GENERAL INFORMATION

GENERAL CABLE DATA

Maximum operating temperature

The maximum permissible continuous operating temperature of a cable core is specified in the product sheet. In the case of underground cables with mesh polyethylene insulation, it should be taken into account that by operating continuously at the maximum permissible temperature of 90°C, the ground near the cable may dry out, which in turn causes the cable to be overloaded. Accordingly, we recommend limiting the maximum permissible operating temperature of conductors to 65°C for underground cables with mesh polyethylene insulation.

Minimum installation temperature

The minimum installation temperature of a cable is specified in the product sheet. At lower temperatures, the cable must be heated before installation. To achieve the required temperature, a cable can be kept for a few days in a heated room or a special device can be used to heat the cable.

Minimum bend radius

The minimum bend radius of a cable during installation is specified in the product sheet. One-time and final smooth bending of a cable with a bend radius of 30% smaller than specified in the catalogue is permitted.

CABLES SHORT CIRCUIT WITHSTAND

Thermal withstand

The maximum permissible final temperature of a cable in the event of a short circuit is specified in the product sheet. The thermal withstand current given in the product sheet has been calculated on the assumption that the cable core temperature before the short circuit was equal to the maximum permissible operating temperature.

The value of the permissible thermal withstand current during 1 second given in the catalogue characterises the maximum final temperature of the cable in the event of a short circuit. If the short-circuit current lasts between 0.2 and 5 seconds, the maximum thermal withstand current of the cable can be calculated by using the formula:

$$I_t = \frac{I_{1s}}{\sqrt{t}}$$

where

- It1s = thermal withstand current during 1 second [kA]
- t = short-circuit current duration [s]

Electrodynamic withstand

The electrodynamic forces are caused by the peak current, i.e. the maximum instantaneous value of the short-circuit current, which can exceed the rms value of the transient short-circuit current by up to 2.5 times. In the case of short circuits in the vicinity of large substation power plants, the electrodynamic forces are much bigger than in the case of short circuits in remote parts of the network.
These mechanical forces affect the cable, as well as the cable accessory. Therefore, the mechanical strength of cable accessories, especially cable fasteners, must also be checked for electrodynamic forces.

In addition to the use of reliable accessories, the careful installation of cables also helps to increase the electrodynamic withstand of cables.

GENERAL DELIVERY CONDITIONS

Unless otherwise agreed, the "General Terms and Conditions of Delivery NL09" document is applied.

Length tolerances

Installation cables, standard length: ± 5%
Rubber cables, standard length: ± 5%
Power cables, standard length: ± 5%

Cable drum label

A cable drum label is provided with a large, clear text and a bar code, which enables faster and simpler handling of goods, including by customers. The barcode systems (code 128 and EAN13) chosen by us are the most used for handling goods. Actual labels are at least 160 mm wide.

INSTRUCTIONS FOR USE

The following are the necessary instructions for installers and end users when handling cables to provide reasonable assurance regarding cable life expectancy. Further information on installation methods can be found in the EN 50565-1 standard and HD 60364 standard series.

- Electrical work may only be carried out by suitably qualified electricians.
- Wires and cables must be chosen, installed, protected, used and maintained in such a way that the actual risk can be avoided to a reasonable extent.
- The cables must be chosen so that they are suitable for any voltage and current that is likely to occur.
- Consideration must be given to the possible damage to wires and cables and their supports by electromechanical impact forces, which may be caused by current, including short-circuit current, in a wire during operation.
- Cables that are not intended for outdoor use should be stored in dry places.
- Load currents must be calculated and in accordance with HD 60364-5-52.
- Care must be taken during handling and transport to minimise any mechanical impact, in particular vibration, impact, strong shaking, bending and twisting.
- Care must be taken not to damage the cable during installation and compounding.
- Avoid contact of the cables with a hot surface and ensure cables are not located near it.
- The maximum continuous operating temperature limits must not be exceeded at any combination of thermal effect of the current and ambient conditions.
- During installation, the tensile strength must not exceed 50 N/mm2 for rigid cables and 15 N/mm2 for flexible cables.
- The cable must not be pressed to such an extent as to cause damage.
- None of the cables covered by EN 50525 is designed to withstand pressure.
- The cables must not be damaged by any mechanical structure used to support them.

- The cables must be adequately supported. The maximum recommended distance between supports is:

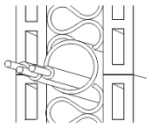
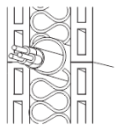
Cable outer diameter D [mm]	Maximum distance between supports [mm]	
	Horizontally	Vertically
D ≤ 9	250	400
9 < D ≤ 15	300	400
15 < D ≤ 20	350	450
20 < D ≤ 40	400	550

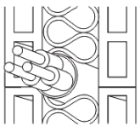
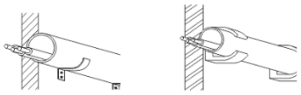
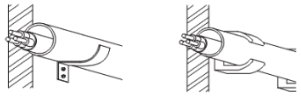
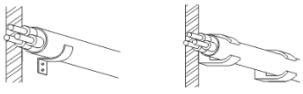
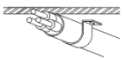
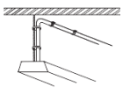
- Recommended minimum bend radius for rigid cables:

