to provide the operation and maintenance offices with complete and timely information on the technical conditions of power supply equipment.

The current trends require predictive maintenance methods to be implemented for electrical equipment.

In view of these trends, ELECTRONMASH JSC equips the entire range of its manufactured equipment with built-in Monitoring and Diagnostic Systems capable of seamless integration into Adaptive Distribution Management Systems (ADMS) with support of functionality for Workforce Management (WFM) and Supervisory Control and Data Acquisition (SCADA) systems.

The software and hardware complex for the monitoring, control and diagnostic system includes a visualization panel, a controller with an integrated web server and field level intelligent digital devices.

The IEC 61850-8-1 (GOOSE) digital interfaces are used to exchange commands and signals between intelligent digital devices, while data link with the upper-level system is carried out via IEC 61850 (MMS).

The monitoring system is accessible from the local visualization panel on the cabinet fronts and from SCADA with no need for major engineering.

For the security purposes, access to viewing, management and settings of the monitoring and control system is differentiated using a password system.

The Monitoring and Diagnostic System functionality is demanded by industrial power equipment.

The Monitoring and Diagnostic System platform solutions, its scalability with well-developed libraries applicable to any equipment, and information security technologies are the key development targets given the new power supply trends.

SAFETY

- Preventing human errors
- Predicting pre-emergency conditions and developing faults
- Ensuring safe operation of electrical equipment
- Informing on a need for maintenance/repair

ENERGY EFFICIENCY

- Monitoring of power supply and electrical equipment
- Energy efficiency analysis

ECONOMIC BENEFITS

- Reduction in operation costs (manpower optimization)
- Reduction in equipment maintenance and operation costs (OPEX)
- Reduction in capital costs (CAPEX)

EASY OPERATION

- Flexible modification of automation algorithms
- Personnel access to all relevant manufacturer's documents (operating manuals, test reports, technical passport, etc.)
- SMS/e-mail warning and emergency alerts

MONITORING AND CONTROL

- Monitoring and control of actual conditions of switching devices
- Load redistribution by reconfiguring the electric distribution network
- Monitoring of digital messaging (GOOSE) referenced to unified exact time
- Collection and transmission of equipment technical condition data to the predictive maintenance system
- Archiving of event/alarm/service logs

ASSOL LV SWITCHGEAR WITH AN MONITORING AND DIAGNOSTIC SYSTEM LOCAL VISUALIZATION PANEL

MONITORING AND DIAGNOSTIC SYSTEM DISPLAYS

POWER SUPPLY AUTOMATION

>>> www.electronmash.ru

COMPLETE PROPOSAL FOR SUPPLY AND IMPLEMENTATION OF AUTOMATION SYSTEMS

ELECTRONMASH JSC offers its Customers a number of integrated innovative solutions for effective automation at different scales, from separate cabinets to substations and power systems.

Our company provides all types of services in all project stages, from drawing initial sketches to testing as integrated into an higher-level system.

The operating performance at each Monitoring and Diagnostic System hierarchy level is tested in the process of manufacturing.

The system quality and guaranteed performance are verified by testing all its components and the entire Monitoring and Diagnostic System, which is carried out as incorporated into a finished product.

The Monitoring and Diagnostic System systems for our Customers are developed on the basis of proven prototype solutions correlated with each specific type of major equipment, layout option and the range of hardware used.

The engineering solutions are based on the application of state-of-art data transmission technologies, IEC protocols and digital networks using either fiber-optic or conventional twisted-pair communication lines.

ELECTRONMASH develops and implements at a Customer's site, high-level engineering solutions resting on various element bases that may differ in structure and complexity.

We provide full management of an automation project from technical assignment to commissioning of the facility.

CADEL CAD

>>> FOR DETAILS AND FREE DOWNLOAD, SEE WWW.CADEL.RU

CADEL COMPUTER-AIDED DESIGN SYSTEM

Helps designers through automated determination of the design parameters for LV/MV Switchgears and DC Systems.

The software can be downloaded for free from either the Electronmash JSC website or the CadEL website.

