High Vacuum Experimentation Systems
UNIVEX 300, UNIVEX 450
UNIVEX 350, UNIVEX 450 B
Special plants
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Accessories / Process Components

<table>
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<tr>
<th>Standard accessories</th>
<th>Page</th>
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<tr>
<td>Base plate and bell jar</td>
<td>C19.05 + 07</td>
<td>✔</td>
</tr>
<tr>
<td>Lifting facility, manually operated</td>
<td>C19.07</td>
<td>✔</td>
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<td>Vacuum chamber with door</td>
<td>C19.09 + 15</td>
<td>✔</td>
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<tr>
<td>Auxiliary operation</td>
<td></td>
<td></td>
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<tr>
<td>Substrate holder</td>
<td>C19.03</td>
<td>✔</td>
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<tr>
<td>Substrate heater</td>
<td>C19.03</td>
<td>✔</td>
</tr>
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<td>Gas admission</td>
<td>C19.03</td>
<td>✔</td>
</tr>
<tr>
<td>Process equipment</td>
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<tr>
<td>Shutters</td>
<td>C19.12</td>
<td>✔</td>
</tr>
<tr>
<td>Thin film measurement</td>
<td>C19.14</td>
<td>✔</td>
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<tr>
<td>Sources</td>
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<td>Custom installations</td>
<td>C19.03</td>
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<td>Glow discharge cleaning</td>
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<td>Thermal evaporation</td>
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<td>Electron-beam evaporation</td>
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<tr>
<td>DC high rate sputtering</td>
<td>C19.14</td>
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<tr>
<td>RF high rate sputtering</td>
<td>C19.14</td>
<td>✔</td>
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</table>
The UNIVEX multi-purpose experimentation systems were developed by LEYBOLD for applications in research and development, as well as for setting up pilot production systems.

The range of applications for these systems covers primarily vacuum coating as well as experiments in vacuum process engineering.

The multi-purpose experimentation systems from LEYBOLD are based on a modern modular concept. The high vacuum pumps are installed horizontally at the level of the base plate or the vacuum chamber.

### Special Accessories for UNIVEX 300, 350, 450 and 450 B

Besides standard process components we can also supply installations according to customers requirements, for example for:

- Vacuum soldering experiments
- Metallurgical experiments
- Thermal conduction experiments
- Diffusion experiments
- Dactyloscopy.

### Automatic Pressure Control

Various processes require a constant pressure in the UNIVEX vacuum chamber. For this purpose LEYBOLD offers a wide range of different pressure or flow control systems.

Special designs which are manufactured according to customer’s specifications are available upon request.

### Substrate Heater

For the purpose of heating substrates, LEYBOLD offers a variety of heating facilities (radiation heaters, heaters with quartz lamps, for example). These systems may be combined with different temperature controllers.

Special designs which are manufactured according to customer’s specifications are available upon request.

### Cooling and Heating Systems

Special experiments require that the temperature of the samples be maintained constant within a wide temperature range for the setpoint.

For this LEYBOLD delivers upon request cooling/heating facilities with LN₂ as the refrigerant and an electric heater, complete with temperature controller.

Special designs which are manufactured according to customer’s specifications are also available upon request.

### Substrate Holders

Upon request LEYBOLD is able to supply substrate holders according to customer’s specifications.

Substrate holders with planetary gear for the UNIVEX 450 and UNIVEX 450 B are available upon request.
UNIVEX 300

Table-Top System with 300 mm dia. Chamber

Advantages to the User

♦ Modular system design
♦ Any kind of process component may be installed
♦ Process components may be retrofitted without problems
♦ Freely accessible vacuum chamber
♦ Freely accessible base plate
♦ Very simple to operate and use
♦ Pump system adapted to the individual process

Typical Applications

♦ Vacuum coating in research and development
♦ Special experiments

Basic Unit

♦ The pump system and the electrical supply system are housed in a 19” rack cabinet.
♦ Moreover, the 19” cabinet provides space (max. 6 height units) for a vacuum gauge and a thickness measuring instrument as well as power supply units for the process components.
♦ The basic unit may be placed on a bench top.

