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## ПвЭгаПнг-45 1х400 ТУ У 31.3-00214534-060:2011

Power cables with copper conductor, flame-retardant, with XLPE, longitudinal and transverse screen sealing and polymer compound outer sheath

For the cable of this mark correspond the foreign-made analogues: HXCHBMK (FI)

Technical cable requirements correspond to IEC 60840

Cables are used for laying:

- in premises, tunnels, ducts, mines, dry soil and outdoor under shelter
- · single laying

It is possible to manufacture cables with extruded semiconductor layer along outer sheath.

Order entry example:

ПвЭгаПнг-П-45 1х400/95 ТУ У 31.3-00214534-060:2011

An extruded semiconductor layer along outer sheath ensures the correct testing of cable line with sections of underground laying in polymer pipes.

It is possible to manufacture cables with an integrated fiber-optic module.

Order entry example:

ПвЭгаПнг-45 1х400/95 (ОМ) ТУ У 31.3-00214534-060:2011

In conjunction with the DTS system, the integrated fiber-optic module can act as a distributed cable line temperature sensor.

It is possible to manufacture cable with sealed conductor.

Order entry example:

ПвЭгаПнг-45 1х400/95 (г) ТУ У 31.3-00214534-060:2011

Fire safety code in accordance with ДСТУ 4809:2007: ПБ101122000

Products of this mark meet the requirements:

- · single wire cable flame retardance
- toxicity class Tk1 of the combustion products of nonmetallic elements (toxicity index from 13 up to 40 g/m<sup>3</sup>)
- class  $\mathcal{L}T\kappa 1$  on smoke-forming ability by smouldering of non-metallic elements (coefficient of smoke formation from 50 to 500 m<sup>2</sup>/kg)
- class ДΠκ2 on smoke-forming ability by combustion (minimum luminous flux more than 60 %)
- corrosive class  $K\kappa 2$  of combustion products of non-metallic elements (the number of halogen hydrides less than 150 mg/g, pH more than 4.3, specific conductivity less than 10  $\mu$ S/mm)







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## ПвЭгаПнг-45 1х400 ТУ У 31.3-00214534-060:2011

Power cables with copper conductor, flame-retardant, with XLPE, longitudinal and transverse screen sealing and polymer compound outer sheath

