

# **ELGA** UAB

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# Metal-clad type switchgear USN 150 series

# **Technical information**



# CONTENTS

Main characteristics	. 3
Service conditions	. 5
Technical data	. 5
Diagrams of main circuits	. 6
Busbar compartment	. 9
Low voltage compartment	10
Cable compartment	. 11
Draw-out element compartment	. 13
Operating elements of cubicle	15
Cubicle design and equipment	. 16
Installation on the ground	. 20
Operating accessories	21
Interlock system	. 22
Option: arc protection system	. 23
Option: prefabricated substation building	. 25
Order blank	. 27



# MAIN CHARACTERISTICS

- breakers
- Type tested according IEC62271-200
  - Designed for high power regional substation switchgears
  - Make-type earthing switch
  - One-sided or two-sided maintenance
  - Operation of all switching devices with front door closed
  - Complete air insulation of all switchboard live parts
  - IP41 degree of protection on the external housing
  - up to 50kA/1s

# APPLICATION

Cubicles are used in indoor switchgears and distribution centers for 12 (17.5) kV (USN 150 series), 24 kV (USN 170 series) voltage 50/60 Hz frequency electrical power distribution, line overload and short circuit protection. Cubicles are equipped with vacuum or  $SF_{6}$  gas circuit breakers of various manufacturers. This document contains technical information about USN 150 series cubicles.

# ORDER NUMBER STRUCTURE

	U	S	Ν	-
Indoor				
Switchgear ————				
rated voltage, kV				
vacuum circuit breaker / function	onal unit	:		
EV – Evolis ("Schneider Electri	ic")			
HV – HVX ("Schneider Electric	;")			
HD – HD ("ABB")				
VD – VD4 ("ABB")				
AK - 3AK ("Siemens")				
SI – SION ("Siemens")				
GS – load break switch				
SS – section disconnector				
IT – voltage transformer				
SR – service transformer				
series number (100, 150 or 17)	0)			
dimensions (depth x width), cm	ייי ו ——			

• Construction of three high voltage compartments with draw-out circuit

• Constructed to withstand the overpressures caused by the internal arc

Mechanical outside door interlock ensures safe maintenance



# CUBICLE STRUCTURE

The torsionally rigid housings of the cubicles are made of 2.0...3.0 mm thickness galvanized steel sheets folded at the edges and bolted together.

With the selection of high quality materials, special surface treatment and powder painting, the conditions for high impact and corrosion resistance are fulfilled.

Special labyrinth construction of panel's side elements and doors ensure personnel safety against arc faults.

Switchboards can be fixed to the special foundation, using anchoring bolts above cable ducts.



### **PROTECTION AGAINST INTERNAL ARC**

Switchboards are designed in compliance with the prescription of the IEC602271-200 standard and ensure maximum personnel safety even under internal arc conditions.

In fact, the switchboards are constructed to withstand the overpressures caused by the internal arc and are fitted with ducts to guide the exhaust gases so that there is no damage to operators or to the rooms.

On request, the UAB "ELGA" switchboards are fitted with an optical arc protection system with sensors in the various compartments (see page 23 - "NOLA arc protection system").



# **TYPE TESTS**

Sophisticated tests are performed at accredited European power laboratories (IPH, CESI, IEL).

manufacture and	CONTRACTOR DESCRIPTION
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Internal arc test at 40kA/1s



Seismic test

# SERVICE CONDITIONS

Cubicles are designed for indoor use (on stationary premises or prefabricated substation buildings) and must be operating under normal conditions in accordance with the IEC 60694 standard. The lower limit of operating ambient air temperature shall be not less - 20° C. The upper limit of operating ambient air temperature shall not exceed + 40° C. Cubicles can be used up to an altitude of 1000m. Beyond that (altitude up to 3000 m) it's necessary to take into account of a decrease in the dielectric strength.

There must be no dust particles, fumes or smoke, corrosive or flammable gases, vapours or salts. Seismic resistance of cubicles is up to 7 on Richter scale and up to 9 on MSK scale (according to IEC 60068-3-3). When commissioning and operating the switchgear under normal conditions, the general electrical safety instructions, as well as operation handling instructions should be respected. The operational safety of the switchboard is dependent on professional installation and assembly, as well as appropriate handling and diligent servicing.

Failure to comply with the instructions contained in this operating manual can result in the guarantee becoming invalid.

