

# C19

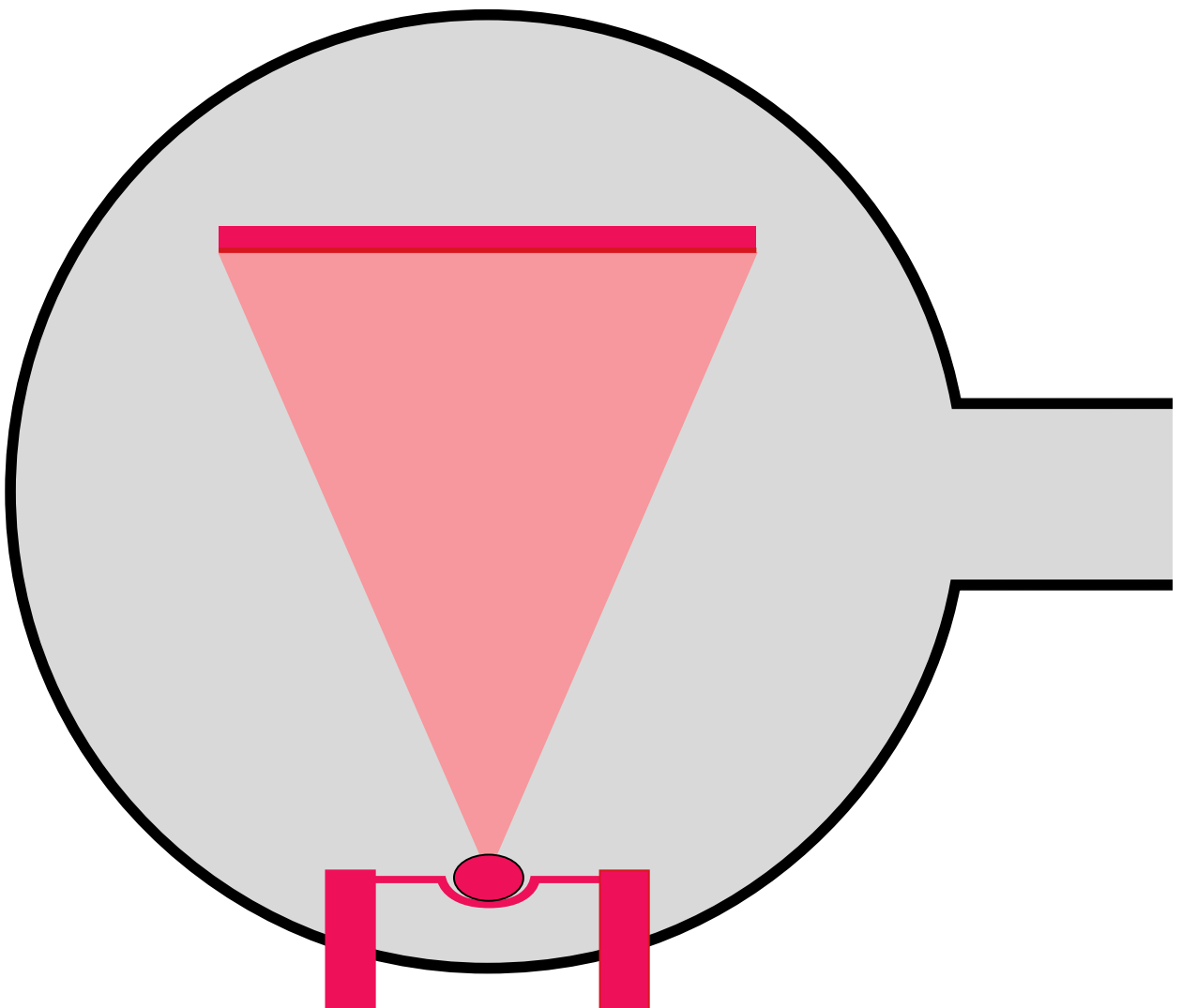
## UNIVEX

High Vacuum Experimentation Systems

UNIVEX 300, UNIVEX 450

UNIVEX 350, UNIVEX 450 B

Special plants



**General**

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**Products**

Bell Jar System  
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**Accessories**

