Power supply technologies: SELAM Low-voltage switchgears

Engineering

SELAM

SE Group Int. Technology

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ABOUT US

- Ukrainian engineering company represented on the world market
- SIEMENS Certified Partner in Solution Partner status
- EPC contractor in the field of automation and power supply of industrial enterprises
- Over 15 years of work, more than 600 complex projects have been implemented in various industries
- Performs work in the areas of electric drive control, technical safety and telecommunication systems
- The company has more than 210 employees
- The only licensee of SIEMENS in Ukraine in the status of Technology Partner
- The company is a member of the German-Ukrainian Chamber of Industry and Commerce (AHK)

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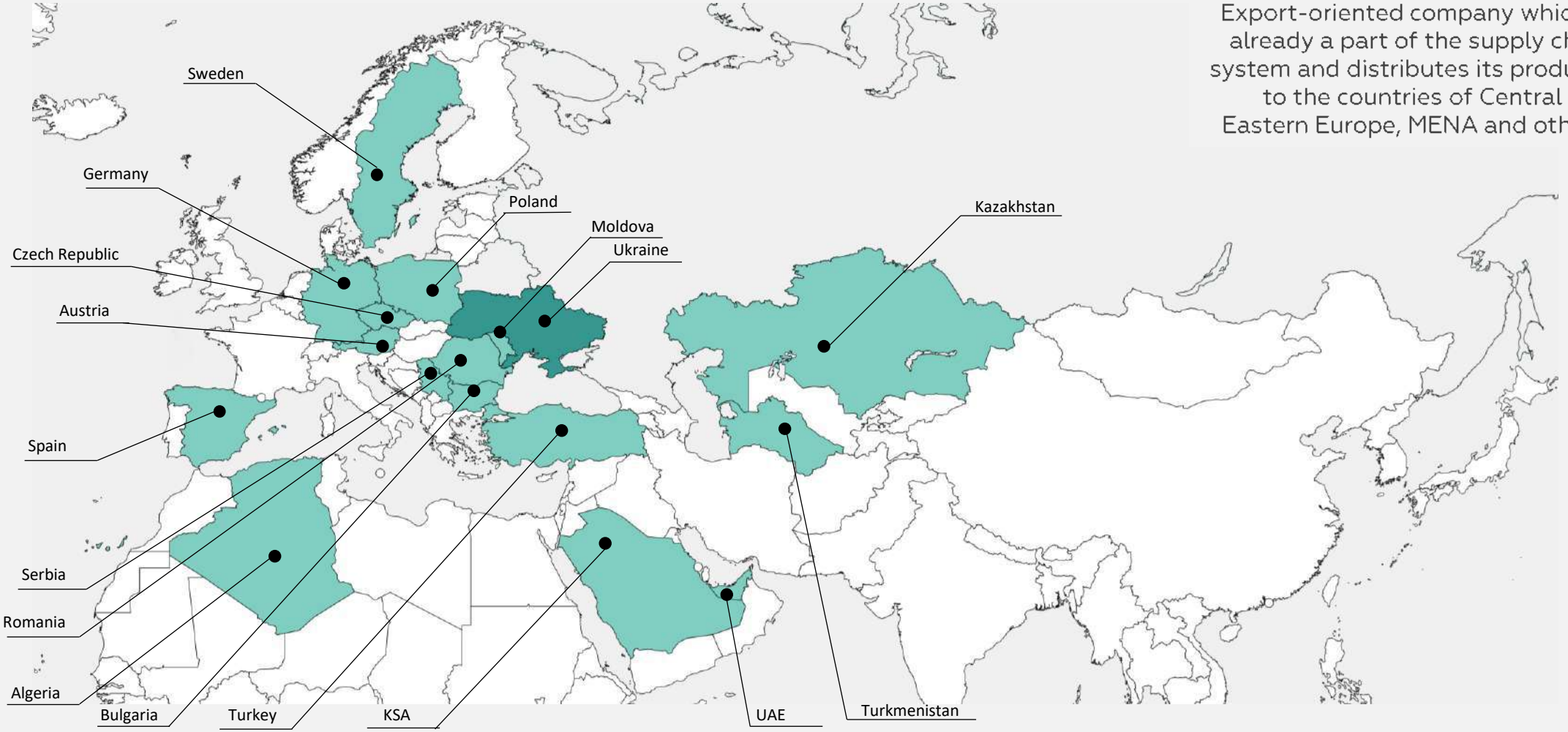
GEOGRAPHY OF IMPLEMENTED PROJECTS



Export-oriented company which is already a part of the supply chain system and distributes its products to the countries of Central and Eastern Europe, MENA and others.

