

COMPANY PRESENTATION



NBS SEVER

Technology in Motion



a company of **A-TEC** INDUSTRIES AG

ADDRESS AND LOCATION

ATB SEVER a.d.

Magnetna polja 6,
24 000 Subotica

Serbia

Phone +381 24 665 100

Fax +381 24 665 105

www.atb-motors.com

e-mail: sever@yu.atb-motors.com

ATB SEVER is one of the oldest producers of electrical machines in south - east Europe.

- It was founded in 1923.
- In 2005 it was privatized and since that SEVER exists in ATB group.
- Today, the factory has 840 employees.
- Wide product spectra, international standards, high quality and business development enables better market position for ATB group in further period.



ATB SEVER
Technology in Motion

ATB SEVER



STANDARD MOTORS PROGRAM

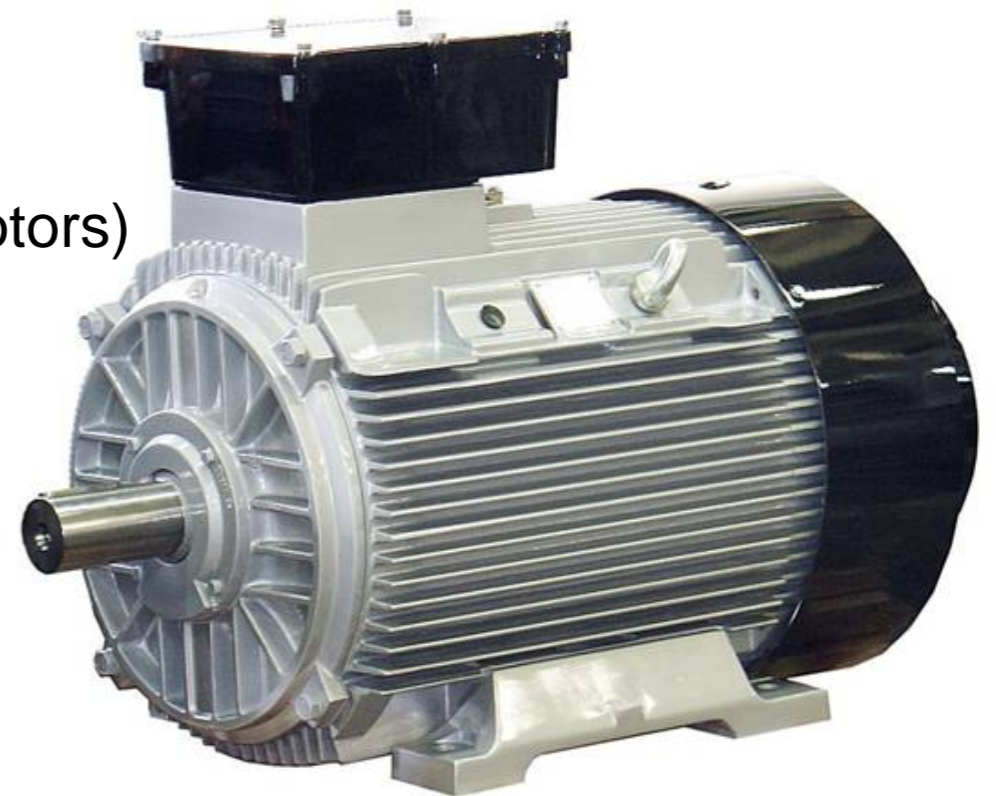
ATB-SEVER's basic production program comprise motor sizes from 63 to 400 mm.