Vacuum Chamber

♦ The base plate is attached to the lateral intake port of the basic unit.
♦ Either a vacuum chamber made of stainless steel or glass may be placed on the base plate.

Pump System

♦ The standard pumping equipment comprises a TRIVAC D 8 B two-stage rotary vane pump and a TURBOVAC 151 turbomolecular pump.
♦ For processes which develop increased quantities of gas or which require low operating pressures, the TURBOVAC 361 may be built-in.
♦ For processes which involve pumping of aggressive media, a barrier gas version of the turbomolecular pump and a rotary vane pump with a filling of special oil may be supplied.
♦ For especially sensitive processes also a dry compressing vacuum pump like the EcoDry M may be used as the backing pump.

Vacuum Measurement

♦ Depending on the type of application, a combination vacuum gauge operating according to the cold cathode or hot cathode principle may be installed.
## Technical Data

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>UNIVEX 300</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>High vacuum pump</td>
<td>TURBOVAC 151</td>
<td>TURBOVAC 361</td>
<td></td>
</tr>
<tr>
<td>Pumping speed for N₂</td>
<td>1 x s⁻¹</td>
<td>145</td>
<td>345</td>
</tr>
<tr>
<td>Backing pump / nominal pumping speed</td>
<td>TRIVAC D 8 B / 9.7 m³ x h⁻¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply unit for high vacuum pump</td>
<td>TURBOTRONIK NT 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Power supply with main switch plug-in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High vacuum connection flange DN</td>
<td></td>
<td>100 ISO-F, lateral</td>
<td></td>
</tr>
<tr>
<td>Electrical connection</td>
<td></td>
<td>230 V, 50 Hz, max. 16 A *)</td>
<td></td>
</tr>
<tr>
<td>Cooling water connection; DN 10 hose bar</td>
<td>4 to 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling water consumption 1 x h⁻¹</td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Weight kg</td>
<td></td>
<td>130</td>
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## Ordering Information

<table>
<thead>
<tr>
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<th>Special</th>
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<tbody>
<tr>
<td>Basic unit</td>
<td>Part No. 030 60</td>
<td>upon request</td>
</tr>
</tbody>
</table>

*) Other voltages and frequencies upon request

## Special Accessories for UNIVEX 300

### Stainless Steel Base Plate

- Dimensions (H x dia.): 60 x 350 mm
- Installation holes: 34.5 mm dia. (13 x)
- Lateral connections: 2 x DN 10 KF, 1 x DN 40 KF
- Weight: 19 kg
- Base plate, stainless steel: Part No. 030 61

### Pyrex Glass Bell Jar (Vacuum Chamber)

- Dimensions (H x dia.): 350 x 300 mm
- Height, cylindrical section: 200 mm
- Seal: FPM
- Weight: 5.6 kg
- Bell jar, Pyrex glass: Part No. 030 10 ¹)

### Stainless Steel Bell Jar (Vacuum Chamber)

- Dimensions (H x dia.): 380 x 300 mm
- Height, cylindrical section: 300 mm
- Seal: FPM
- Weight: 9.6 kg
- Bell jar, stainless steel: Part No. 030 12 ¹)

¹) With punched steel cover for implosion protection

## Technical Data and Ordering Information

### Lateral high vacuum connection flange DN 100 ISO-K

- Dimensions (H x dia.): 60 x 350 mm
- Installation holes: 34.5 mm dia. (13 x)
- Lateral connections: 2 x DN 10 KF, 1 x DN 40 KF
- Weight: 19 kg
- Base plate, stainless steel: Part No. 030 61

### Dimensions (H x dia.): 350 x 300 mm

- Height, cylindrical section: 200 mm
- Seal: FPM
- Weight: 5.6 kg
- Bell jar, Pyrex glass: Part No. 030 10 ¹)

