Precision and **Vacuum** Technology

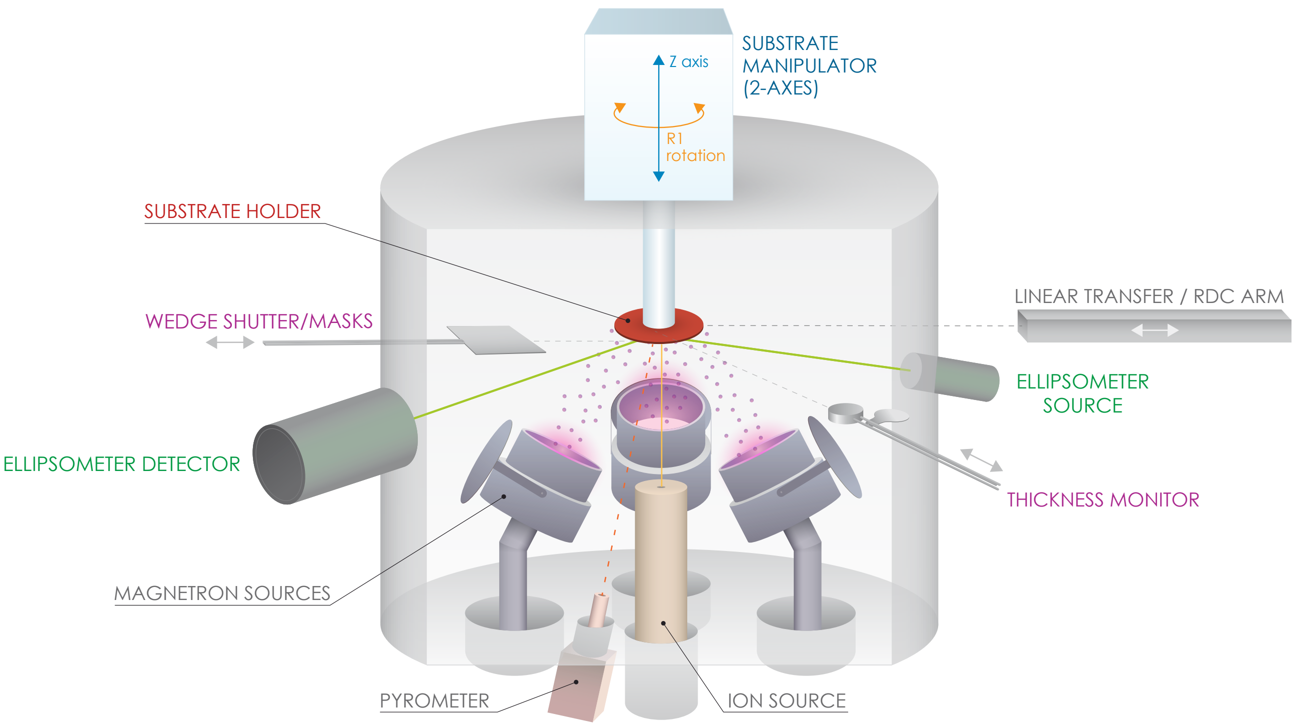
SPUTTERING SYSTEMS

High accuracy deposition platforms
with easy access to the process chamber

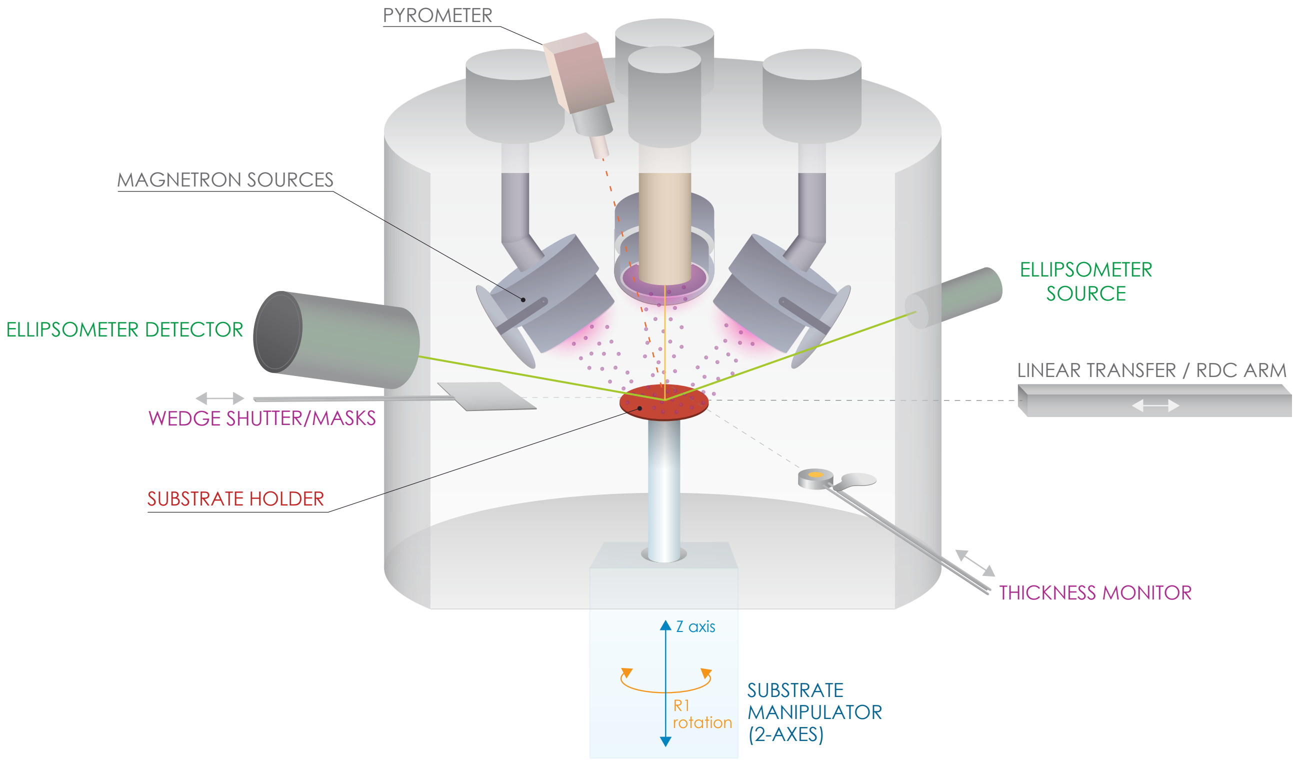
www.prevac.eu

Our family of sputtering systems offer the flexibility of several sputter deposition techniques in a single chamber. Each system features a universal mounting flange which can be configured for magnetron sputtering deposition or combination of other thin film deposition techniques. A modular, user friendly approach to the system design means that the entire system can be reconfigured by simply changing the universal mounting flange, a process that has been made both fast and simple. The systems are configured with appropriate sealing and pumping systems to achieve the base vacuum in the range of 10^{-7} mbar (with viton sealed door), 5×10^{-8} mbar (with viton sealed and differientially pumped door) or UHV pressures (without door, with fast entry load lock for substrate introducing).

THIN FILM GROWTH in the PROCESS CHAMBER - **SPUTTER-UP** ARRANGEMENT



THIN FILM GROWTH in the PROCESS CHAMBER - **SPUTTER-DOWN** ARRANGEMENT



All technical specification and details of sputtering equipment presented on the following pages can be customized to the customer needs and for specific applications.

PROCESS CHAMBER

The chamber is equipped with connecting flanges in UHV standard in different sizes for connecting current and future equipment, including:
- **magnetron sources**,
- **substrate manipulator**,
- **ion source** for cleaning, etching or activate surface of substrate,
- **pumping system**: combination of different types of pumps (e.g. forevacuum pumps, ion pumps, cryo-pumps, turbo pumps, titanium sublimation pumps) individually selected to achieve the best pumping performance according to application demands,
- **transferring system**: entry port for linear transfer/radial distribution chamber/transferring tunnel,
- **gas dosing system** (process gas 2-4 lines, mass flow control for 4 gases),
- protection against cross-contamination,
- **residual gas analyser**,
- **quartz balances**,
- **pyrometers**,
- **ellipsometer** with detector,
- **viewports** (observation windows with shutters),
- **heated viewports** for diagnostic,
- **vacuum gauges.**

MAGNETRON CONFOCAL GEOMETRY

MAGNETRON SOURCES

SUBSTRATE HOLDER

LINEAR TRANSFER / RDC ARM

Z axis

R1 rotation

2-STAGE SUBSTRATE MANIPULATOR

- **Good homogeneity**
- **Possibility of co-sputtering**
