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# ПвЭгаПнг-HF-110 1x400 ТУ У 31.3-00214534-060:2011

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

Technical cable requirements correspond to IEC 60840

Cables are used for laying:

- in premises, tunnels, ducts, mines, dry soil and outdoor under shelter
- at sites, where low smoke and corrosive gas emission are required (NPP, subway, large industrial facilities, high-rise buildings, etc.)

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

Order entry example:

ПвЭгаПнг-НF-П-110 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-HF-110 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-HF-110 1х400/95 (г) ТУ У 31.3-00214534-060:2011

Fire safety code in accordance with ДСТУ 4809:2007: ΠБ122122000

Products of this mark meet the requirements:

- · single wire cable flame retardance
- bunched cable flame retardance category A
- toxicity class Tk2 of the combustion products of nonmetallic elements (toxicity index from 40 up to 120 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)











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

## **TECHNICAL SPECIFICATIONS**

Maximum voltage kV 126 Conductor rated area mm³ 400 Minimum screen cross-section mm³ 35 Partial discharge factor for rated voltage, not more than pC 6 Permissible short circuit current across the screen of kA 7.1 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 784 • in trefoil formation with single-side screen earthing or cross screen earthing A 826 cross screen earthing A 792 • plane with double-side screen earthing or cross screen earthing O PS4 • in trefoil formation with single-side screen earthing A 954 earthing Permissible continious current rating by burial * • in trefoil formation with double-side screen earthing O PS4 • in trefoil formation with double-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation with single-side screen earthing O PS4 • in trefoil formation w	Rated voltage	kV	110
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       7.1         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       784         • in trefoil formation with single-side screen earthing or       A       826         cross screen earthing       A       792         • plane with double-side screen earthing or cross screen       A       954         earthing       A       792         Permissible continious current rating by burial *           • in trefoil formation with double-side screen earthing or cross screen earthing       A       619         • in trefoil formation with single-side screen earthing or       A       662         cross screen earthing       A       662         cross screen earthing       A       667         • plane with double-side screen earthing or cross screen       A       694         earthing       A <td></td> <td>kV</td> <td>126</td>		kV	126
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       7.1         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       784         • in trefoil formation with single-side screen earthing or cross screen earthing       A       826         cross screen earthing       A       792         • plane with double-side screen earthing or cross screen       A       954         earthing       A       619         Permissible continious current rating by burial *       • in trefoil formation with double-side screen earthing or cross screen earthing or cross screen earthing       A       662         • in trefoil formation with single-side screen earthing or cross screen       A       662         • plane with double-side screen earthing or cross screen       A       694         • across screen earthing       A       567         • plane with single-side screen earthing or cross screen       A       694         • continious       °       C       +90	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 or A 826  · in trefoil formation with single-side screen earthing or A 826  cross screen earthing  · plane with double-side screen earthing or cross screen A 954  earthing  Permissible continious current rating by burial *  · in trefoil formation with double-side screen earthing or A 619  · in trefoil formation with double-side screen earthing or A 662  cross screen earthing  · in trefoil formation with single-side screen earthing or A 662  ross screen earthing  · plane with double-side screen earthing or A 694  earthing  Maximum permissible conductor temperature  · Continious  · in emergency operation  · in emergency operation  · c +30  in emergency operation  · c +250  Operating temperature range  Minimum bending radius by laying  mm 1200  Rated outer diameter of the cable (for reference) **  mm 75  Cable weight (approximate)  Rated factory cable length and gross weight of the delivery  m, t # 22YД-60: 319 · 4.1	Minimum screen cross-section		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 A 826  cross screen earthing  plane with double-side screen earthing or cross screen earthing  plane with single-side screen earthing or cross screen A 954  earthing  Permissible continious current rating by burial *  in trefoil formation with double-side screen earthing or A 662  cross screen earthing  in trefoil formation with double-side screen earthing or A 662  cross screen earthing  plane with double-side screen earthing or A 662  cross screen earthing  in trefoil formation with single-side screen earthing or A 664  cross screen earthing  cross screen earthing  in the foil formation with single-side screen earthing or Cross screen A 694  earthing  Maximum permissible conductor temperature  Continious  cross in emergency operation  cross cross of C +90  in emergency operation  cross cross of C +250  Operating temperature range  multiplication of C +250  Minimum bending radius by laying  multiplication of C -60 +50  Minimum bending radius by laying  Rated outer diameter of the cable (for reference) **  multiplication of the delivery	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 earthingA784in trefoil formation with single-side screen earthing or cross screen earthingA826A792plane with double-side screen earthing or cross screenA954earthingA619Permissible continious current rating by burial *in trefoil formation with double-side screen earthing or cross screen earthingA662cross screen earthingA567plane with double-side screen earthing or cross screenA694earthingA694Maximum permissible conductor temperatureC+90in emergency operation°C+130at short circuit°C+250Operating temperature range°C-60 +50Minimum bending radius by layingmm1200Rated outer diameter of the cable (for reference) **mm75Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22yД-60: 319 · 4.1	Permissible short circuit current across the screen of	kA	7.1