### **TECHNICAL SPECIFICATIONS**

Maximum voltage     kV     52       Conductor rated area     mm²     400       Minimum screen cross-section     mm²     35       Partial discharge factor for rated voltage, not more than     pC     6       Permissible short circuit current across the screen of minimum cross-section     kA     5.1       Maximum permissible short-circuit current in core     kA     57.2       Permissible continious current rating by aerial laying *     *       • in trefoil formation with double-side screen earthing     A     742       • in trefoil formation with single-side screen earthing or cross screen earthing     A     793       • plane with double-side screen earthing or cross screen earthing or plane with single-side screen earthing or cross screen earthing     A     940       • plane with single-side screen earthing or cross screen earthing     A     603       • in trefoil formation with double-side screen earthing or cross screen earthing     A     651       • plane with double-side screen earthing or cross screen earthing     A     683       • plane with single-side screen earthing or cross screen     A     683       • plane with single-side screen earthing or cross screen     A     683       • plane with single-side screen earthing or cross screen     A     683       • plane with single-side screen earthing or cross screen     C     +90       •	Rated voltage	kV	45
Conductor rated area       mm²       400         Minimum screen cross-section       mm²       35         Partial discharge factor for rated voltage, not more than       pC       6         Permissible short circuit current across the screen of       kA       5.1         minimum cross-section       kA       5.2         Maximum permissible short-circuit current in core       kA       57.2         Permissible continious current rating by aerial laying *           • in trefoil formation with double-side screen earthing       A       742         • in trefoil formation with single-side screen earthing or cross screen earthing       A       793         • plane with double-side screen earthing or cross screen       A       940         • plane with single-side screen earthing or cross screen       A       603         • in trefoil formation with double-side screen earthing or cross screen earthing       A       651         • in trefoil formation with single-side screen earthing or cross screen       A       651         • plane with double-side screen earthing or cross screen       A       683         • plane with single-side screen earthing or cross screen       A       683         • plane with single-side screen earthing or cross screen       A       683         • continious		kV	52
Minimum screen cross-section       mm²       35         Partial discharge factor for rated voltage, not more than       pC       6         Permissible short circuit current across the screen of minimum cross-section       kA       5.1         Maximum permissible short-circuit current in core       kA       57.2         Permissible continious current rating by aerial laying *       *         • in trefoil formation with double-side screen earthing or in trefoil formation with single-side screen earthing or cross screen earthing       A       742         • in trefoil formation with single-side screen earthing or cross screen earthing       A       793         • plane with double-side screen earthing or cross screen       A       940         • plane with single-side screen earthing or cross screen earthing       A       603         • in trefoil formation with double-side screen earthing or cross screen earthing       A       651         • in trefoil formation with single-side screen earthing or cross screen earthing       A       651         • plane with double-side screen earthing or cross screen       A       683         • plane with single-side screen earthing or cross screen       A       683         • plane with single-side screen earthing or cross screen       A       683         • plane with single-side screen earthing or cross screen       A       683 </td <td>Conductor rated area</td> <td>mm²</td> <td>400</td>	Conductor rated area	mm²	400
Permissible short circuit current across the screen of minimum cross-section  Maximum permissible short-circuit current in core  kA 57.2  Permissible continious current rating by aerial laying *  in trefoil formation with double-side screen earthing A 742  in trefoil formation with single-side screen earthing or cross screen earthing what single-side screen earthing A 793  plane with double-side screen earthing A 738  plane with single-side screen earthing or cross screen  arthing  Permissible continious current rating by burial *  in trefoil formation with double-side screen earthing A 603  in trefoil formation with single-side screen earthing or A 651  cross screen earthing  plane with double-side screen earthing or A 651  cross screen earthing  plane with double-side screen earthing A 683  earthing  Maximum permissible conductor temperature  Continious C +90  in emergency operation C +130  at short circuit C +250  Operating temperature range C C -60 +50  Minimum bending radius by laying mm 944  Rated outer diameter of the cable (for reference) **  mm 59  Cable weight (approximate) kg/km 7310  Rated factory cable length and gross weight of the delivery m, t #22VJ-60: 475 · 4.4  #26VJ-100: **** 1119 · 10.	Minimum screen cross-section	mm²	35