We regularly update the software and add new prototype design diagrams to the base.

CADEL SAVES MONEY

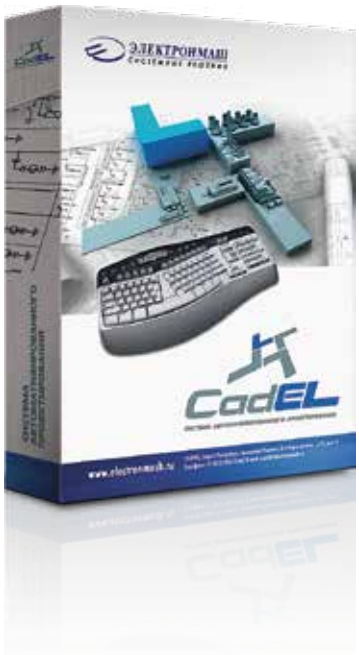
- Calculation of budget equipment cost
- Selection of laydown solutions and components used to optimize the product price

CADEL SAVES TIME

- Automated generation of data sheets, single line diagrams, and general arrangement drawings in AutoCAD
- Generation of a secondary diagram package with a parts list at request

CADEL PREVENTS ERRORS

- Availability of 2000+ ready-made design solutions
- Use of components of leading manufacturers
- Check for errors and discontinued components



ENERGY STORAGE SYSTEMS

>>> www.electronmash.ru

EL Storage
ENERGY
STORAGE
SYSTEMS

EL Storage System is an effective solution to ensure uninterrupted power supply to production electrical consumers, as well as to compensate for voltage dips and regulate the power factor.

ELECTRONMASH currently offers a range of Energy Storage Systems:

- **EL Storage Industry:** for production facilities
- **EL Storage Hybrid:** hybrid units operating together with distribution generation
- **EL Storage Home:** SOLO and TRIO capacity-scalable series of Energy Storage Systems

EL Storage Industry and EL Storage Hybrid systems are designed for production and power network facilities.

They compensate for voltage dips caused by group starts of electric motors or remote short circuits, cover peak power consumption without overloading the transformers, can operate in STATCOM mode, and ensure power supply in case of emergency, which guarantees the high quality and uninterrupted supply of electric power at a Customer's power facility.

EL Storage is an up-to-date intelligent solution to ensure high energy efficiency and cost efficiency performance at power facilities.

ELSTORAGE ENERGY STORAGE SYSTEMS INDUSTRY

ELSTORAGE AUTONOMOUS HYBRID POWER SYSTEMS HYBRID

SAFETY

- Uninterrupted power supply
- Stabilized process load during mains faults
- Redundant power supply for essential process loads

ENERGY EFFICIENCY

- Efficiency ratio >98.6%
- Harmonic distortion <3%
- Active power adjustment over the entire range (0-100)

ECONOMIC BENEFITS

- Saving on power consumption due to reduced load peaks
- Saving on power consumption due to use of stored power at low tariffs
- Reduction in diesel generator fuel consumption (up to 50%) and maintenance costs
- Improvement of power generator unit service life

EASY OPERATION

- High prefabrication
- Easy access to cable connection points
- Equipment maintenance only inside the Energy Storage System
- Flexible adjustment of Energy Storage System modes and sequences
- Automatic switching between Energy Storage System modes

MONITORING AND CONTROL

- Remote control of operating modes and monitoring of all equipment of the Energy Storage System
- Programmable charging and discharging of the Energy Storage System dependent on timeand electricity tariffs
- Control of active-reactive power ratio

TECHNICAL SPECIFICATIONS

Parameter	Value	
Mains voltage, kV	0.4; 0.69	6; 10
Mains supply power, kW	50; 100; 150; 250; 500; 630	500; 1000; 1500; n x 2125
SB capacity, kW-h	50-4000	1000 – n x 4000
Inverter efficiency ratio	≥98.6%	
Power factor control range	–1 to +1	
Design versions	– indoor – containerized scalable	
Connection of diesel generator or solar panels	yes	
Climatic version	N1; NF1	

ENERGY STORAGE SYSTEMS

>>> www.electronmash.ru

EL Storage
ENERGY
STORAGE
SYSTEMS

residential energy storage systems

EL Storage Home is a scalable residential energy storage system for a country house or a business application that maintains a comfortable atmosphere in a home or efficient working environment in operating facilities or an office when other power sources are unavailable.

