# TSLF 18/30 (36) kV 1-core CAS

## Medium voltage cable

## 18/30 (36) kV


DryRex

## Application

Medium-voltage cable for fixed installations outdoors. May be buried directly in soil. Cable is longitudinally and radially watertight and therefore it is suitable where wet soil and / or fresh water permanently occurs. Installations must be in accordance with national regulations and rules of installations. The cable is halogen-free, but without fire protection. The cable is not CPR-classified.

## Design

| | |
|---|---|
| **Standards** | HD 620 10 K |
| **Conductor** | Watertight, circular, stranded aluminium, EN/IEC 60228 class 2 |
| **Conductor screen** | Semiconducting cross-linked polyethylene XLPE |
| **Insulation** | Cross-linked polyethylene XLPE |
| **Insulation screen** | Semiconducting cross-linked polyethylene XLPE |
| **Inner covering** | Semiconducting waterswellable tape |
| **Metal screen** | Copper wires and aluminium foil (CAS). Polyethylene laminated aluminium foil acts as a part of the metallic screen and needs to be connected in cable joints and terminations |
| **Oversheath** | PE-plastic PEMD, Grey + black CL |
| **Longitudinal watertightness** | Water swellable tape applied under and over metal screen |

## Temperature limits

| | |
|---|---|
| **Max. conductor temperature °C** | 90 |
| **Max. cond. temp. short circuit max. 5 s °C** | 250 |
| **Min. cable temperature during operation °C** | -50 |
| **Min. cable temperature during handling °C** | -20 |
| **Min. cable temperature during transport °C** | -40 |

| | |
|---|---|
| **Transverse watertightness** | Polyethylene laminated aluminium foil bonded to the sheath |

