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# АПвЭгаПнг-45 1x2000 ТУ У 31.3-00214534-060:2011



Power cables with aluminium 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: AHXCHBMK (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:

АПвЭгаПнг-П-45 1x2000/95 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:

АПвЭгаПнг-45 1x2000/95 (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:

АПвЭгаПнг-45 1x2000/95 (г) ТУ У 31.3-00214534-060:2011

Fire safety code in accordance with ДСТУ 4809:2007: ПБ121122000

Products of this mark meet the requirements:

single wire cable flame retardance

bunched cable flame retardance category A

• toxicity class Tk1 of the combustion products of nonmetallic elements (toxicity index from 13 up to 40 g/m<sup>3</sup>)

• class  $\Pi \kappa 1$  on smoke-forming ability by smouldering of non-metallic elements (coefficient of smoke formation from 50 to 500 m<sup>2</sup>/kg)

• class ДΠк2 on smoke-forming ability by combustion (minimum luminous flux more than 60 %)

• corrosive class Kk2 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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Power cables with aluminium conductor, flame-retardant, with XLPE, longitudinal and transverse screen sealing and polymer compound outer sheath

### **TECHNICAL SPECIFICATIONS**

| Maximum voltagekV52Conductor rated areamm²2000Minimum screen cross-sectionmm²35Partial discharge factor for rated voltage, not more thanpC6Permissible short circuit current across the screen ofkA10.2minimum cross-sectionmaximum permissible short-circuit current in corekA188Permissible continious current rating by aerial laying *in trefoil formation with double-side screen earthingA1444• in trefoil formation with single-side screen earthing orA1761cross screen earthing• plane with double-side screen earthing or cross screenA2106earthingPermissible continious current rating by burial *••1008•• plane with single-side screen earthing or cross screenA12691269• in trefoil formation with single-side screen earthing or cross screen earthingA1355earthingPermissible continious current rating by burial *••1355earthing• plane with double-side screen earthing or cross screenA1355earthing• plane with double-side screen earthing or cross screenA1355earthing• plane with double-side screen earthing or cross screenA1355• plane with double-side screen earthing or cross screenA1355• plane with single-side screen earthing or cross screenA1355• plane with single-side screen earthing or cross screenA1355• plane with single-side screen earthi                                                                                                    |  |
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| Minimum screen cross-sectionmm²35Partial discharge factor for rated voltage, not more thanpC6Permissible short circuit current across the screen ofkA10.2minimum cross-sectionMaximum permissible short-circuit current in corekA188Permissible continious current rating by aerial laying *••• in trefoil formation with double-side screen earthing or<br>cross screen earthingA1444• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1233• plane with double-side screen earthing or cross screen<br>earthingA2106Permissible continious current rating by burial *••• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1208• plane with double-side screen earthing or cross screen<br>earthingA1269Permissible continious current rating by burial *•1269• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1355• plane with double-side screen earthing or cross screen<br>earthingA1355• plane with double-side screen earthing or cross screen<br>earthingA1355• plane with single-side screen earthing or cross screen<br>earthingA1355 <td></td> |  |
| Partial discharge factor for rated voltage, not more thanpC6Permissible short circuit current across the screen of<br>minimum cross-sectionkA10.2Maximum permissible short-circuit current in corekA188Permissible continious current rating by aerial laying *<br>• in trefoil formation with double-side screen earthingA1444• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1761• plane with double-side screen earthing or cross screen<br>earthingA1233• plane with single-side screen earthing or cross screen<br>earthingA1206Permissible continious current rating by burial *<br>• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1008• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1269• plane with double-side screen earthing or<br>cross screen earthingA1269• in trefoil formation with single-side screen earthing or<br>cross screen earthingA819• plane with double-side screen earthing or cross screen<br>earthingA1355• plane with double-side screen earthing or cross screen<br>earthingA1355• plane with single-side screen earthing or cross screen<br>earthingA1355• plane with single-side screen earthing or cross screen<br>earthingA1355                                                                                                        |  |
| Permissible short circuit current across the screen of<br>minimum cross-sectionkA10.2Maximum permissible short-circuit current in corekA188Permissible continious current rating by aerial laying *.• in trefoil formation with double-side screen earthing or<br>cross screen earthingA1444• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1761• plane with double-side screen earthing or cross screen<br>earthingA1233• plane with single-side screen earthing or cross screen<br>earthingA1206Permissible continious current rating by burial *.• in trefoil formation with double-side screen earthing or<br>earthingA1008• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1008• in trefoil formation with double-side screen earthing or<br>cross screen earthingA1269• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1355• plane with single-side screen earthing or cross screen<br>earthingA1355• plane with single-side screen earthing or cross screen<br>earthingA1355                                                                  |  |