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Special Units  
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Applications	UNIVEX 300		UNIVEX 450		UNIVEX 350		UNIVEX 450 B Special plants	
	Bell jar system		Door system					
Passive components	♦	♦	♦	♦	♦	♦	♦	♦
Sensor technology	♦	♦	♦	♦	♦	♦	♦	♦
Opto-electronics	♦	♦	♦	♦	♦	♦	♦	♦
Tribology	♦	♦	♦	♦	♦	♦	♦	♦
Soldering	♦	♦	♦	♦	♦	♦	♦	♦
Daktyloscopy			♦					
Glove box applications	♦	♦	♦	♦	♦	♦	♦	♦
Special applications	♦	♦	♦	♦	♦	♦	♦	♦
Thermal conduction experiments	♦	♦						
<b>Accessories / Process Components</b>								
Standard accessories	Page							
Base plate and bell jar	C19.05 + 07	♦	♦					
Lifting facility, manually operated	C19.07		♦					
Vacuum chamber with door	C19.09 + 15				♦		♦	
<b>Auxiliary operation</b>								
Substrate holder	C19.03	♦	♦	♦	♦	♦	♦	♦
Substrate heater	C19.03	♦	♦	♦	♦	♦	♦	♦
Gas admission	C19.03	♦	♦	♦	♦	♦	♦	♦
<b>Process equipment</b>								
Shutters	C19.12	♦	♦	♦	♦	♦	♦	♦
Thin film measurement	C19.14	♦	♦	♦	♦	♦	♦	♦
<b>Sources</b>								
Custom installations	C19.03	♦	♦	♦	♦	♦	♦	♦
Glow discharge cleaning	C19.11	♦	♦	♦	♦	♦	♦	♦
Thermal evaporation	C19.12	♦	♦	♦	♦	♦	♦	♦
Electron-beam evaporation	C19.13	♦	♦	♦	♦	♦	♦	♦
DC high rate sputtering	C19.14	♦	♦	♦	♦	♦	♦	♦
RF high rate sputtering	C19.14				♦		♦	

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 LN<sub>2</sub> 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

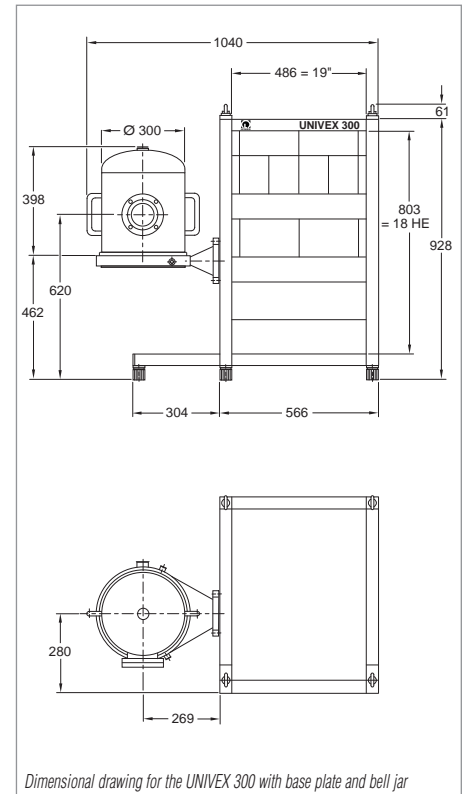
Upon request LEYBOLD is able to supply substrate holders according to customer's specifications.

