

### 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 voltage $U_0/U$  (kV)	Highest system voltage		
		$U_m$		
		three phase system (kV)	single phase system <sup>1)</sup> (kV)	single phase system <sup>2)</sup> (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 ( $U_m$ ) kV	Rated Voltage ( $U_0$ ) 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.