Permissible continious current rating by aerial laying *  in trefoil formation with double-side screen earthing or cross screen earthing or plane with double-side screen earthing or plane with double-side screen earthing or cross screen earthing or plane with double-side screen 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 cross screen earthing or cross screen earthing or cross screen earthing or eross screen earthing earthing earthing earthing or cross screen earthing e	minimum cross-section		
• in trefoil formation with double-side screen earthing       A       784         • in trefoil formation with single-side screen earthing or cross screen earthing       A       826         cross screen earthing       A       792         • plane with double-side screen earthing or cross screen earthing       A       954         earthing       A       954         Permissible continious current rating by burial *       • in trefoil formation with double-side screen earthing       A       619         • in trefoil formation with single-side screen earthing or       A       662         cross screen earthing       A       567         • plane with double-side screen earthing or cross screen       A       694         earthing       A       694         earthing       C       +90         Maximum permissible conductor temperature       ° 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       1200         Rated outer diameter of the cable (for reference) **       mm       75	Maximum permissible short-circuit current in core	kA	57.2
<ul> <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>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</li> <li>plane with single-side screen earthing or cross screen</li> <li>continious</li> <li>*C</li> <li>+90</li> <li>in emergency operation</li> <li>*C</li> <li>+130</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>1200</li> <li>Rated outer diameter of the cable (for reference) **</li> <li>mm</li> <li>75</li> <li>Cable weight (approximate)</li> <li>kg/km</li> <li>9880</li> <li>Rated factory cable length and gross weight of the delivery</li> <li>m, t</li> <li># 22УД-60: 319 · 4.1</li> </ul>	Permissible continious current rating by aerial laying *		
cross screen earthing  • plane with double-side screen earthing or cross screen  • plane with single-side screen earthing or cross screen  earthing  Permissible continious current rating by burial *  • in trefoil formation with double-side screen earthing  • in trefoil formation with single-side screen earthing or  cross screen earthing  • plane with double-side screen earthing or  plane with single-side screen earthing or cross screen  earthing  Maximum permissible conductor temperature  • Continious  • C +90  • in emergency operation  • C +130  • at short circuit  • C +250  Operating temperature range  Minimum bending radius by laying  Rated outer diameter of the cable (for reference) **  mm 75  Cable weight (approximate)  Rated factory cable length and gross weight of the delivery  m, t # 22УД-60: 319 • 4.1	in trefoil formation with double-side screen earthing	Α	784
<ul> <li>plane with double-side screen earthing</li> <li>plane with single-side screen earthing or cross screen</li> <li>earthing</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</li> <li>plane with single-side screen earthing or cross screen</li> <li>plane with single-side screen earthing or cross screen</li> <li>plane with single-side screen earthing or cross screen</li> <li>earthing</li> <li>Maximum permissible conductor temperature</li> <li>Continious</li> <li>continious</li> <li>c +90</li> <li>in emergency operation</li> <li>c +130</li> <li>at short circuit</li> <li>c +250</li> <li>Operating temperature range</li> <li>c -60 +50</li> <li>Minimum bending radius by laying</li> <li>mm 1200</li> <li>Rated outer diameter of the cable (for reference) **</li> <li>mm 75</li> <li>Cable weight (approximate)</li> <li>kg/km 9880</li> <li>Rated factory cable length and gross weight of the delivery</li> <li>m, t #22yД-60: 319 · 4.1</li> </ul>	in trefoil formation with single-side screen earthing or	Α	826
• plane with single-side screen earthing or cross screen earthing       A       954         Permissible continious current rating by burial *       • in trefoil formation with double-side screen earthing       A       619         • in trefoil formation with single-side screen earthing or cross screen earthing       A       662         • plane with double-side screen earthing or cross screen earthing       A       567         • plane with single-side screen earthing or cross screen earthing       A       694         Maximum permissible conductor temperature       • 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       1200         Rated outer diameter of the cable (for reference) **       mm       75         Cable weight (approximate)       kg/km       9880         Rated factory cable length and gross weight of the delivery       m, t       # 229Д-60: 319 • 4.1	cross screen earthing		
earthing Permissible continious current rating by burial * • in trefoil formation with double-side screen earthing • in trefoil formation with single-side screen earthing or A 662 cross screen earthing • plane with double-side screen earthing A 567 • plane with single-side screen earthing or cross screen • plane with single-side screen earthing or cross screen • A 694 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 Rated outer diameter of the cable (for reference) **  Cable weight (approximate) Rated factory cable length and gross weight of the delivery  m, t # 22УД-60: 319 • 4.1	plane with double-side screen earthing	Α	792
