

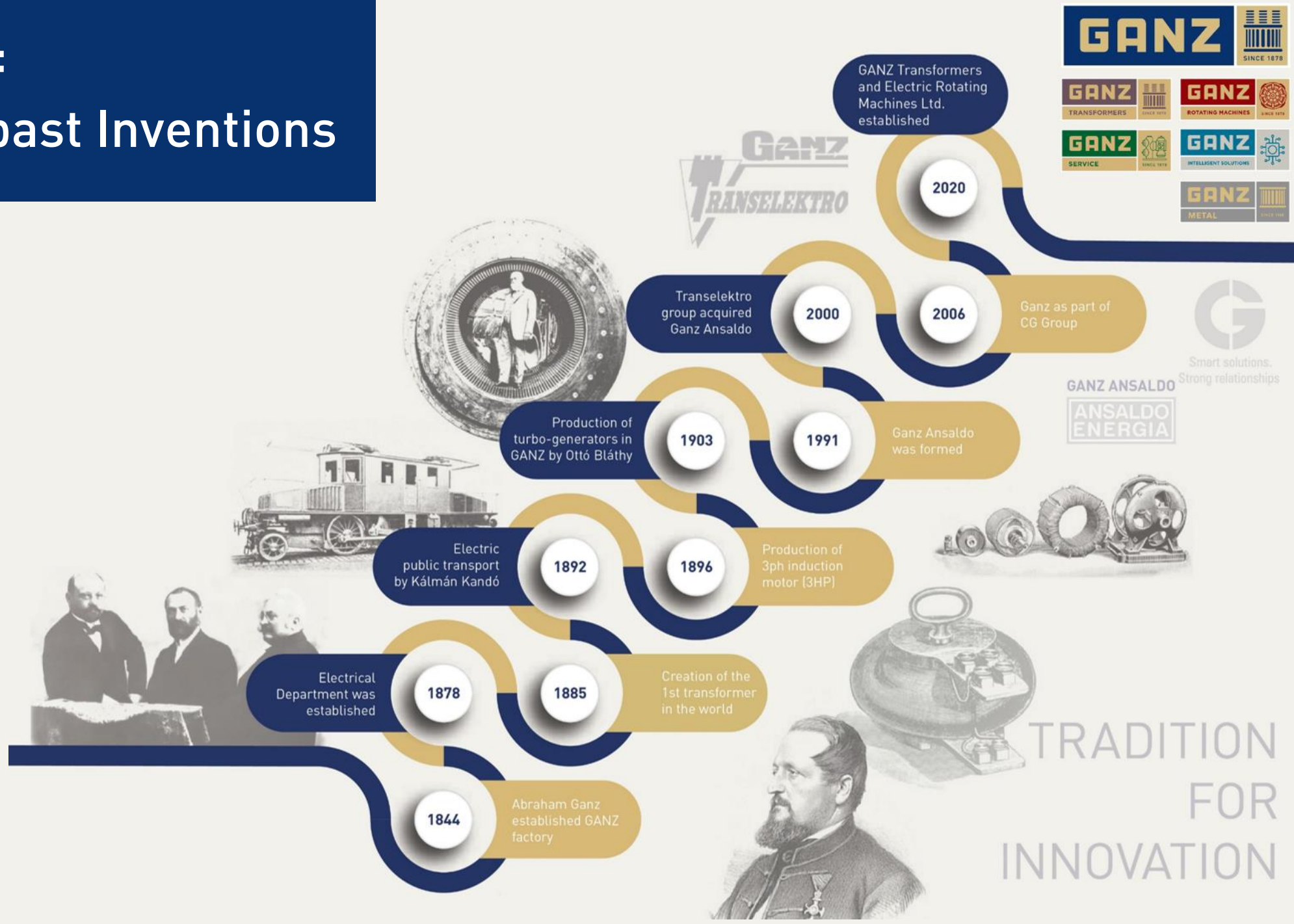


„TRADITION FOR INNOVATION“

Brief introduction to GANZ

**Ganz Transformers
and Electric Rotating Machines Ltd.**

GANZ History: The glorious past Inventions



TRADITION
FOR
INNOVATION



GANZ today

Renowned European manufacturing company
GANZ is a 100% Hungarian traditional brand, providing high engineered electrical products and solutions since 1878.

