

# Production and Research PLASMA-SYSTEMS

S U R F A C E T E C H N O L O G Y



**Tetra-30-LF**  
table machine  
with automatic  
control

**Tetra-100-LF**  
with  
automatic  
control



**Tetra-30-LF-PC**  
with PC-control  
in stand alone  
cabinet



**Tetra-30-LF-PC**  
table machine  
with PC-control



**Tetra-100-LF-PC**  
with PC-control



**Diener electronic**  
Plasma-Surface-Technology

# Technical data

	Tetra-30 Stand-Alone / Table machine	Tetra-100 Stand-Alone Machine																
<b>1. Switch cabinet</b>	<p><b>Dimensions:</b></p> <table> <tr> <td><b>Table machine</b></td> <td><b>Stand-alone-machine</b></td> </tr> <tr> <td>Width: approx. 600 mm</td> <td>approx. 600 mm</td> </tr> <tr> <td>Height: approx. 800 mm</td> <td>approx. 2.200 mm</td> </tr> <tr> <td>Depth: approx. 650 mm</td> <td>approx. 850 mm with undercarriage</td> </tr> </table> <p><b>Inside dimensions:</b></p> <table> <tr> <td>Width: approx. 305 mm</td> <td>approx. 305 mm</td> </tr> <tr> <td>Height: approx. 300 mm</td> <td>approx. 300 mm</td> </tr> <tr> <td>Depth: approx. 370 mm</td> <td>max. 625 mm</td> </tr> <tr> <td>Volume: approx. 34 l</td> <td>max. 57 l</td> </tr> </table> <p><b>Vacuum chamber:</b>            Chamber material: stainless steel            Door material: aluminium</p>	<b>Table machine</b>	<b>Stand-alone-machine</b>	Width: approx. 600 mm	approx. 600 mm	Height: approx. 800 mm	approx. 2.200 mm	Depth: approx. 650 mm	approx. 850 mm with undercarriage	Width: approx. 305 mm	approx. 305 mm	Height: approx. 300 mm	approx. 300 mm	Depth: approx. 370 mm	max. 625 mm	Volume: approx. 34 l	max. 57 l	<p><b>Dimensions:</b></p> <p>Width: approx. 600 mm            Height: approx. 800 mm            Depth: approx. 650 mm with undercarriage</p> <p><b>Inside dimensions:</b></p> <p>Width: approx. 400 mm            Height: approx. 400 mm            Depth: approx. 625 mm            Volume: approx. 100 l</p> <p><b>Vacuum chamber:</b>            Chamber material: stainless steel            Door material: aluminium</p>
<b>Table machine</b>	<b>Stand-alone-machine</b>																	
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<b>2. Gas connection / Pressure measurement</b>	<p><b>3 gas connections, more gas connections are possible</b>            Standard gases: O<sub>2</sub>, noble gases, N<sub>2</sub>, ...            Pressure measurement with <b>Pirani</b>  <b>Vacuum safety switch</b></p>	<p><b>3 gas connections, more gas connections are possible</b>            Standard gases: O<sub>2</sub>, noble gases, N<sub>2</sub>, ...            Pressure measurement with <b>Pirani</b>  <b>Vacuum safety switch</b></p>																
<b>3. Plasma power supply</b>	<p><b>Frequency:</b> 40 kHz  <b>Power:</b> 0 - 1,000 W; Infinitely variable</p>	<p><b>Frequency:</b> 40 kHz  <b>Power:</b> 0 - 2,500 W; Infinitely variable</p>																
<b>4. Electrodes and goods-carriers</b>	<p>The machine can be equipped with <b>one to six goods-carriers</b>, or optionally with a <b>rotary-drum</b></p>	<p>The machine can be equipped with <b>one to six goods-carriers</b>, or optionally with a <b>rotary-drum</b></p>																
<p><b>5. Electric control</b>  <b>Two different controls are possible:</b></p> <p><b>Automatic Control</b>            or  <b>PC - Control</b></p>	<p><b>Automatic Control</b>            or  <b>PC - Control</b></p> <p>The control is based on an <b>IBM - compatible industry personal computer</b> with an industrial field bus            Software runs with <b>MS-Windows</b></p> <p>Data can be stored as an <b>Excel - File</b></p> <p><b>Two Modes:</b>            manuel or automatic operation</p> <p><b>Parameter:</b>            Process start pressure            Max. pump down time            Gas mass flow (ratios)            Pressure stabilization time            Pressure            Power            Flushing time            Ventilation time            Max. temperature</p>	<p><b>Automatic Control</b>            or  <b>PC - Control</b></p> <p>The control is based on an <b>IBM - compatible industry personal computer</b> with an industrial field bus            Software runs with <b>MS-Windows</b></p> <p>Data can be stored as an <b>Excel - File</b></p> <p><b>Two Modes:</b>            manuel or automatic operation</p> <p><b>Parameter:</b>            Process start pressure            Max. pump down time            Gas mass flow (ratios)            Pressure stabilization time            Pressure            Power            Flushing time            Ventilation time            Max. temperature</p>																

