

## RADOX® 4 GKW-AX

1800 V M

Halogen free, compact, dual wall power cable for demanding applications

RADOX 4 GKW-AX are compact, flexible single core power and signal cables, designed for minimum cable weight and diameter. These cables meet the requirements of the modern railway industry. They are halogen free, flame retardant, low smoke and have a low toxicity index. Demands for temperature, abrasion, ozone and oil resistance are also easily fulfilled.

RADOX 4 GKW-AX cables are qualified for permanently protected installations inside and outside of rolling stock to connect fixed and moving parts in AC and DC applications, especially inverter technology applications.

### Features

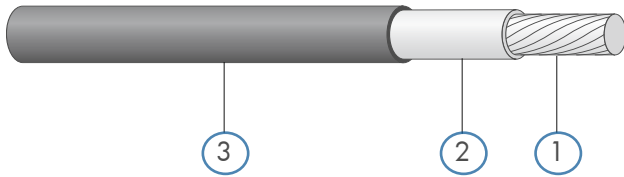
- Electron beam crosslinked RADOX insulation does not melt or flow at high temperatures
- Resistant to mineral oils and detergents
- High flexibility and tight bending radii
- Easy to strip
- Meeting the common railway fire performances

# RADOX® 4 GWK-AX

1800 V M

Single Core

|                      |                           |                   |                   |
|----------------------|---------------------------|-------------------|-------------------|
| Conductor            | EN 60228, class 5         | Voltage rating    | 1800/3000 V AC    |
| Number of conductors | 1                         |                   | 2700/4500 V DC    |
| Cross section        | 1.5 - 400 mm <sup>2</sup> | Temperature range | -40 °C to +120 °C |



## Composition of core

|               |                            |               |
|---------------|----------------------------|---------------|
| 1. Conductor  | stranded tin plated copper |               |
| 2. Insulation | RADOX EI 110               | colour: white |
| 3. Sheath     | RADOX EI 109               | colour: black |

## Characteristics and specialities

- Fully meet the requirements of material level M according to EN 50264-1
  - extra low temperature
  - extra oil resistant
  - extra fuel resistance
- Resistance to ozone and weathering
- Large product range

## Application

- For protected connections of fixed and sporadic moving parts inside and outside of rolling stock.
- Guidelines for selections and the installation are described in the standards EN 50355 and EN50343.

## Standards

| Standard      | Fire protection on railway vehicles |   |
|---------------|-------------------------------------|---|
| BS 6853       | Category                            | int. Ia, Ib, II / ext. Ia, Ib, II       |
| CEN/TS 45545  |                                     |   |
| DIN 5510-2    | Protection level                    | 1, 2, 3, 4                              |
| NF F 16-101   | Class, category                     | C / F0, int. A1, A2, B / ext. A1, A2, B |
| UNI CEI 11170 |                                     |   |

For further technical details please refer to our data sheet.