**State of the Art technology provides
standardized and custom based
solutions**

helping its customers with strong engineering,
production and service capability

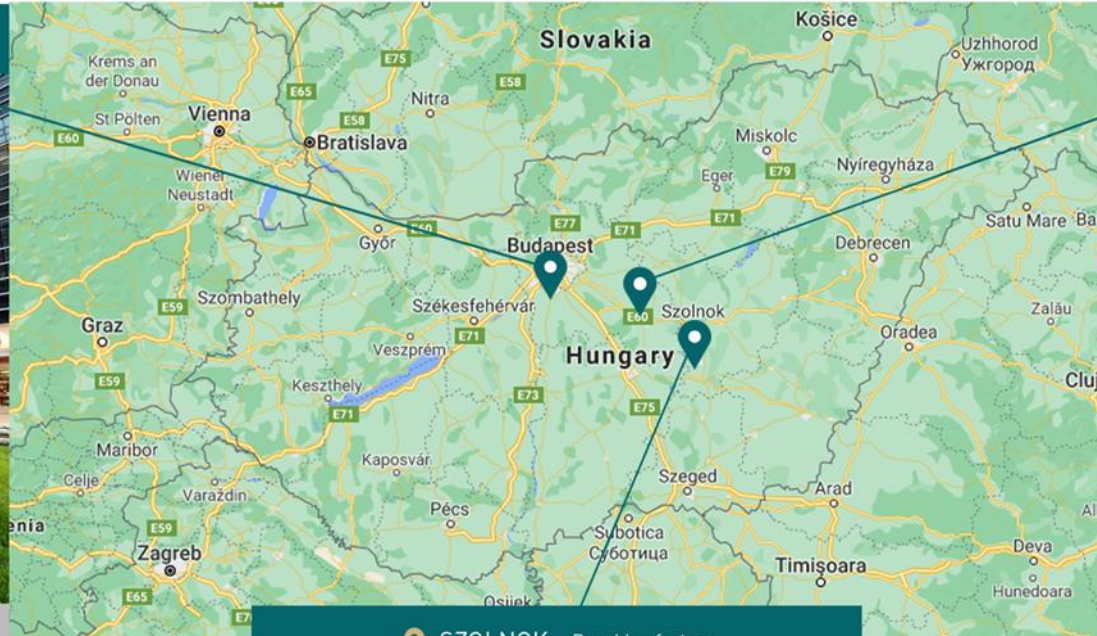
Unique & diverse portfolio

- Power Transformers
- MV Induction Motors
- Synchronous Generators
- Services

GANZ locations

The base of production remains at Tápiószele site, as one of the most modern heavy machinery facilities in Europe. (41000 m² factory)

 **BUDAPEST** Central Administrative Functions | Sales | Design | Purchase



 **TÁPIÓSZELE** Transformer and Rotating Machines Factory – 41.000 m²



 **SZOLNOK** Punching factory

1095 Budapest, Soroksári út. 30-34.

- Central administrative functions (Head Office)
- Finance, PM
- Sales
- Design

Szolnok – Metal Works

- Metal factory
- Steel structure manufacturing

2766 Tápiószele, Györgyei út 14.

- Transformer, Electric Rotating Machine manufacturing
- Purchasing
- Service
- Logistics

GANZ factory

The base of production remains at **Tápiószele** site, about 90 km from Budapest, as one of the most modern heavy machinery facilities in Europe.
(41000 m² factory)



Product scope



63 - 600 MVA
72,5 - 800 kV



Asynchronous Motor
500 kW - 20 MW
Synchronous Generator
1 - 70 MVA



Services of
Transformers,
Rotating Machines,
GIS



GANZ
Intelligent Solutions
monitoring system

GANZ Transformers



Production range: 63 - 600 MVA

Voltage: 72,5 - 800 kV

Frequency: 16,7 - 60Hz

Annual capacity: 10 000 MVA

Equipment limits:

Core Stacking: 200 t

Winding diameter: 3000 mm

height: 3000 mm

weight: 20 t

Crane capacity: 240 t
(limit for active part only)

High engineered Transformer solutions



1. Tailor made designs
2. TCO optimizing
3. Low noise power transformers
4. Biofluid immersed transformers
5. Hybrid insulation systems
6. Short-circuit withstand ability
7. Special applications
 - › Trackside transformers
 - › Transformers for mobile substation



Total Cost of Ownership

Examples to reduce TCO

■ Purchase price

Consult the customer to understand the real needs together and offering the most economical solution

■ Cost of no load and load losses

New core materials with maximum 0.7 W/kg
Stray and load losses analysis with 3D model

■ Cost of commissioning

Supervisor from factory
Fully or semi-assembled transport
Own oil treatment machinery on site

■ Lifetime and reliability

Controlled PD level
IEC req. < 250pC, usual req. < 100pC
We've met German req. < 50pC
Dust and humidity controlled winding shop
Hot Spot temperature calculations
VPD and drying process
Quality materials: TUP, Aramid, Biofluid

■ Maintenance cost

Maintenance free breathers
MR Vacutap OLTC
RIP-RIS and plug in type bushings
Various monitoring systems
Guaranteed surface protection even upto 7 years



