



INFRALEUNA®



Energy

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Energy

Modern networks supply our on-site companies with electricity, steam, gas, hot water and compressed air.

Are you thinking about relocating to Leuna or you already work there? We, InfraLeuna GmbH, will find ways to supply you with power tailor-made to your needs.

InfraLeuna generates electricity and steam for the power supply needs of its customers at the Leuna Site in a state-of-the-art gas and steam turbine.

The co-generation process coupled with a spare steam boiler guarantees you ecological and cost-effective power supply that meets your needs.

Our service begins with energy consultation; you can contact our experienced team to discuss issues pertaining to the energy aspects of planning, erecting or modernizing your plants.

A broad spectrum of energy resources are available at the Leuna site, including electrical energy in various voltages, steam at different pressure levels, hot water, compressed air, natural gas and ultra pure water for technical processes.

Maintenance, inspections and work on investment projects are other components of our services portfolio. We also offer these specific services beyond the site perimeters.

Our environmentally friendly supply networks boast flexible connection points. Nothing stands in your way, whether you are planning to locate at the site or expand or modernize your present facility.

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Energy

1. Main activities

1.1. Steam

InfraLeuna offers steam at varying pressure stages for supplying heat to plants and chemical processes:

- High-pressure steam,
- Medium-pressure steam,
- Low-pressure steam.

High-pressure steam is available for specialized processes.

Our medium-pressure steam network is available for reliable and effective supply of all needs as the main supply process heat system.

Our low-pressure steam network is available for virtually all needs (medium-pressure steam can also be reduced to meet supply needs).

In exothermic cases it is possible to return waste steam to the site network. The requirement for this depends on the parameters and the fulfilment of quality conditions as well as a minimum number of hours in which steam is returned annually.

Selected technical data:

| Network | Operating pressure | | Operating temperature | |
|----------|--------------------|------------|-----------------------|-----------|
| | Min [barg] | Max [barg] | Min [° C] | Max [° C] |
| HP-steam | 39 | 45 | saturated steam | 320 |
| HP-steam | 19 | 21 | saturated steam | 320 |
| MP-steam | 12 | 15 | saturated steam * | 320 |
| LP-steam | 1.7 | 2.3 | saturated steam | 210 |

* steam feed in temperature > 20 K over saturated steam temperature

The design parameters to be observed for the technical plant design have to be arranged between supplier and customer.

1.2. Hot water

InfraLeuna features hot water for effective heating of rooms and buildings and providing utility warm water.

A state-of-the-art district heating net operates in section I of the site as well as in parts of the town of Leuna.

Selected technical data:

| Network | Operating pressure | | Operating temperature | |
|-----------|--------------------|------------|-----------------------|-----------|
| | Min [barg] | Max [barg] | Min [° C] | Max [° C] |
| Hot water | 2.5 | 8.0 | 70 | 110 |

The design data to be kept for the technical plant design have to be coordinated between supplier and customer.

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1.3. Natural gas

Natural gas is available at various pressures for material and thermic uses.

Selected technical data (tu = ambient temperature):

| Network | Operating pressure | | Operating temperature | |
|-------------------------|--------------------|------------|-----------------------|-----------|
| | Min [barg] | Max [barg] | Min [° C] | Max [° C] |
| HP-natural gas - 55 bar | 25.0 | 55.0 | tu | 50 |
| HP-natural gas - 16 bar | 9.0 | 16.0 | tu | 50 |
| HP-natural gas - 4 bar | 2.0 | 3.5 | tu | 50 |

The design data to be kept for the technical plant design have to be coordinated between supplier and customer.

1.4. Air

ILE operates a compressed air and control air network (control air is dried compressed air with a dew point of -20 °C) for control processes.

The control air network is available throughout section II of the site.

The compressed air network is available for special supply tasks.

Selected technical data (tu = ambient temperature):

| Network | Operating pressure | | Operating temperature | |
|----------------|--------------------|------------|-----------------------|-----------|
| | Min [barg] | Max [barg] | Min [° C] | Max [° C] |
| Control air | 6,0 | 7.0 | tu | 50 |
| Compressed air | 6.5 | 8.2 | tu | 50 |

The design data to be kept for the technical plant design have to be coordinated between supplier and customer.

1.5. Electrical energy

Two grids are operated, at various voltages, from two independent infeeds at the 110 kV level.

Provision of electrical energy takes place at voltage levels:

- 30 kV,
- 6 kV,
- 0.4 kV.

The independency of the two grids guarantees high reliability of supply from the storage level (110 kV) to the outgoing level (0.4 kV). The two separate grids are differentiated by means of the indication „switchboard A” or „switchboard B”.

Frequency stability and a constant, around-the-clock current supply is ensured by links to the regional network and power plant storage on-site.