| Cross section<br>mm <sup>2</sup> | Conductor               |         | Core        | Conductor<br>resistance      | Capacitance<br>**        | Fire load    | Weight             |                   | Item no. |
|----------------------------------|-------------------------|---------|-------------|------------------------------|--------------------------|--------------|--------------------|-------------------|----------|
|                                  | construction*<br>n x mm | d<br>mm | d<br>mm     | R <sub>20</sub> max.<br>Ω/km | C <sub>H20</sub><br>pF/m | nom.<br>kJ/m | copper<br>kg/100 m | cable<br>kg/100 m |          |
| 0.5                              | 19 x 0.18               | 0.90    | 2.45 ± 0.05 | 38.5                         | 236                      | 91           | 0.40               | 1.10              | 12547128 |
| 0.75                             | 24 x 0.21               | 1.10    | 2.65 ± 0.05 | 26.7                         | 276                      | 102          | 0.70               | 1.4               | 12548299 |
| 1                                | 37 x 0.18               | 1.20    | 3.00 ± 0.05 | 20.0                         | 266                      | 132          | 0.90               | 1.8               | 12555986 |
| 1.5                              | 37 x 0.23               | 1.50    | 3.55 ± 0.10 | 13.7                         | 307                      | 157          | 1.4                | 2.5               | 12536686 |
| 2.5                              | 61 x 0.23               | 1.95    | 3.75 ± 0.10 | 8.21                         | 343                      | 205          | 2.2                | 3.6               | 12536692 |
| 4                                | 61 x 0.29               | 2.45    | 4.50 ± 0.10 | 5.09                         | 396                      | 257          | 3.5                | 5.2               | 12536694 |
| 6                                | 84 x 0.30               | 2.95    | 5.20 ± 0.15 | 3.39                         | 419                      | 334          | 5.2                | 7.4               | 12536696 |
| 10                               | 80 x 0.40               | 3.90    | 6.40 ± 0.15 | 1.95                         | 488                      | 467          | 9.1                | 12                | 12545527 |
| 16                               | 119 x 0.40              | 5.30    | 8.40 ± 0.20 | 1.24                         | 535                      | 801          | 13                 | 19                | 12545528 |
| 25                               | 182 x 0.40              | 6.60    | 10.2 ± 0.30 | 0.795                        | 565                      | 1125         | 21                 | 28                | 12545529 |
| 35                               | 266 x 0.40              | 7.80    | 11.7 ± 0.30 | 0.565                        | 607                      | 1457         | 30                 | 40                | 12545530 |
| 50                               | 378 x 0.40              | 9.30    | 13.5 ± 0.30 | 0.393                        | 660                      | 1737         | 43                 | 54                | 12545531 |
| 70                               | 348 x 0.50              | 11.4    | 15.8 ± 0.30 | 0.277                        | 755                      | 2178         | 61                 | 75                | 12545532 |
| 95                               | 444 x 0.50              | 12.8    | 17.5 ± 0.30 | 0.210                        | 808                      | 2549         | 78                 | 95                | 12545533 |
| 120                              | 570 x 0.50              | 14.9    | 19.8 ± 0.30 | 0.164                        | 862                      | 3118         | 100                | 120               | 12544522 |
| 150                              | 722 x 0.50              | 16.8    | 22.1 ± 0.30 | 0.132                        | 894                      | 3474         | 127                | 150               | 12545534 |
| 185                              | 874 x 0.50              | 18.3    | 24.0 ± 0.30 | 0.108                        | 903                      | 4432         | 153                | 182               | 12544523 |
| 240                              | 1147 x 0.50             | 21.1    | 27.0 ± 0.30 | 0.0817                       | 994                      | 5225         | 201                | 235               | 12547684 |
| 300                              | 1443 x 0.50             | 23.7    | 29.9 ± 0.30 | 0.0654                       | 1060                     | 6106         | 251                | 291               | 12552906 |
| 400                              | 2016 x 0.50             | 29.1    | 34.1 ± 0.50 | 0.0495                       | 1115                     | 7639         | 342                | 392               | 12555997 |

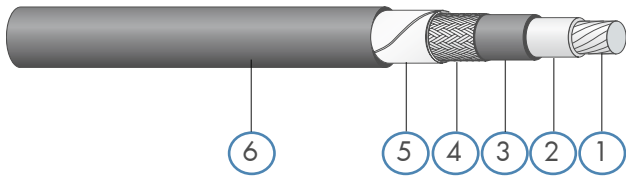
\* Typical value x single wire diameter

\*\* Capacity in water, typical value

# RADOX® 4 GWK-AX EMC-L

# Single Core screened

|                      |                           |                   |                   |
|----------------------|---------------------------|-------------------|-------------------|
| Conductor            | EN 60228, class 5         | Voltage rating    | 1800/3000 V AC    |
| Number of conductors | 1                         |                   | 2700/4500 V DC    |
| Cross section        | 1.5 - 300 mm <sup>2</sup> | Temperature range | -40 °C to +120 °C |



### Composition of cable

|               |   |               |
|---------------|---|---------------|
| 1. Conductor  | stranded tin plated copper                |               |
| 2. Insulation | RADOX GWK K                               | colour: white |
| 3. Sheath     | RADOX GWK S                               | colour: black |
| 4. EMC screen | tin plated copper braid, reduced coverage |               |
| 5. Separator  | tape                                      |               |
| 6. Sheath     | RADOX GWK S                               | colour: black |

### Characteristics and specialities

- Resistance to oil, ozone and weathering

### Application

- For protected connections of fixed and sporadic moving parts inside and outside of rolling stock.
- Guidelines for selections and the installation are described in the standards EN 50355 and EN50343.

### Standards

| Standard      | Fire protection on railway vehicles |   |
|---------------|-------------------------------------|---|
| BS 6853       | Category                            | int. Ia, Ib, II / ext. Ia, Ib, II       |
| CEN/TS 45545  |                                     |   |
| DIN 5510-2    | Protection level                    | 1, 2, 3, 4                              |
| NF F 16-101   | Class, category                     | C / F0, int. A1, A2, B / ext. A1, A2, B |
| UNI CEI 11170 |                                     |   |

For further technical details please refer to our data sheet.