### Dimensions (H x dia.): 380 x 300 mm

- Height, cylindrical section: 300 mm
- Seal: FPM
- Weight: 9.6 kg
- Bell jar, stainless steel: Part No. 030 12 ¹)

¹) With DN 100 viewing window and 2 carrying handles; hole at the top (34.5 mm dia.)
UNIVEX 450

Cabinet Housed System with 450 mm dia. Vacuum Chamber

Advantages to the User
- Modular system design
- Any kind of process component may be installed
- Process components may be retrofitted without problems
- Freely accessible vacuum chamber
- Freely accessible base plate
- Very simple to operate and use
- Pump system adapted to the individual process

Typical Applications
- Vacuum coating in research and development
- Pre-production trials
- Dactyloscopy
- Special experiments

Basic Unit
- The pump system and the electrical supply system are housed in the UNIVEX 450 cabinet.
- Moreover, the 19" cabinet provides space (max. 20 height units) for a vacuum gauge and a thickness measuring instrument as well as power supply units for the process components.

Vacuum Chamber
- The base plate is attached to the lateral intake port of the basic unit.
- A vacuum chamber made of stainless steel may be placed on this base plate.
- A water-cooled vacuum chamber can also be supplied.
- The vacuum chamber is moved by the hoist attached to the basic unit.

Pump System
- The standard pumping equipment comprises a TRIVAC D 40 B two-stage rotary vane pump and a TURBOVAC 1000 turbomolecular pump.
- For processes which develop increased quantities of gas or which require low operating pressures, the UNIVEX 450 can also be equipped with cryo pumps.
- For processes which involve pumping of aggressive media, a barrier gas version of the turbomolecular pump and a rotary vane pump with a filling of special oil may be supplied.
- For especially sensitive processes also a dry compressing vacuum pump like the EcoDry M may be used as the backing pump.

Vacuum Measurement
- Depending on the type of application, a combination vacuum gauge operating according to the cold cathode or hot cathode principle may be installed.
Technical Data

High vacuum pump
Pumping speed for N₂: 1 x s⁻¹

Back ing pump / nominal pumping speed

Supply unit for high vacuum pump
Control

Built-in electro-pneumatic valves

High vacuum connection flange DN

Electrical connection

Cooling water connection; DN 10 hose bar

Cooling water consumption: 1 x h⁻¹

Compressed air connection, DN 10 bar

Weight kg

Ordering Information

Standard

Part No. 030 70

Special

upon request

ORDERING INFORMATION

Standard

Part No. 030 70

Special

upon request

*) Other voltages and frequencies upon request

Specific Accessories for UNIVEX 450

Stainless Steel Base Plate

Technical Data and Ordering Information

Lateral high vacuum connection flange DN 250 ISO-K
Dimensions (H x dia.) 115 x 475 mm
Installation holes 34.5 mm dia. (19 x)
Lateral connections 2 x DN 16 KF, 2 x DN 40 KF
Weight 27 kg
Base plate Kat.-Nr. 030 71

Stainless Steel Bell Jar (Vacuum Chamber)

Dimensions (H x dia.) 500 x 450 mm
Height, cylindrical section 400 mm
Seal FPM
Weight 23 kg
Bell jar, stainless steel Part No. 030 16 ¹)

¹) With DN 100 viewing window; hole at the top fitted with a blank flange. Upon request the stainless steel bell jar may be supplied with a coiled cooling or heating pipe.
UNIVEX 350

Door System with 350 mm dia. Vacuum Chamber

Advantages to the User
◆ Modular system design
◆ Any kind of process component may be installed
◆ Process components may be retrofitted without problems
◆ Vacuum chamber with a door
◆ Freely accessible base plate
◆ Very simple to operate and use via programmable control
◆ For installation into clean-room walls
◆ For RF sputtering
◆ Pump system adapted to the individual process

Typical Applications
◆ Vacuum coating in research and development
◆ Pre-production trials
◆ Special experiments

Basic Unit
◆ The UNIVEX 350 consists of two separable 19” rack mount cabinets.
◆ The process chamber and the pump system are accommodated in one cabinet.
◆ The electric power supply with the pump system controller based on a PLC with display and operating unit is accommodated in the second cabinet. This cabinet also houses the vacuum gauge as well as the power supply units for the process components.