### **TECHNICAL DATA**

Rated voltage, kV	10 (15)	20
Maximum operating voltage, kV	12 (17.5)	24
Frequency, Hz	50/60	50/60
Rated feeder connection current, A	630;1000;1250;1600;	630;1000;1250;1600;
	2000;2500;3150;4000*	2000;2500
Rated main busbar current, A	8006000	8002500
Circuit breaker's making current, kA	16; 20; 25; 31.5; 40; 50	16; 20; 25; 31.5
Rated short-time withstand current (3 s), kA	16; 20; 25; 31.5; 40; 50	16; 20; 25; 31.5;
Rated peak withstand current, kA	40; 50; 63; 80; 100; 125	40; 50; 63; 80
Rated low voltage circuit connection voltage, V	·	
DC	48; 110; 220	
AC	110; 230	
Circuit breaker	SION/3AK - "Siemens",	VD4 - "ABB",
	Evolis, LF, HVX - "Schneider	HVX - "Schneider Electric",
	Electric",	SION - "Siemens"
	VD4/HD4 - "ABB",	
	ISM/TEL - "TAVRIDA ELECTRIC"	
Insulation level	Normal insulation	Normal insulation
Insulation type	Air	Air
Classification according	AFLR	AFLR
internal arc withstand (IEC62271-200)	50kA/1s	31.5kA/1s
Loss of service continuity category	LSC2B	LSC2B
(IEC62271-200)		
Partition class (IEC62271-200)	PM	PM
Degree of protection	IP4X,	
(with the cubicle door closed)	IP41 is available by special order.	
Busbar insulation	Option	Insulated
	(for 17.5 kV networks - insulated)	
Outgoing line connection	Cables (Busbars)	Cables
Maintenance version	One-sided / Two-sided	One-sided
Height (with arcing channels)	2220 (2520)	2240 (2570)
Width	650mm: 630A1250A / 12kV	800mm: 630A1600A / 24kV
	800mm: 630A2500A / 12kV	1000mm: 2000A, 2500A / 24kV
	800mm: 630A2000A / 17.5kV	
	1000mm: 3150A4000A / 12kV	
	1000mm: 2500A3150A / 17.5kV	
Depth	1500mm: 630A3150A / 12kV	1700mm: 630A2500A / 24kV
	1500mm: 630A3150A / 17.5kV	
	1700mm: 4000A / 12kV	

\* - only with forced ventilation

# PRIMARY CIRCUIT DIAGRAM TABLE (FOR 12 AND 17.5 KV CUBICLES)

1	2	3	4	5	6	7	8
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Current up to 4000A Width: 650, 800 and 1000mm	Current up to 4000A Width: 650, 800 and 1000mm	Current up to 4000A Width: 650, 800 and 1000mm	Current up to 3150A Width: 650, 800 and 1000mm	Current up to 4000A Width: 650, 800 and 1000mm	Current up to 4000A Width: 650, 800 and 1000mm	Current up to 4000A Width: 650, 800 and 1000mm	Current up to 3150A Width: 650, 800 and 1000mm
9	10	11	12	13	14	15	16
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Current up to 2500A Width: 800 and 1000mm	Current up to 400A Width: 800mm	Current up to 4000A Width: 800 and 1000mm	Current up to 3150A Width: 800 and 1000mm	Current up to 3150A Width: 800 and 1000mm	Current up to 2500A Width: 650, 800 and 1000mm	Current up to 400A Width: 650mm	Current up to 2500A Width: 650, 800 and 1000mm
17	18	19	20	21	22	23	24
17 <u>^<u>^</u>???</u>	18	19	20 †	21	22	23	24
17 •••••	18	<b>19</b>	20	21	22	23	
<b>17</b>		19 					
				21			
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17	18	19	20	21	22	23 23 Current up to 4000A Width: 800 and 1000mm	24
17	18	19	20	21	22	23	24
17	18	19	20	21	22	23 23 Current up to 4000A Width: 800 and 1000mm 31	24
17	18	19	20	21	22	23 23 Current up to 4000A Width: 800 and 1000mm 31	24
17	18	19	20	21	22	23 23 20 20 20 20 20 20 20 20 20	24
17	18 	19 	20	21	22	23 	24
17	18 	19 	20	21	22	23 	24
17	18 	19 	20	21	22	23 	24
17	18 	19 	20	21	22	23	24
17	18 	19	20	21	22	23 Current up to 4000A Width: 800 and 1000mm 31 Current up to 2500A- top busbar entry (2500A - for the busbar	24

