Prefabricated substation buildings

KAMP

Technical information

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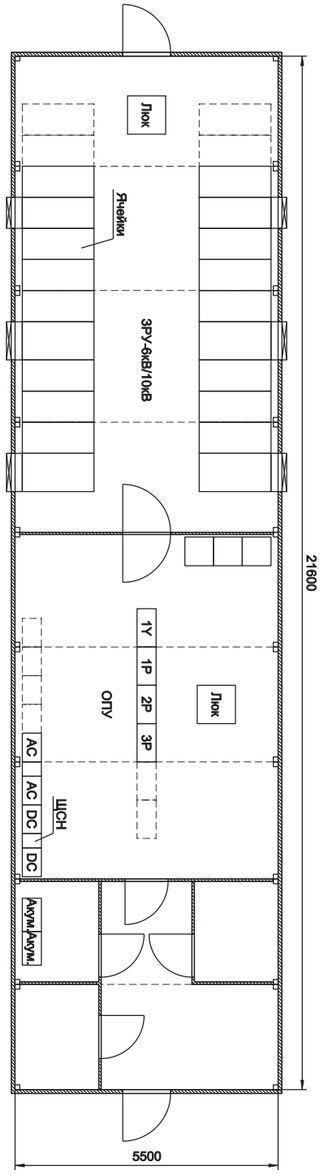
ELGA



MAIN CHARACTERISTICS

The KAMP substation building consists of modules that are preassembled at the factory to give shorter delivery, time and faster installation and commissioning on site, thereby saving both time and costs. Modularization also offers optimized space utilization and a wide variety of layouts that allows substation to be easily extended or relocated in the future.

The KAMP prefabricated substation building is a compact solution that meets all the most stringent requirements for modern switching substations.

The KAMP design is optimized for ELGA switchgears; all individual components therefore match perfectly with each other.

By using standard KAMP modules it is possible to create a wide variety of layouts, to meet all customer requirements for practical substation building. Modules are also available to offer flexibility in meeting special requirements.

In possible arcing situations hot gases and over pressure are directed outside the building via arc relief channels.

Raised access floor system placed in the building is very useful where frequent modifications of electrical, telecom or RTU/SCADA wiring is needed. Raised floor system has approriate heat and fire resistance.

As standard the walls are 60 mm (roof 80 mm) thick, insulated with polyurethane (rock wool on request) and covered on both sides with galvanized and painted profiled steel sheets.

External steel frame parts are hot dip galvanized (>80µm), which makes KAMP resistant to corrosion.

ADVANTAGES:

- Completely Commissioned
- Fast Production and Commissioning
- Less Civil Work
- Easy Extensibility
- Easy Relocation

APPLICATION

Prefabricated substation buildings are designed for indoor switchgear equipment, command and communication posts, 6-10-20-35 kV distribution centers and modular transformer substations.

SERVICE CONDITIONS

Prefabricated substation buildings must be operating under normal conditions in accordance with the LST EN 60721-3 standard; the ambient air temperature in range of -40C to +40C, atmospheric pressure in range of 84kPa to 106kPa, altitude up to 1000m.

Prefabricated substation buildings are not intended for exploitation in corrosive environments.

Prefabricated substation buildings have IP44 degree of protection against external mechanical impacts according to IEC 60529 standard. IP54 degree of protection is available by special order.

On-site erection and commissioning of prefabricated substation buildings and installation of indoor electrical equipment in it are performed in accordance with the design documentation of the object (the contract-order), technical documentation and the "Rules for the Installation of Electrical Units".

TECHNICAL DATA

Parameter		**Parameter values**
Overall dimensions	Width B, mm	3000, 3500, 4000, 4500, 5100, 5500, 6000
	Length L, mm	6000 (when width: 3000, 3500) 10000 (when width: 4000, 4500) according to project (when width: 5000, 5500, 6000)
	Height H, mm	3300 ÷ 4000
	Module width (recommended) Lm, mm	2000, 2400, 2600, 3000
Quantity of modules		depends on amount of electrical equipment to be installed
Approximate weight of the module without electrical equipment	3000 x 6000 mm	3600 kg
	3500 x 6000 mm	4200 kg
	4000 x 2400 mm	1500 kg
	4500 x 2400 mm	1700 kg
	5100 x 2600 mm	2000 kg
	5500 x 2600 mm	2200 kg
	6000 x 2600 mm	2400 kg
Approximate weight of the module with electrical equipment	3000 x 6000 mm	7700 kg
	3500 x 6000 mm	9000 kg
	4000 x 2400 mm	6700 kg
	4500 x 2400 mm	6900 kg
	5100 x 2600 mm	8500 kg
	5500 x 2600 mm	8750 kg
	6000 x 2600 mm	9000 kg

Note: UAB ELGA also can design buildings consisting of non-standard modules for the installation of non-standard electrical equipment.

