

**ROTATING MACHINES**

ELECTRIC MOTORS AND GENERATORS

# Ganz Transformers and Electric Rotating machines Ltd.

ONE OF THE RENOWNED EUROPEAN MANUFACTURER

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

STATE OF THE ART TECHNOLOGY PROVIDING STANDARDIZED AND CUSTOM BASED SOLUTIONS

Helping its customers with strong engineering, production and service capability.

UNIQUE & DIVERSE PORTFOLIO

Transformers | MV Motors | Generators | GIS Services.



# A JOURNEY TO THE FUTURE

» 142 > Years of powerful tradition

» 50 > Countries of GANZ Machines supplies

» 8000 > Large Rotating Machines supplied globally

» 100000 > Power Transformers supplied globally

- ⊕ High Engineered Product lines
- ⊕ 100% Own Hungarian Company
- ⊕ Best Industry Standards and Practices
- ⊕ A strong Quality mission
- ⊕ Emphasis on R&D and new products
- ⊕ Green & renewable initiatives
- ⊕ Increasing cost efficiency



# HISTORY

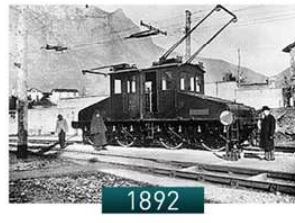
## THE GLORIOUS PAST INVENTIONS



Ábrahám Ganz established Ganz Factory



Electric Department established



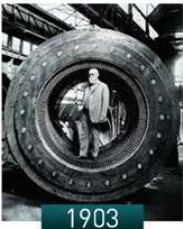
Electric public transport by Kálmán Kandó



Invented First Transformer of the world



Production of 3 phase Induction Motor ( 3HP)



Production of Turbo-Generators in Ganz by Ottó Bláthy (900 kVA)



Formation of Ganz Ansaldo (Motors, Generators, Service)



Transelektro Group acquired Ganz Ansaldo



CG Group acquired Ganz Transelektro- Production continued for large motors, Transformers & GIS



Ganz Transformers and Electric Rotating machines Ltd. has taken over CG Hungary assets





# PRODUCT PORTFOLIO



Transformers



Rotating Machines



TR, RM, Services

# TRANSFORMERS



Production range	:	20-600 MVA
Voltage	:	72,5-800 kV
Frequency	:	16,7-60 Hz
Annual capacity	:	10 000 MVA
Equipment limits:		
Core Stacking	:	200 t
Winding dia.	:	3000 mm
height	:	3000 mm
weight	:	20 t
Crane capacity	:	240 t
(limit for active part only)		



# SERVICES



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.





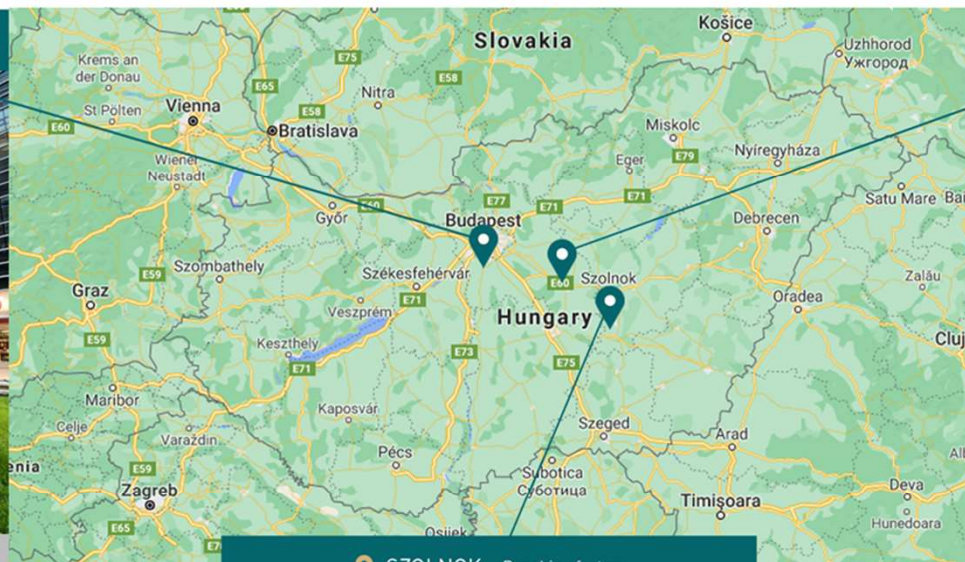
# GANZ - HUNGARY



LOCATIONS

## BUDAPEST

Central Administrative Functions |  
Sales | Design | Purchase



SZOLNOK Punching factory

## TÁPIÓSZÉLE

Transformer and Rotating Machines Factory  
- 41.000 m<sup>2</sup>



Ganz Transformers and Electric Rotating machines Ltd.