GANZ Rotating Machines - Product portfolio



ELECTRIC MOTORS



500 kW - 20 MW
Induction Motors

GENERATORS



1 - 70 MVA
Synchronous Generators

SERVICES



Motor & Generator
Refurbishments

RM: Capabilities and market

Generators
upto 50MVA

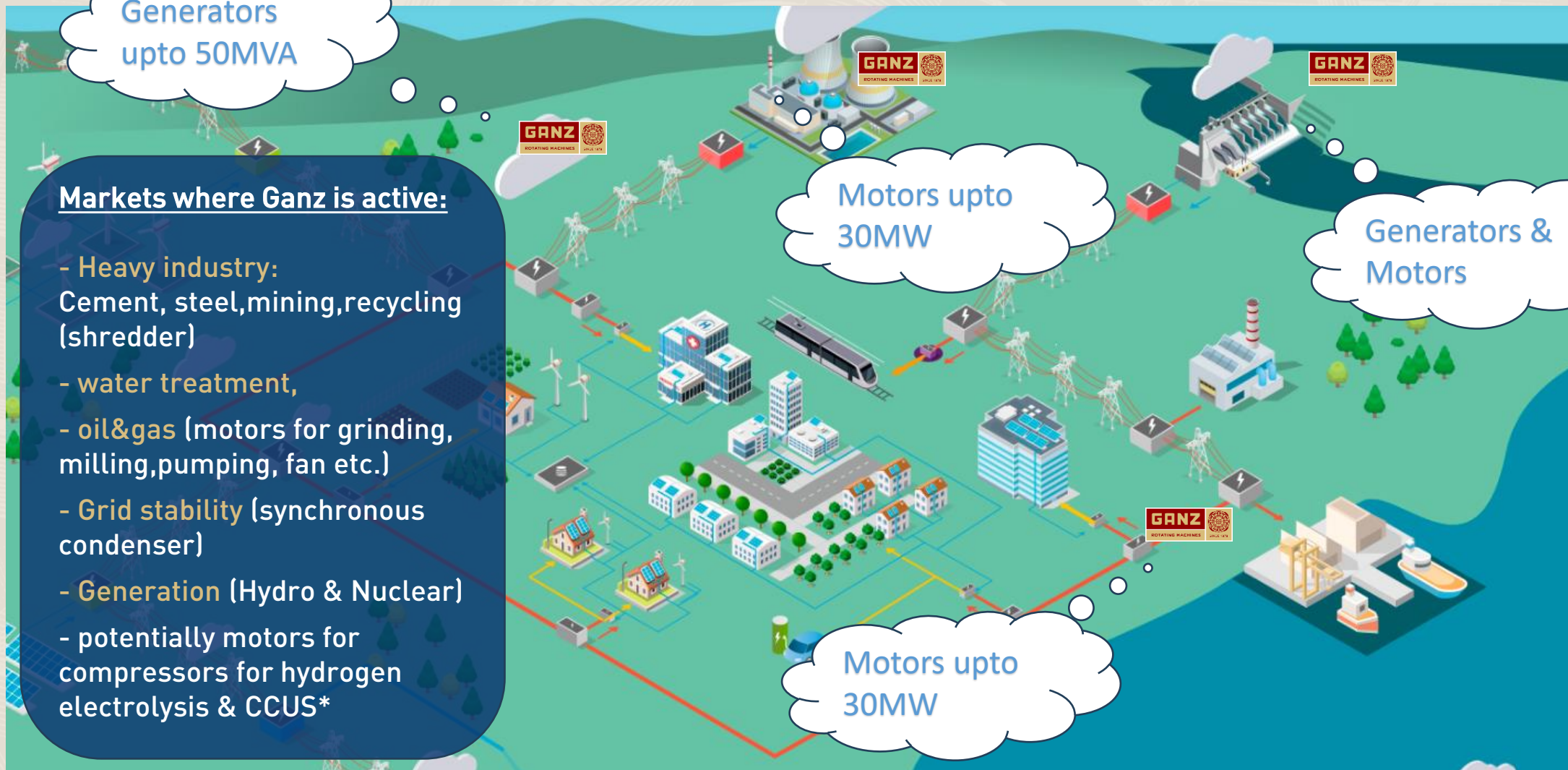
Markets where Ganz is active:

- **Heavy industry:**
Cement, steel,mining,recycling (shredder)
- **water treatment,**
- **oil&gas** (motors for grinding, milling,pumping, fan etc.)
- **Grid stability** (synchronous condenser)
- **Generation** (Hydro & Nuclear)
- potentially motors for compressors for hydrogen electrolysis & CCUS*

Motors upto
30MW

Generators &
Motors

Motors upto
30MW



General applications & markets

- Oil & Gas Industry
- Cement Industry
- Steel Industry
- Mining
- Nuclear Power Stations
- Desalination Plants
- Pumping Stations
- Thermal Power Stations
- Hydro-Electric Projects
- Steam/Gas Power Plants



PRODUCTION FACILITIES



SHOP FLOOR

- ⊕ 12500 m² area
- ⊕ Own facility for laminations
- ⊕ Up-to-date technology (Design, Own manufacturing system, Insulation system, Testing)



INHOUSE MACHINE AND WINDING AREA

- ⊕ Diameter 5 m and Height 3 m machining
- ⊕ Area ideal to accommodate large capacity machines



COIL SHOP

- ⊕ Own Coil shop - employs resin rich & VPI insulation process
- ⊕ Looping, forming, stretching and coil heat treatment machines

PRODUCTION FACILITIES



VPI

- ⊕ The VPI insulation system (Micasytem)
- ⊕ Machines up to 2 m outer core diameter



ROTOR SHAFT MACHINING AND BALANCING

- ⊕ Inhouse shaft machining
- ⊕ Inhouse balancing machine for 50 tons Rotor, capable at 3600 rpm



ASSEMBLY

- ⊕ Crane capacity of 100 tons
- ⊕ Testing in horizontal / vertical configuration possible

GANZ SERVICE



Service Business Unit performs both factory based and on-site work for the company's products as well as products from other manufacturers in the form of

- maintenance,
- inspection,
- renovation, and
- upgrading.

Thanks to our advanced instrumentation and trained workforce, we can also perform **preventive and fault-finding and measurements on site**, thus reducing maintenance / downtime, keeping the interests of the service provider in mind.

In addition to the on-site service, spare parts manufacturing is also offered.