- **Possibility of rotating the R1 axis**

MAGNETRON PLANAR GEOMETRY

MAGNETRON SOURCES

SUBSTRATE HOLDER

R1'' rotation

LINEAR TRANSFER / RDC ARM

Z axis

R1' rotation

2-STAGE SUBSTRATE MANIPULATOR

- **High evaporation rate**
- **Short work distance**
- **Low material losses**
- **No shadow effect for the lift-off process**

OPTIONS

Range of ancillary equipment for streamlining the sputter process is available:

- **Pyrometer -** digital pyrometers are used for non-contact, point-shaped temperature measurement in wide range.
- **Ellipsometer** - analyzes reflected light to determine the thickness and refractive index of dielectrics, semiconductors, and thin metal films. It uses light reflected off the film at a low incident angle.
- **Reflectometer** - non-invasive tool for fast, real-time measurements of deposition rates, film thickness, layers uniformity, optical constants by spectral reflectance system.
- **Plasma emission monitor (PEM)** - optical emission spectroscopy technique for real-time plasma monitoring without affecting it.
- **Water cooling shroud -** as an option the chamber can be equipped with H_2O shroud, when there is necessity to decrease components/process temperature.
- Shield protection against cross contamination.

PROCESS CHAMBER - **UP/DOWN MODULARITY**

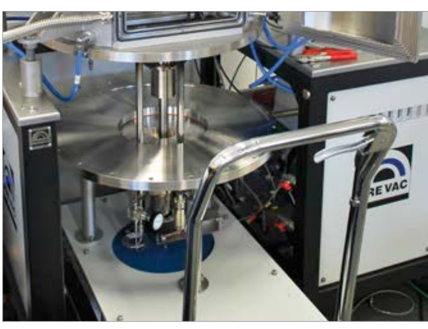
TOP FLANGE

BOTTOM FLANGE

System can be equipped with **lift option for the top flange** what allows to change the magnetron targets or manipulator easily and quickly. Lift mechanism is motorised and fully protected with sensors.

Front access door with differential pumping (option).

The **bottom flange** with substrate manipulator or magnetron sources can be fully accessible or replaced using the dedicated **lifting trolley**.



032 PRIMS

Smart Basic DC Sputtering System

032 PRIMS is a simple deposition system for reproducible applying thin film layers. Magnetron sputtering sources (for metals and inorganics) are included, mounted in sputter-down configuration. Unit is equipped with DC power supply M600DC-PS with switching system for up to 3 magnetron sources. Power supply's power of 600W can be extended to up to 2400W with additional modules. Substrate stage from the bottom can accommodate a range of substrate sizes up to 2" diameter (possibility of substrate heating and rotation). The in full size door provides an easy access to the chamber interior. System includes a turbomolecular pump with manual throttle valve. Dedicated deposition rate checking system is available.