# GANZ ROTATING MACHINES

# PRODUCT PORTFOLIO

ROTATING MACHINES



## ELECTRIC MOTORS



Rating : 500 kW to 20 MW  
Voltage : Up to 15 kV

## GENERATORS



Rating : 1 MVA to 70 MVA  
Voltage : Up to 15 kV

## SERVICES



Motor & Generator  
Refurbishments

# PRODUCTION FACILITIES



## SHOP FLOOR

- ⊕ 12500 m<sup>2</sup> area
- ⊕ Own facility for laminations
- ⊕ Up-to-date technology (Design, Own manufacturing system, Insulation system, Testing)



## INHOUSE MACHINE AND WINDING

- ⊕ 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

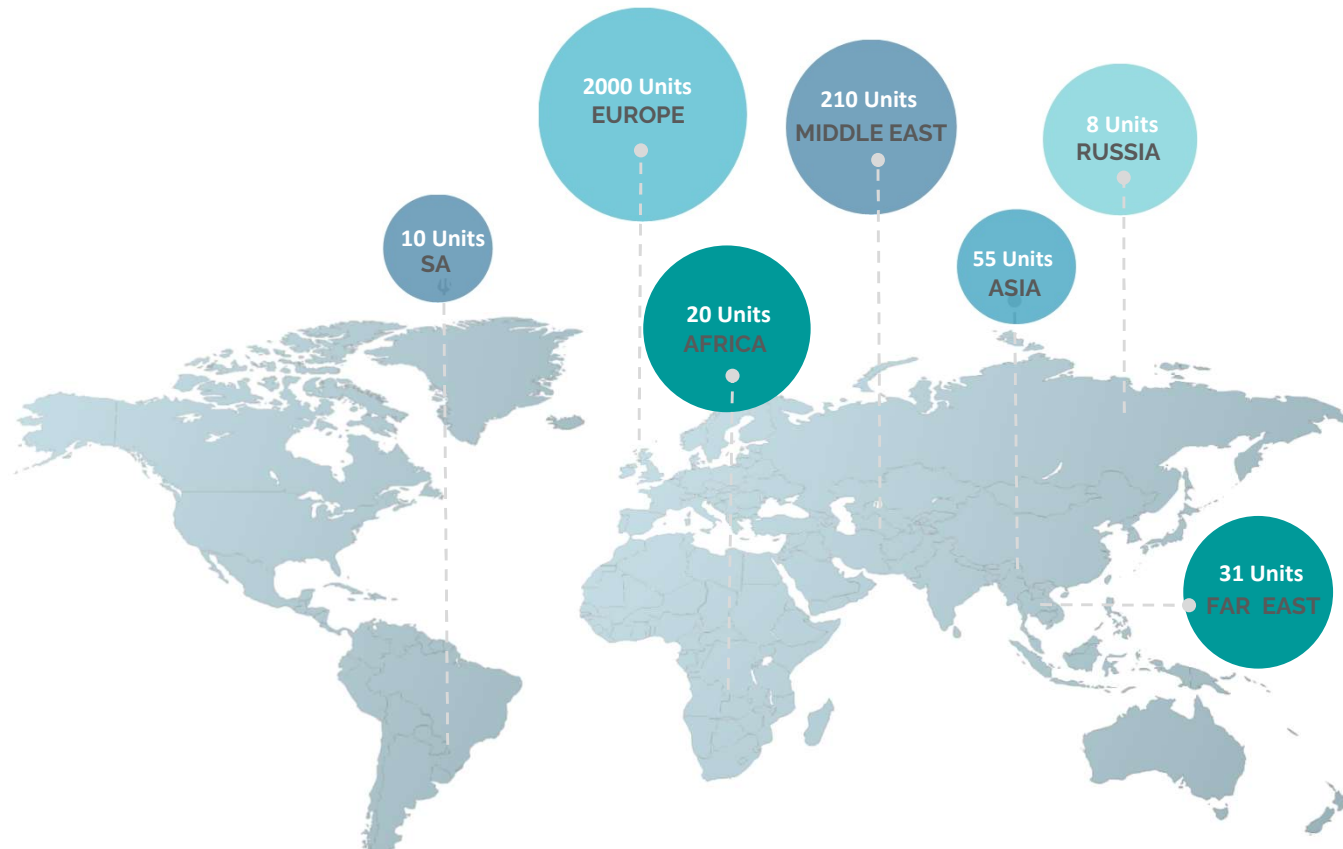


### ASSEMBLY

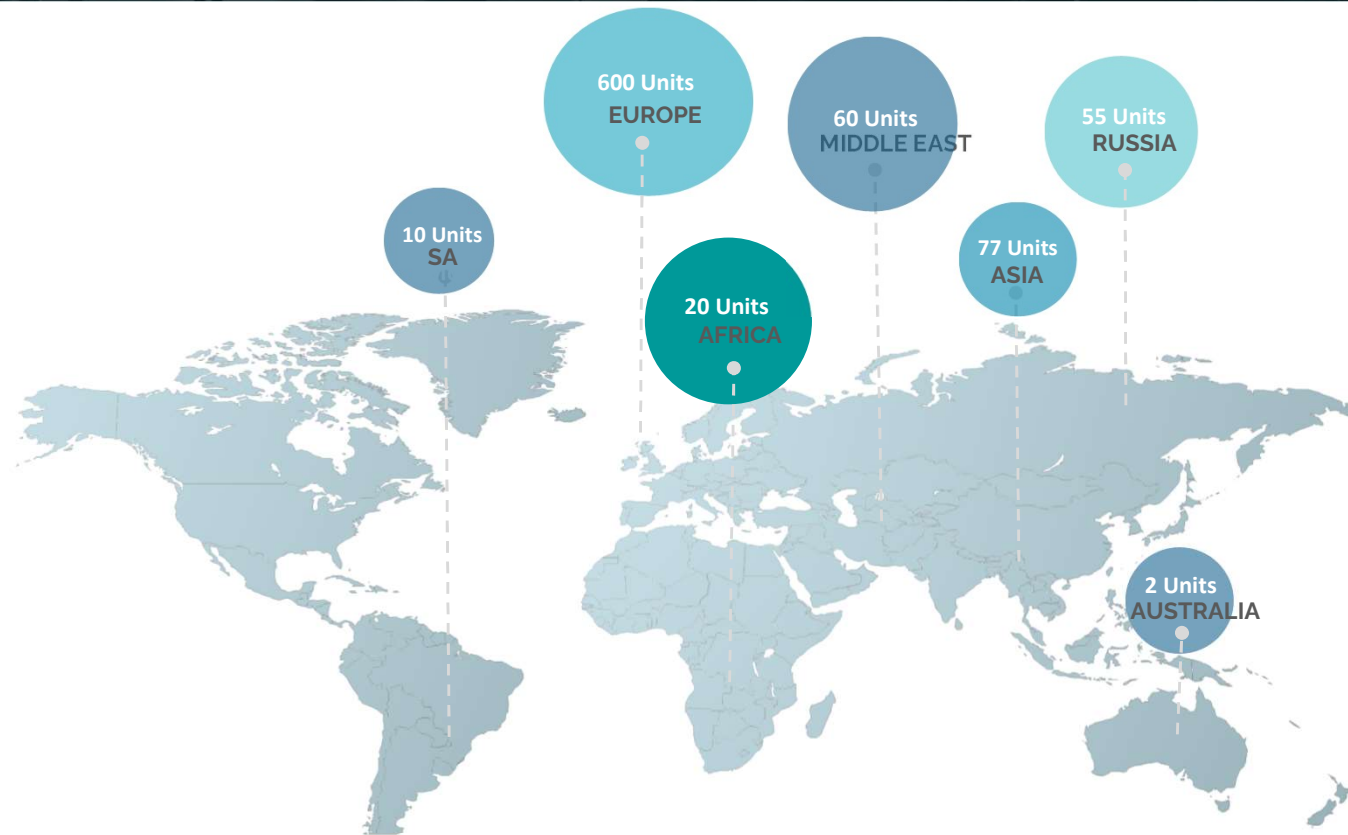
- ⊕ Crane capacity of 100 tons
- ⊕ Testing in vertical configuration possible
- ⊕ Balancing machine for 50 tons Rotor, capable at 3600 rpm