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

## UNIVEX 300



UNIVEX 300, typical arrangement with stainless steel bell jar and process components



Dimensional drawing for the UNIVEX 300 with base plate and bell jar

### 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.

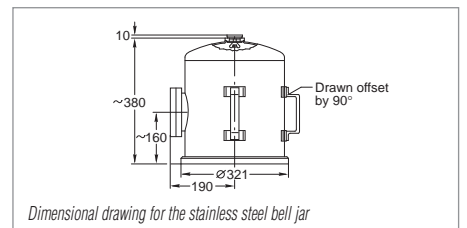
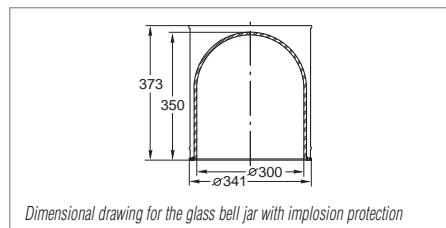
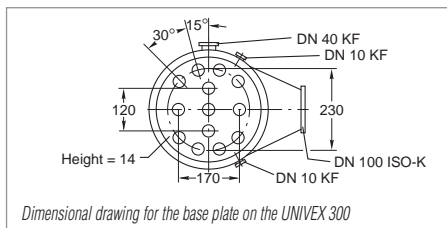
#### Vacuum Measurement

- ♦ 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	UNIVEX 300	
	Standard	Special
High vacuum pump	TURBOVAC 151	TURBOVAC 361
Pumping speed for N <sub>2</sub> l x s <sup>-1</sup>	145	345
Backing pump / nominal pumping speed	TRIVAC D 8 B / 9.7 m <sup>3</sup> x h <sup>-1</sup>	
Supply unit for high vacuum pump	TURBOTRONIK NT 20	
Control	Power supply with main switch plug-in	
High vacuum connection flange      DN	100 ISO-F, lateral	
Electrical connection	230 V, 50 Hz, max. 16 A *)	
Cooling water connection; DN 10 hose      bar	4 to 7	
Cooling water consumption      l x h <sup>-1</sup>	50	
Weight      kg	130	
Ordering Information	Standard	Special
Basic unit	Part No. 030 60	upon request

\*) Other voltages and frequencies upon request

## Special Accessories for UNIVEX 300



### Stainless Steel Base Plate

### Pyrex Glass Bell Jar (Vacuum Chamber)

### Stainless Steel Bell Jar (Vacuum Chamber)

## 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

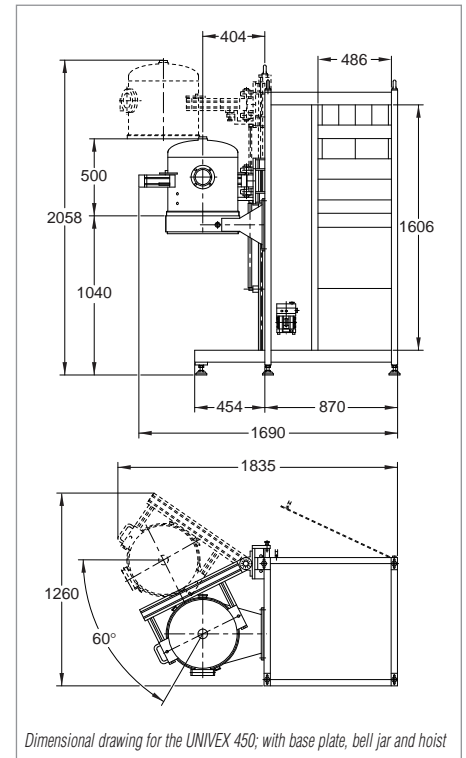
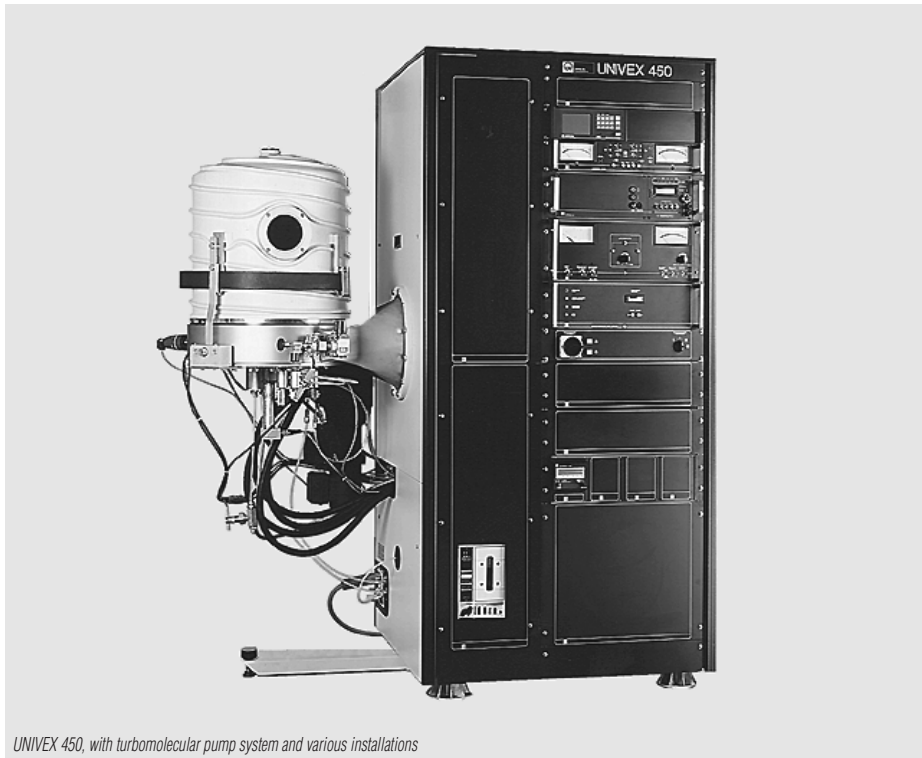
Dimensions (H x dia.)	350 x 300 mm
Height, cylindrical section	200 mm
Seal	FPM
Weight	5.6 kg
Bell jar, Pyrex glass	Part No. 030 10 <sup>1)</sup>

