

## **Power & Control Cables**

$U_0/U$  0.6/1 kV - IEC 60502-1



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Weights, measurements, and properties are approximate.

While every care is taken to ensure that the information contained in this publication is correct, no legal responsibility can be accepted for any inaccuracy. The Company reserves the right to alter or modify the information contained herein at any time in the light of technical or other development.

Note: KERPEN GmbH & Co. KG can not be held responsible in any form for any information derived out of this publication.

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## About this Catalogue

This catalogue contains Power and Control cables designed to IEC 60502-1

The purpose of this catalogue is to provide information on power and control cables used in applications for the international project business. Due to today's global thinking, the many different local specifications are not practical anymore. A plant is very often designed in one country for a customer in another country - very likely on another continent.

Most countries have their own cable factories for power cables, mostly in cable constructions to their local standards for power distribution. This catalogue is not intended to compete with these applications, although the constructions are suitable.

IEC 60502-1 helps the engineers to design with a practical standard and rules which are applicable and acceptable around the world. Engineers will understand each other, being able to use the same standard; a plant, once engineered, can be rebuilt in another country, without having to re-engineer the cable section.

Global thinking - justified, of course, and driven by overall cost saving is what we, as a manufacturer, are bound to support. Fortunately, IEC 60502-1 is a standard which is already used as a common basis for many international projects. More and more end-users have already changed - or are accepting - IEC 60502-1 for their current and future projects.

This catalogue has been produced by KERPEN to support engineers with the most common data on cables in accordance with IEC 60502-1. It will make the engineer's job easier to select the right cable and, in the end, will allow easier and faster procurement of a standard cable as well.

However, KERPEN does not only manufacture to IEC 60502-1. In case you need different power and control cable constructions than manufactured locally, we will be pleased to advise and consult with you.



## 1. Introduction

Power cables are used for transmission of electric power; as control cables are used to measure, control and regulate or monitor industrial plants.

Power cables are mainly used in distribution networks of power utilities, in industries, in mines etc.

To select the cable it is necessary to consider whether the specific system and installation conditions and requirements can be fulfilled.

The following criteria, therefore should have proper consideration to define the suitable cable type:

- occurrence of maximum voltage load
- allowable voltage drop
- power to be transmitted, current carrying capacity
- permissible or necessary short-circuit admittance
- electrical protection
- mechanical stress/influence
- thermal stress/influence
- chemical stress/influence
- standards or specifications to be followed



Feature to differentiate power cables is the voltage grade, which is indicated as quotient  $U_0/U$ , where

$U_0$  signifies the voltage between conductor and metallic coverage or earth

$U$  signifies the voltage among phase conductors (insulated conductors)

In three-phase current systems  $U_0 = U/\sqrt{3}$

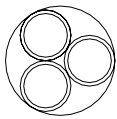
## 2. Construction

### 2.1 Conductor

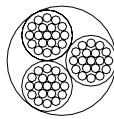
IEC 60228 specifies four different classes of conductors; classes 1, 2, 5 and 6. Power and control cables normally have conductors of class 1 (solid conductors) or class 2 (stranded conductors).

Power and control cables have plain annealed copper conductors.

Conductor forms:



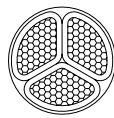
**RE** = circular solid



**RM** = circular stranded



**SE** = sector shaped solid



**SM** = sector shaped stranded

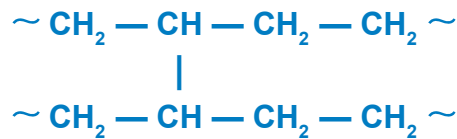
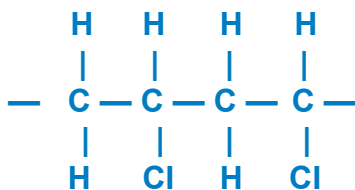
### 2.2 Insulation

The insulation materials for power and control cables are

polyvinyl chloride (PVC)

or

cross-linked polyethylene (XLPE).



### 2.3 Laying Up

The cores of cables are laid up with suitable filling elements (if necessary) to form a compact circular assembly. Suitable binder tape(s) may be applied.

### 2.4 Bedding

Cables incorporating an armour layer have an extruded bedding of polyvinyl chloride (PVC) or zero halogen material (LSZH).

### 2.5 Armour

The primary purpose of armour is to protect the cable against mechanical damage during installation and operation. Apart from this mechanical armour, it can also fulfil various electrical functions, e.g. earth conductor, screen of inductive protection.

Armouring of single core cables is provided by round aluminium wires, multicore cables will have galvanized round steel wires.

### 2.6 Outer Sheath

The outer sheath of cables consists of extruded polyvinyl chloride (PVC) or zero halogen material (LSZH). The colour is primarily black.

### 3. Use

#### 3.1 Range of use

Cables in accordance with IEC 60502-1 are intended for fixed installation:

- indoors
- outdoors
- underground
- in water

(Note: The relevant national installation regulations must be observed)

#### 3.2 Nominal and highest cable voltages

|                            | Nominal rated<br>voltage<br>$U_0/U$<br><br>(kV) | Highest system voltage<br><br>$U_m$ |                                              |                                              |
|----------------------------|-------------------------------------------------|-------------------------------------|----------------------------------------------|----------------------------------------------|
|                            |                                                 | three phase<br>system<br>(kV)       | single phase<br>system <sup>1)</sup><br>(kV) | single phase<br>system <sup>2)</sup><br>(kV) |
|                            |                                                 |                                     |                                              |                                              |
| <b>Low Voltage L.V.</b>    | 0.6 / 1                                         | 1.2                                 | 1.4 <sup>3)</sup>                            | 0.7                                          |
|                            | 1.8 / 3                                         | 3.6                                 | 4.2                                          | 2.1                                          |
| <b>Medium Voltage M.V.</b> | 3.6 / 6                                         | 7.2                                 | 8.3                                          | 4.2                                          |
|                            | 6.0 / 10                                        | 12.0                                | 14.0                                         | 7.0                                          |
|                            | 8.7 / 15                                        | 17.5                                | 20.0                                         | 10.0                                         |
|                            | 12.0 / 20                                       | 24.0                                | 28.0                                         | 14.0                                         |
|                            | 18.0 / 30                                       | 36.0                                | 42.0                                         | 21.0                                         |

<sup>1)</sup> both phases insulated

<sup>2)</sup> one phase grounded

<sup>3)</sup> max. voltage in d.c. systems 1.8 kV

**U:** Rated power-frequency voltage between phase conductors for which the cable is suitable.

**$U_0$ :** Rated power-frequency voltage between conductor and earth or armour, metal sheath or screen for which the cable is suitable.

**$U_m$ :** Maximum value of the „highest system voltage“ between phase conductors for which the cable is suitable.

### 3.3 Network-Systems

The rated voltage of the cable for a given application shall be suitable for the operating conditions in the system in which the cable is used. To facilitate the selection of the cable, systems are divided into three categories (IEC 60502-1):

#### Category A

This category comprises those systems in which any phase conductor that comes in contact with earth or an earth conductor, is disconnected from the system within 1 min.

#### Category B

This category comprises those systems which, under fault conditions, are operated for a short time with one phase earthed. This period, according to IEC 60183, should not exceed 1 h. For cables covered by IEC 60502-1 a longer period, not exceeding 8 h on any occasion, can be tolerated. The total duration of earth faults in any year should not exceed 125 h.

#### Category C

This category comprises all systems which do not fall into category A or B.

Recommended rated voltages  $U_0$  for cables used in three-phase systems:

| Highest system voltage<br>( $U_m$ )<br>kV | Rated Voltage<br>( $U_0$ )<br>kV |            |
|-------------------------------------------|----------------------------------|------------|
|                                           | Categories A and B               | Category C |
| 1.2                                       | 0.6                              | 0.6        |
| 3.6                                       | 1.8                              | 3.6*       |

\*This category is covered by 3.6/6 (7.2) kV cables to IEC 60502-2.

Note: It should be realised that in a system where an earth fault is not automatically and promptly isolated, the extra stresses on the insulation of cables during the earth fault reduce the life of the cables to a certain degree. If the system is expected to be operated fairly often with a permanent earth fault, it may be advisable to classify the system in category C.





## Section 1:

**PVC - Insulated**

**Low Voltage Cables (70 °C)**

$U_0 / U$  0.6 / 1 kV



(2-, 3-, 4- and 5-cores)

 $U_0/U$  0.6 / 1 kV

PVC-Insulation, PVC-Sheath

YY-fl

**Application**

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial. For indoor or outdoor installation in dry and wet locations, on racks, in conduits. (Local and / or legal requirements to be noted)

**Construction**

**Conductor** plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,  
 $\leq 35 \text{ mm}^2$ : circular solid (RE) or circular stranded (RM),  
 $> 35 \text{ mm}^2$ : sector-shaped stranded (SM)<sup>1)</sup>

**Insulation** polyvinyl chloride PVC

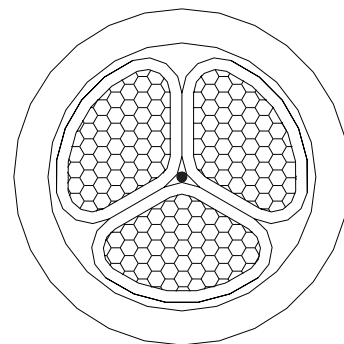
**Colour code**<sup>2)</sup> 2-core: blue, brown  
 3-core: brown, black, grey  
 4-core: blue, brown, black, grey  
 5-core: blue, brown, black, grey, black

**Laying up** cores twisted in layers (if necessary with filling element(s))

**Inner Covering** extruded filler of regenerated rubber

**Outer Sheath** extruded polyvinyl chloride PVC, black

**Cable marking** ELECTRIC CABLE 0.6/1 kV IEC 60502-1,  
 KERPEN, YEAR, LENGTH MARKING

**Technical Data**

**Flame retardancy:** IEC 60332-1  
**Flame propagation:** IEC 60332-3 cat. A

**Outer sheath:**

**Amount of halogen acid gas:** max. 17 %  
 (IEC 60754-1)  
**Limiting Oxygen Index (LOI):** min. 30 %  
 (IEC 60332-3 ann. B)

**Temperature Index (TI):** min. 300 °C  
 (ASTM-D-2863)

**Temperature range:**  
 - 30 °C up to + 70 °C  
 (during operation)  
 - 5° C up to +50 °C  
 (during installation)  
 $\leq 300 \text{ mm}^2$ : max. +160 °C  
 $> 300 \text{ mm}^2$ : max. +140 °C  
 (under short circuit)

**Min. bending radius:**  
 8 x cable-Ø

**Abbreviations**

**Y** insulation & outer sheath of PVC

**-fl** reduced flame propagation

**Electrical Data at 20 °C**

|                                                           | Character | Unit   | Values                         |
|-----------------------------------------------------------|-----------|--------|--------------------------------|
| <b>Conductor resistance</b>                               | max.      | Ohm/km | acc. to IEC 60228              |
| <b>Test voltage <math>U_{\text{rms}}</math> core:core</b> |           | V      | 3500                           |
| <b>Nominal voltage <math>U_0/U</math></b>                 |           | V      | 600 / 1000                     |
| <b>Highest system voltage <math>U_m</math></b>            | max.      | V      | 1200 (for three phase systems) |

<sup>1)</sup> 5core cables only with circular conductors

<sup>2)</sup> other colours on request

for further details see appendix

| Power & Control Cable               |                                |                                  |                  |                      | IEC 60502-1                  |  |
|-------------------------------------|--------------------------------|----------------------------------|------------------|----------------------|------------------------------|--|
| (2-, 3-, 4- and 5-cores)            |                                |                                  |                  |                      | U <sub>0</sub> /U 0.6 / 1 kV |  |
| PVC-Insulation, PVC-Sheath<br>YY-fl |                                |                                  |                  |                      |                              |  |
| Geometrical Data                    |                                |                                  |                  |                      |                              |  |
| No. of cores and cross-section      | Radial thickness of insulation | Radial thickness of outer sheath | Overall diameter | Weigth of cable      | Part number                  |  |
| (nom.)<br>n / mm²                   | (nom.)<br>mm                   | (nom.)<br>mm                     | (approx.)<br>mm  | (approx.)<br>kg / km |                              |  |
| 2 x 1.5 RE                          | 0.8                            | 1.8                              | 10.1             | 150                  | 20230251                     |  |
| 2 x 1.5 RM                          | 0.8                            | 1.8                              | 10.6             | 160                  | 20230003                     |  |
| 2 x 2.5 RE                          | 0.8                            | 1.8                              | 10.9             | 190                  | 20230252                     |  |
| 2 x 2.5 RM                          | 0.8                            | 1.8                              | 11.4             | 200                  | 20230253                     |  |
| 2 x 4 RE                            | 1.0                            | 1.8                              | 12.7             | 260                  | 20230254                     |  |
| 2 x 4 RM                            | 1.0                            | 1.8                              | 13.4             | 290                  | 20230255                     |  |
| 2 x 6 RE                            | 1.0                            | 1.8                              | 13.7             | 320                  | 20230256                     |  |
| 2 x 6 RM                            | 1.0                            | 1.8                              | 14.4             | 350                  | 20230257                     |  |
| 2 x 10 RE                           | 1.0                            | 1.8                              | 15.2             | 430                  | 20230258                     |  |
| 2 x 10 RM                           | 1.0                            | 1.8                              | 16.3             | 480                  | 20230259                     |  |
| 2 x 16 RE                           | 1.0                            | 1.8                              | 17.1             | 600                  | 20230260                     |  |
| 2 x 16 RM                           | 1.0                            | 1.8                              | 18.5             | 660                  | 20230261                     |  |
| 2 x 25 RM                           | 1.2                            | 1.8                              | 21.4             | 920                  | -                            |  |
| 2 x 35 RM                           | 1.2                            | 1.8                              | 23.6             | 1020                 | -                            |  |
| 2 x 50 SM                           | 1.4                            | 1.8                              | 23.1             | 1320                 | 20230264                     |  |
| 2 x 70 SM                           | 1.4                            | 1.9                              | 26.3             | 1730                 | 20230265                     |  |
| 2 x 95 SM                           | 1.6                            | 2.0                              | 30.0             | 2360                 | 20230266                     |  |
| 2 x 120 SM                          | 1.6                            | 2.1                              | 31.9             | 2850                 | 20230267                     |  |
| 2 x 150 SM                          | 1.8                            | 2.2                              | 35.3             | 3480                 | 20230268                     |  |
| 2 x 185 SM                          | 2.0                            | 2.4                              | 39.7             | 4340                 | 20230269                     |  |
| 2 x 240 SM                          | 2.2                            | 2.6                              | 44.6             | 5600                 | 20230270                     |  |
| 2 x 300 SM                          | 2.4                            | 2.7                              | 51.7             | 7200                 | 20230013                     |  |
| 3 x 1.5 RE                          | 0.8                            | 1.8                              | 10.6             | 170                  | 20230271                     |  |
| 3 x 1.5 RM                          | 0.8                            | 1.8                              | 11.1             | 190                  | 20230272                     |  |
| 3 x 2.5 RE                          | 0.8                            | 1.8                              | 11.5             | 220                  | 20230273                     |  |
| 3 x 2.5 RM                          | 0.8                            | 1.8                              | 12.0             | 230                  | 20230274                     |  |
| 3 x 4 RE                            | 1.0                            | 1.8                              | 13.3             | 300                  | 20230275                     |  |
| 3 x 4 RM                            | 1.0                            | 1.8                              | 14.1             | 310                  | 20230276                     |  |
| 3 x 6 RE                            | 1.0                            | 1.8                              | 14.4             | 390                  | 20230277                     |  |
| 3 x 6 RM                            | 1.0                            | 1.8                              | 15.2             | 410                  | 20230278                     |  |
| 3 x 10 RE                           | 1.0                            | 1.8                              | 16.1             | 540                  | 20230279                     |  |
| 3 x 10 RM                           | 1.0                            | 1.8                              | 17.2             | 580                  | 20230280                     |  |
| 3 x 16 RE                           | 1.0                            | 1.8                              | 18.2             | 750                  | 20230281                     |  |
| 3 x 16 RM                           | 1.0                            | 1.8                              | 19.6             | 820                  | 20230282                     |  |
| 3 x 25 RM                           | 1.2                            | 1.8                              |                  |                      |                              |  |
|                                     |                                |                                  |                  |                      |                              |  |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

**Power & Control Cable****IEC 60502-1****(2-, 3-, 4- and 5-cores)****U<sub>0</sub>/U 0.6 / 1 kV****PVC-Insulation, PVC-Sheath****YY-fl****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 3 x 35 RM                                                           | 1.2                                                | 1.8                                                  |                                         |                                             |             |
| 3 x 50 SM                                                           | 1.4                                                | 1.8                                                  | 26.8                                    | 1870                                        | 20230285    |
| 3 x 70 SM                                                           | 1.4                                                | 2.0                                                  | 30.2                                    | 2510                                        | 20230286    |
| 3 x 95 SM                                                           | 1.6                                                | 2.1                                                  | 33.7                                    | 3410                                        | 20230287    |
| 3 x 120 SM                                                          | 1.6                                                | 2.2                                                  | 36.2                                    | 4080                                        | 20230288    |
| 3 x 150 SM                                                          | 1.8                                                | 2.3                                                  | 40.3                                    | 5010                                        | 20230289    |
| 3 x 185 SM                                                          | 2.0                                                | 2.5                                                  | 45.8                                    | 6290                                        | 20230290    |
| 3 x 240 SM                                                          | 2.2                                                | 2.7                                                  | 51.8                                    | 8170                                        | 20230291    |
| 3 x 300 SM                                                          | 2.4                                                | 2.8                                                  | 59.4                                    | 10460                                       | 20230292    |
| 3 x 400 SM                                                          | 2.6                                                | 3.1                                                  | 66.5                                    | 13260                                       | 20230293    |
| 4 x 1.5 RE                                                          | 0.8                                                | 1.8                                                  | 11.4                                    | 190                                         | 20230294    |
| 4 x 1.5 RM                                                          | 0.8                                                | 1.8                                                  | 11.9                                    | 200                                         | 20230295    |
| 4 x 2.5 RE                                                          | 0.8                                                | 1.8                                                  | 12.3                                    | 240                                         | 20230296    |
| 4 x 2.5 RM                                                          | 0.8                                                | 1.8                                                  | 12.9                                    | 250                                         | 20230297    |
| 4 x 4 RE                                                            | 1.0                                                | 1.8                                                  | 14.4                                    | 340                                         | 20230298    |
| 4 x 4 RM                                                            | 1.0                                                | 1.8                                                  | 15.3                                    | 370                                         | 20230299    |
| 4 x 6 RE                                                            | 1.0                                                | 1.8                                                  | 15.6                                    | 440                                         | 20230300    |
| 4 x 6 RM                                                            | 1.0                                                | 1.8                                                  | 16.5                                    | 470                                         | 20230301    |
| 4 x 10 RE                                                           | 1.0                                                | 1.8                                                  | 17.6                                    | 640                                         | 20230302    |
| 4 x 10 RM                                                           | 1.0                                                | 1.8                                                  | 19.0                                    | 680                                         | 20230303    |
| 4 x 16 RE                                                           | 1.0                                                | 1.8                                                  | 19.8                                    | 910                                         | 20230304    |
| 4 x 16 RM                                                           | 1.0                                                | 1.8                                                  | 21.4                                    | 980                                         | 20230305    |
| 4 x 25 RM                                                           | 1.2                                                | 1.8                                                  | 25.3                                    | 1530                                        | -           |
| 4 x 35 RM                                                           | 1.2                                                | 1.8                                                  | 28.0                                    | 2000                                        | -           |
| 4 x 50 SM                                                           | 1.4                                                | 1.9                                                  | 30.8                                    | 2400                                        | 20230308    |
| 4 x 70 SM                                                           | 1.4                                                | 2.1                                                  | 34.2                                    | 3210                                        | 20230309    |
| 4 x 95 SM                                                           | 1.6                                                | 2.2                                                  | 38.4                                    | 4440                                        | 20230310    |
| 4 x 120 SM                                                          | 1.6                                                | 2.3                                                  | 41.6                                    | 5390                                        | 20230311    |
| 4 x 150 SM                                                          | 1.8                                                | 2.5                                                  | 46.0                                    | 6620                                        | 20230312    |
| 4 x 185 SM                                                          | 2.0                                                | 2.7                                                  | 50.4                                    | 8240                                        | 20230313    |
| 4 x 240 SM                                                          | 2.2                                                | 2.9                                                  | 59.0                                    | 10770                                       | 20230314    |
| 4 x 300 SM                                                          | 2.4                                                | 3.1                                                  | 66.1                                    | 13780                                       | 20230315    |
| 4 x 400 SM                                                          | 2.6                                                | 3.4                                                  | 77.0                                    | 17580                                       | 20230316    |
| 5 x 4 RE                                                            | 1.0                                                | 1.8                                                  | 15.7                                    | 440                                         | 20230317    |
| 5 x 4 RM                                                            | 1.0                                                | 1.8                                                  | 16.6                                    | 470                                         | 20230318    |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

## IEC 60502-1

**$U_0/U$  0.6 / 1 kV**

YY-fl

[illegible]

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(Multicores)

U<sub>0</sub>/U 0.6/1 kV

PVC-Insulation, PVC-Sheath

YY-fl

## Application

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial. For indoor and outdoor installation in dry and wet locations, on racks, in conduits

## Construction

**Conductor** plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,  
 $\leq 35 \text{ mm}^2$ : circular solid (RE) or circular stranded (RM),  
 $> 35 \text{ mm}^2$ : sector-shaped stranded (SM)

**Insulation** polyvinyl chloride PVC

**Colour code** <sup>1)</sup> Two-core: blue, brown  
 Three-core: brown, black, grey  
 Four-core: blue, brown, black, grey

**Laying up** cores twisted in layers (if necessary with filling element(s))

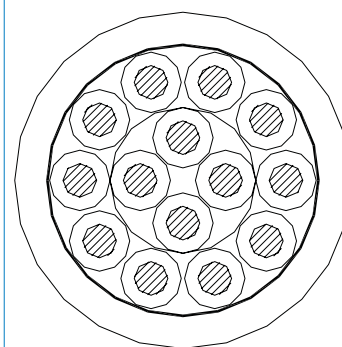
**Wrapping** at least 1 layer of plastic tape

**Bedding** extruded polyvinyl chloride PVC, black

**Armour** galvanized round steel wires

**Outer Sheath** extruded polyvinyl chloride PVC, black

**Cable marking** ELECTRIC CABLE 0.6/1 kV IEC 60502-1  
 KERPEN, YEAR, LENGTH, MARKING



## Technical Data

## Abbreviations

**Flame retardancy:** IEC 60332-1  
**Flame propagation:** IEC 60332-3 cat. A

**Outer Sheath:**

**Amount of halogen acid gas:** max. 17 %  
 (IEC 60754-1)

**Limiting Oxygen Index (LOI):** min. 30 %  
 (IEC 60332-3 ann. B)

**Temperatur Index (TI):** min. 300 °C  
 (ASTM-D-2863)

**Temperature range:**  
 -30 °C up to +70 °C  
 (during operation)  
 -5 °C up to +50 °C  
 (during installation)  
 $\leq 300 \text{ mm}^2$ : max. +160 °C  
 $> 300 \text{ mm}^2$ : max. +140 °C  
 (under short circuit)

**Min. bending radius:**  
 8 x cable-Ø

**Y** insulation, bedding &  
 outer  
 sheath of PVC  
**R** round steel wire armour  
**-fl** reduced flame  
 propagation

## Electrical Data at 20 °C

|                                                  | Character | Unit | Values                         |
|--------------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance</b>                      | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage U<sub>rms</sub> core: core</b>   |           | V    | 3500                           |
| <b>Test voltage U<sub>rms</sub> core: armour</b> |           | V    | 3500                           |
| <b>Nominal voltage U<sub>0</sub> /U</b>          |           | V    | 600 / 1000                     |
| <b>Highest system voltage U<sub>m</sub></b>      | max.      | V    | 1200 (for three phase systems) |