## GLOBAL FLEET-MOTORS since 2000



## GLOBAL FLEET-GENERATORS since 1990



## APPLICATIONS GANZ in Oil & Gas Industry

### APPLICATIONS

- › Water pumps
- › Fluid Pumps
- › Compressors & Blowers

Capacity 0.5 MW-10 MW

Rating Up to 15 kV

Pole 2 pole & above

Frequency 50-60 Hz

Cooling Air/Water Cooled



### FEATURES

- › ATEX certified
- › Increased Safety 'e', Pressurized 'p' Motors
- › Applicable for Zone 1 & 2 gas group I, IIA, IIB, IIC complying to IEC 60034-7 & IEC 60079-1:2007

### MAJOR PROJECTS

- › Hungarian Oil & Gas Company (MOL)
- › SATORP, Saudi Arabia
- › General Electric, Saudi Arabia
- › Carmel Olefins Ltd., Israel

## MAJOR REFERENCES-OIL & GAS

2020



**SATORP, KSA**

FTCp 710G4 (4000 kW, 13800 V 1500 rpm)  
Compressor drive

2004



» Hungarian Oil & Gas Company (MOL)  
Piston-compressor  
(2900 kW, 6000 V, 368 rpm)

2012



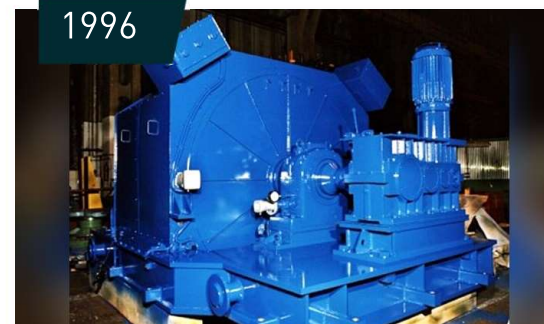
Petrofac Al- Badra Iraq  
FTCn 450Hy4 (6x 280 kW, 2x 355 kW,  
2x 750 kW)

2000-2021



General Electric, Gas Turbine starting  
FHC 450K2 (1000 kW, 6000 V, 2984 rpm)

1996



Carmel Olefins Petrochemical  
FDDRp 903L24 (2x1150 kW, 3300 V, 248 rpm)



## APPLICATIONS GANZ in Cement Industry

### APPLICATIONS

- › Fan (Preheater, Bag-house, Booster, Cooler Vent)
- › Raw Mill, Ball Mill, Coal Mill
- › Limestone Crusher
- › Conveyors
- › Grinders, Kiln

Capacity 0.5 MW-10 MW

Rating Up to 15 kV

Pole 4 pole & above

Frequency 50-60 Hz

Cooling Air/Water Cooled



### FEATURES

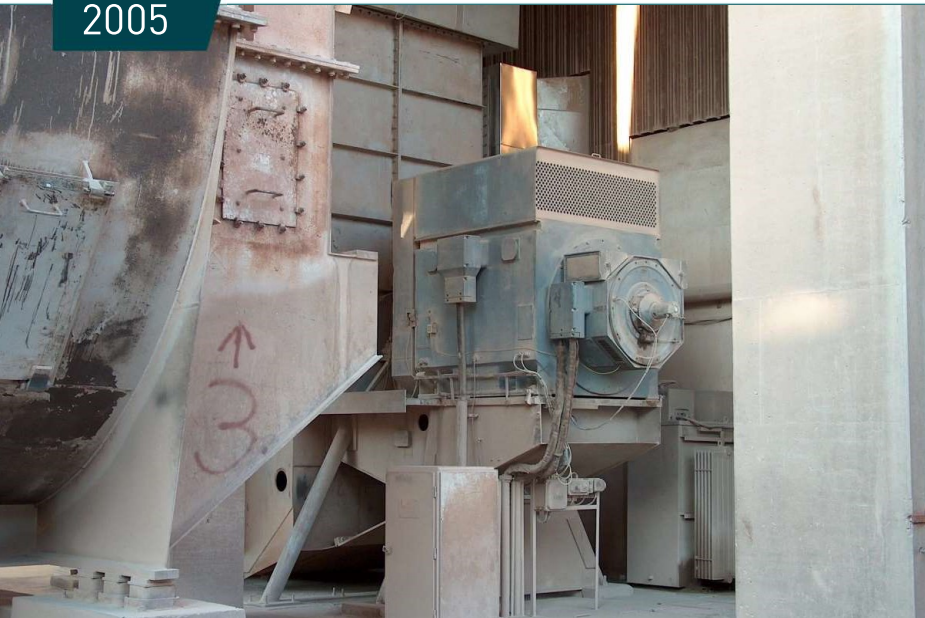
- › Reputed brand in the industry for wound Rotor Motors
- › Special applications with BRUSH LIFTING MECHANISM
- › Interchangeable/retrofit motors
- › Selected designs for Overload duties, low noise & vibration