Vacuum Chamber
◆ The base plate is attached to the base fame.
◆ The door is equipped with a viewing window.
◆ Bottom plate and lid are provided with installation holes.
◆ Additional lateral flanges for installing process components.
◆ A water-cooled vacuum chamber can also be supplied.
◆ Evaporation protection plates which may be easily disassembled are available.

Pump System
◆ The standard pumping equipment comprises a TRIVAC D 16 B two-stage rotary vane pump and a TURBOVAC TW 700 turbomolecular pump.
◆ For processes which develop increased quantities of gas or which require low operating pressures, the UNIVEX 350 can also be equipped with a turbomolecular pump having a higher pumping speed (TURBOVAC 1000, for example) or with cryopumps.
◆ For processes which involve pumping of aggressive media, a barrier gas version of the turbomolecular pump and a rotary vane pump with a filling of special oil may be supplied.
◆ For especially sensitive processes also a dry compressing vacuum pump like the EcoDry M may be used as the backing pump.

Vacuum Measurement
Depending on the type of application, a combination vacuum gauge operating according to the cold cathode or hot cathode principle may be installed.
**Technical Data**

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<tr>
<td>High vacuum pump</td>
<td>TURBOVAC TW 700</td>
<td>COOLVAC 1500 CL</td>
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<td>1 x s⁻¹</td>
<td>680</td>
<td>1500</td>
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<td>Backing pump / nominal pumping speed</td>
<td>TRIVAC D 16 B / 18.9 m³ x h⁻¹</td>
<td>TRIVAC D 25 B / 29.5 m³ x h⁻¹</td>
<td></td>
</tr>
<tr>
<td>Supply unit for high vacuum pump</td>
<td>OEM power supply 59 V DC</td>
<td>Compressor unit</td>
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<tr>
<td>Control</td>
<td>Power supply with programmable control</td>
<td>Power supply with programmable control</td>
<td></td>
</tr>
<tr>
<td>Built-in electro-pneumatic valves</td>
<td>1 x DN 16 KF</td>
<td>1 gate valve DN 16, 2 × right-angle valve DN 25, DN 16 KF</td>
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<tr>
<td>High vacuum connection flange DN</td>
<td>160 ISO-K</td>
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<td>Electrical connection</td>
<td>400 V, 3 ph., 50/60 Hz</td>
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<td>Cooling water connection; DN 10 hose bar</td>
<td>25</td>
<td>140</td>
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<td>Cooling water consumption 1 x h⁻¹</td>
<td>–</td>
<td>6 to 10</td>
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<td>Compressed air connection, DN 10 bar</td>
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<td>425</td>
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*) Other voltages and frequencies upon request

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**Vacuum Chamber**

**Technical Data**

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<td>370</td>
</tr>
<tr>
<td>Inside depth mm</td>
<td>380</td>
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<td>Inside height mm</td>
<td>500</td>
</tr>
<tr>
<td>Connections</td>
<td></td>
</tr>
<tr>
<td>Front side</td>
<td></td>
</tr>
<tr>
<td>Bottom plate</td>
<td></td>
</tr>
<tr>
<td>Lid</td>
<td></td>
</tr>
<tr>
<td>Rear</td>
<td>160 ISO-K, 2 x 10 KF</td>
</tr>
<tr>
<td>Left side</td>
<td>160 ISO-K, further flanges optional</td>
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<tr>
<td>Right side</td>
<td>160 ISO-K, further flanges optional</td>
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<td>Weight kg</td>
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**Ordering Information**

