

Switchgear and control gear (SCG)

AMIRO-Energo LLC offers switchgear and control gear manufactured by the company Switchkraft.

Modular-type SCG GLX24. Switchgear and control gear SCG GLX24 of modular type with sulfur hexafluoride circuit breakers is manufactured as compact expandable (unlimited in number) panels. SCG GLX24 is distinguished by construction flexibility, ergonomic version and modern design. Panel expandability. Panel fastening.

Main specifications of GLX 24

	Description of parameter	Unit of measure	Value
1	Nominal voltage	kV	10; 20
2	Highest operating voltage, kV	kV	12; 24
3	Nominal current: - for modules of L and V type - for module of T type - for modules of other types	A	630; 1250 не более 200 630
4	Heat endurance current with passing during of 3 s: - for modules of L and V type - for other types of modules	kA	20; 25 20
5	Electrodynamic resistance current: - for modules of L and V type	kA	51; 64

	- for other types of modules		51
6	Nominal current of deactivated vacuum circuit breakers: - for modules of L and V type - for module of B type	kA	20; 25 20
7	Nominal current of load-break switches response under the conditions of: - predominantly active load - 5% of active load	A	630 31,5
8	Nominal voltage of control and signaling circuits: - with DC - with AC	V	24; 48; 110; 220 100; 220
9	Range of operating voltages in control and auxiliary circuits (in % of nominal). - with DC - with AC	—	85 – 110 80 – 110
10	One-minute test voltage 50 Hz for U nom. =10 kV/20 kV): - main circuit in relation to ground - between circuit breakers contacts in open position	kV	42/50 48/60
11	One-minute test voltage of lightning impulse for U nom. =10 kV/20 kV): - main circuit in relation to ground - between circuit breakers contacts in open position	kV	75/125 85/145

1 2	Level of partial discharges with $U=1,1U_H$, not more than	pCb	10
1 3	Insulation resistance voltage, not less than: - main current carrying circuits - control and auxiliary circuits	MOhm	1000 1
1 4	Endurance on mechanical durability (number of cycles B-t _n -O): - module of V type - other modules	—	10000 5000
1 5	Commutation life of load switches (number of B-t _n -O cycles executed in nominal current commutation)	—	100
1 6	Nominal excessive pressure of SF6 gas under the ambient air temperature plus 20°C, absolute pressure 101.3 kPa)	kPa	30
1 7	Relative value of SF6 gas mass leak from the tight body of SCG, not	% per year	0.02
1 8	Mass of individual SCG module, not more than	kg	200
1 9	Protection level acc. to GOST 14254 - tight body - fuse cartridge bodies - SCG outer jacket	—	IP 67 IP 67 IP 4X
2 0	Life time before decommissioning, not less than	years	

SMALL-SIZED CELL WITH SF6 GAS INSULATION OF GLX24 FOR 10 kV, 20 kV

The Company AMIRO-Energo brings to your attention a new small-sized cell for 10 kV and 20 kV with SF6 gas insulation. GLX24 cell fully complies with GOST requirements to the cells of this voltage class. As of today, the cell being offered is the smallest cell for 10 kV and 20 kV on the Russian market. Depth at the base is 800 mm, height 1380 mm, width varies from 350 mm to 600 mm. Small overall dimensions of the cell allow to significantly reduce the area of the switchgear, as well as to use GLX24 at compact small-size substations.

By design the cell GLX24 represents one or several functional modules of various applications enclosed in a steel tight housing filled with SF6 gas under a small manometric pressure. Each functional module is intended for the execution of a certain function in the common circuit of the switchgear (SG) and has its set of switching and measuring equipment.