### MAJOR PROJECTS

- › LAFARGE Plants, Global- New Cement Lines & Retrofits
- › FIVES FCB, France
- › POLYSIUS, Germany
- › CEMEX, UK
- › ASEC, Egypt
- › VICAT, France
- › Plant rehabilitation projects

## MAJOR REFERENCES-CEMENT

2005



**BEREMEND Cement, Hungary**  
FTA 630 (4000 kW, 13800 V 1500 rpm)

2015



**Polysius Germany Cement line**  
FTA Type MV Motors  
(9x 315 kW-5000 kW)

2015



**MEFTAH Lafarge Cement plant, Algeria**  
FRA 710Hm8  
(2x 3300 kW, 5500 V, 744 rpm)

2013



**Karbala Cement Plant Rehabilitation, Iraq**  
FTA Type MV Motors  
(11x 700 kW-2800 kW)

2016



**FIVES FCB D'Ech Cheliff Cement, Algeria**  
FDDRp 903L24  
(2x 1150 kW, 3300 V, 248 rpm)

## APPLICATIONS GANZ in Steel Industry

### APPLICATIONS

- › Rolling Mills
- › Shredders

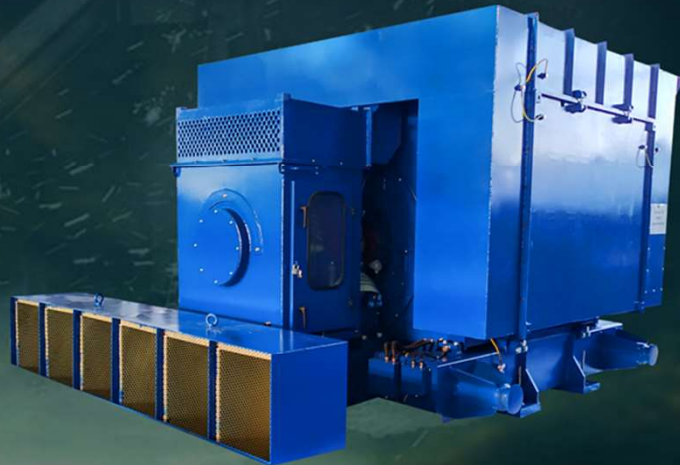
Capacity 0.5 MW-10 MW

Rating Up to 15 kV

Pole 4 pole & above

Frequency 50-60 Hz

Cooling Air/Water Cooled



### FEATURES

- › Reinforced and robust mechanical design
- › Structural strength
- › Compliance with standards
- › Special applications with BRUSH LIFTING MECHANISM
- › Interchangeable/retrofit motors
- › Selected designs for Overload duties, low noise & vibration
- › Resistance to corrosion

### MAJOR PROJECTS

- › ISD Dunafer Steel, Hungary
- › Mobarakeh Steel Co., Iran
- › Egyptian Co. For Iron and Steel Products



## MAJOR REFERENCES-STEEL

2019



Mobarakeh Steel Co., Iran

FDAO 716V6 (2200 kW, 6.6 kV, 988 rpm)

2014



Italy Shredder Drive  
FTA 560Es6 (1400 kW, 6000 V, 744 rpm)

2009



Mobarakeh Steel Co., Iran  
FRA 710Hm8 (8300 kW, 6.6 kV, 744 rpm)

2005



Shredder Drive, Germany  
FBA 906W16 (4410 kW, 4.8 kV, 446 rpm)



## APPLICATIONS GANZ in Mining

### APPLICATIONS

- > Pumps
- > Compressors
- > Conveyors

**Capacity** 0.5 MW-20 MW

**Rating** Up to 15 kV

**Pole** 2 pole & above

**Frequency** 50-60 Hz

**Cooling** Air/Water Cooled



### FEATURES

- » Powerful MV Motors for mining applications
- » Cage and Wound Rotor types
- » Special applications with BRUSH LIFTING MECHANISM
- » Chosen brand for interchangeable/retrofit motors
- » Underground mining applications

