



CABLE PRODUCTS

Power cable for nominal alternating voltage of 0.66 and 1 kV (GOST 31996-2012).

Power cables with copper conductors and plastic insulation are intended for transmission and distribution of electric power in stationary installations at a nominal alternating voltage of 0.66 and 1 kV with a nominal frequency of 50 Hz.

Unarmored cables are used for laying cable lines in cable structures and in outdoor (open) electrical installations (cable trestles, galleries) as well as indoor (enclosed) electrical installations, provided there is no risk of mechanical damage during operation.

Shielded cables are used when it is necessary to protect electrical circuits from the influence of external electric fields, provided there is no risk of mechanical damage during operation.

Cables armored with steel tapes are used for laying cable lines in cable structures and in outdoor (open) electrical installations (cable trestles, galleries), indoor (enclosed) electrical installations, and in the ground (trenches), including aggressive environments, provided the cable is not subjected to significant tensile forces but there is a risk of mechanical damage during operation.

Cables armored with steel wires are used for laying cable lines in cable structures and in outdoor (open) electrical installations (cable trestles, galleries), indoor (enclosed) electrical installations, and in the ground (trenches), including aggressive environments, when the cable is subjected to significant tensile forces.

Cables can be manufactured in a fire-safe design in accordance with GOST 31565-2012.



- Conductive cores:
 - Class 1 or 2 according to GOST 22483-2021;
 - Core cross-section from 1.5 mm² to 1000 mm²;
 - Number of cores in the cable: from 1 to 5.



- Cables may be equipped with a screen made of copper tapes or copper wires «E»



- Cables may have protective armor:
 - «B» – two galvanized steel tapes;
 - «K» – a winding of galvanized steel wires.



- Wide operating temperature range: from minus 60 to plus 50 °C.
Minimum installation temperature: minus 15 °C.

- Climatic versions UHL, HL, T, placement categories 1–5 (according to GOST 15150-69).



- Fire-resistant cables «FR» maintain functionality under flame exposure for at least 180 minutes (PO1 according to GOST 31565-2012).



- Warranty period of operation: at least 5 years.

Service life: at least 30 years.



Cable construction

Copper single- or multi-wire current-carrying conductors of round or sector (segment) shape, class 1 or 2 according to GOST 22483-2021.

Conductor construction and nominal cross-section

Conductor designation	Nominal cross-section of the conductor, mm ²	
	round	sector (segment)
Single-wire conductors	1,5 - 10	-
Multi-wire conductors	1,5 - 1000	70 - 400

Nominal cross-section and number of conductors

Number of conductors	Nominal cross-section of the main conductors, mm ²	
	Nominal voltage, kV	
	0,66	1
1 - 5	1,5 - 50	1,5 - 240
1 - 4		1,5 - 400
1		1,5 - 1000

Multicore cables have all conductors of equal cross-section. Four- and five-core cables may have one conductor of reduced cross-section (neutral (N) or protective earth (PE)). The current-carrying conductor of reduced cross-section may be either round or sector-shaped, single- or multi-wire compacted, depending on the class of the main conductors in the cable.

The insulated conductors of multicore cables are twisted into a core.

Two- and three-core unarmoured cables with insulation made of polyvinyl chloride (PVC) compounds or cross-linked polyethylene (XLPE) for rated voltages up to and including 1 kV, with conductor cross-sections up to and including 10 mm², may have a flat design with insulated conductors laid parallel in one plane.

In fire-resistant cables marked «FR», the conductors are wrapped with two mica-containing tapes, which prevent the conductors from short-circuiting in the event of a fire.

Conductor insulation materials:

- «V» - polyvinyl chloride (PVC) compound, including low fire hazard versions;
- «Pv» - cross-linked polyethylene (XLPE);
- «P» - halogen-free polymer compound.

Outer sheath materials:

- «V» - polyvinyl chloride (PVC) compound, including versions with reduced flammability or low fire hazard;
- «P» - halogen-free polymer compound.

Screen and protective armour:

- «E» - screen made of copper tape or copper wires;
- «B» - inner sheath and armour consisting of two galvanized steel tapes;
- «K» - inner sheath and armour consisting of galvanized steel wires.

