KONČAR worldwide
Century of excellence on markets worldwide
Solutions, products and services delivered to 130 markets.
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KONČAR Group consists of 15 companies and almost 3500 employees. Our core business areas include energy, power engineering, transport, industry, digital solutions, renewable energy sources, research, development and innovations, laboratory testing and certification.

Our business activities rely on state-of-the-art manufacturing and strong social responsibility principles. All phases of our production cycle, delivery, installation and after-sales activities are aligned with the highest professional standards. We are committed to responsible usage of natural energy resources, appropriate waste disposal and recycling, protection of human and natural environment, and continuous development and implementation of new technologies. In order to best respond to customer needs and challenges of contemporary global markets, we have built a team of highly educated experts, and we foster lifelong learning and upskilling of all our employees.

Research, development and innovation drive our business, providing us with expertise, competences and technology required to carry out projects independently or with partners. Focused on digital transformation, we are setting the course for cyber security solutions.
Through several decades of experience, numerous references, and by keeping-up with modern technical and technological development trends, we have become successful and efficient in implementing turnkey projects involving design, construction and refurbishment of the most-complex electric power facilities and plants in Croatia and worldwide.

Through our own development and business cooperation with domestic and foreign partners, we have mastered all necessary knowledge required to provide full engineering services pertaining to construction of hydro power plants and substations, and to equip thermal power plants, biomass power plants, cogeneration plants and facilities using renewable energy sources.

Our engineering activities in the field of power engineering rely on primary (generators, transformers, switchgear) and secondary electrical equipment products (excitation systems, metering, protection and control devices, automatic control systems) not only from the KONČAR group production programme, but also from other globally renowned manufacturers.
Hydro power plants

Turnkey projects

- Project realization management
- Design and coordination of technical documentation preparation
- Equipment production, delivery and installation
- Testing and commissioning
- Training of client’s staff
- Plant maintenance (management)
- Refurbishment, expansion and retrofitting

Hydro power plant in Slovenia
Substations

Transmission and distribution system operators are facing a variety of diverse challenges arising from continuous growth of the energy industry and increasing demand for renewable energy sources. We are specialized in complex market and industry-specific solutions and deliver turnkey projects to meet the needs of the global energy industry.

We offer custom-made solutions, construction, reconstruction, refurbishment and retrofitting of transmission and distribution power facilities within voltage ranges up to 400 kV for AIS and 220 kV for GIS.

Our solutions include:
• Equipment manufacturing
• Secondary control and protection systems
• Metering
• Telecommunications
• Proprietary programming solutions for supervision, control and diagnostics
Substation in the south of Croatia
Electric power plant services
Engineering
Expertise and experience in turnkey project management.

Maintenance
Continuous plant maintenance and servicing in order to extend the useful life of equipment.

Training
Workshops designed to provide in-depth theoretical and practical understanding of the plant and installed systems.

Technical support
Technical on-site support with 24/7 maintenance service upon project completion.
Synchronous machines

Hydro generators

- Rated output ranging from 300 kVA to 300 MVA, rated voltage up to 18.5 kV
- Large generators
- VPI, Global VPI and RR insulation systems
- Generators for Francis, Kaplan, Pelton and Saxo turbines
- Bulb-type generators

- Reversible motor–generators
- Compact generators for small hydro power plants
- Overhauls, servicing and current state assessment for all generator types
- Power upgrade and refurbishment of all hydro generator types
HPP Binga, 4x41.2 MVA (power upgrade from 27.8 MVA), Philippines
HPP Brežice,
3x21.5 MVA, Slovenia
New compact generator for HPP Haunoldühle in Austria
Turbo generators

- Major overhaul
- Maintenance
- Service and delivery of replacement parts
- Available for turbo generators manufactured by KONČAR or by other manufacturers

Wind turbine generators

- Rated output of 1 MVA and 2.6 MVA

Special synchronous generators

- Diesel engine-driven generators for nuclear power plants, shipbuilding industry and other
- Motor-generators for testing stations
Excitation systems and voltage regulators for synchronous machines

- Digital regulator (AVR)
- Excitation converter - with natural or forced cooling (air or water)
- Excitation transformer
- De-excitation circuit and overvoltage protection
- Field flashing
- Electrical braking (HPP) equipment
Condition monitoring systems for rotating machines

- Online condition monitoring systems for all types of rotating machines
- Real-time protection based on international standard (ISO 20816 – Mechanical vibration)
- Modular and customized solution for a new or an existing machine
- Early fault detection and failure prevention

Synchronous motors

- Constant rotational speed and torque
- Reactive power compensation
- Electric motor drives for rolling mills and compressors
- Rated output from 500 kW up to 10 MW