The 110 kV and 30 kV voltage levels are preferred transportation levels; 6 kV and 0.4 kV are the preferred distribution levels for electrical energy.

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We will jointly seek the most favorable voltage level and decide on how to interface power grid switchgear when electricity and reliability requirements are stated.

The on-site grid is a radial network, although the exit points could also be ring-shaped in the distribution and customer levels of 6 kV.

The use of modern technology (central energy grid guidance system) means that short reaction times can be guaranteed in the event of a disruption.

A central switching point constantly monitors and controls the power, steam, drinking water and natural gas networks to guarantee a safe and appropriate supply.

1.6. Provision of cable routes

Cable routes are available for the laying of customers' own cables at the InfraLeuna site (routes embedded in earth, laid-in cable or accessible canals).

2. Services offered

2.1. Energy plants

Advice on optimum chemical-physical operation of water-steam circuits (conditioning, monitoring, etc.);

We have longstanding experience in operating power plants which guarantees reliable and serious consultation with experts for operating gas turbines, steam turbines, compressors steam-boilers, heat exchangers, etc.

Advice on planning and effective use of the primary energy sources natural gas, heating oil (heavy and light) as well as other fuels in small plants, with regards to technical/technological aspects;

We take over the entire power plant operation.

2.2. Electrical networks

Advice on plant layout (e.g. for investments);

Advice on dimension calculation and laying out of electrical energy supply system;

Calculation of electrical grids (for example, provision of short-circuit current capability and transmission performance);

Monitoring and evaluation of energy-saving systems;

Planning, assembly, inspection and maintenance of measuring equipment and meters as well as advice on their optimal usage;

Implementation of tests for selectivity of network safety features employed;

Implementation of new settings and cyclical checking of setting values on protective relays in switching units;

Operation of power distribution units;

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Operation of switching units with:

- Implementation of switching operations, planned and in response to malfunction,
- Granting of permission for the carrying-out of work on switching units or connected equipment, as with secondary features (control, protection, directcurrent voltage),
- Implementation of checks on-site and maintenance work in switching units,
- Monitoring and implementation of tests;

Evaluation of malfunctions and advice on how to prevent them or reduce their effects;

Advice on optimizing maintenance tasks;

2.3. Pipe network

Maintenance of piping system for energy supply;

Starting up and shutting down pipelines and carrying out switching operations in pipeline networks;

Co-ordination of repair measures on piping, detection of malfunctions and testing work on repair procedures, where requested;

Support in the selection of sub-contractors for assembly;

Procurement and processing of necessary permits;

Care and maintenance of fittings, condensate pipes and piping;

Provision of connectors/transfer points on pipe bridges;

Assistance and support in preparation and realization of investments;

Monitoring and acceptance of works carried out on piping routes, during or after initial laying;

Statement of necessary piping identification according to regulations applicable on site;

Maintenance and operation of gas measurement and control devices including appropriate piping;

Maintenance and operation of customer's building connections to district heating network;

2.4. Measurement technology and measurement tests

2.4.1. Pipeline system, Power generation equipment

Qualified consulting in the field of automation engineering and data communication;

Assistance with task allocation, project work and assembly;

Taking over of maintenance, service and analysis of automation system;

Review and determination of accuracy of measuring chains

Parameter setting of flow rate measuring devices.

2.4.2. Power grid/Relay protection technology

Triphase record and analysis of the following physical values and processes: Voltage (AC up to 400 V, DC up to 700 V), Current, Phase angle $\cos \varphi$, Active and dummy work, Flicker, Frequency analysis, Harmonic oscillation analysis;

Examination of: Transient processes in the grid, Start-up procedure for motors, On-off switching procedures of large consumers.

Checkup of electrotechnical installations on a regular schedule;

Comprehensive knowledge and experience in the field of setting and calibration of electromechanical and digital protection relays in power networks, in particular: Dependent overcurrent time protection, independent overcurrent time protection, over and under-voltage relay, power direction relay, frequency relay, earthing direction relay, distance protection relay, balanced protection relay.

Consulting services for the development of concepts for relay protection as well as determining settings of protective relays.

2.4.3. Cable inspection

Implementation of cable inspection activities in accordance with quality and regulatory guidelines.

Our service program includes particularly:

- Cable malfunction detection in telephone cables, signal cables, control and heavy current cables up to 110 kV,
- High-voltage checks on ground wires up to 30 kV, as well as on plastic cables (with PVC-, PE- or VPE-insulation) up to 30 kV,
- Checks on sheathing and detection of sheathing failure in plastic cables,
- Use of measurement technology to determine cable course in cable routes,
- Determination of appropriate cables, cutting and checking for necessary repair work, laying and removal work in cable routes and cable stacks,
- Statistical presentation of high-voltage checks and evaluation of ground wire test results.