33	34	35	36		
Current up to 2500A - top busbar entry	Current up to 2500A	Current up to 2500A	Current up to 2500A		
(2500A - left busbar connection) Width: 800 and 1000mm	(400A - right busbar connection) Width: 800 and 1000mm	(400A - right busbar connection) Width: 800 and 1000mm	(400A - left busbar connection) Width: 800 and 1000mm		
41	42	43	44		
∳⊣κ	Т Г М К	HK HK	Γ <u></u> ικ		
Current up to 4000A Width: 650, 800 and 1000mm	Current up to 3150A Width: 650, 800 and 1000mm	Current up to 3150A Width: 650, 800 and 1000mm	Current up to 3150A Width: 650, 800 and 1000mm		
48	48a	49	50		
	48a	<b>49</b>	50 50		
	48a	<b>49</b>	50 • • • • • • • • • • • • • • • • • • •		
48	48a	49	50		
48 	48a + - - - - - - - - - - - - -	49	50 		
48 	48a + 48a 	49 ••••••••••••••••••••••••••••••••••••	50 		



62	63	64	65	66	67	68	69
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Current up to 4000A Width: 650, 800 and 1000mm	Current up to 3150A Width: 650, 800 and 1000mm	Current up to 3150A Width: 650, 800 and 1000mm	Current up to 3150A Width: 650, 800 and 1000mm	Current up to 3150A Width: 650, 800 and 1000mm	Current up to 200A Width: 800 and 1000mm	Current up to 200A Width: 800 and 1000mm	Current up to 200A Width: 800 and 1000mm
70	71	72	73	74	75	76	77
	8 5100N/A	5_100kVA		т к к			
Current up to 200A Width: 800 and 1000mm	Current up to 200A Width: 800 and 1000mm	Current up to 200A Width: 800 and 1000mm	Current up to 1250A (400A - with fuses) Width: 500, 650 and 800mm	Current up to 200A Width: 500, 650 and 800mm	Current up to 200A Width: 500, 650 and 800mm	Current up to 1250A (400A - with fuses) Width: 500, 650 and 800mm	Current up to 1250A (400A - with fuses) Width: 500, 650 and 800mm
78	79	80	81	82	83	84	
Current up to 1250A (400A - with fuses) Width: 500, 650 and 800mm	Current up to 1250A (400A - with fuses) Width: 500, 650 and 800mm	Current up to 630A Width: 650 and 800mm	Current up to 630A Width: 650 and 800mm	Current up to 630A Width: 650 and 800mm	Current up to 630A Width: 650 and 800mm	Current up to 4000A	

# **BUSBAR COMPARTMENT**

The busbar system is made of flat copper or aluminum bars connected by bolted connection. Busbar for 17.5kV and 24kV are additionally covered with insulating material (for 12kV - on

special order). Busbar compartment, as well as draw-out element and cable compartments, has an exhaust channel to let out overpressured hot gases in the case of a fault. On request, busbar compartments between two adjacent cubicles can be separated by special cast resin bushings.



Busbar with special cast resin bushings





Busbar without special cast resin bushings

4000A busbar



Removable access panel to busbars in circuit breaker compartment





**Busbar connection** 



# LOW VOLTAGE COMPARTMENT

Low voltage compartment is manufactured in double steel plate system to have low voltage instruments well protected against the effects of short circuit currents from the primary compartments. The auxiliary circuits of the circuit breaker are automatically connected by means of a specially designed multi-pole connector, which is automatically connected during circuit breaker sliding-in.









ö

LV compartment door

The low voltage circuit connection between cubicles

The auxiliary circuits of the circuit breaker are automatically connected

### **Relay-protection devices**



USN cubicles can be equipped with various digital protection and automation devices, electronic and multifunctional microprocessor-based energy meters. Typical diagrams realized using digital protection and automation devices, namely SEPAM, REF, SPAC, MiCOM, SIPROTEC, F 650, VAMP. Other digital devices can be utilized on request.

### **Diagrams of auxiliary circuits**

Principal and secondary wiring diagrams for auxiliary circuits are the part of USN switchgear documentation. Diagrams are realized with DC or AC auxiliary voltage. AC/DC panels can be offered on request.