minimum cross-section  Maximum permissible short-circuit current in core  Permissible continious current rating by aerial laying *  · in trefoil formation with double-side screen earthing or cross screen earthing  · plane with double-side screen earthing or cross screen earthing  · plane with single-side screen earthing or cross screen earthing  Permissible continious current rating by burial *  · in trefoil formation with double-side screen earthing or cross screen earthing  Permissible continious current rating by burial *  · in trefoil formation with double-side screen earthing or cross screen earthing in trefoil formation with single-side screen earthing or cross screen earthing  · plane with double-side screen earthing or cross screen earthing  A 549  · plane with single-side screen earthing or cross screen A 683  earthing  Maximum permissible conductor temperature  · Continious  · C +90  · in emergency operation · C +130  · at short circuit · C +250  Operating temperature range · C -60 +50  Minimum bending radius by laying  Mated outer diameter of the cable (for reference) **  mm 59  Cable weight (approximate)  Kg/km 7310  Rated factory cable length and gross weight of the delivery on the drums ***  # 25VJL-90: 838 · 7.7  # 26VJL-100: **** 1119 · 10.	Partial discharge factor for rated voltage, not more than	рС	6
Maximum permissible short-circuit current in corekA57.2Permissible continious current rating by aerial laying *.in trefoil formation with double-side screen earthing or cross screen earthingA742.in trefoil formation with single-side screen earthing or cross screen earthingA793.plane with double-side screen earthing or cross screen earthingA940Permissible continious current rating by burial * .in trefoil formation with double-side screen earthing or .in trefoil formation with single-side screen earthing or .in trefoil formation with single-side screen earthing or .plane with double-side screen earthing or .plane with double-side screen earthing or cross screen .plane with single-side screen e	Permissible short circuit current across the screen of	kA	5.1
Permissible continious current rating by aerial laying *  in trefoil formation with double-side screen earthing or cross screen earthing with single-side screen earthing or cross screen earthing with double-side screen earthing or cross screen earthing has been earthing or cross screen earthing or cross screen earthing earthing  Permissible continious current rating by burial *  in trefoil formation with double-side screen earthing or earthing or cross screen earthing or earthing and formation with single-side screen earthing or earthing or earthing or earthing earthing and followed by the earthing or earthing or earthing or earthing	minimum cross-section		
• in trefoil formation with double-side screen earthingA742• in trefoil formation with single-side screen earthing or cross screen earthingA793• plane with double-side screen earthing or cross screen earthingA940Permissible continious current rating by burial * • in trefoil formation with double-side screen earthing or cross screen earthingA603• in trefoil formation with single-side screen earthing or cross screen earthingA651cross screen earthing • plane with double-side screen earthing or cross screen earthingA549• plane with single-side screen earthing or cross screen earthingA683Maximum permissible conductor temperature• C+90• in emergency operation° C+90• in emergency operation° C+250• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 229/Д-60: 475 • 4.4on the drums ***# 259/Д-90: 838 • 7.7# 269/Д-100: **** 1119 • 10.	Maximum permissible short-circuit current in core	kA	57.2
• in trefoil formation with single-side screen earthing or cross screen earthing A 793   • plane with double-side screen earthing or cross screen A 940   • plane with single-side screen earthing or cross screen A 940   earthing A 603   • In trefoil formation with double-side screen earthing or cross screen earthing A 651   • plane with double-side screen earthing or cross screen earthing A 683   • plane with double-side screen earthing or cross screen A 683   • plane with single-side screen earthing or cross screen A 683   • plane with single-side screen earthing or cross screen A 683   • plane with single-side screen earthing or cross screen C 683   • plane with single-side screen earthing or cross screen C 683   • continious ° C +90   • in emergency operation ° C +90   • in emergency operation ° C +130   • at short circuit ° C +250   Operating temperature range ° C -60 +50   Minimum bending radius by laying mm 944   Rated outer diameter of the cable (for reference) ** mm 59   Cable weight (approximate) kg/km 7310   Rated factory cable length and gross weight of the delivery on the drums *** m, t #22YД-60: 475 • 4.4   on the drums *** #25YД-90: 838 • 7.7   #26YД-100: **** 1119 • 10.	Permissible continious current rating by aerial laying *		
ross screen earthing plane with double-side screen earthing or cross screen plane with single-side screen earthing or cross screen permissible continious current rating by burial * in trefoil formation with double-side screen earthing or A 651 cross screen earthing in trefoil formation with single-side screen earthing or A 651 cross screen earthing plane with double-side screen earthing or A 683 plane with single-side screen earthing or cross screen screen earthing or cros	in trefoil formation with double-side screen earthing	Α	742
<ul> <li>plane with double-side screen earthing</li> <li>plane with single-side screen earthing or cross screen</li> <li>permissible continious current rating by burial *</li> <li>in trefoil formation with double-side screen earthing</li> <li>in trefoil formation with single-side screen earthing or cross screen earthing</li> <li>plane with double-side screen earthing</li> <li>plane with double-side screen earthing or cross screen</li> <li>plane with single-side screen earthing or cross screen earthing or cross screen</li> <li>plane with single-side screen earthing or</li></ul>	in trefoil formation with single-side screen earthing or	Α	793