<sup>1)</sup> With punched steel cover for implosion protection

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 <sup>1)</sup>

<sup>1)</sup> 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.

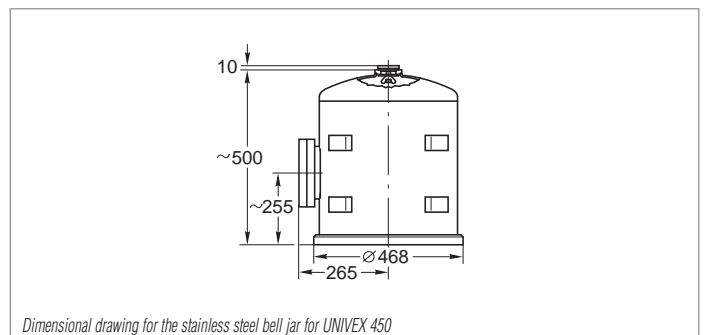
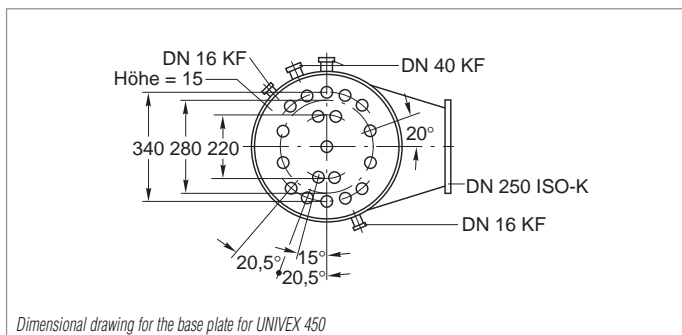
#### Vacuum Measurement