For further electrical details see appendix

**Power & Control Cable****IEC 60502-1****(multicores)****U<sub>0</sub>/U 0.6/1 kV****PVC-Insulation, PVC-Sheath  
YY-fl****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 5 x 1.5 RE                                                          | 0.8                                                | 1.8                                                  | 11.9                                    | 190                                         | 20230045    |
| 7 x 1.5 RE                                                          | 0.8                                                | 1.8                                                  | 12.8                                    | 230                                         | 20230046    |
| 10 x 1.5 RE                                                         | 0.8                                                | 1.8                                                  | 15.7                                    | 330                                         | 20230047    |
| 12 x 1.5 RE                                                         | 0.8                                                | 1.8                                                  | 16.2                                    | 360                                         | 20230048    |
| 19 x 1.5 RE                                                         | 0.8                                                | 1.8                                                  | 18.7                                    | 510                                         | 20230049    |
| 27 x 1.5 RE                                                         | 0.8                                                | 1.8                                                  | 22.2                                    | 700                                         | 20230050    |
| 37 x 1.5 RE                                                         | 0.8                                                | 1.8                                                  | 24.8                                    | 920                                         | 20230051    |
| 48 x 1.5 RE                                                         | 0.8                                                | 1.9                                                  | 28.3                                    | 1160                                        | 20230052    |
| 5 x 1.5 RM                                                          | 0.8                                                | 1.8                                                  | 12.4                                    | 210                                         | 20230053    |
| 7 x 1.5 RM                                                          | 0.8                                                | 1.8                                                  | 13.4                                    | 270                                         | 20230000    |
| 10 x 1.5 RM                                                         | 0.8                                                | 1.8                                                  | 16.6                                    | 360                                         | 20230009    |
| 12 x 1.5 RM                                                         | 0.8                                                | 1.8                                                  | 17.1                                    | 380                                         | 20230054    |
| 19 x 1.5 RM                                                         | 0.8                                                | 1.8                                                  | 19.9                                    | 540                                         | 20230055    |
| 27 x 1.5 RM                                                         | 0.8                                                | 1.8                                                  | 23.6                                    | 740                                         | 20230056    |
| 37 x 1.5 RM                                                         | 0.8                                                | 1.8                                                  | 26.3                                    | 970                                         | 20230057    |
| 48 x 1.5 RM                                                         | 0.8                                                | 1.9                                                  | 30.1                                    | 1230                                        | 20230058    |
| 5 x 2.5 RE                                                          | 0.8                                                | 1.8                                                  | 13.0                                    | 260                                         | 20230059    |
| 7 x 2.5 RE                                                          | 0.8                                                | 1.8                                                  | 14.0                                    | 320                                         | 20230060    |
| 10 x 2.5 RE                                                         | 0.8                                                | 1.8                                                  | 17.2                                    | 420                                         | 20230061    |
| 12 x 2.5 RE                                                         | 0.8                                                | 1.8                                                  | 17.8                                    | 490                                         | 20230062    |
| 19 x 2.5 RE                                                         | 0.8                                                | 1.8                                                  | 20.8                                    | 710                                         | 20230063    |
| 27 x 2.5 RE                                                         | 0.8                                                | 1.8                                                  | 24.6                                    | 970                                         | 20230064    |
| 37 x 2.5 RE                                                         | 0.8                                                | 1.9                                                  | 27.4                                    | 1270                                        | 20230065    |
| 48 x 2.5 RE                                                         | 0.8                                                | 2.0                                                  | 31.7                                    | 1650                                        | 20230066    |
| 5 x 2.5 RM                                                          | 0.8                                                | 1.8                                                  | 13.6                                    | 270                                         | 20230067    |
| 7 x 2.5 RM                                                          | 0.8                                                | 1.8                                                  | 14.7                                    | 330                                         | 20230068    |
| 10 x 2.5 RM                                                         | 0.8                                                | 1.8                                                  | 18.2                                    | 440                                         | 20230069    |
| 12 x 2.5 RM                                                         | 0.8                                                | 1.8                                                  | 18.8                                    | 520                                         | 20230070    |
| 19 x 2.5 RM                                                         | 0.8                                                | 1.8                                                  | 22.0                                    | 810                                         | 20230031    |
| 27 x 2.5 RM                                                         | 0.8                                                | 1.8                                                  | 26.1                                    | 1030                                        | 20230071    |
| 37 x 2.5 RM                                                         | 0.8                                                | 1.9                                                  | 29.5                                    | 1370                                        | 20230072    |
| 48 x 2.5 RM                                                         | 0.8                                                | 2.0                                                  | 33.8                                    | 1750                                        | 20230073    |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

(2-, 3-, and 4-cores)

U<sub>0</sub>/U 0.6 / 1 kV

PVC-Insulation, Armour

YYRY-fl

## Application

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial. For indoor and outdoor installation in dry and wet locations, on racks, in conduits

## Construction

**Conductor** plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,  
 $\leq 35 \text{ mm}^2$ : circular solid (RE) or circular stranded (RM),  
 $> 35 \text{ mm}^2$ : sector-shaped stranded (SM)

**Insulation** polyvinyl chloride PVC

**Colour code** <sup>1)</sup> Two-core: blue, brown  
 Three-core: brown, black, grey  
 Four-core: blue, brown, black, grey

**Laying up** cores twisted in layers (if necessary with filling element(s))

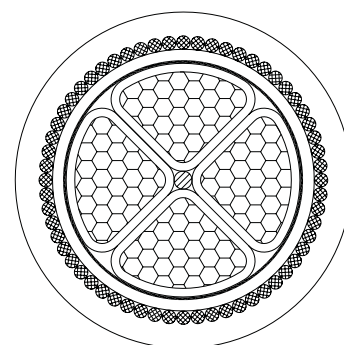
**Wrapping** at least 1 layer of plastic tape

**Bedding** extruded polyvinyl chloride PVC, black

**Armour** galvanized round steel wires

**Outer Sheath** extruded polyvinyl chloride PVC, black

**Cable marking** ELECTRIC CABLE 0.6/1 kV IEC 60502-1  
 KERPEN, YEAR, LENGTH, MARKING



## Technical Data

**Flame retardancy:** IEC 60332-1  
**Flame propagation:** IEC 60332-3 cat. A

**Outer Sheath:**

**Amount of halogen acid gas:** max. 17 %  
 (IEC 60754-1)

**Limiting Oxygen Index (LOI):** min. 30 %  
 (IEC 60332-3 ann. B)

**Temperatur Index (TI):** min. 300 °C  
 (ASTM-D-2863)

**Temperature range:**  
 - 30 °C up to + 70 °C  
 (during operation)  
 - 5 °C up to + 50 °C  
 (during installation)  
 $\leq 300 \text{ mm}^2$ : max. + 160 °C  
 $> 300 \text{ mm}^2$ : max. + 140 °C  
 (under short circuit)

**Min. bending radius:**  
 8 x cable-Ø

## Abbreviations

**Y** insulation, bedding & outer sheath of PVC  
**R** round steel wire armour  
**-fl** reduced flame propagation

## Electrical Data at 20 °C

|                                                  | Character | Unit | Values                         |
|--------------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance</b>                      | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage U<sub>rms</sub> core: core</b>   |           | V    | 3500                           |
| <b>Test voltage U<sub>rms</sub> core: armour</b> |           | V    | 3500                           |
| <b>Nominal voltage U<sub>0</sub> /U</b>          |           | V    | 600 / 1000                     |
| <b>Highest system voltage U<sub>m</sub></b>      | max.      | V    | 1200 (for three phase systems) |

<sup>1)</sup> other colours on request

further details see appendix

**Power & Control Cable****IEC 60502-1****(2-, 3-, and 4-cores)****U<sub>0</sub>/U 0.6 / 1 kV****PVC-Insulation, Armour  
YYRY-fl****Geometrical Data**

| No. of cores<br>and cross-<br>section<br>(nom.)<br>n / mm <sup>2</sup> | Radial<br>thickness of<br>insulation<br>(nom.)<br>mm | Diameter<br>over<br>bedding<br>(approx.)<br>mm | Armour<br>wire<br>diameter<br>(nom.)<br>mm | Radial<br>thickness of<br>outer sheath<br>(nom.)<br>mm | Overall<br>Diameter<br>(approx.)<br>mm | Weight of<br>cable<br>(approx.)<br>kg / km | Part<br>number |
|------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------------------------------|----------------------------------------|--------------------------------------------|----------------|
| 2 x 1.5 RE                                                             | 0.8                                                  | 7.7                                            | 0.8                                        | 1.8                                                    | 13.1                                   | 320                                        | 20300006       |
| 2 x 1.5 RM                                                             | 0.8                                                  | 8.2                                            | 0.8                                        | 1.8                                                    | 13.6                                   | 340                                        | 20300007       |
| 2 x 2.5 RE                                                             | 0.8                                                  | 8.5                                            | 0.8                                        | 1.8                                                    | 13.9                                   | 360                                        | 20300008       |
| 2 x 2.5 RM                                                             | 0.8                                                  | 9.0                                            | 0.8                                        | 1.8                                                    | 14.4                                   | 380                                        | 20300009       |
| 2 x 4 RE                                                               | 1.0                                                  | 10.3                                           | 0.8                                        | 1.8                                                    | 15.7                                   | 450                                        | 20300010       |
| 2 x 4 RM                                                               | 1.0                                                  | 11.0                                           | 0.8                                        | 1.8                                                    | 16.4                                   | 490                                        | 20300011       |
| 2 x 6 RE                                                               | 1.0                                                  | 11.3                                           | 1.25                                       | 1.8                                                    | 17.4                                   | 610                                        | 20300012       |
| 2 x 6 RM                                                               | 1.0                                                  | 12.0                                           | 1.25                                       | 1.8                                                    | 18.1                                   | 650                                        | 20300013       |
| 2 x 10 RE                                                              | 1.0                                                  | 12.8                                           | 1.25                                       | 1.8                                                    | 18.9                                   | 750                                        | 20300014       |
| 2 x 10 RM                                                              | 1.0                                                  | 13.8                                           | 1.25                                       | 1.8                                                    | 19.9                                   | 790                                        | 20300015       |
| 2 x 16 RE                                                              | 1.0                                                  | 14.7                                           | 1.25                                       | 1.8                                                    | 20.8                                   | 930                                        | 20300016       |
| 2 x 16 RM                                                              | 1.0                                                  | 16.0                                           | 1.25                                       | 1.8                                                    | 22.1                                   | 1020                                       | 20300017       |
| 2 x 25 RM                                                              | 1.2                                                  | 19.5                                           | 1.6                                        | 1.8                                                    | 26.3                                   | 1400                                       | -              |
| 2 x 35 RM                                                              | 1.2                                                  | 21.7                                           | 1.6                                        | 1.8                                                    | 28.5                                   | 1700                                       | -              |
| 2 x 50 SM                                                              | 1.4                                                  | 20.8                                           | 1.6                                        | 1.9                                                    | 27.8                                   | 2050                                       | 20300020       |
| 2 x 70 SM                                                              | 1.4                                                  | 23.8                                           | 2.0                                        | 2.0                                                    | 31.8                                   | 2740                                       | 20300021       |
| 2 x 95 SM                                                              | 1.6                                                  | 27.7                                           | 2.0                                        | 2.2                                                    | 36.1                                   | 3640                                       | 20300022       |
| 2 x 120 SM                                                             | 1.6                                                  | 29.4                                           | 2.0                                        | 2.3                                                    | 38.0                                   | 4150                                       | 20300023       |
| 2 x 150 SM                                                             | 1.8                                                  | 32.6                                           | 2.5                                        | 2.4                                                    | 42.4                                   | 5300                                       | 20300024       |
| 2 x 185 SM                                                             | 2.0                                                  | 37.0                                           | 2.5                                        | 2.6                                                    | 47.2                                   | 6390                                       | 20300025       |
| 2 x 240 SM                                                             | 2.2                                                  | 41.5                                           | 2.5                                        | 2.8                                                    | 52.1                                   | 7920                                       | 20300026       |
| 2 x 300 SM                                                             | 2.4                                                  | 48.6                                           | 2.5                                        | 2.9                                                    | 59.4                                   | 9950                                       | 20300180       |
| 3 x 1.5 RE                                                             | 0.8                                                  | 8.2                                            | 0.8                                        | 1.8                                                    | 13.6                                   | 360                                        | 20300029       |
| 3 x 1.5 RM                                                             | 0.8                                                  | 8.7                                            | 0.8                                        | 1.8                                                    | 14.1                                   | 370                                        | 20300030       |
| 3 x 2.5 RE                                                             | 0.8                                                  | 9.1                                            | 0.8                                        | 1.8                                                    | 14.5                                   | 400                                        | 20300150       |
| 3 x 2.5 RM                                                             | 0.8                                                  | 9.6                                            | 0.8                                        | 1.8                                                    | 15.0                                   | 430                                        | 20300031       |
| 3 x 4 RE                                                               | 1.0                                                  | 10.9                                           | 1.25                                       | 1.8                                                    | 17.0                                   | 610                                        | 20300032       |
| 3 x 4 RM                                                               | 1.0                                                  | 11.7                                           | 1.25                                       | 1.8                                                    | 17.8                                   | 660                                        | 20300033       |
| 3 x 6 RE                                                               | 1.0                                                  | 12.0                                           | 1.25                                       | 1.8                                                    | 18.1                                   | 730                                        | 20300034       |
| 3 x 6 RM                                                               | 1.0                                                  | 12.8                                           | 1.25                                       | 1.8                                                    | 18.9                                   | 780                                        | 20300035       |
| 3 x 10 RE                                                              | 1.0                                                  | 13.7                                           | 1.25                                       | 1.8                                                    | 19.8                                   | 910                                        | 20300036       |
| 3 x 10 RM                                                              | 1.0                                                  | 15.0                                           | 1.25                                       | 1.8                                                    | 21.1                                   | 990                                        | 20300037       |
| 3 x 16 RE                                                              | 1.0                                                  | 15.8                                           | 1.25                                       | 1.8                                                    | 21.9                                   | 1160                                       | 20300038       |
| 3 x 16 RM                                                              | 1.0                                                  | 17.3                                           | 1.25                                       | 1.8                                                    | 23.4                                   | 1280                                       | 20300039       |
| 3 x 25 RM                                                              | 1.2                                                  | 20.8                                           | 1.6                                        | 1.8                                                    | 27.6                                   | 1890                                       | -              |
|                                                                        |                                                      |                                                |                                            |                                                        |                                        |                                            |                |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

# Power & Control Cable

IEC 60502-1

(2-, 3-, and 4-cores)

U<sub>0</sub>/U 0.6 / 1 kV

PVC-Insulation, Armour

YYRY-fl

## Geometrical Data

| No. of cores and cross-section (nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation (nom.)<br>mm | Diameter over bedding (approx.)<br>mm | Armour wire diameter (nom.)<br>mm | Radial thickness of outer sheath (nom.)<br>mm | Overall diameter (approx.)<br>mm | Weight of cable (approx.)<br>kg / km | Part number |
|--------------------------------------------------------------|---------------------------------------------|---------------------------------------|-----------------------------------|-----------------------------------------------|----------------------------------|--------------------------------------|-------------|
| 3 x 35 RM                                                    | 1.2                                         | 23.2                                  | 1.6                               | 1.8                                           | 30.0                             | 2260                                 | -           |
| 3 x 50 SM                                                    | 1.4                                         | 24.5                                  | 1.6                               | 2.0                                           | 31.7                             | 2740                                 | 20300042    |
| 3 x 70 SM                                                    | 1.4                                         | 27.9                                  | 2.0                               | 2.1                                           | 36.1                             | 3790                                 | 20300043    |
| 3 x 95 SM                                                    | 1.6                                         | 31.2                                  | 2.0                               | 2.2                                           | 39.6                             | 4780                                 | 20300044    |
| 3 x 120 SM                                                   | 1.6                                         | 33.7                                  | 2.0                               | 2.3                                           | 42.3                             | 5710                                 | 20300045    |
| 3 x 150 SM                                                   | 1.8                                         | 38.0                                  | 2.5                               | 2.5                                           | 48.0                             | 7200                                 | 20300046    |
| 3 x 185 SM                                                   | 2.0                                         | 42.9                                  | 2.5                               | 2.7                                           | 53.3                             | 8710                                 | 20300047    |
| 3 x 240 SM                                                   | 2.2                                         | 48.7                                  | 2.5                               | 2.9                                           | 59.5                             | 11030                                | 20300048    |
| 3 x 300 SM                                                   | 2.4                                         | 56.1                                  | 2.5                               | 3.2                                           | 67.5                             | 13760                                | 20300049    |
| 3 x 400 SM                                                   | 2.6                                         | 62.8                                  | 3.15                              | 3.4                                           | 75.9                             | 17780                                | 20300050    |
| 4 x 1.5 RE                                                   | 0.8                                         | 9.0                                   | 0.8                               | 1.8                                           | 14.4                             | 410                                  | 20300151    |
| 4 x 1.5 RM                                                   | 0.8                                         | 9.5                                   | 0.8                               | 1.8                                           | 14.9                             | 430                                  | 20300051    |
| 4 x 2.5 RE                                                   | 0.8                                         | 9.9                                   | 0.8                               | 1.8                                           | 15.3                             | 470                                  | 20300052    |
| 4 x 2.5 RM                                                   | 0.8                                         | 10.5                                  | 0.8                               | 1.8                                           | 15.9                             | 500                                  | 20300053    |
| 4 x 4 RE                                                     | 1.0                                         | 12.0                                  | 1.25                              | 1.8                                           | 18.1                             | 700                                  | 20300054    |
| 4 x 4 RM                                                     | 1.0                                         | 12.9                                  | 1.25                              | 1.8                                           | 19.0                             | 780                                  | 20300055    |
| 4 x 6 RE                                                     | 1.0                                         | 13.2                                  | 1.25                              | 1.8                                           | 19.3                             | 850                                  | 20300056    |
| 4 x 6 RM                                                     | 1.0                                         | 14.1                                  | 1.25                              | 1.8                                           | 20.2                             | 900                                  | 20300057    |
| 4 x 10 RE                                                    | 1.0                                         | 15.2                                  | 1.25                              | 1.8                                           | 21.2                             | 1030                                 | 20300058    |
| 4 x 10 RM                                                    | 1.0                                         | 16.6                                  | 1.25                              | 1.8                                           | 22.7                             | 1180                                 | 20300059    |
| 4 x 16 RE                                                    | 1.0                                         | 17.8                                  | 1.6                               | 1.8                                           | 24.6                             | 1580                                 | 20300060    |
| 4 x 16 RM                                                    | 1.0                                         | 19.5                                  | 1.6                               | 1.8                                           | 26.3                             | 1710                                 | 20300061    |
| 4 x 25 RM                                                    | 1.2                                         | 23.0                                  | 1.6                               | 1.8                                           | 29.8                             | 2140                                 | -           |
| 4 x 35 RM                                                    | 1.2                                         | 25.7                                  | 1.6                               | 1.9                                           | 32.7                             | 2650                                 | -           |
| 4 x 50 SM                                                    | 1.4                                         | 28.7                                  | 2.0                               | 2.1                                           | 36.9                             | 3710                                 | 20300064    |
| 4 x 70 SM                                                    | 1.4                                         | 31.7                                  | 2.0                               | 2.2                                           | 40.1                             | 4720                                 | 20300065    |
| 4 x 95 SM                                                    | 1.6                                         | 36.1                                  | 2.5                               | 2.4                                           | 45.5                             | 6320                                 | 20300066    |
| 4 x 120 SM                                                   | 1.6                                         | 39.1                                  | 2.5                               | 2.5                                           | 49.1                             | 7630                                 | 20300067    |
| 4 x 150 SM                                                   | 1.8                                         | 43.1                                  | 2.5                               | 2.7                                           | 53.5                             | 9050                                 | 20300068    |
| 4 x 185 SM                                                   | 2.0                                         | 49.0                                  | 2.5                               | 2.8                                           | 59.6                             | 11010                                | 20300069    |
| 4 x 240 SM                                                   | 2.2                                         | 55.5                                  | 2.5                               | 3.1                                           | 66.7                             | 13940                                | 20300070    |
| 4 x 300 SM                                                   | 2.4                                         | 62.0                                  | 3.15                              | 3.3                                           | 74.9                             | 18090                                | 20300071    |
| 4 x 400 SM                                                   | 2.6                                         | 72.7                                  | 3.15                              | 3.6                                           | 86.2                             | 22600                                | 20300072    |
|                                                              |                                             |                                       |                                   |                                               |                                  |                                      |             |
|                                                              |                                             |                                       |                                   |                                               |                                  |                                      |             |
|                                                              |                                             |                                       |                                   |                                               |                                  |                                      |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

## KERPEN's Focus:

Competence - Flexibility - Quality - Service

### Competence

- cable engineering to over 150 national, international and customer standards
- specification service based on electrical, mechanical, environmental and other customer/site requirements
- more than 30.000 designs
- key supplier to oil, gas, petrochemical and chemical industry
- consulting service for design

(Multicores)

 $U_0/U$  0.6 / 1 kV

PVC-Insulation, Armour

YYRY-fl

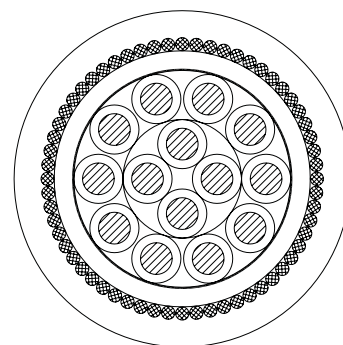
## Application

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial. For indoor and outdoor installation in dry and wet locations, on racks, in conduits

## Construction

|                      |                                                                                                                                       |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>     | plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228<br>class 1: circular solid (RE)<br>class 2: circular stranded (RM) |
| <b>Insulation</b>    | polyvinylchlorid PVC                                                                                                                  |
| <b>Colour code</b>   | black, continuously numbered                                                                                                          |
| <b>Laying up</b>     | cores twisted in layers (if necessary with filling element(s))                                                                        |
| <b>Wrapping</b>      | at least 1 layer of plastic tape                                                                                                      |
| <b>Bedding</b>       | extruded polyvinyl chloride PVC, black                                                                                                |
| <b>Armour</b>        | galvanized round steel wires                                                                                                          |
| <b>Outer Sheath</b>  | extruded polyvinyl chloride PVC, black                                                                                                |
| <b>Cable marking</b> | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN, YEAR, LENGTH MARKING                                                                   |



## Technical Data

|                                    |                                  |
|------------------------------------|----------------------------------|
| <b>Flame retardancy:</b>           | IEC 60332-1                      |
| <b>Flame propagation:</b>          | IEC 60332-3 cat. A               |
| <b>Outer Sheath:</b>               |                                  |
| <b>Amount of halogen acid gas:</b> | max. 17 %<br>(IEC 60754-1)       |
| <b>Limiting Oxygen Index(LOI):</b> | min. 30 %<br>(IEC 60332-3 ann.B) |
| <b>Temperature Index (TI):</b>     | min. 300 °C<br>(ASTM-D-2863)     |

|                                               |
|-----------------------------------------------|
| <b>Temperature range:</b>                     |
| - 30 °C up to + 70 °C<br>(during operation)   |
| - 5 °C up to + 50 °C<br>(during installation) |
| max. + 160 °C<br>(under short circuit)        |

**Min. bending radius:**  
8 x cable-Ø

## Abbreviations

|            |                                           |
|------------|-------------------------------------------|
| <b>Y</b>   | insulation, bedding & outer sheath of PVC |
| <b>R</b>   | round steel wire armour                   |
| <b>-fl</b> | reduced flame propagation                 |

## Electrical Data at 20 °C

|                                     | Character | Unit | Values                         |
|-------------------------------------|-----------|------|--------------------------------|
| Conductor resistance                | max.      | Ω/km | acc. to IEC 60228              |
| Test voltage $U_{rms}$ core: core   |           | V    | 3500                           |
| Test voltage $U_{rms}$ core: armour |           | V    | 3500                           |
| Nominal voltage $U_0/U$             |           | V    | 600/1000                       |
| Highest system voltage $U_m$        | max.      | V    | 1200 (for three phase systems) |

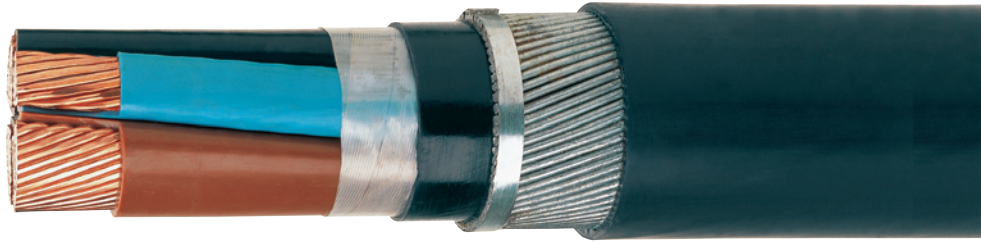
For further electrical details see appendix