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| Technical information | 1x95/25 CAS | 1x120/35 CAS | 1x150/35 CAS | 1x240/35 CAS | 1x300/35 CAS | 1x400/35 CAS | 1x500/35 CAS | 1x630/35 CAS | 1x630/50 CAS | 1x800/50 CAS |
|---|---|---|---|---|---|---|---|---|---|---|
| **Product code** | **1181229** | **1181227** | **1181230** | **1181231** | **1181232** | **1181233** | **1181234** | **1181242** | **1181235** | **1181236** |
| Nominal cross-sectional area of conductor mm² | 95 | 120 | 150 | 240 | 300 | 400 | 500 | 630 | 630 | 800 |
| Nominal diameter of conductor mm | 11,1 | 12,6 | 13,9 | 17,8 | 19,8 | 22,4 | 25,7 | 29,3 | 29,3 | 33,3 |
| Nominal thickness of conductor screen mm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Nominal thickness of insulation mm | 8,0 | 8,0 | 8,0 | 8,0 | 8,0 | 8,0 | 8,0 | 8,0 | 8,0 | 8,0 |
| Nominal diameter over the insulation without insulation screen mm | 26,8 | 28,2 | 29,5 | 33,6 | 35,9 | 38,0 | 41,3 | 45,1 | 45,1 | 49,1 |
| Nominal thickness of insulation screen mm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Nominal size of metal screen mm² | 25 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 50 | 50 |
| Nominal thickness of PE-laminated aluminium foil mm | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| Nominal thickness of oversheath mm | 2,1 | 2,1 | 2,2 | 2,3 | 2,4 | 2,5 | 2,6 | 2,7 | 2,7 | 2,9 |
| Nominal cable diameter mm | 35,990 | 37,920 | 39,370 | 43,520 | 45,290 | 48,140 | 51,640 | 55,590 | 55,970 | 60,420 |
| Nominal cable weight kg/km | 1194,107 | 1379,762 | 1511,490 | 1917,628 | 2173,547 | 2440,033 | 2921,179 | 3514,807 | 3601,625 | 4308,741 |
| Metall weight Cu kg/m | 0,140 | 0,198 | 0,198 | 0,198 | 0,195 | 0,195 | 0,195 | 0,195 | 0,278 | 0,278 |
| Metall weight Al kg/m | 0,244 | 0,316 | 0,381 | 0,631 | 0,806 | 0,960 | 1,298 | 1,718 | 1,718 | 2,204 |
| **Maximum forces during installation when pulling by** | | | | | | | | | | |
| Max. pulling force by pulling-eye kN | 4,8 | 6,0 | 7,5 | 12,0 | 15,0 | 20,0 | 20,0 | 20,0 | 20,0 | 20,0 |
| Max. pulling force by pulling-stocking kN | 1,4 | 1,8 | 2,3 | 3,6 | 4,5 | 6,0 | 7,5 | 8,5 | 8,5 | 8,5 |
| **Minimum bending radii** | | | | | | | | | | |
| During handling and installation, cable cm | 54 | 57 | 59 | 65 | 68 | 72 | 77 | 83 | 84 | 91 |
| In final installation, cable cm | 38 | 40 | 41 | 46 | 48 | 51 | 54 | 58 | 59 | 63 |
| **Minimum bending radii** | | | | | | | | | | |
| During handling and installation, cable m | 0,54 | 0,57 | 0,59 | 0,65 | 0,68 | 0,72 | 0,78 | 0,83 | 0,84 | 0,91 |
| In final installation, cable m | 0,38 | 0,40 | 0,41 | 0,46 | 0,48 | 0,51 | 0,54 | 0,58 | 0,59 | 0,63 |
| **DC resistance** | | | | | | | | | | |
| Max. DC resistance of conductor at 20 °C Ω/km | 0,320 | 0,253 | 0,206 | 0,125 | 0,100 | 0,0778 | 0,0605 | 0,0469 | 0,0469 | 0,0367 |
| Maximum DC resistance at 20 °C, metal screen Ω/km | 0,727 | 0,524 | 0,524 | 0,524 | 0,524 | 0,524 | 0,524 | 0,524 | 0,387 | 0,387 |
| **AC resistance of phase conductor, screen circuit closed** | | | | | | | | | | |
| Conductor temperature 40 °C Ω/km | 0,3460 | 0,2736 | 0,2229 | 0,1356 | 0,1088 | 0,0850 | 0,0666 | 0,0522 | 0,0522 | 0,0416 |
| Conductor temperature 65 °C Ω/km | 0,3782 | 0,2991 | 0,2436 | 0,1482 | 0,1188 | 0,0927 | 0,0726 | 0,0568 | 0,0568 | 0,0451 |
| Conductor temperature 70 °C Ω/km | 0,3846 | 0,3042 | 0,2478 | 0,1507 | 0,1208 | 0,0943 | 0,0738 | 0,0577 | 0,0577 | 0,0458 |
| Conductor temperature 90 °C Ω/km | 0,4104 | 0,3246 | 0,2644 | 0,1607 | 0,1288 | 0,1005 | 0,0786 | 0,0614 | 0,0614 | 0,0487 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Inductance per phase** | | | | | | | | | | |
| In flat formation, free space between cables equal to one cable diam | 0,60 | 0,59 | 0,58 | 0,55 | 0,53 | 0,52 | 0,51 | 0,50 | 0,50 | 0,49 |
| In trefoil formation, cables touching each other mH/km | 0,42 | 0,40 | 0,39 | 0,36 | 0,35 | 0,34 | 0,32 | 0,31 | 0,31 | 0,30 |
| **Electrical values** | | | | | | | | | | |
| Calculated operation capacitance µF/km | 0,16 | 0,17 | 0,18 | 0,22 | 0,23 | 0,26 | 0,29 | 0,32 | 0,32 | 0,36 |
| Calculated charging current with main voltage A/km | 0,9 | 0,9 | 1,0 | 1,2 | 1,3 | 1,4 | 1,6 | 1,7 | 1,8 | 1,9 |
| Calculated earth fault current with main voltage A/km | 2,6 | 2,8 | 3,0 | 3,6 | 3,8 | 4,2 | 4,7 | 5,2 | 5,3 | 5,8 |
| **Current ratings** | | | | | | | | | | |
| **Cables in air (25 °C)** | | | | | | | | | | |
| Flat, conductor 90 °C, open screen A | 320 | 370 | 425 | 570 | 650 | 790 | 920 | 1040 | 1040 | 1220 |
| Flat, conductor 90 °C, closed screen A | 310 | 350 | 395 | 515 | 580 | 680 | 755 | 840 | 840 | 950 |
| Trefoil, conductor 90 °C, open screen A | 285 | 330 | 380 | 505 | 580 | 695 | 800 | 915 | 915 | 1045 |
| Trefoil, conductor 90 °C, closed screen A | 280 | 325 | 370 | 490 | 565 | 680 | 775 | 880 | 880 | 1010 |
| **Cables in the ground (15 °C and 1,0 K.m/W), Installation depth 0,7 m** | | | | | | | | | | |
| Flat, conductor 65 °C, open screen A | 255 | 295 | 330 | 435 | 485 | 570 | 645 | 720 | 720 | 805 |
| Flat, conductor 65 °C, closed screen A | 250 | 280 | 315 | 395 | 440 | 500 | 550 | 610 | 610 | 650 |
| Flat, conductor 90 °C, open screen A | 300 | 345 | 390 | 510 | 570 | 670 | 760 | 850 | 850 | 950 |
| Flat, conductor 90 °C, closed screen A | 295 | 330 | 370 | 465 | 515 | 590 | 650 | 715 | 715 | 841 |
| Trefoil, conductor 65 °C, open screen A | 240 | 270 | 305 | 395 | 445 | 525 | 590 | 665 | 665 | 725 |
| Trefoil, conductor 65 °C, closed screen A | 235 | 265 | 300 | 385 | 435 | 510 | 570 | 635 | 635 | 695 |
| Trefoil, conductor 90 °C, open screen A | 280 | 320 | 360 | 465 | 525 | 615 | 695 | 780 | 780 | 863 |
| Trefoil, conductor 90 °C, closed screen A | 275 | 310 | 355 | 455 | 510 | 600 | 670 | 745 | 745 | 845 |
| **Maximum thermal short circuit current during 1 s** | | | | | | | | | | |
| Phase (initial 90 °C, final 250 °C) kA | 8,9 | 11,3 | 14,1 | 22,6 | 28,3 | 37,8 | 47,2 | 59,5 | 59,5 | 75,6 |
| Metal screen (initial 80 °C, final 250 °C) kA | 3,7 | 5,2 | 5,2 | 5,2 | 5,2 | 5,2 | 5,2 | 5,2 | 7,4 | 7,4 |