ELECTRONMASH JSC produces:

- **EL Storage Home:** SOLO and TRIO capacity-scalable series of Energy Storage Systems.

These systems implement the concept of power supply independence from various types of energy sources.

The mains, sun, battery, or generator are utilized at 100% and work in synergy.

Due to its technical specifications, EL Storage Home is suitable for supplying electricity to private houses, cottages, and summer houses, as well as shops, car services, or small hotels.

ELSTORAGE
RESIDENTIAL ENERGY STORAGE SYSTEMS
HOME

SAFETY

- Lockable door
- Protection from contact with live parts
- Safe batteries for domestic use
- Fire Safety Certificate
- Remote monitoring and control

ENERGY EFFICIENCY

- Reduced power consumption from mains
- Battery discharge efficiency >97%

ECONOMIC BENEFITS

- Saving on power consumption due to reduced load peaks
- Saving on power consumption due to use of stored power at low tariffs
- Reduction in generator fuel consumption (up to 50%) and maintenance costs
- Improvement of generator service life

EASY OPERATION

- Compatibility with generator and solar panels
- Optimum generator operating conditions
- Occupies less than 1 m^2 and is easily scalable
- Integrable into a Smart Home system

MONITORING AND CONTROL

- Monitoring and control from anywhere in the world
- Monitoring of mains power
- Automatic control of generator

TECHNICAL SPECIFICATIONS

Parameter	Value	
Rated power, kW	5; 10	15
Mains voltage, V	220	380
Storage capacity, kWh	up to 45	up to 60
Battery discharge efficiency, %	97	
Overload capacity	100%, 2 s	
Number of battery cycles at DOD 80%	>6000	
Solar panel power, kW	up to 15	
Generator input	yes	

SOLUTIONS FOR SOLAR POWER PLANTS

>>> www.electronmash.ru

PV BOX

PV Box is an effective solution for electric power conversion from large solar panel arrays.

ELECTRONMASH JSC offers its Customers proven and reliable solutions for receiving electric power from solar panel assemblies and transmitting it with high quality to power system.

Our company provides a full cycle of services in solar power projects adapted to the Customer's individual requirements and to applicable Russian Federation codes and regulations:

- Development of design and layout solutions for solar power plants LV and HV sides
- Development of design solutions for solar power plants automation
- Development of detailed design documentation
- Manufacture of PV Boxes, MV distribution stations, and control stations for solar power plants
- Installation supervision and commissioning onsite
- Equipment management in service during the post-warranty service period

The renewable energy projects implemented by ELECTRONMASH demonstrate the optimized technical, economic and time performances, which ensure fast return on investment for our Customers.

SAFETY

- Electromagnetic and mechanical interlocking
- Gas flue ducts from the inverter ventilation system
- Remote operation, monitoring and control

ENERGY EFFICIENCY

- Efficiency ratio >98.7%
- MPPT efficiency >99.9%
- Reactive power control

ECONOMIC BENEFITS

- Reduced losses improve the payback period
- Wide input voltage range ensures a long inverter life

EASY OPERATION

- Automatic mode switching (Normal, Standby, Night)
- The inverter maintains the generation-to-network mode with power factor of –0.9 to +0.9

MONITORING AND CONTROL

- Remote control of operating modes for all PV Box equipment
- Remote switching on/off of inverter units
- Adjustment of output power
- Control of active-reactive power ratio

TECHNICAL SPECIFICATIONS

Parameter	Value	
Maximum output DC voltage, V	1000	1500
Inverter rated power, kW	1500; 2250; 3000	2500; 3000; 4500; 5000
Power transformer capacity, kVA	1600; 2500; 3200	2800; 3200; 5000
Mains power supply voltage, kV	6; 10; 35*	
MPPT accuracy, %	>98.93	
Maximum inverter efficiency ratio, %	>98.7	
Invertor standby power (night time), W**	<10	<50; <200
Power factor PV Box	–0.9 to +0.9	–0.9 to +0.9 0 to 1
Climatic version	N1; NF1	

*Nonstandard PV Box versions, in terms of installed mains power and voltage, can be manufactured.
**Depends on inverter manufacturer.