**Power & Control Cable****IEC 60502-1****(Multicores)****U<sub>0</sub>/U 0.6 / 1 kV****PVC-Insulation, Armour  
YYRY-fl****Geometrical Data**

| No. of cores and cross-section<br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br>(nom.)<br>mm | Diameter over bedding<br>(approx.)<br>mm | Armour wire diameter<br>(nom.)<br>mm | Radial thickness of outer sheath<br>(nom.)<br>mm | Overall diameter<br>(approx.)<br>m | Weight of cable<br>(approx.)<br>kg / km | Part number |
|-----------------------------------------------------------------|------------------------------------------------|------------------------------------------|--------------------------------------|--------------------------------------------------|------------------------------------|-----------------------------------------|-------------|
| 5 x 1.5 RE                                                      | 0.8                                            | 9.8                                      | 0.8                                  | 1.8                                              | 15.2                               | 450                                     | 20300084    |
| 7 x 1.5 RE                                                      | 0.8                                            | 10.7                                     | 0.8                                  | 1.8                                              | 16.1                               | 520                                     | 20300085    |
| 10 x 1.5 RE                                                     | 0.8                                            | 13.7                                     | 1.25                                 | 1.8                                              | 19.8                               | 790                                     | 20300086    |
| 12 x 1.5 RE                                                     | 0.8                                            | 14.1                                     | 1.25                                 | 1.8                                              | 20.2                               | 850                                     | 20300087    |
| 19 x 1.5 RE                                                     | 0.8                                            | 17.1                                     | 1.6                                  | 1.8                                              | 23.9                               | 1260                                    | 20300090    |
| 27 x 1.5 RE                                                     | 0.8                                            | 20.6                                     | 1.6                                  | 1.8                                              | 27.4                               | 1610                                    | 20300093    |
| 37 x 1.5 RE                                                     | 0.8                                            | 23.1                                     | 1.6                                  | 1.9                                              | 30.1                               | 1950                                    | 20300096    |
| 48 x 1.5 RE                                                     | 0.8                                            | 26.5                                     | 1.6                                  | 2.0                                              | 33.7                               | 2380                                    | 20300100    |
| 5 x 1.5 RM                                                      | 0.8                                            | 10.4                                     | 0.8                                  | 1.8                                              | 15.8                               | 480                                     | 20300101    |
| 7 x 1.5 RM                                                      | 0.8                                            | 11.4                                     | 0.8                                  | 1.8                                              | 16.8                               | 560                                     | 20300102    |
| 10 x 1.5 RM                                                     | 0.8                                            | 14.5                                     | 1.25                                 | 1.8                                              | 20.6                               | 850                                     | 20300103    |
| 12 x 1.5 RM                                                     | 0.8                                            | 15.1                                     | 1.25                                 | 1.8                                              | 21.2                               | 910                                     | 20300104    |
| 19 x 1.5 RM                                                     | 0.8                                            | 18.3                                     | 1.6                                  | 1.8                                              | 25.1                               | 1360                                    | 20300107    |
| 27 x 1.5 RM                                                     | 0.8                                            | 21.9                                     | 1.6                                  | 1.8                                              | 28.7                               | 1730                                    | 20300110    |
| 37 x 1.5 RM                                                     | 0.8                                            | 24.6                                     | 1.6                                  | 1.9                                              | 31.6                               | 2040                                    | 20300113    |
| 48 x 1.5 RM                                                     | 0.8                                            | 28.7                                     | 2.0                                  | 2.0                                              | 36.7                               | 2810                                    | 20300117    |
| 5 x 2.5 RE                                                      | 0.8                                            | 10.9                                     | 0.8                                  | 1.8                                              | 16.3                               | 540                                     | 20300152    |
| 7 x 2.5 RE                                                      | 0.8                                            | 11.9                                     | 1.25                                 | 1.8                                              | 18.0                               | 690                                     | 20300118    |
| 10 x 2.5 RE                                                     | 0.8                                            | 15.2                                     | 1.25                                 | 1.8                                              | 21.3                               | 950                                     | 20300119    |
| 12 x 2.5 RE                                                     | 0.8                                            | 15.7                                     | 1.25                                 | 1.8                                              | 21.8                               | 1030                                    | 20300120    |
| 19 x 2.5 RE                                                     | 0.8                                            | 19.1                                     | 1.6                                  | 1.8                                              | 25.9                               | 1560                                    | 20300123    |
| 27 x 2.5 RE                                                     | 0.8                                            | 23.0                                     | 1.6                                  | 1.9                                              | 30.0                               | 2010                                    | 20300125    |
| 37 x 2.5 RE                                                     | 0.8                                            | 25.8                                     | 1.6                                  | 2.0                                              | 33.0                               | 2450                                    | 20300128    |
| 48 x 2.5 RE                                                     | 0.8                                            | 30.1                                     | 2.0                                  | 2.1                                              | 38.3                               | 3330                                    | 20300132    |
| 5 x 2.5 RM                                                      | 0.8                                            | 11.6                                     | 0.8                                  | 1.8                                              | 17.0                               | 570                                     | 20300133    |
| 7 x 2.5 RM                                                      | 0.8                                            | 12.6                                     | 1.25                                 | 1.8                                              | 18.7                               | 770                                     | 20300134    |
| 10 x 2.5 RM                                                     | 0.8                                            | 16.2                                     | 1.25                                 | 1.8                                              | 22.3                               | 1010                                    | 20300135    |
| 12 x 2.5 RM                                                     | 0.8                                            | 16.8                                     | 1.25                                 | 1.8                                              | 22.9                               | 1110                                    | 20300136    |
| 19 x 2.5 RM                                                     | 0.8                                            | 20.4                                     | 1.6                                  | 1.8                                              | 27.2                               | 1650                                    | 20300139    |
| 27 x 2.5 RM                                                     | 0.8                                            | 24.5                                     | 1.6                                  | 1.9                                              | 31.5                               | 2130                                    | 20300142    |
| 37 x 2.5 RM                                                     | 0.8                                            | 27.6                                     | 1.6                                  | 2.0                                              | 34.8                               | 2630                                    | 20300145    |
| 48 x 2.5 RM                                                     | 0.8                                            | 32.1                                     | 2.0                                  | 2.1                                              | 40.3                               | 3550                                    | 20300149    |
|                                                                 |                                                |                                          |                                      |                                                  |                                    |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                    |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                    |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                    |                                         |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded





## Section 2:

**XLPE - Insulated**

**Low Voltage Cables (90 °C)**

$U_0 / U$  0.6 / 1 kV



# Power & Control Cable

IEC 60502-1

(2-, 3-, 4- and 5-cores)

U<sub>0</sub>/U 0.6 / 1 kV

XLPE-Insulation, PVC-Sheath  
2XY-fl

## Application

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial. For indoor and outdoor installation in dry and wet locations, on racks, in conduits. (Local and / or legal requirements to be noted)

## Construction

**Conductor** plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,  
≤ 35 mm<sup>2</sup>: circular solid (RE) or circular stranded (RM),  
> 35 mm<sup>2</sup>: sector-shaped stranded (SM)<sup>1)</sup>

**Insulation** cross-linked polyethylene XLPE

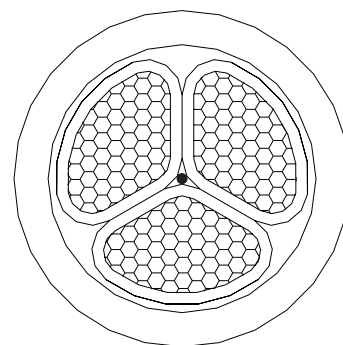
**Colour code** <sup>1) 2)</sup> Two-core: blue, brown  
Three-core: brown, black, grey  
Four-core: blue, brown, black, grey  
Five-core: blue, brown, black, grey, black

**Laying up** cores twisted in layers

**Inner Covering** extruded filler of regenerated rubber

**Outer Sheath** extruded polyvinyl chloride PVC, black

**Cable marking** ELECTRIC CABLE 0.6/1 kV IEC 60502-1  
KERPEN, YEAR, LENGTH MARKING



## Technical Data

**Flame retardancy :** IEC 60332-1  
**Flame propagation :** IEC 60332-3 cat. A  
**Outer Sheath :**  
**Amount of halogen acid gas :** max. 17 %  
(IEC 60754-1)  
**Limiting Oxygen Index (LOI):** min. 30 %  
(IEC 60332-3 ann. B)  
**Temperature Index (TI) :** min. 300 °C

**Temperature range:**  
- 30 °C up to + 90 °C  
(during operation)  
- 5 °C up to + 50 °C  
(during installation)  
max. + 250 °C  
(under short circuit)  
**Min. bending radius:**  
8 x cable-Ø

## Abbreviations

**2X** insulation of XLPE  
**Y** outer sheath of PVC  
**-fl** reduced flame propagation

## Electrical Data at 20 °C

|                                           | Character | Unit | Values                         |
|-------------------------------------------|-----------|------|--------------------------------|
| Conductor resistance :                    | max.      | Ω/km | acc. to IEC 60228              |
| Test voltage U <sub>rms</sub> core:core : |           | V    | 3500                           |
| Nominal voltage U <sub>0</sub> /U :       |           | V    | 600/1000                       |
| Highest system voltage U <sub>m</sub> :   | max.      | V    | 1200 (for three phase systems) |

<sup>1)</sup> 5core cables only with circular conductors <sup>2)</sup> other colours on request

For further details see appendix

**Power & Control Cable****IEC 60502-1****(2-, 3-, 4- and 5-cores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, PVC-Sheath****2XY-fl****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 2 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 9.7                                     | 140                                         | 20810021    |
| 2 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 10.2                                    | 150                                         | 20810022    |
| 2 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 10.5                                    | 170                                         | 20810023    |
| 2 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 11.0                                    | 180                                         | 20810024    |
| 2 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 11.5                                    | 210                                         | 20810025    |
| 2 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 12.2                                    | 230                                         | 20810026    |
| 2 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 12.5                                    | 270                                         | 20810027    |
| 2 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 13.2                                    | 290                                         | 20810028    |
| 2 x 10 RE                                                           | 0.7                                                | 1.8                                                  | 14.0                                    | 370                                         | 20810029    |
| 2 x 10 RM                                                           | 0.7                                                | 1.8                                                  | 15.0                                    | 410                                         | 20810030    |
| 2 x 16 RE                                                           | 0.7                                                | 1.8                                                  | 15.9                                    | 530                                         | 20810031    |
| 2 x 16 RM                                                           | 0.7                                                | 1.8                                                  | 17.3                                    | 580                                         | 20810032    |
| 2 x 25 RM                                                           | 0.9                                                | 1.8                                                  | 20.2                                    | 740                                         | -           |
| 2 x 35 RM                                                           | 0.9                                                | 1.8                                                  | 22.8                                    | 1100                                        | -           |
| 2 x 50 SM                                                           | 1.0                                                | 1.8                                                  | 21.5                                    | 1200                                        | 20810035    |
| 2 x 70 SM                                                           | 1.1                                                | 1.8                                                  | 24.9                                    | 1620                                        | 20810036    |
| 2 x 95 SM                                                           | 1.1                                                | 2.0                                                  | 28.0                                    | 2200                                        | 20810037    |
| 2 x 120 SM                                                          | 1.2                                                | 2.1                                                  | 30.1                                    | 2640                                        | 20810038    |
| 2 x 150 SM                                                          | 1.4                                                | 2.2                                                  | 33.5                                    | 3250                                        | 20810039    |
| 2 x 185 SM                                                          | 1.6                                                | 2.3                                                  | 37.7                                    | 4050                                        | 20810040    |
| 2 x 240 SM                                                          | 1.7                                                | 2.5                                                  | 42.4                                    | 5260                                        | 20810041    |
| 2 x 300 SM                                                          | 1.8                                                | 2.7                                                  | 49.3                                    | 6760                                        | 20810091    |
| 3 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 10.2                                    | 150                                         | 20810042    |
| 3 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 10.7                                    | 170                                         | 20810043    |
| 3 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 11.0                                    | 190                                         | 20810044    |
| 3 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 11.6                                    | 210                                         | 20810045    |
| 3 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 12.0                                    | 250                                         | 20810046    |
| 3 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 12.8                                    | 280                                         | 20810047    |
| 3 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 13.1                                    | 330                                         | 20810048    |
| 3 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 13.9                                    | 350                                         | 20810049    |
| 3 x 10 RE                                                           | 0.7                                                | 1.8                                                  | 14.8                                    | 470                                         | 20810050    |
| 3 x 10 RM                                                           | 0.7                                                | 1.8                                                  | 15.9                                    | 500                                         | 20810051    |
| 3 x 16 RE                                                           | 0.7                                                | 1.8                                                  | 16.9                                    | 670                                         | 20810052    |
| 3 x 16 RM                                                           | 0.7                                                | 1.8                                                  | 18.3                                    | 730                                         | 20810053    |
| 3 x 25 RM                                                           | 0.9                                                | 1.8                                                  | 21.5                                    | 1060                                        | -           |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

**Power & Control Cable****IEC 60502-1****(2-, 3-, 4- and 5-cores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, PVC-Sheath****2XY-fl****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall Diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 3 x 35 RM                                                           | 0.9                                                | 1.8                                                  | 24.3                                    | 1450                                        | -           |
| 3 x 50 SM                                                           | 1.0                                                | 1.8                                                  | 25.0                                    | 1710                                        | 20810056    |
| 3 x 70 SM                                                           | 1.1                                                | 1.9                                                  | 28.6                                    | 2320                                        | 20810057    |
| 3 x 95 SM                                                           | 1.1                                                | 2.0                                                  | 31.3                                    | 3150                                        | 20810058    |
| 3 x 120 SM                                                          | 1.2                                                | 2.1                                                  | 34.3                                    | 3820                                        | 20810059    |
| 3 x 150 SM                                                          | 1.4                                                | 2.3                                                  | 38.6                                    | 4730                                        | 20810060    |
| 3 x 185 SM                                                          | 1.6                                                | 2.4                                                  | 43.8                                    | 5920                                        | 20810061    |
| 3 x 240 SM                                                          | 1.7                                                | 2.6                                                  | 49.2                                    | 7670                                        | 20810062    |
| 3 x 300 SM                                                          | 1.8                                                | 2.8                                                  | 56.7                                    | 9870                                        | 20810063    |
| 3 x 400 SM                                                          | 2.0                                                | 3.1                                                  | 63.9                                    | 12560                                       | 20810064    |
| 4 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 10.9                                    | 180                                         | 20810065    |
| 4 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 11.4                                    | 190                                         | 20810066    |
| 4 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 11.8                                    | 230                                         | 20810067    |
| 4 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 12.4                                    | 240                                         | 20810068    |
| 4 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 12.9                                    | 300                                         | 20810069    |
| 4 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 13.8                                    | 330                                         | 20810070    |
| 4 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 14.2                                    | 400                                         | 20810071    |
| 4 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 15.0                                    | 420                                         | 20810072    |
| 4 x 10 RE                                                           | 0.7                                                | 1.8                                                  | 16.1                                    | 580                                         | 20810073    |
| 4 x 10 RM                                                           | 0.7                                                | 1.8                                                  | 17.3                                    | 620                                         | 20810074    |
| 4 x 16 RE                                                           | 0.7                                                | 1.8                                                  | 18.3                                    | 840                                         | 20810075    |
| 4 x 16 RM                                                           | 0.7                                                | 1.8                                                  | 19.9                                    | 910                                         | 20810076    |
| 4 x 25 RM                                                           | 0.9                                                | 1.8                                                  | 23.5                                    | 1400                                        | -           |
| 4 x 35 RM                                                           | 0.9                                                | 1.8                                                  | 26.5                                    | 1700                                        | -           |
| 4 x 50 SM                                                           | 1.0                                                | 1.9                                                  | 28.8                                    | 2240                                        | 20810079    |
| 4 x 70 SM                                                           | 1.1                                                | 2.0                                                  | 32.5                                    | 3050                                        | 20810080    |
| 4 x 95 SM                                                           | 1.1                                                | 2.1                                                  | 35.7                                    | 4130                                        | 20810081    |
| 4 x 120 SM                                                          | 1.2                                                | 2.3                                                  | 39.6                                    | 5070                                        | 20810082    |
| 4 x 150 SM                                                          | 1.4                                                | 2.4                                                  | 43.8                                    | 6220                                        | 20810083    |
| 4 x 185 SM                                                          | 1.6                                                | 2.6                                                  | 49.7                                    | 7790                                        | 20810084    |
| 4 x 240 SM                                                          | 1.7                                                | 2.8                                                  | 56.3                                    | 10150                                       | 20810085    |
| 4 x 300 SM                                                          | 1.8                                                | 3.0                                                  | 62.9                                    | 12990                                       | 20810086    |
| 4 x 400 SM                                                          | 2.0                                                | 3.3                                                  | 73.8                                    | 16580                                       | 20810087    |
| 5 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 14.0                                    | 360                                         | 20810331    |
| 5 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 14.9                                    | 370                                         | 20810332    |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

|                                    |                                   |
|------------------------------------|-----------------------------------|
| <b>Power &amp; Control Cable</b>   | <b>IEC 60502-1</b>                |
| <b>(2-, 3-, 4- and 5-cores)</b>    | <b>U<sub>0</sub>/U 0.6 / 1 kV</b> |
| <b>XLPE-Insulation, PVC-Sheath</b> |                                   |
| <b>2XY-fl</b>                      |                                   |

|                                    |                                   |
|------------------------------------|-----------------------------------|
| <b>Power &amp; Control Cable</b>   | <b>IEC 60502-1</b>                |
| <b>(2-, 3-, 4- and 5-cores)</b>    | <b>U<sub>0</sub>/U 0.6 / 1 kV</b> |
| <b>XLPE-Insulation, PVC-Sheath</b> |                                   |
| <b>2XY-fl</b>                      |                                   |

|                                    |                                   |
|------------------------------------|-----------------------------------|
| <b>Power &amp; Control Cable</b>   | <b>IEC 60502-1</b>                |
| <b>(2-, 3-, 4- and 5-cores)</b>    | <b>U<sub>0</sub>/U 0.6 / 1 kV</b> |
| <b>XLPE-Insulation, PVC-Sheath</b> |                                   |
| <b>2XY-fl</b>                      |                                   |

|                                    |                                   |
|------------------------------------|-----------------------------------|
| <b>Power &amp; Control Cable</b>   | <b>IEC 60502-1</b>                |
| <b>(2-, 3-, 4- and 5-cores)</b>    | <b>U<sub>0</sub>/U 0.6 / 1 kV</b> |
| <b>XLPE-Insulation, PVC-Sheath</b> |                                   |
| <b>2XY-fl</b>                      |                                   |

|                                    |                                   |
|------------------------------------|-----------------------------------|
| <b>Power &amp; Control Cable</b>   | <b>IEC 60502-1</b>                |
| <b>(2-, 3-, 4- and 5-cores)</b>    | <b>U<sub>0</sub>/U 0.6 / 1 kV</b> |
| <b>XLPE-Insulation, PVC-Sheath</b> |                                   |
| <b>2XY-fl</b>                      |                                   |

## Geometrical Data

[illegible]

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

(Multicores)

 $U_0/U$  0.6 / 1 kV

XLPE-Insulation, PVC-Sheath

2XY-fl

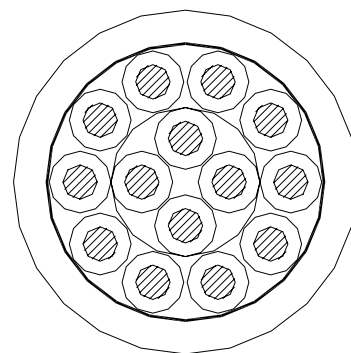
## Application

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial. For indoor and outdoor installation in dry and wet locations, on racks, in conduits.  
(Local and / or legal requirements to be noted)

## Construction

|                      |                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>     | plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,<br>class 1: circular solid (RE)<br>class 2: circular stranded (RM) |
| <b>Insulation</b>    | cross-linked polyethylene XLPE                                                                                                         |
| <b>Colour code</b>   | black, continuously numbered                                                                                                           |
| <b>Laying up</b>     | cores twisted in layers (if necessary with filling element/s)                                                                          |
| <b>Wrapping</b>      | at least 1 layer of plastic tape                                                                                                       |
| <b>Outer Sheath</b>  | extruded polyvinyl chloride PVC, black                                                                                                 |
| <b>Cable marking</b> | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN, YEAR, LENGTH MARKING                                                                    |



## Technical Data

|                                     |                                   |                                                                                                                                                                                                                       |
|-------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Flame retardancy:</b>            | IEC 60332-1                       | <b>Temperature range:</b><br>- 30 °C up to + 90 °C<br>(during operation)<br>- 5 °C up to + 50 °C<br>(during installation)<br>max. + 250 °C<br>(under short circuit)<br><br><b>Min. bending radius:</b><br>8 x cable-Ø |
| <b>Flame propagation:</b>           | IEC 60332-3 cat. A                |                                                                                                                                                                                                                       |
| <b>Outer sheath:</b>                |                                   |                                                                                                                                                                                                                       |
| <b>Amount of halogen acid gas:</b>  | max. 17 %<br>(IEC 60754-1)        |                                                                                                                                                                                                                       |
| <b>Limiting Oxygen Index (LOI):</b> | min. 30 %<br>(IEC 60332-3 ann. B) |                                                                                                                                                                                                                       |
| <b>Temperature Index (TI):</b>      | min. 300 °C<br>(ASTM-D-2863)      |                                                                                                                                                                                                                       |

## Abbreviations

|            |                           |
|------------|---------------------------|
| <b>2X</b>  | insulation of XLPE        |
| <b>Y</b>   | outer sheath of PVC       |
| <b>-fl</b> | reduced flame propagation |

## Electrical Data at 20 °C

|                                    | Character | Unit | Values                         |
|------------------------------------|-----------|------|--------------------------------|
| Conductor resistance :             | max.      | Ω/km | acc. to IEC 60228              |
| Test voltage $U_{rms}$ core:core : |           | V    | 3500                           |
| Nominal voltage $U_0/U$ :          |           | V    | 600/1000                       |
| Highest system voltage $U_m$ :     | max.      | V    | 1200 (for three phase systems) |

For further electrical details see appendix

**Power & Control Cable****IEC 60502-1****(Multicores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, PVC-Sheath  
2XY-fl****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall Diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 5 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 11.3                                    | 180                                         | 20810131    |
| 7 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 12.2                                    | 220                                         | 20810132    |
| 10 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 14.9                                    | 310                                         | 20810133    |
| 12 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 15.3                                    | 340                                         | 20810134    |
| 19 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 17.7                                    | 480                                         | 20810137    |
| 27 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 21.0                                    | 660                                         | 20810140    |
| 37 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 23.4                                    | 860                                         | 20810144    |
| 48 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 26.5                                    | 1080                                        | 20810148    |
| 5 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 11.9                                    | 190                                         | 20810150    |
| 7 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 12.8                                    | 230                                         | 20810151    |
| 10 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 15.8                                    | 320                                         | 20810152    |
| 12 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 16.2                                    | 360                                         | 20810153    |
| 19 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 18.8                                    | 510                                         | 20810156    |
| 27 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 22.3                                    | 700                                         | 20810108    |
| 37 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 24.8                                    | 910                                         | 20810112    |
| 48 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 28.3                                    | 1150                                        | 20810164    |
| 5 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 12.4                                    | 240                                         | 20810351    |
| 7 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 13.4                                    | 300                                         | 20810167    |
| 10 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 16.4                                    | 400                                         | 20810168    |
| 12 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 16.9                                    | 460                                         | 20810169    |
| 19 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 19.8                                    | 670                                         | 20810172    |
| 27 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 23.4                                    | 920                                         | 20810175    |
| 37 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 26.1                                    | 1210                                        | 20810179    |
| 48 x 2.5 RE                                                         | 0.7                                                | 1.9                                                  | 29.9                                    | 1550                                        | 20810183    |
| 5 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 13.0                                    | 250                                         | 20810115    |
| 7 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 14.0                                    | 310                                         | 20810207    |
| 10 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 17.4                                    | 420                                         | 20810116    |
| 12 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 18.0                                    | 490                                         | 20810186    |
| 19 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 21.0                                    | 710                                         | 20810189    |
| 27 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 24.9                                    | 980                                         | 20810192    |
| 37 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 27.8                                    | 1290                                        | 20810196    |
| 48 x 2.5 RM                                                         | 0.7                                                | 1.9                                                  | 31.9                                    | 1650                                        | 20810200    |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

(2-, 3-, and 4-cores)

U<sub>0</sub>/U 0.6 / 1 kVXLPE-Insulation, Armour  
2XYRY-fl

## Application

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial. For indoor and outdoor installation in dry and wet locations, on racks, in conduits.