Single phase motors:

- with permanent split capacitor
- with starting capacitor
- with starting capacitor and permanent split capacitor
- special single phase motors for domestic appliances

Three phase motors

- TEFC cage motors
- Drip proof cage motors
- TEFC motors with wound rotor (slip ring motors)
- Drip proof motors with wound rotor
- brake motors
- gear motors
- marine motors
- crane motors
- multi speed motors
- Ex motors



LARGE AND SPECIAL MOTORS PROGRAM

Frame size: 315 up to 500 mm

According to frequent market demands for higher rated powers we have developed motors of welded construction:

- Technical execution:
 - Wound rotor motors (P)
 - Squirrel cage rotor motors (K)
- Cooling:
 - Totally enclosed IC 411
 - Drip proof IC 01
- Mounting:
 - IMB3 (1001) - with foot
 - IMV1 (3001) - with flange

Motors in basic execution satisfy:

- S1 running duty, permanent working conditions
- Voltage 400/690V, 50Hz;
- Ambient temperature max. 40°C
- Altitude up to 1000m ASL

- * On enquire: 500V, 690V for 50Hz
400V, 575V, 790V for 60Hz



2.RZKIT 500 Ldd-6

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LARGE AND SPECIAL MOTORS PROGRAM

Frame size: 315 up to 500 mm



2.BOKIT 400 L-4



2.BOPT 280 M-4

MOTOR MAIN PARTS FEATURES:

Stator winding

- The sizes 315, 355, 400 mm are made of copper wire (IEC 60317-13) class 200 GR.2, Insulation class H
- The sizes 450, 500 mm are made of profiled copper wire (LGGL) in resin-rich system
- Temperature class F
- Windings for inverter duty motors are executed with round or profiled copper wire but with special insulating system (insulation and impregnation)

Rotor winding

- Cage rotors are made of copper and/or brass bars with shortcircuited rings
- Slipring rotor windings are made of profiled insulated copper wire in F insulation class

Lamination pack

- High grade dynamo steel with small specific losses (330-50-A5), thickness 0,5 mm

Frames

- Welded construction
- Heights 315-400 - endshields of cast iron
- Heights 450-500 - welded construction flange and endshields



2.ZPDIST 355 L-4

MOTOR MAIN PARTS FEATURES AND MOTOR TESTING

Terminal boxes

- Top mounted
- Upon request other positions are available
- RTD terminals are placed in separate box
- Heaters terminals are placed in main box

