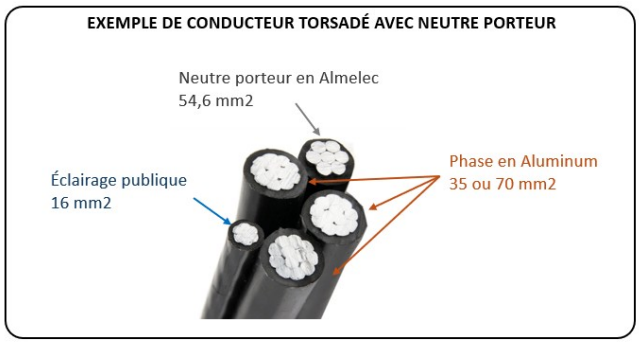
# Low voltage distribution line

## Description of the distribution line

The distribution network will be overhead, low voltage (400 Vac with 3 phases + neutral) with a nominal frequency of 50 Hz and will consist of the following elements.

- Three-phase cabletwisted aluminumwith neutral carrier, including single-phase public lighting.




- Wooden distribution line poles.
- Accessories for the distribution line, including suspension, anchoring and tensioning clamps, insulation piercing branch connectors, splicing sleeves, guy wires, etc.
- Grounding system with a TT type neutral system, both at several points of the distribution line and at each user's premises.
- LED street lighting.
- The distribution line will be equipped with at least five disconnectors, ensuring efficient energy management in critical situations by allowing the disconnection of certain parts of the network. This installation will prioritize the energy supply to the health center and other healthcare facilities.
- Low-voltage connections for users:
    - Network connection, including:
        - 2x16 mm2 Alu connection cables for single-phase users.
        - Wooden receiving post, installed next to the user's wall. The existing fireplaces are not strong enough to withstand the mechanical forces of the connection. Therefore, it is preferable to connect the user via an additional receiving pole.
        - Individual circuit breaker installed on the walloutside the home.
    - Individual derivation, including:
        - Wiring between the individual circuit breaker and the delivery point, located inside the home, having passed through the wall.
        - Single-phase prepayment electricity meter.Some meters, dedicated to special users for whom the standard meter is not suitable (drinking water supply, welding workshops, grain mills, etc.), will have to be defined by the developer on a case-by-case basis, taking into consideration the specific characteristics of the user (three-phase, power demand, current and energy, etc.).
        - Individual protective equipment box.The internal protection boxes for specific users such as drinking water supply (DWS) or welding workshops must be arranged on a case-by-case basis with the user concerned and in accordance with the relevant quality and safety standards associated.
        - Individual grounding.

    - Indoor installation, including
        - Sockets, switches, LEDs and all necessary wiring and accessories.

- Any other equipment and materials necessary for the proper and safe operation of the distribution line.

The distribution line and branches must be designed and constructed according to the standards used by the national network manager, or NF C 11-201 and NF C 15-100.

## Component requirements

The bidder is required to complete all technical specification tables provided in this section, also attached in Excel format as Appendix F – Technical Specification Table. The bidder will indicate whether a requirement is fully compliant (FC), partially compliant (PC), or non-compliant (NC). The bidder will provide an explanatory note if the requirement is PC or NC. The bidder will indicate which document (and which section of the document, if applicable) provides evidence for each requested requirement. The supporting document may be, for example, a technical data sheet, a design drawing prepared by the bidder, a specific section of the bidder's design report, or other documents.

All critical requirements (EC) specified in the last column must be met to ensure that the bulk of the offer complies with these minimum technical requirements. Non-critical requirements (ENC) are recommended, but not mandatory.

*Distribution line poles*

| ID | Specification | Values/Standards | Critical requirement (CR) or Non-critical requirement (NCR) |
|---|---|---|---|
| LD-POT-1 | Applicable standards | NF EN 14229: Wooden poles for overhead lines | EC |
| LD-POT-2 | Material | Drink | EC |
| LD-POT-3 | Height | 9 m | EC |
| LD-POT-4 | Nominal effort | 255 daN for all poles which are intended to suspend the bundle of twisted cable in alignment.<br><br>550 daN for all poles located at an angle (change of direction of the line), branch or stop of line, and which are subject to one or more cable anchorages (either single or double). | EC |
| LD-POT-5 | Permissible fuels | Pine, Fir, Spruce, Larch. Eucalyptus is prohibited. | EC |
| LD-POT-6 | Wood preservation treatment | According to NF EN 599-1 and NF EN 351-1, creosote treatment is prohibited. | EC |
| LD-POT-7 | Marking | Each post must bear the following inscriptions in indelible characters: - Supplier's name - Impregnation process designated by its reference letter - Year of manufacture - Height of the post in meters - Nominal force - Manufacturing order number if applicable. The marking support is placed on the | EC |