## Construction

**Conductor** plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,  
≤ 35 mm<sup>2</sup>: circular solid (RE) or circular stranded (RM),  
> 35 mm<sup>2</sup>: sector-shaped stranded (SM)

**Insulation** cross-linked polyethylene XLPE

**Colour code** Two-core: blue, brown  
Three-core: brown, black, grey  
Four-core: blue, brown, black, grey

**Laying up** cores twisted in layers (if necessary with filling element(s))

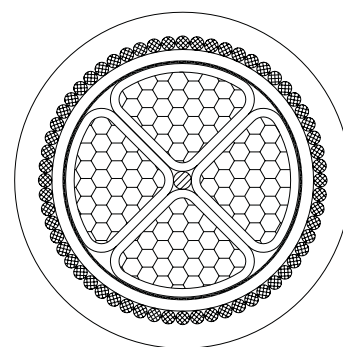
**Wrapping** at least 1 layer of plastic tape

**Bedding** extruded polyvinyl chloride PVC, black

**Armour** galvanized round steel wires

**Outer Sheath** extruded polyvinyl chloride PVC, black

**Cable marking** ELECTRIC CABLE 0.6/1 kV IEC 60502-1  
KERPEN, YEAR, LENGTH MARKING



## Technical Data

**Flame retardancy:** IEC 60332-1  
**Flame propagation:** IEC 60332-3 cat. A

**Outer Sheath:**  
**Amount of halogen acid gas:** max. 17 %  
(IEC 60754-1)  
**Limiting Oxygen Index (LOI):** min. 30 %  
(IEC 60332-3 ann. B)

**Temperature Index (TI):** min. 300 °C  
(ASTM-D-2863)

**Temperature range:**  
- 30 °C up to + 90 °C  
(during operation)  
- 5 °C up to + 50 °C  
(during installation)  
max. +250 °C  
(under short circuit)

**Min. bending radius:**  
8 x cable-Ø

## Abbreviations

**2X** insulation of XLPE  
**Y** bedding & outer sheath of PVC  
**R** round steel wire armour  
**-fl** reduced flame propagation

## Electrical Data at 20 °C

|                                                 | Character | Unit | Values                         |
|-------------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance</b>                     | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage U<sub>rms</sub> core:core</b>   |           | V    | 3500                           |
| <b>Test voltage U<sub>rms</sub> core:armour</b> |           | V    | 3500                           |
| <b>Nominal voltage U<sub>0</sub> /U</b>         |           | V    | 600/1000                       |
| <b>Highest system voltage U<sub>m</sub></b>     | max.      | V    | 1200 (for three phase systems) |

<sup>1)</sup> other colours on request

For further details see appendix

**Power & Control Cable****IEC 60502-1****(2-, 3-, and 4-cores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, Armour  
2XYRY-fl****Geometrical Data**

| No. of cores and cross-section<br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br>(nom.)<br>mm | Diameter over bedding<br>(approx.)<br>mm | Armour wire diameter<br>(nom.)<br>mm | Radial thickness of outer sheath<br>(nom.)<br>mm | Overall diameter<br>(approx.)<br>mm | Weight of cable<br>(approx.)<br>kg / km | Part number |
|-----------------------------------------------------------------|------------------------------------------------|------------------------------------------|--------------------------------------|--------------------------------------------------|-------------------------------------|-----------------------------------------|-------------|
| 2 x 1.5 RE                                                      | 0.7                                            | 7.3                                      | 0.8                                  | 1.8                                              | 12.7                                | 310                                     | 20050038    |
| 2 x 1.5 RM                                                      | 0.7                                            | 7.8                                      | 0.8                                  | 1.8                                              | 13.2                                | 330                                     | 20050154    |
| 2 x 2.5 RE                                                      | 0.7                                            | 8.1                                      | 0.8                                  | 1.8                                              | 13.5                                | 350                                     | 20050039    |
| 2 x 2.5 RM                                                      | 0.7                                            | 8.6                                      | 0.8                                  | 1.8                                              | 14.0                                | 370                                     | 20050155    |
| 2 x 4 RE                                                        | 0.7                                            | 9.1                                      | 0.8                                  | 1.8                                              | 14.5                                | 410                                     | 20050040    |
| 2 x 4 RM                                                        | 0.7                                            | 9.8                                      | 0.8                                  | 1.8                                              | 15.2                                | 440                                     | 20050156    |
| 2 x 6 RE                                                        | 0.7                                            | 10.1                                     | 0.8                                  | 1.8                                              | 15.5                                | 480                                     | 20050041    |
| 2 x 6 RM                                                        | 0.7                                            | 10.8                                     | 0.8                                  | 1.8                                              | 16.2                                | 510                                     | 20050042    |
| 2 x 10 RE                                                       | 0.7                                            | 11.6                                     | 0.8                                  | 1.8                                              | 17.0                                | 600                                     | 20050043    |
| 2 x 10 RM                                                       | 0.7                                            | 12.8                                     | 1.25                                 | 1.8                                              | 18.9                                | 770                                     | 20050044    |
| 2 x 16 RE                                                       | 0.7                                            | 13.5                                     | 1.25                                 | 1.8                                              | 19.6                                | 890                                     | 20050045    |
| 2 x 16 RM                                                       | 0.7                                            | 14.9                                     | 1.25                                 | 1.8                                              | 21.0                                | 960                                     | 20050046    |
| 2 x 25 RM                                                       | 0.9                                            | 18.3                                     | 1.6                                  | 1.8                                              | 25.1                                | 1350                                    | -           |
| 2 x 35 RM                                                       | 0.9                                            | 20.5                                     | 1.6                                  | 1.8                                              | 27.3                                | 1620                                    | -           |
| 2 x 50 SM                                                       | 1.0                                            | 19.2                                     | 1.6                                  | 1.9                                              | 26.0                                | 1845                                    | 20050157    |
| 2 x 70 SM                                                       | 1.1                                            | 20.4                                     | 1.6                                  | 2.0                                              | 27.6                                | 2310                                    | 20050049    |
| 2 x 95 SM                                                       | 1.1                                            | 23.5                                     | 2.0                                  | 2.1                                              | 31.7                                | 3145                                    | 20050050    |
| 2 x 120 SM                                                      | 1.2                                            | 27.8                                     | 2.0                                  | 2.2                                              | 36.2                                | 3865                                    | 20050051    |
| 2 x 150 SM                                                      | 1.4                                            | 31.0                                     | 2.0                                  | 2.3                                              | 39.6                                | 4640                                    | 20050052    |
| 2 x 185 SM                                                      | 1.6                                            | 35.4                                     | 2.5                                  | 2.5                                              | 45.4                                | 6090                                    | 20050053    |
| 2 x 240 SM                                                      | 1.7                                            | 39.5                                     | 2.5                                  | 2.7                                              | 49.9                                | 7520                                    | 20050054    |
| 2 x 300 SM                                                      | 1.8                                            | 46.2                                     | 2.5                                  | 2.8                                              | 56.8                                | 9360                                    | 20050221    |
| 3 x 1.5 RE                                                      | 0.7                                            | 7.8                                      | 0.8                                  | 1.8                                              | 13.2                                | 340                                     | 20050057    |
| 3 x 1.5 RM                                                      | 0.7                                            | 8.3                                      | 0.8                                  | 1.8                                              | 13.7                                | 360                                     | 20050158    |
| 3 x 2.5 RE                                                      | 0.7                                            | 8.6                                      | 0.8                                  | 1.8                                              | 14.0                                | 390                                     | 20050058    |
| 3 x 2.5 RM                                                      | 0.7                                            | 9.2                                      | 0.8                                  | 1.8                                              | 14.6                                | 410                                     | 20050159    |
| 3 x 4 RE                                                        | 0.7                                            | 9.6                                      | 0.8                                  | 1.8                                              | 15.0                                | 460                                     | 20050059    |
| 3 x 4 RM                                                        | 0.7                                            | 10.4                                     | 0.8                                  | 1.8                                              | 15.8                                | 510                                     | 20050160    |
| 3 x 6 RE                                                        | 0.7                                            | 10.7                                     | 0.8                                  | 1.8                                              | 16.1                                | 550                                     | 20050060    |
| 3 x 6 RM                                                        | 0.7                                            | 11.5                                     | 0.8                                  | 1.8                                              | 16.9                                | 600                                     | 20050161    |
| 3 x 10 RE                                                       | 0.7                                            | 12.4                                     | 1.25                                 | 1.8                                              | 18.5                                | 830                                     | 20050061    |
| 3 x 10 RM                                                       | 0.7                                            | 13.5                                     | 1.25                                 | 1.8                                              | 19.6                                | 890                                     | 20050162    |
| 3 x 16 RE                                                       | 0.7                                            | 14.5                                     | 1.25                                 | 1.8                                              | 20.6                                | 1080                                    | 20050062    |
| 3 x 16 RM                                                       | 0.7                                            | 15.8                                     | 1.25                                 | 1.8                                              | 21.9                                | 1150                                    | 20050163    |
| 3 x 25 RM                                                       | 0.9                                            | 19.6                                     | 1.6                                  | 1.8                                              | 26.4                                | 1660                                    | -           |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

# Power & Control Cable

IEC 60502-1

(2-, 3-, and 4-cores)

U<sub>0</sub>/U 0.6 / 1 kV

XLPE-Insulation, Armour

2XYRY-fl

## Geometrical Data

| No. of cores and cross-section<br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br>(nom.)<br>mm | Diameter over bedding<br>(approx.)<br>mm | Armour wire diameter<br>(nom.)<br>mm | Radial thickness of outer sheath<br>(nom.)<br>mm | Overall diameter<br>(approx.)<br>mm | Weight of cable<br>(approx.)<br>kg / km | Part number |
|-----------------------------------------------------------------|------------------------------------------------|------------------------------------------|--------------------------------------|--------------------------------------------------|-------------------------------------|-----------------------------------------|-------------|
| 3 x 35 RM                                                       | 0.9                                            | 22.0                                     | 1.6                                  | 1.8                                              | 28.8                                | 2050                                    | -           |
| 3 x 50 SM                                                       | 1.0                                            | 22.7                                     | 1.6                                  | 1.9                                              | 29.7                                | 2500                                    | 20050166    |
| 3 x 70 SM                                                       | 1.1                                            | 26.5                                     | 2.0                                  | 2.0                                              | 34.5                                | 3540                                    | 20050167    |
| 3 x 95 SM                                                       | 1.1                                            | 29.0                                     | 2.0                                  | 2.2                                              | 37.4                                | 4440                                    | 20050168    |
| 3 x 120 SM                                                      | 1.2                                            | 32.0                                     | 2.0                                  | 2.3                                              | 40.6                                | 5280                                    | 20050169    |
| 3 x 150 SM                                                      | 1.4                                            | 36.3                                     | 2.5                                  | 2.5                                              | 46.3                                | 6810                                    | 20050170    |
| 3 x 185 SM                                                      | 1.6                                            | 41.1                                     | 2.5                                  | 2.6                                              | 51.3                                | 8200                                    | 20050063    |
| 3 x 240 SM                                                      | 1.7                                            | 46.1                                     | 2.5                                  | 2.8                                              | 56.7                                | 10310                                   | 20050171    |
| 3 x 300 SM                                                      | 1.8                                            | 53.4                                     | 2.5                                  | 3.0                                              | 64.4                                | 12900                                   | 20050064    |
| 3 x 400 SM                                                      | 2.0                                            | 59.8                                     | 2.5                                  | 3.2                                              | 71.2                                | 15860                                   | 20050065    |
| 4 x 1.5 RE                                                      | 0.7                                            | 8.5                                      | 0.8                                  | 1.8                                              | 13.9                                | 370                                     | 20050066    |
| 4 x 1.5 RM                                                      | 0.7                                            | 9.0                                      | 0.8                                  | 1.8                                              | 14.4                                | 400                                     | 20050067    |
| 4 x 2.5 RE                                                      | 0.7                                            | 9.4                                      | 0.8                                  | 1.8                                              | 14.8                                | 440                                     | 20050068    |
| 4 x 2.5 RM                                                      | 0.7                                            | 10.0                                     | 0.8                                  | 1.8                                              | 15.4                                | 460                                     | 20050172    |
| 4 x 4 RE                                                        | 0.7                                            | 10.5                                     | 0.8                                  | 1.8                                              | 15.9                                | 530                                     | 20050069    |
| 4 x 4 RM                                                        | 0.7                                            | 11.4                                     | 0.8                                  | 1.8                                              | 16.8                                | 580                                     | 20050173    |
| 4 x 6 RE                                                        | 0.7                                            | 11.8                                     | 0.8                                  | 1.8                                              | 17.2                                | 650                                     | 20050070    |
| 4 x 6 RM                                                        | 0.7                                            | 12.7                                     | 1.25                                 | 1.8                                              | 18.8                                | 800                                     | 20050071    |
| 4 x 10 RE                                                       | 0.7                                            | 13.7                                     | 1.25                                 | 1.8                                              | 19.8                                | 970                                     | 20050072    |
| 4 x 10 RM                                                       | 0.7                                            | 14.9                                     | 1.25                                 | 1.8                                              | 21.0                                | 1040                                    | 20050073    |
| 4 x 16 RE                                                       | 0.7                                            | 15.9                                     | 1.6                                  | 1.8                                              | 22.7                                | 1390                                    | 20050074    |
| 4 x 16 RM                                                       | 0.7                                            | 17.5                                     | 1.6                                  | 1.8                                              | 24.3                                | 1500                                    | 20050174    |
| 4 x 25 RM                                                       | 0.9                                            | 21.6                                     | 1.6                                  | 1.8                                              | 28.4                                | 1980                                    | -           |
| 4 x 35 RM                                                       | 0.9                                            | 24.0                                     | 1.6                                  | 1.9                                              | 31.0                                | 2530                                    | -           |
| 4 x 50 SM                                                       | 1.0                                            | 26.3                                     | 1.6                                  | 2.0                                              | 33.5                                | 3150                                    | 20050077    |
| 4 x 70 SM                                                       | 1.1                                            | 29.7                                     | 2.0                                  | 2.0                                              | 37.7                                | 4370                                    | 20050078    |
| 4 x 95 SM                                                       | 1.1                                            | 33.2                                     | 2.0                                  | 2.3                                              | 41.8                                | 5590                                    | 20050079    |
| 4 x 120 SM                                                      | 1.2                                            | 37.1                                     | 2.5                                  | 2.5                                              | 47.1                                | 7170                                    | 20050080    |
| 4 x 150 SM                                                      | 1.4                                            | 41.1                                     | 2.5                                  | 2.6                                              | 51.3                                | 8550                                    | 20050081    |
| 4 x 185 SM                                                      | 1.6                                            | 46.6                                     | 2.5                                  | 2.8                                              | 57.2                                | 10460                                   | 20050082    |
| 4 x 240 SM                                                      | 1.7                                            | 53.0                                     | 2.5                                  | 3.0                                              | 64.0                                | 13190                                   | 20050083    |
| 4 x 300 SM                                                      | 1.8                                            | 59.0                                     | 2.5                                  | 3.2                                              | 70.4                                | 16360                                   | 20050084    |
| 4 x 400 SM                                                      | 2.0                                            | 69.7                                     | 3.15                                 | 3.5                                              | 83.0                                | 21470                                   | 20050085    |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

## KERPEN's Focus:

Competence - Flexibility - Quality - Service

### Flexibility

- new designs to customer required standards
- short delivery times to meet your project plan
- equipped for „short length“ production
- fast response to customer needs
- general purpose production equipment to manufacture large variety of products

(Multicores)

 $U_0/U$  0.6 / 1 kV

XLPE-Insulation, Armour

2XYRY-fl

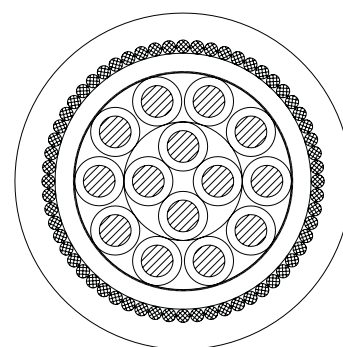
## Application

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial. For indoor and outdoor installation in dry and wet locations, on racks, in conduits

## Construction

|                      |                                                                                                                                      |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>     | plain annealed copper, class 1 or class 2 resp., acc. to IEC60228<br>class 1: circular solid (RE)<br>class 2: circular stranded (RM) |
| <b>Insulation</b>    | cross-linked polyethylene XLPE                                                                                                       |
| <b>Colour code</b>   | black, continuously numbered                                                                                                         |
| <b>Laying up</b>     | cores twisted in layers (if necessary with filling element(s))                                                                       |
| <b>Wrapping</b>      | at least 1 layer of plastic tape                                                                                                     |
| <b>Bedding</b>       | extruded polyvinyl chloride PVC, black                                                                                               |
| <b>Armour</b>        | galvanized round steel wires                                                                                                         |
| <b>Outer Sheath</b>  | extruded polyvinyl chloride PVC, black                                                                                               |
| <b>Cable marking</b> | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN, YEAR, LENGTH MARKING                                                                  |



## Technical Data

|                                     |                                   |                                               |
|-------------------------------------|-----------------------------------|-----------------------------------------------|
| <b>Flame retardancy:</b>            | IEC 60332-1                       | <b>Temperature range:</b>                     |
| <b>Flame propagation:</b>           | IEC 60332-3 cat. A                | - 30 °C up to + 90 °C<br>(during operation)   |
| <b>Outer Sheath:</b>                |                                   | - 5 °C up to + 50 °C<br>(during installation) |
| <b>Amount of halogen acid gas:</b>  | max. 17 %<br>(IEC 60754-1)        | max. + 250 °C<br>(under short circuit)        |
| <b>Limiting Oxygen Index (LOI):</b> | min. 30 %<br>(IEC 60332-3 ann. B) |                                               |
| <b>Temperature Index (TI):</b>      | min. 300 °C<br>(ASTM-D-2863)      |                                               |

## Abbreviations

|            |                               |
|------------|-------------------------------|
| <b>2X</b>  | insulation of XLPE            |
| <b>Y</b>   | bedding & outer sheath of PVC |
| <b>R</b>   | round steel wire armour       |
| <b>-fl</b> | reduced flame propagation     |

## Electrical Data at 20 °C

|                                                      | Character | Unit | Values                         |
|------------------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance :</b>                        | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage <math>U_{rms}</math> core:core</b>   |           | V    | 3500                           |
| <b>Test voltage <math>U_{rms}</math> core:armour</b> |           | V    | 3500                           |
| <b>Nominal voltage <math>U_0/U</math> :</b>          |           | V    | 600/1000                       |
| <b>Highest system voltage <math>U_m</math> :</b>     | max.      | V    | 1200 (for three phase systems) |

For further details see appendix

# Power & Control Cable

IEC 60502-1

(Multicores)

U<sub>0</sub>/U 0.6 / 1 kV

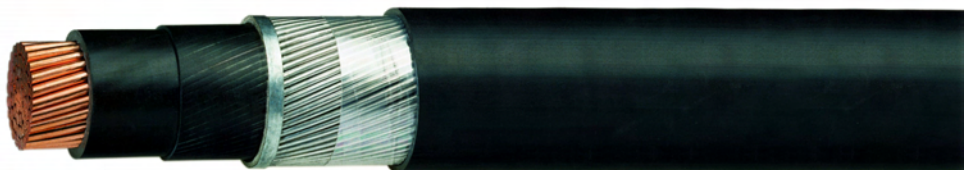
XLPE-Insulation, Armour  
2XYRY-fl

## Geometrical Data

| No. of cores and cross-section (nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation (nom.)<br>mm | Diameter over bedding (approx.)<br>mm | Armour wire diameter (nom.)<br>mm | Radial thickness of outer sheath (nom.)<br>mm | Overall diameter (approx.)<br>mm | Weight of cable (approx.)<br>kg / km | Part number |
|--------------------------------------------------------------|---------------------------------------------|---------------------------------------|-----------------------------------|-----------------------------------------------|----------------------------------|--------------------------------------|-------------|
| 5 x 1.5 RE                                                   | 0.7                                         | 9.3                                   | 0.8                               | 1.8                                           | 14.7                             | 420                                  | 20050093    |
| 7 x 1.5 RE                                                   | 0.7                                         | 10.1                                  | 0.8                               | 1.8                                           | 15.5                             | 480                                  | 20050094    |
| 10 x 1.5 RE                                                  | 0.7                                         | 12.9                                  | 1.25                              | 1.8                                           | 19.0                             | 730                                  | 20050095    |
| 12 x 1.5 RE                                                  | 0.7                                         | 13.3                                  | 1.25                              | 1.8                                           | 19.4                             | 780                                  | 20050096    |
| 19 x 1.5 RE                                                  | 0.7                                         | 15.7                                  | 1.25                              | 1.8                                           | 21.8                             | 1000                                 | 20050099    |
| 27 x 1.5 RE                                                  | 0.7                                         | 19.3                                  | 1.6                               | 1.8                                           | 26.1                             | 1450                                 | 20050102    |
| 37 x 1.5 RE                                                  | 0.7                                         | 21.7                                  | 1.6                               | 1.8                                           | 28.5                             | 1730                                 | 20050105    |
| 48 x 1.5 RE                                                  | 0.7                                         | 24.9                                  | 1.6                               | 1.9                                           | 31.9                             | 2100                                 | 20050109    |
| 5 x 1.5 RM                                                   | 0.7                                         | 9.9                                   | 0.8                               | 1.8                                           | 15.3                             | 450                                  | 20050034    |
| 7 x 1.5 RM                                                   | 0.7                                         | 10.8                                  | 0.8                               | 1.8                                           | 16.2                             | 510                                  | 20050035    |
| 10 x 1.5 RM                                                  | 0.7                                         | 13.8                                  | 1.25                              | 1.8                                           | 19.9                             | 770                                  | 20050036    |
| 12 x 1.5 RM                                                  | 0.7                                         | 14.2                                  | 1.25                              | 1.8                                           | 20.3                             | 830                                  | 20050110    |
| 19 x 1.5 RM                                                  | 0.7                                         | 16.8                                  | 1.25                              | 1.8                                           | 22.9                             | 1070                                 | 20050113    |
| 27 x 1.5 RM                                                  | 0.7                                         | 20.7                                  | 1.6                               | 1.8                                           | 27.5                             | 1560                                 | 20050116    |
| 37 x 1.5 RM                                                  | 0.7                                         | 23.2                                  | 1.6                               | 1.8                                           | 30.0                             | 1830                                 | 20050119    |
| 48 x 1.5 RM                                                  | 0.7                                         | 26.7                                  | 1.6                               | 1.9                                           | 33.7                             | 2270                                 | 20050123    |
| 5 x 2.5 RE                                                   | 0.7                                         | 10.3                                  | 0.8                               | 1.8                                           | 15.7                             | 500                                  | 20050124    |
| 7 x 2.5 RE                                                   | 0.7                                         | 11.3                                  | 1.25                              | 1.8                                           | 17.4                             | 660                                  | 20050125    |
| 10 x 2.5 RE                                                  | 0.7                                         | 14.4                                  | 1.25                              | 1.8                                           | 20.5                             | 880                                  | 20050126    |
| 12 x 2.5 RE                                                  | 0.7                                         | 14.9                                  | 1.25                              | 1.8                                           | 21.0                             | 950                                  | 20050127    |
| 19 x 2.5 RE                                                  | 0.7                                         | 18.1                                  | 1.6                               | 1.8                                           | 24.9                             | 1430                                 | 20050130    |
| 27 x 2.5 RE                                                  | 0.7                                         | 21.7                                  | 1.6                               | 1.8                                           | 28.5                             | 1800                                 | 20050133    |
| 37 x 2.5 RE                                                  | 0.7                                         | 24.4                                  | 1.6                               | 1.9                                           | 31.4                             | 2230                                 | 20050136    |
| 48 x 2.5 RE                                                  | 0.7                                         | 28.5                                  | 2.0                               | 2.1                                           | 36.7                             | 3010                                 | 20050140    |
| 5 x 2.5 RM                                                   | 0.7                                         | 11.0                                  | 0.8                               | 1.8                                           | 16.4                             | 530                                  | 20050029    |
| 7 x 2.5 RM                                                   | 0.7                                         | 12.0                                  | 1.25                              | 1.8                                           | 18.1                             | 690                                  | 20050030    |
| 10 x 2.5 RM                                                  | 0.7                                         | 15.4                                  | 1.25                              | 1.8                                           | 21.5                             | 930                                  | 20050031    |
| 12 x 2.5 RM                                                  | 0.7                                         | 16.0                                  | 1.25                              | 1.8                                           | 22.1                             | 1020                                 | 20050032    |
| 19 x 2.5 RM                                                  | 0.7                                         | 19.4                                  | 1.6                               | 1.8                                           | 26.2                             | 1510                                 | 20050143    |
| 27 x 2.5 RM                                                  | 0.7                                         | 23.3                                  | 1.6                               | 1.8                                           | 30.1                             | 1930                                 | 20050146    |
| 37 x 2.5 RM                                                  | 0.7                                         | 26.2                                  | 1.6                               | 1.9                                           | 33.2                             | 2360                                 | 20050149    |
| 48 x 2.5 RM                                                  | 0.7                                         | 30.5                                  | 2.0                               | 2.1                                           | 38.7                             | 3240                                 | 20050141    |
|                                                              |                                             |                                       |                                   |                                               |                                  |                                      |             |
|                                                              |                                             |                                       |                                   |                                               |                                  |                                      |             |
|                                                              |                                             |                                       |                                   |                                               |                                  |                                      |             |
|                                                              |                                             |                                       |                                   |                                               |                                  |                                      |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded





## Section 3:

### Zero Halogen

### Low Voltage Cables (90 °C)

$U_0 / U$  0.6 / 1 kV



# Power & Control Cable

IEC 60502-1

(2-, 3-, 4-, and 5-cores)

U<sub>0</sub>/U 0.6 / 1 kV

XLPE-Insulation, LSZH-Sheath

2XH

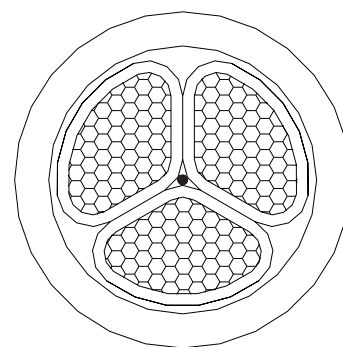
## Application

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial (partly). For indoor and outdoor installation in dry and wet locations, on racks, in conduits. (Local and / or legal requirements to be noted)

