

# High Voltage / 2XS(FL)2Y, A2XS(FL)2Y 110kV Power Cable



Eland Product Group: A9K

## APPLICATION

The HV power cables contained within this datasheet are suitable for the primary distribution of power up to a maximum network voltage of 110kV. The cables are triple extruded to the latest IEC standards using proprietary materials on modern catenary line equipment. The foil laminate layer provides an effective moisture barrier and imparts a limited increase in mechanical protection although it should be noted that these cables should be adequately protected from potential mechanical damage. Waterblocking tape options ensure that, should the cable be damaged, repair lengths and associated works are kept to a minimum. The cables are provided with a High Density Polyethylene sheath selected to offer the best compromise between abrasion resistance and flexibility. The range can be customised to meet specific project requirements

## CHARACTERISTICS

### Voltage Rating (U<sub>o</sub>/U)(U<sub>m</sub>)

64/110kV (123kV)

**Highest Network Voltage:** 123kV

### Temperature Rating

Short Circuit Temperature: +250°C

Operating Temperature: -30°C to 90°C

Minimum Installation Temperature: -20°C

## CONSTRUCTION

### Conductor

Class 2 copper or aluminium, compacted or segment

### Conductor Screen

Extruded semi-conductive XLPE (Cross-Linked Polyethylene)

### Insulation

XLPE (Cross-Linked Polyethylene)

### Insulation Screen

Extruded semi-conductive XLPE (Cross-Linked Polyethylene)

### Separator

Water swellable semi-conductive tape

### Screen

Copper wire screen, with a counter helix of copper tape

### Separator

Water swellable semi-conductive tape

### Moisture Barrier

Aluminium or Copper tape with copolymer

### Sheath

HDPE (High Density Polyethylene)

(To be specified at time of order. Other options available)

### Sheath Colour

● Black

## STANDARDS

IEC 60840, HRN HD 632, IEC/EN 60228

## ISO/IEC 17025 LABORATORY TESTED

This product is subject to the Quality Assurance protocols of The Cable Lab®, an ISO/IEC 17025 accredited cable testing laboratory. Testing includes vertical flame, conductor resistance, tensile & elongation, and dimensional consistency, verified to published standards and approved product drawings.



## REGULATORY COMPLIANCE

This cable meets the requirements of the RoHS Directive 2011/65/EU. RoHS compliance has been tested and confirmed by The Cable Lab® as meeting the requirements of the BSI RoHS Trusted Kitemark™.





## DIMENSIONS

### 2XS(FL)2Y Copper Conductor

| ELAND PART NO. | NO. OF CORES | NOMINAL CROSS SECTIONAL AREA<br>mm <sup>2</sup> | ELECTRICAL PROTECTION<br>mm <sup>2</sup> | NOMINAL DIAMETER OF CONDUCTOR<br>mm | NOMINAL THICKNESS OF INSULATION<br>mm | NOMINAL DIAMETER OVER INSULATION<br>mm | NOMINAL OVERALL DIAMETER<br>mm | NOMINAL WEIGHT<br>kg/km | MINIMUM BENDING RADIUS (FIXED)<br>mm | MAXIMAL FORCE OF DRAGGING (CONDUCTOR PULLING)<br>kN |
|----------------|--------------|---|--|-------------------------------------|---------------------------------------|--|--------------------------------|-------------------------|--------------------------------------|---|
| A9K2XSFL150    | 1            | 150   | 95                                       | 14.1                                | 18                                    | 54.9                                   | 64.9                           | 5035                    | 970                                  | 7.5   |
| A9K2XSFL185    | 1            | 185   | 95                                       | 15.7                                | 17                                    | 54.5                                   | 64.5                           | 5272                    | 960                                  | 9.2   |
| A9K2XSFL240    | 1            | 240   | 95                                       | 18                                  | 16                                    | 54.8                                   | 64.8                           | 5742                    | 970                                  | 12  |
| A9K2XSFL300    | 1            | 300   | 95                                       | 20.3                                | 15                                    | 55.1                                   | 65.1                           | 6210                    | 980                                  | 15  |
| A9K2XSFL400    | 1            | 400   | 95                                       | 23                                  | 15                                    | 57.6                                   | 67.4                           | 7208                    | 1010                                 | 20  |
| A9K2XSFL500    | 1            | 500   | 95                                       | 26.5                                | 15                                    | 61.3                                   | 71.7                           | 8322                    | 1070                                 | 25  |
| A9K2XSFL630    | 1            | 630   | 95                                       | 30.3                                | 15                                    | 64.5                                   | 75.2                           | 9886                    | 1200                                 | 31.5  |
| A9K2XSFL800    | 1            | 800   | 95                                       | 36.9                                | 15                                    | 71.8                                   | 82.6                           | 12042                   | 1240                                 | 40  |