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ACTIVITIES

- Automated control systems for technological processes
- Electric drive systems
- Power supply systems up to 110 kV
- Technical security systems and telecommunication systems
- Service maintenance
- Consulting services
- Outsourcing

Complex projects of any scope and difficulty:

- Development of design documentation
- Software development
- Testing and quality control by an electrical laboratory
- Purchase and delivery of equipment to the customer
- Installation of equipment
- Commissioning works
- Commissioning and training of customer's personnel
- Service maintenance

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OUR SOLUTIONS

Automated control systems for technological processes

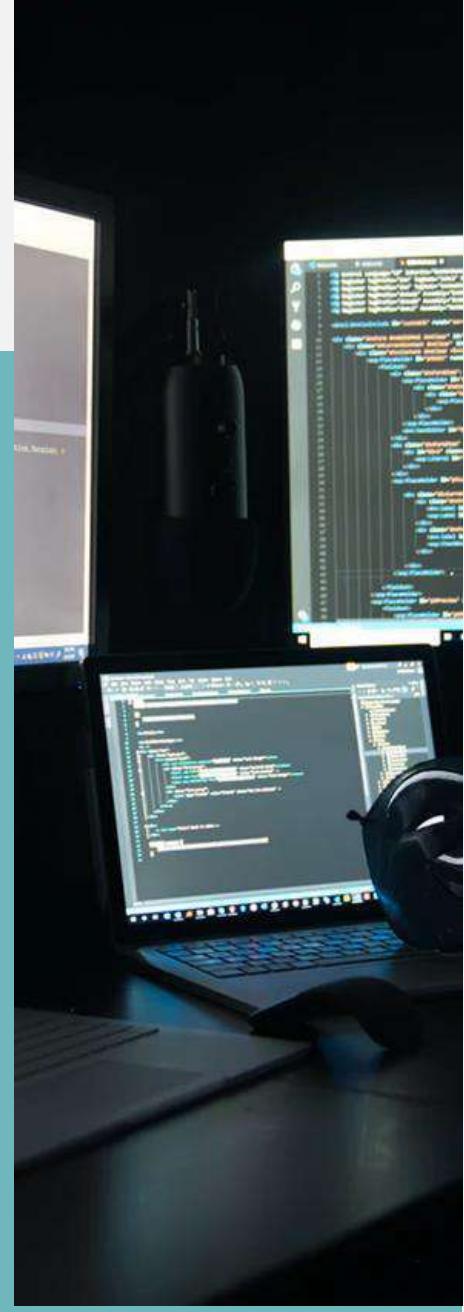
- Field device level (instrumentation and actuators)
- PLC level, AC and DC drives
- SCADA level of visualization and process control systems, standard control algorithms
- Expert systems level, non-standard control and regulation algorithms
- Analytical information systems level
- Control of AC and DC electric drives

Power supply systems

- Integrated power supply systems up to 110kV
- Modular and capital step-down / step-up substations 0.4kV - 150kV
- Manufacturing of complete switchgears:- voltage up to 1000V and for currents up to 7000A- voltage up to 6-17.5 kV and for currents up to 3600A
- Cable and overhead transmission lines 0.4 - 150kV
- Dispatching systems
- Power distribution and power management of electrical consumers
- Electrical heating of pipelines and tanks
- Indoor and outdoor lighting
- Grounding and lightning protection

Process safety systems

- Fire alarm
- Firefighting
- CCTV
- Evacuation alert
- Access control
- Telephony, information data transmission
- Structured cabling systems



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COMPETITIVE ADVANTAGES

Full production cycle

Maximum depth of added value formation

Localization of technologies from world leaders in the industry (franchises)

Formed production system of the company:

- well-established business processes of the enterprise
- multi-level training of employees
- high-tech equipment
- an implemented product quality control system, etc.