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| | | shaft of the post, 3.50m from the base. | |
| LD-POT-8 | Type test report | The manufacturer must provide a type test report. The tests will be carried out according to the standards in force, and concern both: - the quality of the supplies and the proper execution of the processing operations, - the dimensions, straightness and quality of the wood, - mechanical resistance tests (yield strength and breaking strength). | EC |

*User reception posts*

| ID | Specification | Values/Standards | Critical requirement (CR) or Non-critical requirement (NCR) |
|---|---|---|---|
| LD-POT-REC-1 | Applicable standards | NF EN 14229: Wooden poles for overhead lines | EC |
| LD-POT-REC-2 | Height | 5 m | EC |
| LD-POT-REC-3 | Nominal effort | 550 daN | EC |
| LD-POT-REC-4 | Permissible fuels | Pine, Fir, Spruce, Larch. Eucalyptus is prohibited. | EC |
| LD-POT-REC-5 | Wood preservation treatment | According to NF EN 599-1 and NF EN 351-1, creosote treatment is prohibited. | EC |
| LD-POT-REC-6 | Marking | Each post must bear the following inscriptions in indelible characters: - Supplier's name - Impregnation process designated by its reference letter - Year of manufacture - Height of the post in meters - Nominal force - Manufacturing order number if applicable. The marking support is placed on the shaft of the post, 3.50m from the base. | EC |
| LD-POT-REC-7 | Type test report | The manufacturer must provide a type test report. The tests will be carried out according to the standards in force, and concern both: - the quality of the supplies and the proper execution of the processing operations, - the dimensions, straightness and quality of the wood, - mechanical resistance tests (yield | EC |

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| | | strength and breaking strength). | |

*Cables*

| ID | Specification | Value/Standards/Requirement | Critical requirement (CR) or Non-critical requirement (NCR) |
|---|---|---|---|
| **Three-phase distribution cables with public lighting** | | | |
| LD-C-1 | Applicable standards | NF C 33-209 | EC |
| LD-C-2 | Cable Type | Pre-assembled twisted conductors in a bundle consisting of a neutral carrier made of aluminium alloy (Almelec) around which the phase conductors of the distribution and public lighting line are twisted. | EC |
| LD-C-3 | Material | The phase conductors are made of aluminium and the neutral is made of Almelec. | EC |
| LD-C-4 | Cable size. | 3*35+54.6+16mm²3*70+54.6+16mm² | EC |
| LD-C-5 | phase conductor type | Circular cross-section, stranded and compacted aluminum | EC |
| LD-C-6 | Neutral conductor type | Circular cross-section, twisted and must be made of uncompacted aluminum alloy. | EC |
| LD-C-7 | Insulation. | The conductors must be insulated with cross-linked polyethylene (CRP). | EC |
| LD-C-8 | Facility | Air | EC |
| LD-C-9 | Nominal voltage. | 0.6/1 KV | EC |
| LD-C-10 | Manufacturer | | |
| LD-C-11 | Model | | |
| **Single-phase user connection cable** | | | |
| LD-C-12 | Applicable standards | NF C 33-209 | EC |
| LD-C-13 | Cable Type | Twisted | EC |
| LD-C-14 | Conductive material. | Aluminum | EC |
| LD-C-15 | Cable size. | 2x16 mm2 | EC |
| LD-C-16 | Insulation. | The conductors must be insulated with cross-linked polyethylene (CRP). | EC |
| LD-C-17 | Facility | Air | EC |
| LD-C-18 | Nominal voltage. | 0.6/1 KV | EC |
| LD-C-19 | Manufacturer | | |
| LD-C-20 | Model | | |
| **Three-phase user connection cable** | | | |
| LD-C-21 | Applicable standards | NF C 33-209 | EC |
| LD-C-22 | Cable Type | Twisted | EC |
| LD-C-22 | Conductive material. | Aluminum | EC |
| LD-C-23 | Cable size. | 4x25 mm2 | EC |
| LD-C-24 | Insulation. | The conductors must be insulated with cross-linked polyethylene (CRP). | EC |
| LD-C-25 | Facility | Air | EC |
| LD-C-26 | Nominal voltage. | 0.6/1 KV | EC |
| LD-C-27 | Manufacturer | | |
| LD-C-28 | Model | | |