A complete set of diagrams is available for all typical USN switchgear cubicles: incoming, outgoing, section disconnector, metering, load break switch, voltage transformer, service transformer and etc.

Diagrams of auxiliary circuits for USN switchgears are realized through a range of typical schemes using various microprocessor-based protection, control, automation and signaling devices. Diagrams of an energy metering can be realized using electronic or multifunctional microprocessor-based energy meters.

# CABLE COMPARTMENT

Access to the cable compartment is from the front side. It is very easy to reach cable area, due to the compact design of busbar and circuit breaker compartments. Up to 45% of switchgear panel volume can be used as the cable termination compartment. A connection of 6 parallel cables up to 500 mm<sup>2</sup> per phase does not provide any problem, since two partitions between cable and draw-out element compartments can be removed. USN switchboards are fitted with a fault making earthing switch mounted in the cable compartment to connect the busbar, incoming or outgoing cables to earth. The earthing switch is controlled from the front of the switchboard by means of manual or motor (on request) operation. Electromechanical interlocks can link switch operation to other switching device in the substation or to lack of voltage in the cable.

In	Width, mm	Rated short-time withstand current	Max. number of cables per phase	The height of the cable connection point from the ground, mm
630A	650 or 800	Up to 31.5kA	1	700
			2	580
1000A	650 or 800	Up to 31.5kA	3	535
1250A	650 or 800	Up to 31.5kA	3	535
630A	800	Up to 50kA	3	535
1250A	800	Up to 50kA	4	500
1600A	800	Up to 50kA	4	500
2000A	800	Up to 50kA	4	500
2500A	800	Up to 50kA	4	500
2500A	1000	Up to 50kA	5	480
3150A	1000	Up to 50kA	5	480
4000A	1000	Up to 50kA	6	480





Aluminum busbar connection

Bottom of cubicle hermetically sealed with cable entry sealing inserts





Locking earthing switch mechanism



Earthing switch operation



Earthing busbar connection between cubicles (connecting up the earthing circuit)



Fixing the cables and connecting cable earthing braid



Opening cable compartment door



Mechanical indicator of earthing switch status



Passage of the LV cables in the cable compartment



Removable access panel to current transformers



Earthing switch



Electronic indicator of earthing switch status

# DRAW-OUT ELEMENT COMPARTMENT

Standardized construction of draw-out element allows integration of voltage transformers, contactors, section disconnectors and  $SF_6$  gas or vacuum circuit breakers from major worldwide suppliers.



Siemens



3AK Siemens

VD4





HVX Schneider Electric Schneider Electric





Voltage transformer on draw-out element

Section disconnector on draw-out element





ABB



ABB



**EVOLIS** Schneider Electric



**ISM/TEL** Tavrida Electric





Opening draw-out element compartment door



Operating draw-out element

DRAW-OUT UNIT POSITION





Removing partition between draw-out element and cable compartments



Operating segregation shutters





Locking shutter operating mechanism



Earthing contact of draw-out element

# **OPERATING ELEMENTS OF CUBICLE WITH "SION" (SIEMENS) CIRCUIT BREAKER**

"SION" circuit breaker is mounted on draw-out element. Operating elements of cubicle with other manufacturer's circuit breakers may differ (please refer to the appropriate manual).



1. Local/remote control switch 2. Low voltage and cable compartment lighting switch 3. Voltage indicator 4. Mechanical indicator of circuit breaker's position (CLOSED/OPEN), operating cycle counter and spring state indicator 5. Openings for circuit breaker's mechanical switch on/off handle 6. Opening for draw-out element control handle 7. Opening for overriding draw-out element's electromechanical interlock (using special handle) 8. Opening for overriding circuit breaker and cable compartment door mechanical interlock (using special handle) 9. Window for cable connection and earthing switch's position inspection

# CUBICLE DESIGN AND EQUIPMENT

Indoor switchgear consists of USN cubicles with different functional units, control and protection relays, signaling and metering devices and other auxiliary equipment, which are interconnected electricaly.

Design layouts of USN switchgear cubicles are given below.