- Process chamber diameter: Ø 355 mm,
- Equipped with ports for up to three 2" magnetron sources,
- Base pressure range 10^{-7} mbar,
- Substrate stage for up to 2" samples,
- Process chamber with in full size vacuum door,
- DC power supply with switching system.

Options:
- Substrate heating up to 600 °C,
- Sample/substrate stage rotation,
- Deposition rate measurement,
- Co-deposition.

Semi-Industrial solution for sputter deposition techniques: DC/RF magnetron sputtering, reactive sputtering and evaporation using electron beam.

- Process chamber diameter: Ø 570 mm,
- Equipped with ports for two 3" magnetrons and 6-pocket electron beam evaporator,
- Base pressure range < $3x10^{-7}$ mbar,
- Substrate holder: up to 6" substrate stage,
- Substrate temperature: heating up to 300 °C,
- 2 axes manipulator: Z 100 mm, R2 continuous rotation (20 rpm),
- Electronic cabinets with integrated computer unit (with touchscreen) and dedicated software.

Compact sputtering systems with easy access to substrate stage and top/bottom flanges.

- Process chamber diameter: Ø 570 mm,
- Equipped with 5 x DN 160 ISO-K ports for 3" magnetrons,
- Base pressure < 0.5 x 10^{-7} mbar,
- Substrate holder for up to Ø 140 mm samples,
- Substrate temperature: heating up to 500 °C,
- 1 axis manipulator: R1 continuous rotation (12 rpm),
- Top flange lifting mechanism, with motorisation (for easy and quick change of magnetron targets),
- Dedicated lifting trolley for accessing/replacing the bottom flange,
- Front opening access door,
- Ready for DC, RF and bipolar pulsed mode sputtering.

Design with linear transfer and load-lock chamber for substrate holder fast introducing.

- Process chamber diameter: Ø 570 mm,
- Equipped with 6 x DN100CF ports for 2" magnetrons,
- Base pressure < 1.8 x 10^{-8} mbar,
- Substrate holder: 4" 3-pins plate style holder,
- Substrate temperature: heating up to 650 °C,
- 2 axes manipulator: Z 50 mm, R1 continuous rotation (20 rpm),
- Top flange lifting mechanism, with motorisation,
- Dedicated lifting trolley for accessing/replacing the bottom flange,
- Differentially pumped front access door,
- Ready for DC and RF mode sputtering.

System prepared for planar or confocal sputter-down process.

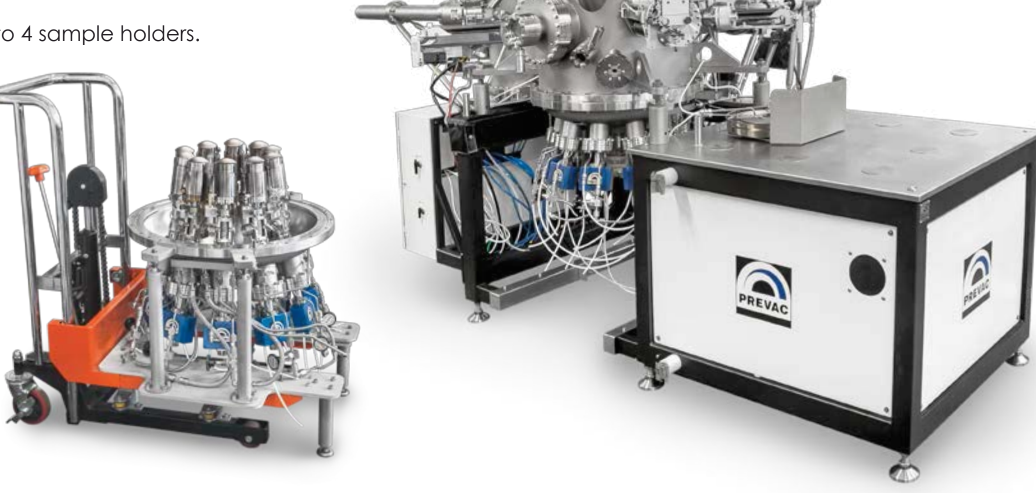
- Process chamber diameter: Ø 715 mm,
- Equipped with 6 x DN160CF ports for 4" magnetrons,
- Base pressure < 5 x 10^{-7} mbar,
- Substrate holder: up to Ø 100 mm wafers or 50x50 mm^2 cylindrical substrates,
- Substrate temperature: heating up to 600 °C,
- 2 axes manipulator with 2 stations: Z 100 mm, R1 continuous rotation (30 rpm) for one station. Both stations has thermal stabilisation,
- Dedicated lifting trolley for accessing/replacing the bottom flange,
- Differentially pumped front access door,
- Load-Lock/storage chamber for up to 6 holders,
- Fully motorised and automated transferring/ positioning system,
- Ready for DC, pulsed-DC and RF mode sputtering in planar or confocal geometry,
- Compatible with photolithographic lift-off process technology.

System with motorised, computer-controllable substrate shutter (integrated with manipulator) for gradient deposition.