*Accessories*

| ID | Specification | Value/Standards/Requirement | Critical requirement (CR) or Non-critical requirement (NCR) |
|---|---|---|---|
| **Main line** | | | |
| LD-ACC-1 | Hardware | They must be effectively protected against corrosion | EC |
| LD-ACC-2 | Insulation. | The parts in direct contact are made of insulating material and their insulation voltage must be at least 6 kV. | EC |
| LD-ACC-3 | Anchor clamps | They must not break or allow permanent slippage of the conductor for a force less than 1500 daN for a carrier of 54.6 mm2.<br><br>Applicable standards: NF C 33-041 and NF C 33-042 | EC |
| LD-ACC-4 | Neutral carrier suspension clamps | They must not allow permanent slippage of the conductor for a force less than 30 daN, in the direction of the line, moreover, they must be calculated to withstand the mechanical tension of the cable according to the assumption considered. Applicable standards: NF C 33-040 | EC |
| LD-ACC-5 | Joint sleeves and end lugs | Hexagonal taper. Applicable standards: NF C 33-021 | EC |
| LD-ACC-6 | Insulation of joint sleeves and branch fittings | Same insulation characteristics as the cable. | EC |
| **User connections** | | | |
| LD-ACC-7 | Hardware and accessories | The parts in direct contact with the cable insulation are made of insulating material and their insulation voltage must be at least 4 kV for one minute. | EC |
| LD-ACC-8 | Branch connectors | Insulation perforation. Applicable standard: NF C 33-020 | EC |

*Public lighting*

| ID | Specification | Value/Standards/Requirement | Critical requirement (CR) or Non-critical requirement (NCR) |
|---|---|---|---|
| LP-1 | Type of lighting | Single body with two independent volumes: one for electronic equipment and the other for the LED type lamp optical group. | EC |
| LP-2 | Lamp power | ≥34 W | EC |
| LP-3 | LED Output | ≥ 110 Lm/W | EC |
| LP-4 | Lifetime | 50,000 h | EC |
| LP-5 | Color temperature | 5,000 K | EC |

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| LP-6 | Lighting fixture materials | Polyester or Aluminum | EC |
| LP-7 | IP protection rating | ≥ IP 66 | EC |

*Energy meters*

| ID | Specification | Value/Standards/Requirement | Critical requirement (CR) or Non-critical requirement (NCR) |
|---|---|---|---|
| CM-1 | Number of phases | Single-phase | EC |
| CM-2 | Nominal voltage. | 230 V | EC |
| CM-3 | Tension tolerance | 80%...110% of rated voltage | EC |
| CM-4 | Nominal frequency. | 50 Hz | EC |
| CM-5 | Frequency tolerance | 90%...110% of the nominal frequency | EC |
| CM-6 | Accuracy of energy measurement. | Active energy: Class I<br>Reactive energy: Class II | EC |
| CM-7 | Base current Ib | ≥ 5 A | EC |
| CM-8 | Maximum current. | ≥ 40 A | EC |
| CM-9 | Starting current. | ≤ 20 mA | EC |
| CM-10 | Self-consumption | ≤ 3 W | EC |
| CM-11 | IP rating | ≥ IP53 | EC |
| CM-12 | Operating temperature range | 0-50C | EC |
| CM-13 | Payment type | Prepaid and postpaid features. | EC |
| CM-14 | Type of recharge | External rechargeable card, tokens, or automatically via remote management | EC |
| CM-15 | It is possible to program different plans per user (i.e., variation of the energy/power limit) and with a minimum of 6 different consumption levels (6 different user types). | Included | EC |
| CM-16 | Data storage capacity for at least one month in case of power outage (internal battery to retain memory) | Included | EC |
| CM-17 | Interface | LCD screen with LED indicators that show: - Remaining energy display (energy balance, credit level...) - Current power - Alarms | EC |
| CM-18 | Automatic disconnection. | In case of non-payment, sabotage, exceeding the power | EC |

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| | | limit (for current), and exceeding the daily energy allocation. | |
| CM-19 | License management platform | Included for > 3 years, including: - client mini-network management software - client database management - account and transaction recording - individual flat-rate configuration for clients - ensuring data security and encryption by allowing different access levels | EC |
| CM-20 | Theft protection | The upstream terminals will be protected and sealed against theft. | EC |
| CM-21 | Relay | Auxiliary relay for disconnecting non-essential loads. | ENC |

*Indoor installation protection box*

| ID | Specification | Value/Standards/Requirement | Critical requirement (CR) or Non-critical requirement (NCR) |
|---|---|---|---|
| BPII-1 | IP rating | ≥IP54 | EC |
| BPII-2 | Insulation | Class II | EC |
| BPII-3 | Protective Equipment | Single-phase general residual current circuit breaker (nominal voltage 230V, nominal current 25A, sensitivity 30 mA, 2 poles);<br><br>Single-phase thermal-magnetic switch for sockets (rated voltage 230V, rated current 10A, 2 poles);<br><br>Single-phase thermal-magnetic switch for lighting lines (rated voltage 230V, rated current 6A, 2 poles); | EC |