Bearing assembly

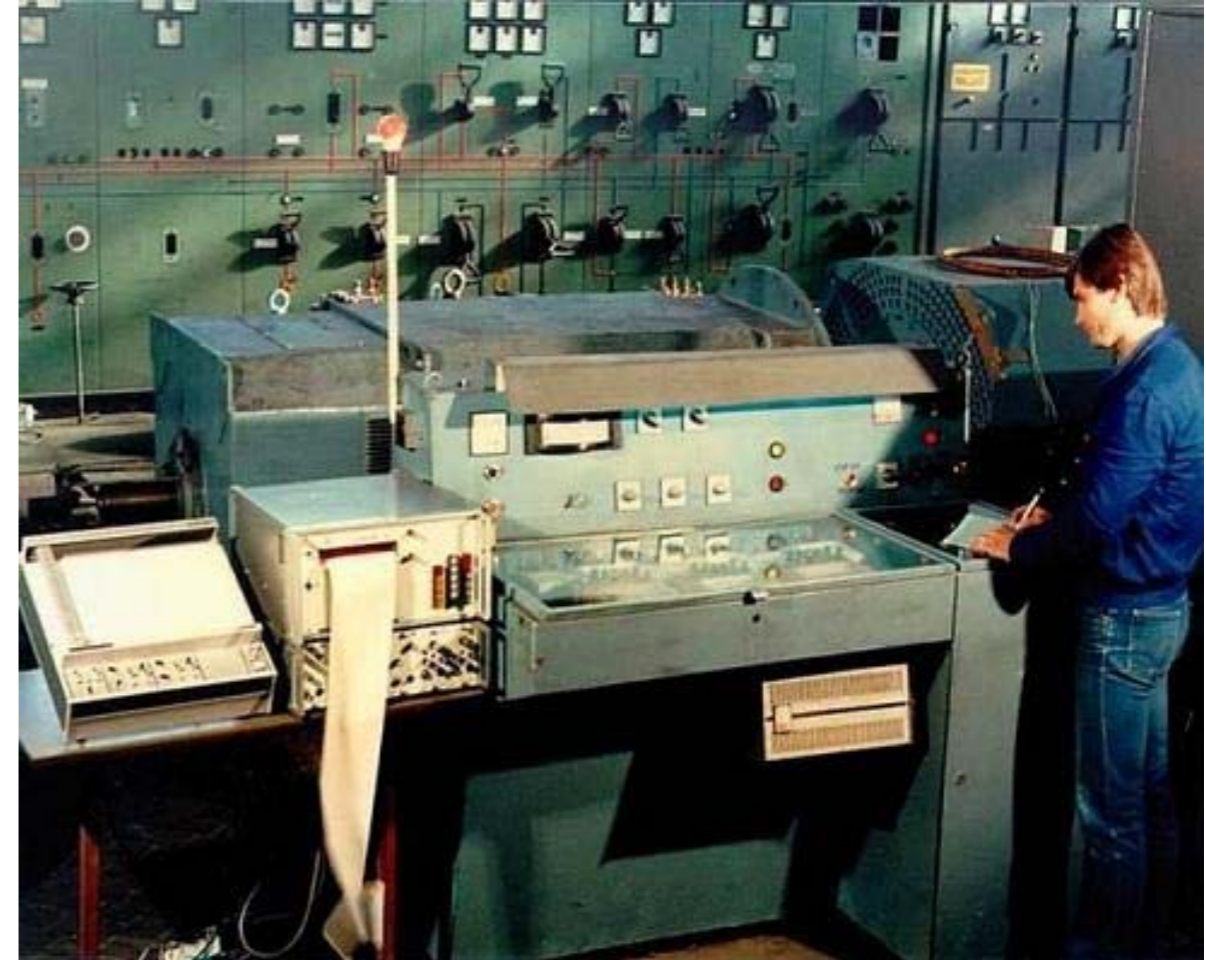
- Rolling bearings (SKF, FAG)
- For inverter duty motors insulated NDE bearing is applicated if necessary

Special features

- Forced ventilation is available

Motor testing

- IEC 60034-2 or national standards
- Special test according to special requests
- 100% serial testing
- Prototype: type testing



APPLICATION

- wide ranges of mining machines
- stonemills and mills in powerplants and cement factories
- fans for exhaust and fresh air in thermo powerplants
- pump drives in powerplants, water supplies and irrigation systems
- paper industry
- wide range of machines in steel industry
- rubber industry, e.g. for mixers
- Sea going vessels (bow trusters and fire distinguishing pumps)
- Oil and petrochemical industry



APPLICATION



ASYNCHRONOUS HV MOTORS IN WELDED CONSTRUCTION

This series of electromotors was designed according to “ Baucasten “ principle. It enables the use of identical construction elements for the following execution of motors:

- **According to rotor type:**
Squirrel cage motors (K)*
Slipring motors (P)*
- **According to cooling type:**
Inner cooling IC 01, IP 23 (O)*
Inner cooling with filter IC 01, IPW 24 (W)*
Inner cooling with air- duct inlet IC 31, IP 33, IC 37, IP 44 (R)*
Cooling with air-water heat exchanger IC81 W, IP 54 (V)*
Cooling with air-air heat exchanger IC 611, IP 54 (Z)*
- **According to mounting arrangement:**
Arrangements with feet IMB3 (horizontal)
Arrangements with flange IMV1 (F)* (vertical)
- **According to voltage:**
3 / 3,3 / 6 / 6,6 /10 kV
Standard execution is with 6kV, other voltages is available on request



PRODUCTION FACILITIES FOR HV MOTORS

Upon request ATB SEVER has the facilities to produce motors up to frame size $H = 710$ mm. For frame sizes above $H = 710$ mm we have no production possibilities at this moment.

