



production program

**KONČAR**



# KONČAR Group



**KONČAR Group consists of 17 companies and has around 4000 employees. Annual sales account for more than 300 million euros, with almost half the amount in exports. KONČAR products and services have been delivered to more than 100 countries on all the continents.**

Business and manufacturing activities comply with state-of-the-art manufacturing requirements as well as social responsibility principles. All the phases from acquisition of raw materials and components to delivery, assembly and after sales activities are harmonised with the Quality Management System and ISO 9001 Standards.

Rational usage of natural energy resources, appropriate disposal and recycling of the waste during the manufacturing process, protection of human and natural environment and continuous implementation of new technologies, including decreased negative influences, are only a part of everyday efforts made in KONČAR manufacturing processes meeting ISO 14001 Standards.

The Group continuously takes care of employees' satisfaction and the quality of working environment (OHSAS 18000 Standards), as well as cooperation with the local community.

The main corporative value is reflected in highly educated and expert employees oriented towards life-time education and skilling trying to achieve all the requirements not only of buyers, but also of the contemporary global market.

## Research and Development

Research and development of products and equipment represent a basis of independency of KONČAR Group regarding know-how and technology as well as a potential for cooperation with other complementary manufacturers. Research and Development is present in KONČAR - Electrical Engineering Institute and all Group's manufacturing companies and performed in cooperation with faculties and scientific institutions.

### **An in-house Institute enables:**

- Applied research and development of products implementing contemporary technologies;
- Testing and diagnostics of electric engineering products, equipment and plants;
- Checking of compliance and certification of electric engineering products and equipment;
- Supervision and counselling during construction of facilities for generation, transmission and distribution of electric power



# Power Engineering



## Hydro Power Plants

### HPP construction on a “turnkey” principle

Design, delivery, installation, supervision and commissioning

- Overall electrical plants (generators, transformers, high voltage and medium voltage switchyards, excitation systems and voltage regulator, auxiliary supply etc.)
- Central computer control systems of hydro power plants, automatic control and protection systems of the powerhouse, switchyards and dams, metering and signalization systems
- Computer control and optimization of cascade plants operation at basin and production area levels

## Transformer Substations (AIS and GIS)

### Construction on a “turnkey” principle

- S/S for power transmission systems up to 420 kV
- S/S for power distribution systems





## Electric Power Plants

**applicable for TPP, GPP, industry, water supply, production and transport of oil and gas**

### **Construction on a "turnkey" principle**

Design, delivery, installation, supervision and commissioning

- Overall electrical plants (generators, electromotive drives, transformers...)
- Switchgears, auxiliary systems, AC and DC power supply systems
- Instrumentation systems, protection, control, metering and signalization systems



## Services Related to Electric Power Plants

- Conceptual solutions and design
- Site management, coordination of works on site and commissioning
- Preventive and corrective maintenance of plants
- Refurbishment and upgrading of plants

# Rotating Machines



## Hydro Generators

Rated output from 500 kVA up to 300 MVA

- Generators for Francis, Kaplan and Pelton turbines
- Bulb-type generators
- Motor-generators
- Generators for small hydro power plants

## Turbo Generators

Rated output from 5 MVA up to 200 MVA



## Wind Turbine Generators

Rated output 1 MW and 2.6 MW



## Excitation Systems and Voltage Regulators for Synchronous Generators

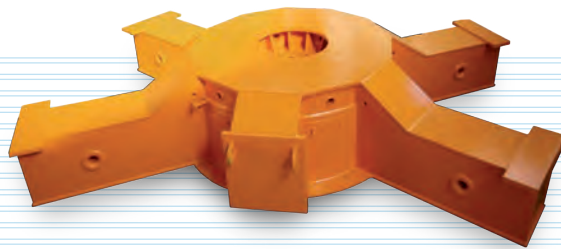
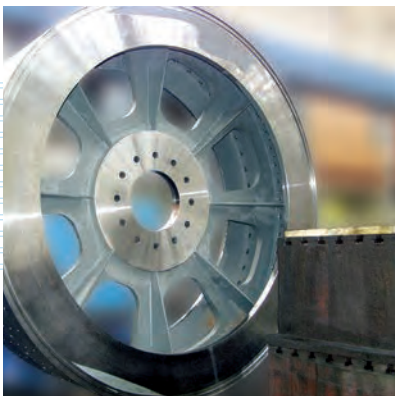
- Digital regulator (AVR)
- Excitation converter - with natural or forced cooling (air or water)
- Excitation transformer
- De-excitation circuit and overvoltage protection
- Field flashing
- Equipment for electrical braking (HPP)





## Condition Monitoring Systems for Rotating Machines

- Modular integrated computer systems
- Continuous and intermittent measuring including trend analysis
- Increased security through forecasting and early fault detection
- More efficient property management
- Increased reliability and operating life of equipment



## Generator Steel Components

- Welded generator and high voltage electrical motor components (generator stator frames, pole wheels, rotor spiders, bearing supports)