### MAJOR PROJECTS

- » Hungarian Mines
- » Kazakh Phosphate Mines
- » RWE Germany
- » South African Copper Mines

## MAJOR REFERENCES-MINES

2006



RWE Mines, Rheinbraun Germany

FOA 710Ls6 (62x 2000 kW, 6 kV, 993 rpm, conveyors)

2012



Kazakh Phosphate Mines, Twin Drives  
FRC 630Kt6 (4x 2250 kW, 4x 2500 kW)

2012



Konkola Copper Mines, Underground  
8x 1300 kW, 1500 rpm, 11 kV Interchangeable  
8x 2500 kW, 1500 rpm, 11 kV Interchangeable

2014



Konkola Copper Mines, Zambia  
FTC Type MV Motors (6x 4500 kW,  
6x 2500 kW)

2018



RWE Germany  
FOA Type (1x 1400 kW, 11 kV, 900 rpm)

## APPLICATIONS GANZ in Nuclear Stations

### APPLICATIONS

- › Cooling water Pumps
- › Circulating water pump
- › Recirculating water pump
- › Condense water pump

Capacity 0.5 MW-20 MW

Rating Up to 15 kV

Pole 2 pole & above

Frequency 50-60 Hz

Cooling Air/Water Cooled



### FEATURES

- › OIT Certified MV Motors
- › Carefully designed machines to meet Nuclear standards
- › Machines are approved by global Nuclear contractors

### MAJOR PROJECTS

- › PAKS NPP, Hungary
- › ROSTOV NPP 3, NPP 4 Russia
- › NOVovoronyezhskaya NPP, Russia
- › Belarus NPP
- › Koodankulam NPP Phase 3, India
- › Koodankulam NPP Phase 4, India



## MAJOR REFERENCES-NUCLEAR

2012



SOUTH Ukraine NPP

FTC 450Hm8 (6x 630 kW, 6kV, 750rpm)

2012



ROSTOV 3 NPP, Russia  
FVDZ1126 V20, FVDZ 1126V22  
(3x 3300 kW, 6kV, 300 rpm)  
(4x 4500 kW, 6kV, 272 rpm)

2014



ROSTOV 4 NPP, Russia  
FVDZ1126 V20, FVDZ 1126V22  
(3x 3300 kW, 6kV, 300 rpm)  
(4x 4500 kW, 6kV, 272 rpm)

2018



Paks Nuclear Plant Hungary  
FRC 560 J2 (2500 kW, 6kV, 2984 rpm)

2020



Kudankulam NPP, India  
FTCV 400Jv4 (18x 2000 kW, 6kV, 1490 rpm)



## APPLICATIONS GANZ in Desalination Plants

### APPLICATIONS

#### > Pumps

Capacity	0.5 MW-20 MW
Rating	Up to 15 kV
Pole	2 pole & above
Frequency	50-60 Hz
Cooling	Air/Water Cooled



### FEATURES

- » Special designs for Salty environments
- » Replacement/interchangeable designs
- » Hollow shaft design shall be offered on requests
- » Protection types even up to IP 65

### MAJOR PROJECTS

- » Dubai Electricity and Water Authority (DEWA), Dubai
- » SWCC, Saudi Arabia

## MAJOR REFERENCES-DESALINATION PLANTS

1995



SHOIBA Water SWCC, Saudi Arabia

FTA 710K4 type (5 x 3100 kW, 13.8 kV, 1788 rpm)

2013



Via Maris Desalination Plant  
FTA Type MV Motors (9x 315 kW-5000 kW)

2016



SWCC Saudi Arabia, IP65  
FOC 710Ls6 (6x 1950 kW, 6.6 kV 1000 rpm)

2016



SWCC Saudi Arabia , IP65  
FTCV 560Lw14 (300 kW, 6.6 kV, 410 rpm)

2018



Dubai Electricity and Water Authority  
(2000 kW, 6000 V, 428 rpm)  
(180 kW, 300 kW, 640 kW, 700 kW)

# APPLICATIONS GANZ in Pumping Stations

## APPLICATIONS

- › Water Pumps

Capacity	0.5 MW-20 MW
Rating	Up to 15 kV
Pole	2 pole & above
Frequency	50-60 Hz
Cooling	Air/Water Cooled



## FEATURES

- › New as well retrofit designs
- › For those applications for high starting torque, wound Rotor motors equipped with BRUSH LIFTING MECHANISM
- › High Axial Thrust designs