# RADOX® 4 GWK-AX EMC-L

# Single Core screened

| Cross section<br>mm <sup>2</sup> | Conductor               |                         | Core                    |                         | Screen                           |             | Cable                                     |  | Conductor resistance |          | I <sub>K</sub><br>** | I<br>*** | Z <sub>T</sub> | Capacitance<br>C<br>pF/m | Fire load<br>nom.<br>kJ/m | Weight       |                   | Item no. |
|----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|----------------------------------|-------------|---|--|----------------------|----------|----------------------|----------|----------------|--------------------------|---------------------------|--------------|-------------------|----------|
|                                  | construction*<br>n x mm | d <sub>nom.</sub><br>mm | d <sub>nom.</sub><br>mm | d <sub>max.</sub><br>mm | cross section<br>mm <sup>2</sup> | d<br>mm     | conductor<br>R <sub>20</sub> max.<br>Ω/km | screen<br>R <sub>20</sub> max.<br>Ω/km | screen A             | screen A |                      |          |                |                          |                           | max.<br>mΩ/m | copper<br>kg/100m |          |
| 1.5                              | 37 x 0.23               | 1.50                    | 3.35                    | 3.7                     | 0.9                              | 5.20 ± 0.15 | 13.7                                      | 21.33                                  | 355                  | 18       | 100                  | 254      | 363            | 2.1                      | 4.8                       | 12556535     |                   |          |
| 2.5                              | 61 x 0.23               | 1.95                    | 3.90                    | 4.8                     | 1.0                              | 5.80 ± 0.15 | 8.21                                      | 18.66                                  | 405                  | 20       | 100                  | 292      | 440            | 3.2                      | 6.3                       | 12556536     |                   |          |
| 4                                | 61 x 0.29               | 2.45                    | 4.50                    | 5.1                     | 1.3                              | 6.70 ± 0.15 | 5.09                                      | 14.14                                  | 529                  | 24       | 100                  | 322      | 584            | 4.6                      | 8.9                       | 12556537     |                   |          |
| 6                                | 84 x 0.30               | 2.93                    | 5.20                    | 5.7                     | 1.5                              | 7.40 ± 0.15 | 3.39                                      | 12.43                                  | 606                  | 26       | 100                  | 350      | 701            | 6.5                      | 12                        | 12556538     |                   |          |
| 10                               | 80 x 0.4                | 3.89                    | 6.40                    | 7.1                     | 2.0                              | 9.00 ± 0.2  | 1.95                                      | 9.48                                   | 795                  | 30       | 100                  | 392      | 1003           | 11                       | 18                        | 12556539     |                   |          |
| 16                               | 119 x 0.4               | 5.30                    | 8.40                    | 9.3                     | 3.5                              | 11.2 ± 0.2  | 1.24                                      | 5.70                                   | 1363                 | 42       | 100                  | 447      | 1489           | 17                       | 28                        | 12556540     |                   |          |
| 25                               | 182 x 0.4               | 6.60                    | 10.20                   | 11.2                    | 4.2                              | 13.4 ± 0.25 | 0.795                                     | 4.62                                   | 1637                 | 48       | 100                  | 451      | 2181           | 25                       | 40                        | 12556541     |                   |          |
| 35                               | 266 x 0.4               | 7.80                    | 11.70                   | 12.7                    | 4.9                              | 14.8 ± 0.25 | 0.565                                     | 3.98                                   | 1907                 | 52       | 100                  | 489      | 2557           | 35                       | 51                        | 12556542     |                   |          |
| 50                               | 378 x 0.4               | 9.30                    | 13.50                   | 14.7                    | 5.6                              | 16.8 ± 0.3  | 0.393                                     | 3.50                                   | 2182                 | 57       | 100                  | 512      | 3138           | 48                       | 70                        | 12556543     |                   |          |
| 70                               | 348 x 0.5               | 11.4                    | 15.80                   | 16.9                    | 8.0                              | 19.0 ± 0.3  | 0.277                                     | 2.67                                   | 3120                 | 67       | 100                  | 619      | 3867           | 69                       | 92                        | 12556544     |                   |          |
| 95                               | 444 x 0.5               | 12.8                    | 17.50                   | 18.6                    | 9.2                              | 20.7 ± 0.3  | 0.210                                     | 2.34                                   | 3564                 | 73       | 100                  | 640      | 4228           | 87                       | 116                       | 12556545     |                   |          |
| 120                              | 570 x 0.5               | 14.9                    | 19.80                   | 21.0                    | 10.2                             | 23.4 ± 0.3  | 0.164                                     | 2.10                                   | 3960                 | 78       | 100                  | 650      | 5471           | 104                      | 145                       | 12556546     |                   |          |
| 150                              | 722 x 0.5               | 16.8                    | 22.10                   | 23.6                    | 15.7                             | 25.9 ± 0.3  | 0.132                                     | 1.33                                   | 6066                 | 103      | 100                  | 719      | 6143           | 142                      | 183                       | 12556547     |                   |          |
| 185                              | 874 x 0.5               | 18.3                    | 24.00                   | 25.5                    | 15.7                             | 27.8 ± 0.3  | 0.108                                     | 1.37                                   | 6066                 | 101      | 100                  | 725      | 7034           | 168                      | 213                       | 12556548     |                   |          |
| 240                              | 1147 x 0.5              | 21.1                    | 27.00                   | 28.9                    | 20.7                             | 31.2 ± 0.3  | 0.0817                                    | 0.93                                   | 8023                 | 129      | 100                  | 791      | 8606           | 221                      | 291                       | 12556549     |                   |          |
| 300                              | 1443 x 0.5              | 23.7                    | 29.90                   | 31.8                    | 22.1                             | 34.2 ± 0.3  | 0.0654                                    | 0.95                                   | 8560                 | 127      | 100                  | 918      | 9618           | 276                      | 337                       | 12558471     |                   |          |

