



# TECHNICAL REQUIREMENTS

## ELECTRICAL

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## ELECTRICAL HEATING FOR PIPING AND EQUIPMENT

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## 1. SCOPE

The present document is intended to define the technical requirements of the electrical heating for piping and process equipment.

## 2. REFERENCES

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

*Specialiujų patalpų ir technologinių procesų elektros įrenginių įrengimo taisyklės*

**OL-TR-GR-000**                      *General Requirements*

**OL-TR-ER-000**                      *Electrical. General*

## 3. TERMS AND DEFINITIONS

**HOA:** Hand-Off-Auto.

**RCD:** Residual Current Circuit Breaker.

**DCS:** Distributed Control System of Process.

## 4. GENERAL

**4.1** Electrical heating systems for piping designed to protect from freezing and to maintain the process temperature will cover the control panel of electrical heating, electrical pipe heaters, temperature sensors, temperature regulators, starters, circuit breakers, enclosures, power cables and all necessary equipment and controls.

**4.2** Seeking to minimize the length of heating circuits, the control panels of electrical pipe heating will be installed in the center of the area or close substation where they are used.

**4.3** The control panels will be suitable to use in the zone of that class where they are installed. In general the panels will be installed where possible in non-hazardous zones.

**4.4** Pipe heating equipment, including materials, fittings, devices, equipment and similar items will be ATEX certified.

### 4.5 Control Panels of Electrical Process Pipe Heating

**4.5.1** Each control panel of electrical pipe heating will be mounted on the rack with enclosure and it will contain the devices as follows:

- a) Primary circuit breakers (the 2 incomings is preferred to use);
- b) Starter for heating circuit (RCD circuit breaker, contactor, thermostat);
- c) Temperature controllers;
- d) Switch "HAND-OFF-AUTO";
- e) Indicating light "POWER ON" (green);
- f) General light checking circuit;
- g) Panel heater for outside panels;
- h) Fault signal circuits for DCS.

- 4.6** The cables of electrical heater will be controlled by the panel of electrical pipe heating that will ensure the switching on of circuit supply, the current strength and indication of signaling disconnection in each circuit.
- 4.7** Each circuit will be equipped with switch HOA to select the circuit control mode (hand, off, automatic).
- 4.8** The signals of temperature sensor, corresponding to the surrounding air and process temperature will be sent to automatic circuit control.
- 4.9** Each circuit will be provided with line end indication –outside installed signaling lights or other means on control panel- for visual indication that the electrical installation of the heater operates along the whole length
- 4.10** In general the circuit breakers of all branches will be 6-40A, bipolar, single phase, thermomagnetic with RCD 300 mA (maximal).
- 4.11 Cables for Electrical Heating**
- 4.11.1** In those places where the lines are not affected by emitted steam and where the highest temperature is maintained and allows all cables for electrical heating will be self-regulating. The cables of constant power in hazardous zone can be used after careful evaluating and acceptance by OL only.
- 4.11.2** Only for the protection against freezing, where the highest operating temperature of pipes and equipment is 65°C or lower self-regulating heating cables will be used, designed to operate at the temperature of 85°C (BTV-CT prod. Pentair or equivalent).
- 4.11.3** For the protection against freezing and for the heating of all pipes and equipment, the highest operating temperature of which is up to 135°C with maintained temperature of 63°C, self-regulating heating cables will be used, designed to operate at the temperature of 215°C (XTV-CT prod. Pentair or equivalent).
- 4.11.4** For the heating of all pipes and equipment the highest operating temperature of which is up to 135°C with maintained temperature from 65°C to 93°C self-regulating heating cables may be used, designed to operate at the temperature of 215°C or cables insulated with mineral materials.
- 4.11.5** For the heating of all pipes and equipment systems that are regularly affected by steaming and the temperature lower than 135°C self-regulating heating cables will be used, designed to operate at the temperature of 215°C (XTV-CT prod. Pentair or equivalent).
- 4.11.6** For the heating of all pipes and equipment the highest operating temperature of which is higher than 135°C or maintained temperature is higher than 93°C the cables insulated with mineral materials will be used.
- 4.12 Mineral Insulation Cables of Electrical Heating**
- 4.12.1** The high temperature systems with mineral insulation cables shall be controlled with microprocessor based temperature controllers. All controllers shall have MODBUS interface for connection to remote control panel and DCS.
- 4.12.2** MODBUS address list and data list shall be provided in design of heat trace system.

- 4.12.3** The temperature sensors should be indicated in isometric drawings and location of it's should be selected very responsible and should be accepted by process part of design and OL. The additional sensors should be used in by-pass lines of pumps and other parts of pipes where different temperature can occurs than in main operated line.
- 4.12.4** The valves size DN200 (8") and more should be heated by separate segment of heating cable with possibility to dismount it. Heating cables shall be fixed before the flanges of valve.
- 4.12.5** The outer sheet of heating cables should be mechanically and corrosive resistance in all rage of operating temperature. Can't be used the cables with copper or copper included alloys outer sheets.