SERVICES of Transformers



- Activities are performed both on-site and in factory
- Planned maintenance
- Spare parts supply
- Troubleshooting and site repair
- On-site and factory testing (IEC and IEEE standards)
- Transformer oil treatment, oil regeneration
- Full oil testing (IEC 60422) and dissolved gas analysis (IEC60599)
- Condition assessment based on factory testing
- Active part removal for visual inspection
- General refurbishments
- Transformer oil tank revamping
- Site supervising, installation & commissioning
- Retrofit with GANZ Intelligent Solutions monitoring system

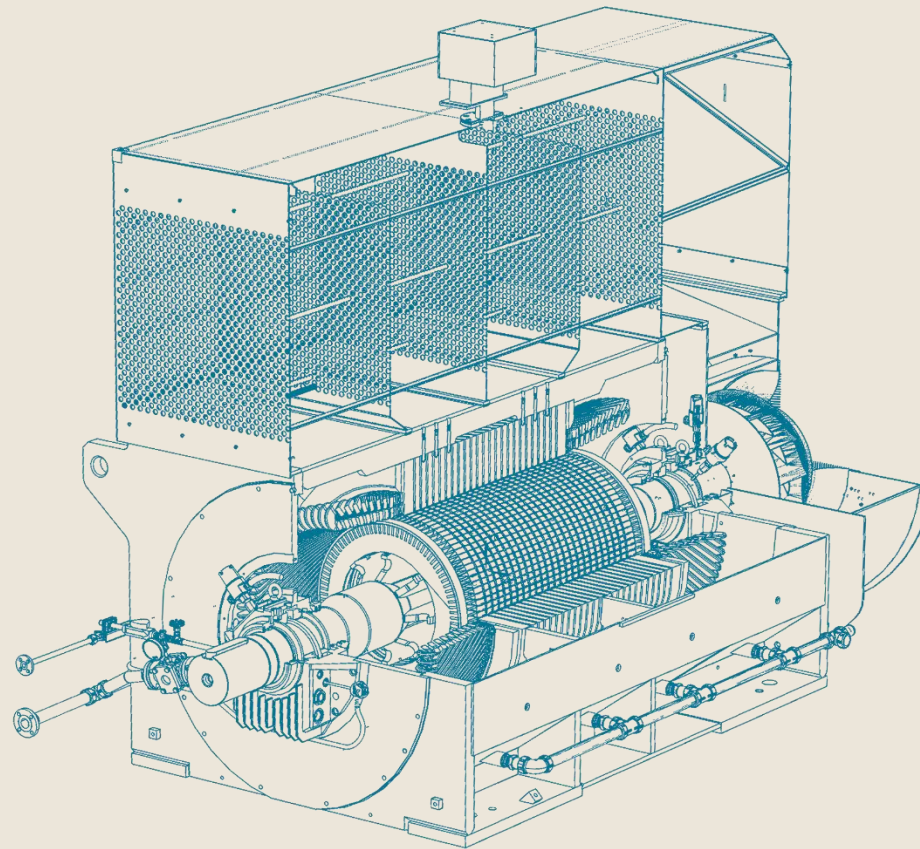
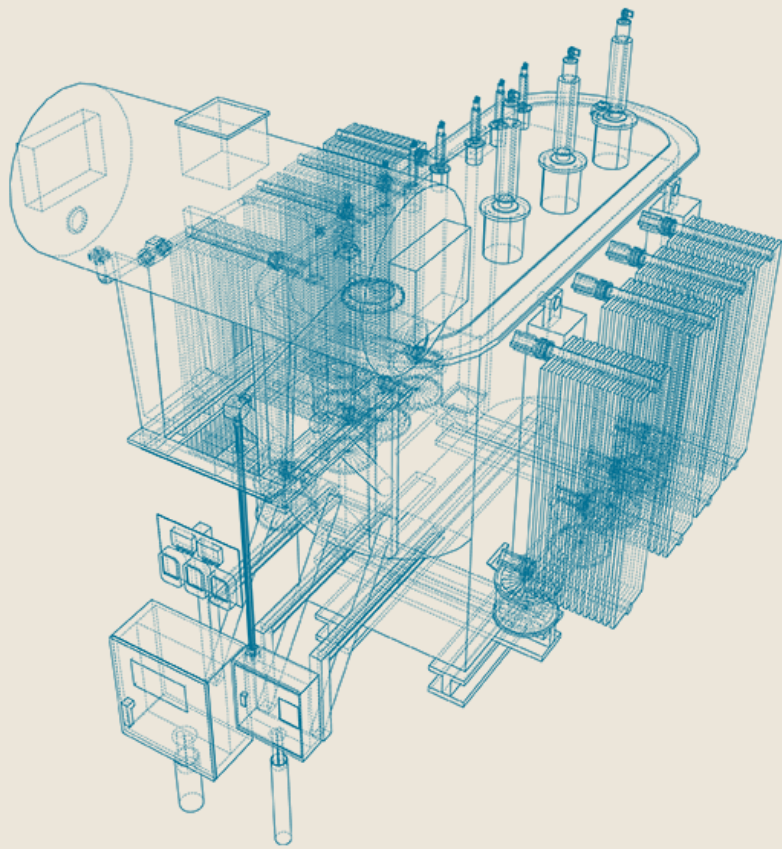


SERVICES of Rotating Machines



- Activities are performed both on-site and in factory
- Complete diagnostic test of motors and generators (IEC-60034 standard)
- Modernization with rewinding the rotor and stator of motors, hydro- and turbogenerators to „F” or „H” class
- Revision and maintenance of AC/DC motors and generators
- Changing the slot wedges for rotor and stator
- Reverse engineering
- Revamping and retrofiting
- On-line balancing up to 50 tons in own testbay
- Spare parts manufacturing & supply
- Site supervising, installation & commissioning



