COMPANIES OF DR. AICHHORN GROUP

High pressure equipment and components for chemical and petrochemical industry with main application on fertilizer production up to 700 bar, LDPE plants up to 3,600 bar as well as oil and energy

High pressure pumps and components for waterjet cutting up to 6,000 bar, for injection of peroxides in LDPE plants up to 3,500 bar, as well as equipment for pressure testing equipment up to 5,500 bar and autofrettage up to 12,000 bar

Alternators, gensets for power plants from 70 kW to 3 MW, UPS systems, converter and airport equipment

Safety technology for hiway and railway tunnels, sheet metal processing, steel construction and metal working

Evaporation technology, vessels for pharmaceutical industry, thin film evaporator, special process equipment

Forest estate

Employees: 900
Turnover: € 200 mill.
Why should you buy an European product?
Because a product made in the EU fits best for companies in the EU. Because it is made for responsible treatment of energy and water and easy to maintain, because of the use of metric measurements and European manufacturing standard and quality. Austria is proud about their quality.
SERVOTRON®
High Pressure Pumps
SERVOTRON® - THE LATEST EVOLUTION
High Efficient High Pressure Pump for Waterjet Cutting

Energy efficient high pressure pump for waterjet cutting with patented frequency controlled servo drive

SERVOTRON® 40.37/40.45+
Power supply: 37/45 kW
Operating pressure: 400 MPa
Flow rate: 3.8/4.6 l/min
Compared to a conventional high pressure intensifier pump for water jet cutting, the SERVOTRON works with a constant flow gear pump instead of a variable adjustable axial piston pump. When cutting head closes, the servo motor stops immediately. Conventional pumps adjusting the flow of the variable hydraulic pump.

The SERVOTRON has huge advantages:

- There is no use of energy or noise emission during closed cutting head. Conventional pumps continue to produce heat and noise also in idle mode.
- The hydraulic pump on the SERVOTRON is far more silent in operation.
- Two pressure transducers are installed, with the high pressure transducer, the pump controls the actual operating pressure very precise from 10 – 400 MPa automatically.
- By using the bleed down valve for controlled pressure release inside the pump, it is possible to create a feed back loop for an exact pressure control without using the cutting head.

The result is:

- Save more than 24 % electrical energy
- More silent pump < 73 dB(A)
- Perfect control of high pressure
- No pressure spikes at closed head
ECOTRON® & SERVOTRON® - COMPARISON MEASUREMENTS
Hydraulic controlled pump - frequency controlled pump with servo drive

**ECOTRON®**

- **Wye-delta starter**
  - 100 A
  - 400 Mpa
  - Strom: high pressure

- **Switch-off waterjet**
  - 430 MPa
  - average 65 A
  - current: idle mode 23 A

**SERVOTRON®**

- **Soft start**
  - high pressure: 82 A
  - current: 400 MPa

- **Switch-off waterjet**
  - High pressure: 400 MPa
  - current: average 55 A
  - idle mode: 2 A (for auxiliaries only)
EFFECTIVE POWER
Hydraulic controlled pump - frequency controlled pump with servo drive

EFFECTIVE POWER P [kW]
hydraulic controlled

EFFECTIVE POWER P [kW]
frequency controlled servo drive

24.3%
Compared to conventional high pressure pumps, the TUV Austria has confirmed, that with SERVOTRON® high pressure pumps up to 24.3 % energy can be saved!
This is a thermographic video on a conventional, hydraulically controlled pump like BFT ECOTRON®. The real running time is 45 minutes.

The thermographic video of the BFT SERVOTRON® shows a different picture. The temperature stays visible under the level of the conventional pump. Lower operating temperature increases life time of components and saves energy and money.

Please start the video one after the other by clicking on it and watch the heat rising.
SERVOTRON® - FRONT VIEW

Intensifier

Control system

Oil/air cooler

Servo motor

Internal gear pump

Hydraulic tank
SERVOTRON® - REAR VIEW

- Accumulator, volume 2.49 liter
- Booster pump
- High pressure transducer
- Bleed down valve
- Double filter unit with mesh size 5 and 1.2 μm
- Water pre-pressure gauge
- Supply and drain connections
Advantages of BFT SERVOTRON® in Detail Part 1

The standard booster pump is necessary if the feed water pressure can fall under the required 3 bar. If the feed water pressure is too low, air bubbles can enter the intensifier. If compressed to 400 MPa, the air gets hot and burns the components of the intensifier. To have a booster pump secures a good life time of the intensifier components.

Double filter unit with mesh size 5 and 1.2 µm is a standard to make sure that no hard substances can come into the intensifier with the cutting water and damage the sensible high pressure components. That minimizes unnecessary break down during operations.