REFERENCE-LIST

Year	Customer. Project	Equipment supplied
2019	**Siemens Gamesa Renewable Energy**	• *Wind turbine converters*
2019	**Lambery cottage complex**	• *El Storage Home 5 kW, 10 kWh*
2019	**Schneider Electric GmbH (Germany).** Nord Stream 2	• *ELM BPS 2x500/10/0.4 kV*
2019	**Kovdorskiy Mining and Processing Plant**	• *ExOnSys DC System S-series (ExOn DC cabinet) 50 Ah*
2019	**Tominskiy Mining and Processing Plant.** Transformer Substation 35/10 Mednaya	• *Eltema MVS 10 kV* • *ELM PS 2x1000/10/0.4 kV* • *ELM PS 2x2000/10/0.4 kV* • *ELM PS 2x3200/10/0.69 kV* • *ELM PS 2x2500/10/0.4 kV*
2019	**Gazprom Invest LLC.**Gryazovetskaya Compressor Station	• *ExOnSys DC System XL-series 1500 Ah*
2019	**Far-Eastern Grids Company.** Leninsk Substation	• *Eltema+ MVS 35 kV*
2019	**IDGC of North-West.** Potok Substation	• *ExOnSys DC System M-series 80 Ah*
2019	**International Paper.** Svetogorsk Pulp-and-Paper-Mill	• *Assol LVS 800 A*
2019	**Yamal LNG**	• *ELM PS 2x2500/6/0.4 kV*
2019	**Bashkir Soda Company**	• *Assol LVS 630 A*
2019	**Akron**	• *ELM PS 2x630/6/0.4 kV* • *ELM PS 2x2500/6/0.4 kV* • *Eltema MVS 6 kV*
2018	**YarGeo**	• *ELM BPS 2x630/6/0.4 kV*
2018	**Angarskaya Petrochemical Company**	• *Assol LVS 400 A*
2018	**SalekhardEnergo**	• *Assol LVS 160 A, 400 A, 800 A, 1000 A, 1600 A* • *Soft starter cabinets: 37 kW, 47 kW, 48 kW, 55 kW, 110 kW*
2018	**TymenNefteGas**	• *ELM BPS 35-5H/10-2x16000*
2018	**Lukoil-Perm.** Aptugai Substation 35/6 kV	• *ELM BPS 35-5H/6-2x4000*
2018	**Suzun (ROSNEFT Oil Company Group)**	• *ELM BPS 35-5H/6-2x4000*
2018	**Gazpromneft-Moscow Refinery**	• *Dry-type transformer with cast insulation 1600 kVA* • *Assol LVS 250 A, 3200 A*