## Construction

|                                    |                                                                                                                                                                                                                  |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>                   | plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,<br>≤ 35 mm <sup>2</sup> : circular solid (RE) or circular stranded (RM),<br>> 35 mm <sup>2</sup> : sector-shaped stranded (SM) <sup>1)</sup> |
| <b>Insulation</b>                  | cross-linked polyethylene XLPE                                                                                                                                                                                   |
| <b>Colour code<sup>1) 2)</sup></b> | Two-core: blue, brown<br>Three-core: brown, black, grey<br>Four-core: blue, brown, black, grey<br>Five-core: blue, brown, black, grey, black                                                                     |
| <b>Laying up</b>                   | cores twisted in layers                                                                                                                                                                                          |
| <b>Inner Covering</b>              | extruded filler of regenerated rubber                                                                                                                                                                            |
| <b>Outer Sheath</b>                | extruded zero halogen flame retardant compound LSZH, black                                                                                                                                                       |
| <b>Cable marking</b>               | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN, YEAR, LENGTH MARKING                                                                                                                                              |



## Technical Data

|                                     |                                                      |                                               |
|-------------------------------------|------------------------------------------------------|-----------------------------------------------|
| <b>Flame retardancy:</b>            | IEC 60332-1                                          | <b>Temperature range:</b>                     |
| <b>Flame propagation:</b>           | IEC 60332-3 cat. A                                   | - 30 °C up to + 90 °C<br>(during operation)   |
| <b>Smoke density:</b>               | IEC 61034-1 and 2                                    | - 5 °C up to + 50 °C<br>(during installation) |
| <b>Amount of halogen acid gas:</b>  | IEC 60754-1; 0 %                                     | max. +250 °C<br>(under short circuit)         |
| <b>Degree of acidity of gases:</b>  | IEC 60754-2                                          |                                               |
| <b>Outer sheath:</b>                |                                                      |                                               |
| <b>Limiting Oxygen Index (LOI):</b> | min. 30 %                                            | <b>Min. bending radius:</b>                   |
| <b>Temperature Index (TI):</b>      | (IEC 60332-3 ann. B)<br>min. 250 °C<br>(ASTM-D-2863) | 8 x cable-Ø                                   |

## Abbreviations

|           |                      |
|-----------|----------------------|
| <b>2X</b> | insulation of XLPE   |
| <b>H</b>  | outer sheath of LSZH |

## Electrical Data at 20 °C

|                                                 | Character | Unit | Values                         |
|-------------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance :</b>                   | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage U<sub>rms</sub> core:core :</b> |           | V    | 3500                           |
| <b>Nominal voltage U<sub>0</sub> /U</b>         |           | V    | 600/1000                       |
| <b>Highest system voltage U<sub>m</sub> :</b>   | max.      | V    | 1200 (for three phase systems) |

<sup>1)</sup> 5core cables only with circular conductors <sup>2)</sup> other colours on request

For further details see appendix

**Power & Control Cable****IEC 60502-1****(2-, 3-, 4,- and 5-cores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, LSZH-Sheath****2XH****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall Diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 2 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 9.7                                     | 140                                         | 22220000    |
| 2 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 10.2                                    | 150                                         | 22220001    |
| 2 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 10.5                                    | 170                                         | 22220002    |
| 2 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 11.0                                    | 180                                         | 22220003    |
| 2 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 11.5                                    | 210                                         | 22220004    |
| 2 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 12.2                                    | 230                                         | 22220005    |
| 2 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 12.5                                    | 270                                         | 22220006    |
| 2 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 13.2                                    | 290                                         | 22220007    |
| 2 x 10 RE                                                           | 0.7                                                | 1.8                                                  | 14.0                                    | 370                                         | 22220008    |
| 2 x 10 RM                                                           | 0.7                                                | 1.8                                                  | 15.0                                    | 410                                         | 22220009    |
| 2 x 16 RE                                                           | 0.7                                                | 1.8                                                  | 15.9                                    | 530                                         | 22220010    |
| 2 x 16 RM                                                           | 0.7                                                | 1.8                                                  | 17.3                                    | 580                                         | 22220011    |
| 2 x 25 RM                                                           | 0.9                                                | 1.8                                                  | 20.2                                    | 740                                         | -           |
| 2 x 35 RM                                                           | 0.9                                                | 1.8                                                  | 22.8                                    | 1100                                        | -           |
| 2 x 50 SM                                                           | 1.0                                                | 1.8                                                  | 21.5                                    | 1200                                        | 22220014    |
| 2 x 70 SM                                                           | 1.1                                                | 1.8                                                  | 24.9                                    | 1620                                        | 22220015    |
| 2 x 95 SM                                                           | 1.1                                                | 2.0                                                  | 28.0                                    | 2200                                        | 22220016    |
| 2 x 120 SM                                                          | 1.2                                                | 2.1                                                  | 30.1                                    | 2640                                        | 22220017    |
| 3 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 10.2                                    | 150                                         | 22220018    |
| 3 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 10.7                                    | 170                                         | 22220019    |
| 3 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 11.0                                    | 190                                         | 22220020    |
| 3 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 11.6                                    | 210                                         | 22220021    |
| 3 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 12.0                                    | 250                                         | 22220022    |
| 3 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 12.8                                    | 280                                         | 22220023    |
| 3 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 13.1                                    | 330                                         | 22220024    |
| 3 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 13.9                                    | 350                                         | 22220025    |
| 3 x 10 RE                                                           | 0.7                                                | 1.8                                                  | 14.8                                    | 470                                         | 22220026    |
| 3 x 10 RM                                                           | 0.7                                                | 1.8                                                  | 15.9                                    | 500                                         | 22220027    |
| 3 x 16 RE                                                           | 0.7                                                | 1.8                                                  | 16.9                                    | 670                                         | 22220028    |
| 3 x 16 RM                                                           | 0.7                                                | 1.8                                                  | 18.3                                    | 730                                         | 22220029    |
| 3 x 25 RM                                                           | 0.9                                                | 1.8                                                  | 21.5                                    | 1060                                        | -           |
| 3 x 35 RM                                                           | 0.9                                                | 1.8                                                  | 24.3                                    | 1450                                        | -           |
| 3 x 50 SM                                                           | 1.0                                                | 1.8                                                  | 25.0                                    | 1710                                        | 22220032    |
| 3 x 70 SM                                                           | 1.1                                                | 1.9                                                  | 28.6                                    | 2320                                        | 22220033    |
| 3 x 95 SM                                                           | 1.1                                                | 2.0                                                  | 31.3                                    | 3150                                        | 22220034    |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

**Power & Control Cable****IEC 60502-1****(2-, 3-, 4-, and 5-cores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, LSZH-Sheath****2XH****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall Diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 4 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 10.9                                    | 180                                         | 22220035    |
| 4 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 11.4                                    | 190                                         | 22220036    |
| 4 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 11.8                                    | 230                                         | 22220037    |
| 4 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 12.4                                    | 240                                         | 22220038    |
| 4 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 12.9                                    | 300                                         | 22220039    |
| 4 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 13.8                                    | 330                                         | 22220040    |
| 4 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 14.2                                    | 400                                         | 22220041    |
| 4 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 15.0                                    | 420                                         | 22220042    |
| 4 x 10 RE                                                           | 0.7                                                | 1.8                                                  | 16.1                                    | 580                                         | 22220043    |
| 4 x 10 RM                                                           | 0.7                                                | 1.8                                                  | 17.3                                    | 620                                         | 22220044    |
| 4 x 16 RE                                                           | 0.7                                                | 1.8                                                  | 18.3                                    | 840                                         | 22220045    |
| 4 x 16 RM                                                           | 0.7                                                | 1.8                                                  | 19.9                                    | 910                                         | 22220046    |
| 4 x 25 RM                                                           | 0.9                                                | 1.8                                                  | 23.5                                    | 1400                                        | -           |
| 4 x 35 RM                                                           | 0.9                                                | 1.8                                                  | 26.5                                    | 1700                                        | -           |
| 4 x 50 SM                                                           | 1.0                                                | 1.9                                                  | 28.8                                    | 2240                                        | 22220049    |
| 4 x 70 SM                                                           | 1.1                                                | 2.0                                                  | 32.5                                    | 3050                                        | 22220050    |
| 5 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 14.0                                    | 360                                         | 22220055    |
| 5 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 14.9                                    | 370                                         | 22220056    |
| 5 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 15.4                                    | 470                                         | 22220057    |
| 5 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 16.3                                    | 500                                         | 22220058    |
| 5 x 10 RE                                                           | 0.7                                                | 1.8                                                  | 17.5                                    | 690                                         | 22220059    |
| 5 x 10 RM                                                           | 0.7                                                | 1.8                                                  | 18.8                                    | 730                                         | 22220060    |
| 5 x 16 RE                                                           | 0.7                                                | 1.8                                                  | 20.0                                    | 1010                                        | 22220061    |
| 5 x 16 RM                                                           | 0.7                                                | 1.8                                                  | 21.8                                    | 1080                                        | 22220062    |
| 5 x 25 RM                                                           | 0.9                                                | 1.8                                                  | 25.8                                    | 1650                                        | 22220063    |
| 5 x 35 RM                                                           | 0.9                                                | 1.8                                                  | 28.8                                    | 2120                                        | 22220064    |
| 5 x 50 RM                                                           | 1.0                                                | 1.8                                                  | 32.9                                    | 2840                                        | 22220065    |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

## KERPEN's Focus:

Competence - Flexibility - Quality - Service

### Quality

- new designs to customer required standards
- one of the first with ISO 9001 certificate (1990)  
ISO 9001:2000 (2002)
- first cable manufacturer with ISO 14001 environment certificate (1998)
- test certificates for every drum length
- special certificates for fire resistant cables
- UL approvals, GOST certificates
- acceptance through inspection companies

# Power & Control Cable

IEC 60502-1

(Multicores)

U<sub>0</sub>/U 0.6 / 1 kV

XLPE-Insulation, LSZH-Sheath

2XH

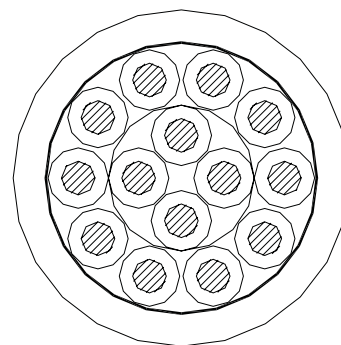
## Application

For electricity supply and control in public networks and industrial plants; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial (partly). For indoor and outdoor installation in dry and wet locations, on racks, in conduits. (Local and / or legal requirements to be noted)

## Construction

|                      |                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>     | plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,<br>class 1: circular solid (RE)<br>class 2: circular stranded (RM) |
| <b>Insulation</b>    | cross-linked polyethylene XLPE                                                                                                         |
| <b>Colour code</b>   | black, continuously numbered                                                                                                           |
| <b>Laying up</b>     | cores twisted in layers (if necessary with filling element/s)                                                                          |
| <b>Wrapping</b>      | at least 1 layer of plastic tape                                                                                                       |
| <b>Outer Sheath</b>  | extruded zero halogen flame retardant compound LSZH, black                                                                             |
| <b>Cable marking</b> | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN, YEAR, LENGTH MARKING                                                                    |



## Technical Data

|                                     |                                   |                             |                                               |
|-------------------------------------|-----------------------------------|-----------------------------|-----------------------------------------------|
| <b>Flame retardancy:</b>            | IEC 60332-1                       | <b>Temperature range:</b>   | - 30 °C up to + 90 °C<br>(during operation)   |
| <b>Flame propagation:</b>           | IEC 60332-3 cat. A                |                             | - 5 °C up to + 50 °C<br>(during installation) |
| <b>Smoke density:</b>               | IEC 61034-1 and 2                 |                             | max. +250 °C<br>(under short circuit)         |
| <b>Amount of halogen acid gas:</b>  | IEC 60754-1; 0 %                  |                             |                                               |
| <b>Degree of acidity of gases:</b>  | IEC 60754-2                       |                             |                                               |
| <b>Outer sheath:</b>                |                                   | <b>Min. bending radius:</b> | 8 x cable-Ø                                   |
| <b>Limiting Oxygen Index (LOI):</b> | min. 30 %<br>(IEC 60332-3 ann. B) |                             |                                               |
| <b>Temperature index (TI):</b>      | min. 250 °C<br>(ASTM-D-2863)      |                             |                                               |

## Abbreviations

|           |                      |
|-----------|----------------------|
| <b>2X</b> | insulation of XLPE   |
| <b>H</b>  | outer sheath of LSZH |

## Electrical Data at 20 °C

|                                               | Character | Unit | Values                         |
|-----------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance</b>                   | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage U<sub>rms</sub> core:core</b> |           | V    | 3500                           |
| <b>Nominal voltage U<sub>0</sub>/U</b>        |           | V    | 600/1000                       |
| <b>Highest system voltage U<sub>m</sub></b>   | max.      | V    | 1200 (for three phase systems) |

For further electrical details see appendix

**Power & Control Cable****IEC 60502-1****(Multicores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, LSZH-Sheath****2XH****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 5 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 11.3                                    | 180                                         | 22220066    |
| 7 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 12.2                                    | 220                                         | 22220067    |
| 10 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 14.9                                    | 310                                         | 22220068    |
| 12 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 15.3                                    | 340                                         | 22220069    |
| 19 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 17.7                                    | 480                                         | 22220070    |
| 27 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 21.0                                    | 660                                         | 22220071    |
| 37 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 23.4                                    | 860                                         | 22220072    |
| 48 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 26.5                                    | 1080                                        | 22220073    |
| 5 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 11.9                                    | 190                                         | 22220074    |
| 7 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 12.8                                    | 230                                         | 22220075    |
| 10 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 15.8                                    | 320                                         | 22220076    |
| 12 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 16.2                                    | 360                                         | 22220077    |
| 19 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 18.8                                    | 510                                         | 22220078    |
| 27 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 22.3                                    | 700                                         | 22220079    |
| 37 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 24.8                                    | 910                                         | 22220080    |
| 48 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 28.3                                    | 1150                                        | 22220081    |
| 5 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 12.4                                    | 240                                         | 22220082    |
| 7 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 13.4                                    | 300                                         | 22220083    |
| 10 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 16.4                                    | 400                                         | 22220084    |
| 12 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 16.9                                    | 460                                         | 22220085    |
| 19 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 19.8                                    | 670                                         | 22220086    |
| 27 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 23.4                                    | 920                                         | 22220087    |
| 37 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 26.1                                    | 1210                                        | 22220088    |
| 48 x 2.5 RE                                                         | 0.7                                                | 1.9                                                  | 29.9                                    | 1550                                        | 22220089    |
| 5 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 13.0                                    | 250                                         | 22220090    |
| 7 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 14.0                                    | 310                                         | 22220091    |
| 10 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 17.4                                    | 420                                         | 22220092    |
| 12 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 18.0                                    | 490                                         | 22220093    |
| 19 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 21.0                                    | 710                                         | 22220094    |
| 27 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 24.9                                    | 980                                         | 22220095    |
| 37 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 27.8                                    | 1290                                        | 22220096    |
| 48 x 2.5 RM                                                         | 0.7                                                | 1.9                                                  | 31.9                                    | 1650                                        | 22220097    |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

# Power & Control Cable

IEC 60502-1

(2-, 3-, and 4-cores)

U<sub>0</sub>/U 0.6 / 1 kV

## XLPE-Insulation, Armour, LSZH-Sheath

2XHRH

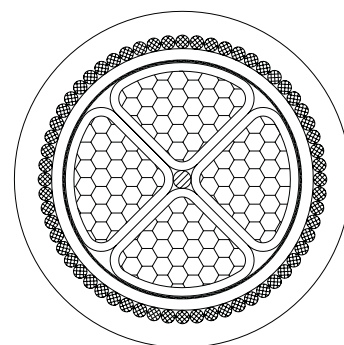
### Application

For electricity supply and control in public networks and industrial plants or public buildings, where people are potentially endangered in case of fire; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial (partly). For indoor and outdoor installation in dry and wet locations, on racks, in conduits (Local and / or legal requirements to be noted)

### Construction

|                                  |                                                                                                                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>                 | plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,<br>≤ 35 mm <sup>2</sup> : circular solid (RE) or circular stranded (RM),<br>> 35 mm <sup>2</sup> : sector-shaped stranded (SM) |
| <b>Insulation</b>                | cross-linked polyethylene XLPE                                                                                                                                                                     |
| <b>Colour code <sup>1)</sup></b> | Two-core: blue, brown<br>Three-core: brown, black, grey<br>Four-core: blue, brown, black, grey                                                                                                     |
| <b>Laying up</b>                 | cores twisted in layers (if necessary with filling element/s)                                                                                                                                      |
| <b>Wrapping</b>                  | at least 1 layer of plastic tape                                                                                                                                                                   |
| <b>Bedding</b>                   | extruded zero halogen flame retardant compound LSZH, black                                                                                                                                         |
| <b>Armour</b>                    | galvanized round steel wires                                                                                                                                                                       |
| <b>Outer Sheath</b>              | extruded zero halogen flame retardant compound LSZH, black                                                                                                                                         |
| <b>Cable marking</b>             | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN, YEAR, LENGTH MARKING                                                                                                                                |



### Technical Data

|                                     |                                   |                             |                                               |
|-------------------------------------|-----------------------------------|-----------------------------|-----------------------------------------------|
| <b>Flame retardancy:</b>            | IEC 60332-1                       | <b>Temperature range:</b>   | - 30 °C up to + 90 °C<br>(during operation)   |
| <b>Flame propagation:</b>           | IEC 60332-3 cat. A                |                             | - 5 °C up to + 50 °C<br>(during installation) |
| <b>Smoke density:</b>               | IEC 61034-1 and 2                 |                             | max. + 250 °C<br>(under short circuit)        |
| <b>Amount of halogen acid gas:</b>  | IEC 60754-1; 0 %                  |                             |                                               |
| <b>Degree of acidity of gases:</b>  | IEC 60754-2                       |                             |                                               |
| <b>Outer sheath:</b>                |                                   |                             |                                               |
| <b>Limiting Oxygen Index (LOI):</b> | min. 30 %<br>(IEC 60332-3 ann. B) | <b>Min. bending radius:</b> | 8 x cable-Ø                                   |
| <b>Temperature Index (TI):</b>      | min. 250 °C<br>(ASTM-D-2863)      |                             |                                               |

### Abbreviations

|           |                                |
|-----------|--------------------------------|
| <b>2X</b> | insulation of XLPE             |
| <b>H</b>  | bedding & outer sheath of LSZH |
| <b>R</b>  | round steel wire armour        |

### Electrical Data at 20 °C

|                                                 | Character | Unit | Values                         |
|-------------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance</b>                     | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage U<sub>rms</sub> core:core</b>   |           | V    | 3500                           |
| <b>Test voltage U<sub>rms</sub> core:armour</b> |           | V    | 3500                           |
| <b>Nominal voltage U<sub>0</sub> /U</b>         |           | V    | 600/1000                       |
| <b>Highest system voltage U<sub>m</sub></b>     | max.      | V    | 1200 (for three phase systems) |

<sup>1)</sup> other colours on request

For further details see appendix

**Power & Control Cable****IEC 60502-1****(2-, 3-, and 4-cores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, Armour, LSZH-Sheath****2XHRH****Geometrical Data**

| No. of cores and cross-section<br>(nom.)<br>n/ mm <sup>2</sup> | Radial thickness of insulation<br>(nom.)<br>mm | Diameter over bedding<br>(approx.)<br>mm | Armour wire diameter<br>(nom.)<br>mm | Radial thickness of outer sheath<br>(nom.)<br>mm | Overall diameter<br>(approx.)<br>mm | Weight of cable<br>(approx.)<br>kg / km | Part number |
|----------------------------------------------------------------|------------------------------------------------|------------------------------------------|--------------------------------------|--------------------------------------------------|-------------------------------------|-----------------------------------------|-------------|
| 2 x 1.5 RE                                                     | 0.7                                            | 7.3                                      | 0.8                                  | 1.8                                              | 12.7                                | 310                                     | 21380071    |
| 2 x 1.5 RM                                                     | 0.7                                            | 7.8                                      | 0.8                                  | 1.8                                              | 13.2                                | 330                                     | 21380072    |
| 2 x 2.5 RE                                                     | 0.7                                            | 8.1                                      | 0.8                                  | 1.8                                              | 13.5                                | 350                                     | 21380073    |
| 2 x 2.5 RM                                                     | 0.7                                            | 8.6                                      | 0.8                                  | 1.8                                              | 14.0                                | 370                                     | 21380074    |
| 2 x 4 RE                                                       | 0.7                                            | 9.1                                      | 0.8                                  | 1.8                                              | 14.5                                | 410                                     | 21380075    |
| 2 x 4 RM                                                       | 0.7                                            | 9.8                                      | 0.8                                  | 1.8                                              | 15.2                                | 440                                     | 21380076    |
| 2 x 6 RE                                                       | 0.7                                            | 10.1                                     | 0.8                                  | 1.8                                              | 15.5                                | 480                                     | 21380077    |
| 2 x 6 RM                                                       | 0.7                                            | 10.8                                     | 0.8                                  | 1.8                                              | 16.2                                | 510                                     | 21380078    |
| 2 x 10 RE                                                      | 0.7                                            | 11.6                                     | 0.8                                  | 1.8                                              | 17.0                                | 600                                     | 21380079    |
| 2 x 10 RM                                                      | 0.7                                            | 12.8                                     | 1.25                                 | 1.8                                              | 18.9                                | 770                                     | 21380080    |
| 2 x 16 RE                                                      | 0.7                                            | 13.5                                     | 1.25                                 | 1.8                                              | 19.6                                | 890                                     | 21380081    |
| 2 x 16 RM                                                      | 0.7                                            | 14.9                                     | 1.25                                 | 1.8                                              | 21.0                                | 960                                     | 21380082    |
| 2 x 25 RM                                                      | 0.9                                            | 18.3                                     | 1.6                                  | 1.8                                              | 25.1                                | 1350                                    | -           |
| 2 x 35 RM                                                      | 0.9                                            | 20.5                                     | 1.6                                  | 1.8                                              | 27.3                                | 1620                                    | -           |
| 2 x 50 SM                                                      | 1.0                                            | 19.2                                     | 1.6                                  | 1.9                                              | 26.0                                | 1845                                    | 21380085    |
| 2 x 70 SM                                                      | 1.1                                            | 20.4                                     | 1.6                                  | 2.0                                              | 27.6                                | 2310                                    | 21380086    |
| 2 x 95 SM                                                      | 1.1                                            | 23.5                                     | 2.0                                  | 2.1                                              | 31.7                                | 3145                                    | 21380087    |
| 2 x 120 SM                                                     | 1.2                                            | 27.8                                     | 2.0                                  | 2.2                                              | 36.2                                | 3865                                    | 21380088    |
| 2 x 150 SM                                                     | 1.4                                            | 31.0                                     | 2.0                                  | 2.3                                              | 39.6                                | 4640                                    | 21380089    |
| 2 x 185 SM                                                     | 1.6                                            | 35.4                                     | 2.5                                  | 2.5                                              | 45.4                                | 6090                                    | 21380090    |
| 2 x 240 SM                                                     | 1.7                                            | 39.5                                     | 2.5                                  | 2.7                                              | 49.9                                | 7520                                    | 21380091    |
| 2 x 300 SM                                                     | 1.8                                            | 46.2                                     | 2.5                                  | 2.8                                              | 56.8                                | 9360                                    | 21380092    |
| 3 x 1.5 RE                                                     | 0.7                                            | 7.8                                      | 0.8                                  | 1.8                                              | 13.2                                | 320                                     | 21380023    |
| 3 x 1.5 RM                                                     | 0.7                                            | 8.3                                      | 0.8                                  | 1.8                                              | 13.7                                | 340                                     | 21380010    |
| 3 x 2.5 RE                                                     | 0.7                                            | 8.6                                      | 0.8                                  | 1.8                                              | 14.0                                | 390                                     | 21380037    |
| 3 x 2.5 RM                                                     | 0.7                                            | 9.2                                      | 0.8                                  | 1.8                                              | 14.6                                | 410                                     | 21380050    |
| 3 x 4 RE                                                       | 0.7                                            | 9.6                                      | 0.8                                  | 1.8                                              | 15.0                                | 460                                     | 21380093    |
| 3 x 4 RM                                                       | 0.7                                            | 10.4                                     | 0.8                                  | 1.8                                              | 15.8                                | 510                                     | 21380094    |
| 3 x 6 RE                                                       | 0.7                                            | 10.7                                     | 0.8                                  | 1.8                                              | 16.1                                | 550                                     | 21380095    |
| 3 x 6 RM                                                       | 0.7                                            | 11.5                                     | 0.8                                  | 1.8                                              | 16.9                                | 600                                     | 21380096    |
| 3 x 10 RE                                                      | 0.7                                            | 12.4                                     | 1.25                                 | 1.8                                              | 18.5                                | 830                                     | 21380097    |
| 3 x 10 RM                                                      | 0.7                                            | 13.5                                     | 1.25                                 | 1.8                                              | 19.6                                | 890                                     | 21380098    |
| 3 x 16 RE                                                      | 0.7                                            | 14.5                                     | 1.25                                 | 1.8                                              | 20.6                                | 1080                                    | 21380099    |
| 3 x 16 RM                                                      | 0.7                                            | 15.8                                     | 1.25                                 | 1.8                                              | 21.9                                | 1150                                    | 21380100    |
| 3 x 25 RM                                                      | 0.9                                            | 19.6                                     | 1.6                                  | 1.8                                              | 26.4                                | 1660                                    | -           |
|                                                                |                                                |                                          |                                      |                                                  |                                     |                                         |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

