The NEXTor® Z 100 is an extremely compact pump able to sorb gases very effectively and with large capacity down to the XHV level. The getter cartridge is made of the new ZAO®1 sintered getter disks stacked in a highly efficient gas trapping structure featuring pumping speed in excess of 150 l/s (H2). The cartridge is integrated into a CF 35 flange containing a heating element for the getter activation. After the activation is carried out (500 °C x 1 h), the pump removes gases at room temperature without any need for electric power to operate. On the other side of the same flange, a diode ion pump featuring 6 l/s (Ar) is connected. Gas flows from the vacuum system to the ion pump through an optimized conductance. The optimized conductance and the special internal design of the ion pump allow the maximum exploitation of the ion pump sorption performance.

The configuration of the ion pump with respect of the getter cartridge provides additional pumping synergies. Gases released by the ion pump during the operation, are intercepted and removed by the getter element, with a substantial reduction of backstreaming effects. For the same reasons, increased pumping efficiency for H2 and CH4 are obtained. Fine titanium particles which are known to be continuously emitted by ion pumps during operation are also effectively trapped by the getter element, reducing potential contamination of the vacuum system.
The NEXTorr® Z 100 product line incorporates and exploits the patented concept of a combined pumping system comprising a getter pump and an ion pump, and has global intellectual property rights coverage with patents already granted in the US (8,287,247), Europe (2,409,034), Japan (5,372,239), China (102356236).

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### Ordering Information

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<tr>
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<td>NEXTorr Z 100</td>
<td>SD0211</td>
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<tr>
<td>Pump power supply</td>
<td>NEXT Ferrite Plus Power Supply</td>
<td>380048</td>
</tr>
<tr>
<td>Power supply cables</td>
<td>NEXT ferrite PLUS KIT OF CABLES (3m)</td>
<td>180049</td>
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<tr>
<td>NEG element power supply</td>
<td>NEG POWER-LP C1**</td>
<td>180521</td>
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<tr>
<td>ION element power supply</td>
<td>SIP POWER</td>
<td>180506</td>
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<td>Output cable NEG element</td>
<td>NEG POWER-NEXTOR D02/D020 Output Cable - 3MT***</td>
<td>380495</td>
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<tr>
<td>Output cable ION element</td>
<td>NIOGS-03 - OUTPUT CABLE ION - 3 MT***</td>
<td>180410</td>
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<td>NEG element power supply</td>
<td>Capacitorr CF 35 D100 Power Supply</td>
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<td>Input Cable</td>
<td>Cable Mains Input CF 35 3 MT</td>
<td>180318</td>
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<tr>
<td>Output Cable</td>
<td>Cable Supply Output CF 35 D50/D100/200 3 MT</td>
<td>180386</td>
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* The power supply includes the input cable.
** Other models, able to simultaneously drive up to four pumps, are available.
*** Longer output cables are available on request.

**Measured at 3x10⁻⁶ Torr Unsaturated pump (saturated pump).**

**Capacity values with the NEG element at room temperature, corresponding to a drop of the pumping speed to 10% of its initial value.** A drop to 15% has been considered in the case of N₂.

**Total capacity values for each single gas obtained after many reactivations (getter fully consumed). Capacity values for the various gases are not additive (a getter fully reacted with one gas species will not sorb another gas).**

After the getter element has reached its H₂ capacity, it can be “regenerated”. Through the regeneration process, it is possible to extract the hydrogen stored in the getter. After a full regeneration process, the pump can start pumping hydrogen again.

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The NEXTor® Z 200 is an extremely compact pump able to sorb gases very effectively and with large capacity down to the XHV level. The getter cartridge is made of the new ZAO1 sintered getter disks stacked in a highly efficient gas trapping structure featuring pumping speed in excess of 300 l/s (H₂). The cartridge is integrated into a CF 35 flange containing a heating element for the getter activation. After the activation is carried out (500 °C x 1 h), the pump removes gases at room temperature without any need for electric power to operate. On the other side of the same flange, a diode ion pump featuring 6 l/s (Ar) is connected. Gas flows from the vacuum system to the ion pump through an optimized conductance. The optimized conductance and the special internal design of the ion pump allow the maximum exploitation of the ion pump sorption performance.

The configuration of the ion pump with respect of the getter cartridge provides additional pumping synergies. Gases released by the ion pump during the operation, are intercepted and removed by the getter element, with a substantial reduction of back-streaming effects. For the same reasons, increased pumping efficiency for H₂ and CH₄ are obtained. Fine titanium particles which are known to be continuously emitted by ion pumps during operation are also effectively trapped by the getter element, reducing potential contamination of the vacuum system.