Year	Customer. Project	Equipment supplied
2018	**EuroChem VolgaKaliy.** Gremyachenskiy Mining and Processing Plant	• *ELM BPS 400/10/0.4 kV*
2018	**Apatit**	• *Eltema MVS 6 kV* • *ExOnSys DC System S-series (ExOn DC cabinet) 100 Ah, 200 Ah*
2018	**BashkirEnergo.** Blagoveschensk Substation	• *Eltema MVS 6 kV*
2018	**CryogenMash**	• *Eltema MVS 10 kV* • *Assol LVS 63 A* • *Power Factor Correction Unit* • *Rectifier charger Suppressor Cabinet* • *UPS Cabinet 20 kVA* • *ExOnSys DC System S-series (ExOn DC cabinet) 100 Ah*
2018	**KuibyshevAzot**	• *Eltema MVS 6 kV*
2018	**Avelar Solar Technology.** Funtovskaya, Akhtubinskaya, and Novouzenskaya PV Power Plants	• *PV Box 3200 kVA*
2018	**MAZDA SOLLERS Manufacturing Rus**	• *Eltema MVS 6 kV* • *Assol LVS 3200 A* • *Automated Control System Cabinet*
2018	**Mondi Syktyvkar Forest Industry Complex**	• *ELM BPS 2x2500/10/0.4 kV* • *ELM BPS 4x2500/10/0.4 kV* • *Distribution Centre 0.4 kV* • *Eltema MVS 10 kV* • *Assol LVS 400 A, 500 A, 1000 A, 1600 A* • *ExOnSys DC System S-series (ExOn DC cabinet) 40 Ah*
2018	**Norilsk Nickel Metals and Mining Company**	• *ExOnSys DC System S-series (ExOn DC cabinet) 180 Ah, 155 Ah*
2018	**Gazprom Invest LLC.** Ukhta-Torzhok Gas Trunk-Line System. Train II (Yamal)	• *ELM PS 2x1250/10/0.4 kV* • *ELM PS 2x1600/10/0.4 kV*
2018	**Siberian Coal Energy Company – Kuzbass.** Sychyovskaya Substation 35/6 kV; Magistralnaya Substation 110/35/6 kV; Sokolovskaya Substation 220/110/35 kV	• *Eltema MVS 6 kV* • *Eltema+ MVS 35 kV*
2018	**Mikheyevskiy Mining and Processing Plant**	• *Dry-type transformer with cast insulation 3,200 kVA* • *Indoor Switchgear 10 kV with Eltema MVS* • *Eltema MVS 10 kV* • *Assol LVS 3200 A, 5000 A* • *ExOnSys DC System S-series (ExOn DC cabinet) 75 Ah*
2018	**Novolipetsk Metallurgical Production Complex**	• *ExOnSys DC System S-series (ExOn DC cabinet) 14 Ah* • *Eltema Pro MVS 10 kV*
2018	**SIBUR Tobolsk**	• *ELM BPS 2x630/10/0.4 kV* • *Assol LVS 25 A, 100 A, 160 A, 250 A*
2018	**SIBUR TyumenGas**	• *Assol LVS 250 A*
2018	**Novokuibyshevsk Refinery**	• *Eltema MVS 6 kV*
2017	**OrskNefteOrgSintez**	• *ExOnSys DC System S-series (ExOn DC cabinet) 105 Ah*
2017	**ROSPAN International (ROSNEFT Oil Company Group)**	• *ELM BPS 2x25000/35/10 kV*
2017	**PhosAgro-Cherepovets**	• *Eltema MVS 6 kV*
2017	**Fortum.** Ulyanovskaya wind power plant 35 MW	• *ELM BPS 3200-35/0.69 kV*
2017	**ROSNEFT Oil Company.** Savelyevskaya Substation 110/35/10 kV	• *Substation Control Room 110 kV*
2017	**ROSNEFT-Komsomolsk Refinery**	• *Eltema MVS 6 kV*
2017	**ZapSibNeftekhim**	• *Assol LVS 40 A, 63 A, 100 A, 250 A, 630 A, 1000 A, 1600 A* • *Eltema MVS 10 kV* • *ExOnSys DC System S-series (ExOn DC cabinet) 62 Ah, 100 Ah* • *Soft starter 10 kW MVC-4* • *Dry-type transformer with cast insulation 800 kVA* • *ELM BPS 2x40/0.69/0.4 kV* • *ELM PS 2x250/0.69/0.4 kV* • *ELM BPS 2x630/10/0.4 kV* • *ELM PS 2x1600/10/0 69 kV*

Full version of reference list can be found on www.electronmash.ru

PARTNERSHIP

>>> www.electronmash.ru

BENEFITS OF COOPERATION WITH ELECTRONMASH

LONG HISTORY, RESPONSIBILITY FOR OUR PRODUCTS, AND FINANCIAL STABILITY

COMPREHENSIVE APPROACH THAT ENSURES THE COMPLETION OF COMPLEX TURNKEY CONSTRUCTION INVESTMENT PROJECTS

STRICT CONTROL OF PRODUCT QUALITY (ISO 9000)

since 2008

ELECTRONMASH JSC has been implementing a program for establishment of its network of regional offices in the Russian Federation

HIGH ENGINEERING EXPERTISE OF OUR EMPLOYEES

OPTIMAL TIME AND COST OF EQUIPMENT PRODUCTION AND DELIVERY

INDIVIDUAL APPROACH TO EVERY CUSTOMER

A STEP AHEAD

It is important for our company to provide our Customers with high-quality electrical equipment and prompt technical support in all regions.