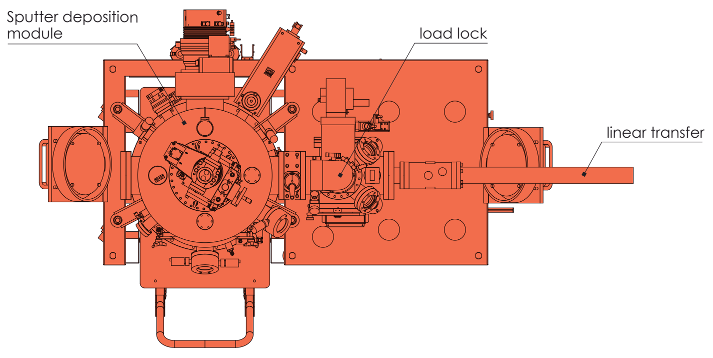
- Process chamber diameter: Ø 570 mm,
- Equipped with 4 x DN100CF ports for 2" magnetrons,
- Base pressure < 1 x 10^{-7} mbar,
- Substrate holder: 100x100 mm PTS sample holder,
- Substrate temperature: heating up to 600 °C,
- 2 axes manipulator: Z 50 mm, R1 continuous rotation (60 rpm),
- Dedicated lifting trolley for accessing/replacing the bottom flange,
- Differentially pumped front access door,
- Ready for DC and RF mode sputtering in planar or confocal geometry,
- Motorised shutter (following the substrate) for sputter deposition with thickness gradient,
- Load-Lock for substrate fast introducing.

Sputtering system designed in UHV standard.

- Process chamber diameter: Ø 570 mm,
- Equipped with 10 x DN100CF ports for 2" magnetrons,
- Base pressure range 10^{-10} mbar,
- Substrate holder: 2" PTS sample holder,
- Substrate temperature: heating up to 800 °C,
- 2 axes manipulator: Z 100 mm, R1 continuous rotation (60 rpm),
- Dedicated lifting trolley for accessing/replacing the bottom flange,
- Load-Lock/storage for up to 4 sample holders.



STAND-ALONE CONFIGURATION WITH **LINEAR TRANSFER**

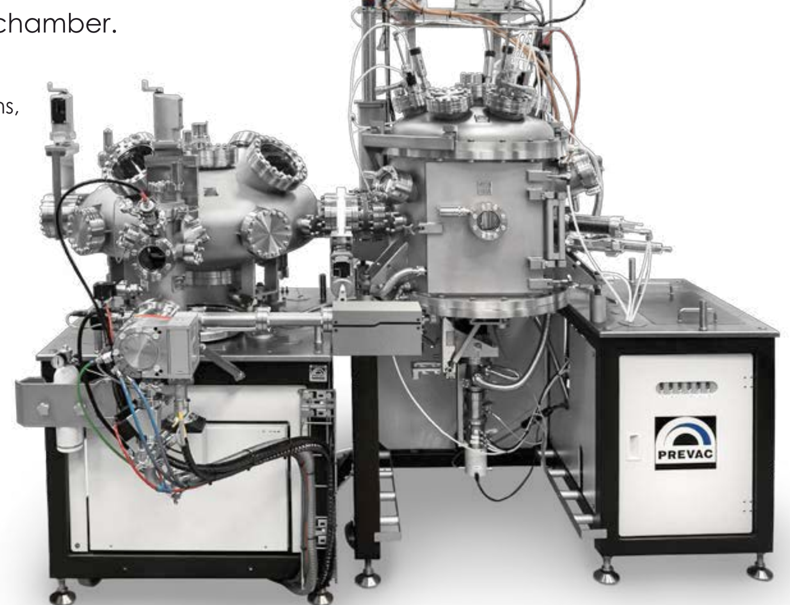


Multi-technique deposition system with glovebox and radial distribution transferring system.

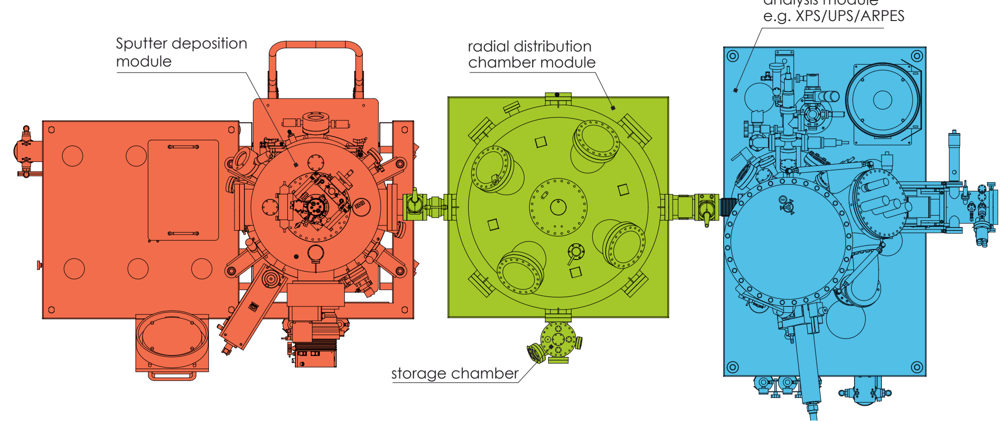
- Sputtering chamber diameter: Ø 475 mm,
- Equipped with 4 x DN100CF ports for 2" magnetrons,
- Base pressure < 1 x 10^{-8} mbar,
- Substrate holder: 4" plate style sample holder,
- Substrate temperature: heating up to 1200 °C (also in O_2 and other reactive gases atmosphere),
- 4 axes manipulator: XY ± 25mm, Z 50 mm, R1 continuous rotation (60 rpm),
- Dedicated lifting trolley for accessing/ replacing the bottom flange,
- Load-Lock for up to 2 substrate holders,
- Storage for up to 6 substrate holders,
- PLD chamber with substrate and target manipulators,
- Load-Lock/storage for up to 6 target holders (1" or 2"),
- Glove box preparation module.

Sputtering system with radial distribution chamber.