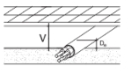
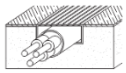
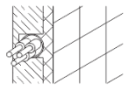
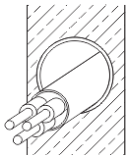
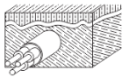
Cable outer diameter D [mm]	Minimum bend radius R [mm]	
	During handling	When installed
D ≤ 8	4xD	2xD
8 < D ≤ 12	5xD	3xD
D > 12	6xD	4xD

- Flexible wires and cables covered by EN 50525 are not intended to be twisted or twisted in the longitudinal direction.
- It is recommended to remove a sheath of cables with a minimum length so as not to alter their mechanical properties.
- When removing a sheath, damaging the insulation must also be avoided.
- When removing an insulation, care must be taken not to damage the conductor in any way.
- Wires and cables in use can be damaged when moved. This may be due to the natural aging of the physical properties of materials.

INSTALLATION METHODS

Installation method	Description	Typical installation method to find the permissible continuous current
	Single core insulated wires or cables in a tube installed in a thermal insulation wall [a, c]	A1
	Multi-core cable or sheathed wire in a tube installed in a thermal insulation wall [a, c]	A2

	Multi-core cable or sheathed wire directly in the thermal insulation wall [a, c]	A1
	Single core insulated wires or cables installed on a wooden or stone wall or in a tube less than 0.3 times the tube diameter from the wall [c]	B1
	Multi-core cable or sheathed wire installed on a wooden or stone wall or in a tube less than 0.3 times the tube diameter from the wall [c]	B2
	Single core insulated wires or cables in an openable cable box (including a multi-section box) installed on a wooden or stone wall - horizontal installation [b] - vertical installation [b, c]	B1
	Multi-core cable or sheathed wire in an openable cable box (including a multi-section box) installed on a wooden or stone wall - horizontal installation [b] - vertical installation [b, c]	Under discussion [d] Method B2 may be used
	Single or multi-core cable or sheathed wire attached to a wooden or stone wall or in a tube less than 0.3 times the tube diameter from the wall [c]	C
	Single or multi-core cable or sheathed wire attached directly to a wooden or stone ceiling	C, together with a row 3 in Table B.52.17
	Fixed installation of a suspended power consumer	C, together with a row 3 in Table B.52.17

	Single or multi-core cable or sheathed wire - in a ceiling cavity - in a double floor [h, i]	For 1,5 D_e ≤ V < 5 D_e - B2 For 5 D_e ≤ V < 50 D_e - B1
	Single or multi-core cable or sheathed wire in an open or ventilated horizontal or vertical cable duct [n]	B1
	Single or multi-core cable or sheathed wire directly in a stone wall with a specific thermal resistance not exceeding 2 K*m/W Without additional mechanical protection [o, p]	C
	Single core insulated wires or cables in a tube located in the masonry [p]	B1
	Multi-core cable or sheathed wire in a tube located in the masonry [p]	B2
	Multi-core cable or sheathed wire in a tube or enclosed cable box located in the soil	D1
	Single or multi-core cable directly in the soil without additional mechanical protection [q]	D2

[a] The heat transfer coefficient of the wall inner covering is not less than 10 W/(m^2 x K).

[b] The permissible currents given in Annex B for installation methods B1 and V2 apply to a single circuit. If there is more than one circuit in the box, the group reduction factors given in Table B.52.17 must be used, regardless of the possible presence of partitions or sections.

[c] Particular care must be taken when the cables run upright and ventilation is limited. In the upper part of the upright section, the ambient temperature can rise significantly higher (this fact is under discussion).

[h] D_e is the diameter of a multi-core cable:

- in the case of a triangular arrangement of single core cables, 2.2 times the diameter of the single phase cable is taken for this purpose;
- in the case of a level arrangement of single core cables, 3 times the diameter of the single phase cable is taken for this purpose;

[i] V is the smaller dimension of a masonry box or cavity or the vertical depth of a rectangular box, floor or wall cavity or a duct. The depth of a duct is much more important than its width.

[j] D_e is the outer diameter of a tube or the vertical depth of a cable box.

[n] It is recommended that these installation methods be used only in places accessible to authorised persons solely, in order to avoid a reduction of the permissible current and a risk of fire due to the accumulation of debris.

[o] For cables with a core cross-section of no more than 16 mm^2, the permissible current may be bigger.

[p] When it is said that the specific thermal resistance of a masonry or stone wall does not exceed 2 K * m/W, masonry or stone wall means brick, concrete and gypsum walls and structures the materials of which cannot be considered as heat insulating.

[q] For cables installed directly in the soil, the specific thermal resistance of the soil is assumed to be about 2.5 K * m/W. With a lower specific thermal resistance of the soil, the permissible current of the cables directly in the soil is significantly higher than when installed in boxes.