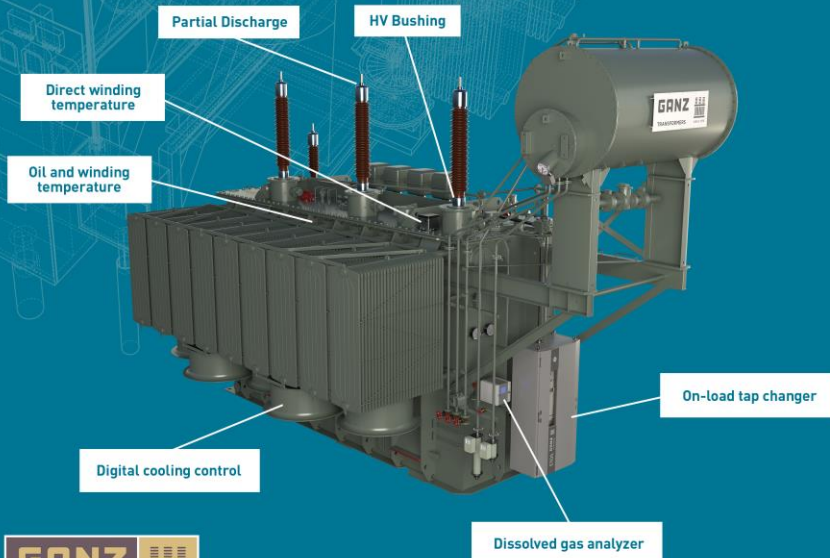


Monitoring and Digitalization for Power Transformers and e-Rotating Machines

the new generation of transformers and electric rotating machines
equipped with digital monitoring system



Monitoring in Transformers



Monitoring in Motors & Generators



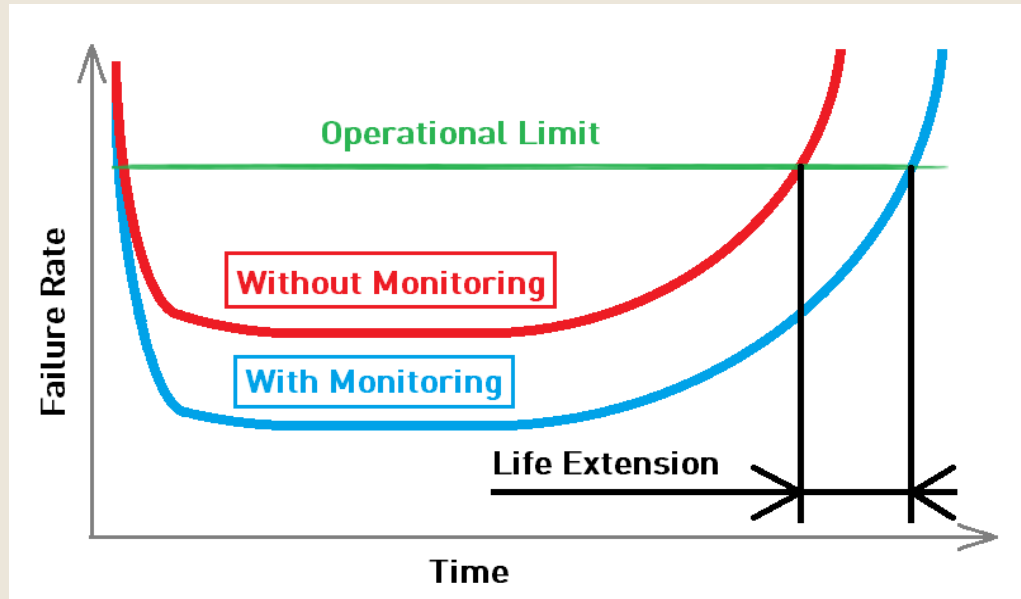
Digitalization Solution by GANZ

Main advantages of use

- Avoiding Critical Failures – detection at an early stage
- Reducing the duration and frequency of unplanned downtimes
- Predictive maintenance and replacement of components
- Access to Digitalization features

Business	Estimated cost (USD / minute)
Automotive	35.000
Mining	3.400
Oil & Gas	7.500
Utilities	1.800

The cost of unplanned downtime for different industries



Additional benefits through Retrofit Application

- Asset Life Extension
- Data-Based scheduling of Asset Replacement
- Digital integration of older assets
- Applicable to any Asset regardless of Brand or Make
- Can be performed during otherwise planned downtimes

Power Transformers (packages)