### Dimensions in mm

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
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<tbody>
<tr>
<td>Diameter</td>
<td>14</td>
</tr>
<tr>
<td>Height</td>
<td>25</td>
</tr>
<tr>
<td>Width</td>
<td>68.5</td>
</tr>
<tr>
<td>Depth</td>
<td>50</td>
</tr>
</tbody>
</table>

### HIGHLIGHTS

- **Total pump weight (magnets included)**: 2.2 kg
- **Total pump volume**: 0.5 litre
- **Type of ion pump**: Diode
- **Operation Voltage Ion Element**: 5.0 kVdc
- **Operation Voltage NEG Element**: 12 Vdc
### Pumping speed curves for various gases

**NEXTorr® Z 200**

**Sorption test (according to ASTM FT98-97)**
- Activation: 550°C x 60’
- Sorption pressure: 3x10⁻⁶ torr
- Sorption temperature: 25°C

<table>
<thead>
<tr>
<th>Gas</th>
<th>Initial pumping speed (l/s)</th>
<th>NEG activated</th>
<th>NEG saturated</th>
</tr>
</thead>
<tbody>
<tr>
<td>O₂</td>
<td>140</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>H₂</td>
<td>290</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>120</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>N₂</td>
<td>70</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>H₂O</td>
<td>190</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CH₄</td>
<td>13</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gas</th>
<th>Sorption capacity (Torr l)</th>
<th>Single run capacity²</th>
<th>Total capacity³</th>
</tr>
</thead>
<tbody>
<tr>
<td>O₂</td>
<td>2.8</td>
<td>&gt;2000</td>
<td></td>
</tr>
<tr>
<td>H₂</td>
<td>1120</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>0.7</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>H₂O</td>
<td>5.5</td>
<td>&gt;4000</td>
<td></td>
</tr>
<tr>
<td>N₂</td>
<td>0.3</td>
<td>&gt;100</td>
<td></td>
</tr>
<tr>
<td>CH₄</td>
<td>55</td>
<td>50,000 hours at 10⁻⁴ torr</td>
<td></td>
</tr>
</tbody>
</table>

NEG section
- Getter alloy type: ZAO1
- Alloy composition: Zr V Ti Al
- Getter mass (g): 56 g
- Getter surface (cm²): 295

ION section
- Voltage applied: DC+5kV
- Number of Penning cells: 4
- Standard bake-out temperature: 150 °C

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The SAES Group manufacturing companies are ISO9001 certified and the Italian companies are also ISO14001 certified. Full information about our certifications for each company of the Group are available on our website at: www.saesgroup.com

D.VS.152.3.17
The NEXTorr® Z 300 is an extremely compact pump able to sorb gases very effectively and with large capacity down to the XHV level.

The getter cartridge is made of the new ZAO1 sintered getter disks stacked in a highly efficient gas trapping structure featuring pumping speed in excess of 400 l/s (H₂). The cartridge is integrated into a CF 63 flange containing a heating element for the getter activation. After the activation is carried out (500 °C x 1 h), the pump removes gases at room temperature without any need for electric power to operate. On the other side of the same flange, a diode ion pump featuring 6 l/s (Ar) is connected. Gas flows from the vacuum system to the ion pump through an optimized conductance. The optimized conductance and the special internal design of the ion pump allow the maximum exploitation of the ion pump sorption performance.

The configuration of the ion pump with respect of the getter cartridge provides additional pumping synergies. Gases released by the ion pump during the operation, are intercepted and removed by the getter element, with a substantial reduction of back-streaming effects. For the same reasons, increased pumping efficiency for H₂ and CH₄ are obtained. Fine titanium particles which are known to be continuously emitted by ion pumps during operation are also effectively trapped by the getter element, reducing potential contamination of the vacuum system.

**HIGHLIGHTS**

- Total pump weight (magnets included): 3.1 kg
- Total pump volume: 0.6 litre
- Type of ion pump: Diode
- Operation Voltage Ion Element: 5.0 kVdc
- Operation Voltage NEG Element: 20 Vdc

**Dimensions in mm**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 59</td>
<td></td>
</tr>
<tr>
<td>Ø 113,5</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>120</td>
</tr>
<tr>
<td>Width</td>
<td>81</td>
</tr>
</tbody>
</table>
Pumping speed curves for various gases

NEXTorr® Z 300

sorption test (according to ASTM FT98-97)

Initial pumping speed (l/s) | Gas | NEG activated | NEG saturated  
--- | --- | --- | ---  
O₂ | 220 | 4 |  
H₂ | 400 | 6 |  
CO | 200 | 5 |  
N₂ | 120 | 4 |  
H₂O | 280 | 4 |  
CH₄ | 15 | 8 |  
Argon | 6 (0.3) | 6 (0.3) |  

Sorption capacity (Torr·l) | Gas | Single run capacity | Total capacity  
--- | --- | --- | ---  
O₂ | 5 | >3500 |  
H₂ | 1920 | N/A |  
CO | 0.8 | >850 |  
N₂ | 0.6 | >170 |  
H₂O | 10 | >7000 |  
CH₄ | 50,000 hours at 10⁻⁶ Torr |  

NEG section | Getter alloy type | ZAO®  
--- | --- | ---  
Alloy composition | Zr V Ti Al |  
Getter mass (g) | 96 |  
Getter surface (cm²) | 500 |  
ION section | Voltage applied | DC+5kV |  
Number of Penning cells | 4 |  
Standard bake-out temperature | 150 °C |  

1 Measured at 3x10⁻⁶ Torr. Unsaturated pump (saturated pump).  
2 Capacity values with the NEG element at room temperature, corresponding to a drop of the pumping speed to 10% of its initial value.  
3 Total capacity values for each single gas obtained after many reactivations (getter fully consumed). Capacity values for the various gases are not additive (a getter fully reacted with one gas specie will not sorb another gas).  
4 After the getter element has reached its room temperature H₂ capacity it can be "regenerated". The regeneration process extracts the H₂ stored in the getter. After being regenerated, the pump can start pumping H₂ again.