Installed production capacity for HV motors are around 10 motors per month (depends on motor sizes).

Development:

The development should include frame sizes $H = 630$ and 710 mm, and also cooling type IC 411 up to $H = 500$ mm.



TESTING STATION AND CAPACITIES

All motors are subjects of serial final testings. For prototypes we make testings according to IEC 60034-2, VDE-Standard 0530. Upon request a special testing program can be determined for the testing station or at the motor erection site. All testing results are recorded in test protocols.

At the time being we can perform only direct measurements up to 700kW and indirect measurements up to 1800kW and 200A.



TERMINAL BOXES AND WINDINGS

The motor is connected through the terminal box. It is located on the right hand side of the motor (upon request also on the left hand side and on both sides).

The cable inlet is turned downwards and is movable for about 90 °. All three phase ends are insulated and connected to connection terminals .

“Star connection” is located inside motor.

Rotor terminal box is executed on similar way as main terminal box, according to rotor current and voltage.

RTD and heater terminals are placed in separate terminal boxes.

Stator windings are executed as “double-layered”, from profiled copper wire (LGGL), insulated in resin-rich system based on mica paper and epoxy resin in temperature class F.

Motors are executed with permanent laying brushes. Slip-ring set is located outside of the motor.



APPLICATION

- Conveyor belt and excavators in mining
- Mills in quarries and cement factories
- Fans for exhaust and fresh air in thermo powerplant
- Pump drives in powerplants, water plants and irrigation systems
- Paper industry
- Steel mills for pressdrives
- Mixers in rubber industry
- Motors for inverter operations (slipping motors are substituted with cage motors)
- Motors in open and closed construction for ship drives (main - and auxiliary drives). On request special construction for bow thruster drives and pumps in explosion-proof protection is available
- For pump drives in the oil industry motors in Exd and Exe version with the certification of the Federal Institution for Standards (Serbia and Montenegro).



LOW AND HIGH VOLTAGE MOTORS WINDING FACILITY



HIGH VOLTAGE ROTOR PRODUCTION



HIGHVOLTAGE STATOR WINDING



HYDROPOWERPLANT

INVESTOR: **ELECTRIC POWER INDUSTRY OF SERBIA,**
OBJECT: **HE ĐERDAP /Danube**
DUTY: **Pump**
MOTOR: Type: **OKF 6200 A/10**
Power: **400 kW**
Voltage: **6 000 V**
Speed: **582 min⁻¹**
Cooling: **Air**
Mounting: **IM V1**
Protection: **IP 23**



INVESTOR: **ELECTRIC POWER INDUSTRY OF MONTENEGRO,**
OBJECT: **HPP Perućica/Zeta**
PROCESS CONTROL: **Generator**
Selfconsumption 40 MVA
Main distributor: 0,4 kVAC; 48VDC; 200VDC
Reconstruction of Command table



MINING

INVESTOR: **ELECTRIC POWER INDUSTRY OF SERBIA,
Mine Kostolac**

OBJECT: **Excavator**

DUTY: **Surface mining machines**

MOTOR: Type: **2.RZKIT 315 Mk – 6 (and other Types)**
Power: **90 kW (6 st)+[3 st+2 st]**
Voltage: **380 V**
Speed: **985 min⁻¹**
Cooling: **Air**
Mounting: **IM B3**
Protection: **IP 54**

INVESTOR: **ELECTRIC POWER INDUSTRY OF SERBIA,
Mine Drmno**

OBJEKT: **Transportsystem**

DUTY: **Transport band**

MOTOR: Type: **1.PZ 6450 Mb - 6**
Power: **630 kW**
Voltage: **6 000 V**
Speed: **985 min⁻¹**
Cooling: **Air**
Mounting: **IM B3**
Protection: **IP 54**



MINING

INVESTOR: **ELECTRIC POWER INDUSTRY OF SERBIA,
Mine Kolubara**

OBJEKT: **Transportsystem**

DUTY:

