Tetra 30/50

electronic diener
Plasma-Surface-Technology

Plasma Systems For Production And Research

Tetra 30/50

Technical Data

Standard: Tetra-30-LF / Tetra-50-LF

1. Dimensions of cabinet (19“ Rack):
without connections:
Tetra-30: approx. W 600mm x H 1800 mm x D 800 mm
Tetra-50: approx. W 600mm x H 1800 mm x D 800 mm
Weight: approx. 250 kg (without pump)

2. Dimensions of vacuum chamber:
Tetra-30: approx. W 305 mm x H 300 mm x D 370 mm
Tetra-50: approx. W 305 mm x H 300 mm x D 625 mm
Chamber volume: approx. 33 l / 57 l

3. Gas connections:
2 gas channels through needle valve

4. Plasma generator:
40 kHz / 0 – 1.000 W, infinitely variable

5. Electrodes and goods-carriers:
The machine can be equipped with one to eight goods-carriers / electrodes
optionally with a rotary-drum

6. Hardware Control:
Full automatic, process time by timer
Start button / Stop button

Parameters: pump down pressure, process pressure, gas mass flow (ratios), stabilization time, power, process time, flushing time

7. Connections:
Gas: 6 mm Swagelok
Power supply: 400 V / 16 A

8. Pump:
2-stage rotary vane pump
Pumping speed: min. 16 m^3/hr
the pump can run with oxygen
exhaust filter

Technical Data

Standard: Tetra-30-LF-PC / Tetra-50-LF-PC

1. Dimensions of cabinet (19“ Rack):
Tetra-30: approx. W 600mm x H 1800 mm x D 800 mm
Tetra-50: approx. W 600mm x H 1800 mm x D 800 mm
Weight: approx. 250 kg (without pump)

2. Dimensions of vacuum chamber:
Tetra-30: approx. W 305 mm x H 300 mm x D 370 mm
Tetra-50: approx. W 305 mm x H 300 mm x D 625 mm
Chamber volume: approx. 33 l / 57 l

3. Gas connections:
2 gas channels through mass flow controller

4. Plasma generator:
40 kHz / 0 – 1.000 W, infinitely variable

5. Electrodes and goods-carriers:
The machine can be equipped with one to eight goods-carriers / electrodes
optionally with a rotary-drum

6. Hardware Control:
The PC control is based on an MS Windows computer with an industrial field bus.

Gas mass flow, pressure and power are regulated

Two Modes: manual or automatic operation

Parameter: pump down pressure, process pressure, gas mass flow, pressure stabilization time, power, process time, flushing time, ventilation time

Failure limits for: pressure, mass-flow, power, temperature

Miscellaneous: digital pressure regulation, acoustic advice of process-end, vacuum safety switch, door safety switch, compressed air pressure sensor, signal lamp, network interface card

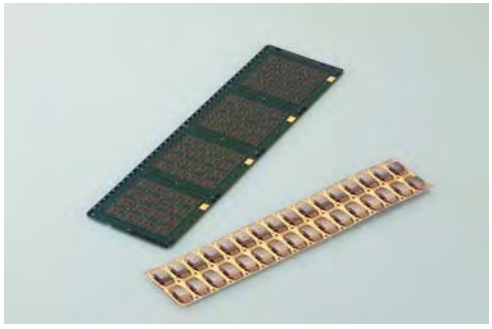
7. Connections:
Gas: 6 mm Swagelok
Power supply: 400 V / 16 A

8. Pump:
2-stage rotary vane pump, pumping speed: min. 16 m^3/hr
the pump can run with oxygen, exhaust filter

Tetra 100/150

electronic diener
Plasma-Surface-Technology

Plasma Systems For Production And Research



Tetra 100/150

Technical Data

Standard: Tetra 100 LF / Tetra 150 LF

1. Dimensions of cabinet (19“ Rack):
without connections:
Tetra-100: approx. W 1000 mm x H 1800 mm x D 1000 mm
Tetra-150: approx. W 1000 mm x H 2400 mm x D 1000 mm
Weight: approx. 300 kg (without pump)

2. Dimensions of vacuum chamber:
Tetra-100: approx. W 400 mm x H 400 mm x D 625 mm
Tetra-150: approx. W 400 mm x H 600 mm x D 625 mm
Chamber volume: approx. 100 l / 150 l

3. Gas connections:
2 gas channels through needle valve

4. Plasma generator:
40 kHz / 0 – 2.500 W, infinitely variable

5. Electrodes and trays:
The machine can be equipped with one to sixteen goods-carriers / electrodes
optionally with a rotary-drum