The gear pump creates the hydraulic pressure. The cutting pressure is adjustable from 10-400 MPa at the touch panel. This allows a very flexible optimization of pressure in the CNC cutting program, related to the material to be cut. The highly-dynamic servo motor accelerates from zero to 2700 rpm within to 60 milliseconds.

Easy access to all connections of SERVOTRON® from the outside. This saves time at installation on site.
In BFT pumps, the good accessible, service friendly installed dump valve has 2 important functions:

1. In case of an emergency stop, the pressure on the cutting system can be released within the pump.
2. For piercing with lower pressure, e.g. to cut brittle materials like glass, stone and tiles, it is possible to release the cutting pressure (high level) inside the pump. The pump provides the required piercing pressure (low level) at the cutting head, when starting a new cutting line automatically.

This saves time compared to pumps, which have to use the cutting head to lower the pressure. BFT pumps allow to lower the pressure and to go to the new starting position with the cutting head in parallel. The result is more efficiency and higher productivity through time savings.

The 2.49 liter accumulator which is standard on the BFT pumps, provides an excellent cutting signal with 8 MPa pressure fluctuations only. Pressure fluctuations on high pressure pumps can cause a marking on the cutting surface and an early wear on all HP components including tubes. Together with the connected cutting head signal the BFT pump has a very good HP signal which provides an excellent cutting result.
The oil/air heat exchanger is at BFT pumps installed in the pump frame. This is a request according to CE because the pump frame can collect the oil in case of a leakage. The frame construction is designed to contain the full hydraulic oil contends of the SERVOTRON®.

Optional without additional cost the customer can choose an oil/water exchanger to cool down the hydraulic oil. If the ambience temperature is lower than 35°C; we recommend a oil/air heat exchanger because in countries with a high price for feed water, the saving can be up to € 2,000.00 per year in favor to the air cooling.

As an option BFT offers for the SERVOTRON® pumps an oil/air cooler combined with oil/water cooler.

Up to 35°C the oil/air cooler is in operation. At higher temperatures up to max. 45°C the oil/water cooler will be activated automatically.

Only the difference of temperature will be cooled down by the additional water cooling to minimize the use of cooling water.

This is a patented energy saving option for the SERVOTRON®.

The new SERVOTRON® 40.45+ is equipped with a double hydraulic pump to increase the oil flow and optimize the output to 4,6 L/min at 4000 bar. Enough to feed a 0,4 mm orifice and come close to the cutting speed of a conventional 6000 bar pump. But with the proven 4000 bar reliability.
SERVOTRON® - OPERATING PANEL
With Touch Pad and USB Connection

Electrical cabinet with useful standards:
- Various analysis functions like temperature control (see picture)
- Master–Slave function up to 3 pumps standard
- Profi Bus connection to machine controller
- Frequency modulator to control the servo motor
- Soft starter to avoid energy peaks.
- Electronically logbook for tracing the pump history.
Suction and pressure valves: Easy maintenance without opening the high pressure part.

Shrinked high pressure cylinder with patented sealing system
## SUMMARY ADVANTAGES - SERVOTRON®
High pressure pumps with frequency controlled servo drive

<table>
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<tr>
<th>Our Performance</th>
<th>Your Benefit</th>
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<tbody>
<tr>
<td>Continuous pressure adjustment</td>
<td>It allows a wide application spectrum for the whole cutting table</td>
</tr>
<tr>
<td>from 1.450 to 58,000 psi</td>
<td></td>
</tr>
<tr>
<td>Practically no pulsation at piercing</td>
<td>No damage at brittle materials</td>
</tr>
<tr>
<td>Increased life time of high pressure</td>
<td></td>
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<tr>
<td>components (sealings, valves tubes)</td>
<td></td>
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<tr>
<td>No pressure overload and minimal</td>
<td>Reduced wear of the whole high</td>
</tr>
<tr>
<td>pressure drop at on / off mode of</td>
<td>pressure system, from the pump to</td>
</tr>
<tr>
<td>cutting head</td>
<td>the cutting head</td>
</tr>
<tr>
<td>At closed cutting head, no current</td>
<td>Much higher energy efficiency, less</td>
</tr>
<tr>
<td>consumption at servo drive</td>
<td>operating costs</td>
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AUXILIARIES INCLUDED
Spare Part Kit, Special Tools and Lubricants
FULL RANGE OF HIGH PRESSURE COMPONENTS

High quality tubings and fittings for operating pressures up to 4.550 bar
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HIGH PRESSURE PUMPS FOR WATERJET CUTTING