- Process chamber diameter: Ø 570 mm,
- Equipped with 6 x DN100CF ports for 2" magnetrons,
- Base pressure < 1 x 10^{-7} mbar,
- Substrate holder: 2" PTS sample holder,
- Substrate temperature: heating up to 800 °C,
- 2 axes manipulator: Z 150 mm, R1 continuous rotation (30 rpm),
- Dedicated lifting trolley for accessing/replacing the bottom flange,
- Load-Lock for up to 3 PTS sample holders,
- Storage for up to 6 PTS sample holders,
- Equipped with ion source for sample cleaning.



MULTI-CHAMBER CONFIGURATION WITH **RADIAL DISTRIBUTION MECHANISM**



RF/DC sputtering system as a part of interconnected set of thin-film deposition tools for different deposition techniques.

- Process chamber diameter: Ø 450 mm,
- Equipped with 7 x DN100CF ports for 2" magnetrons,
- Base pressure range 10^{-10} mbar,
- Substrate holder: 2" 4-holes plate style sample holder,
- Substrate temperature: heating up to 800 °C (also in O_2 and other reactive gases atmosphere),
- 2 axes manipulator: Z 100 mm, R1 continuous rotation (60 rpm),
- Dedicated lifting trolley for accessing/replacing the bottom flange,
- Internal liner/shield for protecting the wall of process chamber against coating of evaporated materials,
- Load-Lock for up to 6 sample holders,
- Storage for up to 12 sample holders.

MULTI-CHAMBER CONFIGURATION WITH RADIAL DISTRIBUTION TRANSFERRING SYSTEM

MBE module
organic evaporation module
laser
sputtering module
radial distribution chamber module
PLD module
load lock
radial distribution chamber module
storage
glove box
reorientation chamber
STM module
load lock

SPUTTERING SYSTEM EXTENSION POSSIBILITIES

Transferring tunnel for stable and easy sample moving between UHV chambers.

- Unlimited number of sections connected to UHV chambers,
- Up to 15 PTS (or flag style) sample holders can be loaded and transferred via the dedicated sample holder trolley,
- Guaranteed base pressure 2×10^{-10} mbar,
- The movement of the trolley is realized through linear magnetic drive (outside the vacuum) and rail transfer inside tube,
- Manual/motorised operation with valve separation.

Sample holder cassette

Process chamber for multi-technique deposition.

- Process chamber diameter: Ø 570 mm ,
- Equipped with ports for 2" magnetrons, multi-pocket EBS, ion milling source and plasma etching source,
- Base pressure range of 10^{-9} mbar,
- Substrate holder: 1" PTS sample holder,
- Substrate temperature: heating up to 800 °C,
- 2 axes manipulator: Z 100 mm, R1 continuous rotation (60 rpm),
- Dedicated lifting trolley for accessing/replacing the bottom flange.

MULTI-CHAMBER CONFIGURATION WITH **TRANSFERRING TUNNEL**

analysis module e.g. XPS/UPS/ARPES

laser

load lock

preparation chamber

load lock

PLD module

radial distribution chamber module

storage

sample holders

intro chamber

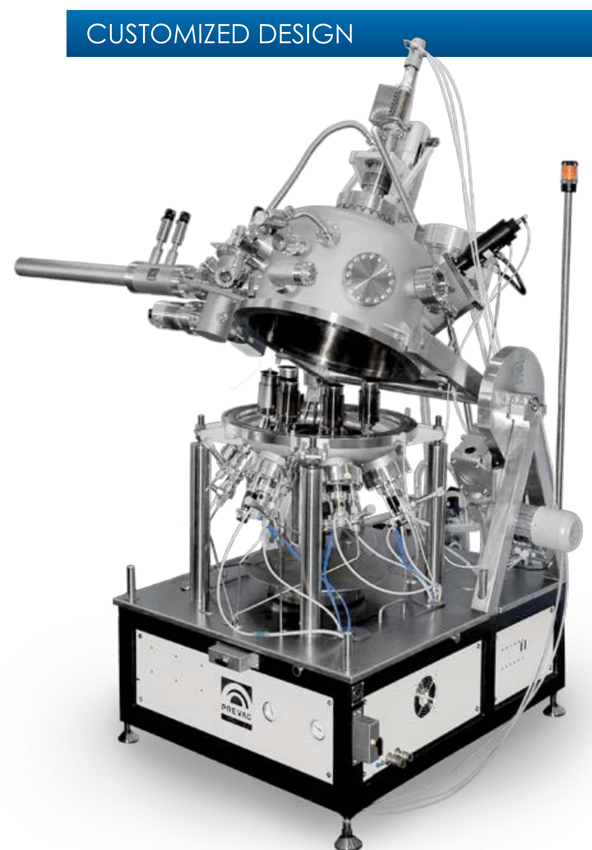
transferring tunnel

linear transfer

Sputtering module

MBE module

CUSTOMIZED DESIGN



Special design magnetron sputtering system with automated chamber opening.

The seven DN100CF ports located on the bottom of the chamber are occupied by the magnetron sources which are suitable for DC sputtering, RF/pulsed DC sputtering or reactive DC sputtering for the deposition of both metallic and compound layers. A two axes motorised manipulator is mounted on the top of the chamber and contains two sample receiving stations: one in the focal point (confocal geometry) and the second over the magnetron (planar geometry). This configuration allows deposition from each magnetron separately or from all magnetrons simultaneously with up to 30 deg. angle.

- Process chamber diameter: Ø 508 mm,
- Equipped with 7 x DN100CF ports for 2" magnetrons,
- Base pressure: < 1x10^{-8} mbar,
- Substrate holder: 1" PTS sample holder,
- Substrate temperature: heating up to 800 °C,
- 2 axes manipulator: Z 150 mm, R1 continuous rotation,
- The top of the chamber is mechanically hinged providing a large, unobstructed internal working area.