### Outgoing circuit breaker cubicle USN-10SI-14 up to 1250A

1 Internal arc channel for directing arc outside the building (obligatory when height of the premises < 3000mm and I<sub>sc</sub> > 20kA)

#### A Busbar compartment

- 2 Internal arc pressure relief flap for busbar compartment
- 3 Busbars
- 4 Bushing insulator

#### **B** Draw-out element compartment

- 5 Internal arc pressure relief flap for draw-out element compartment
- Segregation shutters 6
- 7 Circuit breaker on draw out element
- 8 Draw-out element compartment door

### C Low voltage compartment

- 9 Control cable passage
- 10 Low voltage compartment door

#### **D** Cable compartment

- 11 Internal arc pressure relief flap for cable compartment
- 12 Current transformer
- 13 Surge arrester
- 14 Rear access panel (in two-sided maintenance version)
- 15 Cable connection lugs
- 16 Earthing switch
- 17 Cable clamping parts
- 18 Earthing bar (neutral)
- 19 Zero sequence current transformer





### Incoming circuit breaker cubicle USN-10SI-18

- 1 Extension for incoming/outgoing busbar connection
- 2 Voltage transformer



### Bus coupler circuit breaker cubicle USN-10SI-42(44)

1 Bushing insulator between cubicles



Section disconnector cubicle USN-10SS-59

- Section disconnector on draw out element 1
- 2 Draw-out element compartment ventilation openings3 Cable compartment ventilation openings

- 1500m

6



Voltage transformer cubicle USN-10IT-46

- 1 Fuse with blowout indication
- Voltage transformer on draw out element
   Bushing insulator
   Surge arresters



- 1 Load break switch with fuses
- 2 Bushing insulator between cubicles3 Service transformer up to 40kVA



#### 630A load break switch cubicle with fuses USN-10GS-76

1 Load break switch with fuses

18

Service transformer cubicle USN-10SR-69(70)

# INSTALLATION ON THE GROUND

Cubicles must be positioned on installation site in accordance with certified project and electrical diagram. There must be duct or opening for cable passing in the floor. The cubicle is fixed to the ground with 2 anchor bolts M12x110.











R-F

A-A



Installation of a back-to-wall switchboard (top view)

# Positioning cubicles in switchgear

Cubicles must be positioned in the order of priority in accordance with the singleline diagram.

For a switchboard composed of 1 to 10 cubicles, it is recommended to begin installation from the first to the last cubicle on the side opposite the access to the premises. For a switchboard with more than 10 units, begin the installation of the equipment by the middle of the switchboard.

### Connecting cubicles

Check the perpendicularity of each of them in relation to the ground. Align up the front facing panels.

Proceed with the layout of the other cubicles by repeating the same checks each time.

Cubicles interconnected by M8 bolts in 6 fixing points (in accordance with the diagram).

### **OPERATING ACCESSORIES**

### Equipment handling table for the draw out element



- 2. Adjusting the table height
- 3. Area for storing the accessories (operating handles, keys)
- 4. Locking/unlocking the wheels

# **Operating handles and keys**

Locking and unlocking

key for the door of the

LV compartment



Locking and unlocking key for the door of the draw-out element switch on/off compartment







1. Handle for unlocking the draw out element from its compartment





The crank-handle for the The handle for earthing draw out element control switch control



# **OPTION**

# POSITION OF COMMUTATION DEVICES AND ITS OPERATION POSSIBILITY SUBJECT TO **DRAW-OUT ELEMENT POSITION**

		Draw-out element position						
		Operation	Intermediate	Isolated	Service			
ker	Operation possibility	YES	NO	YES	NO (YES - when auxiliary voltage connected)			
it brea	Position	ON/OFF	OFF	ON/OFF	ON/OFF			
Circu	Movement possibility (possibility to put in control handle)	NO (if circuit breaker is switched on); YES (if circuit breaker is switched off)	YES	YES (if earthing switch is opened); NO (if earthing switch is closed)	YES			
iing switch	Possibility to put in control handle	NO	NO	YES	YES			
Earth	Position	OFF	OFF	ON/OFF	ON/OFF			



# **ARC PROTECTION SYSTEM**

# MAIN CHARACTERISTICS

The new arc protection relay NOLA-03-M with extension unit NOLA-02-S are designed to be used for the protection of medium and low-voltage switchgear to increase personnel safety and minimize equipment damage. The central unit type NOLA-03-M operates independently or together with the extension unit NOLA-02-S. This unit helps to create selective arc protection system increasing number of sensors and extending the area to be protected.