- ◆ 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	UNIVEX 450	
	Standard	Special
High vacuum pump	TURBOVAC 1100	COOLVAC 1500 CL
Pumping speed for N <sub>2</sub> l x s <sup>-1</sup>	1150	1500
Backing pump / nominal pumping speed	TRIVAC D 40 B / 46 m <sup>3</sup> x h <sup>-1</sup>	
Supply unit for high vacuum pump	TURBOTRONIK NT 20	Compressor unit
Control	Power supply	Power supply with automatic pump system control
Built-in electro-pneumatic valves	-	Push gate valve DN 250 ISO-F, 2 angled valves DN 40 KF
High vacuum connection flange DN	250 ISO-F, lateral	
Electrical connection	400 V, 3 ph., 50 Hz, max. 32 A *)	
Cooling water connection; DN 10 hose bar	4 to 7	
Cooling water consumption l x h <sup>-1</sup>	100	140
Compressed air connection, DN 10 bar	-	6 to 10
Weight kg	225	350
Ordering Information	Standard	Special
Basic unit	Part No. 030 70	upon request

\*) Other voltages and frequencies upon request

## Specific Accessories for UNIVEX 450



### Stainless Steel Base Plate

### Stainless Steel Bell Jar (Vacuum Chamber)

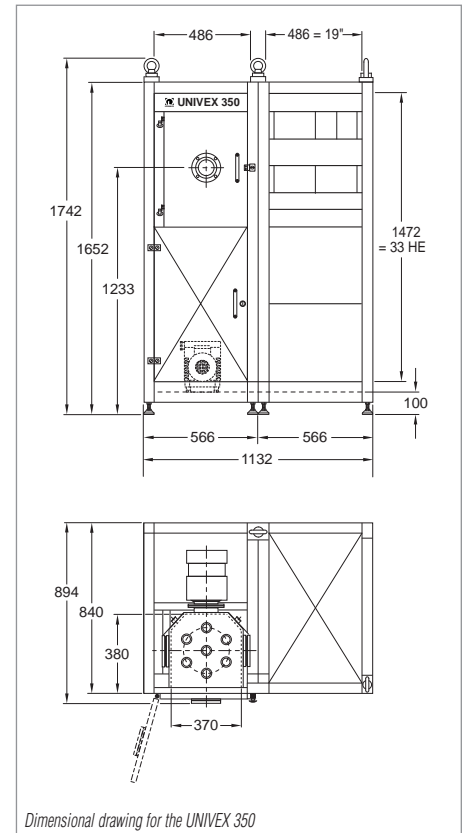
## Technical Data and Ordering Information

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

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 <sup>1)</sup>

<sup>1)</sup> 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 frame.
- ♦ 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

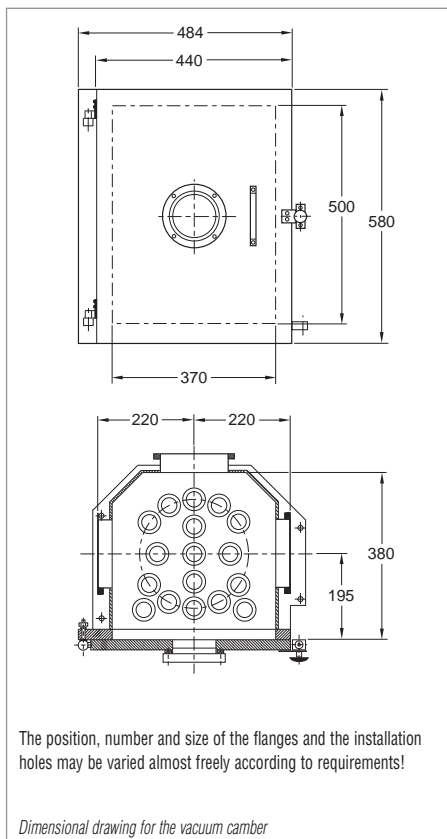
Depending on the type of application, a combination vacuum gauge operating according to the cold cathode or hot cathode principle may be installed.