Over the armor, a protective sheath is applied, made of:

- «Shv» - polyvinyl chloride (PVC) compound, including versions with reduced flammability or low fire hazard;
- «Shp» - polyethylene;
- «P» - halogen-free polymer compound.

The colour of the cable sheath/protective covering is determined in agreement with the customer; if not specified, the cables are manufactured in black.

Cable manufacture upon customer request:

- with a different number and nominal cross-section of conductors;
- with a different class of conductors;
- with coloured outer sheath/protective covering (red, white, blue, or other colours).

Technical specifications

Rated voltage	0.66 and 1 kV rated voltage, with a nominal frequency of 50 Hz
Insulation resistance during operation, at t=+20 °C not less than	– For cross-linked polyethylene insulation: 150 MΩ; – For polyvinyl chloride (PVC) compound and halogenfree polymer compound insulation: 12 MΩ (conductor cross-section from 1.5 to 4.0 mm²); 10 MΩ (conductor cross-section from 6.0 to 25 mm²); 5 MΩ (conductor cross-section from 35 to 500 mm²); 3 MΩ (conductor cross-section from 500 to 1000 mm²)
Conductor resistance at t=+20 °C not more than	Complies with GOST 22483-2021
Test voltage, kV	– 3 kV - for cables with a rated voltage of 0.66 kV; – 3.5 kV - for cables with a rated voltage of 1 kV
Ambient temperature, upper limit	Plus 50 °C
Ambient temperature, lower limit	Cables of climate design HL and cables with a protective sheath made of: – Polyethylene - down to minus 60 °C; – Cables of other types - down to minus 50 °C
Installation temperature, not lower than	– Minus 30 °C - for cables of HL design; – Minus 20 °C - for cables with a protective sheath made of polyethylene (Shp); – Minus 15 °C - for cables of other types
Maximum operating temperature of the conductor	– Polyvinyl chloride (PVC) compound and halogen-free polymer compound - plus 70 °C; – Cross-linked polyethylene (XLPE) - 90 °C
Minimum allowable bending radius of the cables	– Multicore cables - 7.5 times the calculated outer diameter of the cable; – Single-core cables - 10 times the calculated outer diameter of the cable
Fire resistance of cables with the «FR» index	At least 180 minutes under the influence of an open flame and a temperature of at least 750 °C (P01 according to GOST 31565-2012)
Fungus resistance	Cables resistant to fungal growth, with a degree of infestation up to 2 points
Service life of the cables, not less than	30 years (when laid in rooms, tunnels, or ducts - 25 years)
Warranty period of operation, not less than	5 years

Cable design in accordance with fire hazard ratings according to GOST 31565-2012

Fire hazard rating	Description of the sheath material, cable design according to the fire hazard rating (according to GOST 31565-2012)
(without the index)	Cables with insulation made of polyvinyl chloride (PVC) compound or cross-linked polyethylene (XLPE), with an outer sheath or protective covering made of polyvinyl chloride (PVC) compound, non-flame propagating when laid individually.
ng(A)	Cables with insulation made of polyvinyl chloride (PVC) compound or cross-linked polyethylene (XLPE), with an outer sheath or protective covering made of low flammability polyvinyl chloride (PVC) compound, non-flame propagating when grouped together according to category A.
ng(A)-LS	Cables with insulation made of low fire hazard polyvinyl chloride (PVC) compound or cross-linked polyethylene (XLPE), with an outer sheath or protective covering made of low fire hazard polyvinyl chloride (PVC) compound, with reduced smoke and gas emissions, non-flame propagating when grouped together according to category A.
ng(A)-LSLTx	Cables with insulation, outer sheath, or protective covering made of low fire hazard polyvinyl chloride (PVC) compound, with reduced smoke and gas emissions, low toxicity of combustion products, non-flame propagating when grouped together according to category A.
ng(A)-HF	Cables with insulation, outer sheath, or protective covering made of halogen-free polymer compound, non-flame propagating when grouped together according to category A, and not emitting corrosive and reactive gaseous products during combustion and smoldering.
ng(A)-FRLS	Fire-resistant cables with insulation, outer sheath, or protective covering made of low fire hazard polyvinyl chloride (PVC) compound, with reduced smoke and gas emissions, non-flame propagating when grouped together according to category A.
ng(A)-FRLSLTx	Fire-resistant cables with insulation, outer sheath, or protective covering made of low fire hazard polyvinyl chloride (PVC) compound, with reduced smoke and gas emissions, low toxicity of combustion products, non-flame propagating when grouped together according to category A.
ng(A)-FRHF	Fire-resistant cables with insulation, outer sheath, or protective covering made of halogen-free polymer compound, non-flame propagating when grouped together according to category A, and not emitting corrosive and reactive gaseous products during combustion and smoldering.