# Technical data

	Tetra-30 Stand-Alone / Table machine	Tetra-100 Stand-Alone Machine
	<p><b>Failure limits for:</b> Pressure Mass-flow Power Temperature</p> <p>Digital <b>pressure regulation</b></p> <p>100 automatic processes adjustable</p> <p>Acoustic advice of process-end</p> <p>Data or text input facility</p> <p>Password</p> <p>Vacuum safety switch</p> <p>Door safety switch</p> <p>Pirani switch</p>	<p><b>Failure limits for:</b> Pressure Mass-flow Power Temperature</p> <p>Digital <b>pressure regulation</b></p> <p>100 automatic processes adjustable</p> <p>Acoustic advice of process-end</p> <p>Data or text input facility</p> <p>Password</p> <p>Vacuum safety switch</p> <p>Door safety switch</p> <p>Pirani switch</p> <p>Signal lamp</p>
<b>6. Connections</b>	<p>Gas: 6 mm Swagelok Power supply: 230 V / 13 A Pressure: 6 bar Consumption: approx. 10 l / min Tubes with 4/6 mm diameter</p>	<p>Gas: 6 mm Swagelok Power supply: 400 V / 13 A Pressure: 6 bar Consumption: approx. 10 l / min Tubes with 4/6 mm diameter</p>
<b>7. Pump</b>	<p><b>2-stage rotary vane pump</b> filled with <b>mineral oil</b> (not with the extremely expensive PFPE-oil). <b>Exhaust filter</b> <b>Purge system</b> makes it possible to run the pump with <b>oxygen, . . .</b> <b>Pumping Speed:</b> min. 16 m<sup>3</sup> / hr</p>	<p><b>2-stage rotary vane pump</b> filled with <b>mineral oil</b> (not with the extremely expensive PFPE-oil). <b>Exhaust filter</b> <b>Purge system</b> makes it possible to run the pump with <b>oxygen, . . .</b> <b>Pumping Speed:</b> min. 25 m<sup>3</sup> / hr</p>

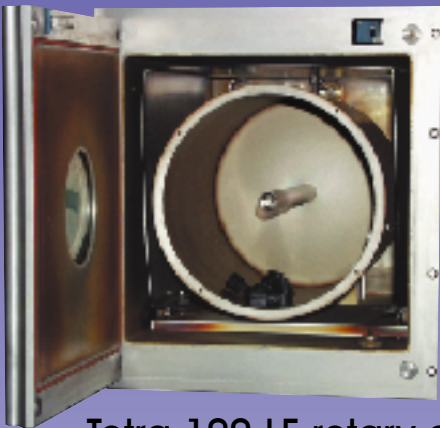
## Available options:

- Rotary drum
- Spare parts package
- Additional gas channels
- Polymerisation accessories
- Bias voltage measurement
- Automatic door
- Special flanges / additional flanges
- Safety valve
- Different generators for LF (40 kHz), RF (13,56 MHz), MW (2,45 GHz Microwave)
- Additional parts for special gases (CF<sub>4</sub>, NH<sub>3</sub>, SiH<sub>4</sub>, H<sub>2</sub>, . . .)
- Network connection
- Maintenance agreement
- Hot plate
- Following processes
- Pressure reducing valve for gas bottle
- Custom made goods carriers
- RIE-electrode
- Ion measuring sensor
- Test inks
- Butterfly valve
- Active carbon exhaust filter
- Printer for labels
- Input filter for vacuum pump
- Label reader
- Barcode reader
- Temperature measurement

# PLASMA-SYSTEMS

## SURFACE TECHNOLOGY

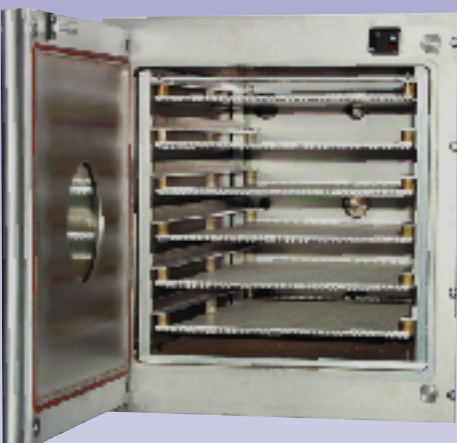
### Options for Tetra-30 and Tetra-100



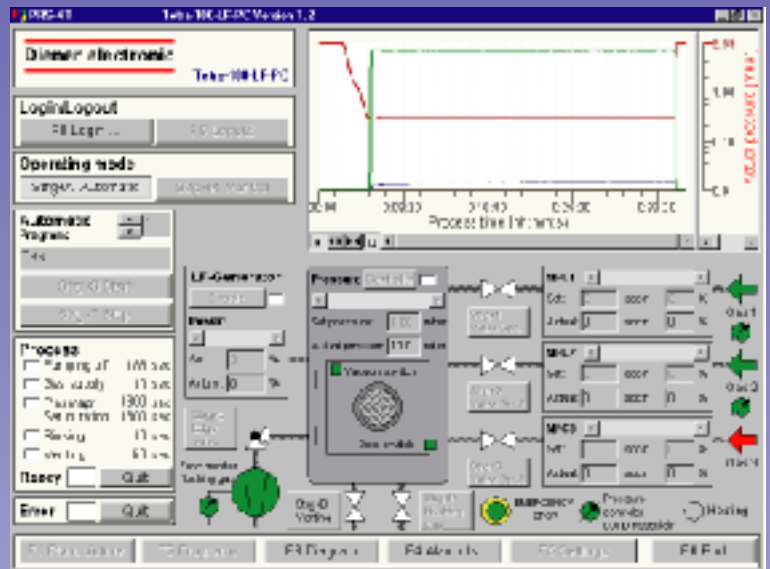
Tetra-100-LF rotary drum



Goods carrier



Tetra-100-LF goods carrier



Main menu



Program

**Diener electronic**

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HF-Generators

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