### A2XS(FL)2Y Aluminium Conductor

| ELAND PART NO. | NO. OF CORES | NOMINAL CROSS SECTIONAL AREA<br>mm <sup>2</sup> | ELECTRICAL PROTECTION<br>mm <sup>2</sup> | NOMINAL DIAMETER OF CONDUCTOR<br>mm | NOMINAL THICKNESS OF INSULATION<br>mm | NOMINAL DIAMETER OVER INSULATION<br>mm | NOMINAL OVERALL DIAMETER<br>mm | NOMINAL WEIGHT<br>kg/km | MINIMUM BENDING RADIUS (FIXED)<br>mm | MAXIMUM PULLING FORCE<br>kN |
|----------------|--------------|---|--|-------------------------------------|---------------------------------------|--|--------------------------------|-------------------------|--------------------------------------|-----------------------------|
| A9KA2XSFL150   | 1            | 150   | 95                                       | 14.1                                | 18                                    | 54.9                                   | 64.9                           | 4128                    | 970                                  | 4.5                         |
| A9KA2XSFL185   | 1            | 185   | 95                                       | 15.7                                | 17                                    | 54.5                                   | 64.5                           | 4153                    | 960                                  | 5.5                         |
| A9KA2XSFL240   | 1            | 240   | 95                                       | 18                                  | 16                                    | 54.8                                   | 64.8                           | 4283                    | 970                                  | 7.2                         |
| A9KA2XSFL300   | 1            | 300   | 95                                       | 20.3                                | 15                                    | 55.1                                   | 65.1                           | 4397                    | 980                                  | 9                           |
| A9KA2XSFL400   | 1            | 400   | 95                                       | 23                                  | 15                                    | 57.6                                   | 67.4                           | 4880                    | 1010                                 | 12                          |
| A9KA2XSFL500   | 1            | 500   | 95                                       | 26.5                                | 15                                    | 61.3                                   | 71.7                           | 5433                    | 1070                                 | 15                          |
| A9KA2XSFL630   | 1            | 630   | 95                                       | 30.3                                | 15                                    | 64.5                                   | 75.2                           | 6064                    | 1200                                 | 18.9                        |
| A9KA2XSFL800   | 1            | 800   | 95                                       | 36.9                                | 15                                    | 71.8                                   | 82.6                           | 7100                    | 1240                                 | 24                          |
| A9KA2XSFL1000  | 1            | 1000  | 95                                       | 37.9                                | 15                                    | 72.8                                   | 84.7                           | 7795                    | 1270                                 | 30                          |
| A9KA2XSFL1200* | 1            | 1200*   | 95                                       | 44                                  | 15                                    | 78                                     | 95.7                           | 8350                    | 1400                                 | 36                          |

\* Milliken conductor

## CONDUTORS

### Class 2 Stranded Conductors for Single Core and Multi-Core Cables

| NOMINAL CROSS SECTIONAL AREA<br>mm <sup>2</sup> | MINIMUM NO. OF WIRES IN CONDUCTOR |    |                    |    | MAXIMUM RESISTANCE OF CONDUCTOR AT 20°C<br>ohms/km |  |
|---|-----------------------------------|----|--------------------|----|--|--|
|   | Circular                          |    | Circular Compacted |    | Annealed Copper Conductor                          | Aluminium or Aluminium Alloy Conductor |
|   | Cu                                | Al | Cu                 | Al | Plain Wires  |  |
| 150   | 37                                | 37 | 18                 | 15 | 0.124  | 0.206                                  |
| 185   | 37                                | 37 | 30                 | 30 | 0.0991   | 0.164                                  |
| 240   | 37                                | 37 | 34                 | 30 | 0.0754   | 0.125                                  |
| 300   | 61                                | 61 | 34                 | 30 | 0.0601   | 0.1                                    |
| 400   | 61                                | 61 | 53                 | 53 | 0.047  | 0.0778                                 |
| 500   | 61                                | 61 | 53                 | 53 | 0.0366   | 0.0605                                 |
| 630   | 91                                | 91 | 53                 | 53 | 0.0283   | 0.0469                                 |
| 800   | 91                                | 91 | 53                 | 53 | 0.0221   | 0.0367                                 |
| 1000  | 91                                | 91 | 53                 | 53 | 0.0176   | 0.0291                                 |
| 1200*   | -                                 | -  | -                  | -  | -  | 0.0247                                 |