Welded and machined generator components

- Welded and machined generator and high-voltage electrical motor components, (generator stator frames, brake rings, fans, pole wheels, rotor spiders, bearing supports, brackets)
- Welded generator and motor steel components for nuclear power plants
Machine Condition Monitoring – MCM

Pole wheel
Asynchronous machines

Explosion-proof motors

- Designed for oil and gas industry and mining
- ATEX motors with Ex protection "d", "e", "p", "n"

Motors with special water cooling

- Designed for application in speed-regulated drives (ship propulsion, winches, pumps)
- Rated power from 315 kW to 3800 kW, rated voltage from 400 V to 690 V
Asynchronous motors and generators

- HV and LV squirrel-cage and slip-ring motors for pumps, fans, compressors, crushers, conveyers, propulsion, thrusters, winches and traction
- Asynchronous generators for small HPPs
- Rated power from 160 kW to 10 MW; rated voltage up to 13.8 kV

Shaftless motors

- Compressors for plastics industry
- Rated output from 160 kW to 550 kW; rated voltage up to 6 kV
Low-voltage motors and fans

Asynchronous motors

- Three-phase asynchronous induction motor, power up to 200 kW (efficiency IE1/IE2/IE3/IE4)
- Single phase asynchronous induction motor, power up to 2.5 kW
- Other versions: multispeed motors, motors with brake, winch motors
- Special design – stainless steel housing three-phase asynchronous induction motors up to 1.5 kW
- Synchro reluctance motors (efficiency IE4/IE5)
- Electric motors for marine application (with type certificate: CRS, BUREAU VERITAS, RMRS)

Explosion-proof motors

- Explosion protected motors, power up to 200 kW (efficiency IE1/IE2/IE3/IE4) in protection type: “db”, “eb”, “ec”, “tb”, “tc”
- Certificate: ATEX, IECEx, TR CU (EAC)
- Explosion protected motors for marine application (type certificate: CRS, BUREAU VERITAS, RMRS)
Fans

- Axial fans from 315 to 1600 mm diameter
- Centrifugal fans from 160 to 1120 mm diameter
- Special transformer cooling fans and fans for HVAC application
- Special industrial solution in ventilation
- Explosion protected fans in protection type „h“ (certificates ATEX)
- Fans for marine application (with type certificate: CRS, BUREAU VERITAS, RMRS)
Transformers

Power transformers (mineral oil or alternative liquid)

- Generator transformers, transmission transformers and autotransformers up to 1,000 MVA, rated voltage up to 550 kV.
- HVDC power transformers up to 550 kV.

HVDC converter transformer delivered to New Zealand.
Medium power transformers

Rated power up to 160 MVA and voltage up to 170 kV

- With on-load tap changer
- With off-circuit tap changer
- Without regulation tappings
Distribution transformers

Oil-immersed distribution transformers, rated power up to 8000 kVA and voltage up to 36 kV

- Standard transformers with off-load regulation
- Transformers with on-load regulation
- Transformers with low electromagnetic radiation
- Amorphous core transformers
Special transformers

- Earthing transformers
- Converter transformers
- Transformers for locomotives and EMUs
- Furnace transformers
- Vibration-proof transformers
- Transformers with reduced width for installation in wind turbine towers
- Transformers for offshore application
- Autotransformers
- Transformers for mobile substations
- Traction transformers for fixed installations
- Dry-type transformers, rated power up to 5000 kVA and voltage up to 24 kV
- Reactors for compensation, metallurgical plants, rectifying devices, short-circuit and ground-fault current limitations
Transformer and reactor diagnostics, servicing and repairs
Earthing transformer, rated power 500 kVA
Three phase oil immersed transformer, rated power 40 MVA
Instrument transformers

- Current transformers from 72.5 to 800 kV
- Inductive voltage transformers from 72.5 to 550 kV
- Capacitor voltage transformers from 72.5 to 800 kV
- Combined transformers from 72.5 to 550 kV
- Power voltage transformers from 72.5 to 550 kV // from 10 to 333 kVA
- Earthing reactors for HVDC systems from 72.5 to 550 kV
- Medium-voltage current and voltage transformers up to 52 kV
- Low-voltage current transformers
- Special transformers for laboratory purposes
Combined transformers
245 kV for Austria
Current transformers 420 kV for Bulgaria
Current transformers 525 kV for Russia
Transformer monitoring system

• Online condition monitoring systems for all types of power transformers and shunt reactors
• Modular and adaptive solutions for new and existing transformers on the market
• Monitors and checks all vital transformer components (bushings, active parts, OLTC and cooling system)
• Asset management: condition assessments, diagnostics and fleet wide prognostics
Transformer tanks

- Customer-specific transformer tanks for large (LPT) and medium (MPT) power transformers
- Capable of meeting the highest demands such as of shore, low-temperature exploitation, girder tanks and HVDC tanks
Switchgear

