

# X-VOLT<sup>®</sup> CU (-OL/-2OL) RHZ1 (S)

Medium Voltage copper cable, XLPE insulation.

ACCORDING TO: IEC 60502-2



E<sub>ca</sub>

## APPLICATION

X-VOLT<sup>®</sup> RHZ1 (S) is a Medium Voltage copper cable halogen-free and no flame propagation properties for fixed installations. Suitable for transport and distribution of electric power in medium voltage networks.

## CONSTRUCTION

### Conductor

Electrolytic annealed copper, class 2 according to EN 60228 and IEC 60228.

Optionally, with longitudinal water tightness (cable type -2OL).

### Conductor screen

Screen over the conductor, made of thermosetting semiconductor material.

### Insulation

Cross-linked polyethylene type XLPE according to IEC 60502-2 and type DIX3 according to HD 620-1, natural colour.

Cross linked in catenary line with nitrogen atmosphere through a triple layer extrusion process.

### Insulation screen

Screen over the insulation, made of thermosetting and strippable semiconductor material.

### Metallic screen

Copper wires and copper tape screen, with a minimum cross-section of 16mm<sup>2</sup>.

### Longitudinal water tightness

Hygroscopic tape completely covering the screen (cable type -OL and -2OL).

### Outer sheath

Polyolefin type ST12 according to IEC 60502-2 and type DMZ2 according to HD 620-1.

Red colour with two grey stripes.

Other colours under request.

## CHARACTERISTICS



### Electrical performance

Medium Voltage: 6/10 (12) kV  
8,7/15 (17,5) kV  
12/20 (24) kV  
18/30 (36) kV



### Thermal performance

Maximum conductor temperature: 90°C.  
Maximum short-circuit temperature: 250°C (max 5 s).  
Minimum service temperature: -15°C.



### Fire performance

Flame non-propagation according to EN 60332-1 / IEC 60332-1.  
Reaction to fire CPR: E<sub>ca</sub> according to EN 50575.  
Halogen free according to EN 60754-1 / IEC 60754-1.  
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.



### Mechanical performance

Minimum bending radius permanently installed: 15x cable diameter.  
Minimum bending radius while installation: 20x cable diameter.  
Abrasion resistant.  
Tear resistant.



### Environmental performance

UV Resistant according to UNE 211605.  
Water Resistance: AD6 Waves.



### Installation conditions

Open Air.  
Buried.  
In conduit.

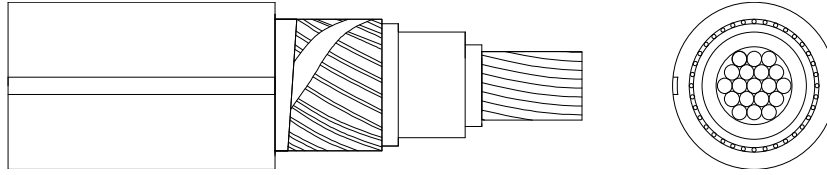
## STANDARDS / COMPLIANCE



According to  
IEC 60502-2

# X-VOLT<sup>®</sup> CU (-OL/-2OL) RHZ1 (S)

## DIMENSIONS & ADMISSIBLE INTENSITIES



### X-VOLT<sup>®</sup> RHZ1 (S) 6/10 (12) kV

| Cross-section (mm <sup>2</sup> ) | Screen (mm <sup>2</sup> ) | Conductor Diameter (mm) | Insulation Diameter (mm) | External Diameter (mm) | Weight (Kg/Km) | R max. 20°C (Ω/km) | X (Ω/km) | C (μF/km) | Open air (A) <sup>1</sup> | Buried (A) <sup>2</sup> |
|----------------------------------|---------------------------|-------------------------|--------------------------|------------------------|----------------|--------------------|----------|-----------|---------------------------|-------------------------|
| 1 x 70                           | H16                       | 10,0                    | 17,2                     | 25,1                   | 1.215          | 0,268              | 0,117    | 0,270     | 296                       | 239                     |
| 1 x 240                          | H16                       | 18,1                    | 25,3                     | 31,6                   | 2.810          | 0,0754             | 0,094    | 0,463     | 641                       | 469                     |