CONSTRUCTION

Prefabricated substation buildings are assembled of standard modules and consist of one or more standard modules depending on the necessary number and area of the interior rooms to be created.

Framework and all supporting constructions of building are made of hot-rolled steel profiles, hot-rolled steel pipes and steel sheets. Supporting constructions of building are hot-dip galvanized (average coating - 70 µm), according to ISO 1461.

The walls of the building are covered with 80mm thick standardized sandwich panels (core material: rigid CFC-free fire-resistant polyurethane foam, surface material: galvanized and polyester lacquer painted steel sheets). The roof of the building is covered with 120/80mm thick standardized sandwich panels. The heat transfer coefficient of walls is no more than 0.3 W/m²K, roof - 0.25 W/m²K, doors (excluding door to the transformer room) - 0.5 W/m²K, floor - 0.4 W/m²K.

Wall and roof panels are fixed to framework with self-drilling screws.

Junctions between sandwich panels are sealed with silicone or sealing foam (makroflex) and additionally covered by tin strips. Tin strips are fixed to the exterior side of panels with self-drilling screws.

Ceiling of rooms, where electrical distribution equipment will be installed, consists of three layers:

- lower supporting layer: hot-dip galvanized 1,5 mm thick steel sheets,
- middle insulation layer: fire-proof thermal mineral wool blanket,
- upper floor layer: fire-resistant plates (laid over the surface of a steel framework base).

Under electrical distribution equipment the floor is not lied out and elastic plates of mineral wool is used for lower supporting layer.
When distribution center has separate room for power transformers, then the floor of such room is made of corrugated steel sheets with a thickness of not less than 3mm.

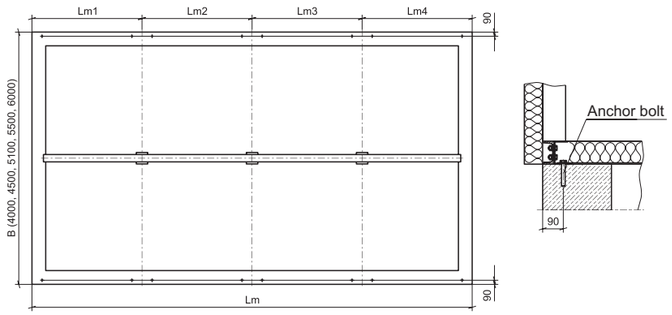
Door jamb and door leaf are made of special steel profiles (internal padding – 50mm thick multilayered plate). The doors of the building are usually open outward. Door locks, embedded in the doors, are self-locking. All doors from the outside can be opened with one key and from inside – without key. Doors have fully open position restrictors.

Lightning, heating, ventilation and electricity metering systems of the building are designed in accordance with standard or particular projects.

INSTALLATION

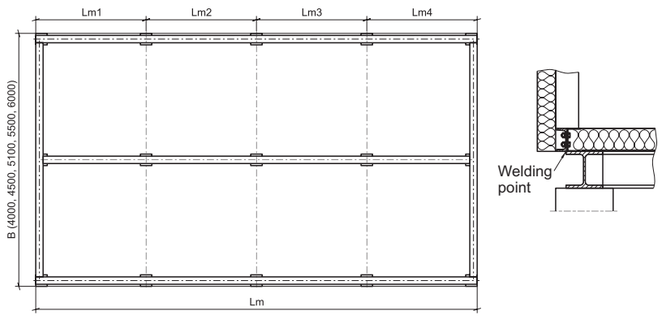
Usually prefabricated substation buildings are erected on concrete strip or pile and steel beam foundations.
Prefabricated substation building must be attached to concrete strip foundation using anchor bolts. The module is placed on the foundation and through the holes provided on the framework base of the module must be drilled holes for the anchor bolts in the foundation.
Prefabricated substation building must be welded to pile and steel beam foundation in specified points.