Technical Data		UNIVEX 350	
		Standard	Special
High vacuum pump		TURBOVAC TW 700	COOLVAC 1500 CL
Pumping speed for N <sub>2</sub>	l x s <sup>-1</sup>	680	1500
Backing pump / nominal pumping speed		TRIVAC D 16 B / 18.9 m <sup>3</sup> x h <sup>-1</sup>	TRIVAC D 25 B / 29.5 m <sup>3</sup> x h <sup>-1</sup>
Supply unit for high vacuum pump		OEM power supply 59 V DC	Compressor unit
Control		Power supply with programmable control	Power supply with programmable control
Built-in electro-pneumatic valves		1 x DN 16 KF	1 x gate valve DN 160, 2 x right-angle valve DN 25, DN 16 KF
High vacuum connection flange	DN	160 ISO-K	
Electrical connection		400 V, 3 ph., 50/60 Hz *)	
Cooling water connection; DN 10 hose	bar	4 to 7	
Cooling water consumption	l x h <sup>-1</sup>	25	140
Compressed air connection, DN 10	bar	–	6 to 10
Weight	kg	350	425
Ordering Information		Standard	Special
Basic unit		upon request	upon request

\*) Other voltages and frequencies upon request

## Vacuum Chamber



Technical Data		Vacuum Chamber for UNIVEX 350
Material		Stainless steel
Dimensions		
Inside width	mm	370
Inside depth	mm	380
Inside height	mm	500
Connections		
Front side		Door with window
Bottom plate		15 installation holes, 34.5 mm dia.
Lid		7 installation holes, 34.5 mm dia.
Rear	DN	160 ISO-K, 2 x 10 KF, 2 x 40 KF
Left side	DN	160 ISO-K, further flanges optional
Right side	DN	160 ISO-K, further flanges optional
Weight	kg	55
Ordering Information		Vacuum Chamber for UNIVEX 350
Vacuum chamber		Is included with the UNIVEX 350



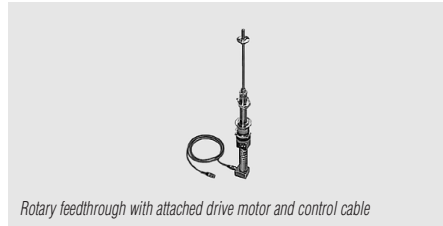
## Standard Accessories for UNIVEX 300, 350, 450 and 450 B



Blank-off screw fitting

### Blank-Off Screw Fitting

For 34.5 mm dia. hole.



Rotary feedthrough with attached drive motor and control cable

### 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

Material	Stainless steel
Gasket	FPM
Weight	0.1 kg
Blank-off screw fitting Part No. 030 40	

Total length	400 mm
Shaft dia.; atmosphere/vacuum	8/10 mm
Max. rotational speed	150 rpm
Permissible torque	2 Nm
Weight	2 kg
Rotary Feedthrough Part No. 030 63	

Dimensions	70 mm dia., 300 mm long
Speed	0 to 150 rpm, load dependent control
Electrical power supply	24 V/DC
Weight	2 kg
Motor drive for rotary feedthrough Part No. 030 64	

### Control Cable, 6-Way

Used to connect the motor to the power supply, complete with plugs.

### Supply Unit VS 024

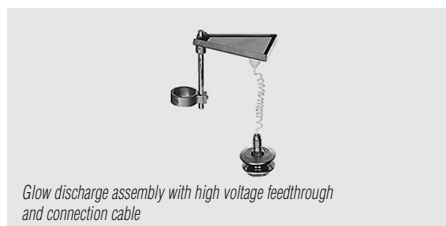
For driving the motor.

## Technical Data and Ordering Information

Length	3 m
Weight	0.2 kg
Control cable Part No. 030 56	

Cabinet	1/2 19" rack module, 3 HU
Output	24 V/DC, load dependent control via potentiometer
Connection	230 V, 50/60 Hz
Weight	3 kg
Supply unit VS 024 Part No. 200 02 466	

## 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

Electrode material	Aluminium
Insulation	Ceramics
Max. ratings	2000 V/65 mA
Sealing material of the high voltage feedthrough	FPM
Length of the connection cable	2 m
Weight	1 kg
Glow discharge assembly for UNIVEX 300 and 350	Part No. 030 34
for UNIVEX 450 and 450 B	Part No. 030 35