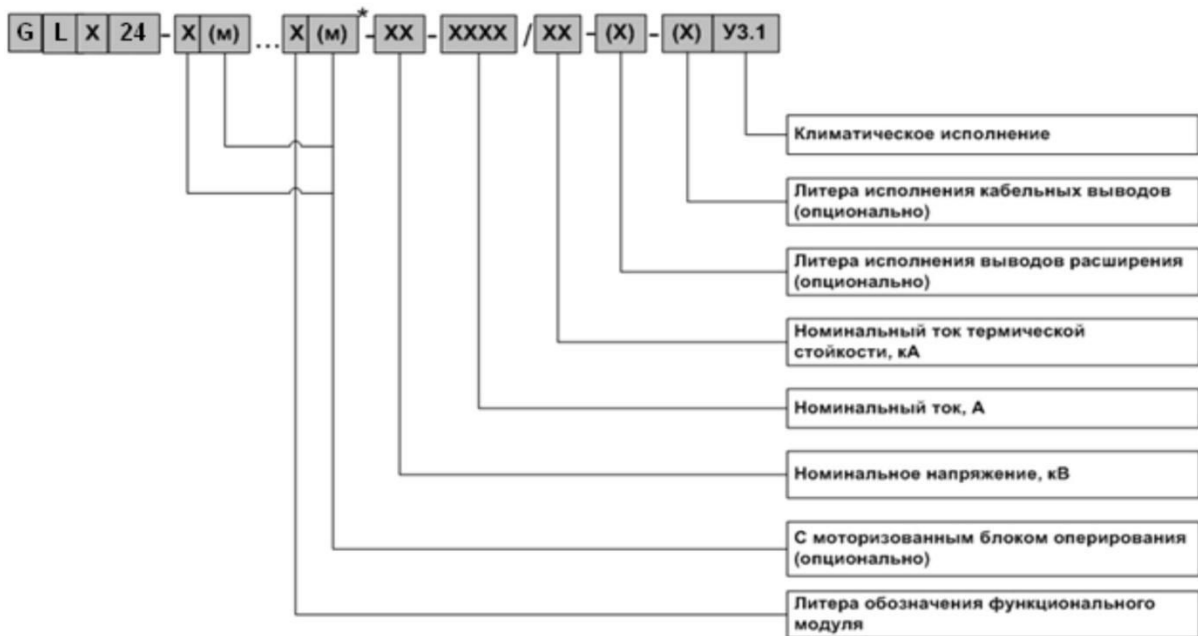
SGC GLX24 cells are intended for operation in three-phase 50 Hz AC switchgears with a nominal voltage of 10 (20) kV with grounded or insulated neutral.

SGC GLX24 cells are intended for operation under the following environmental conditions:

- a) highest elevation of the installation above the sea level – not more than 1000 m;
- b) range of working ambient air temperatures is from minus 25⁰ C to plus 40⁰ C;
- c) relative air humidity is 80% with the temperature plus 15⁰ C;
- d) atmosphere type II according to GOST 15150;
- e) environment is not explosion hazardous, does not contain electrically conductive dust, aggressive gases and vapors in concentrations destructing materials and insulation;

f) packed and preserved items should be kept under ambient air temperature from minus 40⁰ C to plus 70⁰ C.

Symbol structure:



* number of three-digit groups corresponds to the number of functional modules.

Description of designation symbols, exterior, main circuits diagrams, standard and optional configuration of functional modules are given in attachment 1.

Description of cable outlets and extension outlets location symbols is given in table 1.

Table 1

	Cable outlet (extension outlet) location	Symbol
1	On left side wall	Л

2	On right side wall	II
3	On left and right side walls	III
4	Absent	O

Example of symbol recording:

GLX 24-KKT_M-10-630/20-JI-II Y3.1 – switchgear and control gear with functional modules of K type, without mechanized operating block and one module of T type with mechanized operating block, for nominal voltage 10 kV, nominal current 630 A, nominal short-circuit current 20 kA, with extension outlets on the left side wall, cable outlets on the right side wall, climatic version Y3.1.

[Standard versions of SGC GLX24 cells](#)

1. Module with load switch

Module symbol and exterior	Standard configuration	Optional configuration
	Bus bars 630 A Three-position load switch Single-spring drive with three positions and independent shafts for linear operations and grounding Indicator of load switch contacts position Cable inlet 630 A with measuring	Collector bus bars connector Mechanized drive for linear operations by load switch Indicators of short circuit and missing grounding Current transformers in the main circuit Voltage surge protector

	<p>function installed horizontally in front</p> <p>Voltage indicator</p> <p>Locks on front panel for each operation</p> <p>Device for monitoring of SF6 gas pressure</p> <p>Grounding bus</p> <p>Block system between grounding contacts and cable compartment door</p>	<p>Additional block contacts:</p> <p>for line contacts 3HO+3H3</p> <p>for grounding contacts 2HO+2H3</p> <p>Relay protection device (can be installed in the upper compartment and does not alter panel height)</p>
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2. Module with load switch equipped with automatic releaser with fuses.