Compliance of products with international standards

Modern software:

- Wrike
- EPLAN
- AutoCAD
- Pipedrive
- SAP
- etc.

Own innovative solutions

Weighted pricing policy

The total area of the plant is 7500 sq. M.

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MANUFACTURING

Full production cycle:

- Cutting, bending and manufacturing of sheet metal parts;
- Mechanical processing of metal (turning and milling group and welding equipment);
- Cutting and manufacturing of copper and aluminum busbars;
- Manufacturing of steel structures;
- Assembly of switchboard equipment;
- Test lab.

Digital high precision CNC machines

High precision tools

Quality control at every stage

Advanced Processing technologies

LOW-VOLTAGE SELAM CABINETS

SELAM cabinets are manufactured in compliance with State Standards of Ukraine EN 61439-1 (ДСТУ IEC 60439-1:2003), ДСТУ EN 61439-2, ДСТУ EN 61439-6, harmonized with the relevant IEC EN standards

Low-voltage SELAM series cabinets include the following electrical systems components:

- main and secondary distribution swithboards;
- reactive power compensation devices;
- power control cabinets for technological electrical equipment (MCC);
- APCS cabinets;
- relay protection and automation cabinets.

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MAIN TECHNICAL CHARACTERISTICS OF LOW-VOLTAGE SELAM CABINETS

Rated operational AC voltage 50(60)Hz, V	**up to 690**
Rated operational DC voltage, V	**up to 1000**
Rated AC insulation voltage 50(60)Hz, V	**1000**
Rated DC insulation voltage, V	**1500**
Degree of internal separation	**up to 4b**
Rated current, A	**up to 4000**
Rated peak withstand rating (Ipk), kA	**143**
Rated short circuit withstand rating (Icw) (1sec), kA	**65**
Ingress Protection rating	**up to IP54**
Height (without base), mm	**2000, 2200**
Width, mm	**400...1200**
Depth (one row installation), mm	**600...800**
Operating Temperature	**-25... +40 °C**
Frame	**galvanized sheet steel**
Busbar system material	**copper, aluminium**

SELAM: MAIN ADVANTAGES

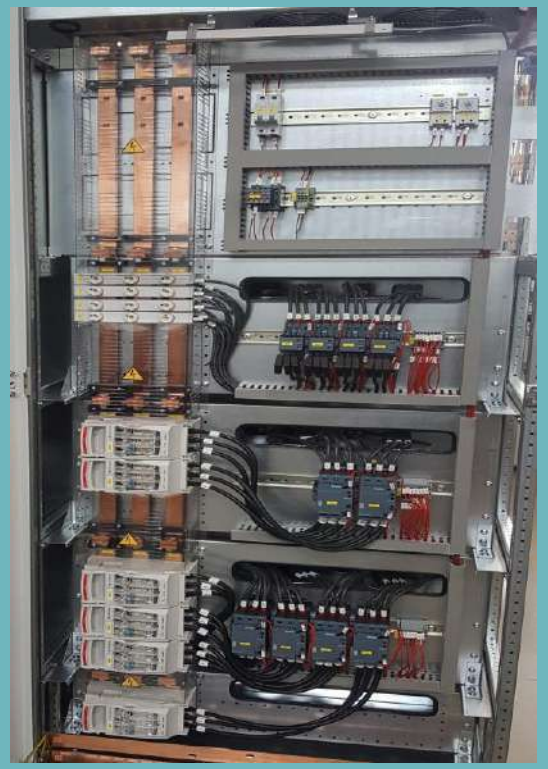
- High reliability, ease of maintenance and installation, maximum personnel safety
- Compactness and rational use of the installation area due to the universal dimensions of the sections, high installation density
- Different levels of design for arc, earthquake, shock and vibration resistance, depending on operating conditions and the environment
- Each "SELAM" unit is assembled from modules. Modular design allows the instllation to be flexibly adapted to changing technical requirements
- Adaptation to new operating conditions is carried out by replacing or introducing new modules
- Fast replacement and build-up of functional units
- High degree of internal separation (up to 4b)
- Possibility of using components from leading domestic and European manufacturers
- Freely configurable function blocks
- High degree of combination possibilities