## Maintenance, Overhauls, Rated Power Increase, Refurbishment and Upgrading

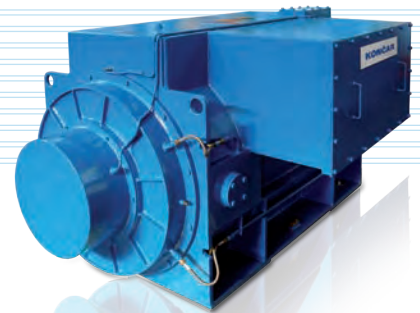
# Rotating Machines



## Synchronous Motors

**Synchronous motors over 500 kW, applied to:**

- Constant rotation speed and reactive power compensation
- Electric motor drives for pumps, fans, compressors, mills, crushers and similar



## Water Jacket Cooled Motors

Designed for application in speed and torque regulated drives for ship propulsion, winches, other regulated drives with rated output of 350-4800 kW and rated voltage of 400-690 V

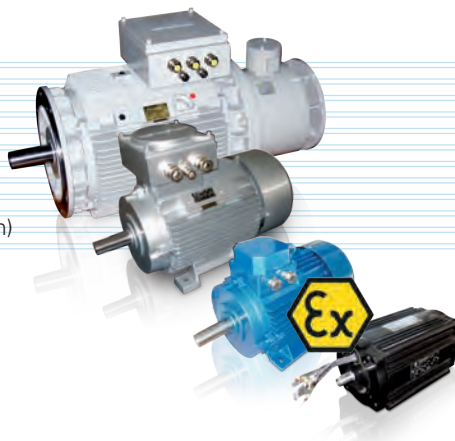


## Asynchronous Motors

LV and HV squirrel-cage and slip-ring motors applied in pumps, fans, compressors, transporters, crushers, propulsion, traction, irrigation systems, plants, pumping stations, process industry, etc. Voltage up to 13.8 kV, rated output 160-15000 kW

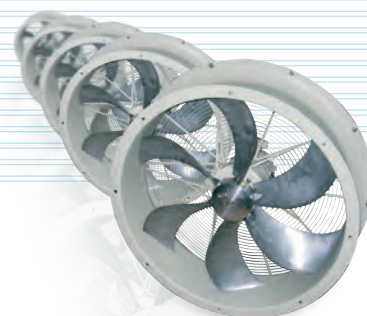
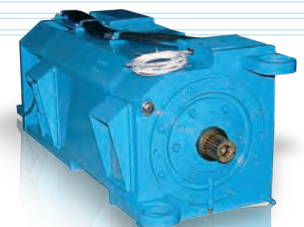
## Electric motors

- Three phase squirrel cage induction motors up to 200 kW and shaft height 315 (IEC standards and special design)
- Complete program available in ATEX
- High and premium efficiency IE2 and IE3
- Multi speed motors
- Marine design motors Winch motors
- Electric motors for high temperatures
- Single phase induction motors up to 2,5 kW
- Induction motors with fail-safe electromagnetic brakes
- Brushless AC servomotors
- Special electric motors and drives (control cabinets, complete solutions)



## Traction Motors

AC squirrel-cage motors fed through frequency converter with rated output 65-525 kW



## Fans

- Axial fans up to diameter 1600 mm
- Centrifugal fans up to inlet size 1120 mm
- Special fans for transformer cooling up to size 1250 mm



# Transformers



## Power Transformers

- Generator transformers rating up to 800 MVA, rated voltage up to 550 kV
- Large transmission transformers and autotransformers rating up to 800 MVA, rated voltage up to 550 kV
- HVDC up to 550 kV

## Distribution Transformers

- Medium power transformers and autotransformers rating 5 to 100 MVA, rated voltage up to 170 kV
- Oil-immersed distribution transformers with rated power up to 2500 kVA, rated voltage up to 36 kV
- Dry-type transformers with rated power up to 5000 kVA, rated voltage up to 24 kV



## Special Transformers

- Transformers for railways
- Traction transformers (locomotive transformers)
- Furnace transformers
- Rectifier transformers
- Earthing transformers
- Transformers for mines



## Instrument Transformers

- Current transformers for 72,5 up to 800 kV (insulation paper-oil or gas)
- Potential transformers for 72,5 up to 550 kV (insulation paper-oil or gas)
- Capacitive transformers for 72,5 up to 800 kV
- Combined transformers for 72,5 up to 550 kV (insulation paper-oil or gas)
- Current and potential transformers for GIS up to 550 kV
- Medium voltage current and potential transformers up to 40,5 kV (insulation paper-oil or epoxy)
- Low voltage current transformers
- Special transformers



## Transformer Monitoring System

- Detects failures during appearance preventing and/or decreasing their consequences and unplanned faults
- Enables condition based maintenance
- Increases human safety and environmental protection
- Provides for valuable analysis data in case of faults
- Enables life time estimation and better transformer management

## Transformer Tanks and Steel Components

# Switchgear



## High Voltage Apparatus and Switchgear

- Circuit breakers (live tank and dead tank), up to rated voltage of 550 kV
- Disconnectors and earthing switches, up to rated voltage of 550 kV
- Metal-enclosed gas-insulated switchgear, up to rated voltage of 170 kV