6. Hardware Control:
Full automatic, process time by timer
Start button / Stop button

Parameters: pump down pressure, process pressure, gas mass flow (ratios), stabilization time, power, process time, flushing time

7. Connections:
Gas: 6 mm Swagelok
Power supply: 400 V / 16 A

8. Pump:
2-stage rotary vane pump
Pumping speed: min. 40 m^3/hr (Tetra 100)
min. 65 m^3/hr (Tetra 150)
the pump can run with oxygen
exhaust filter

Technical Data

Standard: Tetra 100 LF PC / Tetra 150 LF PC

1. Dimensions of cabinet (19“ Rack):
Tetra-100: approx. W 1000 mm x H 1800 mm x D 1000 mm
Tetra-150: approx. W 1000 mm x H 2200 mm x D 1000 mm
Weight: approx. 300 kg (without pump)

2. Dimensions of vacuum chamber:
Tetra-100: approx. W 400 mm x H 400 mm x D 625 mm
Tetra-150: approx. W 400 mm x H 600 mm x D 625 mm
Chamber volume: approx. 100 l / 150 l

3. Gas connections:
2 gas channels through mass flow controller

4. Plasma generator:
40 kHz / 0 – 2.500 W, infinitely variable

5. Electrodes and trays:
The machine can be equipped with one to sixteen goods-carriers / electrodes
optionally with a rotary-drum

6. Hardware Control:
The PC control is based on an MS Windows computer with an industrial field bus.

Gas mass flow, pressure and power are regulated

Two Modes: manual or automatic operation

Parameter: pump down pressure, process pressure, gas mass flow, pressure stabilization time, power, process time, flushing time, ventilation time

Failure limits for: pressure, mass-flow, power, temperature

Miscellaneous: digital pressure regulation, acoustic advice of process-end, vacuum safety switch, door safety switch, compressed air pressure sensor, signal lamp, network interface card

7. Connections:
Gas: 6 mm Swagelok
Power supply: 400 V / 16 A

8. Pump:
2-stage rotary vane pump, pumping speed: min. 40 m^3/hr (Tetra 100), min. 65 m^3/hr (Tetra 150)
the pump can run with oxygen, exhaust filter

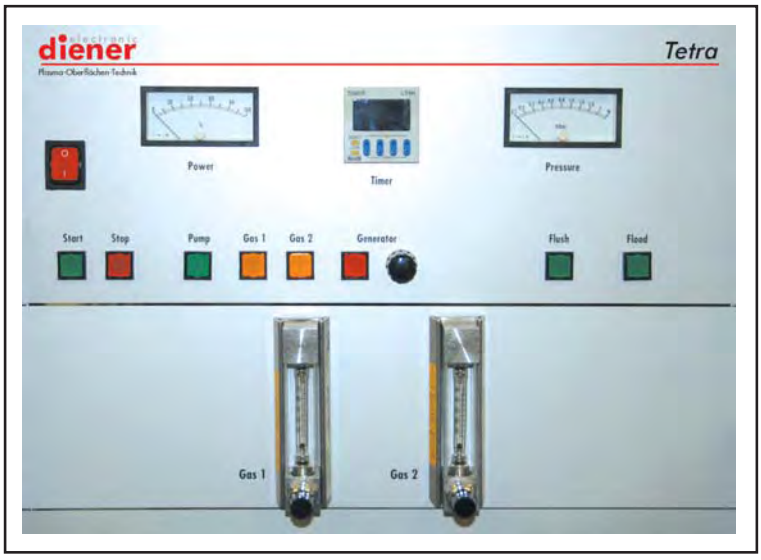
The Fully Automatic Control:

The fully automatic control was conceived for continuously running processes with only a **few parameter changes**. In contrast to the PC variant gas flow, pressure and power are only steered and not electronically regulated.