| minimum cross-sectionMaximum permissible short-circuit current in corekA188Permissible continious current rating by aerial laying *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| Maximum permissible short-circuit current in corekA188Permissible continious current rating by aerial laying *.• in trefoil formation with double-side screen earthingA1444• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1761· plane with double-side screen earthing or<br>cross screen earthingA1233• plane with double-side screen earthing or cross screen<br>earthingA2106Permissible continious current rating by burial *<br>· in trefoil formation with double-side screen earthing or<br>cross screen earthingA1008• in trefoil formation with single-side screen earthing or<br>cross screen earthingA1269· in trefoil formation with single-side screen earthing or<br>cross screen earthingA1355• plane with double-side screen earthing or cross screen<br>earthingA1355• plane with single-side screen earthing or cross screen<br>earthingA1355• plane with single-side screen earthing or cross screen<br>earthingA1355• plane with single-side screen earthing or cross screen<br>earthingA1355                                                                                                                                                                                                                                                                                                                                    |  |
| Permissible continious current rating by aerial laying *• in trefoil formation with double-side screen earthingA1444• in trefoil formation with single-side screen earthing orA1761cross screen earthingA1233• plane with double-side screen earthing or cross screenA2106earthingPermissible continious current rating by burial *-• in trefoil formation with double-side screen earthing orA1008• in trefoil formation with double-side screen earthing orA1269• in trefoil formation with single-side screen earthing orA1269• in trefoil formation with single-side screen earthing orA1355• plane with double-side screen earthing or cross screenA1355• plane with single-side screen earthingA1355• plane with single conductor temperature                                                                                                                               |  |
| <ul> <li>in trefoil formation with double-side screen earthing</li> <li>in trefoil formation with single-side screen earthing or</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>Parmissible continious current rating by burial *</li> <li>in trefoil formation with single-side screen earthing or</li> <li>Permissible continious current rating by burial *</li> <li>in trefoil formation with single-side screen earthing or</li> <li>plane with double-side screen earthing or</li> <li>A 1008</li> <li>in trefoil formation with single-side screen earthing or</li> <li>plane with double-side screen earthing or</li> <li>plane with double-side screen earthing or cross screen</li> <li>A 1269</li> <li>cross screen earthing</li> <li>plane with double-side screen earthing or</li> <li>A 1269</li> <li>maximum permissible conductor temperature</li> </ul>                                                                                                                                                                                                                                                                                                                                                                        |  |
| <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>A 1233</li> <li>plane with single-side screen earthing or cross screen</li> <li>A 2106</li> <li>earthing</li> <li>Permissible continious current rating by burial *</li> <li>in trefoil formation with double-side screen earthing or</li> <li>A 1008</li> <li>in trefoil formation with single-side screen earthing or</li> <li>A 1233</li> <li>Plane with double-side screen earthing or</li> <li>A 1008</li> <li>in trefoil formation with single-side screen earthing or</li> <li>Plane with double-side screen earthing or cross screen</li> <li>A 819</li> <li>plane with single-side screen earthing or cross screen</li> <li>A 1355</li> <li>earthing</li> <li>Maximum permissible conductor temperature</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| cross screen earthingA1233• plane with double-side screen earthing or cross screenA2106earthingA2106Permissible continious current rating by burial *·• in trefoil formation with double-side screen earthing orA1008• in trefoil formation with single-side screen earthing orA1269cross screen earthing·A1269• plane with double-side screen earthing or cross screenA819• plane with double-side screen earthing or cross screenA1355earthing·Maximum permissible conductor temperature·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| <ul> <li>plane with double-side screen earthing</li> <li>plane with single-side screen earthing or cross screen</li> <li>A 2106</li> <li>earthing</li> <li>Permissible continious current rating by burial *</li> <li>in trefoil formation with double-side