SELAM: MAIN ADVANTAGES

- High reliability and quality
- Maximum personnel safety
- Ease of maintenance and installation
- Compact and high mounting density
- High degree of internal separation (up to 4b)
- Modular design
- Adaptation to new operating conditions is carried out by replacing or introducing new modules
- Fast replacement and extension of functional units
- Freely configurable function blocks
- High degree of combination possibilities

REACTIVE POWER COMPENSATION DEVICES

Reactive power compensation devices are designed to operate in three-phase low voltage electrical networks of industrial frequency. The use of modern control, management and protection devices ensures reliable and long-term operation of the unit.



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MAIN TECHNICAL CHARACTERISTICS OF SELAM COMPENSATION DEVICES

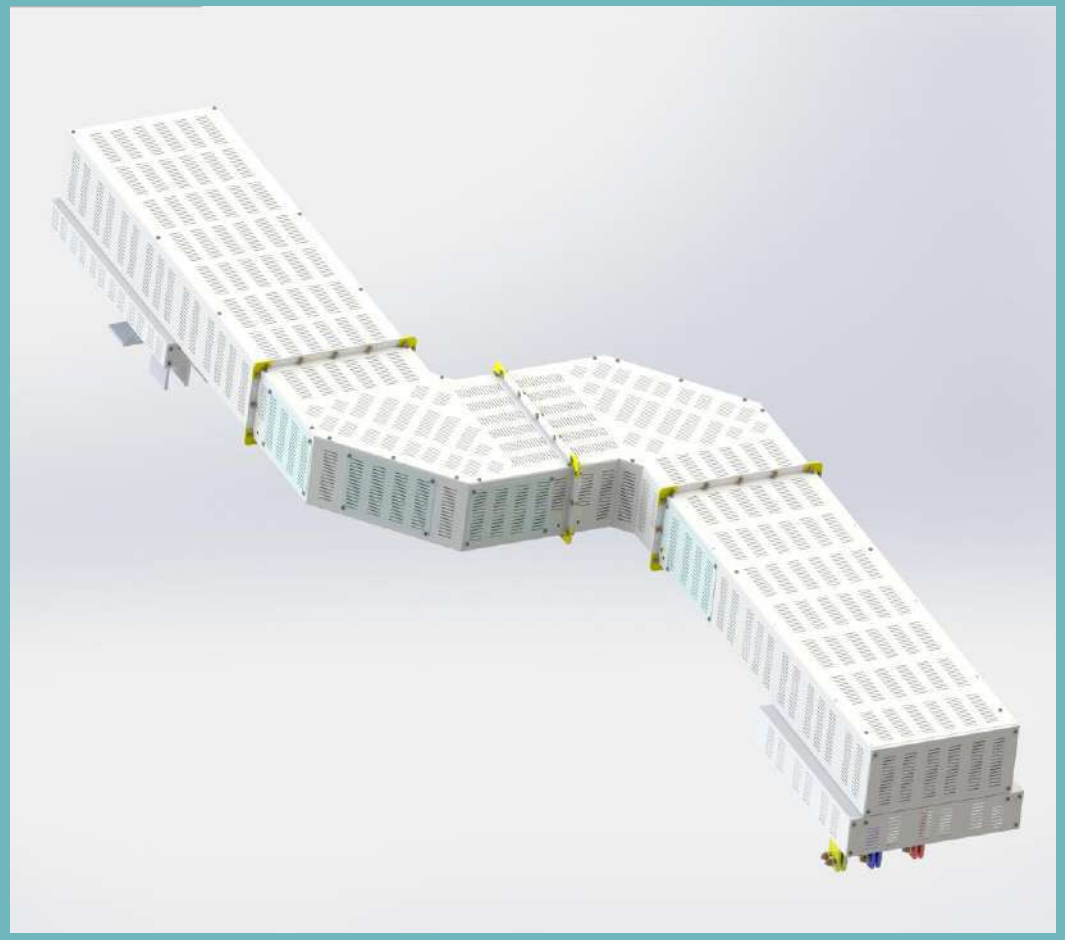
Nominal voltage, kV	**0,4 (other voltages on request)**
Mains frequency, Hz	**50**
Rated power per cabinet, kVAR	**2,5 – 600**
Number of control steps	**2-14 (16 – on request)**
Power per step module, kVAR	**2,5 - 200**
Auxiliary circuits rated voltage, V	**~ 220, ~ 110, =24**
Ingress Protection rating	**up to IP54**
Grounding system type	**TN-C, TN-C-S, TN-S**
Ambient temperature	**- 5 °C + 40 °C for У3**
Powder coated parts color	**RAL 7035, light grey (DIN 43656)**
Shell	**Powdered coating**
Doors	**Powdered coating**
Busbar system material	**copper, aluminium**
Mounting altitude above sea level	**Up to 1000 m**