The scheme of anchoring the prefabricated substation building to the concrete strip foundation



Lm – Length of the building framework without wall panels

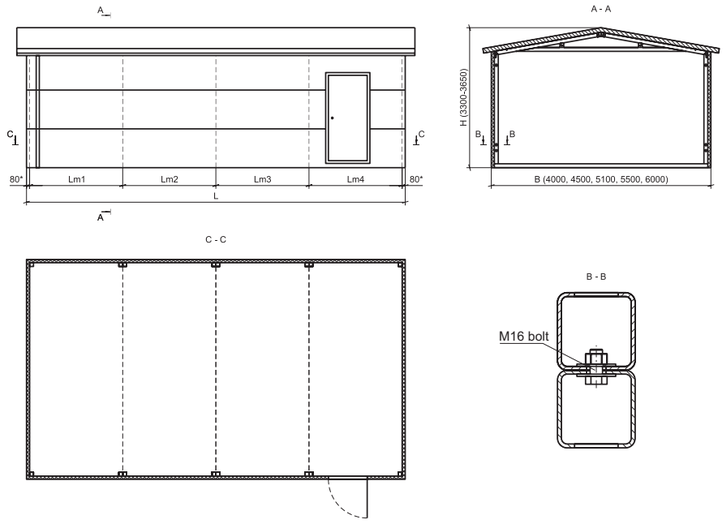
The scheme of welding the prefabricated substation building to the pile and steel beam foundation



Each corner of the module must be welded. Length of the welded seam should be 150mm. Sprayed zinc must be applied over the welded areas.

Lm – Length of the building framework (without wall panels)

The scheme of connecting modules together



Modules are joined together in 4 points by screws (section B-B).

ACCESSORIES AND OPTIONS

Prefabricated substation buildings and electrical distribution equipment installed in it are completed in accordance with technical specification of a particular order (contract and project).

Standard safety features:

- Arc relief channels
- Automatic DC emergency lighting
- Door alarm contacts
- Motion sensors for automatic switching of outdoor lights
- Separate doors for switchgear and control room
- All earthing connections inside building are connected to a common main earthing bar
- Safety signs for maintenance
- Ventilation system

Accessories:

- Electric heaters
- Lighting board
- Rack for MV Switchgear maintenance tools
- Fuse holders for MV fuses (if fuses included in delivery)
- Cabinet for fuses

Miscellaneous accessories:

- Fastening elements for connecting modules together
- Anchor bolts for fixing modules to the foundation
- Documents certifying the quality of the product (data sheet, the declaration of conformity of the product)
- Documentation of the installed electrical equipment
- Test reports of the internal wiring (lighting, heating, ventilation) of the building
- Technical documentation on installation and assembly
- The act of acceptance of the building
- User manual

Options:

- Toilet
- Separate battery room
- Infrared heaters (temporary heating)
- Special color on building
- Air conditioning
- Fire alarm system

PREFABRICATED SUBSTATION BUILDING ORDER FORM

Nr	Parameter	Parameter values (underline or write down required values)	Other requirements
1	Overall dimensions of the building		
2	Requirements in “Rules for the Installation of Electrical Units” for prefabricated substation buildings		
3	Degree of fire resistance		
4	Core material of wall and roof panels	fire-resistant polyurethane / mineral wool	
5	Color of wall and roof panels	walls - RAL 9006 roof - RAL 9006	
6	Heat transfer coefficient of roof and walls, Uo (W/m²K)	walls - no more than 0.3 roof - no more than 0.25	
7	Heat transfer coefficient of floor, Uo (W/m²K)	no more than 0.4	
8	Heat transfer coefficient of doors, Uo (W/m²K)	no more than 0.5	
9	Type of door handle and lock		
10	Requirements for lightning equipment		
11	Requirements for ventilation and conditioning equipment		
12	Fire alarm system	yes / no	
13	Foundation type	concrete strip / pile and steel beams	
14	Staircase landings	yes / no	
15	Stairs / staircase to cable basement	yes / no	
16	Water spillway system	yes / no	
17	Oil receiver capacity (for distribution centers and transformer substations)	20% of oil volume 100% of oil volume	

Prepared by: _____

(Title) (Name, Surname)