GANZ offers Monitoring and Digitalization Solutions

iReady+

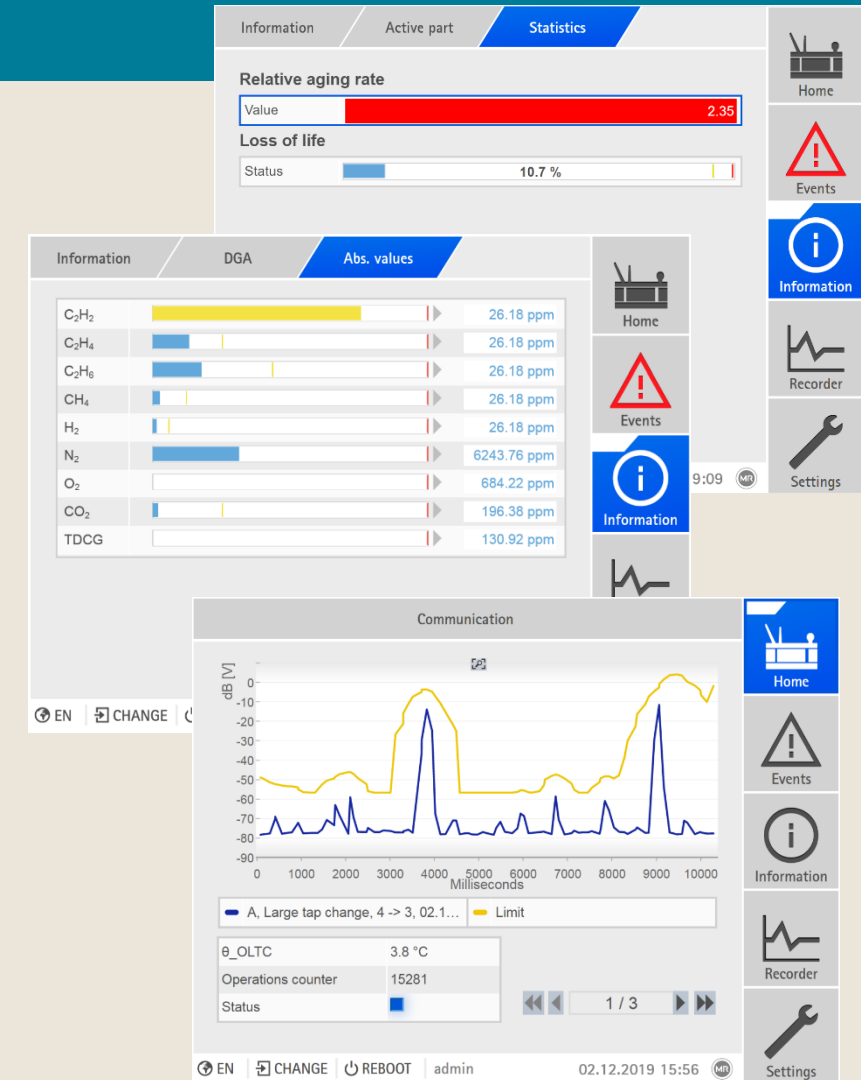
- HV Bushing Monitoring (Capacitive)
- Tap Changer Wear Progression
- Temperature Monitoring, Loss of Life
- DGA - Early Warning Indication

iStandard

- Fiber Optic Temperature Measurement
- Electronic Cooling Control

iAdvanced

- Vibro Acoustic Tap Changer Monitoring
- Online Fault Gas Assessment



Apart from the packages, GANZ offers *tailor-made solutions* as well!

Rotating Machines (packages)

iReady

- Temperature Monitoring (Winding, Bearing)
- Vibration Monitoring

iStandard

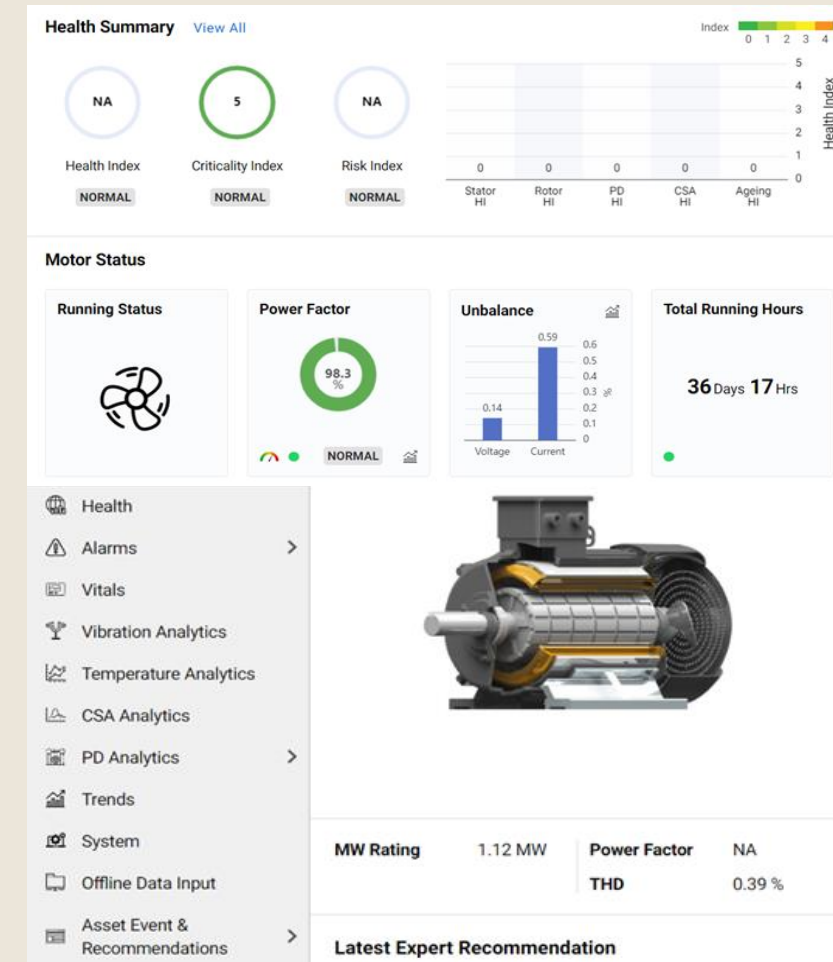
- Accessories Digitalization
- Cooling and Lubrication Monitoring

iAdvanced

- Partial Discharge Online Monitoring
- Multi-Parameter configurations

Optional features

- Brush Wear – Pre-indication or Continuous Monitoring
- Current Signature Analyzer
- RPM Monitoring
- Fiber Optic Temperature Measurement



GANZ Intelligent Solutions

Training &
demonstration
center



Growth plan now and in the future



In the past years we have been able to **triple our manufacturing output** and the number of our **employees** have **increased by 40%**



Also for the coming years, we expect this growth to continue, where we expect the **output to double till 2025** and also increase our employees by another 40%.

