

# FLAME-RETARDANT POWER CABLES, WITH INSULATION AND SHEATH OF HALOGEN-FREE POLYMERIC COMPOUND, INCLUDING FIRE-RESISTANT CABLES

ACC. TO GOST 31996-2012 ТУ 16.К71-304-2001, ТУ 16.К71-339-2004

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ППГнг(A)-HF, ППГЭнг(A)-HF, ПБПнг(A)-HF, ПвПГнг(A)-HF, ППГнг(A)-FRHF,  
PPGng(A)-HF, PPGEng(A)-HF, PBPng(A)-HF, PvPng(A)-HF, PPGng(A)-FRHF,

ППГЭнг(A)-FRHF, ПвПГнг(A)-FRHF, ПвПГЭнг(A)-FRHF, ПвБПнг(A)-FRHF, ПБПнг(A)-FRHF  
PPGEng(A)-FRHF, PvPng(A)-FRHF, PvPGEng(A)-FRHF, PvBPng(A)-FRHF, PBPng(A)-FRHF

## APPLICATION

The cables are intended for transmission and distribution of electric power and electric signals in fixed electrical installations for nominal voltage 660 and 1000 VAC up to 100 Hz, or 1000 and 1500 VDC accordingly, including cable lines for power of equipment of nuclear power plants safety systems outside the containment areas.

The cables are used in power systems with grounded or insulated neutral conductor, where duration of operation in conditions of single phase-to-ground fault does not exceed 8 hours, and total duration of operation in conditions of single phase-to-ground fault does not exceed 125 hours/year.

## DESIGN

**Conductor** – copper, single- or multi-conductor, sector-shaped or round, Class 1 or 2 acc. to GOST 22483-2012. Conductor resistance per 1 km and temperature 20°C complies with Class 1 and 2 acc. to requirements of GOST 22483-2012.

**Thermal barrier** – for cables ППГнг(A)-FRHF, ППГЭнг(A)-FRHF, ПвПГнг(A)-FRHF, ПвПГЭнг(A)-FRHF, ПвБПнг(A)-FRHF, ПБПнг(A)-FRHF : two mica tapes, wrapped around with overlapping.

**Conductor insulation** – for cables Пв...– XLPE; for cable П...- halogen-free polymeric compound.

Nominal insulation wall thickness complies with requirements of GOST 31996-2012.

Insulation volume resistivity at continuously permissible conductor temperature:

- for cables П... – min.  $1 \cdot 10^{10}$  Ohm•cm;

- for cables Пв... – min.  $1 \cdot 10^{12}$  Ohm•cm.

**Stranding** – insulated conductors of multi-conductor cables are stranded into a cable core (right-hand direction). Interstices of the core composed of insulated conductors with cross-section 25 mm<sup>2</sup> and above are filled with extruded kordel of halogen-free polymeric compound. Filling of external interstices between insulated conductors is performed simultaneously with extrusion of inner sheath.

All the conductors of multi-conductor cables are of equal cross-section. Four-conductor cables with conductor nominal cross-section 25 mm<sup>2</sup> and above can have one conductor of lesser cross-section (neutral or ground conductor).

**Inner sheath** – extruded of halogen-free polymeric compound

**Separating layer** – for cables ПвПГнг(A)-HF, ПвПГнг(A)-FRHF, ПвПГЭнг(A)-FRHF

with conductor diameter 50 mm<sup>2</sup>: glass tape, wrapped helically with overlapping.

**Shield** – for cables ППГЭнг(A)-HF, ППГЭнг(A)-FRHF, ПвПГЭнг(A)-FRHF: copper tapes wrapped helically with overlapping.

**Sheath** - extruded of halogen-free polymeric compound. Nominal wall-thickness of outer sheath complies with category Обп-2 acc. to GOST 23286-78; at this, nominal sheath wall thickness for single-conductor cables is min. 1,4 mm, and the one for multi-conductor cables is min. 1,8mm.