screen earthing or</li> <li>A 1008</li> <li>in trefoil formation with single-side screen earthing or</li> <li>A 1269</li> <li>cross screen earthing</li> <li>plane with double-side screen earthing or cross screen</li> <li>A 819</li> <li>plane with single-side screen earthing or cross screen</li> <li>A 1355</li> <li>earthing</li> <li>Maximum permissible conductor temperature</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| <ul> <li>plane with single-side screen earthing or cross screen</li> <li>Parmissible 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</li> <li>A 1008</li> <li>in trefoil formation with single-side screen earthing or</li> <li>Plane with double-side screen earthing</li> <li>Plane with double-side screen earthing or cross screen</li> <li>A 819</li> <li>plane with single-side screen earthing or cross screen</li> <li>A 1355</li> <li>earthing</li> <li>Maximum permissible conductor temperature</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| earthingPermissible continious current rating by burial *• in trefoil formation with double-side screen earthingA1008• in trefoil formation with single-side screen earthing orA1269cross screen earthingA• plane with double-side screen earthing or cross screenA• plane with single-side screen earthing or cross screenA1355earthingMaximum permissible conductor temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| Permissible continious current rating by burial *• in trefoil formation with double-side screen earthingA1008• in trefoil formation with single-side screen earthing orA1269cross screen earthing• plane with double-side screen earthing or cross screenA819• plane with single-side screen earthing or cross screenA1355earthingMaximum permissible conductor temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| <ul> <li>in trefoil formation with double-side screen earthing</li> <li>in trefoil formation with single-side screen earthing or</li> <li>in trefoil formation with single-side screen earthing or</li> <li>plane with double-side screen earthing or cross screen</li> <li>plane with single-side screen earthing or cross screen</li> <li>A 1269</li> <li>A 819</li> <li>plane with single-side screen earthing or cross screen</li> <li>A 1355</li> <li>earthing</li> <li>Maximum permissible conductor temperature</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <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>A 819</li> <li>plane with single-side screen earthing or cross screen</li> <li>Maximum permissible conductor temperature</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| cross screen earthingA819• plane with double-side screen earthing or cross screenA1355• plane with single-side screen earthing or cross screenA1355earthingMaximum permissible conductor temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| <ul> <li>plane with double-side screen earthing</li> <li>plane with single-side screen earthing or cross screen</li> <li>A 1355</li> <li>earthing</li> <li>Maximum permissible conductor temperature</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| • plane with single-side screen earthing or cross screen A 1355     earthing     Maximum permissible conductor temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| earthing Maximum permissible conductor temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
| Maximum permissible conductor temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| • Continious °C +90                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| • in emergency operation °C +130                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
| • at short circuit °C +250                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| Operating temperature range °C -60 +50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Minimum bending radius by laying mm 1584                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| Rated outer diameter of the cable (for reference) ** mm 99                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| Cable weight (approximate) kg/km 13670                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Rated factory cable length and gross weight of the delivery m, t # 30УД-130: **** 52 on the drums ***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |

Notes:

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

\* 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 % 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 \*\* The external diameter may differ from the rated up to ± 10 %

\*\*\* Отклонение фактической массы брутто от указанного значения может составлять ± 7 %

\*\*\*\* Option delivery on not full drum



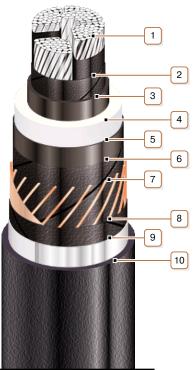


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## АПвЭгаПнг-45 1x2000 ТУ У 31.3-00214534-060:2011



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



#### 0 25 50 75

#### **CONSTRUCTION**

- 1. Aluminium multiwire compacted conductor
- Notes: • It is possible to manufacture cable with sealed conductor. • Conductor segment twisting is not illustrated
- 2. Lapping layer of semiconductive swellable tape
- 3. Inner extruded semiconducting layer
- 4. XLPE insulation
- 5. Outer extruded semiconducting layer
- 6. Lapping layer of semiconductive swellable tape

#### 7. 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

- 8. Lapping layer of semiconductive swellable tape
- 9. Alumopolymer tape

10. Flame-retardant polymer compound outer sheath Note: It is possible to manufacture cable with extruded semiconductor layer along outer sheath