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<th>Vacuum Chamber for UNIVEX 350</th>
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<tr>
<td>Vacuum chamber</td>
<td>Is included with the UNIVEX 350</td>
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</tbody>
</table>
Standard Accessories for UNIVEX 300, 350, 450 and 450 B

**Blank-off Screw Fitting**
For 34.5 mm dia. hole.

**Rotary Feedthrough**
With mount for substrate holder; for all common bell jar sizes; suitable for 34.5 mm dia. holes.

**Motor Drive for Rotary Feedthrough**
With connection flange and coupling; is electrically operated through the VS 024 supply unit.

### Technical Data and Ordering Information

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<td>Blank-off screw fitting</td>
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<tr>
<td>Shaft dia.: atmosphere/vacuum</td>
<td>8/10 mm</td>
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<tr>
<td>Max. rotational speed</td>
<td>150 rpm</td>
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<tr>
<td>Permissible torque</td>
<td>2 Nm</td>
</tr>
<tr>
<td>Weight</td>
<td>2 kg</td>
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<td>Rotary Feedthrough</td>
<td>Part No. 030 63</td>
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<table>
<thead>
<tr>
<th>Dimensions</th>
<th>70 mm dia., 300 mm long</th>
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<tbody>
<tr>
<td>Speed</td>
<td>0 to 150 rpm, load dependent control</td>
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<tr>
<td>Electrical power supply</td>
<td>24 V/DC</td>
</tr>
<tr>
<td>Weight</td>
<td>2 kg</td>
</tr>
<tr>
<td>Motor drive for rotary feedthrough</td>
<td>Part No. 030 64</td>
</tr>
</tbody>
</table>

**Control Cable, 6-Way**
Used to connect the motor to the power supply, complete with plugs.

### Technical Data and Ordering Information

<table>
<thead>
<tr>
<th>Length</th>
<th>3 m</th>
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<tr>
<td>Weight</td>
<td>0.2 kg</td>
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<tr>
<td>Control cable</td>
<td>Part No. 030 56</td>
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</table>

**Supply Unit VS 024**
For driving the motor.

### Technical Data and Ordering Information

<table>
<thead>
<tr>
<th>Cabinet</th>
<th>1/2 19&quot; rack module, 3 HU</th>
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<tbody>
<tr>
<td>Output</td>
<td>24 V/DC, load dependent control via potentiometer</td>
</tr>
<tr>
<td>Connection</td>
<td>230 V, 50/60 Hz</td>
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<tr>
<td>Weight</td>
<td>3 kg</td>
</tr>
<tr>
<td>Supply unit VS 024</td>
<td>Part No. 200 02 466</td>
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</tbody>
</table>
Components for Glow Discharge Cleaning

Glow Discharge Assembly
With glow discharge electrode, high voltage feedthrough for 34.5 mm dia. hole and connection cable for fitting to the central rotary feedthrough.

C 2000 High Voltage Power Supply Unit
For supplying the glow discharge assembly; with selector switch, meter and timer.

PS 113 Safety Switch
For pressure-dependant locking of the high voltage power supply C 2000.
Connecting the PS 113 to the C 2000 requires the 6-way control cable (Part No. 030 56) (see section “Accessories”, paragraph “Standard Accessories”).

Technical Data and Ordering Information

<table>
<thead>
<tr>
<th>Electrode material</th>
<th>Aluminium</th>
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<tbody>
<tr>
<td>Insulation</td>
<td>Ceramics</td>
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<tr>
<td>Max. ratings</td>
<td>2000 V/65 mA</td>
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<tr>
<td>Sealing material of the high voltage feedthrough</td>
<td>FPM</td>
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<tr>
<td>Length of the connection cable</td>
<td>2 m</td>
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<tr>
<td>Weight</td>
<td>1 kg</td>
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</tbody>
</table>

Glow discharge assembly for UNIVEX 300 and 350 Part No. 030 34
for UNIVEX 450 and 450 B Part No. 030 35