Permissible continious current rating by burial *  • in trefoil formation with double-side screen earthing  • in trefoil formation with single-side screen earthing or  • in trefoil formation with single-side screen earthing or  • plane with double-side screen earthing  • plane with single-side screen earthing or cross screen  • plane with single-side screen earthing or cross screen  • continious  • C +90  • in emergency operation  • C +130  • at short circuit  • C +250  Operating temperature range  Minimum bending radius by laying  Rated outer diameter of the cable (for reference) **  Cable weight (approximate)  Rated factory cable length and gross weight of the delivery  m, t # 22УД-60: 319 • 4.1	plane with single-side screen earthing or cross screen	Α	954
• in trefoil formation with double-side screen earthingA619• in trefoil formation with single-side screen earthing or cross screen earthingA662• plane with double-side screen earthingA567• plane with single-side screen earthing or cross screen earthingA694Maximum permissible conductor temperature• Continious° C+90• in emergency operation° C+130• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm1200Rated outer diameter of the cable (for reference) **mm75Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 319 • 4.1	earthing		
<ul> <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>plane with single-side screen earthing or cross screen</li> <li>plane with single-side screen earthing or cross screen</li> <li>continious</li> <li>C</li> <li>in emergency operation</li> <li>in emergency</li></ul>	Permissible continious current rating by burial *		
cross screen earthing  • plane with double-side screen earthing  • plane with single-side screen earthing or cross screen  • plane with single-side screen earthing or cross screen  earthing  Maximum permissible conductor temperature  • Continious  • C +90  • in emergency operation  • C +130  • at short circuit  • C +250  Operating temperature range  Minimum bending radius by laying  Rated outer diameter of the cable (for reference) **  Cable weight (approximate)  Rated factory cable length and gross weight of the delivery  m, t # 22УД-60: 319 • 4.1	in trefoil formation with double-side screen earthing	Α	619
<ul> <li>plane with double-side screen earthing</li> <li>plane with single-side screen earthing or cross screen</li> <li>plane with double-side screen earthing</li> <li>plane with single-side screen</li> <li>plane with sc</li></ul>	<ul> <li>in trefoil formation with single-side screen earthing or</li> </ul>	Α	662
<ul> <li>plane with single-side screen earthing or cross screen earthing</li> <li>Maximum permissible conductor temperature</li> <li>Continious</li> <li>in emergency operation</li> <li>at short circuit</li> <li>C +250</li> <li>Operating temperature range</li> <li>C -60 +50</li> <li>Minimum bending radius by laying</li> <li>Rated outer diameter of the cable (for reference) **</li> <li>mm 75</li> <li>Cable weight (approximate)</li> <li>kg/km 9880</li> <li>Rated factory cable length and gross weight of the delivery</li> <li>m, t #22УД-60: 319 • 4.1</li> </ul>	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 layingmm1200Rated outer diameter of the cable (for reference) **mm75Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 319 • 4.1	<ul> <li>plane with double-side screen earthing</li> </ul>	Α	567
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 layingmm1200Rated outer diameter of the cable (for reference) **mm75Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 319 • 4.1	<ul> <li>plane with single-side screen earthing or cross screen</li> </ul>	Α	694
• Continious° C+90• in emergency operation° C+130• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm1200Rated outer diameter of the cable (for reference) **mm75Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 319 • 4.1	earthing		
• in emergency operation° C+130• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm1200Rated outer diameter of the cable (for reference) **mm75Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 319 • 4.1	Maximum permissible conductor temperature		
• at short circuit° C+250Operating temperature range° C-60 +50Minimum bending radius by layingmm1200Rated outer diameter of the cable (for reference) **mm75Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 319 • 4.1	Continious		+90
Operating temperature range °C -60 +50 Minimum bending radius by laying mm 1200 Rated outer diameter of the cable (for reference) ** mm 75 Cable weight (approximate) kg/km 9880 Rated factory cable length and gross weight of the delivery m, t # 22УД-60: 319 • 4.1	in emergency operation	° C	+130
Minimum bending radius by layingmm1200Rated outer diameter of the cable (for reference) **mm75Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 319 • 4.1	at short circuit		
Rated outer diameter of the cable (for reference) **mm75Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 319 • 4.1	Operating temperature range	° C	-60 +50
Cable weight (approximate)kg/km9880Rated factory cable length and gross weight of the deliverym, t# 22УД-60: 319 • 4.1		mm	1200
Rated factory cable length and gross weight of the delivery m, t # 22УД-60: 319 • 4.1	Rated outer diameter of the cable (for reference) **	mm	75
	Cable weight (approximate)	kg/km	9880
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• •	on the drums ***		# 25УД-90: 443 • 5.9
# 26УД-100: 664 • 8.4			# 26УД-100: 664 • 8.4

### 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 %

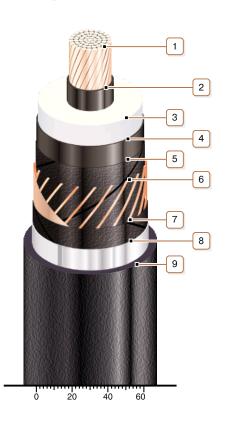






# ПвЭгаПнг-HF-110 1x400 ТУ У 31.3-00214534-060:2011

Power cables with copper conductor, flame-retardant and halogen-free, 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. Polymer compound outer sheath:flame-retardant and halogen-free Note: It is possible to manufacture cable with extruded semiconductor layer along outer sheath