High-voltage switching apparatus and switchgear

- High-voltage circuit breakers, rated voltage up to 145 kV, 8E1 series
- Disconnectors and earthing switches, rated voltage up to 420 kV, CB-N2 and Z series
- Metal-enclosed gas-insulated switchgear, rated voltage up to 145 kV
Medium-voltage switching apparatus and switchgear

- Air-insulated MV switchgear, metal-enclosed and compartmented, for rated voltages up to 7.2 kV, 12 kV, 24 kV and 38 kV, BVK series
- Metal-enclosed gas-insulated compact switchgear modules for primary distribution of electrical energy, for rated voltages up to 24 and 38 kV, KSMV and KSMA series
- Metal-enclosed gas-insulated ring main units (RMU) for secondary distribution of electrical energy, rated voltage up to 24 kV, VDA, VDA and VDAP series
- Factory pre-assembled concrete and containerised substations for secondary distribution of electrical energy in distribution and industrial networks, types KTS and VTS
- Vacuum circuit-breakers, rated voltage from 12 to 38 kV, VK and VK∑ series
- Three-pole and single-pole disconnectors for indoor installation, rated voltage from 12 to 38 kV, RU series
Numerical protection

feeder terminal units for MV power systems

- Protection, measurement and control
- Fault analysis
BVK 12 switchgear installed in the United Arab Emirates Substation for secondary distribution of electrical energy, motorway in Croatia
Gas-insulated MV switchgear KSMV24 installed in Croatia
Low-voltage power distribution cabinets

- Low-voltage switchgear VMF series, with fixed apparatus groups and VMI series with withdrawable apparatus groups for power distribution and industry-related applications
- Low-voltage switchgear VMF-K series, with fixed apparatus groups, intended for reactive power compensation
Uninterruptible power supply systems for 24, 48, 60, 110 and 220 V

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

Remote critical infrastructure monitoring and control

- Development of process information systems for automatic monitoring and regulation of facilities in the energy industry, gas distribution and transmission, water management and drainage, district heating and transport sectors and superordinate dispatch control centres
- Predictive equipment maintenance and maintenance process management
Flagship projects

KONČAR Digital Platforms – PROZA HAT and MARS (Meter Data Management Software)
Electric power facilities

Comprehensive solutions for automation of substations, hydro power plants and renewable energy sources, and cyber security for remote data access.

Telecommunication and network infrastructure

Design and implementation of telecommunication and network infrastructures intended for local and remote control at all levels.

Advanced metering systems

- Advanced metering systems
- Industrial Internet of Things
- Wireless local and long-distance networks
- Systems for wireless monitoring of pressure, temperature and other process parameters
- Centralized monitoring and consumption optimization
Development of microgrid-related software solutions

PROZA MEMS Microgrid energy management system

- System for microgrid planning, optimization and generation
- Battery storage system optimization
- Electric vehicle charging stations
- Advanced metering/Industrial Internet of Things software platform
- Grid connection and voltage regulation
• Highly-scalable, flexible and extensible – can be adapted as your microgrid configuration changes and supports up to 100% renewable energy systems
• Cybersecure – it supports multi-layer password protection, encrypted data, VLANs for traffic segregation, firewalls and smart switches in accordance with IEC 62443

• Self-renewable microgrid – maintains system integrity, reliability and stability should a power generation source go off-line
• Applying experience from successful H2020 research projects dealing with flexibility and active demand response
Automatic Generation Control (AGC)

- PROZA AGC system, developed in-house
- Load frequency control (LFC) for transmission system operators (TSOs)
- LFC and automatic schedule execution in generation control centres (GCCs)
PROZA AGC functionalities include:

- Input and output data pre-processing
- Control area and control block support
- Unlimited sources for input measurement
- Imbalance netting support
- PI regulation algorithm
- Priority order list for AGC unit selection
- Optimal power distribution based on AGC price
KONČAR’s development, design and manufacture of rail transport equipment dates back to 1949, when the company developed the electric traction motor for trams. Ever since then, KONČAR has been continuously present in the rail transport industry.

Today, KONČAR is involved in development, design, manufacture, retrofitting and maintenance of rolling stock intended for railway, industrial and urban transport. This includes electric locomotives, electric-motor and diesel-electric trains, and trams. In addition, we also design, develop and manufacture components and subsystems for rolling stock, such as power and instrument transformers, control and communication systems, static voltage converters for main and auxiliary drives, control, switchgear, protection and signalling devices, traction and other electric motors, as well as steel structures of car bodies and bogie frames.
Our solutions include:
• Rail systems
• Rail vehicles
• Components and systems for rail vehicles
• Rail infrastructure

Vehicles
• EMU (Electric Multiple Units)
• DMU (Diesel Multiple Units)
• Trams
• Electric locomotives
• RV retrofitting
Three-module low-floor tram for Liepāja, Latvia