Cabinet 19” rack module, 3 HU
Output 2000 V/65 mA, max. continuously adjustable, selectable +/− and 50 Hz AC
Timer 0 to 6 h max.
Connection 230 V, 50/60 Hz, 150 VA
Remote control and locking input included
C 2000 High voltage power supply unit Part No. 032 95

Switching pressure 5 mbar below atmospheric pressure
Connection flange DN 16 KF
Switching capacity 5 A at 250 V/AC
Weight 0.2 kg

PS 113 safety switch Part No. 160 14

Variable Leak Valve with Isolation Valve

Gas admission rate $q_L$ $5 \times 10^{-6}$ to $1 \times 10^3$ mbar x l x s$^{-1}$
Connection flange DN 16 KF
(see also Product Section C14 “Vacuum Valves”)
Variable leak valve Part No. 215 010
Components for Thermal Evaporation

**Single Thermal Evaporator**
Consisting of two water-cooled high voltage feedthroughs with terminal blocks for 34.5 mm dia. holes.

**Dual Thermal Evaporator**
Consisting of three water-cooled high voltage feedthroughs with terminal blocks for 34.5 mm dia. holes.

**Solenoid Actuated Vapor Source Shutter**
With rotary magnet and shutter screen; for installation to the rotary feedthrough.

### Technical Data and Ordering Information

<table>
<thead>
<tr>
<th>Component</th>
<th>Rating per conductor</th>
<th>Seals</th>
<th>Water connection</th>
<th>Weight</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single thermal evaporator</td>
<td>max. 100 V/500 A</td>
<td>FPM</td>
<td>hose 4/6 mm dia.</td>
<td>2.5 kg</td>
<td>030 20</td>
</tr>
<tr>
<td>Dual thermal evaporator</td>
<td>max. 100 V/500 A</td>
<td>FPM</td>
<td>hose 4/6 mm dia.</td>
<td>3.9 kg</td>
<td>030 21</td>
</tr>
<tr>
<td>Vapor source shutter</td>
<td></td>
<td></td>
<td></td>
<td>0.2 kg</td>
<td>030 59</td>
</tr>
</tbody>
</table>

**Power Supply Cables**
For single and dual thermal evaporators, equipped with terminals and clamping pieces.

**6-Way Measurement Feedthroughs**
For connection of the vapor source shutter; for 34.5 mm holes, plug-in soldered contact on the inside.

### Technical Data and Ordering Information

<table>
<thead>
<tr>
<th>Component</th>
<th>Rating per conductor</th>
<th>Seal</th>
<th>Weight</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply cables (set of 2)</td>
<td>max. 100/500 A</td>
<td>FPM</td>
<td>0.2 kg</td>
<td>030 53</td>
</tr>
<tr>
<td>Measurement feedthrough</td>
<td>max. 700 V/16 A</td>
<td></td>
<td>0.3 kg</td>
<td>500 001 543</td>
</tr>
<tr>
<td>9 way control cable</td>
<td></td>
<td></td>
<td>0.2 kg</td>
<td>500 001 549</td>
</tr>
</tbody>
</table>

*Two sets of power supply cables are needed for the dual thermal evaporator.*
Components for Thermal Evaporation

AS 053 Power Supply Unit
For supplying thermal evaporators and one solenoid-actuated source shutter.
With LCD display for current read out; with membrane key pad.

Technical Data and Ordering Information

<table>
<thead>
<tr>
<th>Cabinet</th>
<th>1/2 19&quot; rack module, 3 HU, 400 mm deep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outputs</td>
<td>1 x evaporator output, 5 V, 400 A max. can be rewired to 10 V, 200 A max. 1 x shutter output, 24 V DC, 1 s pulse</td>
</tr>
<tr>
<td>Inputs</td>
<td>Remote control unit for controlling the evaporation power (0 to 10 V) Remote control for the shutter</td>
</tr>
<tr>
<td>Main power supply</td>
<td>230 V, 50/60 Hz, 10 A</td>
</tr>
<tr>
<td>Weight</td>
<td>15 kg</td>
</tr>
<tr>
<td>AS 053 power supply unit</td>
<td>Part No. 200 23 209</td>
</tr>
</tbody>
</table>

AS 053-2 Power Supply Unit
For supplying power to two thermal evaporators with vapor source shutters.
With LCD display for current read out; with membrane key pad.