MOTOR: Type: **1.ZK 200 L-6**
Power: **22 kW**
Voltage: **380 V**
Speed: **980 min⁻¹**
Cooling: **Air**
Mounting: **IM B3**
Protection: **IP 54**



INVESTOR: **ELECTRIC POWER INDUSTRY OF SERBIA,
Mine Kostolac**

OBJEKT: **Excavator**

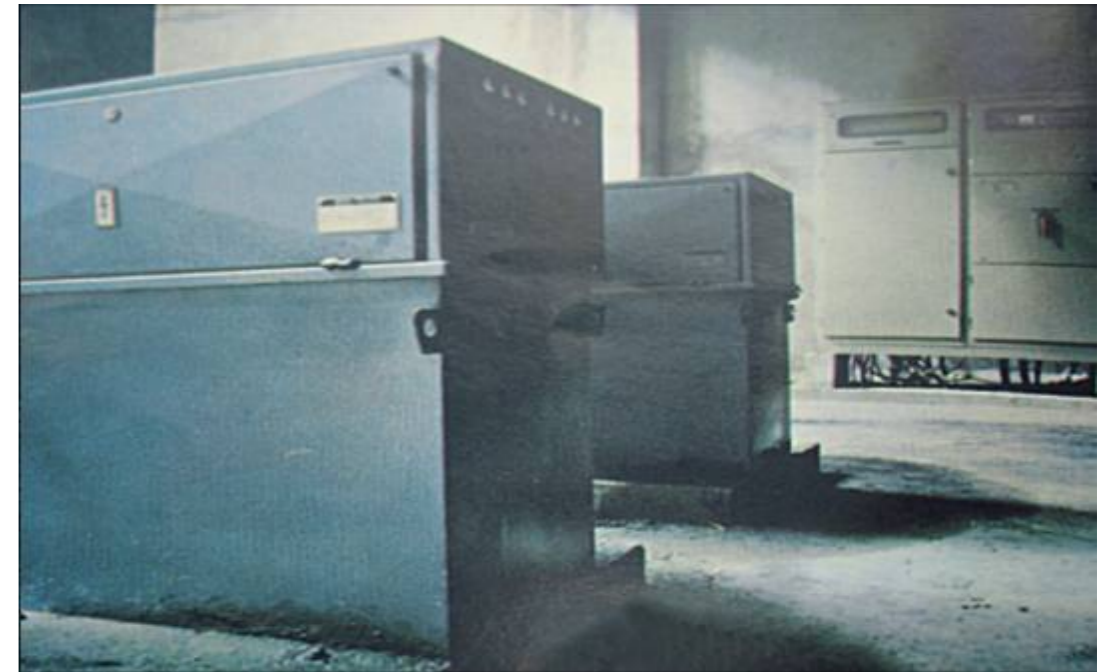
DUTY: **With frequency inverter**

MOTOR: Type: **2.RZKIT 355 Mk – 8 (2 st)**
Power: **160 kW**
Voltage: **380 V**
Speed: **742 min⁻¹**
Cooling: **Air**
Mounting: **IM B3**
Protection: **IP 54**



WATERSUPPLY

INVESTOR: **Copper mine BOR**
OBJEKT: **Surface mine CEROVO**
DUTY: **Chrushing mill**
Starter: Type: 3 TNAUn – 12
Power: 630 kW
Voltage: 1500 V
Mounting: 440 A
Protection: IP 44



INVESTOR: **WATER SUPPLY SYSTEM SUBOTICA**
OBJEKT: **Waterplant**
DUTY: **Pumps**
MOTOR: Type: 1.ZKI 315 M-4 (with invertor)
Power: 200 kW
Voltage: 380 V
Speed: 1485 min⁻¹
Colling: Air
Mounting: IM B3
Protection: IP 54