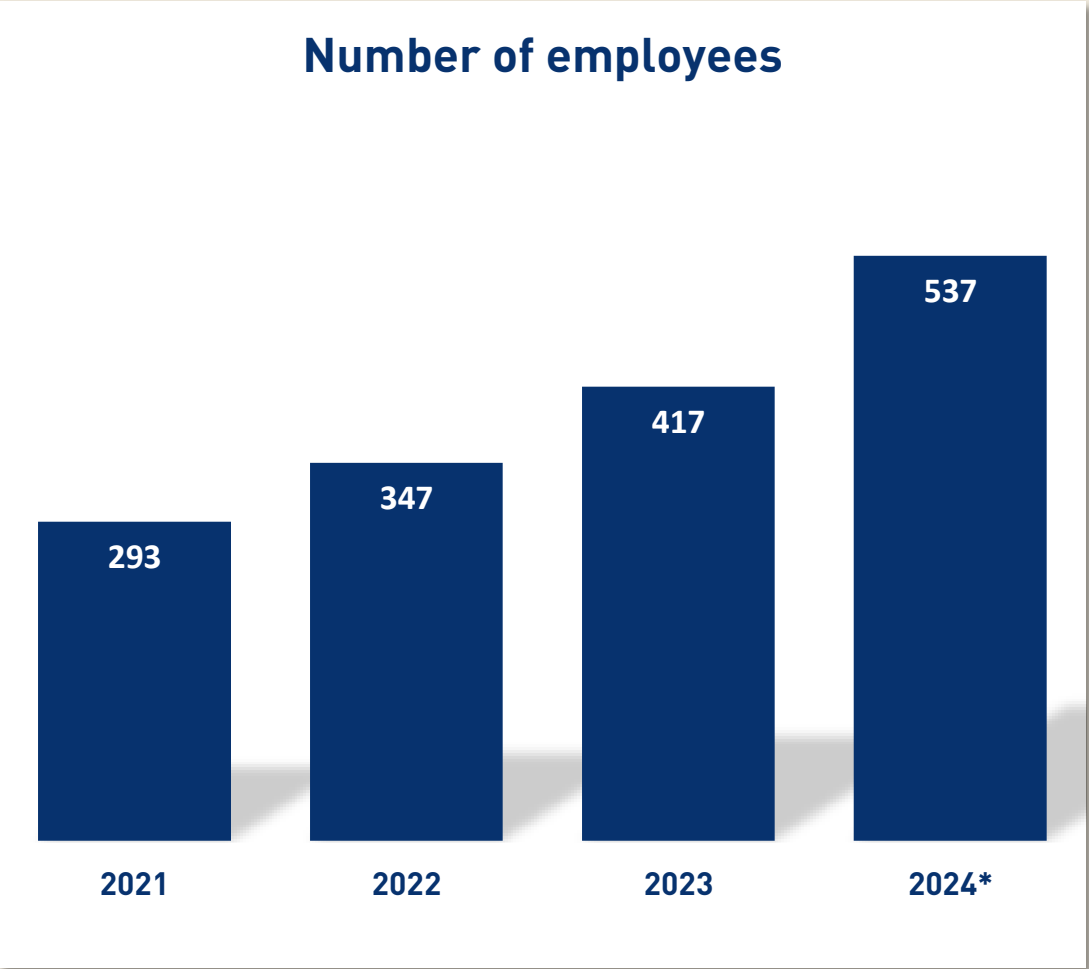
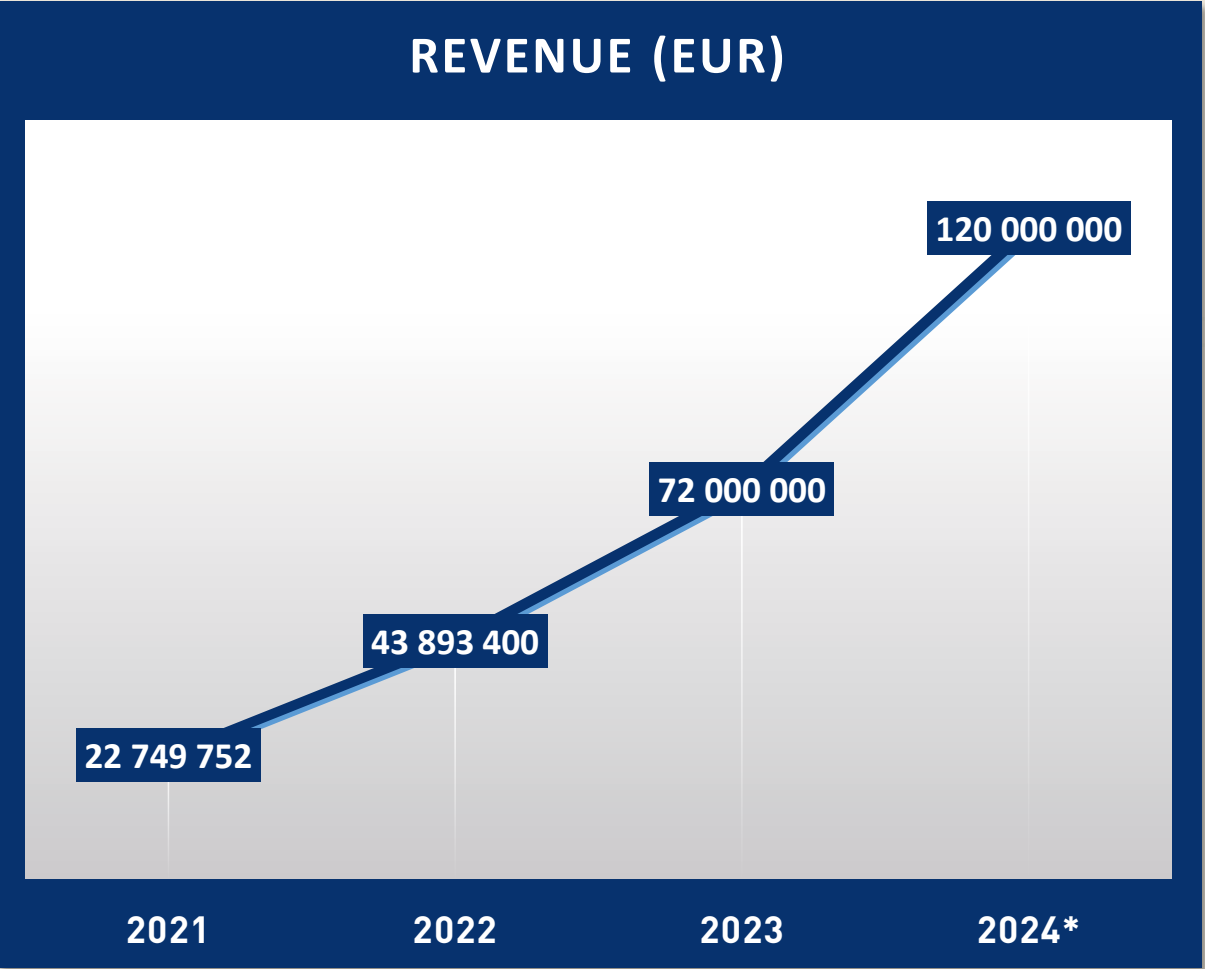