LOW VOLTAGE BUS DUCTS UP TO 4000 A

MAIN TECHNICAL CHARACTERISTICS:

Rated operational AC voltage 50(60)Hz, V	**up to 1000**
Grounding system type:	**TN-C, TN-S**
Rated current, A	**up to 4000**
Rated peak thermal withstand current, Icw, kA	**up to 100**
Ingress Protection rating	**up to IP54**
Busbars material	**copper, aluminium**

MAIN ADVANTAGES OF SELAM BUS DUCTS



- High safety and reliability for personnel
- Configuration flexibility
- High resistance to electric arc, starting from IP21
- Busbar set is equipped with power modules with power switches
- Busbar set is equipped with fire barriers

RELAY PROTECTION AND EMERGENCY AUTOMATION CABINETS

Complete cabinets for relay protection and automation (RPA), emergency response automation kits for energy complex facilities - stations and substations of various voltage levels. Complete devices are manufactured on the basis of microprocessor devices from leading manufacturers: SIEMENS, ABB, GE, WOODWARD and include:

- main and backup protection cabinets for 110-500 kV lines;
- control cabinets for switches and disconnectors 220 kV and above;
- RPA cabinets for substation equipment 110 - 500 kV: transformers, autotransformers, tires, bus bars, etc.;
- relay protection and automation cabinets for generator-transformer units;
- emergency response automation kits according to the customer's requirements.

On the requirements of the customer, preliminary parameterization of microprocessor-based relay protection and automation devices can be carried out in production.

19″ IT TYPE CABINETS

IT type enclosure is an enclosed cabinet with unified racks of standard size 19″. The cabinets are made on the basis of a collapsible steel frame and are designed to create:

- telecommunication cabinets;
- server cabinets;
- routers, switches, hubs
- battery cabinets for uninterruptible power supply systems;
- other uses designed for mounting on a standard 19″ rack
- Non-standard 19″ cabinets are also available upon request.

It is possible to complete with additional accessories (19″ modules for modular equipment, stands for KVM, roof ventilators, etc.) produced by S-Engineering.

NP SERIES FLOOR MOUNTED ENCLOSURES

- NP cabinets are a series of universal electrical floor mounted enclosures designed for both indoor and outdoor installations. NP enclosures have a prefabricated frame structure and are made of high quality sheet steel.
- Non-painted parts of the structure are made of galvanized steel according to EN 10346 coated - ZN 275 with a density of 275 g/m2.
- NP series enclosures are supplied assembled by default (in kit form as an option)
- The basic package includes a mounting plate made of galvanized steel.
- The standard paint color is RAL 7035.