The above table is in accordance with EN 60228

## ELECTRICAL CHARACTERISTICS

| CONDUCTOR TYPE                               | COPPER CONDUCTOR     |     |         |     |             |      |         |      | ALUMINIUM CONDUCTOR |     |         |     |             |      |         |      |
|--|----------------------|-----|---------|-----|-------------|------|---------|------|---------------------|-----|---------|-----|-------------|------|---------|------|
|  | GROUND               |     |         |     | AIR         |      |         |      | GROUND              |     |         |     | AIR         |      |         |      |
| INSTALLATION                                 | Flat Spaced          |     | Trefoil |     | Flat Spaced |      | Trefoil |      | Flat Spaced         |     | Trefoil |     | Flat Spaced |      | Trefoil |      |
| METHOD OF INSTALLATION                       | ↓                    | ↓↓  | ↓       | ↓↓  | ↓           | ↓↓   | ↓       | ↓↓   | ↓                   | ↓↓  | ↓       | ↓↓  | ↓           | ↓↓   | ↓       | ↓↓   |
| METHOD OF EARTHING                           | ↓                    | ↓↓  | ↓       | ↓↓  | ↓           | ↓↓   | ↓       | ↓↓   | ↓                   | ↓↓  | ↓       | ↓↓  | ↓           | ↓↓   | ↓       | ↓↓   |
| NOMINAL CROSS SECTIONAL AREA mm <sup>2</sup> | CURRENT RATINGS Amps |     |         |     |             |      |         |      |                     |     |         |     |             |      |         |      |
| 150  | 435                  | 406 | 410     | 406 | 551         | 515  | 478     | 473  | 335                 | 325 | 320     | 320 | 431         | 415  | 373     | 373  |
| 185  | 490                  | 448 | 465     | 453 | 630         | 574  | 546     | 538  | 380                 | 363 | 360     | 358 | 494         | 465  | 425     | 423  |
| 240  | 570                  | 505 | 540     | 519 | 740         | 659  | 645     | 628  | 445                 | 416 | 420     | 416 | 583         | 541  | 504     | 499  |
| 300  | 640                  | 535 | 610     | 580 | 805         | 685  | 710     | 685  | 495                 | 445 | 475     | 460 | 625         | 565  | 550     | 540  |
| 400  | 720                  | 595 | 690     | 650 | 915         | 775  | 820     | 785  | 565                 | 500 | 540     | 525 | 715         | 640  | 640     | 625  |
| 500  | 825                  | 650 | 785     | 730 | 1060        | 860  | 945     | 895  | 645                 | 555 | 620     | 595 | 835         | 725  | 745     | 720  |
| 630  | 940                  | 705 | 890     | 810 | 1235        | 950  | 1085    | 1010 | 740                 | 610 | 710     | 670 | 975         | 820  | 865     | 830  |
| 800  | 1055                 | 755 | 1000    | 885 | 1415        | 1040 | 1235    | 1130 | 845                 | 665 | 805     | 745 | 1130        | 910  | 995     | 940  |
| 1000   | -                    | -   | -       | -   | -           | -    | -       | -    | 950                 | 720 | 900     | 820 | 1295        | 1005 | 1135    | 1055 |
| 1200*  | -                    | -   | -       | -   | -           | -    | -       | -    | 1025                | 755 | 970     | 870 | 1420        | 1070 | 1235    | 1140 |

↓ = cross-bonding of grounding

↓↓ = both ends grounded

\* Milliken conductor

As per IEC 60287. Calculated pursuant to the standard IEC 60287 for the maximal conductor temperature of 90°C.

Earth temperature: 20°C

Specific Earth Resistance: 1.0km/W

Air temperature: 30°C

Depth of Laying: 1m

Space between cables: 70mm + D (external diameter of cable)

### Maximum Short Circuit Current

95mm<sup>2</sup> Copper Wire Screen = 15kA/1 Second

Other sizes available on request to meet your protection requirements.

## DE-RATING FACTORS

| AMBIENT TEMPERATURE | 10°C | 15°C | 20°C | 25°C | 30°C | 35°C | 40°C | 45°C | 50°C | 55°C | 60°C | 65°C | 70°C |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| In Ground           | 1.07 | 1.04 | 1.00 | 0.96 | 0.93 | 0.89 | 0.85 | 0.80 | 0.76 | 0.71 | 0.65 | 0.60 | 0.53 |
| In Air              | 1.15 | 1.12 | 1.08 | 1.04 | 1.00 | 0.96 | 0.91 | 0.87 | 0.82 | 0.76 | 0.71 | 0.65 | 0.58 |

The information contained within this datasheet is for guidance only and is subject to change without notice or liability. All the information is provided in good faith and is believed to be correct at the time of publication. When selecting cable accessories, please note that actual cable dimensions may vary due to manufacturing tolerances.