\* Typical value x single wire diameter

\*\* Short-circuit current rating of screen acc. to IEC 60949 (adiabatic), duration of short-circuit 0.1 s, initial temperature +90 °C, final temperature +200 °C

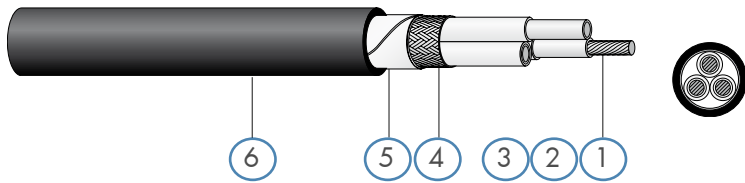
\*\*\* Permissible continuous current of screen under standard conditions of current rating acc. to table current rating 4/9GWK-AX single core cables 557 578

EMC = Electromagnetic Compatibility  
L = Reduced Screen Coverage

# RADOX® 4 GKW-AX/S EMC

## Multi Core screened

|                      |                          |                   |                   |
|----------------------|--------------------------|-------------------|-------------------|
| Conductor            | EN 60228, class 5        | Voltage rating    | 1800/3000 V AC    |
| Number of conductors | 2 - ...                  |                   | 2700/4500 V DC    |
| Cross section        | 1.5 - 95 mm <sup>2</sup> | Temperature range | -40 °C to +120 °C |



### Composition of cable

|                           |                         |                         |
|---------------------------|-------------------------|-------------------------|
| 1. Cores of type          | 4 GKW-AX                | colour: black, numbered |
| 2 Fillers (optional)      | RADOX                   |                         |
| 3 Separator(s) (optional) | tape                    |                         |
| 4 EMC screen              | tin plated copper braid |                         |
| 5 Separator               | tape                    |                         |
| 6 Sheath                  | RADOX GKW S             | colour: black           |

### Characteristics and specialities

- Resistance to oil, ozone and weathering
- High screening effectiveness
- Wide product range

### Application

- For protected connections of fixed and sporadic moving parts inside and outside of rolling stock.
- Guidelines for selections and the installation are described in the standards EN 50355 and EN50343.

### Standards

| Standard      | Fire protection on railway vehicles |   |
|---------------|-------------------------------------|---|
| CEN/TS 45545  |                                     |   |
| DIN 5510-2    | Protection level                    | 1, 2, 3, 4                              |
| NF F 16-101   | Class, category                     | C / F0, int. A1, A2, B / ext. A1, A2, B |
| UNI CEI 11170 |                                     |   |

For further technical details please refer to our data sheet.

