



# CABLE PRODUCTS

## Control cable (GOST 1508-78, ST AO KEK-004-2024).

Control cables with copper conductors are intended for fixed connection to stationary electrical devices, equipment, and assemblies of clamps of electrical distribution devices with a rated alternating voltage up to 660 V at a frequency of up to 100 Hz or a direct voltage up to 1000 V.

Unarmored cables are used for installation in premises, channels, and tunnels where there are no mechanical impacts.







Shielded cables are used for installation in premises, channels, and tunnels where there are no mechanical impacts and where protection of electrical circuits from external electric fields is required.

Cables armored with steel tapes are used for installation in premises, channels, tunnels, in the ground (trenches), including in aggressive environments and in areas exposed to stray currents, provided the cable is not subjected to significant tensile forces.

Cables armored with steel wires are used for installation in premises, channels, tunnels, in the ground (trenches), including in aggressive environments and in areas exposed to stray currents, where the cable is subjected to significant tensile forces.

Cables can be manufactured in fire-resistant design according to GOST 31565-2012.



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 • Conductive conductors:  
 Class 1 according to GOST 22483-2021;  
 Conductor cross-section from 0.75 mm<sup>2</sup> to 10 mm<sup>2</sup>;  
 Number of conductors in the cable from 4 to 61;  
 Color or numerical conductor marking.
- Cables may have a common core shield made of:  
 Copper foil or copper tape;  
 Aluminum foil;  
 Alu-polymer tape;  
 Copper-polymer tape.
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 • Cables may have protective armor:  
 - Made of galvanized steel wires;  
 - Made of galvanized steel tapes.
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 • Wide operating temperature range: from minus 60 to plus 50 °C.  
 Minimum cable installation temperature: minus 15 °C.
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 • Climate design UHL, HL, T, placement categories 2-5 (according to GOST 15150-69).
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 • Fire-resistant cables "FR" maintain operability when exposed to flame for at least 180 minutes (PO1 according to GOST 31565-2012).
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 • Warranty period for cable operation is 3 years.  
 Service life of cables is at least 15 years from the date of manufacture.

### Cable construction

Copper solid conductive conductor of round shape, class 1 according to GOST 22483-2021.

Nominal cross-section and number of conductors

Nominal conductor cross-section, mm <sup>2</sup>	Number of conductors
0,75; 1; 1,5	4; 5; 7; 10; 14; 19; 27; 37; 52; 61
2,5	4; 5; 7; 10; 14; 19; 27; 37
4; 6; 10	4; 5; 10

By agreement with the customer, cables with a different number of conductors can be manufactured.

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In fire-resistant cables "FR", a wrap of two mica-containing tapes should be applied over the conductive conductors, which prevent the conductors from short-circuiting in case of fire.

The insulation of the conductors can be made from the following materials:

- «V» – polyvinyl chloride plastisol, including low fire hazard type;
- «P» – polymer composition, free from halogens.

The marking of insulated conductors can be either color-coded or numerical (with the distance between digits not exceeding 35 mm).

Cables without the letter «C» in their designation must have a counting pair in each twist, with the insulated conductors of this pair differing in color from each other and from the other conductors. The color marking should be solid or in the form of longitudinal stripes with a width of at least 1 mm.

Insulated conductors in round cables are twisted into a core.

Insulated conductors in flat cables are arranged in one plane.

Shield:

«E» – shield made of copper or aluminum tape (foil), or aluminum-polymer tape, or copper-polymer tape.

Outer sheath:

«V» – polyvinyl chloride plastisol, including low combustibility and low fire hazard types;

«P» – polymer composition, free from halogens.

Protective armor:

«Bb» – separating layer (inner sheath) and armor made of two galvanized steel tapes;

«Kb» – separating layer (inner sheath) and armor made of galvanized steel wires.

A protective hose is applied over the armor:

«Shv» – made of polyvinyl chloride plastisol, including low combustibility or low fire hazard types;

«P» – polymer composition, free from halogens.

The color of the outer sheath/protective hose of the cable is determined by agreement with the consumer. In the absence of specifications, cables are made in black color.

### Cable manufacturing according to the customer's specifications:

- with a different number and nominal cross-section of conductors;
- with a different class of current-carrying conductors;
- with a colored outer sheath/protective hose (red, white, blue, or another color).

### Technical specifications

Nominal voltage	– alternating voltage up to 660 V with a frequency up to 100 Hz – direct voltage up to 1000 V
Insulation resistance during operation, t = +20 °C, not less than	10 MΩ (conductor cross-section from 0.75 to 1.5 mm <sup>2</sup> ); 9 MΩ (conductor cross-section from 2.5 to 4.0 mm <sup>2</sup> ); 6 MΩ (conductor cross-section from 6.0 to 10.0 mm <sup>2</sup> ).
Electrical resistance of conductors at t = +20 °C, not less than	complies with GOST 22483-2021
Testing of cables with alternating voltage at a frequency of 50 Hz (5 minutes)	2500 V
Ambient temperature, upper limit	plus 50 °C
Ambient temperature, lower limit	minus 50 °C
Installation at a temperature not lower than	Non-armored: minus 15 °C Armored: minus 7 °C
Maximum operating temperature of the conductor	plus 70 °C
Fire resistance of cables with the "FR" index	Not less than 180 minutes under the influence of an open flame and a temperature of at least plus 750 °C(P01 according to GOST 31565-2012)
Resistance to mould fungi	Cables resistant to mould fungi, fouling degree up to 2 points
Minimum allowable bending radius of cables	– for armored cables – 10 calculated outer diameters of the cable; – for non-armored cables – 6 calculated outer diameters of the cable
Service life of cables, not less than	15 years (when installed in rooms, tunnels, channels – 25 years)
Warranty period of operation	3 years

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

Designation of the cable type in terms of fire hazard indicators	Cable type according to fire hazard indicators according to GOST 31565-2012
(without index)	Cables with insulation, outer sheath, or protective hose made of polyvinyl chloride plastic, non-flame propagating when installed individually
ng(A)	Cables with insulation made of polyvinyl chloride plastic, with an outer sheath or protective hose made of low-flammability polyvinyl chloride plastic, non-flame propagating when installed in groups, category A
ng(A)-LS	Cables with insulation, outer sheath, or protective hose made of low-fire-hazard polyvinyl chloride plastic, non-flame propagating when installed in groups, category A, with reduced smoke and gas emission
ng(A)-LSLTx	Cables with insulation, outer sheath, or protective hose made of low-fire-hazard polyvinyl chloride plastic, non-flame propagating when installed in groups, category A, with reduced smoke and gas emission, and low toxicity of combustion products
ng(A)-HF	Cables with insulation, outer sheath, or protective hose made of a halogen-free polymer composition, non-flame propagating when installed in groups, category A, not emitting corrosive and chemically active gaseous products during combustion and smoldering
ng(A)-FRLS	Fire-resistant cables with insulation, outer sheath, or protective hose made of low-fire-hazard polyvinyl chloride plastic, non-flame propagating when installed in groups, category A, with reduced smoke and gas emission
ng(A)-FRLSLTx	Fire-resistant cables with insulation, outer sheath, or protective hose made of low-fire-hazard polyvinyl chloride plastic, non-flame propagating when installed in groups, category A, with reduced smoke and gas emission, and low toxicity of combustion products
ng(A)-FRHF	Fire-resistant cables with insulation, outer sheath, or protective hose made of a halogen-free polymer composition, non-flame propagating when installed in groups, category A, not emitting corrosive and chemically active gaseous products during combustion and smoldering

# Ordering designation