**Power & Control Cable****IEC 60502-1****(2-, 3-, and 4-cores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, Armour, LSZH-Sheath****2XHRH****Geometrical Data**

| No. of cores and cross-section<br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br>(nom.)<br>mm | Diameter over bedding<br>(approx.)<br>mm | Armour wire diameter<br>(nom.)<br>mm | Radial thickness of outer sheath<br>(nom.)<br>mm | Overall diameter<br>(approx.)<br>mm | Weight of cable<br>(approx.)<br>kg / km | Part number |
|-----------------------------------------------------------------|------------------------------------------------|------------------------------------------|--------------------------------------|--------------------------------------------------|-------------------------------------|-----------------------------------------|-------------|
| 3 x 35 RM                                                       | 0.9                                            | 22.0                                     | 1.6                                  | 1.8                                              | 28.8                                | 2050                                    | -           |
| 3 x 50 SM                                                       | 1.0                                            | 22.7                                     | 1.6                                  | 1.9                                              | 29.7                                | 2500                                    | 21380103    |
| 3 x 70 SM                                                       | 1.1                                            | 26.5                                     | 2.0                                  | 2.0                                              | 34.5                                | 3540                                    | 21380104    |
| 3 x 95 SM                                                       | 1.1                                            | 29.0                                     | 2.0                                  | 2.2                                              | 37.4                                | 4440                                    | 21380105    |
| 3 x 120 SM                                                      | 1.2                                            | 32.0                                     | 2.0                                  | 2.3                                              | 40.6                                | 5280                                    | 21380106    |
| 3 x 150 SM                                                      | 1.4                                            | 36.3                                     | 2.5                                  | 2.5                                              | 46.3                                | 6810                                    | 21380107    |
| 3 x 185 SM                                                      | 1.6                                            | 41.1                                     | 2.5                                  | 2.6                                              | 51.3                                | 8200                                    | 21380108    |
| 3 x 240 SM                                                      | 1.7                                            | 46.1                                     | 2.5                                  | 2.8                                              | 56.7                                | 10310                                   | 21380109    |
| 3 x 300 SM                                                      | 1.8                                            | 53.4                                     | 2.5                                  | 3.0                                              | 64.4                                | 12900                                   | 21380110    |
| 3 x 400 SM                                                      | 2.0                                            | 59.8                                     | 2.5                                  | 3.2                                              | 71.2                                | 15860                                   | 21380111    |
| 4 x 1.5 RE                                                      | 0.7                                            | 8.5                                      | 0.8                                  | 1.8                                              | 13.9                                | 370                                     | 21380024    |
| 4 x 1.5 RM                                                      | 0.7                                            | 9.0                                      | 0.8                                  | 1.8                                              | 14.4                                | 400                                     | 21380011    |
| 4 x 2.5 RE                                                      | 0.7                                            | 9.4                                      | 0.8                                  | 1.8                                              | 14.8                                | 440                                     | 21380038    |
| 4 x 2.5 RM                                                      | 0.7                                            | 10.0                                     | 0.8                                  | 1.8                                              | 15.4                                | 460                                     | 21380051    |
| 4 x 4 RE                                                        | 0.7                                            | 10.5                                     | 0.8                                  | 1.8                                              | 15.9                                | 530                                     | 21380112    |
| 4 x 4 RM                                                        | 0.7                                            | 11.4                                     | 0.8                                  | 1.8                                              | 16.8                                | 580                                     | 21380113    |
| 4 x 6 RE                                                        | 0.7                                            | 11.8                                     | 0.8                                  | 1.8                                              | 17.2                                | 650                                     | 21380114    |
| 4 x 6 RM                                                        | 0.7                                            | 12.7                                     | 1.25                                 | 1.8                                              | 18.8                                | 800                                     | 21380115    |
| 4 x 10 RE                                                       | 0.7                                            | 13.7                                     | 1.25                                 | 1.8                                              | 19.8                                | 970                                     | 21380116    |
| 4 x 10 RM                                                       | 0.7                                            | 14.9                                     | 1.25                                 | 1.8                                              | 21.0                                | 1040                                    | 21380117    |
| 4 x 16 RE                                                       | 0.7                                            | 15.9                                     | 1.6                                  | 1.8                                              | 22.7                                | 1390                                    | 21380118    |
| 4 x 16 RM                                                       | 0.7                                            | 17.5                                     | 1.6                                  | 1.8                                              | 24.3                                | 1500                                    | 21380119    |
| 4 x 25 RM                                                       | 0.9                                            | 21.6                                     | 1.6                                  | 1.8                                              | 28.4                                | 1980                                    | -           |
| 4 x 35 RM                                                       | 0.9                                            | 24.0                                     | 1.6                                  | 1.9                                              | 31.0                                | 2530                                    | -           |
| 4 x 50 SM                                                       | 1.0                                            | 26.3                                     | 1.6                                  | 2.0                                              | 33.5                                | 3150                                    | 21380122    |
| 4 x 70 SM                                                       | 1.1                                            | 29.7                                     | 2.0                                  | 2.0                                              | 37.7                                | 4370                                    | 21380123    |
| 4 x 95 SM                                                       | 1.1                                            | 33.2                                     | 2.0                                  | 2.3                                              | 41.8                                | 5590                                    | 21380124    |
| 4 x 120 SM                                                      | 1.2                                            | 37.1                                     | 2.5                                  | 2.5                                              | 47.1                                | 7170                                    | 21380125    |
| 4 x 150 SM                                                      | 1.4                                            | 41.1                                     | 2.5                                  | 2.6                                              | 51.3                                | 8550                                    | 21380126    |
| 4 x 185 SM                                                      | 1.6                                            | 46.6                                     | 2.5                                  | 2.8                                              | 57.2                                | 10460                                   | 21380127    |
| 4 x 240 SM                                                      | 1.7                                            | 53.0                                     | 2.5                                  | 3.0                                              | 64.0                                | 13190                                   | 21380128    |
| 4 x 300 SM                                                      | 1.8                                            | 59.0                                     | 2.5                                  | 3.2                                              | 70.4                                | 16360                                   | 21380129    |
| 4 x 400 SM                                                      | 2.0                                            | 69.7                                     | 3.15                                 | 3.5                                              | 83.0                                | 21470                                   | 21380130    |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

## **KERPEN's Focus:**

Competence   -   Flexibility   -   Quality   -   Service

### **Service**

- consultation for technical and economical solutions
- engineering service to meet customer requirements
- availability of production schedules, progress reports, technical specifications, data sheets, ...
- ex stock deliveries for various standards, stock in different countries
- world wide logistic and international documentation know how

(Multicores)

 $U_0/U$  0.6 / 1 kV

XLPE-Insulation, Armour, LSZH-Sheath

2XHRH

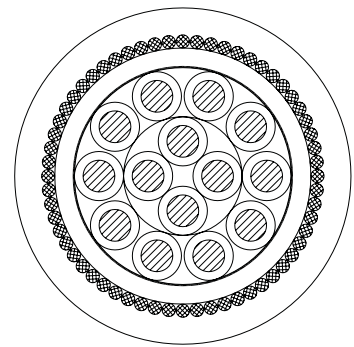
## Application

For electricity supply and control in public networks and industrial plants or public buildings, where people are potentially endangered in case of fire; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

Recommended for direct burial (partly). For indoor and outdoor installation in dry and wet locations, on racks, in conduits (Local and / or legal requirements to be noted)

## Construction

|                      |                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>     | plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,<br>class 1: circular solid (RE)<br>class 2: circular stranded (RM) |
| <b>Insulation</b>    | cross-linked polyethylene XLPE                                                                                                         |
| <b>Colour code</b>   | black, continuously numbered                                                                                                           |
| <b>Laying up</b>     | cores twisted in layers (if necessary with filling element/s)                                                                          |
| <b>Wrapping</b>      | at least 1 layer of plastic tape                                                                                                       |
| <b>Bedding</b>       | extruded zero halogen flame retardant compound LSZH, black                                                                             |
| <b>Armour</b>        | galvanized round steel wires                                                                                                           |
| <b>Outer Sheath</b>  | extruded zero halogen flame retardant compound LSZH, black                                                                             |
| <b>Cable marking</b> | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN, YEAR, LENGTH MARKING                                                                    |



## Technical Data

|                                     |                                   |                             |                                               |
|-------------------------------------|-----------------------------------|-----------------------------|-----------------------------------------------|
| <b>Flame retardancy:</b>            | IEC 60332-1                       | <b>Temperature range:</b>   | - 30 °C up to + 90 °C<br>(during operation)   |
| <b>Flame propagation:</b>           | IEC 60332-3 cat. A                |                             | - 5° C up to + 50 °C<br>(during installation) |
| <b>Smoke density:</b>               | IEC 61034-1 and 2                 |                             | max. + 250 °C<br>(under short circuit)        |
| <b>Amount of halogen acid gas:</b>  | IEC 60754-1; 0 %                  |                             |                                               |
| <b>Degree of acidity of gases:</b>  | IEC 60754-2                       |                             |                                               |
| <b>Outer sheath:</b>                |                                   |                             |                                               |
| <b>Limiting Oxygen Index (LOI):</b> | min. 30 %<br>(IEC 60332-3 ann. B) | <b>Min. bending radius:</b> | 8 x cable-Ø                                   |
| <b>Temperature Index (TI):</b>      | min. 250 °C<br>(ASTM-D-2863)      |                             |                                               |

## Abbreviations

|           |                                |
|-----------|--------------------------------|
| <b>2X</b> | insulation of XLPE             |
| <b>H</b>  | bedding & outer sheath of LSZH |
| <b>R</b>  | round steel wire armour        |

## Electrical Data at 20 °C

|                                                      | Character | Unit | Values                         |
|------------------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance</b>                          | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage <math>U_{rms}</math> core:core</b>   |           | V    | 3500                           |
| <b>Test voltage <math>U_{rms}</math> core:armour</b> |           | V    | 3500                           |
| <b>Nominal voltage <math>U_0/U</math></b>            |           | V    | 600/1000                       |
| <b>Highest system voltage <math>U_m</math></b>       | max.      | V    | 1200 (for three phase systems) |

For further details see appendix

**Power & Control Cable****IEC 60502-1****(Mulicores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, Armour, LSZH-Sheath****2XHRH****Geometrical Data**

| No. of cores and cross-section<br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br>(nom.)<br>mm | Diameter over bedding<br>(approx.)<br>mm | Armour wire diameter<br>(nom.)<br>mm | Radial thickness of outer sheath<br>(nom.)<br>mm | Overall diameter<br>(approx.)<br>mm | Weight of cable<br>(approx.)<br>kg / km | Part number |
|-----------------------------------------------------------------|------------------------------------------------|------------------------------------------|--------------------------------------|--------------------------------------------------|-------------------------------------|-----------------------------------------|-------------|
| 5 x 1.5 RE                                                      | 0.7                                            | 9.3                                      | 0.8                                  | 1.8                                              | 14.7                                | 420                                     | 21380025    |
| 7 x 1.5 RE                                                      | 0.7                                            | 10.1                                     | 0.8                                  | 1.8                                              | 15.5                                | 480                                     | 21380026    |
| 10 x 1.5 RE                                                     | 0.7                                            | 12.9                                     | 1.25                                 | 1.8                                              | 19.0                                | 690                                     | 21380027    |
| 12 x 1.5 RE                                                     | 0.7                                            | 13.3                                     | 1.25                                 | 1.8                                              | 19.4                                | 770                                     | 21380028    |
| 19 x 1.5 RE                                                     | 0.7                                            | 15.7                                     | 1.25                                 | 1.8                                              | 21.8                                | 990                                     | 21380031    |
| 27 x 1.5 RE                                                     | 0.7                                            | 19.3                                     | 1.6                                  | 1.8                                              | 26.1                                | 1440                                    | 21380034    |
| 37 x 1.5 RE                                                     | 0.7                                            | 21.7                                     | 1.6                                  | 1.8                                              | 28.5                                | 1720                                    | 21380063    |
| 48 x 1.5 RE                                                     | 0.7                                            | 24.9                                     | 1.6                                  | 1.9                                              | 31.9                                | 2090                                    | 21380064    |
| 5 x 1.5 RM                                                      | 0.7                                            | 9.9                                      | 0.8                                  | 1.8                                              | 15.3                                | 450                                     | 21380012    |
| 7 x 1.5 RM                                                      | 0.7                                            | 10.8                                     | 0.8                                  | 1.8                                              | 16.2                                | 510                                     | 21380013    |
| 10 x 1.5 RM                                                     | 0.7                                            | 13.8                                     | 1.25                                 | 1.8                                              | 19.9                                | 770                                     | 21380014    |
| 12 x 1.5 RM                                                     | 0.7                                            | 14.2                                     | 1.25                                 | 1.8                                              | 20.3                                | 830                                     | 21380015    |
| 19 x 1.5 RM                                                     | 0.7                                            | 16.8                                     | 1.25                                 | 1.8                                              | 22.9                                | 1070                                    | 21380018    |
| 27 x 1.5 RM                                                     | 0.7                                            | 20.7                                     | 1.6                                  | 1.8                                              | 27.5                                | 1560                                    | 21380021    |
| 37 x 1.5 RM                                                     | 0.7                                            | 23.2                                     | 1.6                                  | 1.8                                              | 30.0                                | 1830                                    | 21380065    |
| 48 x 1.5 RM                                                     | 0.7                                            | 26.7                                     | 1.6                                  | 1.9                                              | 33.7                                | 2270                                    | 21380066    |
| 5 x 2.5 RE                                                      | 0.7                                            | 10.3                                     | 0.8                                  | 1.8                                              | 15.7                                | 490                                     | 21380039    |
| 7 x 2.5 RE                                                      | 0.7                                            | 11.3                                     | 1.25                                 | 1.8                                              | 17.4                                | 660                                     | 21380040    |
| 10 x 2.5 RE                                                     | 0.7                                            | 14.4                                     | 1.25                                 | 1.8                                              | 20.5                                | 880                                     | 21380041    |
| 12 x 2.5 RE                                                     | 0.7                                            | 14.9                                     | 1.25                                 | 1.8                                              | 21.0                                | 950                                     | 21380042    |
| 19 x 2.5 RE                                                     | 0.7                                            | 18.1                                     | 1.6                                  | 1.8                                              | 24.9                                | 1430                                    | 21380045    |
| 27 x 2.5 RE                                                     | 0.7                                            | 21.7                                     | 1.6                                  | 1.8                                              | 28.5                                | 1800                                    | 21380048    |
| 37 x 2.5 RE                                                     | 0.7                                            | 24.4                                     | 1.6                                  | 1.9                                              | 31.4                                | 2230                                    | 21380067    |
| 48 x 2.5 RE                                                     | 0.7                                            | 28.5                                     | 2.0                                  | 2.1                                              | 36.7                                | 3010                                    | 21380068    |
| 5 x 2.5 RM                                                      | 0.7                                            | 11.0                                     | 0.8                                  | 1.8                                              | 16.4                                | 530                                     | 21380052    |
| 7 x 2.5 RM                                                      | 0.7                                            | 12.0                                     | 1.25                                 | 1.8                                              | 18.1                                | 690                                     | 21380053    |
| 10 x 2.5 RM                                                     | 0.7                                            | 15.4                                     | 1.25                                 | 1.8                                              | 21.5                                | 930                                     | 21380054    |
| 12 x 2.5 RM                                                     | 0.7                                            | 16.0                                     | 1.25                                 | 1.8                                              | 22.1                                | 1020                                    | 21380055    |
| 19 x 2.5 RM                                                     | 0.7                                            | 19.4                                     | 1.6                                  | 1.8                                              | 26.2                                | 1510                                    | 21380058    |
| 27 x 2.5 RM                                                     | 0.7                                            | 23.3                                     | 1.6                                  | 1.8                                              | 30.1                                | 1930                                    | 21380061    |
| 37 x 2.5 RM                                                     | 0.7                                            | 26.2                                     | 1.6                                  | 1.9                                              | 33.2                                | 2360                                    | 21380069    |
| 48 x 2.5 RM                                                     | 0.7                                            | 30.5                                     | 2.0                                  | 2.1                                              | 38.7                                | 3240                                    | 21380070    |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded





## Section 4:

**Zero Halogen & Fire Resistant**

**Low Voltage Cables (90 °C)**

$U_0 / U$  0.6 / 1 kV



(2-, 3-, 4- and 5-cores)

U<sub>0</sub>/U 0.6 / 1 kV

XLPE-Insulation, LSZH-Sheath, Fire Resistant

2XH

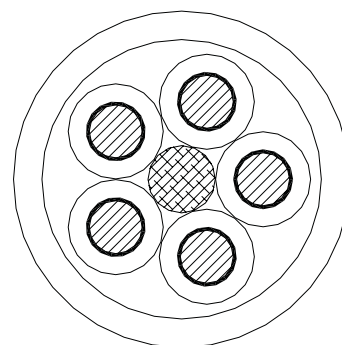
## Application

For electricity supply and control in public networks and industrial plants or public buildings, where people are potentially endangered in case of fire and where, for a defined period of time, the continuity of control and energy supply is of vital necessity; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

For indoor and outdoor installation in dry and wet locations, on racks, in conduits (Local and / or legal requirements to be noted) Recommended for direct burial (partly).

## Construction

|                                  |                                                                                                                                              |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>                 | plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,<br>class 1: circular solid (RE)<br>class 2: circular stranded (RM)       |
| <b>Insulation</b>                | cross-linked polyethylene XLPE, over the MICA-tape wrapped conductor                                                                         |
| <b>Colour code</b> <sup>1)</sup> | Two-core: blue, brown<br>Three-core: brown, black, grey<br>Four-core: blue, brown, black, grey<br>Five-core: blue, brown, black, grey, black |
| <b>Laying up</b>                 | cores twisted in layers (if necessary with filling element(s))                                                                               |
| <b>Inner Covering</b>            | extruded filler of regenerated rubber                                                                                                        |
| <b>Outer Sheath</b>              | extruded zero halogen flame retardant compound LSZH, black                                                                                   |
| <b>Cable marking</b>             | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN, YEAR, LENGTH MARKING, IEC 60331                                                               |



## Technical Data

## Abbreviations

|                                     |                                   |                                            |    |                      |
|-------------------------------------|-----------------------------------|--------------------------------------------|----|----------------------|
| <b>Flame retardancy:</b>            | IEC 60332-1                       | <b>Temperature range:</b>                  | 2X | insulation of XLPE   |
| <b>Flame propagation:</b>           | IEC 60332-3 cat. A                | - 30 °C up to + 90 °C                      | H  | outer sheath of LSZH |
| <b>Fire resistance:</b>             | IEC 60331-21<br>(90 min/750 °C)   | (during operation)<br>- 5 °C up to + 50 °C |    |                      |
| <b>Smoke density:</b>               | IEC 61034-1 and 2                 | (during installation)                      |    |                      |
| <b>Amount of halogen acid gas:</b>  | IEC 60754-1; 0 %                  | max. + 250 °C                              |    |                      |
| <b>Degree of acidity of gases:</b>  | IEC 60754-2                       | (under short circuit)                      |    |                      |
| <b>Outer sheath:</b>                |                                   | <b>Min. bending radius:</b>                |    |                      |
| <b>Limiting Oxygen Index (LOI):</b> | min. 30 %<br>(IEC 60332-3 ann. B) | 8 x cable-Ø                                |    |                      |
| <b>Temperature Index (TI):</b>      | min. 250 °C<br>(ASTM-D-2863)      |                                            |    |                      |

## Electrical Data at 20 °C

|                                               | Character | Unit | Values                         |
|-----------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance</b>                   | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage U<sub>rms</sub> core:core</b> |           | V    | 3500                           |
| <b>Nominal voltage U<sub>0</sub> /U</b>       |           | V    | 600/1000                       |
| <b>Highest system voltage U<sub>m</sub></b>   | max.      | V    | 1200 (for three phase systems) |

<sup>1)</sup> other colours on request

For further details see appendix

**Power & Control Cable****IEC 60502-1****(2-, 3-, 4- and 5-cores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, LSZH-Sheath, Fire Resistant****2XH****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall Diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 2 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 11.8                                    | 190                                         | 21180010    |
| 2 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 12.2                                    | 170                                         | 21180000    |
| 2 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 12.5                                    | 220                                         | 21180033    |
| 2 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 13.0                                    | 230                                         | 21180020    |
| 2 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 13.5                                    | 260                                         | 21180037    |
| 2 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 14.2                                    | 280                                         | 21180041    |
| 2 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 14.5                                    | 320                                         | 21180045    |
| 2 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 15.2                                    | 340                                         | 21180049    |
| 3 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 12.3                                    | 200                                         | 21180011    |
| 3 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 12.8                                    | 220                                         | 21180001    |
| 3 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 13.2                                    | 240                                         | 21180034    |
| 3 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 13.7                                    | 260                                         | 21180021    |
| 3 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 14.2                                    | 290                                         | 21180038    |
| 3 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 15.0                                    | 330                                         | 21180042    |
| 3 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 15.3                                    | 380                                         | 21180046    |
| 3 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 16.1                                    | 400                                         | 21180050    |
| 4 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 13.3                                    | 230                                         | 21180012    |
| 4 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 13.8                                    | 240                                         | 21180002    |
| 4 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 14.3                                    | 280                                         | 21180035    |
| 4 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 14.8                                    | 290                                         | 21180022    |
| 4 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 15.5                                    | 350                                         | 21180039    |
| 4 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 16.3                                    | 380                                         | 21180043    |
| 4 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 16.7                                    | 450                                         | 21180047    |
| 4 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 17.5                                    | 470                                         | 21180051    |
| 5 x 4 RE                                                            | 0.7                                                | 1.8                                                  | 16.8                                    | 410                                         | 21180040    |
| 5 x 4 RM                                                            | 0.7                                                | 1.8                                                  | 17.8                                    | 420                                         | 21180044    |
| 5 x 6 RE                                                            | 0.7                                                | 1.8                                                  | 18.2                                    | 520                                         | 21180048    |
| 5 x 6 RM                                                            | 0.7                                                | 1.8                                                  | 19.2                                    | 550                                         | 21180052    |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

(Mulicores)

 $U_0/U$  0.6 / 1 kV

XLPE-Insulation, LSZH-Sheath, Fire Resistant

2XH

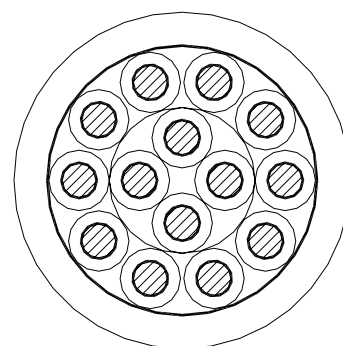
## Application

For electricity supply and control in public networks and industrial plants or public buildings, where people are potentially endangered in case of fire and where, for a defined period of time, the continuity of control and energy supply is of vital necessity; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

For indoor and outdoor installation in dry and wet locations, on racks, in conduits (Local and/or legal requirements to be noted).