## Medium Voltage Apparatus and Switchgear

- Switchgear with withdrawable vacuum circuit-breakers, rated voltage of 7.2 - 38 kV
- Metal-enclosed gas-insulated modules, rated voltage of 24 - 38 kV
- Gas-insulated ring main units with vacuum interrupters in each apparatus, compact and modular type, rated voltage of 12 - 24 kV
- Three-pole and single-pole disconnectors for indoor and outdoor installation & earthing devices, rated voltage of 12 - 38 kV



## Low Voltage Apparatus, Switchgear, Control Cubicles, Boards and Panels

- Low voltage switchgear for reactive power distribution and compensation
- Control cubicles, boards and panels
- Rotary cam switches (of the rated current from 10 to 1200 A)
- Moulded case circuit breakers up to 1250 A
- Contactors, overload relays and motor protection switches
- Fuses and fuse holders
- Control and signal devices, line up terminals and post insulators



## DC Uninterruptible Power Supply Systems for 24, 48, 60, 110 and 220 V DC

- Highly reliable integrated power supply systems
- Modular rectifiers in redundant parallel mode
- Integrated maintenance - free batteries
- Battery protection against short circuit, deep discharging and inadequate charging
- DC distribution board with fully selective circuit breakers
- Insulation monitoring and ground fault locating
- Real time local and remote monitoring and control

# Control Systems and ICT



## Control Systems in Energy, Transport and Industry

- Dispatching control centers (SCADA)
- Systems for network analysis (DMS/EMS/GMS/AGC, load forecast, security analysis, „What If“ analysis, control of losses)
- Protection and control systems in substations (IEC 61850)
- Local control and automation (DCS, load shedding, emergency shutdown)
- Automatic meter reading and infrastructure

## Software Development and Implementation for Utilities

### Systems for support of business processes in energy and water market

- Electrical energy - Market Management Systems, System planning, optimization and production planning, Outage Management System, Quality of Supply
- Gas - Commercial dispatching systems for transport capacities and supply
- Water - Water Leakage Management, commercial dispatching of water wells

## Integrated Computer Systems in

- Rail vehicles
- Wind turbines
- Monitoring systems
- Autonomous sources
- Advanced networks
- Hydro and thermal power plants



## Systems and Devices for Protection, Control and Smart Measurement

### Numerical protection / feeder terminal devices for MV power systems:

- Protection, measurement and control
- Fault analysis

### Temperature monitoring devices and systems for:

- Generators and Motors
- Power Transformers

### Ripple control systems

- for MV grid

### Smart measurement systems:

- Automated meter infrastructure
- Wireless local and long distance networks
- Wireless monitoring systems for pressure, temperature and other process parameters
- Centralized monitoring and optimization of consumption

### Business & networking SW solutions

- Business Information Systems (HRM, MIS, BIS)
- Design and implementation of computer networks (LAN, WAN)

### IT equipment

- Personal computers
- Laptops
- Servers
- Industrial Computers
- UPS - Uninterruptible Power supply Systems



# Transport



## Vehicles

- EMU (Electric Multiple Units)
- Tramcars
- Electric locomotives
- Modernisation

## Engineering in transport

### Electric traction line-side equipment

- Transformer substations for power supply
- Line-side equipment remote control centres
- Line-side transformer substations
- Reactive power compensation plants

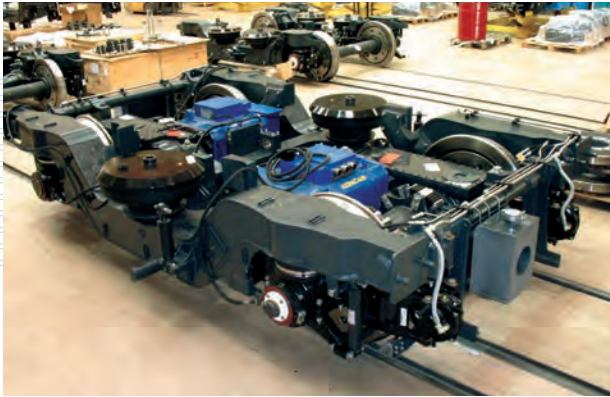
### Equipment for railway infrastructure and stations

- Signalling and safety devices
- Point machine heating devices
- Sectioning posts
- Level crossings

### Motorway electrical equipment

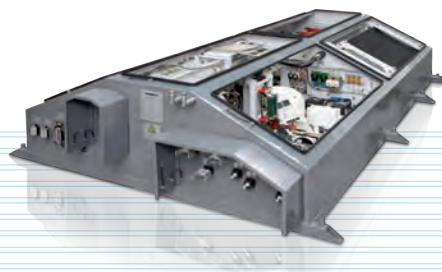
- Transformer substations for power supply of motorways (signalisation, tunnel ventilation, etc.)





## Vehicle Equipment

- Traction motors
- Auxiliary drive motors
- Transformers
- Powered and running bogies



### Electronic vehicle equipment

- Propulsion converters for EMUs and DMUs, tramcars and locomotives
- Auxiliary power supply converters and battery chargers for EMUs and DMUs, tramcars, locomotives and passenger coaches
- Control systems



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Končar - Electrical Industry Inc.

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