



TECHNICAL REQUIREMENTS

ELECTRICAL

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POWER AND CONTROL CABLES

Document No. OL-TR-ER-026

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1. SCOPE

The present document is intended to define the technical requirements of the power and control cables.

2. REFERENCES

The following standards, acts of law and other documents are referenced in the standards:

Elektros įrenginių įrengimo bendrosios taisyklės, patvirtintos energetikos ministro 2012 m. vasario 3 d. įsakymu Nr. 1-22 (Žin., 2012, Nr. 18-816).

Elektros linijų ir instaliacijos įrengimo taisyklės, patvirtintos energetikos ministro 2011 m. gruodžio 20 d. įsakymu Nr. 1-309 (Žin., 2012, Nr. 2-58), įsakymo pakeitimas – 2012 m. gruodžio 12 d. įsakymu Nr. 1-268 (Žin., 2012, Nr. 147-7585)

Specialiųjų patalpų ir technologinių procesų elektros įrenginių įrengimo taisyklės

OL-TR-GR-000

General Requirements

OL-TR-ER-000

Electrical. General

3. TERMS AND DEFINITIONS

For terms and definition see:

OL-TR-ER-000

Electrical. General

4. GENERAL

4.1 In general the cables design for intended usage will be as follows:

- a) Power cable for 6,0 kV switchgear incoming and transformers – should be 6/10 kV 3-conductor cable with 70 mm² (minimum) stranded copper wires, oil impregnated paper or XLPE insulation, galvanized steel tape armored and PVC sheath, flame retardancy IEC 60332-1-1;
- b) Power cable for 6,0 kV motors - should be 6/10 kV 3-conductor cable with stranded copper wires, oil impregnated paper, PVC or XLPE insulation, galvanized steel tape armored and PVC sheath, flame redundancy IEC 60332-1-1;
- c) Power cable for 0,4 kV motors and other 3-phase users – 4-conductors cable of 500/750V with 1,5 mm² (minimum) copper wires, (not solid conductors should be used for 16 mm² and large cross section), PVC or XLPE insulation and PVC sheath. The power supply cables for illumination and other 3-phase 5-wire (1 phase 3 wires) loads will be of similar design like 4-wire cables only with PE conductor with yellow/green insulation, flame redundancy IEC 60332-1-1;
- d) Control cables – 300 / 450 V, copper conductors, PVC insulation, PVC sheath, flame redundancy IEC 60332-1-1.

4.2 The metal sheets, screens should be designed for cables for circuits which is sensitive or can generate electromagnetic disturbance.

- 4.3** Cables laid for equipment installed beyond explosive areas should not run through those areas.
- 4.4** Power cables for motors driving two or more process machines for the same purpose (one in operation and remaining in stand-by condition) should be connected to different sections in switchgear.
- 4.5** Cables in explosive areas should be laid in the following manner:
- a) In underground cable trenches wholly filled with sand;
 - b) As aboveground runs in pipe racks, cable trays or ladders.
- 4.6** Cable trays or cable ladders should be sheltered from external impact like atmospheric precipitation, sunlight, unintentional mechanical or thermal damages by means of appropriate shelters.
- 4.7** Cable trays or cable ladders should be:
- a) Designed with minimum 20% of spare capacity;
 - b) Manufactured of hot-galvanizing steel sheets (in accordance with DIN 50976 Standard); zinc coat should be of min. 50 µm;
 - c) Mounted in the manner assuring durability of anti-corrosion protection used;
 - d) Properly protected from corrosion when introducing cables and conduits to cable trays and/ or ladders.
- 4.8** Minimum allowed long-lasting loading capacity of power engineering cables for motors should be at least 125% of motor rated current at a maximum voltage drop of 5 %.
- 4.9** Cables for guaranteed voltage installations should be laid in independence and marked routes protected from expected mechanical, thermal and chemical damages.
- 4.10** All cable entries through the walls should be permanently sealed. Plant cable entries from underground location to intermediate junction box should be sealed with sealing compound.
- 4.11** Obligatory Regulations of European Union should be applied (after earlier obtaining of Buyer's acceptance) in the case when economic reasons indicate on solutions different from above mentioned ones.
- 4.12** Self-extinguishing or fireproof covering cables and conductors resistant to chemical exposures shall be used. Cables and conduits for safety installations routed in fire hazard areas should be of construction assuring at least 20-minute resistance for fire (IEC 332).
- 4.13** Cables laid in explosive area (totally or partially) should have the core minimum cross sections acc. to Table 1.

Table 1. Core Minimum Cross Sections

Description	Value
Power cables	2.5 mm ²
Control cables	1.5 mm ²

- 4.14** Cables should have improved level of insulation acc. to Table 2.

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Table 2. Cable Insulation Improved Level

Cables	Rated Voltage
For 6 kV MV power cables	Should be 6/10 kV
For LV power cables and control cables	Should be 0,6/1 kV