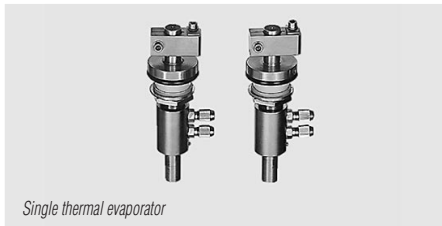
Cabinet	19" rack module, 3 HU
Output	2000 V/65 mA, max. continuously adjustable, selectable +/- and 50 Hz AC
Timer	0 to 6 h max.
Connection	230 V, 50/60 Hz, 150 VA
Remote control and locking input	included
C 2000 High voltage power supply unit	Part No. 032 95

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 <sup>-1</sup>
Connection flange	DN 16 KF
(see also Product Section C14 "Vacuum Valves")	
Variable leak valve	Part No. 215 010

## Components for Thermal Evaporation



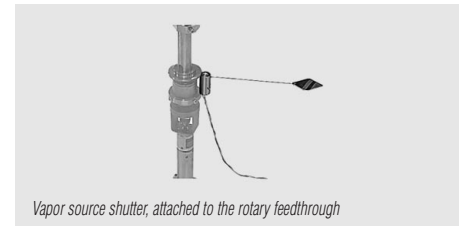
### Single Thermal Evaporator

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

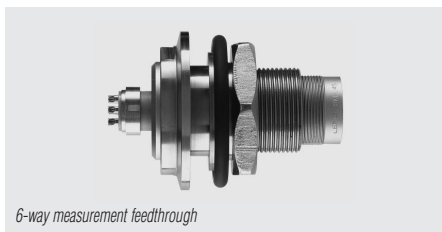
With rotary magnet and shutter screen; for installation to the rotary feedthrough

## Technical Data and Ordering Information

Rating per conductor	max. 100 V/500 A
Seals	FPM
Water connection	hose 4/6 mm dia.
Weight	2.5 kg
Single thermal evaporator	Part No. 030 20

Rating per conductor	max. 100 V/500 A
Seals	FPM
Water connection	hose 4/6 mm dia.
Weight	3.9 kg
Dual thermal evaporator	Part No. 030 21

Connection for actuation	24 V = 1 s pulse
Dimensions of the shutter screen	50 x 50 mm
Weight	0.2 kg
Vapor source shutter	Part No. 030 59



### 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.

### Control cable, 6-way

For connection between measurement feedthrough and power supply unit for the vapor source shutter, complete with connection plugs.

## Technical Data and Ordering Information

Length	2 m
Rating	max. 100/500 A
Cross section	120 mm <sup>2</sup>
Weight	3.5 kg
Power supply cables (set of 2)	Part No. 030 53 *)

Rating per conductor	max. 700 V/16 A
Seal	FPM
Weight	0.3 kg
Measurement feedthrough	Part No. 500 001 543

Length	3 m
Weight	0.2 kg
9 way control cable	Part No. 500 001 549

\*) 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.



AS 053 power supply unit

### 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.

## Technical Data and Ordering Information

Cabinet	1/2 19" rack module, 3 HU, 400 mm deep
Outputs	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
Inputs	Remote control unit for controlling the evaporation power (0 to 10 V) Remote control for the shutter
Main power supply	230 V, 50/60 Hz, 10 A
Weight	15 kg
AS 053 power supply unit	Part No. 200 23 209

Cabinet	19" rack module, 3 HU, 400 mm deep
Outputs	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
Inputs	Remote control unit for controlling the evaporation power (0 to 10 V) Remote control for the shutter Switchover evaporator 1 / 2
Main power supply	230 V, 50/60 Hz, 10 A
Weight	30 kg
AS 053-2 power supply unit	Part No. 200 02 461

## 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-axis and a holder for accommodating various evaporation crucibles.

The ESV 4 has been designed to evaporate small to medium amounts of material.

### 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 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.

However, depending on the kind of application the customer may select the required evaporator from a broad range of different power ratings and crucible variants.