Designation when ordering

Material of the outer sheath of the unarmoured cable	
-	Armoured cables
V	PVC compound, including low flammability and low fire hazard versions
P	Halogen-free polymer compound

Presence of a conductor with a smaller cross-section in the cable, cross-section, mm²	
-	Conductor with a smaller cross-section is absent
+1xS*	Number and cross-sectional area of conductors

Conductor construction	
ok	Single-wire round conductors
mk	Multi-wire round conductors
ms	Multi-wire sector-shaped conductors

Presence of a screen	
-	No screen
E	Overall screen made of copper wires/tapes
Material of the outer sheath of the armored cable	
-	Unarmored cables.
Shv	PVC plastic, including low-flammability and low-fire-hazard types.
Shp	Polyethylene
P	Halogen-free polymer compound
Cross-sectional area of conductors, mm²	
S	Cross-sectional area of the conductor
+1xS*	
Cross-sectional area of the screen, mm²	
-	Non-screened cables
/S**	Cross-sectional area of the screen

V	V	B	-	Shv	-	ng(A)-FRLSLTx	-HL	n	x	S	+1xS*	ok	(N)	-	-1		
						Cable design		Climatic design		Presence of grounding and/or neutral conductor							
						-	Round cable	-	UHL	-	Without neutral and grounding conductors						
						P	Flat cable	-HL	HL	(N)	Neutral conductor						
								-T	T	(PE)	Grounding conductor						
										(N,PE)	Neutral and grounding conductors						
Presence of armor																	
G	Without armor																
B	Armor made of two galvanized steel tapes																
K	Armor made of galvanized steel wires																
										Number of conductors							
										n	Number of cores						

Fire safety index	
-	Insulation made of PVC plastic or cross-linked polyethylene, outer sheath or protective hose made of PVC plastic, flame-retardant when laid individually.
ng(A)	Insulation made of PVC plastic or cross-linked polyethylene, outer sheath or protective hose made of low-flammability PVC plastic, flame-retardant when laid in groups according to category A.
ng(A)-LS	Insulation made of PVC plastic or cross-linked polyethylene, outer sheath or protective hose made of low-fire-hazard PVC plastic, flame-retardant when laid in groups according to category A.
ng(A)-LSLTx	Insulation and outer sheath or protective hose made of low-fire-hazard PVC plastic, flame-retardant when laid in groups according to category A. and with low toxicity of combustion products.
ng(A)-HF	Insulation, outer sheath, or protective hose made of a polymer compound free of halogens, flame-retardant when laid in groups according to category A, and not emitting corrosive gaseous products during combustion and smoldering.
ng(A)-FRLS	Insulation and outer sheath or protective hose made of low-fire-hazard PVC plastic, flame-retardant when laid in groups according to category A, with reduced smoke and gas emissions.
ng(A)-FRLSLTx	Insulation and outer sheath or protective hose made of low-fire-hazard PVC plastic, flame-retardant when laid in groups according to category A, with reduced smoke and gas emissions, low toxicity of combustion products, fire-resistant.
ng(A)-FRHF	Insulation, outer sheath, or protective hose made of a halogen-free polymer compound, flame-retardant when laid in groups according to category A, and not emitting corrosive gaseous products during combustion and smoldering.

Example of cable notation when ordering:

VVGng(A)-LS 3x50mk+1x25mk(N)-1

Power cable VVGng(A)-LS with three copper, multi-core, round conductors with a nominal cross-section of 50 mm², with a zero copper, multi-core, round conductor with a nominal cross-section of 25 mm², rated for a nominal voltage of 1 kV.

Example of cable notation when ordering:

VVGEng(A)-LS 4x25mk(N)/16-0,66

Power cable VVGEng(A)-LS with four copper, multi-core, round conductors with a nominal cross-section of 25 mm², screened with a copper screen with a nominal cross-section of 16 mm², rated for a nominal voltage of 0.66 kV.