| Technical information | 1x1000/50 CAS |
|---|---|
| **Product code** | **1181237** |
| Nominal cross-sectional area of conductor mm² | 1000 |
| Nominal diameter of conductor mm | 37,8 |
| Nominal thickness of conductor screen mm | 0,5 |
| Nominal thickness of insulation mm | 8,0 |
| Nominal diameter over the insulation without insulation screen mm | 55,0 |
| Nominal thickness of insulation screen mm | 0,5 |
| Nominal size of metal screen mm² | 50 |
| Nominal thickness of PE-laminated aluminium foil mm | 0,2 |
| Nominal thickness of oversheath mm | 3,0 |
| Nominal cable diameter mm | 66,140 |
| Nominal cable weight kg/km | 5067,062 |
| Metall weight Cu kg/m | 0,279 |
| Metall weight Al kg/m | 2,826 |
| **Maximum forces during installation when pulling by** | |
| Max. pulling force by pulling-eye kN | 20,0 |
| Max. pulling force by pulling-stocking kN | 8,5 |
| **Minimum bending radii** | |
| During handling and installation, cable cm | 99 |
| In final installation, cable cm | 69 |
| **Minimum bending radii** | |
| During handling and installation, cable m | 0,99 |
| In final installation, cable m | 0,69 |
| **DC resistance** | |
| Max. DC resistance of conductor at 20 °C Ω/km | 0,0291 |
| Maximum DC resistance at 20 °C, metal screen Ω/km | 0,387 |
| **AC resistance of phase conductor, screen circuit closed** | |
| Conductor temperature 40 °C Ω/km | 0,0338 |
| Conductor temperature 65 °C Ω/km | 0,0366 |
| Conductor temperature 70 °C Ω/km | 0,0371 |
| Conductor temperature 90 °C Ω/km | 0,0394 |

| Technical information | 1x1000/50 CAS |
|---|---|
| **Inductance per phase** | |
| In flat formation, free space between cables equal to one cable diam | 0,48 |
| In trefoil formation, cables touching each other mH/km | 0,30 |
| **Electrical values** | |
| Calculated operation capacitance µF/km | 0,41 |
| Calculated charging current with main voltage A/km | 2,2 |
| Calculated earth fault current with main voltage A/km | 6,7 |
| **Current ratings** | |
| **Cables in air (25 °C)** | |
| Flat, conductor 90 °C, open screen A | 1390 |
| Flat, conductor 90 °C, closed screen A | 1060 |
| Trefoil, conductor 90 °C, open screen A | 1170 |
| Trefoil, conductor 90 °C, closed screen A | 1130 |
| **Cables in the ground (15 °C and 1,0 K.m/W), Installation depth 0,7 m** | |
| Flat, conductor 65 °C, open screen A | 900 |
| Flat, conductor 65 °C, closed screen A | 700 |
| Flat, conductor 90 °C, open screen A | 1067 |
| Flat, conductor 90 °C, closed screen A | 922 |
| Trefoil, conductor 65 °C, open screen A | 800 |
| Trefoil, conductor 65 °C, closed screen A | 760 |
| Trefoil, conductor 90 °C, open screen A | 968 |
| Trefoil, conductor 90 °C, closed screen A | 940 |
| **Maximum thermal short circuit current during 1 s** | |
| Phase (initial 90 °C, final 250 °C) kA | 94,5 |
| Metal screen (initial 80 °C, final 250 °C) kA | 7,4 |