### Power supplies

The selection of the power supply unit for the individual electron-beam evaporator depends on the manufacturer and the demanded maximum evaporation power. As a rule, the maximum output power of the power supply unit must not exceed the maximum power specified for the evaporator.

### 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.

**Further information upon request.**

DC sputtering sources are suited for all UNIVEX systems.

### 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.

**Further information upon request.**

RF sputtering sources are only suited for the UNIVEX 350 and UNIVEX 450 B.

Sputtering sources can only be operated with gas admission. For this, manually operated variable leak valves up to automatically controlled mass flow controllers are available.

#### 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.

Interlocking kit	for	UNIVEX 300	UNIVEX 450	UNIVEX 350	UNIVEX 450 B
	Part No.	030 84	030 85	Included	Included

## Components for Film Thickness Measurements

Various thin film thickness measuring instruments may be installed in the UNIVEX units.

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

The selection depends on the demanded measurements tasks and the required degree of automation.

**Further information upon request.**

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.



UNIVEX 450 B having a chamber diameter of 490 mm and with a 10-fold thermal evaporator



UNIVEX 450 B having a chamber diameter of 490 mm and with RF sputter sources and dry compressing vacuum pump system; with EcoDry L pump



UNIVEX 450 B having a chamber diameter of 490 mm and with electron-beam evaporator with heatable and coolable chamber walls; with COOLVAC 3010 cryopump

### UNIVEX 450 B (Chamber systems)

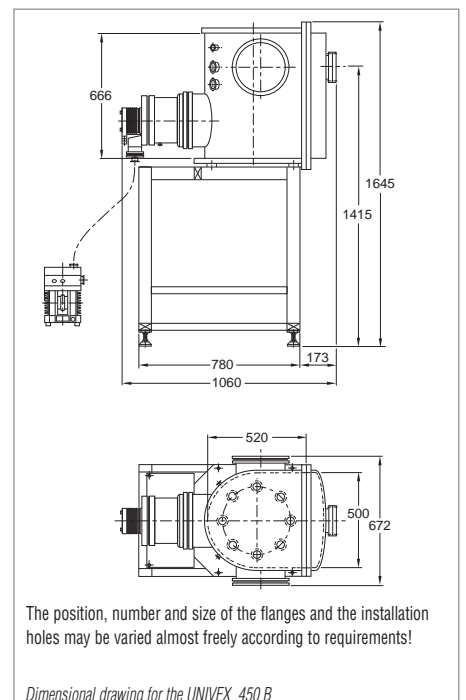
Besides the standard UNIVEX systems we are also prepared to deliver modified systems for special applications.

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.**





### 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

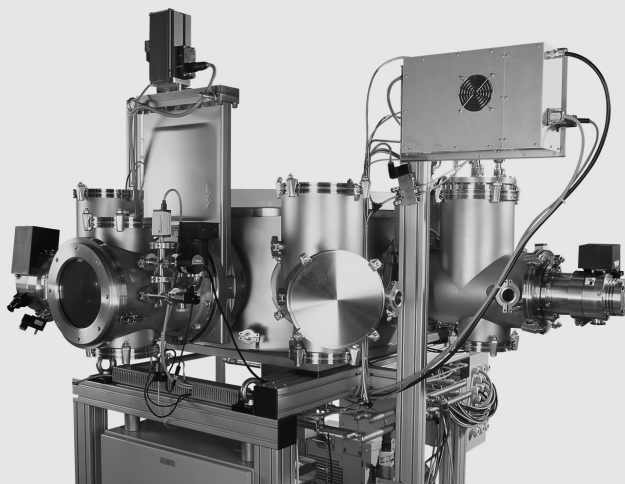
For special applications we can also supply cluster systems based on the UNIVEX concept. These clusters are equipped according to customers requirements and incorporate separate processing and load lock and transfer chambers.

#### Test systems with a vacuum chamber

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



UNIVEX 450 for dactyloscopy



Cluster system with lock, transfer chamber and with the possibility of adding up to six processing chambers.



Test system with a 700 mm dia. chamber