Five-module low-floor tram TMK2200
Modernised locomotive for Croatian railways
Rail infrastructure engineering

Electric traction

- Electric traction substations
- Reactive power compensation plants
- Overhead contact line sectioning plants
- Local and remote control
- Coach preheating and air-conditioning devices
- Rectifier station
Railway traffic safety

- Level crossing protection and signalling devices
  - Electronic devices for the KLC3 system for protection of road-to-rail level crossing
  - Safety human-to-machine interface - SafeHMI and safety input-output device - SafeI/O
  - Electrohydraulic drive for half-barrier
- Point heating systems
- Power supply for safety and signalling devices
- Track circuits for control of insulated and short section occupancy

Infrastructure facilities

- Substations in the proximity of infrastructure facilities and major roads
DC traction power supply system

- Compact DC switchgear with integrated rectifier
- Nominal voltage of 750 V, nominal busbar current up to 4,000 A
- Metal-enclosed withdrawable feeder 2,600 A
- Twelve-pulse diode rectifier up to 3,000 A
Electronic equipment for vehicles – Control systems

- Train Control and Management Systems (TCMS)
- Energy Metering Systems (EMS) for electric rolling stock

Components of a train control and management system
Electronic equipment for vehicles – Rolling stock converters and traction motors

• Propulsion converters for electric and diesel-electric trains, trams and locomotives
• Self-consumption inverters and battery chargers for electric and diesel-electric trains, trams, locomotives and passenger rolling stock

Traction motors

• Asynchronous squirrel-cage motors
• Rated output from 65 to 525 kW
KONTRAC GP550DE – propulsion and auxiliary converter for diesel-electric multiple unit trains

KONTRAC GP550AC – propulsion converter for electric multiple units

KONTRAC GP170DC – propulsion converter for trams
Renewables and environment

Wind power plants (WPPs)

Planning, design and maintenance

Wind turbine control system

- Modular embedded computer system
- High level of vibration and EM resistance
- Independent blade control and management
- Diagnostics and visualisation tools
- Advanced control algorithms
PROZA and RTGO for WPP control, monitoring and predictive maintenance.
Frequency converter

- Robust and compact design (high power density)
- Fully automated control
- Remote monitoring
- Reactive power control
- Generator excitation system integrated in the converter

Wind turbine monitoring

- Independent embedded computer system
- Continuous monitoring of structure conditions by measuring vibrations, stress and electric system values
- Early detection of non-permissible and potentially dangerous conditions
- Operation analysis and optimization
Small Hydro Power Plants

Turnkey projects – electrical and mechanical equipment

• Generator and turbine
• Control, measuring, protection and remote control
• LV and MV plants
• Hydro-mechanical equipment – water intake
Solar Photovoltaic Power Plants

• Turnkey projects – photovoltaic power stations with a central inverter
• Project contracting based on the principles of functionality and integrity
PROZA and RTGO for SPPP control, monitoring and predictive maintenance

KonSol – converter equipment in a container at a SPPP in Croatia
Modular central inverter equipment

- Two independent parallel inverters up to 1.5 MW
- Connection to a 10 or 20 kV network via a transformer and SF₆ MV switchgear
- Compact turnkey solution integrated in a container
- Remote control and monitoring
- Low transportation, installation and maintenance costs

Cubicle-integrated power converters

- High-power converters with various modes of operation
- Easy integration into smart grid solutions
- Advanced power plant monitoring
KonSol – converter equipment in a container at a SPPP in Croatia

Power converter
Smart Environment

Electromagnetic field monitoring system

• Continuous monitoring of electromagnetic non-ionising radiation from all sources (radio, TV, telecommunications)
• Easy and intuitive web access allows local communities to monitor electromagnetic pollution
• Results facilitate dialogue and understanding between telecom operators and local communities
• Autonomous power supply through photovoltaic panels
Air quality monitoring system

- Continuous monitoring of gases and particles in the environment
- Electromagnetic field system extension within the same web platform
Laboratory Center

- Accredited in accordance with requirements of standard EN ISO/IEC 17025
- Established to help tackle global market demands
- Its operation is based on 60 years of experience, the competencies of experts, quality and speed, and modern testing and metering equipment
The Laboratory Center consists of eight laboratories equipped and trained to carry out various testing and calibrating methods in accordance with requirements of international standards and technical specifications.
It offers services in the following areas:

- High-voltage and low-voltage power equipment
- Cables
- Material properties (physical, chemical, electrical, magnetic)
- Environmental impact
- Electromagnetic compatibility
- Electrical safety

- Radio equipment
- Gas appliances
- Electromagnetic field sources
- Low-voltage electrical installations and lightning protection systems
- Acoustics (noise)
- Calibration of measuring and test equipment