We invest in the development of the network of regional offices and open service centres and customer support centres on the basis of the regional offices in the Russian Federation.

Presently, our offices successfully operate in **Moscow, Yekaterinburg, Ufa, Chelyabinsk, Novosibirsk, Irkutsk and Khabarovsk.**

- **WE MAINTAIN** PROFESSIONAL CONTACTS WITH COMPETENCE CENTRES IN DIFFERENT INDUSTRIES
- **WE PROVIDE** NEW INTEGRATED SYSTEMS AND TECHNOLOGIES
- **WE OFFER** OUR CUSTOMERS INNOVATIVE IDEAS AND SOLUTIONS
- **WE COLLECT** AND ANALYZE THE FEEDBACKS ON OUR PRODUCTS AND SERVICES
- **WE INVEST** IN PRODUCTION, TECHNOLOGIES AND HUMAN RESOURCES

THE QUALITY MANAGEMENT SYSTEM OF ELECTRONMASH IS CERTIFIED TO ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007

LICENSES

- License to design equipment for nuclear objects
- License to manufacture equipment for nuclear objects

CERTIFICATES OF ADMISSION

- Certificate of admission to a particular type or types of works that have an impact on the safety of capital construction objects (construction work)
- Certificate of admission to a particular type or types of works that have an impact on the safety of capital construction objects (design and engineering)

CERTIFICATES OF PRODUCT COMPLIANCE WITH INDUSTRIAL SAFETY REGULATIONS

- ELM Prefabricated Substation up to 6300 kVA up to 35 kV
- Eltema MVS rated for 6 (10) kV and up to 4000 A
- Eltema+ MVS rated for 35 kV and up to 2500 A
- ELM Block-type Prefabricated Substation 25-4000 kVA 10 (6) kV

CERTIFICATES AND GOST R DECLARATIONS OF CONFORMITY

Declarations

- ELM Prefabricated Substation up to (inclusive) 6300 kVA up to (inclusive) 35 kV
- ELM Block-type Prefabricated Substation 25-4000 kVA 6 (10) kV
- ELM Modular Prefabricated Substation, capacity from (exclusive) 6.3 kVA to (inclusive) 25 MVA, voltage up to (inclusive) 35 kV
- ELM Block-type Prefabricated Substation 35-110 kV
- Eltema+ MVS rated for 35 kV and up to 2500 A and short circuit breaking current up to 31.5 kA
- Eltema MVS rated for 6 (10) kV and up to 4000 A and short-time withstand current up to 50 kA
- T3R Dry-type Power Transformer (including TS3R, TD3R, and TU3R modifications) up to (inclusive) 25 kVA up to (inclusive) 35 kV

Conformity certificates of Custom Union

- ExOn DC Cabinet
- ExOnSys DC System
- ExOnChar Rectifier Charger
- Assol LV Switchgear

INDUSTRY-SPECIFIC CERTIFICATION

- ROSNEFT Oil Company Accreditation
- Entry into the TRANSNEFT Register of Basic Products
- ROSSETI PJSC Attestation Committee Decision Eltema MV Switchgear and Eltema+ MV Switchgear

The full list of ELECTRONMASH's certificates and licenses can be found on the website: www.electronmash.ru

Head office:
3rd Verkhniy per., 12, lit. A,
Parnas, St. Petersburg, 194292, Russia
Phone/Fax: +7 (812) 702-12-62
E-mail: elm@electronmash.ru

www.electronmash.ru