The HIPIMS reactor system for accurate and reproducible thin film layer deposition and extensive plasma diagnostic investigation.

- Process chamber diameter: Ø 386 mm,
- Equipped with 3 x DN100CF ports for 2" magnetrons,
- Base pressure range 10^{-8} mbar,
- Substrate holder: 2" PTS sample holder,
- Substrate temperature: heating up to 500 °C,
- 1 axis manipulator: Z 25 mm,
- Mechanically lifted top of the chamber.

CUSTOMIZED SOLUTIONS

In situ tilt option for magnetron sources

In situ tilt is used for fine adjustments of the deposition profile for maximum level of flexibility during process (ability to adjust specific optimal angle for some materials).

Off-axis sputtering

The magnetron is positioned of the angle to the substrate, on the side of the chamber, to enable vaporization without exerting a strong stress on the sample (stress-free sample).

MS2 63C1 MAGNETRON SOURCE

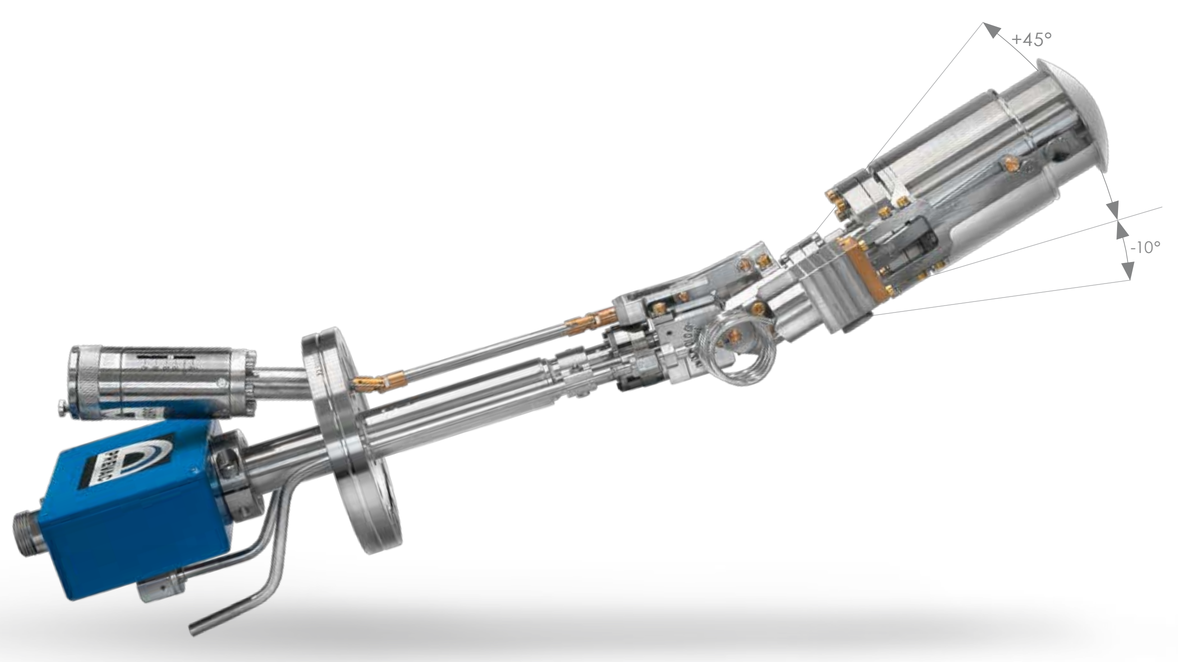
A novel magnetron source used to apply thin layers with high homogeneity in the sputtering process.

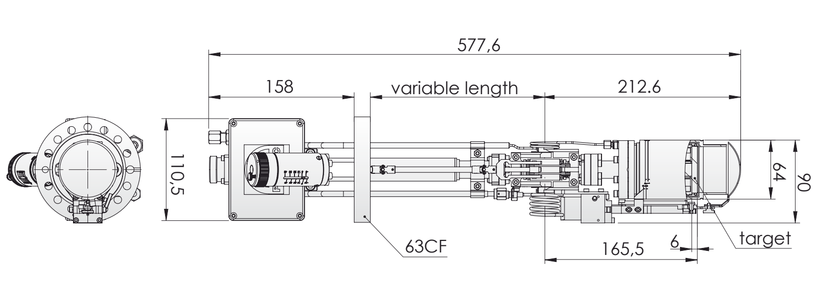
The source is compatible with UHV conditions. Thanks to the integrated in situ tilt system, it can be used in both standard and custom geometry chambers. By using the dome type design we minimize the space needed to open the shutter. MS2 63C1 is fully compatible with our M600DC-PS power supply as well as all other DC, RF and pulsed DC power supplies available on the market.

- **Mounting flange: DN 63 CF**
- **In situ tilt range: +45° ÷ -10°**
- **Chimney as standard**
- **Pneumatic dome type shutter**

Targets:

- **Diameter: 2"**
- Thickness | non-magnetic: 1 - 6 mm
- Thickness | magnetic: Fe 1 mm, Co 2-3 mm, Ni 2 mm
- Indirectly cooled





Dome type shutter

M600DC-PS MAGNETRON POWER SUPPLY

Compact switch-mode DC power supply designed to drive up to 3 magnetron sources.

All adjustable parameters are displayed on the large TFT display with touchscreen. All settings can be manually adjusted or can be stored and recalled automatically after unit switch on. The unit also features a built in timer and automatic standby mode. It is fully interlocked for both, user and device safety. Unit can be remotely controlled via one of available analog or digital interfaces.