**Protective covering:**

- armour of two galvanized steel tapes is applied helically so that upper tape overlaps the gaps between the wraps of the lower tape;

- protective jacket extruded of halogen-free polymeric compound. Nominal wall thickness of protective jacket complies with requirements of GOST 31996-2012.

## OPERATION AND LAYING CONDITIONS

1. Cables ППГнг(A)-FRHF, ППГЭнг(A)-FRHF, ПвПГнг(A)-FRHF, ПвПГЭнг(A)-FRHF are intended for wiring of fire safety systems (fire alarm circuits, power for fire-fighting pumps, lighting of fire escapes and escape routs, smoke exhaust and forced ventilation systems, evacuation lifts), including explosion hazard zones Class B-1a, for wiring in hospital surgical units, emergency power supply circuits and for power of equipment (current collectors) activated in case of fire.

2. Cables ПБПнг-FRHF, ПвБПнг(A)-FRHF are intended for laying in the same places, if there are risk of mechanical damage during operation.

3. Cables ППГнг(A)-HF, ППГЭнг(A)-HF, ПБПнг(A)-HF, ПвПГнг(A)-HF are intended for wiring in office rooms equipped with computer equipment and microprocessor equipment, in kindergartens, schools, hospitals and for cable lines of social centers and sports facilities.

4. The cables can be used for operation in DC power systems not exceeding  $2,4U_0$ .

5. Conductor limit temperature keeping requirement regarding non-inflammability in case of short-circuit:

- ППГнг(A)-FRHF, ППГЭнг(A)-FRHF, ПБПнг(A)-FRHF, ППГнг(A)-HF, ПБПнг(A)-HF, ППГЭнг(A)-HF : 350 °C,

- ПвПГнг(A)-FRHF, ПвБПнг(A)-FRHF, ПвПГЭнг(A)-FRHF : 400 °С.
- 6. Continuously permissible conductor temperature during operation:
  - ПвПГнг(A)-HF, ПвПГнг(A)-FRHF, ПвПГЭнг(A)-FRHF, ПвБПнг(A)-FRHF max. 90 °С;
  - ППГнг(A)-HF, ППГЭнг(A)-HF, ПБПнг(A)-HF, ППГнг(A)-FRHF, ППГЭнг(A)-FRHF, ПБПнг(A)-FRHF max. 70 °С.
- 7. Operation at ambient temperature from - 50°C to +50°C.
- 8. Laying without preheating can be performed at ambient temperature not less than minus 15 °С.
- 9. Cable bending radius by laying, min.:
  - single-conductor cable           10 cable diameters;
  - multi-conductor cable           7,5 cable diameters.

#### DELIVERY

1. The cables are delivered on wooden drums acc. to GOST 5151-79 «Wooden drums for electrical wires and cables». Packing and marking comply with GOST 18690-2012 «Cables, wires, cords and cable accessories»
2. Max. cable length on drum is limited by weight of 5 tons.

#### BASIC RANGE OF PRODUCTS

Cable type		number of conductors	Nominal cross-section of main conductors, mm <sup>2</sup>	
			Nominal voltage, kV	
			0,66	1
TU 16.K71-304-2001	ППГнг(A)-HF, ППГЭнг(A)-HF	1	1,5 – 50	1,5 – 630
		2, 3, 4, 5		1,5 – 240
	ПБПнг(A)-HF	1	2,5 – 50	(10 – 630)*
		2, 3, 4, 5		2,5 – 240
	ПвПГнг(A)-HF	1	-	16 – 630
		2, 3, 4, 5		16 – 240
TU 16.K71-339-2004	ППГнг(A)-FRHF, ППГЭнг(A)-FRHF,	1	1,5 – 50	1,5 – 630
		2, 3, 4, 5		1,5 – 240
	ПвПГнг(A)-FRHF, ПвПГЭнг(A)-FRHF	1	-	16 – 630
		2, 3, 4, 5		16 – 240
	ПБПнг(A)-FRHF	2, 3, 4, 5	1,5 – 50	1,5 – 240
		ПвБПнг(A)-FRHF		2, 3, 4, 5

\* for operation in DC networks only