• plane with single-side screen earthing or cross screen earthing  Permissible continious current rating by burial * • in trefoil formation with double-side screen earthing or cross screen earthing • in trefoil formation with single-side screen earthing or cross screen earthing • plane with double-side screen earthing or cross screen earthing • plane with single-side screen earthing or cross screen • plane with single-side screen earthing or cross screen • A 683  earthing  Maximum permissible conductor temperature • Continious • °C +90 • in emergency operation • at short circuit • °C +250  Operating temperature range • °C -60 +50  Minimum bending radius by laying  Mated outer diameter of the cable (for reference) **  Cable weight (approximate)  Rated factory cable length and gross weight of the delivery on the drums ***  # 25УД-60: 475 • 4.4  # 25УД-90: 838 • 7.7  # 26УД-100: **** 1119 • 10.	cross screen earthing		
Permissible continious current rating by burial *  · in trefoil formation with double-side screen earthing	plane with double-side screen earthing	Α	738
Permissible continious current rating by burial *     · in trefoil formation with double-side screen earthing	plane with single-side screen earthing or cross screen	Α	940
<ul> <li>in trefoil formation with double-side screen earthing</li> <li>in trefoil formation with single-side screen earthing or cross screen earthing</li> <li>plane with double-side screen earthing</li> <li>plane with single-side screen earthing or cross screen</li> <li>continious</li> <li>C</li> <li>in emergency operation</li> <li>c</li> <li>t +30</li> <li>at short circuit</li> <li>C</li> <li>-250</li> <li>Operating temperature range</li> <li>C</li> <li>-60 +50</li> <li>Minimum bending radius by laying</li> <li>mm</li> <li>944</li> <li>Rated outer diameter of the cable (for reference) **</li> <li>mm</li> <li>59</li> <li>Cable weight (approximate)</li> <li>kg/km</li> <li>7310</li> <li>Rated factory cable length and gross weight of the delivery on the drums ***</li> <li># 22УД-60: 475 • 4.4</li> <li># 25УД-90: 838 • 7.7</li> <li># 26УД-100: **** 1119 • 10.</li> </ul>	earthing		
• in trefoil formation with single-side screen earthing or cross screen earthingA651• plane with double-side screen earthingA549• plane with single-side screen earthing or cross screen earthingA683Maximum permissible conductor temperature• Continious° C+90• in emergency operation° C+130• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4# 25УД-90: 838 • 7.7 # 26УД-100: **** 1119 • 10.	Permissible continious current rating by burial *		
cross screen earthing  • plane with double-side screen earthing  • plane with single-side screen earthing or cross screen  earthing  Maximum permissible conductor temperature  • Continious  • in emergency operation  • at short circuit  • C  — +250  Operating temperature range  Minimum bending radius by laying  Rated outer diameter of the cable (for reference) **  mm  59  Cable weight (approximate)  Rated factory cable length and gross weight of the delivery on the drums ***  # 25 / Д-90: 838 • 7.7 # 26 / Д-100: **** 1119 • 10.	in trefoil formation with double-side screen earthing	Α	603
• plane with double-side screen earthingA549• plane with single-side screen earthing or cross screen earthingA683Maximum permissible conductor temperature° C+90• Continious° C+130• in emergency operation° C+250• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***# 22УД-60: 475 • 4.4# 25УД-90: 838 • 7.7# 25УД-90: 838 • 7.7# 26УД-100: ***** 1119 • 10.	in trefoil formation with single-side screen earthing or	Α	651
• plane with single-side screen earthing or cross screen earthingA683Maximum permissible conductor temperature• Continious° C+90• in emergency operation° C+130• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4# 25УД-90: 838 • 7.7 # 26УД-100: ***** 1119 • 10.	cross screen earthing		
earthingMaximum permissible conductor temperature• Continious° C+90• in emergency operation° C+130• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4*** 25УД-90: 838 • 7.7# 25УД-90: 838 • 7.7# 26УД-100: **** 1119 • 10.		Α	549
Maximum permissible conductor temperature°C+90• Continious°C+90• in emergency operation°C+130• at short circuit°C+250Operating temperature range°C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4• 25УД-90: 838 • 7.7# 26УД-100: **** 1119 • 10.	<ul> <li>plane with single-side screen earthing or cross screen</li> </ul>	Α	683
· Continious° C+90· in emergency operation° C+130· at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4**** # 25УД-90: 838 • 7.7# 26УД-100: **** 1119 • 10.	earthing		
• in emergency operation° C+130• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4**** # 25УД-90: 838 • 7.7# 26УД-100: **** 1119 • 10.	Maximum permissible conductor temperature		
• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 475 • 4.4on the drums ***# 25УД-90: 838 • 7.7# 26УД-100: **** 1119 • 10.	Continious		+90
Operating temperature range° C-60 +50Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4****# 25УД-90: 838 • 7.7# 26УД-100: ***** 1119 • 10.	in emergency operation	°C	+130
Minimum bending radius by layingmm944Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4# 25УД-90: 838 • 7.7# 26УД-100: **** 1119 • 10.	at short circuit		+250
Rated outer diameter of the cable (for reference) **mm59Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4# 25УД-90: 838 • 7.7 # 26УД-100: **** 1119 • 10.		° C	-60 +50
Cable weight (approximate)kg/km7310Rated factory cable length and gross weight of the delivery on the drums ***m, t# 22УД-60: 475 • 4.4# 25УД-90: 838 • 7.7 # 26УД-100: **** 1119 • 10.		mm	944
Rated factory cable length and gross weight of the delivery on the drums *** # 22УД-60: 475 • 4.4 # 25УД-90: 838 • 7.7 # 26УД-100: **** 1119 • 10.	Rated outer diameter of the cable (for reference) **	mm	59
on the drums *** # 25УД-90: 838 • 7.7 # 26УД-100: **** 1119 • 10.	Cable weight (approximate)	kg/km	7310
# 26УД-100: **** 1119 · 10.		m, t	• •
• •	on the drums ***		# 25УД-90: 838 • 7.7
0			# 26УД-100: **** 1119 • 10.
			0