Module symbol and exterior	Standard configuration	Optional configuration
	<p>Bus bars 630 A</p> <p>Three-position load switch equipped with automatic releaser with fuses</p> <p>Single-spring drive with three positions and independent shafts for linear operations and grounding</p> <p>Indicator of load switch contacts position</p>	<p>Collector bus bars connector</p> <p>Mechanized drive for linear operations by load switch</p> <p>Shunt releaser</p> <p>Indicators of short circuit and missing grounding</p> <p>Current transformers in the main circuit</p> <p>Voltage surge protector</p>

	<p>Cable inlet 630 A with measuring function</p> <p>Voltage indicator</p> <p>Locks on front panel for each operation</p> <p>Device for monitoring of SF6 gas pressure</p> <p>Grounding bus</p> <p>Block system between grounding contacts and cable compartment door</p>	<p>Additional block contacts:</p> <ul style="list-style-type: none"> - for line contacts 3HO+3H3 - for grounding contacts 2HO+2H3 - for status of fuse 1HO <p>Relay protection device (can be installed in the upper compartment and does not alter panel height)</p> <p>Transformer protection bus bar</p>
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3. Module with vacuum circuit breaker and load switch (simplified diagram of line inlet/outlet)

Литера и внешний вид модуля	Стандартная конфигурация	Опциональная конфигурация
	<p>Bus bars 630 A</p> <p>Vacuum circuit breaker 630 A</p> <p>Three-position load switch</p> <p>Single-spring drive with three positions and independent shafts for linear operations and grounding</p> <p>Mechanical interlocking between three-position load</p>	<p>Collector bus bars connector</p> <p>Shunt releaser</p> <p>Indicators of short circuit and missing grounding</p> <p>Current transformers in the main circuit</p> <p>Voltage surge protector</p>

	<p>switch and vacuum circuit breaker</p> <p>Indicators of load switch and vacuum circuit breaker contacts position</p> <p>Microprocessor protection relay</p> <p>Shunt releaser (for protection)</p> <p>Cable inlet 630 A with measuring function</p> <p>Voltage indicator</p> <p>Locks on front panel for each operation</p> <p>Device for monitoring of SF6 gas pressure</p> <p>Grounding bus</p> <p>Block system between grounding contacts and cable compartment door</p> <p>Interlock between load switch and operating mechanism of disconnected switch</p>	<p>Additional block contacts:</p> <ul style="list-style-type: none"> - for contacts of vacuum circuit breaker 4HO+4H3 - for line contacts of load switch 3HO+3H3 - for grounding contacts of load switch 2HO+2H3 - for status of fuse 1HO <p>Relay protection device (can be installed in the upper compartment and does not alter panel weight)</p>
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4. Module with vacuum circuit breaker and disconnecting switch (standard diagram of line inlet/outlet)

Литера и внешний вид модуля	Стандартная конфигурация	Опциональная конфигурация
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	<p>Bus bars 630 A/ 1250 A</p> <p>Vacuum circuit breaker 630 A / 1250 A</p> <p>Spring drive for vacuum circuit breaker</p> <p>Three-position disconnecting switch</p> <p>Mechanical interlocking between three-position load switch and vacuum circuit breaker</p> <p>Indicators of disconnecting switch and vacuum circuit breaker contacts position</p> <p>Cable inlet 630 A with measuring function installed horizontally in front</p> <p>Voltage indicator</p> <p>Locks on front panel for each operation</p> <p>Device for monitoring of SF6 gas pressure</p> <p>Grounding bus</p> <p>Block system between grounding contacts and cable compartment door</p> <p>Interlock between load switch and operating</p>	<p>Collector bus bars connector</p> <p>Mechanized drive for linear operations by load switch</p> <p>Independent shunt releaser</p> <p>Disconnecting shunt switch</p> <p>Indicators of short circuit and missing grounding</p> <p>Current transformers in the main circuit</p> <p>Voltage surge protector</p> <p>Additional block contacts:</p> <ul style="list-style-type: none"> - for contacts of vacuum circuit breaker 4HO+4H3 - for line contacts of load switch 3HO+3H3 - for grounding contacts of load switch 2HO+2H3 - for status of fuse 1HO <p>Relay protection device (can be installed in the upper compartment and does not alter panel weight)</p>
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	mechanism of disconnected switch	
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5. Module with sectional load switch.