TELECOMMUNICATION - UPS

INVESTOR: **TELEKOM SRBIJA**
OBJEKT: **TKC Beograd**
DUTY: **Diesel generator station**
GENERATOR TYPE: DEAN 500 STM/PTT
Power: 500 kVA
Voltage: 3x400 V; 50 Hz
Diesel Motor: CUMMINS



THERMO POWER PLANTS

INVESTOR: **ELECTRIC POWER INDUSTRY OF SERBIA (EPS)**
OBJEKT: **TE "NIKOLA TESLA" - B**
ANTRIEB: **Cool water pump**
MOTOR: type: **FVKR 1126 V 20**
Power: **4100 kW**
Voltage: **6600 V**
Speed: **295 min⁻¹**
Cooling: **Water**
Mounting: **IM V1**
Protection: **IP 44**



INVESTOR: **ELECTRIC POWER INDUSTRY OF SERBIA (EPS)**
OBJEKT: **THERMO POWER PLANT "TE SVILAJNAC"**
ANTRIEB: **Turbo generator**
GENERATOR: type: **KONČAR (Rewinding)**
Power: **150 MVA**
Voltage: **13,8 kV**
No. of poles: **2p = 2**



ENERGETIC SECTOR – HYDRO POWER PLANTS

INVESTOR: **ELECTRIC POWER INDUSTRY OF SERBIA (EPS)**
OBJEKT: **HPP BAJINA BAŠTA /Drina**
DUTY: **Pump**
GENERATOR: Sub. **TOSHIBA (Overhaul)**
Power: **315 MVA**
Voltage: **11,0 kV**
No. of poles: **2p = 14**



INVESTOR: **ELECTRIC POWER INDUSTRY OF SERBIA (EPS)**
OBJEKT: **HE ĐERDAP /Dunav**
DUTY: **Turbine**
GENERATOR: Sub. **ELEKTROSILA (Reparatur)**
Power: **185 MVA**
Voltage: **15,7 kV**
No. of poles: **2p = 84**



METALLURGY AND TRAFIC INDUSTRY

INVESTOR: **RMK ZENICA**
OBJECT: **Iron plant**
DUTY: **Rolling mill (Overhaul)**
MOTOR: Type: /
Power: **7 500 kW**
Voltage: **850 VDC**
Speed: **60 / 120 min⁻¹**



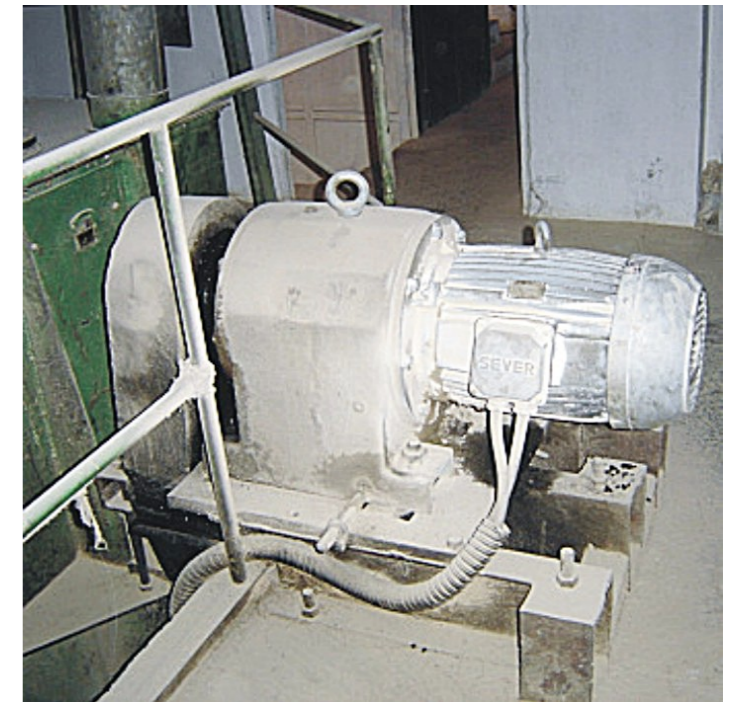
INVESTOR: **ZTP BEOGRAD**
OBJEKT: **Locomotive, type 441**
DUTY: **Drive**
MOTOR: Type: **ISVK 664 – 8 (repaire, 4 st/lok)**
Power: **800 kW**
Voltage: **770 VDC**
Speed: **1100 min⁻¹**
Cooling: **Fan**