## Construction

|                      |                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>     | plain annealed copper, class 1 or class 2 resp., acc. to IEC 60228,<br>class 1: circular solid (RE)<br>class 2: circular stranded (RM) |
| <b>Insulation</b>    | cross-linked polyethylene XLPE, over the MICA-tape wrapped conductor                                                                   |
| <b>Colour code</b>   | black, continuously numbered                                                                                                           |
| <b>Laying up</b>     | cores twisted in layers (if necessary with filling element(s))                                                                         |
| <b>Wrapping</b>      | at least 1 layer of plastic tape                                                                                                       |
| <b>Outer Sheath</b>  | extruded zero halogen flame retardant compound LSZH, black                                                                             |
| <b>Cable marking</b> | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN, YEAR, LENGTH MARKING, IEC 60331                                                         |



## Technical Data

|                                     |                                   |                             |                                               |
|-------------------------------------|-----------------------------------|-----------------------------|-----------------------------------------------|
| <b>Flame retardancy:</b>            | IEC 60332-1                       | <b>Temperature range:</b>   | - 30 °C up to + 90 °C<br>(during operation)   |
| <b>Flame propagation:</b>           | IEC 60332-3 cat. A                |                             | - 5 °C up to + 50 °C<br>(during installation) |
| <b>Fire resistance:</b>             | IEC 60331-21<br>(90 min/750 °C)   |                             | max. +250° C<br>(under short circuit)         |
| <b>Smoke density:</b>               | IEC 61034-1 and 2                 |                             |                                               |
| <b>Amount of halogen acid gas:</b>  | IEC 60754-1; 0 %                  |                             |                                               |
| <b>Degree of acidity of gases:</b>  | IEC 60754-2                       |                             |                                               |
| <b>Outer sheath:</b>                |                                   | <b>Min. bending radius:</b> | 8 x cable-Ø                                   |
| <b>Limiting Oxygen Index (LOI):</b> | min. 30 %<br>(IEC 60332-3 ann. B) |                             |                                               |
| <b>Temperature Index (TI):</b>      | min. 250 °C<br>(ASTM-D-2863)      |                             |                                               |

## Abbreviations

|           |                      |
|-----------|----------------------|
| <b>2X</b> | insulation of XLPE   |
| <b>H</b>  | outer sheath of LSZH |

## Electrical Data at 20 °C

|                                                    | Character | Unit | Values                         |
|----------------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance</b>                        | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage <math>U_{rms}</math> core:core</b> |           | V    | 3500                           |
| <b>Nominal voltage <math>U_0/U</math></b>          |           | V    | 600/1000                       |
| <b>Highest system voltage <math>U_m</math></b>     | max.      | V    | 1200 (for three phase systems) |

For further details see appendix

**Power & Control Cable****IEC 60502-1****(Mulicores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, LSZH-Sheath, Fire Resistant****2XH****Geometrical Data**

| No. of cores and cross-section<br><br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br><br>(nom.)<br>mm | Radial thickness of outer sheath<br><br>(nom.)<br>mm | Overall Diameter<br><br>(approx.)<br>mm | Weight of cable<br><br>(approx.)<br>kg / km | Part number |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|-----------------------------------------|---------------------------------------------|-------------|
| 5 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 14.1                                    | 270                                         | 21180053    |
| 7 x 1.5 RE                                                          | 0.7                                                | 1.8                                                  | 15.1                                    | 280                                         | 21180014    |
| 10 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 18.9                                    | 400                                         | 21180015    |
| 12 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 19.5                                    | 430                                         | 21180016    |
| 19 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 22.9                                    | 570                                         | 21180054    |
| 27 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 27.1                                    | 750                                         | 21180055    |
| 37 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 30.4                                    | 950                                         | 21180056    |
| 48 x 1.5 RE                                                         | 0.7                                                | 1.8                                                  | 34.7                                    | 1170                                        | 21180057    |
| 5 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 14.7                                    | 280                                         | 21180058    |
| 7 x 1.5 RM                                                          | 0.7                                                | 1.8                                                  | 15.8                                    | 300                                         | 21180004    |
| 10 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 19.8                                    | 410                                         | 21180005    |
| 12 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 20.4                                    | 450                                         | 21180006    |
| 19 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 24.0                                    | 600                                         | 21180059    |
| 27 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 28.5                                    | 790                                         | 21180060    |
| 37 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 31.9                                    | 1000                                        | 21180061    |
| 48 x 1.5 RM                                                         | 0.7                                                | 1.8                                                  | 36.5                                    | 1240                                        | 21180062    |
| 5 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 15.1                                    | 330                                         | 21180063    |
| 7 x 2.5 RE                                                          | 0.7                                                | 1.8                                                  | 16.4                                    | 390                                         | 21180064    |
| 10 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 20.5                                    | 490                                         | 21180065    |
| 12 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 21.2                                    | 550                                         | 21180066    |
| 19 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 24.8                                    | 760                                         | 21180067    |
| 27 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 29.5                                    | 1010                                        | 21180068    |
| 37 x 2.5 RE                                                         | 0.7                                                | 1.8                                                  | 33.1                                    | 1300                                        | 21180069    |
| 48 x 2.5 RE                                                         | 0.7                                                | 1.9                                                  | 37.8                                    | 1640                                        | 21180070    |
| 5 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 15.8                                    | 340                                         | 21180071    |
| 7 x 2.5 RM                                                          | 0.7                                                | 1.8                                                  | 17.0                                    | 380                                         | 21180024    |
| 10 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 21.4                                    | 510                                         | 21180025    |
| 12 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 22.1                                    | 600                                         | 21180026    |
| 19 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 26.1                                    | 800                                         | 21180072    |
| 27 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 31.1                                    | 1070                                        | 21180073    |
| 37 x 2.5 RM                                                         | 0.7                                                | 1.8                                                  | 34.9                                    | 1380                                        | 21180074    |
| 48 x 2.5 RM                                                         | 0.7                                                | 1.9                                                  | 40.1                                    | 1740                                        | 21180075    |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |
|                                                                     |                                                    |                                                      |                                         |                                             |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded

# Power & Control Cable

IEC 60502-1

(2-, 3-, and 4-cores)

U<sub>0</sub>/U 0.6 / 1 kV

**XLPE-Insulation, Armour, LSZH-Sheath, Fire Resistant**

**2XHRH**

## Application

For electricity supply and control in public networks and industrial plants or public buildings, where people are potentially endangered in case of fire and where, for a defined period of time, the continuity of control and energy supply is of vital necessity; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

For indoor and outdoor installation in dry and wet locations, on racks, in conduits (Local and / or legal requirements to be noted).

## Construction

**Conductor** plain annealed copper, class 1 or class 2, resp., acc. to IEC 60228,  
class 1: circular solid (RE)

class 2: circular stranded (RM)

**Insulation** cross-linked polyethylene XLPE, over the MICA-tape wrapped conductor

**Colour code** <sup>1)</sup> Two-core: blue, brown  
Three-core: brown, black, grey  
Four-core: blue, brown, black, grey

**Laying up** cores twisted in layers (if necessary with filling element(s))

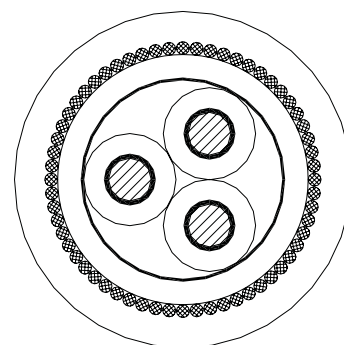
**Wrapping** at least 1 layer of plastic tape

**Bedding** extruded zero halogen flame retardant compound LSZH, black

**Armour** galvanized round steel wires

**Outer Sheath** extruded zero halogen flame retardant compound LSZH, black

**Cable marking** ELECTRIC CABLE 0.6/1 kV IEC 60502-1  
KERPEN, YEAR, LENGTH MARKING, IEC 60331



## Technical Data

**Flame retardancy:** IEC 60332-1  
**Flame propagation:** IEC 60332-3 cat. A  
**Fire resistance:** IEC 60331-21  
(90 min/750 °C)  
**Smoke density:** IEC 61034-1 and 2  
**Amount of halogen acid gas:** IEC 60754-1; 0 %  
**Degree of acidity of gases:** IEC 60754-2

**Outer sheath:**  
**Limiting Oxygen Index (LOI):** min. 30 %  
(IEC 60332-3 ann. B)  
**Temperature Index (TI):** min. 250 °C  
(ASTM-D-2863)

**Temperature range:**  
- 30 °C up to + 90 °C  
(during operation)  
- 5 °C up to + 50 °C  
(during installation)  
max. + 250 °C  
(under short circuit)

**Min. bending radius:**  
8 x cable-Ø

## Abbreviations

**2X** insulation of XLPE  
**H** bedding & outer sheath of LSZH  
**R** round steel wire armour

## Electrical Data at 20 °C

|                                           | Character | Unit | Values                         |
|-------------------------------------------|-----------|------|--------------------------------|
| Conductor resistance                      | max.      | Ω/km | acc. to IEC 60228              |
| Test voltage U <sub>rms</sub> core:core   |           | V    | 3500                           |
| Test voltage U <sub>rms</sub> core:armour |           | V    | 3500                           |
| Nominal voltage U <sub>0</sub> /U         |           | V    | 600/1000                       |
| Highest system voltage U <sub>m</sub>     | max.      | V    | 1200 (for three phase systems) |

<sup>1)</sup> other colours on request

For further detail see appendix

## IEC 60502-1

**$U_0/U$  0.6 / 1 kV**

## 2XHRH

[illegible]

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(Multicores)

U<sub>0</sub>/U 0.6 / 1 kV

XLPE-Insulation, Armour, LSZH-Sheath, Fire Resistant

2XHRH

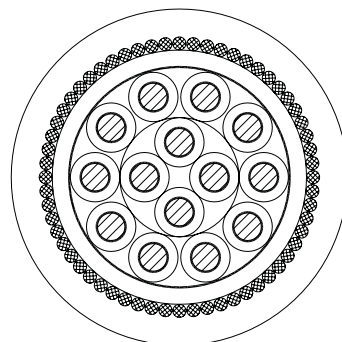
## Application

For electricity supply and control in public networks and industrial plants or public buildings, where people are potentially endangered in case of fire and where, for a defined period of time, the continuity of control and energy supply is of vital necessity; suitable for use in zone 1 and zone 2 group II classified areas (IEC 60079-14).

For indoor and outdoor installation in dry and wet locations, on racks, in conduits (Local and / or legal requirements to be noted).

## Construction

|                      |                                                                                                                                       |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conductor</b>     | plain annealed copper, class 1 or class 2 resp., acc. to IEC 0228,<br>class 1: circular solid (RE)<br>class 2: circular stranded (RM) |
| <b>Insulation</b>    | cross-linked polyethylene XLPE, over the MICA-tape wrapped conductor                                                                  |
| <b>Colour code</b>   | black, continuously numbered                                                                                                          |
| <b>Laying up</b>     | cores twisted in layers (if necessary with filling element(s))                                                                        |
| <b>Wrapping</b>      | at least 1 layer of plastic tape                                                                                                      |
| <b>Bedding</b>       | extruded zero halogen flame retardant compound LSZH, black                                                                            |
| <b>Armour</b>        | galvanized round steel wires                                                                                                          |
| <b>Outer Sheath</b>  | extruded zero halogen flame retardant compound LSZH, black                                                                            |
| <b>Cable marking</b> | ELECTRIC CABLE 0.6/1 kV IEC 60502-1<br>KERPEN , YEAR, LENGTH MARKING, IEC 60331                                                       |



## Technical Data

## Abbreviations

|                                     |                      |                             |                                         |
|-------------------------------------|----------------------|-----------------------------|-----------------------------------------|
| <b>Flame retardancy:</b>            | IEC 60332-1          | <b>Temperature range:</b>   | <b>2X</b> insulation of XLPE            |
| <b>Flame propagation:</b>           | IEC 60332-3 cat. A   | - 30 °C up to + 90 °C       | <b>H</b> bedding & outer sheath of LSZH |
| <b>Fire resistance:</b>             | IEC 60331-21         | (during operation)          | <b>R</b> round steel wire armour        |
|                                     | (90 min/750 °C)      | - 5 °C up to + 50 °C        |                                         |
| <b>Smoke density:</b>               | IEC 61034-1 and 2    | (during installation)       |                                         |
| <b>Amount of halogen acid gas:</b>  | IEC 60754-1; 0 %     | max. + 250 °C               |                                         |
| <b>Degree of acidity of gases:</b>  | IEC 60754-2          | (under short circuit)       |                                         |
| <b>Outer sheath:</b>                |                      | <b>Min. bending radius:</b> |                                         |
| <b>Limiting Oxygen Index (LOI):</b> | min. 30 %            | 8 x cable-Ø                 |                                         |
|                                     | (IEC 60332-3 ann. B) |                             |                                         |
| <b>Temperature Index (TI):</b>      | min. 250 °C          |                             |                                         |
|                                     | (ASTM-D-2863)        |                             |                                         |

## Electrical Data at 20 °C

|                                                 | Character | Unit | Values                         |
|-------------------------------------------------|-----------|------|--------------------------------|
| <b>Conductor resistance</b>                     | max.      | Ω/km | acc. to IEC 60228              |
| <b>Test voltage U<sub>rms</sub> core:core</b>   |           | V    | 3500                           |
| <b>Test voltage U<sub>rms</sub> core:armour</b> |           | V    | 3500                           |
| <b>Nominal voltage U<sub>0</sub> /U</b>         |           | V    | 600/1000                       |
| <b>Highest system voltage U<sub>m</sub></b>     | max.      | V    | 1200 (for three phase systems) |

For further details see appendix

**Power & Control Cable****IEC 60502-1****(Multicores)****U<sub>0</sub>/U 0.6 / 1 kV****XLPE-Insulation, Armour, LSZH-Sheath, Fire Resistant****2XHRH****Geometrical Data**

| No. of cores and cross-section<br>(nom.)<br>n / mm <sup>2</sup> | Radial thickness of insulation<br>(nom.)<br>mm | Diameter over bedding<br>(approx.)<br>mm | Armour wire diameter<br>(nom.)<br>mm | Radial thickness of outer sheath<br>(nom.)<br>mm | Overall diameter<br>(approx.)<br>mm | Weight of cable<br>(approx.)<br>kg / km | Part number |
|-----------------------------------------------------------------|------------------------------------------------|------------------------------------------|--------------------------------------|--------------------------------------------------|-------------------------------------|-----------------------------------------|-------------|
| 5 x 1.5 RE                                                      | 0.7                                            | 12.1                                     | 0.8                                  | 1.8                                              | 17.4                                | 500                                     | 21190013    |
| 7 x 1.5 RE                                                      | 0.7                                            | 13.1                                     | 0.8                                  | 1.8                                              | 18.3                                | 570                                     | 21190014    |
| 10 x 1.5 RE                                                     | 0.7                                            | 16.9                                     | 1.25                                 | 1.8                                              | 23.0                                | 780                                     | 21190015    |
| 12 x 1.5 RE                                                     | 0.7                                            | 17.5                                     | 1.25                                 | 1.8                                              | 23.6                                | 820                                     | 21190016    |
| 19 x 1.5 RE                                                     | 0.7                                            | 20.9                                     | 1.25                                 | 1.8                                              | 27.0                                | 1200                                    | 21190031    |
| 27 x 1.5 RE                                                     | 0.7                                            | 25.5                                     | 1.6                                  | 1.8                                              | 32.3                                | 1860                                    | 21190032    |
| 37 x 1.5 RE                                                     | 0.7                                            | 28.8                                     | 1.6                                  | 1.8                                              | 35.6                                | 2150                                    | 21190040    |
| 48 x 1.5 RE                                                     | 0.7                                            | 33.1                                     | 1.6                                  | 1.9                                              | 40.1                                | 2630                                    | 21190041    |
| 5 x 1.5 RM                                                      | 0.7                                            | 12.6                                     | 0.8                                  | 1.8                                              | 17.8                                | 520                                     | 21190003    |
| 7 x 1.5 RM                                                      | 0.7                                            | 13.8                                     | 0.8                                  | 1.8                                              | 19.2                                | 630                                     | 21190004    |
| 10 x 1.5 RM                                                     | 0.7                                            | 17.8                                     | 1.25                                 | 1.8                                              | 23.9                                | 810                                     | 21190005    |
| 12 x 1.5 RM                                                     | 0.7                                            | 18.5                                     | 1.25                                 | 1.8                                              | 24.6                                | 1040                                    | 21190006    |
| 19 x 1.5 RM                                                     | 0.7                                            | 21.9                                     | 1.25                                 | 1.8                                              | 28.0                                | 1340                                    | 21190034    |
| 27 x 1.5 RM                                                     | 0.7                                            | 26.8                                     | 1.6                                  | 1.8                                              | 33.6                                | 1950                                    | 21190035    |
| 37 x 1.5 RM                                                     | 0.7                                            | 30.2                                     | 1.6                                  | 1.8                                              | 37.0                                | 2340                                    | 21190042    |
| 48 x 1.5 RM                                                     | 0.7                                            | 34.9                                     | 1.6                                  | 1.9                                              | 41.9                                | 2810                                    | 21190043    |
| 5 x 2.5 RE                                                      | 0.7                                            | 13.1                                     | 0.8                                  | 1.8                                              | 18.3                                | 580                                     | 21190047    |
| 7 x 2.5 RE                                                      | 0.7                                            | 14.4                                     | 1.25                                 | 1.8                                              | 20.5                                | 770                                     | 21190048    |
| 10 x 2.5 RE                                                     | 0.7                                            | 18.5                                     | 1.25                                 | 1.8                                              | 24.6                                | 1050                                    | 21190049    |
| 12 x 2.5 RE                                                     | 0.7                                            | 19.2                                     | 1.25                                 | 1.8                                              | 25.3                                | 1140                                    | 21190050    |
| 19 x 2.5 RE                                                     | 0.7                                            | 23.2                                     | 1.6                                  | 1.8                                              | 30.0                                | 1720                                    | 21190051    |
| 27 x 2.5 RE                                                     | 0.7                                            | 27.9                                     | 1.6                                  | 1.8                                              | 34.7                                | 2190                                    | 21190052    |
| 37 x 2.5 RE                                                     | 0.7                                            | 31.5                                     | 1.6                                  | 1.9                                              | 38.5                                | 2730                                    | 21190053    |
| 48 x 2.5 RE                                                     | 0.7                                            | 36.6                                     | 2.0                                  | 2.1                                              | 44.8                                | 3670                                    | 21190054    |
| 5 x 2.5 RM                                                      | 0.7                                            | 13.8                                     | 0.8                                  | 1.8                                              | 18.9                                | 610                                     | 21190023    |
| 7 x 2.5 RM                                                      | 0.7                                            | 15.2                                     | 1.25                                 | 1.8                                              | 21.3                                | 810                                     | 21190024    |
| 10 x 2.5 RM                                                     | 0.7                                            | 19.5                                     | 1.25                                 | 1.8                                              | 25.6                                | 1100                                    | 21190025    |
| 12 x 2.5 RM                                                     | 0.7                                            | 20.2                                     | 1.25                                 | 1.8                                              | 26.3                                | 1210                                    | 21190026    |
| 19 x 2.5 RM                                                     | 0.7                                            | 24.5                                     | 1.6                                  | 1.8                                              | 31.2                                | 1800                                    | 21190037    |
| 27 x 2.5 RM                                                     | 0.7                                            | 29.5                                     | 1.6                                  | 1.8                                              | 36.2                                | 2320                                    | 21190038    |
| 37 x 2.5 RM                                                     | 0.7                                            | 33.3                                     | 1.6                                  | 1.9                                              | 40.3                                | 2860                                    | 21190055    |
| 48 x 2.5 RM                                                     | 0.7                                            | 38.7                                     | 2.0                                  | 2.1                                              | 46.9                                | 3920                                    | 21190056    |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |
|                                                                 |                                                |                                          |                                      |                                                  |                                     |                                         |             |

RE: circular solid • RM: circular stranded • SM: sector shaped stranded





## Section 5:

### Additional Cable Variations

### Low Voltage Cables

$U_0 / U$  0.6 / 1 kV





## Additional Cable Variations

Beside the cable constructions described in detail within this catalogue further cable types and constructions are available on request; e.g.:

| KERPEN-Type:     | Description                                                                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YYQY-fi</b>   | PVC-insulated and sheathed cables with galvanized steel wire braid armour, flame retardant. (only for cables with conductor cross-section not exceeding 6 mm <sup>2</sup> )      |
| <b>2XYQY-fi</b>  | XLPE-insulated and PVC-sheathed cables with galvanized steel wire braid armour, flame retardant. Only for cables with conductor cross-section not exceeding 6 mm <sup>2</sup> ). |
| <b>YYBY-fi</b>   | PVC-insulated and sheathed cables with galvanized double steel tape armour, flame retardant.                                                                                     |
| <b>2XYBY-fi</b>  | XLPE-insulated and PVC-sheathed cables with galvanized double steel tape armour, flame retardant.                                                                                |
| <b>YKYRY-fi</b>  | PVC-insulated and sheathed cables with lead sheath and galvanized round steel wire armour, flame retardant.                                                                      |
| <b>2XKYRY-fi</b> | XLPE-insulated and PVC-sheathed cables with lead sheath and galvanized round steel wire armour, flame retardant.                                                                 |
| <b>YKYBY-fi</b>  | PVC-insulated and sheathed cables with lead sheath and galvanized double steel tape armour, flame retardant.                                                                     |
| <b>2XKYBY-fi</b> | XLPE-insulated and PVC-sheathed cables with lead sheath and galvanized double steel tape armour, flame retardant.                                                                |





## Appendix:

### I Additional Electrical Data

### II Tests on Power and Control Cables

### III General Information



## Appendix

### I Additional Electrical Data

**Table 1: Resistance**

| Nominal<br>cross-sectional<br>area<br><br>nom<br>(mm <sup>2</sup> ) | DC resistance<br>at 20 °C<br>(copper)<br><br>max<br>(Ω/km) | Max.<br>Active resistance<br>(copper) |                             |
|---------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------|-----------------------------|
|                                                                     |                                                            | at 70 °C for PVC<br>(Ω/km)            | at 90 °C for XLPE<br>(Ω/km) |
| 1.5                                                                 | 12.1                                                       | 14.5                                  | 15.4                        |
| 2.5                                                                 | 7.41                                                       | 8.87                                  | 9.45                        |
| 4                                                                   | 4.61                                                       | 5.52                                  | 5.88                        |
| 6                                                                   | 3.08                                                       | 3.69                                  | 3.93                        |
| 10                                                                  | 1.83                                                       | 2.19                                  | 2.33                        |
| 16                                                                  | 1.15                                                       | 1.38                                  | 1.47                        |
| 25                                                                  | 0.727                                                      | 0.872                                 | 0.927                       |
| 35                                                                  | 0.524                                                      | 0.628                                 | 0.669                       |
| 50                                                                  | 0.387                                                      | 0.464                                 | 0.494                       |
| 70                                                                  | 0.268                                                      | 0.322                                 | 0.342                       |
| 95                                                                  | 0.193                                                      | 0.233                                 | 0.247                       |
| 120                                                                 | 0.153                                                      | 0.186                                 | 0.196                       |
| 150                                                                 | 0.124                                                      | 0.152                                 | 0.160                       |
| 185                                                                 | 0.0991                                                     | 0.122                                 | 0.128                       |
| 240                                                                 | 0.0754                                                     | 0.0948                                | 0.0988                      |
| 300                                                                 | 0.0601                                                     | 0.0774                                | 0.0800                      |
| 400                                                                 | 0.0470                                                     | 0.0619                                | 0.0641                      |
| 500                                                                 | 0.0366                                                     | 0.0495                                | 0.0514                      |
| 630                                                                 | 0.0283                                                     | 0.0405                                | 0.0421                      |
| 800                                                                 | 0.0221                                                     | 0.0332                                | 0.0350                      |
| 1000                                                                | 0.0176                                                     | 0.0273                                | 0.0302                      |

**Table 2: Reactance**

| Nominal<br>cross-sectional<br>area | Reactance <sup>1)</sup> (inductive) per conductor<br>at 50 Hz<br>for U <sub>o</sub> /U 0.6/1 kV |                             |                                             |                             |
|------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------|-----------------------------|
|                                    | PVC insulated                                                                                   |                             | XLPE insulated                              |                             |
|                                    | single core <sup>2)</sup><br>nom.<br>(Ω/km)                                                     | multicore<br>nom.<br>(Ω/km) | single core <sup>2)</sup><br>nom.<br>(Ω/km) | multicore<br>nom.<br>(Ω/km) |
| 1.5                                | -----                                                                                           | 0.119                       | -----                                       | 0.114                       |
| 2.5                                | -----                                                                                           | 0.114                       | -----                                       | 0.105                       |
| 4                                  | -----                                                                                           | 0.110                       | -----                                       | 0.098                       |
| 6                                  | -----                                                                                           | 0.103                       | -----                                       | 0.094                       |
| 10                                 | -----                                                                                           | 0.097                       | -----                                       | 0.088                       |
| 16                                 | 0.117                                                                                           | 0.091                       | 0.118                                       | 0.084                       |
| 25                                 | 0.110                                                                                           | 0.088                       | 0.112                                       | 0.083                       |
| 35                                 | 0.105                                                                                           | 0.085                       | 0.107                                       | 0.081                       |
| 50                                 | 0.102                                                                                           | 0.085                       | 0.104                                       | 0.080                       |
| 70                                 | 0.097                                                                                           | 0.081                       | 0.101                                       | 0.079                       |
| 95                                 | 0.095                                                                                           | 0.081                       | 0.098                                       | 0.077                       |
| 120                                | 0.092                                                                                           | 0.079                       | 0.096                                       | 0.077                       |
| 150                                | 0.091                                                                                           | 0.079                       | 0.096                                       | 0.077                       |
| 185                                | 0.090                                                                                           | 0.079                       | 0.096                                       | 0.077                       |
| 240                                | 0.088                                                                                           | 0.079                       | 0.094                                       | 0.077                       |
| 300                                | 0.088                                                                                           | 0.079                       | 0.093                                       | 0.077                       |
| 400                                | 0.086                                                                                           | 0.079                       | 0.093                                       | 0.076                       |
| 500                                | 0.085                                                                                           | -----                       | 0.093                                       | -----                       |
| 630                                | 0.084                                                                                           | -----                       | 0.090                                       | -----                       |
| 800                                | 0.083                                                                                           | -----                       | 0.092                                       | -----                       |
|                                    |                                                                                                 |                             |                                             |                             |

<sup>1)</sup> Values for steel wire armoured cables. For unarmoured cables the values can be reduced by approx. 10 %.

