

## **Cables universal flame retardant for fire and security alarm КУИИ-СП manufactured acc. to TU 3581-031-76960731-2014**

Cables КУИИ-СП fully comply with the federal law number 123 "Technical Regulations on fire safety requirements", GOST R 53315-2009 "Cable products. Fire safety requirements", Code of SP fire protection systems 5.13130.2009 and СП 6.13130.2009. The cables have a higher fire resistance limit ПО1 and is able to operate in the conditions of fire, do not less than 180 minutes.

The cables fully comply with the technical regulations of the Customs Union TP TC 012/2011 "On the safety of equipment for use in explosive atmospheres" and GOST R MEC 60079-14-2008 "Explosive atmospheres . Part of the 14. Design, selection and installation of electrical installations", so they can be used in hazardous zones of all classes (except lightweight performance cables – with index "O").

### **Application area**

Fire-resistant cables are designed for single and group fixed installation in the modern systems as:

- Fire trails and security alarm;
- cable connection between the fire detectors and control panels in the address and indirect systems;
- cable to the alert systems and evacuation management (СОУЭ);
- at emergency ventilation and smoke protection systems;
- at automatic fire-extinguishing systems;
- and at other systems that must continue to operate in the fire conditions.

The cables are designed for indoor and outdoor installation at the objects to which increased fire safety requirements are applied :

- technically complex objects (subways, high-rise buildings, airports, river ports, tunnels, bridges, industrial facilities)
- with mass stay of people (high-rise buildings and office centers, hotels, children's preschool educational institutions, specialized nursing homes, hospitals, dormitories of educational institutions and residential child care institutions),
- hazardous production facilities (waterworks, thermal power plants, oil storage depots, hazardous areas and etc).

Primary application area of these cables taking into account the type of execution and fire safety class in accordance with ГОСТ Р 53315-2009 is listed in the Table 4.

### **Cable Design**

The conductors, solid or stranded, "мж", made of tinned "л" or untinned copper wire. Class of conductors in accordance with GOST 22483 set in the Table 2. Cables of extra-flexibility "Г" have got a core of class 5. Number of pairs and nominal cross-section of conductors are given in Table 2. The colouring of insulated cores listed in the Table 3. Conductors twisted into a pair in order to reduce the influence of electromagnetic interference .

Fire-resistant cables with material index "P" are insulated with the silicone rubber, which forms solid ceramic insulation around the conductor in case of fire. . In all other cables, fire resistance is achieved by using mica tape imposed on a core before the imposition of insulation. The use of mica tape provides maximum resistance to mechanical impacts in the fire.

The cables may have a shield: each pair individually and / or the shared for all pairs. Shields can be made as:

- braid of copper wire - "ЭМ",
- tinned copper wire - "Эл",
- aluminium-foil film (AlumoFlex ) with drain tinned copper wire "Э".

Individual shields can be isolated with each other, and also be made combined - to combine AlumoFlex and copper braid.

The cables have got a round shape and the substrate (special filling) obtained by extrusion, preventing the free flow of gas under the shell. Cables of light performance ("O" index) have not got the substrate, and due to this - can't be used in explosive hazardous areas.

The cables may be manufactured with water swelling element "B" that is imposed on the top of twisted pairs core and prevents the moisture propagation under the sheath. Cables may have armour of galvanized steel wire "K", or galvanized steel tapes "Б". The outer sheath is superimposed on top of an armour.

The Table 1 shows the insulation and sheath , and the corresponding fire safety index.

By customised order cables can be produced with the combined cross-section of conductors.

Service life of cables made with thermoplastic elastomer "T" is not less than 25 years, all other cable - not less than 30 years.

Table 1. Fire safety index depending on the insulation and sheath , the maximum operating temperature

Sheath and insulation material	Fire safety index	Sheath and insulation material ; all cables are flame retardant if laying in group.	The maximum operating temperature of the cable, °C
B	нг(A)-FRLS	insulation and sheath made of PVC compound with low smoke and gas emission	75
	нг(A)-FRLSLTx	insulation and sheath made of PVC compound with low smoke and gas emission, low toxicity of combustion products	75
П	нг(A)-FRHF	insulation and sheath made of halogen free polymer compositions	75
	нг(A)-FRHFLTx	insulation and sheath made of of halogen free polymer compositions with low toxicity of the combustion products	75
T	нг(A)-FR	insulation and sheath made of thermoplastic elastomers	120
T-150	нг(A)-FR	insulation and sheath made of high heat resistant thermoplastic elastomer	150
У	нг(A)-FR	insulation and sheath made of polyurethane	120
У-250	нг(A)-FR	insulation and sheath made of high temperature composition	250
Ф	нг(A)-FR	insulation and sheath made of fluoropolymer (Teflon)	220
PB	нг(A)-FRLS	insulation made of silicone rubber; sheath made of PVC compound with low smoke and gas emission	75
ПП	нг(A)-FRHF	insulation made of silicone rubber; sheath made of halogen free polymer compositions	75
PT	нг(A)-FR	insulation made of silicone rubber; sheath made of thermoplastic elastomer	75

Table 1. Fire safety index depending on the insulation and sheath, the maximum operating temperature

PY	нr(A)-FR	insulation made of silicone rubber, sheath made of polyurethane	75
PY-250	нr(A)-FR	insulation made of silicone rubber; sheath made of heat resistant composition	75
PΦ	нr(A)-FR	insulation made of silicone rubber; sheath made of fluoropolymer	75

Table 2. Number and nominal cross-section of pairs, class of cores

Number of twisted pairs	Cross-section, mm <sup>2</sup>	Insulation and sheath material index	Grade copper conductors ГОСТ 22483-77		
			solid conductor	stranded conductor "МЖ"	flexible stranded conductor "Г"
1..10	0,20	PB, PП, ПТ, PУ, PY-250, PΦ	1	4	5
	0,35				
	0,50				
	0,75				
	1,0				
	1,5				
	2,5	All materials	1	4 for "Т" and "Т-150"; other - 3	5

Table 3. The colouring of conductor insulation

Number of pairs	Colour of conductors in the pair	
1	white	blue
2		orange
3		green
4		brown
5		grey
6	red	blue
7		orange
8		green
9		brown
10		grey

Table 4. Primary application area of cables taking into account the type of execution and fire safety class GOST R 53315-2009

Type of execution	Class of fire safety	Primary area of application for the GOST R 53315-2009
нг(А)-FR	П16.1.2.2.3	
нг(А)-FRLS	П16.1.2.2.2	For installation, taking into account the amount of cables combustive load, in fire protection systems, and other systems that must continue to operate in the fire conditions
нг(А)-FRHF	П16.1.1.2.1	
нг(А)-FRLSLTx	П16.1.2.1.2	For installation, taking into account the amount of cables combustive load, in the fire protection systems, and other systems that must continue to operate in the conditions of fire - in buildings and pre-school educational institutions, specialized nursing homes, hospitals in sleeping buildings residential educational institutions, and children's institutions