GEARMOTORS

HELICAL GEARMOTORS

$P = 0,12 - 160 \text{ kW}$
 $n_2 = 0.1 - 900 \text{ min}^{-1}$
 $T_2 \leq 25000 \text{ Nm}$



HELICAL SHAFT MOUNTED GEARMOTORS

$P = 0,12 - 15 \text{ kW}$
 $n_2 = 0.1 - 280 \text{ min}^{-1}$
 $T_2 \leq 1800 \text{ Nm}$



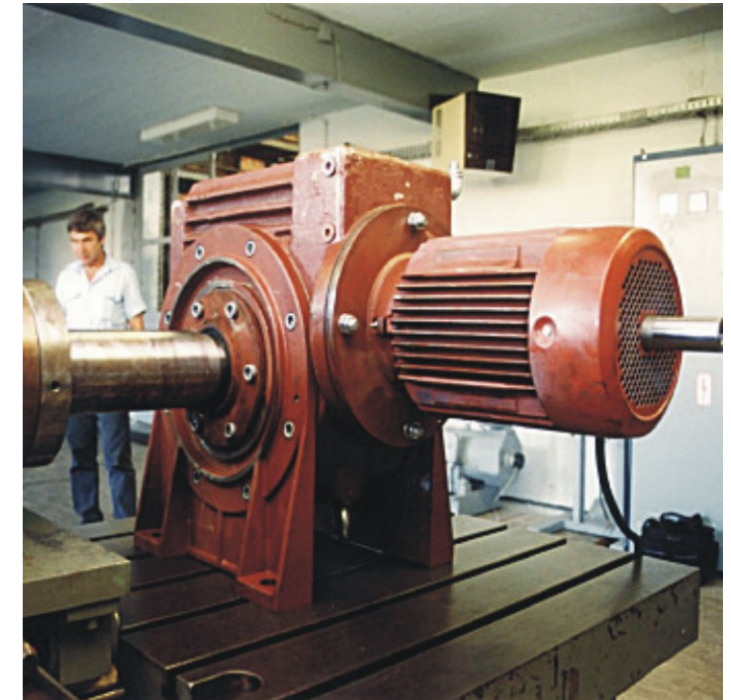
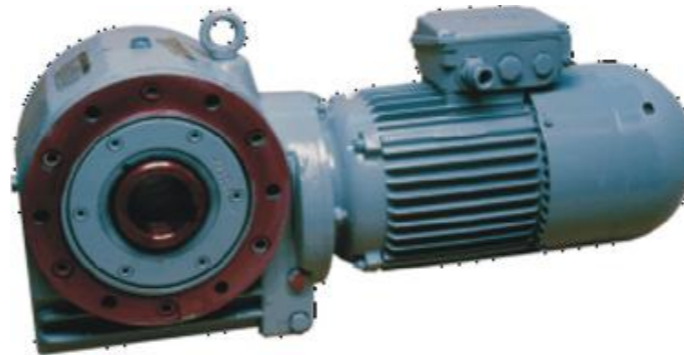
GEARMOTORS