#### Notes:

When ordering it is neccesary to agree the factory length of the product with the manufacturer

<sup>\*</sup> Long permissible current loads are calculated for the following conditions: conductor temperature 90 °C, air temperature 30 °C, soil temperature 20 °C, load factor 1.0, thermal resistivity of soil 1.0 °K • m/W, laying depth in the ground 1.5 m, while laying in flat formation the distance between cables in clear is equal to the cable diameter, while laying in trefoil formation cables are laid side by side

<sup>\*\*</sup> The external diameter may differ from the rated up to  $\pm$  10 %

<sup>\*\*\*</sup> Отклонение фактической массы брутто от указанного значения может составлять ± 7 %

<sup>\*\*\*\*</sup> Option delivery on not full drum







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# ПвЭгаПнг-45 1х400 ТУ У 31.3-00214534-060:2011

Power cables with copper conductor, flame-retardant, with XLPE, longitudinal and transverse screen sealing and polymer compound outer sheath



#### **CONSTRUCTION**

1. Copper multiwire compact conductor

Note: It is possible to manufacture cable with sealed conductor.

- 2. Inner extruded semiconducting layer
- 3. XLPE insulation
- 4. Outer extruded semiconducting layer
- 5. Lapping layer of semiconductive swellable tape
- 6. Copper screen

Note: It is possible to manufacture a cable with a fiber optic module built into the screen, including as a DTS system sensor

- 7. Lapping layer of semiconductive swellable tape
- 8. Alumopolymer tape
- 9. Flame-retardant polymer compound outer sheath

Note: It is possible to manufacture cable with extruded semiconductor layer along outer sheath