### X-VOLT<sup>®</sup> RHZ1 (S) 8,7/15 (17,5) kV

| Cross-section (mm <sup>2</sup> ) | Screen (mm <sup>2</sup> ) | Conductor Diameter (mm) | Insulation Diameter (mm) | External Diameter (mm) | Weight (Kg/Km) | R max. 20°C (Ω/km) | X (Ω/km) | C (μF/km) | Open air (A) <sup>1</sup> | Buried (A) <sup>2</sup> |
|----------------------------------|---------------------------|-------------------------|--------------------------|------------------------|----------------|--------------------|----------|-----------|---------------------------|-------------------------|
| 1 x 185                          | H16                       | 16,5                    | 25,7                     | 32,0                   | 2.435          | 0,0991             | 0,100    | 0,339     | 543                       | 406                     |
| 1 x 240                          | H16                       | 18,1                    | 27,3                     | 34,2                   | 2.900          | 0,0754             | 0,099    | 0,389     | 641                       | 469                     |
| 1 x 400                          | H16                       | 25,3                    | 35,0                     | 42,1                   | 4.585          | 0,0470             | 0,091    | 0,488     | 845                       | 590                     |
| 1 x 500                          | H16                       | 26,5                    | 36,2                     | 43,5                   | 5.555          | 0,0366             | 0,090    | 0,507     | 1.002                     | 670                     |
| 1 x 630                          | H16                       | 30,0                    | 39,7                     | 48,0                   | 6.990          | 0,0283             | 0,089    | 0,600     | 1.196                     | 772                     |

### X-VOLT<sup>®</sup> RHZ1 (S) 12/20 (24) kV

| Cross-section (mm <sup>2</sup> ) | Screen (mm <sup>2</sup> ) | Conductor Diameter (mm) | Insulation Diameter (mm) | External Diameter (mm) | Weight (Kg/Km) | R max. 20°C (Ω/km) | X (Ω/km) | C (μF/km) | Open air (A) <sup>1</sup> | Buried (A) <sup>2</sup> |
|----------------------------------|---------------------------|-------------------------|--------------------------|------------------------|----------------|--------------------|----------|-----------|---------------------------|-------------------------|
| 1 x 95                           | H16                       | 11,1                    | 22,1                     | 28,2                   | 1.535          | 0,193              | 0,118    | 0,216     | 361                       | 285                     |
| 1 x 120                          | H16                       | 12,8                    | 23,8                     | 30,1                   | 1.790          | 0,153              | 0,113    | 0,239     | 417                       | 323                     |
| 1 x 150                          | H16                       | 15,0                    | 26,0                     | 32,3                   | 2.130          | 0,124              | 0,107    | 0,268     | 473                       | 361                     |
| 1 x 185                          | H16                       | 16,5                    | 27,5                     | 34,0                   | 2.535          | 0,0991             | 0,105    | 0,288     | 543                       | 406                     |
| 1 x 240                          | H16                       | 18,1                    | 29,1                     | 36,3                   | 3.040          | 0,0754             | 0,103    | 0,309     | 641                       | 469                     |
| 1 x 300                          | H16                       | 20,6                    | 33,3                     | 40,7                   | 3.760          | 0,0601             | 0,098    | 0,365     | 735                       | 526                     |
| 1 x 400                          | H16                       | 25,3                    | 36,5                     | 43,8                   | 4.750          | 0,0470             | 0,094    | 0,407     | 845                       | 590                     |
| 1 x 500                          | H16                       | 26,5                    | 38,0                     | 45,3                   | 5.680          | 0,0366             | 0,093    | 0,427     | 1.002                     | 670                     |
| 1 x 630                          | H16                       | 30,0                    | 42,1                     | 50,8                   | 7.215          | 0,0283             | 0,092    | 0,592     | 1.196                     | 772                     |

