

GENERAL SPECIFICATION

ELECTRICAL

GS EP ELE 061

Minimum requirements for HV & LV cable sizing
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1. Scope

The purpose of this document is to define the minimum requirements for HV and LV Cable Sizing.

The Contractor shall demonstrate during the design stage (Basic or Detailed Design) that the present specification and standard requirements have been carefully evaluated and taken into account when performing the cable sizing.

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

Design and engineering shall conform as a minimum requirement to the current edition of the following in order of precedence:

- Applicable laws, rules and regulations of the country in which the system will be operated. In cases where no "local" regulations exist, then French laws and legislation shall be used
- Company Particular Specifications (if any)
- Company General Specifications
- Applicable International Electrotechnical Commission (IEC) publications
- Applicable French Standards
- Applicable recognised standards and codes (e.g. BSI, VDE, etc.) where IEC publications have not yet been issued.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of this document.

Reference	Title
IEC 60183	Guide of the selection of High Voltage Cables
IEC 60228	Conductor of insulated cables
IEC 60269-1	Low Voltage Fuses - Part 1: General Requirements
IEC 60287 (All parts)	Electric Cables - Calculation of the current rating - All parts
IEC 60364-4-41	Electrical Installation of Buildings - Protection for Safety - Protection against Electric Shock
IEC 60364-4-43	Electrical Installation of Buildings - Protection for Safety - Protection against overcurrent
IEC 60364-5-52	Electrical Installation of Buildings - Protection for Safety - Selection and erection of Electrical Equipment Wiring Systems

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Reference	Title
IEC 60502-2	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) - Part 2: Cables for rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV)
IEC 60947 (All parts)	Low Voltage Switchgear and Controlgear - All parts
IEC 61892-4	Mobile and fixed offshore units - Electrical installations - Part 4: Cables
NF C13-200	High Voltage Electrical Installations - Rules
NF C15-100	Low Voltage Electrical Installations (Whenever particular fields are not covered by the IEC recommendations)

The above list shall not be considered as complete and other applicable IEC standards or French Standards can be referred to by the Contractor when performing the cable sizing calculation note.

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

Reference	Title
GS EP ELE 001	Electrical design criteria
GS EP ELE 021	Electrical design criteria for floating units
GS EP ELE 091	Minimum Contractor document requirements
GS EP ELE 161	Electrical cables

3. Deviations

The Contractor shall advise the Company of any deviations made in respect of the present specification and shall request Company's specific prior approval.

Should this Specification conflict with requirements of the listed standards, the Contractor shall request clarification from the Company.

4. General requirements

4.1 General

With reference to the **GS EP ELE 091**, a cable sizing calculation note shall be issued by the Contractor at the Basic Engineering phase of the project based on the present specification and listed standards.

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During the Detailed Engineering Phase, the Contractor shall endorse and reissue the calculation note performed at the basic design stage based on updated Vendor, Manufacturer data for:

- Cables
- Protection devices (fuses, CB, relays, etc.)
- Etc.

4.2 Required results

The calculation note shall provide all details for the appropriate selection of HV, LV power feeder, Motor feeder, AC and DC power and main lighting cables.

All the cable sizing parameters and requirements further detailed in Section 5 of the present specification shall be carefully addressed and submitted for Company's review/approval.

5. Cable Sizing Requirements/Criteria

The minimum following requirements/parameters shall be taken into account when performing cable sizing:

- Site Conditions
 - Ambient conditions (soil/air temperature, soil thermal resistivity, etc.)
 - Type of installation, above head, underground, depth of laying, number of layers, exposition to sun radiation, etc.
- Network characteristics (voltage, number of phases, neutral system IT, TN, TT, TN-S, TN-C, distributed neutral or not, etc.)
- Cable Type (armoured, non-armoured, single core, multicore, etc.)
- Cable Current Carrying Capacities according to the standard conditions
- Cable Current Carrying Capacities according to the site conditions (derating factors based on site conditions)
- Type of loads to be fed
- Steady state condition voltage drop
- Motor starting voltage drop
- Fault level of system (based on switchgear fault rating)
- Maximum permissible fault duration
- Type and setting of overload and Short-Circuit Protection
- Prospective and maximum permissible touch voltage when applicable
- Harmonic level
- When required in Project specification, economic sizing may also be considered.