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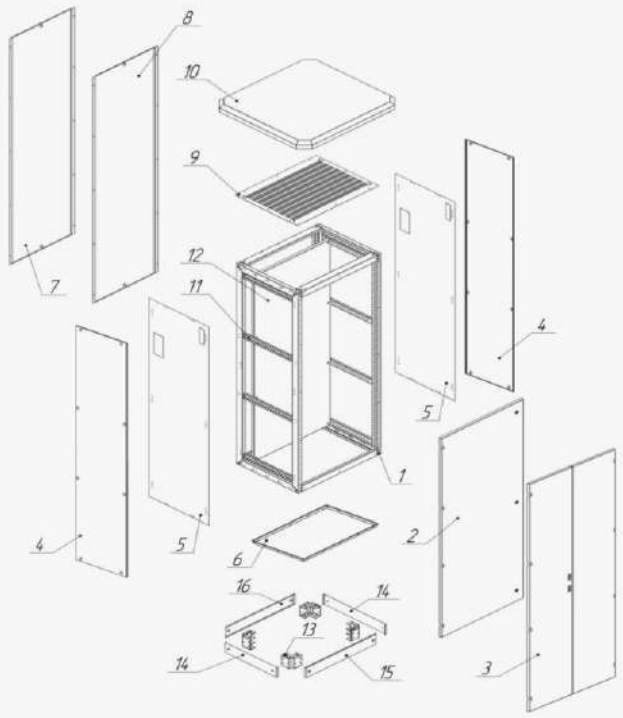
MAIN TECHNICAL CHARACTERISTICS OF NP SERIES ENCLOSURES

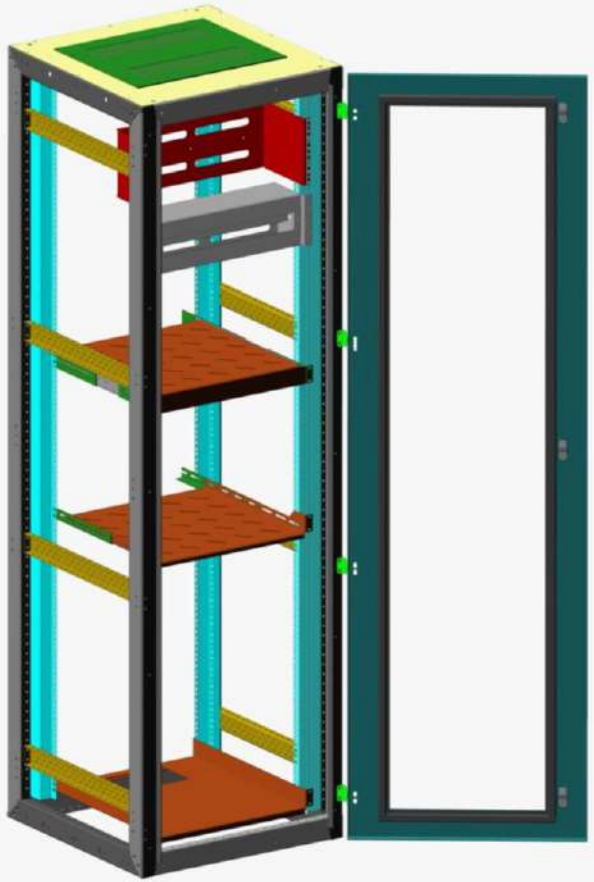
Ingress Protection rating	**Up to IP54**
Resistance to external mechanical impact	**IK10**
Door opening angle	**180°**
Connection options	**Top and bottom**
Frame and mounting plate	**2 mm thick galvanized sheet steel**
Door	**2 mm thick painted sheet steel**
Side walls	**1 mm thick painted sheet steel**
Top and bottom plates	**1,5 mm thick galvanized sheet steel**
Back wall	**1 mm thick galvanized sheet steel**
Color of painted parts	**RAL 7035, structured powder coating**
Door seal material (for IP54)	**ethylene-propylene triple copolymer**

NP ENCLOSURE COMPONENTS



1. Frame
2. Single door
3. Double door
4. Side wall
5. Interpanel partition
6. Bottom plate (galvanized steel)
7. Back wall (galvanized steel)
8. Back wall (RAL 7035)
9. Top plate
10. Roof for outdoor cabinets
11. Side channel
12. Mounting plate (galvanized steel)
13. Base leg
14. Base side wall
15. Base façade
16. Rear base wall (galvanized steel or RAL7035 available)

NP SERIES FLOOR MOUNTED ENCLOSURES



NP series enclosures are universal multi-purpose constructs and can be used for:

- distribution devices up to 1000 V;
- battery cabinets for uninterruptible power supply systems;
- automation and drive control cabinets;
- cabinets for low-voltage systems, etc.;
- 19-inch telecommunication, server cabinets.