# RADOX® 4 GKW-AX/S EMC

# Multi Core screened

| Cable type<br>n x mm <sup>2</sup> | Conductor               |                         | Core                    | Screen                  |                         | Cable      | Conductor resistance                      |  | Z <sub>T</sub> | Weight             |                   | Item no. |
|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------|---|--|----------------|--------------------|-------------------|----------|
|                                   | construction*<br>n x mm | d <sub>nom.</sub><br>mm | d <sub>nom.</sub><br>mm | d <sub>max.</sub><br>mm | size<br>mm <sup>2</sup> | d<br>mm    | conductor<br>R <sub>20</sub> max.<br>Ω/km | screen<br>R <sub>20</sub> max.<br>Ω/km | max.<br>m Ω/M  | copper<br>kg/100 m | cable<br>kg/100 m |          |
| 2 x 1.5                           | 37 x 0.23               | 1.50                    | 3.35                    | 7.0                     | 2.0                     | 9.2 ± 0.3  | 13.7                                      | 9.2                                    | 100            | 5.0                | 13.5              | 12552642 |
| 3 x 1.5                           | 37 x 0.23               | 1.50                    | 3.35                    | 7.6                     | 2.8                     | 10.0 ± 0.3 | 13.7                                      | 7                                      | 50             | 6.7                | 16.4              | 12566644 |
| 6 x 1.5                           | 37 x 0.23               | 1.50                    | 3.35                    | 10.9                    | 5.9                     | 13.8 ± 0.4 | 13.7                                      | 3.3                                    | 50             | 14.5               | 31.7              | 12564185 |
| 3 x 2.5                           | 61 x 0.29               | 1.95                    | 3.90                    | 9.1                     | 3.3                     | 11.4 ± 0.4 | 8.21                                      | 5.9                                    | 70             | 10.3               | 22.5              | 12564186 |
| 4 x 4                             | 61 x 0.29               | 2.45                    | 4.50                    | 12.2                    | 6.2                     | 15.4 ± 0.5 | 4.8                                       | 3.5                                    | 60             | 20.4               | 42.7              | 12568683 |
| 3 x 10                            | 80 x 0.41               | 3.90                    | 6.40                    | 15.0                    | 8.6                     | 18.2 ± 0.5 | 1.95                                      | 2.2                                    | 25             | 37.5               | 65.0              | 12556070 |
| 3 x 16                            | 119 x 0.40              | 5.30                    | 8.40                    | 19.2                    | 12.0                    | 23.1 ± 0.5 | 1.24                                      | 1.6                                    | 50             | 52.0               | 90.0              | 12564357 |
| 3 x 25                            | 182 x 0.40              | 6.60                    | 10.20                   | 23.7                    | 19.1                    | 28.4 ± 0.6 | 0.795                                     | 1.10                                   | 50             | 81.7               | 152               | 12564358 |
| 3 x 25<br>+10                     | 182 x 0.40<br>80 x 0.40 | 6.60<br>3.90            | 10.20<br>6.40           | 24.6                    | 19.1                    | 29.5 ± 0.6 | 0.795<br>1.95                             | 1.10                                   | 50             | 91.3               | 165               | 12563358 |
| 4 x 25                            | 182 x 0.40              | 6.60                    | 10.20                   | 27.9                    | 18.1                    | 34.1 ± 0.6 | 0.795                                     | 1.26                                   | 50             | 104                | 187               | 12563356 |
| 2 x 35                            | 266 x 0.40              | 7.80                    | 11.70                   | 24.9                    | 19.4                    | 29.8 ± 0.6 | 0.565                                     | 1.06                                   | 20             | 78.6               | 158               | 12583239 |
| 3 x 35                            | 266 x 0.40              | 7.80                    | 11.70                   | 26.7                    | 21.5                    | 31.6 ± 0.7 | 0.565                                     | 0.89                                   | 50             | 112                | 197               | 12561687 |
| 3 x 35<br>+10                     | 266 x 0.40<br>80 x 0.40 | 7.80<br>3.90            | 11.70<br>6.40           | 27.0                    | 21.9                    | 32.8 ± 0.6 | 0.565<br>1.95                             | 1.03                                   | 50             | 125                | 214               | 12563359 |
| 4 x 35                            | 266 x 0.40              | 7.80                    | 11.70                   | 30.9                    | 35.2                    | 37.1 ± 0.7 | 0.565                                     | 0.66                                   | 50             | 163                | 210               | 12563357 |

\* Typical value x single wire diameter

Other colours on request.

S = GKW S sheath  
EMC = Electromagnetic Compatibility