## MAJOR PROJECTS

- › Hungary Water works
- › Ministry of Water & Irrigation(MED) Pumping Station, Egypt
- › Water companies, Egypt
- › Dubai Electricity and Water Authority (DEWA), Dubai



## MAJOR REFERENCES-PUMPING STATION

2018



Kilo 57 Pumping Station, Ministry of Water Resources, Egypt

FVM 630Kz4 (6x 2000 kW, 11 kV, 1500 rpm)

2000-12



Tolombat Pumping Station Egypt  
FVM 909E14 (1200 kW, 11 kV, 424 rpm)

2011



Reggio Emilia Italy  
FHCV 800Lw18/24  
(800/400 kW, 3.15 kV, 331/ 248 rpm)

2010



Salheia & El Shabab East Delta,  
FHMV 560Lm6 (4x 1000 kW, 11 kV, 992 rpm)

2012/13



Helwan Pumping Station, Egypt  
FTMV 560Ht8 (5x 800 kW, 10.5 kV, 744 rpm)  
FHMV 630Ls8 (2x 900 kW, 11 kV, 744 rpm)

## APPLICATIONS GANZ in Thermal Power Stations

### APPLICATIONS

- › Cooling water pumps
- › Boiler Feed pumps
- › Feedwater pumps
- › Condenser Pumps
- › Cooling tower pumps
- › Forced draft fans
- › Induced draft fans

Capacity 0.5 MW-20 MW

Rating Up to 15 kV

Pole 2 pole & above

Frequency 50-60 Hz

Cooling Air/Water Cooled



### FEATURES

- › Designs for demanding environments
- › Well established insulation system for long-term operation
- › Global Supplies for thermal power stations

### MAJOR PROJECTS

- › Hungarian Thermal Power Stations
- › ENEL Power, Italy
- › EDISON Power, Italy
- › EUAS - KANGAL PP, Turkey
- › Tufanbeyli Power Plant, Turkey
- › Hamitabat Power Plant, Turkey
- › NTPC Vidhyachal, India

## MAJOR REFERENCES-THERMAL P.S.

2015



EGI Hamitabat Power Plant, Turkey

FTC 710L14 (5 x 1260 kW, 6.3 kV, 425 rpm)

1978-79



Obrenovac Power Plant, Yugoslavia, 1978  
Kardia Power Plant, Greece, 1979  
FDKZ 806x4 (3x 7000 kW, 6.6 kV, 1480 rpm)  
FDKZ 806W4 (3x 6000 kW, 6.6 kV, 1480 rpm)

2011



Tufanbeyli Power Plant, Turkey  
FTC 560Hs10 (6x 700 kW, 6.3 kV, 587 rpm)

2009



EUAS - KANGAL PP, Turkey,  
FBDZ 566L4 (1700 kW, 6 kV, 1481 rpm)  
FBDz 716 L12 (1250 kW, 6 kV, 493 rpm)

2017



NTPC Vidhyacha, Alstom India  
(4x 1100 kW, 2x 315 kW)



## APPLICATIONS GANZ in Hydro-Electric Projects

GANZ Type	SHG, ON Types
Capacity	500 kVA-70,000 kVA
Rating	Up to 15 kV
Pole	4 pole & above
Frequency	50-60 Hz
Construction	B3 & V1



### FEATURES

- » Construction: Salient & Round Rotor
- » Brushless & Static Excitation types
- » Compact design and lower weight
- » Sturdy mechanical construction
- » High efficiency maximizing power generation
- » Minimum vibration, noise and longer bearing life through precise balancing the machine
- » Well established Insulation System which ensures long life

## MAJOR REFERENCES-SMALL HYDRO

2016



HPP South Maris Canal, Philippines

2 x 5000 kVA, 10P - 720 rpm - Pit Kaplan Turbines

2009



HPP Zho Tuwei, Taiwan  
4000 kVA, 30 pole, V1 ONv2600L30 Kaplan

2011



HPP COGNO, Italy  
3x 2400 kVA, 6P - SRGb 636Ks6 Pelton

2013



HPP CREMA  
1200 kVA, 40P, 150 rpm, V1 -  
Onv 2660x275/40 Kaplan

2020



HPP Xeset, Lao PDR  
2x 5795 kVA, 12P, 11 kV, 500 rpm Francis



## MAJOR REFERENCES-LARGE HYDRO

2020



HPP RONGNICHU, Sikkim India

2 x 62766 kVA 16P 375 rpm, ONv 4250x1500/16

2010



HPP Albano, Italy  
FVM 909E14 (1200 kW, 11000 V, 424 rpm)