By pushing the „Start“ button, the plasma process runs **fully automatic**:

1. Pump
2. Gas delivery
3. Power / Timer / Plasma process
4. Flushing
5. Ventilation

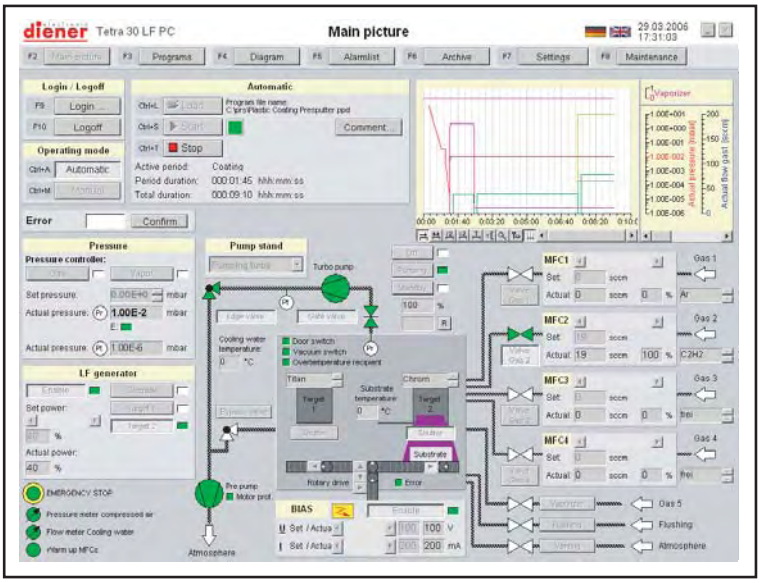
There is also the possibility of starting and of terminating each sequence of the process **manually**. For this the buttons are successively operated.



The PC-control:

The PC-control was developed by us, for applications with frequent changes of parameters and a high requirement to the **process regulation** and the **process documentation**.

- Visualization of the system
- Simple operation
- Password protection
- Input of comments
- Regulation of all process-relevant parameters
- Recording of all process-relevant parameters
- Documentation of all process-relevant parameters
- 100 programs with 10 subroutines, each are storable
- Customizations are possible



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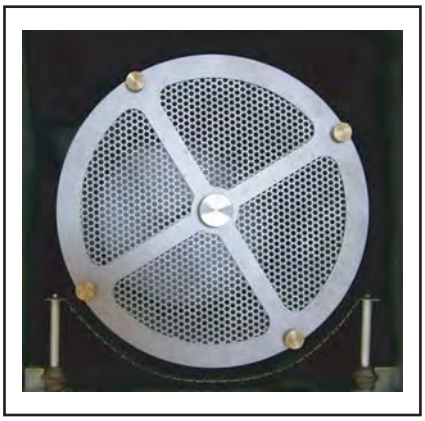
Available options:

- 13.56 MHz generator
- 2.45 GHz generator
- intake filter for vacuum pump
- carbon exhaust filter
- automatic door
- barcode reader
- bias voltage measurement
- butterfly valves
- rotary drum (bulk goods, powder)
- pressure-reducing valve
- spare parts set
- faraday box
- gas shower
- heating plate
- ion measuring sensor
- corrosive gas version
- monomer bottle
- network connection
- PC-control
- polymerization accessories
- RIE electrode
- safety valve
- software (also customized)
- special flanges
- temperature sensors
- test inks
- vacuum pump systems
- device for powder treatment
- trays (also customized)
- service contract
- additional gas channels
- Mass-Flow-Controller, needle valves
- roll to roll system (foil treatment)
- more options on request



pics: removable rotary drum
for Tetra 100 / 150

pics: trays
for Tetra 100 / 150

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Applications

- degreasing / cleaning
- photoresist ashing
- hydrophilization
- hydrophobization
- oleophobization
- powder treatment
- pre-treatment before printing
- pre-treatment before bonding
- pre-treatment before painting
- pre-treatment before soldering
- pre-treatment before molding
- pre-treatment before casting
- pre-treatment before gluing
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Applications

- Analysis
- Archaeology
- Automotive industry
- Biotechnology
- Elastomer technology
- Electrotechnology
- Electron microscopy
- Precision mechanics technology
- Research and development
- Semiconductor technology
- Small-batch manufacturing
- Plastic industry
- Medical devices manufacturing
- Micro system technology
- Solar cell technology
- Textile technology
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Our Service Offers

- Individual customer service
- Free treatment of examples
- Free consulting regarding plasma treatment
- Development of plasma systems
- Plasma systems for rent
- Plasma systems for hire purchase
- Different financing concepts
- Contract labour
- Process development also locally
- Surface analysis
- Providing informative materials
- Complete technical service
- Service contracts
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Visit our homepage: www.plasma.de

Diener electronic GmbH + Co. KG
Talstr. 5
D-72202 Nagold (Germany)

Telefon: +49 (0) 7452 / 888 07 - 0
Telefax: +49 (0) 7452 / 888 07 - 50
E-Mail: info@diener-electronic.de