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SPECIFICATIONS

Technical conditions:

Introductionary cable: **AXPR 4G240**

Main fuse: **3x425A**

Power supply:

- voltage: **Y+N 230/400V**
- type of current: **~3 AC**
- frequency: **50Hz**
- type of power system: **3-phase**

Ground:

- missing (voltage doesn't exceed 50V)
- TN-C
- **TN-C-S**
- TN-S
- T-T
- I-T
- M+ and M- with grounded tap

Substation:

- breaking current: **min. 6kA**
- transformer: **TAC-1000 0.99 MW**

Installation properties:

- Voltage drop: **3.27%**
- cos\(\phi\): **>0.9**

Wiring way:

- overhead powerline
- **cable shaft**
- cables on wall surface
- cables inside the wall
- cables in cable tray
- other: __________

Type of cabling: **NYM and NYM-J**

Main panel:

- wall surface
- inside the wall
- **other: utility cabinet**

Ingress Protection Rating: **min. IP20**

Ground impedance: **2.9 Ohm**
POWER DISTRIBUTION BETWEEN CABINETS ON FLOORS 3-10

<table>
<thead>
<tr>
<th>Receptors</th>
<th>Symbol</th>
<th>Number</th>
<th>Name</th>
<th>Phase</th>
<th>Cable (Cu)</th>
<th>L(n)</th>
<th>Power</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>Cabnet 4</td>
<td>L1</td>
<td>3 wires (L, N, PE) 16 mm</td>
<td>22</td>
<td>7500</td>
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<td></td>
<td>2</td>
<td>Cabnet 5</td>
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<td>7300</td>
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<td>3</td>
<td>Cabnet 6</td>
<td>L3</td>
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<td></td>
<td>4</td>
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<td>7300</td>
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<tr>
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<td></td>
<td>5</td>
<td>Cabnet 2</td>
<td>L2</td>
<td>3 wires (L, N, PE) 16 mm</td>
<td>25</td>
<td>7300</td>
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<tr>
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<td></td>
<td>6</td>
<td>Cabnet 3</td>
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<td>7</td>
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<td>9</td>
<td>Cabnet 9</td>
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<td>3 wires (L, N, PE) 16 mm</td>
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<td>10</td>
<td>1-phase socket</td>
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<td>3C2.5</td>
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<td>11</td>
<td>Lamps in hallway</td>
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<td></td>
<td>3C2.5</td>
<td>10</td>
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<tr>
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<td></td>
<td>12</td>
<td>Lamps in WC</td>
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<td></td>
<td>3C1.5</td>
<td>10</td>
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</table>
Calculation:
Ground material: limestone, 5000 ohm/meter

1) metal tape around perimeter
\[
\frac{0.336 \times \rho \times \lg \frac{2 \times l^2}{B \times T}}{L} = \frac{6.1 \times \lg 450000}{450000} = 34.54 \text{ ohm}
\]

2) 5 electrodes attached to steel tape
2.1) for 1 electrode:
\[
\frac{0.336 \times \rho}{L} \times \left(2 \times \frac{2 \times L}{D} + 0.5 \times \lg \frac{4T + L}{4T - L}\right)
\]
\[
= 6.1 \times (1.83 + 0.24) = 12.63 \text{ Ohm}
\]
2.2) for 5 electrodes:
\[
R = \frac{R(1)}{5} = \frac{12.63}{5} = 2.52 \text{ Ohm}
\]

3) full ground impedance:
\[
R = \frac{R(1) \times R(e)}{R(1) + R(e)} = \frac{34.53 \times 2.52}{34.53 + 2.52} = 2.9 \text{ Ohm}
\]
MATERIALS

Fuse boxes:
- Distribution board 1500x2000 1
- Fuse box 650x1200 8
- Fuse box 51M + energy meter 1
- Fuse box 42M, metal 1
- Fuse box 24M, PVC 65
- DIN-rail 5 meters

Busbars:
- Copper busbar 30x5 10 meters
- FORK busbar 16mm, 3-phase 105M
- FORK busbar 10mm, 1-phase 192M
- Bench busbar holder 30x5 1
- Busbar N and PE 4x16+14x10 8
- Busbar N and PE 10x16+30x10 2
- Busbar blue 7 terminals 65
- Busbar green 7 terminals 65
- Equipotential busbar 1

Disconnectors and releases:
- Load switch 630A, 3-phase 1
- Load switch 3x80A 10
- Load switch 1x40A 65

Fuses and circuit breakers:
- Fuse disconnector RBK1 10
- Knife fuse gG, 50A, size "1" 30
- Circuit breaker C32 3-phase 2
- Circuit breaker C32 1-phase 42
- Circuit breaker D25 3-phase 1
- Circuit breaker K25 3-phase 1
- Circuit breaker C25 1-phase 42
- Circuit breaker C20 3-phase 1
- Circuit breaker C16 3-phase 5
- Circuit breaker C16 1-phase 3
- Circuit breaker C13 1-phase 42
- Circuit breaker C10 1-phase 85
- Fuse disconnector RBK000 1
- Knife fuse aM, 10A, size "000" 3
- Circuit breaker C4 1-phase 35
- Circuit breaker C3 1-phase 3
- RCBO C16/30mA 103
- RCBO C10/30mA 14
- RCD 25A/30mA 4-pole 7

Relays:
- Photorelay for DIN rail 16A 3
- Relay 2P 20A 2NO+2NC for DIN rail 3
- Contactor 3-phase 20A for DIN-rail 1

Other panel products:
- Terminal PM5X 40
- Control lamps for DIN rail, 2W 3
- Electricity meter 3-phase 5-65A 1
- Electricity meter 1-phase 40A 63

Cables and wires:
- Cable NYM 5G25 900 meters
- Cable NYM 5G10 150 meters
- Cable NYM 5G6 500 meters
- Cable NYM 5G2.5 35 meters
- Cable NYM 3G2.5 1600 meters
- Cable NYM 3G1.5 2800 meters
- Cable NYM 3G1.0 1300 meters
- Copper wire S=16mm, black 2000 meters
- Copper wire S=16mm, blue 2000 meters
- Copper wire S=16mm, yellow-green 2000 meters
- Copper wire S=10mm, black 2100 meters
- Copper wire S=10mm, blue 2100 meters
- Copper wire S=16mm, yellow-green 2100 meters
- Copper wire S=120mm, yellow-green 20 meters
- Copper wire S=50mm, yellow-green 30 meters
- Copper wire S=25mm, yellow-green 450 meters

Ground and lightning safety:
- Steel tape 50cm 305 meters
- Galvanized rods, L=10 meters, D=30cm 5
- Clay 5400 kilograms
- Grounding collars ~40
- Welding *employ the welder to join
  steel tape with rods

Installation appliances:
- Light fixtures *ask lighting schemes
  from photodesigner
- Sockets 3-phase 32A 2
- Sockets 3-phase 16A 5
- Schuko sockets 16A 1690
- Light switches IP20 10A 250VAC 150
- Junction boxes ~2400
- Cable trays *by installation process
- Cable channels *by installation process
- Flexible conduit *by installation process
- Other (nails, screws) 1

Work *will be calculated by construction company