# **TECHNICAL DATA**

Current inputs	
Rated current	1A / 5A
Triggering current setting step	0.1A / 0.5A
Max triggering current	5A / 25A
Short time current for 1s	500A
Rated frequency	50 / 60 Hz
Outputs	
Contacts HSO1 ir HSO2:	
Rated voltage	24260 V dc/ac
Continuous carry	3 A
Make and carry for 0.5 s	10 A
Time constant	<2.5ms
Contacts TRIP, TRIP DEL, IRF:	
Rated voltage	260 V dc/ac
Continuous carry	3 A
Breaking capacity	60W, 125VA
Time constant	<10ms
Inputs	
RESET, TRIP MON:	
Logical 1	≥ 24260 V dc /ac
Logical 0	≤12 V dc/ac
Uaux (Power Supply)	110 - 260 V dc/ ac,
	48 - 110 V dc/ac
Optical fiber	
Max length	50 m
Cable type	Plastic optical fiber,
	not jacketed
Core diameter	1 mm
RS-485 link	
Max cable length	60 m
Cable type	Ethernet, shielded
Optical link	
Max cable length	100 m
Cable type	Plastic optical fiber,
	polyethylene jacketed
Core diameter	1 mm
Jacket diameter	2.2 mm
Standards	IEC60255-5,
	IEC60255-11,
	IEC60255-22,
	EN61000 (3/4/5/6),
	EN60529 1999

# **OPTION**

# **FEATURES**

- Three-phase overcurrent function - as additional criteria for trip decision
- Loop-type fiber arc sensor for arc detection and light intensity measuring
- Two high-speed semiconductor outputs for fast tripping (<=2,5 ms), much faster than conventional protection relays
- · Two relay outputs for trip signalization and circuit breaker failure protection
- Two fiber optic or RS-485 interfaces for the connection of other Master or slave units (up to 16)
- 5 push-button membrane keyboard for local configuration
- Informative OLED display and 9 LED indicators for reliable information presenting even at low temperatures
- USB port for PC configuration, event evaluation and software upgrade
- Event logs (650 events) and real-time clock
- Configured by the FREE NOLASET software tool
- Continuous selfsupervision and monitoring of sensor fibers, operating voltages and cabling between master units and slave units
- Selective tripping of the faulted feeder (with NOLA-02-S)



Arc duration and resulting damage







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.

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

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.

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:**

- Less Civil Work
- · Easy Extensibility
- Easy Relocation

# PREFABRICATED SUBSTATION BUILDING

# **MAIN CHARACTERISTICS**

Completely Commissioned

Fast Production and Commissioning

# **ORDER TABLE**

# 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

# **OPTIONS**

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











1	Project name								
2	Name and address of the customer								
4	Main circuit rated voltage, kV								
5	Main busbar rated current, A								
6	Rated short-time withstand current, kA								
7	Serial number of the cubicle acc	cording to p	lan						
8	Primary circuit diagram number								
9	Cubicle type (incoming, outgoing transformer, circuit breaker, load	g, voltage ti I break swit	ransformer, service ch and etc.)						
10	Main circuit rated current, A (630, 1000, 1250, 1600, 2000, 2	2500, 3150,	4000)						
11	Circuit breaker (load break	type							
	switch, contactor)	rated curre	ent, A						
		breaking c	urrent, kA						
12	Fuse-link rated current								
13	Current transformers	ratio							
		quantity							
		accuracy o	lass						
		burden, VA	A						
14	Voltage transformers	1st	burden, VA						
		winding	accuracy class						
		2nd	burden, VA						
		winding	accuracy class						
		3rd	burden, VA						
		winding	accuracy class						
15	Zero sequence current transform	ner, quantit	у						
16	Surge arresters, type								
17	Service transformer capacity, kV	/A							
18	Capacitor bank capacity, kVAr	-							
19	Microprocessor-based	type							
		protection	functions						
20	Energy meters	active							
		reactive							
21	Amperemeter								
22	Voltmeter								
23	Cubicle heating								
24	Motor drive for draw-out elemen	It							
25	Internal are channel for direction		a tha building						
20 27	Tin or silver plated bushars	y arc outside	e me pullang						
28	Insulated husbars								
29	Other color								
30	Two-sided maintenance								
31	Options (NOLA, KAMP)								

#### Annex to the order blank:

- 1. Single line diagram with specified types of protection. Automatic Load Transfer (ALT) algorithm.
- 2. Layout plan of cubicles in switchgear and
- dimensions of available installation place.
- 3. Other additional requirements.

Customer:

signature