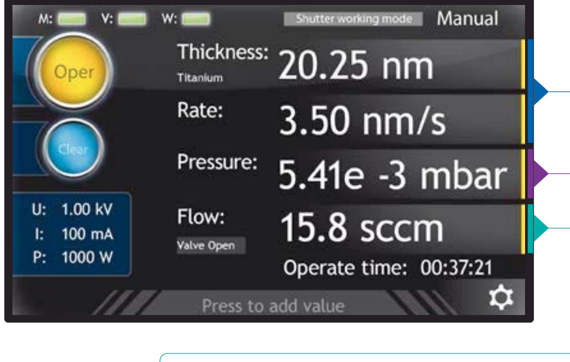
- **Easy to extend power up to 1200 W/1800 W/2400 W** with additional modules
- **Switch for 3 magnetron sources with shutters control**
- Adjustable limits of voltage, current and power separately for each output
- Multiple I/O - individually programmable
- Arc detection system

Support for:

- **Thickness and evaporation rate measurements** (TM13/14)
- **Vacuum measurements** (active gauge)
- **Mass Flow Controller** (MKS MF1)

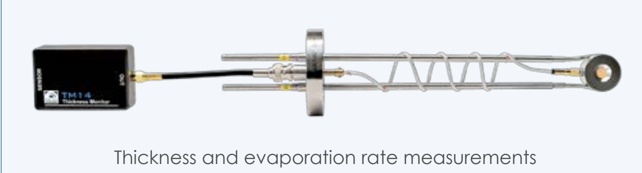
600 W

M600DC-PSE additional power extending modules



Mass Flow Controller

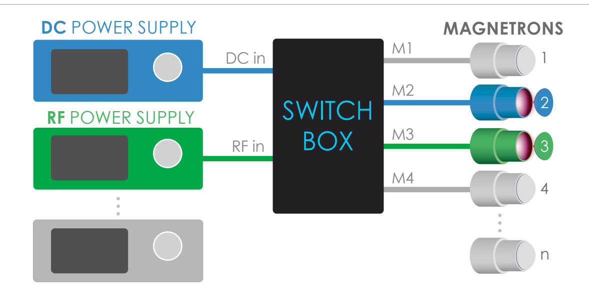
Vacuum measurements

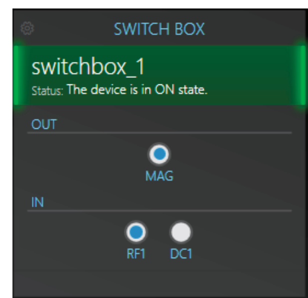


Thickness and evaporation rate measurements

SWITCH BOX

Switch box is mainly used for easy switching power supplies between available magnetron sources.





SPUTTERING MANIPULATORS

The 1-4 axes motorised manipulator is a high rigidity, UHV specimen manipulator of modular construction, suitable for a range of R1 motorised continuous substrate rotation and Z translation (additionally it can be equipped with XY movement module).

Options:
- H_2O cooling,
- Side or integrated wedge shutter,
- XY movement stage,
- BIAS, DC, DC/RF.

It is prepared to heat the substrate up to 1200°C with accuracy +/- 0.5 °C. The station includes the substrate positioner (for up to 6" substrate holder) and allows precise angular position of substrate in relation to linear shutter.

Continuous, primary R1 rotation module for substrate manipulator is motorised with rotation speed up to 60 rpm.

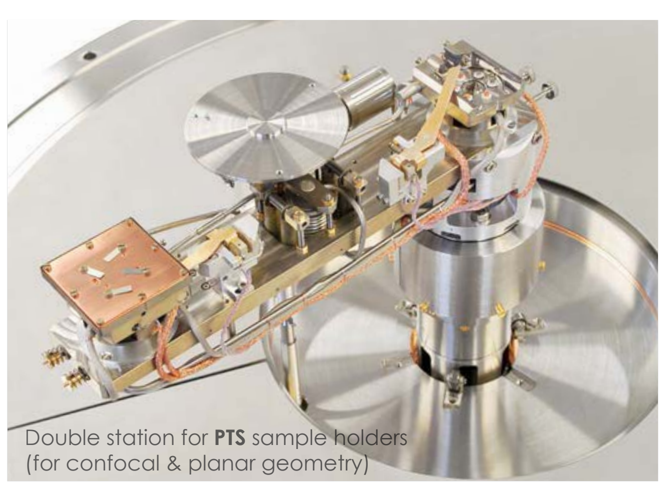
The heater material is optimally adapted depending on the customer's requirements and the specific conditions of the deposition process (e.g. heating temperature, presence of reactive gases). Exemplary heaters: thermocoax, graphite coated SiC, SiC solid (β).

Shutter can be integrated or external, motorised or manual.

Example:
2-axes sputtering manipulator for 1" PTS sample holder.