Литера и внешний вид модуля	Стандартная конфигурация	Опциональная конфигурация
	<p>Bus bars 630 A</p> <p>Two-position load switch</p> <p>Spring drive</p> <p>Contacts position indicator</p> <p>Locks on front panel for each operation</p> <p>Device for monitoring of SF6 gas pressure</p> <p>Relay protection device (can be installed in the upper compartment and does not alter panel weight)</p>	<p>Collector bus bars connector</p> <p>Mechanized drive for load switch</p> <p>Additional block contacts: for load switch 3HO+3H3</p>

6. Cable connection module

Литера и внешний вид модуля	Стандартная конфигурация	Опциональная конфигурация
	<p>Housing with air insulation</p> <p>Housing with SF6 gas insulation</p>	<p>Housing with SF6 gas insulation</p>

	Bus bars 630 A Voltage indicator Grounding bus	
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7. Measuring module.

Литера и внешний вид модуля	Стандартная конфигурация	Опциональная конфигурация
	Housing with air insulation Bus bars 630 A Current transformers on two phases Voltage transformers with two windings Protection bus bar Voltage indicator	Housing with SF6 gas insulation Current transformers on three phases Voltage transformers with three windings Voltage surge protector One active energy meter and one reactive energy meter

8. Module of voltage measuring transformer

Литера и внешний вид модуля	Стандартная конфигурация	Опциональная конфигурация
	Housing with air insulation Bus bars 630 A Two-phase current transformer Transformer protection bus bar	Housing with SF6 gas insulation Voltage transformers with three outlets Disconnection switch

	Single-phase voltage meter	
	Voltage surge protector	
	Voltage indicator	

9. Auxiliary transformer module.

Литера и внешний вид модуля	Стандартная конфигурация	Опциональная конфигурация
	Bus bars 630 A Auxiliary transformer Transformer protection bus bar Single-phase voltage meter Battery with charger Voltage indicator	Disconnection switch Voltage surge protector

Modular construction diagrams

	Symbol	Combination	Main circuits diagram	Overall dimensions (L xBxH) , mm	Weight , kg
1	КРУ-СТ	Cable connection module + module with load switch and fuse with		700 x 800 x 1380 (1150)	280

		automatic releaser			
2	KPY-KK	Two modules with load switch		700 x 800 x 1380 (1150)	320
3	KPY-KT	Module with load switch + module with load switch and fuse with automatic releaser		700 x 800 x 1380 (1150)	340
4	KPY-KK K	Three modules with load switch		1050 x 800 x 1380 (1150)	480
5	KPY-KKT	Two modules with load switch + module with load switch and fuse with automatic releaser		1050 x 800 x 1380 (1150)	500
6	KPY-KTT	Module with load switch + two modules with load switch and fuse with automatic releaser		1050 x 800 x 1380 (1150)	520
7	KPY-TTT	Three modules with load switch and fuse with automatic releaser		1050 x 800 x 1380 (1150)	540
8	KPY-KKK K	Four modules with load switch		1400 x 800 x	640

				1380 (1150)	
9	KPY-KKK T	Two modules with load switch + module with load switch and fuse with automatic releaser		1400 x 800 x 1380 (1150)	650
10	KPY-KKT T	Two modules with load switch + two modules with load switch and fuse with automatic releaser		1400 x 800 x 1380 (1150)	680
11	KPY-KTT T	Module with load switch + three modules with load switch and fuse with automatic releaser		1400 x 800 x 1380 (1150)	700
12	KPY-TTT T	Four modules with load switch and fuse with automatic releaser		1400 x 800 x 1380 (1150)	720
13	KPY-KKK KK	Five modules with load switch		1750 x 800 x 1380 (1150)	800
14	KPY-KKK TT	Three modules with load switch + two modules with load switch and fuse with automatic releaser		1750 x 800 x 1380 (1150)	840

15	КРУ-ККТ ТТ	Two modules with load switch + three modules with load switch and fuse with automatic releaser		1750 x 800 x 1380 (1150)	860
16	КРУ-ТТТ ТТ	Five modules with load switch and fuse with automatic releaser		1750 x 800 x 1380 (1150)	900

Типовые решения РУ на основе КРУ GLX 24

STANDARD SOLUTIONS FOR SG ON THE BASIS OF SCG GLX 24

1. Single-section SG with outgoing lines and transformers protection
2. Two-section SG with outgoing lines and transformers protection
3. Switchgear with two independent inlets
4. Common diagram of switchgear for several block-type SCGs