WORM HELICAL GEAR MOTORS

$P = 0,12 - 30 \text{ kW}$

$n_2 = 0,1 - 200 \text{ min}^{-1}$

$T_2 \leq 4000 \text{ Nm}$

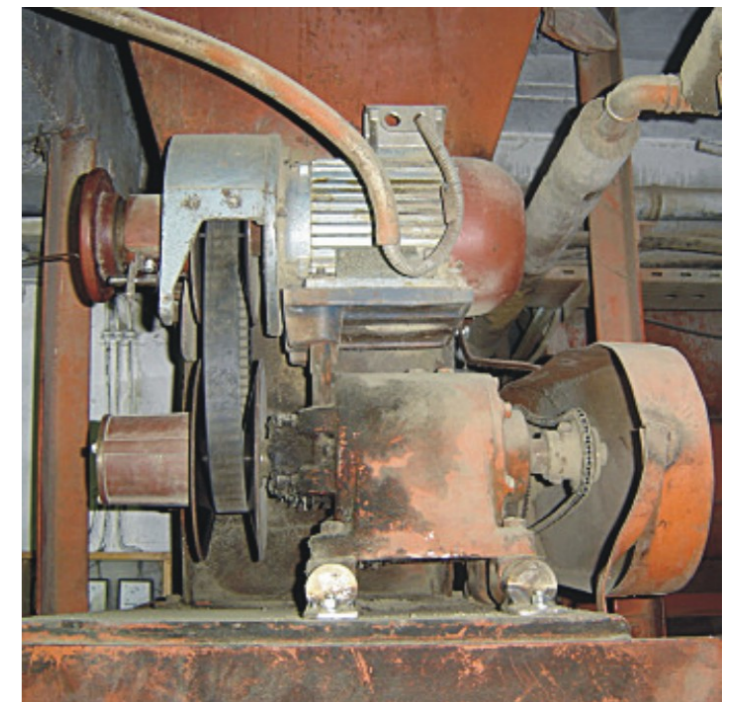


VARIJABLE SPEED DRIVES

$P = 0,12 - 15 \text{ kW}$

$n_2 = 450 - 3550 \text{ min}^{-1}$

$R = 1:4, 1:6, 1:8$



GSR AND GSRR PLANTS

Characteristics:

- Flow: up to 110 m³/h
- Discharge head of a pump: up to 120 m
- Rated pressure: max 16 bar
- Liquid temperature: up to 50 °C
- Microprocessor control and frequent speed regulation

Field of application:

- increasing of water pressure in the facilities
- consumers potable and technical water supplying
- fire prevention



AUTOMATIC DOMESTIC PUMPS AQUAMAT AND HIDROPAK

Characteristics Aquamat:

- Flow: do 5,1 m³/h
- Head: do 68 m
- Inlet pressure: max 3 bar
- Outlet pressure: max 10 bar
- Connection: R1 1/4"
- Liquid temperature: up to 50 °C

Application:

- for supplying households, motels, farms with cold consumption water and for irrigation



Characteristics Hidropak:

- Flow: do 4,2 m³/h
- Head: do 40 m
- Suction height: up to 30 m
- Working pressure range: 1-4,5 bar
- Connection: suction: R1 1/4" / discharge: R1"
- Liquid temperature: up to 50 °C

Application:

- for supplying with cold consumption water



CIRCULATING PUMPS 1RS I CS

Characteristics 1RS:

- Flow: up to 4 m³/h
- Discharge head of a pump : up to 6 m
- Assembling: DN 1/2", 3/4", 1", 1 1/4"
- Rated pressure: NP10
- Liquid temperature: up to 110 °C
- Switcher with three speed options

Field of application:

- to improve the circulation in the central heating systems, cooling systems and solar systems



Characteristics CS:

- Flow : up to 160 m³/h
- Discharge head of a pump : up to 21 m
- Assembling: DN 40 up to DN 150
- Rated pressure: NP16
- Liquid temperature: up to 120 °C

Field of application:

- to improve the circulation of hot softened water in the central heating systems, hot consume water, cooling water and condensate



CONTACT

ATB SEVER DOO SUBOTICA

Magnetna Polja 6

240000 Subotica

Serbia

Tel.: + 381 24 665 100

Fax: + 381 24 546 893

sever@rs.atb-motors.com



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