NS SERIES WALL MOUNT ENCLOSURES

- NS series wall mount enclosures are made of sheet steel, are practical, efficient, with a wide range of sizes. The use of modern solutions and technologies allows the customer to combine the cabinet for the implementation of various individual tasks.
- The front part of the enclosure frame forms a protective chute that prevents water and dirt from penetrating into the cabinet.
- The cable entry plate is designed to install various types of cable entries.
- Protective grounding is provided between the frame and the door.
- The hinges of NS enclosure provide a door opening angle of at least 120°.
- Body and doors are made of 1.5 mm thick sheet steel. The mounting plate is 2 mm thick, and is made of galvanized sheet steel.
- Double bar lock (90° turn) included as standard.
- The degree of protection of the enclosure shell (according to National Standard 14254) is up to IP54. For outdoor installation, the frame is completed with a canopy.
- Color of powder coated parts (layer thickness 100 ± 25 μm) – finish: RAL 7035 (other colors available on request).
- Standard enclosures are produced with width of 300-1000mm, height of 300-1200mm, and depth of 150-400mm.

ACCESSORIES, VENTILATORS FOR CABINETS

	SM.VENT.80.230AC SM.VENT.80.115AC SM.VENT.80.24DC SM.VENT.125.XXX	SM.VENT.150.230AC SM.VENT.150.115AC SM.VENT.150.24DC SM.VENT.125.XXX	SM.VENT.250.230AC SM.VENT.250.115AC SM.VENT.250.24DC SM.VENT.250.XXX	SM.VENT.300.230AC SM.VENT.300.115AC SM.VENT.300.24DC SM.VENT.250.XXX
Nominal Voltage, V	**24VDC, 110VAC, 220VAC (XXX – filter without ventilator)**			
Airflow, m^3/hr	**80**	**150**	**250**	**300**
Dimensions, (LxW), mm	**125x125**	**125x125**	**250x250**	**250x250**
Protection rating, filter-side	**IP54**			

ACCESSORIES. LED LIGHTS FOR CABINETS

	SM.LED.10.24DC	SM.LED.10.220AC	SM.LED.5.110DC	SM.LED.10.110DC	SM.LED.10.220DC	SM.LED.5.110AC	SM.LED.10.110AC
Light source type	LED (Light-emitting diode SMD2835) P max=0,2W, Φmax=26Lm, RA=80, 6000-6500K)						
Nominal voltage, V	24VDC	220VAC	110VDC	110VDC	220VDC	110VAC	110VAC
Permissible voltage range, V	21÷26 VDC	(180÷255 VAC)/ (250÷365 VDC)	(65÷145V AC)/ (95÷205V DC)	(65÷145V AC)/ (95÷205V DC)	(120÷200V AC)/ (175÷285V DC)	(98÷175VAC)/ (140÷250V DC)	(98÷175VAC)/ (140÷250V DC)
LED quantity	70	84	28	57	57	43	84
Rated power, W	10	10	5	10	10	5	10
Light output, Lm	900±10%	1000±10%	500±10%	1000±10%	1000±10%	500±10%	1000±10%
Dimensions (LxHxw), mm	290x10x24	330x10x24	185x10x24	290x10x24	290x10x24	220x10x24	330x10x24
Protection rating	IP41, IP54 (on request)						
Power factor, cosφ	0,98						

It is possible to manufacture to order lamps with power, length and voltage different from those indicated in the table. It is also possible to use LEDs with other lighting characteristics.

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