<table>
<thead>
<tr>
<th>Cabinet</th>
<th>19&quot; rack module, 3 HU, 400 mm deep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outputs</td>
<td>2 x evaporator output, 5 V, 400 A max. can be rewired to 10 V, 200 A max. 2 x shutter output, 24 V DC, 1 s pulse</td>
</tr>
<tr>
<td>Inputs</td>
<td>Remote control unit for controlling the evaporation power (0 to 10 V) Remote control for the shutter Switchover evaporator 1 / 2</td>
</tr>
<tr>
<td>Main power supply</td>
<td>230 V, 50/60 Hz, 10 A</td>
</tr>
<tr>
<td>Weight</td>
<td>30 kg</td>
</tr>
<tr>
<td>AS 053-2 power supply unit</td>
<td>Part No. 200 02 461</td>
</tr>
</tbody>
</table>

Components for Electron-Beam Evaporation

General
Various types of electron-beam evaporators are available for installation in the UNIVEX systems.

For the UNIVEX 300: electron-beam evaporator ESV 4 as well as makes of other manufacturers.
For the UNIVEX 350: electron-beam evaporator ESV 4 and ESV 6 as well as makes of other manufacturers.
For the UNIVEX 450: electron-beam evaporator ESV 4 and ESV 6 as well as makes of other manufacturers.

The selection of a suitable electron-beam evaporator depends mostly on the space available, the demanded evaporation rate, number and type of materials which need to be evaporated.

Electron-beam evaporator ESV 4
The electron-beam evaporator ESV 4 consists of a beam generating system and a beam deflection unit with electromagnetic deflection for the x and y-axis, and a holder. Through the system of interchangeable crucibles the ESV 6 may be used to solve almost any evaporation problem. It is suited to evaporate small to large amounts of material.

Electron-beam evaporators of other manufacturers
For the UNIVEX system exclusively evaporators with high tension power supplies are used which comply with EC regulations and directives.

Electron-beam evaporator ESV 6
The electron-beam evaporator ESV 6 consists of a beam generating system and a beam deflection unit with electromagnetic deflection for the x and y-axis, and a holder. Through the system of interchangeable crucibles the ESV 6 may be used to solve almost any evaporation problem. It is suited to evaporate small to medium amounts of material.

Safety regulations
When installing electron-beam evaporators in UNIVEX bell jar systems only a stainless steel bell jar must be used.

In this application the bell jar must be secured in place by an interlocking kit with a key operated switch.

Interlocking kit with key-operated switch for UNIVEX 300: Part No. 030 84
Interlocking kit with key-operated switch for UNIVEX 450: Part No. 030 85
Interlocking kit with key-operated switch for UNIVEX 350: included with the basic system.
UNIVEX 450 B: included with the basic system.

As further safety means a water flow monitor is required for each electron-beam evaporation unit so as to ensure intensive cooling of the electron-beam evaporator. This water flow monitor is included with each electron-beam evaporator.

As further safety means a water flow monitor is required for each electron-beam evaporation unit so as to ensure intensive cooling of the electron-beam evaporator.
Components for High Rate Sputtering

DC Sputtering

Various DC sputtering sources may be built into the UNIVEX units. The selection depends on the size of the substrate, the required target material and the available installation space. DC sputtering sources from 50 mm to 200 mm as well as corresponding DC sputtering power supply units from 500 W to 3000 W are available. The power supply units may be built into the basic units.