### X-VOLT<sup>®</sup> RHZ1 (S) 18/30 (36) kV

| Cross-section (mm <sup>2</sup> ) | Screen (mm <sup>2</sup> ) | Conductor Diameter (mm) | Insulation Diameter (mm) | External Diameter (mm) | Weight (Kg/Km) | R max. 20°C (Ω/km) | X (Ω/km) | C (μF/km) | Open air (A) <sup>1</sup> | Buried (A) <sup>2</sup> |
|----------------------------------|---------------------------|-------------------------|--------------------------|------------------------|----------------|--------------------|----------|-----------|---------------------------|-------------------------|
| 1 x 150                          | H16                       | 15,0                    | 30,6                     | 37,8                   | 2.410          | 0,124              | 0,117    | 0,201     | 473                       | 361                     |
| 1 x 185                          | H16                       | 16,5                    | 32,1                     | 39,3                   | 2.815          | 0,0991             | 0,114    | 0,215     | 543                       | 406                     |
| 1 x 240                          | H16                       | 18,1                    | 33,7                     | 40,8                   | 3.320          | 0,0754             | 0,110    | 0,229     | 641                       | 469                     |
| 1 x 500                          | H16                       | 26,5                    | 42,6                     | 50,3                   | 6.045          | 0,0366             | 0,099    | 0,281     | 1.002                     | 670                     |

<sup>1</sup> Three single-core cables in open air at 30°C ambient temperature according to IEC 60502-2.

<sup>2</sup> Three single-core cables direct buried at 0,8 m depth with soil thermal resistivity of 1,5 K·m/W and 20°C of ground temperature according to IEC 60502-2.

Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).  
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.  
In all cases are supposed a three-phase circuit.

# X-VOLT<sup>®</sup> CU (-OL/-2OL) RHZ1 (S)

## SHORT-CIRCUIT CURRENT-CARRYING CAPACITIES

|                   |     |     |     |     |     |     |     |     |    |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Time (s)          | 0,1 | 0,2 | 0,3 | 0,5 | 1   | 1,5 | 2   | 2,5 | 3  |
| A/mm <sup>2</sup> | 452 | 320 | 261 | 202 | 143 | 117 | 101 | 90  | 83 |

## CORRECTION FACTORS FOR AIR TEMPERATURE

|             |      |      |    |      |      |      |      |      |      |
|-------------|------|------|----|------|------|------|------|------|------|
| Air T. (°C) | 20   | 25   | 30 | 35   | 40   | 45   | 50   | 55   | 60   |
| Factor      | 1,08 | 1,04 | 1  | 0,96 | 0,91 | 0,87 | 0,82 | 0,76 | 0,71 |

## CORRECTION FACTORS FOR GROUND TEMPERATURE

|                |      |      |    |      |      |      |      |      |      |
|----------------|------|------|----|------|------|------|------|------|------|
| Ground T. (°C) | 10   | 15   | 20 | 25   | 30   | 35   | 40   | 45   | 50   |
| Factor         | 1,07 | 1,04 | 1  | 0,96 | 0,93 | 0,89 | 0,85 | 0,80 | 0,76 |

## CORRECTION FACTORS FOR SOIL THERMAL RESISTIVITY (calculated for 400 mm<sup>2</sup> cable)

|                      |           |         |           |         |           |         |
|----------------------|-----------|---------|-----------|---------|-----------|---------|
| Direct buried cables |           |         |           |         |           |         |
| 0,5 K·m/W            | 0,8 K·m/W | 1 K·m/W | 1,5 K·m/W | 2 K·m/W | 2,5 K·m/W | 3 K·m/W |
| 1,37                 | 1,30      | 1,19    | 1         | 0,88    | 0,79      | 0,73    |

Other correction factors (for grouping cables, for harmonic currents), that are not in this specification, can be applied. Further information can be found in IEC 60502-2.