<sup>2)</sup> Cables with aluminium wire armouring and in touching trefoil arrangement.

**Table 3: Voltage Drop**

| Nominal cross-sectional area (mm <sup>2</sup> ) | DC-System (mV/A/m) | Single-phase AC-System (mV/A/m) | Three-phase AC-System (mV/A/m) |
|-------------------------------------------------|--------------------|---------------------------------|--------------------------------|
| 1.5                                             | 24.2               | 27.9                            | 24.1                           |
| 2.5                                             | 14.3               | 17.1                            | 14.8                           |
| 4                                               | 9.0                | 10.7                            | 9.3                            |
| 6                                               | 6.0                | 7.2                             | 6.2                            |
| 10                                              | 3.6                | 4.3                             | 3.7                            |
| 16                                              | 2.3                | 2.8                             | 2.4                            |
| 25                                              | 1.5                | 1.8                             | 1.5                            |
| 35                                              | 1.1                | 1.3                             | 1.1                            |
| 50                                              | 0.8                | 0.96                            | 0.85                           |
| 70                                              | 0.6                | 0.70                            | 0.60                           |
| 95                                              | 0.4                | 0.55                            | 0.45                           |
| 120                                             | 0.3                | 0.45                            | 0.35                           |
| 150                                             | 0.25               | 0.35                            | 0.31                           |
| 185                                             | 0.20               | 0.30                            | 0.26                           |
| 240                                             | 0.15               | 0.25                            | 0.22                           |
| 300                                             | 0.12               | 0.22                            | 0.19                           |
| 400                                             | 0.10               | 0.19                            | 0.17                           |

The voltage drop in a circuit, of which the cable forms a part, should not exceed 3 - 5% of the nominal voltage; e.g. 20.0 volts (5%) for a three-phase 400 volts supply. The above mentioned voltage drop is tabulated for a current of 1 ampere for a 1 metre run. For any cable length, the values need to be multiplied by the length of the cable (in metres) and by the current (in amperes).

**Example:**

Formula for the calculated voltage drop in mV/A/m:

$$e_{\text{cal}} = \frac{\text{permissible voltage drop (e)} \times 1000}{\text{current (I)} \times \text{length (l)}}$$

Installation length (l): 300 m  
 Current (I) to carry: 80 A  
 Nominal voltage (U): 400 V (Three-phase AC)  
 Permissible voltage drop (e): 20.0 V (5% of 400 V)

$$e_{\text{cal}} = \frac{20.0 \text{ V} \times 1000}{80 \text{ A} \times 300 \text{ m}} = 0.83 \text{ mV/A/m}$$

Select a cross-section, such that the voltage drop is equal to or less than 0.83 mV/A/m from table 3. It has to be ensured that the selected cross-section will carry the current (see pages H5 up to H7).

The corresponding cross-section will be 50 mm<sup>2</sup>.

**Table 4: Current Ratings (AC) -  $U_0 / U$  0.6 / 1 kV  
Copper conductors laid in air**

| Nominal cross-sectional area<br><br>nom.<br>(mm <sup>2</sup> ) |  <sup>1)</sup> |             |  <sup>2)</sup> |             |  <sup>2)</sup> |             |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------|-------------|
|                                                                | PVC<br>(A)                                                                                      | XLPE<br>(A) | PVC<br>(A)                                                                                      | XLPE<br>(A) | PVC<br>(A)                                                                                        | XLPE<br>(A) |
| 1.5                                                            | 27                                                                                              | 33          | 20                                                                                              | 24          | 21                                                                                                | 27          |
| 2.5                                                            | 35                                                                                              | 43          | 26                                                                                              | 32          | 28                                                                                                | 36          |
| 4                                                              | 47                                                                                              | 57          | 34                                                                                              | 42          | 37                                                                                                | 47          |
| 6                                                              | 59                                                                                              | 72          | 43                                                                                              | 53          | 47                                                                                                | 59          |
| 10                                                             | 81                                                                                              | 99          | 59                                                                                              | 73          | 64                                                                                                | 81          |
| 16                                                             | 107                                                                                             | 131         | 78                                                                                              | 97          | 84                                                                                                | 109         |
| 25                                                             | 144                                                                                             | 177         | 105                                                                                             | 132         | 114                                                                                               | 146         |
| 35                                                             | 176                                                                                             | 217         | 129                                                                                             | 162         | 139                                                                                               | 179         |
| 50                                                             | 214                                                                                             | 265         | 157                                                                                             | 197         | 169                                                                                               | 218         |
| 70                                                             | 270                                                                                             | 336         | 199                                                                                             | 250         | 213                                                                                               | 275         |
| 95                                                             | 334                                                                                             | 415         | 246                                                                                             | 308         | 264                                                                                               | 336         |
| 120                                                            | 389                                                                                             | 485         | 285                                                                                             | 359         | 307                                                                                               | 388         |
| 150                                                            | 446                                                                                             | 557         | 326                                                                                             | 412         | 352                                                                                               | 438         |
| 185                                                            | 516                                                                                             | 647         | 374                                                                                             | 475         | 406                                                                                               | 501         |
| 240                                                            | 618                                                                                             | 775         | 445                                                                                             | 564         | 483                                                                                               | 580         |
| 300                                                            | 711                                                                                             | 894         | 510                                                                                             | 649         | 552                                                                                               | 649         |
| 400                                                            | 843                                                                                             | 1061        | 597                                                                                             | 761         | 646                                                                                               | 734         |
| 500                                                            | 994                                                                                             | 1254        | 663                                                                                             | 860         | 747                                                                                               | 827         |
| 630                                                            | 1180                                                                                            | 1486        | -----                                                                                           | -----       | 858                                                                                               | 934         |
| 800                                                            | 1396                                                                                            | 1751        | -----                                                                                           | -----       | 971                                                                                               | -----       |
| 1000                                                           | 1620                                                                                            | 2044        | -----                                                                                           | -----       | 1078                                                                                              | -----       |

<sup>1)</sup> Current in DC circuits with return conductor far away.

<sup>2)</sup> For auxiliary and multicore cables with 4-cores fully loaded.

**Basic assumption and conditions of installation:**

|                                                       |                      |
|-------------------------------------------------------|----------------------|
| Ambient temperature:                                  | 30 °C                |
| Distance between cables:                              | 2 x overall diameter |
| Loading factor:                                       | 1.0                  |
| Distance between cables and walls, ground or ceiling: | 2 cm                 |
| Distance between systems (one upon another) :         | 30 cm                |
| Distance between cables(side by side):                | 2 x overall diameter |
| Distance between cables(one upon another):            | 2 x overall diameter |
| (VDE 0298)                                            |                      |

**Table 5: Current Ratings (AC) -  $U_0 / U$  0.6 / 1 kV  
Copper conductors laid direct in ground**

| Nominal cross-sectional area |  <sup>1)</sup> |         |  |  <sup>2)</sup> |  |         |
|------------------------------|-------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------|
|                              | nom. (mm²)                                                                                      | PVC (A) | XLPE (A)                                                                          | PVC (A)                                                                                         | XLPE (A)                                                                            | PVC (A) |
| 1.5                          | 41                                                                                              | 48      | 27                                                                                | 31                                                                                              | 30                                                                                  | 33      |
| 2.5                          | 55                                                                                              | 63      | 36                                                                                | 40                                                                                              | 39                                                                                  | 42      |
| 4                            | 71                                                                                              | 82      | 46                                                                                | 52                                                                                              | 50                                                                                  | 54      |
| 6                            | 90                                                                                              | 102     | 58                                                                                | 64                                                                                              | 62                                                                                  | 67      |
| 10                           | 124                                                                                             | 136     | 78                                                                                | 86                                                                                              | 83                                                                                  | 89      |
| 16                           | 160                                                                                             | 176     | 101                                                                               | 111                                                                                             | 107                                                                                 | 115     |
| 25                           | 208                                                                                             | 229     | 132                                                                               | 145                                                                                             | 138                                                                                 | 148     |
| 35                           | 250                                                                                             | 275     | 159                                                                               | 174                                                                                             | 164                                                                                 | 177     |
| 50                           | 296                                                                                             | 326     | 188                                                                               | 206                                                                                             | 195                                                                                 | 209     |
| 70                           | 365                                                                                             | 400     | 232                                                                               | 254                                                                                             | 238                                                                                 | 256     |
| 95                           | 438                                                                                             | 480     | 280                                                                               | 305                                                                                             | 286                                                                                 | 307     |
| 120                          | 501                                                                                             | 548     | 318                                                                               | 348                                                                                             | 325                                                                                 | 349     |
| 150                          | 563                                                                                             | 616     | 359                                                                               | 392                                                                                             | 365                                                                                 | 393     |
| 185                          | 639                                                                                             | 699     | 406                                                                               | 444                                                                                             | 413                                                                                 | 445     |
| 240                          | 746                                                                                             | 815     | 473                                                                               | 517                                                                                             | 479                                                                                 | 516     |
| 300                          | 845                                                                                             | 924     | 535                                                                               | 585                                                                                             | 539                                                                                 | 581     |
| 400                          | 975                                                                                             | 1065    | 613                                                                               | 671                                                                                             | 614                                                                                 | 662     |
| 500                          | 1125                                                                                            | 1228    | 684                                                                               | 756                                                                                             | 693                                                                                 | 749     |
| 630                          | 1304                                                                                            | 1421    | -----                                                                             | -----                                                                                           | 777                                                                                 | 843     |
| 800                          | 1507                                                                                            | 1638    | -----                                                                             | -----                                                                                           | 859                                                                                 | 935     |
| 1000                         | 1715                                                                                            | 1870    | -----                                                                             | -----                                                                                           | 936                                                                                 | 1022    |

<sup>1)</sup> Current in DC circuits with return conductor far away.

<sup>2)</sup> For auxiliary and multicore cables with 4-cores fully loaded.

**Basic assumption and conditions of installation:**

Thermal resistivity of soil: 1.0 Km/W  
Standard ground temperature: 20 °C  
Loading factor: 0.7  
Depth of burial: 0.7 – 1.2 m  
No. of cable systems: 1  
(VDE 0298)

**Table 6: Current Ratings (AC) -  $U_0 / U$  0.6 / 1 kV  
Copper conductors laid in single way ducts**

| Nominal cross-sectional area<br><br>nom.<br>(mm <sup>2</sup> ) |  <sup>1)</sup> |             |  <sup>2)</sup> |             |  |             |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------|-------------|
|                                                                | PVC<br>(A)                                                                                      | XLPE<br>(A) | PVC<br>(A)                                                                                      | XLPE<br>(A) | PVC<br>(A)                                                                          | XLPE<br>(A) |
| 1.5                                                            | 35                                                                                              | 41          | 23                                                                                              | 26          | 26                                                                                  | 28          |
| 2.5                                                            | 47                                                                                              | 54          | 31                                                                                              | 34          | 33                                                                                  | 36          |
| 4                                                              | 60                                                                                              | 70          | 39                                                                                              | 44          | 43                                                                                  | 46          |
| 6                                                              | 77                                                                                              | 87          | 49                                                                                              | 54          | 53                                                                                  | 57          |
| 10                                                             | 105                                                                                             | 116         | 66                                                                                              | 73          | 71                                                                                  | 76          |
| 16                                                             | 136                                                                                             | 150         | 86                                                                                              | 94          | 91                                                                                  | 98          |
| 25                                                             | 177                                                                                             | 195         | 112                                                                                             | 123         | 117                                                                                 | 126         |
| 35                                                             | 213                                                                                             | 234         | 135                                                                                             | 148         | 139                                                                                 | 150         |
| 50                                                             | 252                                                                                             | 277         | 160                                                                                             | 175         | 166                                                                                 | 178         |
| 70                                                             | 310                                                                                             | 340         | 197                                                                                             | 216         | 202                                                                                 | 218         |
| 95                                                             | 372                                                                                             | 408         | 238                                                                                             | 259         | 243                                                                                 | 261         |
| 120                                                            | 426                                                                                             | 466         | 270                                                                                             | 296         | 276                                                                                 | 297         |
| 150                                                            | 479                                                                                             | 524         | 305                                                                                             | 333         | 310                                                                                 | 334         |
| 185                                                            | 543                                                                                             | 594         | 345                                                                                             | 377         | 351                                                                                 | 378         |
| 240                                                            | 634                                                                                             | 693         | 402                                                                                             | 439         | 407                                                                                 | 439         |
| 300                                                            | 718                                                                                             | 785         | 455                                                                                             | 497         | 485                                                                                 | 494         |
| 400                                                            | 829                                                                                             | 905         | 521                                                                                             | 570         | 522                                                                                 | 563         |
| 500                                                            | 956                                                                                             | 1044        | 581                                                                                             | 643         | 589                                                                                 | 637         |
| 630                                                            | 1108                                                                                            | 1208        | -----                                                                                           | -----       | 660                                                                                 | 717         |
| 800                                                            | 1281                                                                                            | 1392        | -----                                                                                           | -----       | 730                                                                                 | 795         |
| 1000                                                           | 1458                                                                                            | 1590        | -----                                                                                           | -----       | 796                                                                                 | 869         |

<sup>1)</sup> Current in DC circuits with return conductor far away.

<sup>2)</sup> For auxiliary and multicore cables with 4-cores fully loaded.

**Basic assumption and conditions of installation:**

Thermal resistivity of soil: 1.0 Km/W  
Standard ground temperature: 20 °C  
Loading factor: 0.7  
Depth of burial: 0.7 – 1.2 m  
No. of cable systems: 1  
(VDE 0298)

The term "ducts" means fibre, ferrous or earthenware pipes. In case of single core cables for use in AC-systems, ferrous ducts should not be applied.

## II Tests

**Table 7: Test Requirements**

| No.                                                   | Tests                                                                                                   | Requirements acc. to | Test method acc. to | Scope of test *) |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------|---------------------|------------------|
| <b>1. Electrical Properties</b>                       |                                                                                                         |                      |                     |                  |
| 1.1                                                   | Conductor resistance                                                                                    | IEC 60228            | IEC 60502-1         | R                |
| 1.2                                                   | Voltage test                                                                                            | IEC 60502-1          | IEC 60502-1         | R                |
| 1.3                                                   | Insulation resistance                                                                                   | IEC 60502-1          | IEC 60502-1         | T                |
| 1.4                                                   | Voltage test for 4 h                                                                                    | IEC 60502-1          | IEC 60502-1         | T                |
| <b>2. Dimensions</b>                                  |                                                                                                         |                      |                     |                  |
| 2.1                                                   | Conductor examination                                                                                   | IEC 60228            | IEC 60502-1         | S                |
| 2.2                                                   | Measurement of thickness of insulation and of non-metallic sheath (excluding inner extruded coverings). | IEC 60502-1          | IEC 60811-1-1       | S                |
| 2.3                                                   | Measurement of armour wires and tapes                                                                   | IEC 60502-1          | IEC 60502-1         | S                |
| 2.4                                                   | Measurement of external diameter                                                                        | ---                  | IEC 60811-1-1       | S                |
| <b>3. Mechanical Properties and Thermal Behaviour</b> |                                                                                                         |                      |                     |                  |
| 3.1                                                   | Hot set test for XLPE insulations and elastomeric sheaths.                                              | IEC 60502-1          | IEC 60811-2-1       | S                |
| 3.2                                                   | Mechanical and thermal properties of insulations and sheaths.                                           | IEC 60502-1          | IEC 60811           | T                |
| <b>4. Cable</b>                                       |                                                                                                         |                      |                     |                  |
| 4.1                                                   | Flame Retardancy**)                                                                                     | IEC 60332-1          | IEC 60332-1         | T                |
| 4.2                                                   | Flame Propagation**)                                                                                    | IEC 60332-3          | IEC 60332-3         | T                |
| 4.3                                                   | Fire Resistance**)                                                                                      | IEC 60331-21         | IEC 60331-21        | T                |
| 4.4                                                   | Smoke Density**)                                                                                        | IEC 61034-1 and 2    | IEC 61034-1 and 2   | T                |
| 4.5                                                   | Amount of halogen gas acid**)                                                                           | data sheet           | IEC 60754-1         | T                |
| 4.6                                                   | Degree of acidity of gases**)                                                                           | IEC 60754-2          | IEC 60754-2         | T                |
| 4.7                                                   | Limiting Oxygen Index (LOI)**)<br>(only for outer sheath material)                                      | data sheet           | IEC 60332-3 ann. B  | T                |
| 4.8                                                   | Temperature Index (TI)**)<br>(only for outer sheath material)                                           | data sheet           | ASTM-D-2863         | T                |

**\*) Routine tests (R)**

Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

**\*) Sample tests (S)**

Tests made by the manufacturer on samples or completed cable or components taken from a completed cable, at a specified frequency, so as to verify that the finished product meets the specified requirements.

**\*) Type tests (T)**

Tests made before supplying, on a general commercial basis, a type of cable covered by this standard, in order to demonstrate satisfactory performance characteristics to meet the intended application. These tests are of such a nature that, after they have been made, they need not to be repeated, unless changes are made in the cable materials or design or manufacturing process which might change the performance characteristics.

\*\*\*) Tests are not applicable to all cable types.

### III General Information

**Table 8: Conductor Comparisons AWG - Metric**

**Comparison of plain annealed copper conductors acc. to ICEA S-61-402 and IEC 60228**

| Conductor Size |                                         | No. of wires <sup>2)</sup> | Electrical Resistance <sup>3)</sup> |                           |
|----------------|-----------------------------------------|----------------------------|-------------------------------------|---------------------------|
| AWG or kcmil   | Metric <sup>1)</sup> (mm <sup>2</sup> ) |                            | IEC <sup>4)</sup> (Ω/km)            | ICEA <sup>5)</sup> (Ω/km) |
| 16             | 1.31                                    | 7                          | -                                   | 13.98                     |
| -              | <b>1.5</b>                              | <b>7</b>                   | <b>12.1</b>                         | -                         |
| 15             | 1.65                                    | 7                          | -                                   | 11.04                     |
| 14             | 2.08                                    | 7                          | -                                   | 8.80                      |
| -              | <b>2.5</b>                              | <b>7</b>                   | <b>7.41</b>                         | -                         |
| 13             | 2.63                                    | 7                          | -                                   | 6.96                      |
| 12             | 3.31                                    | 7                          | -                                   | 5.55                      |
| -              | <b>4</b>                                | <b>7</b>                   | <b>4.61</b>                         | -                         |
| 11             | 4.17                                    | 7                          | -                                   | 4.38                      |
| 10             | 5.261                                   | 7                          | -                                   | 3.48                      |
| -              | <b>6</b>                                | <b>7</b>                   | <b>3.08</b>                         | -                         |
| 9              | 6.631                                   | 7                          | -                                   | 2.760                     |
| 8              | 8.367                                   | 7                          | -                                   | 2.181                     |
| -              | <b>10</b>                               | <b>7</b>                   | <b>1.83</b>                         | -                         |
| 7              | 10.55                                   | 7                          | -                                   | 1.736                     |
| 6              | 13.30                                   | 7                          | -                                   | 1.375                     |
| -              | <b>16</b>                               | <b>7</b>                   | <b>1.15</b>                         | -                         |
| 5              | 16.77                                   | 7                          | -                                   | 1.087                     |
| 4              | 21.15                                   | 7                          | -                                   | 0.863                     |
| -              | <b>25</b>                               | <b>7</b>                   | <b>0.727</b>                        | -                         |
| 3              | 26.67                                   | 7                          | -                                   | 0.686                     |
| 2              | 33.62                                   | 7                          | -                                   | 0.542                     |
| -              | <b>35</b>                               | <b>7</b>                   | <b>0.524</b>                        | -                         |
| 1              | 42.41                                   | 19                         | -                                   | 0.432                     |
| -              | <b>50</b>                               | <b>19</b>                  | <b>0.387</b>                        | -                         |
| 1/0            | 53.49                                   | 19                         | -                                   | 0.341                     |
| 2/0            | 67.43                                   | 19                         | -                                   | 0.2710                    |
| -              | <b>70</b>                               | <b>19</b>                  | <b>0.268</b>                        | -                         |
| 3/0            | 85.01                                   | 19                         | -                                   | 0.2148                    |
| -              | <b>95</b>                               | <b>19</b>                  | <b>0.193</b>                        | -                         |
| 4/0            | 107.2                                   | 19                         | -                                   | 0.1706                    |
| -              | <b>120</b>                              | <b>37</b>                  | <b>0.153</b>                        | -                         |
| 250            | 127                                     | 37                         | -                                   | 0.1442                    |
| -              | <b>150</b>                              | <b>37</b>                  | <b>0.124</b>                        | -                         |
| 300            | 152                                     | 37                         | -                                   | 0.1204                    |
| 350            | 177                                     | 37                         | -                                   | 0.1030                    |
| -              | <b>185</b>                              | <b>37</b>                  | <b>0.0991</b>                       | -                         |
| 400            | 203                                     | 37                         | -                                   | 0.0900                    |
| 450            | 228                                     | 37                         | -                                   | 0.0803                    |
| -              | <b>240</b>                              | <b>61</b>                  | <b>0.0754</b>                       | -                         |
| 500            | 253                                     | 37                         | -                                   | 0.0723                    |
| 550            | 279                                     | 61                         | -                                   | 0.0656                    |
| -              | <b>300</b>                              | <b>61</b>                  | <b>0.0601</b>                       | -                         |
| 600            | 304                                     | 61                         | -                                   | 0.0602                    |
| 650            | 329                                     | 61                         | -                                   | 0.0555                    |
| 700            | 355                                     | 61                         | -                                   | 0.0515                    |
| 750            | 380                                     | 61                         | -                                   | 0.0482                    |
| -              | <b>400</b>                              | <b>61</b>                  | <b>0.0470</b>                       | -                         |
| 800            | 405                                     | 61                         | -                                   | 0.0452                    |
| 900            | 456                                     | 61                         | -                                   | 0.0401                    |
| -              | <b>500</b>                              | <b>61</b>                  | <b>0.0366</b>                       | -                         |
| 1000           | 507                                     | 61                         | -                                   | 0.0361                    |
| 1100           | 557                                     | 91                         | -                                   | 0.0328                    |
| 1200           | 608                                     | 91                         | -                                   | 0.0301                    |
| -              | <b>630</b>                              | <b>91</b>                  | <b>0.0283</b>                       | -                         |
| 1250           | 633                                     | 91                         | -                                   | 0.0289                    |
| 1300           | 659                                     | 91                         | -                                   | 0.0278                    |
| 1400           | 709                                     | 91                         | -                                   | 0.0258                    |
| 1500           | 760                                     | 91                         | -                                   | 0.0241                    |
| -              | <b>800</b>                              | <b>91</b>                  | <b>0.0221</b>                       | -                         |
| 1600           | 811                                     | 127                        | -                                   | 0.0225                    |
| 1700           | 861                                     | 127                        | -                                   | 0.0212                    |
| 1750           | 887                                     | 127                        | -                                   | 0.0206                    |
| 1800           | 912                                     | 127                        | -                                   | 0.0200                    |
| 1900           | 963                                     | 127                        | -                                   | 0.0190                    |
| -              | <b>1000</b>                             | <b>91</b>                  | <b>0.0176</b>                       | -                         |

<sup>1)</sup> Sizes acc. to IEC 60228 printed in bold letters

<sup>2)</sup> Minimum numbers of wires for the corresponding cross-section acc. to IEC 60228

<sup>3)</sup> The value for the electrical resistance is given for 20 °C (68.0 °F)

<sup>4)</sup> The value for the electrical resistance acc. to IEC is for the finished cable and cores in layers

<sup>5)</sup> The value for the electrical resistance acc. to ICEA S-61-402 is calculated for "one layer of conductors"



**Table 9: Cable Abbreviations**

| Abbreviations used by KERPEN for power and control cables |                                                                              |
|-----------------------------------------------------------|------------------------------------------------------------------------------|
| <b>Y</b>                                                  | Insulation or sheath of polyvinyl chloride PVC                               |
| <b>2X</b>                                                 | Insulation of cross-linked polyethylene XLPE                                 |
| <b>H</b>                                                  | Sheath of zero halogen flame retardant compound LSZH(Low Smoke Zero Halogen) |
| <b>R</b>                                                  | Armour of galvanized round steel wires                                       |
| <b>B</b>                                                  | Armour of galvanized steel tapes - double layer                              |
| <b>Q</b>                                                  | Armour of galvanized steel wire braid                                        |
| <b>K</b>                                                  | Lead sheath                                                                  |
| <b>-fl</b>                                                | Cable with reduced flame propagation                                         |