RF Sputtering

Various RF sputtering sources may be built into the UNIVEX 350 and UNIVEX 450 B. The selection depends on the size of the substrate, the required target material and the available installation space. RF sputtering sources from 50 mm to 200 mm as well as corresponding RF sputtering power supply units from 150 W to 1000 W are available. The power supply units may be built into the basic units.

Safety regulations:

When installing electron beam evaporators in the UNIVEX 300 the stainless steel ball jar must be used. Moreover, a safety interlocking arrangement is required. For the UNIVEX 300 and 450 a separate interlocking kit is available; in the case of the UNIVEX 350 and 450 B this kit is already included.

<table>
<thead>
<tr>
<th>Interlocking kit for UNIVEX 350</th>
<th>UNIVEX 300</th>
<th>UNIVEX 450</th>
<th>UNIVEX 350</th>
<th>UNIVEX 450 B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part No.</td>
<td>030 84</td>
<td>030 85</td>
<td>Included</td>
<td>Included</td>
</tr>
</tbody>
</table>

Components for Film Thickness Measurements

Various thin film thickness measuring instruments may be installed in the UNIVEX units. The selection depends on the demanded measurements tasks and the required degree of automation.

We especially recommend the thin film thickness measuring instruments which rely on quartz oscillators XTM/2 in the case of simple tasks, and the XTC/2 for complex control tasks.

Further thin film measuring instruments which may be used to check complex multi-layer films are available.

Further information upon request.
UNIVEX 450 B (Chamber systems)

Besides the standard UNIVEX systems we are also prepared to deliver modified systems for special applications. Besides the standard chamber system UNIVEX 350 we can also supply UNIVEX systems with other chamber sizes. These are then so designed that the chamber containing the processing components and the pump system are mounted to a separate frame. The door flange of the chamber may then easily be integrated in the wall of a clean room. The electric power supply and the system controller are accommodated in a separate 19" electrical cabinet. This will simplify installation and subsequent operation.

All processing components commonly used in thin-film processing may be installed in the chamber.

The scope of the pump system used will in each case depend on the requirements of the desired processes to be run in the chamber.

Design of the entire system in accordance with customer requirements will be undertaken upon request.

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**UNIVEX 450 B**

- Chamber diameter: 490 mm
- RF sputter sources
- Dry compressing vacuum pump system
- EcoDry L pump
- 10-fold thermal evaporator
- Electron-beam evaporator
- Heatable and coolable chamber walls
- COOLVAC 3010 cryopump

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**Dimensional drawing for the UNIVEX 450 B**

The position, number and size of the flanges and the installation holes may be varied almost freely according to requirements!
UNIVEX 450 for Dactyloscopy

Dactyloscopy is a term from the area of criminal investigation meaning: “Identification of a person through his fingerprints”. Depending on the material of the part which was touched, different methods are used to render the fingerprints visible.

In the case of materials like plastic shopping bags, for example, foils, handlebars etc. evaporation methods have been found to be most useful.

The method itself utilises the effect well known from normal evaporation processes where the evaporated material will adhere better (and thicker) on the skin material (water, amino acids, fat and alike) deposited by the finger compared to the surrounding untouched material. An optimum contrast is attained by selecting a suitable evaporation material, usually gold or zinc.

Benefits of this method:

- No “smearing” of existing traces compared to conventional methods
- Large surface areas (up to 80 x 40 cm max.) carrying fingerprints can be checked completely in one pass
- The time needed for one pass is only about 10 minutes (depending on the material carrying the fingerprints)
- Good contrast also in the case of multicolour surfaces
- Fixation of the deposited material with the traces is easy – the results may be well documented (can be photographed)
- The carrier of the fingerprints is not destroyed.

UNIVEX 450 C

For special applications we can also supply cluster systems based on the UNIVEX concept. These clusters are equipped according to customers requirements and incorporate separate processing and load lock and transfer chambers.

Test systems with a vacuum chamber

We can also supply vacuum chambers with custom pump systems for testing of various components.