Ordering Information

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<thead>
<tr>
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<td>NEXTorr Z 300</td>
<td>SH0201</td>
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<td>Pump power supply</td>
<td>NEXTorr PS NIOPS-04</td>
<td>380415</td>
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<td>Power supply cables</td>
<td>NEXTorr KIT OF CABLES-04-06</td>
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<td>Power supply input cable</td>
<td>NIOPS INPUT CABLE</td>
<td>380398</td>
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<td>Output cable ION element</td>
<td>NIOPS04-06 - OUTPUT CABLE ION-3MT</td>
<td>380418</td>
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<tr>
<td>Output cable NEG element</td>
<td>NIOPS04-06 - OUTPUT CABLE NEG-3MT</td>
<td>380419</td>
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</table>

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SIP POWER Controller

The SIP POWER controls the NEXTorr ion pump modules. The controller features an internal system for measuring the ionization current along with an autoranging system. The current (in nA) can be communicated with an external device through a serial interface. The voltage can also be communicated with an external device. Up to 128 SIP Power units can be simultaneously controlled through LAN using a dedicated program.

The SIP Power is protected by two security features: the SAFE connector and the INTERLOCK.

Features:
- SAFE connector and INTERLOCK
- Optional alphanumeric display
- Status LEDs and an RS485 interface on the version without the alphanumeric display

Data interface:
- Remote control through Ethernet
- Recording of the device parameters via USB
- Remote control through RS485 (only available in the version without alphanumeric display)

<table>
<thead>
<tr>
<th>Product description</th>
<th>Code</th>
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<tbody>
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<td>3B0506</td>
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<tr>
<td>SIP POWER LEDS RS485**</td>
<td>3B0509</td>
</tr>
<tr>
<td>NIOPS03-OUTPUT CABLE ION-3MT***</td>
<td>3B0410</td>
</tr>
</tbody>
</table>

*with display
**without alphanumeric display
***other cable lengths available upon request
NIOPS Controller

Electrical Characteristics:
ION module
- Nominal output voltage: 5 kV ± 2%
- Range of adjustment: 1.2÷6 kV
- Output voltage polarity: Positive
- Input current: 1 x 18.5 A
- Maximum output current: 89.9 mA
- Obtainable output power: 25–30 W

NEG module
- Output power Activation mode (45‐280) W

Instrument Protection
- Internal line fuse: 2A T

Weight
- (3-4.5) kg

Dimensions
- 129x198x334 (HxWxD)

Main Features
- Remote control by RS232 interface with ASCII protocol
- Remote control by RS485 interface with Modbus protocol (RTU)

HIGHLIGHTS

The NIOPS is the controller for the NEXTorr pumps. The device consists of two power modules, controlling the ion pump (ION) as well as the Non-Evaporable Getter pump (NEG) modules of a NEXTorr pump.

Both modules are controlled by a microprocessor circuit and utilize a mutual line power module.
The two power units are able to operate independently. The NIOPS can be remotely controlled via the ASCII (RS232) and MODBUS RTU (RS485) serial communication protocols.

ION module
The ion pump module of the NIOPS displays the pressure obtained by ionization current down to nA scale (i.e., down to 1e-10 Torr).

NEG module
The NIOPS is designed for three modes of operation of the NEG pump portion of the NEXTorr:
- Activation
- Timed Activation
- Conditioning

Different NIOPS models (NIOPS-03, NIOPS-04, and NIOPS-06) are available for operating the six NEXTorr pumps.

Ordering Information

<table>
<thead>
<tr>
<th>Product description</th>
<th>Code</th>
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<td>NEXTorr PS NIOPS-03</td>
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<td>Power Supply cables NEXTorr D100-5 &amp; NEXTorr D200-5</td>
<td>NEXTorr Kit of Cables-03</td>
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<tr>
<td>Power Supply cables NEXTorr D300-5 &amp; NEXTorr D500-5</td>
<td>NEXTorr PS NIOPS-06</td>
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<td>Power Supply cables NEXTorr D300-5 &amp; NEXTorr D500-5</td>
<td>NEXTorr Kit of Cables-04-06</td>
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* Cables for the control of the ION and NEG elements of the NEXTorr pump, as well as the main input cable are available separately as well as in kits. The standard cables are 3 m long; other lengths available upon request.