Significant growth in the **Service** and **Rotating Machines** is planned.



Environmental, social, and corporate governance

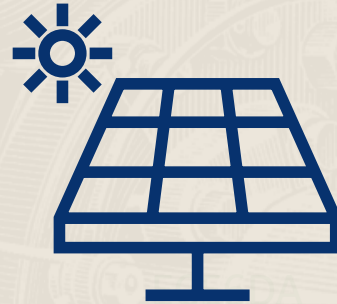
GANZ numbers



The investments till now and in the near future



A total of **13Meuro** has been invested since the restart in 2020.



10Meuro will be invested in the coming 18 months in building a **2MW solar park, improve buildings, and other energy efficiency improvement projects**



14Meuro investment in our **Rotating Machine** will be executed in the coming 24-30 months

Project is called RM 2.0

Restart of steel structure production in Szolnok

- Ganz restarted the **steel structure production** in Szolnok in H1 2023.
- Strengthen the **supply of steel structure needs** of the transformer and rotating machine production
- New – Ganz subsidiary – company to bring to the surface the passive experience in **metal structure production**
- Around 50 new workplace on the **Szolnok** site in the 1st phase
- **4Meuro** investment to increase efficiency



The Ganz Energy Optimization Program



Total 10Meuro investment

Increase in-house energy generation 2MW PV

Reduce natural gas consumption in short term with electrification of the technology

Energy storage and smart operation

Decrease of total energy consumption with building insulations, efficiency improvements
→ ~ 40%

Eliminate fossil fuels from the operation in long term, in-line with EU ambitions

Why GANZ?

GANZ



Competitive delivery times

145 years market experience

International experience,
projects in 40 countries

Best value for money products

High degree flexibility in design
and construction

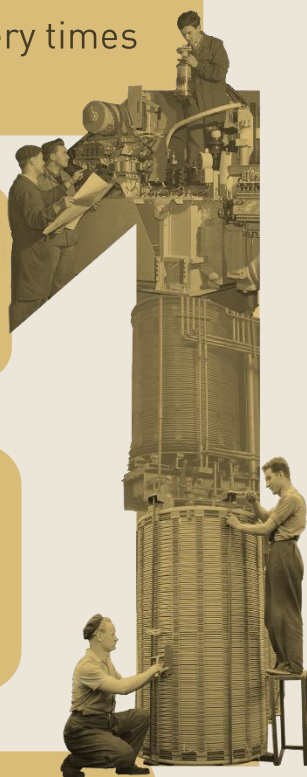
High quality tools, equipment
and skilled professionals for
testing, repairing and
manufacturing transformers

Tailor made solutions satisfying
special requests

Excellent engineering team

Manufacturing facilities are
modernized and in-line with
Western European quality
standards

Proven technical solutions



GANZ is looking forward to working with you!

Visit our website



www.ganzelectric.com

Visit our LinkedIn page



[Ganz Transformers and Electric Rotating Machines Ltd. | LinkedIn](#)

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