2012



HPP Gavünda, FORTUM Sweden  
9000 kVA 250 rpm Kaplan Vertical

2015



HPP Lajanuri, Georgia  
49000 kVA 11000 V, 250 rpm V1

2016



HPP SanBartolo, Panama  
2 x 12000 kVA, 11000 V, 300 rpm  
ONv 3450x670/24 Kaplan



## APPLICATIONS GANZ in Steam / Gas Power Plants

GANZ Type	GTG Type
Capacity	10 MVA - 60 MVA
Rating	Up to 15 kV
Pole	2 , 4 pole
Frequency	50-60 Hz
Cooling	Water/Air cooled



- » Standardized series until 60 MVA
- » Construction: Turbo Smooth Round Rotor
- » Brushless & Static Excitation types
- » Compact design and lower weight
- » Sturdy mechanical construction
- » High efficiency maximizing power generation
- » Minimum vibration, noise and longer bearing life through precise balancing the machine
- » Well established Insulation System which ensures long life

## APPLICATIONS GANZ in Special Applications



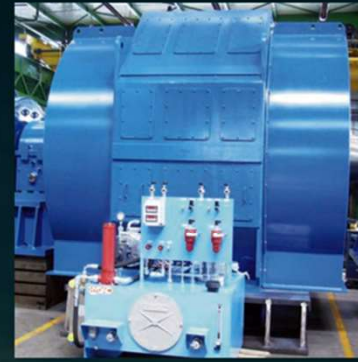
SHREDDERS



WOUND ROTOR MOTOR  
WITH BRUSHLIFTING



GAS TURBINE  
STARTING MOTORS



TEST BED  
APPLICATIONS



BULB GENERATORS



## SERVICE

CAPABILITIES

### TURBOGENERATORS

- ⊕ Until 250 MVA 2 pole or 4 pole types
- ⊕ Performed at Site as well at Factory
- ⊕ Works mainly include
  - Removing old windings, Renewing the old stator bars, rewinding, core re-lamination, rotor works

### HYDROGENERATORS

- ⊕ Small and large generators until 100 tons
- ⊕ Performed at Site as well at Factory
- ⊕ Works mainly include
  - Stator rehabilitations (core, windings),
  - Rotor rehabilitations

### AC & DC MOTORS

- ⊕ Large Motors for special applications
- ⊕ Performed at Factory
- ⊕ Works mainly include
  - Stator rehabilitations
  - Rotor works



## SELECTED SERVICE PROJECTS

2016



**JAVNO PODJETJE ENERGETICA  
LJUBLJANA D.O.O., Slovenia**  
NEW stator together with rotor refurbishment  
KONCAR make, Type: S-1925-2, 49.5 MVA, 10500 V, 50  
Hz, 2 poles

2012



**ABB Sace, Bergamo Italy**  
Generator rotor overhauling – retaining rings changing  
( 50 Hz – 60 Hz )- English Electric, 80 MVA  
Type: TG 40-220-87

2013



**Paks Nuclear Power Plant, Hungary**  
Stator rewinding & refurbishment of TVV-221 type  
250 MVA, 3000 rpm turbogenerator

2018



**Granfors Hydro Power Plant, Sweden**  
Stator manufacturing & rotor refurbishment of ASEA GS  
2910 type 25 MW, 150 rpm generator.

2009



**Bakony Erőmű, Ajka Hungary,**  
Rewinding of generator's stator.

## AC MOTOR SERVICES

### SCOPES

- Stator- and rotor refurbishment
- Rotor runout checking and dynamic balancing
- Professional maintenance and service of GANZ and other make of motors
- Site commissioning services

### Cement mill motor refurbishment



Type FTA 800Ks6  
5400 kW 6300 V 50 Hz 6 Pole



## LARGE DC MOTORS-Steel & Paper/pulp Industry

### CHARACTERISTICS

- Large DC Motors for special applications
- Careful analysis of operational requirements
- Retrofit designs
- Site commissioning services

Alcoa plant Hungary



Stator manufacturing & rotor refurbishment of P23/165-4.6 type  
4600 kW 50/90 rpm DC motor, 2015  
Weight 200 tons



# CERTIFICATIONS FOR QUALITY








OUR  
PRESTIGIOUS  
CLIENTS

# Thank you for your kind attention!



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