Receiving station for **PTS** sample holder

Receiving station for **3-pins plate style** sample holder



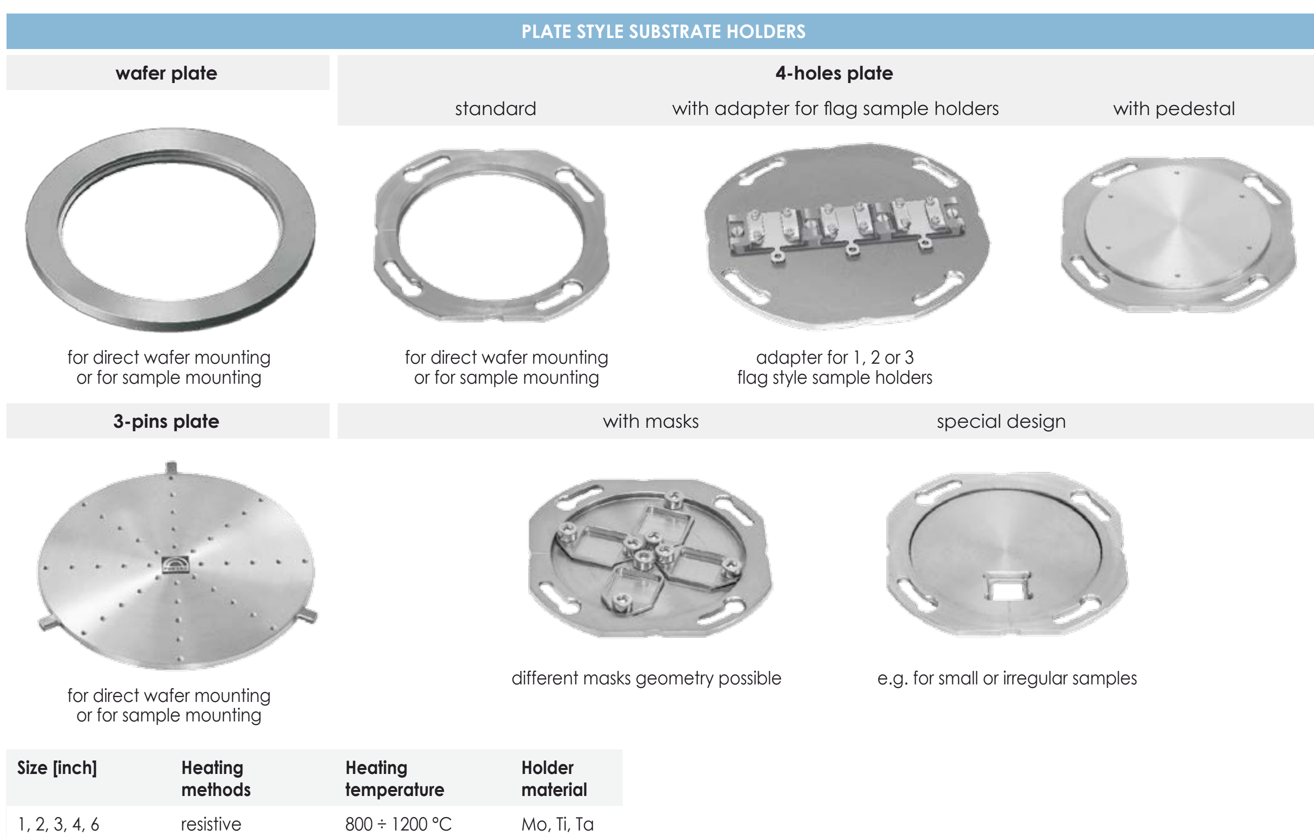
Double station for **PTS** sample holders (for confocal & planar geometry)

Receiving station for **PTS** sample holder, with wedge shutter

SUBSTRATE HOLDERS

Plate styles substrate holders (molyblocs, for wafers or other non-standard size samples) are dedicated for different deposition techniques, such as magnetron sputtering, thermal evaporation, molecular beam epitaxy and others.

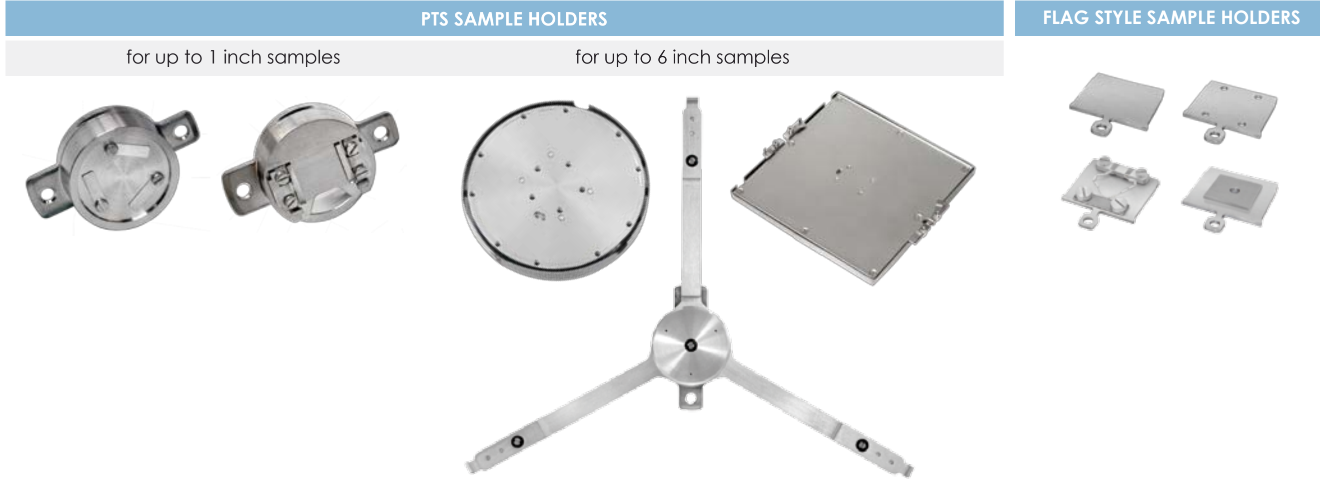
Available in 1", 2", 3", 4" diameter size as standard (6" and larger on request). The holder can be configured with adaptations for single and multiples of other types of sample holders, for example flag style plates. Standard material is molybdenum or titanium, other materials are available on request.



Size [inch]	Heating methods	Heating temperature	Holder material
1, 2, 3, 4, 6	resistive	800 ÷ 1200 °C	Mo, Ti, Ta

NOTE | heating and cooling method and temperature depends on the manipulator

PTS and Flag style sample holders for a very wide range of applications can also be used as well.

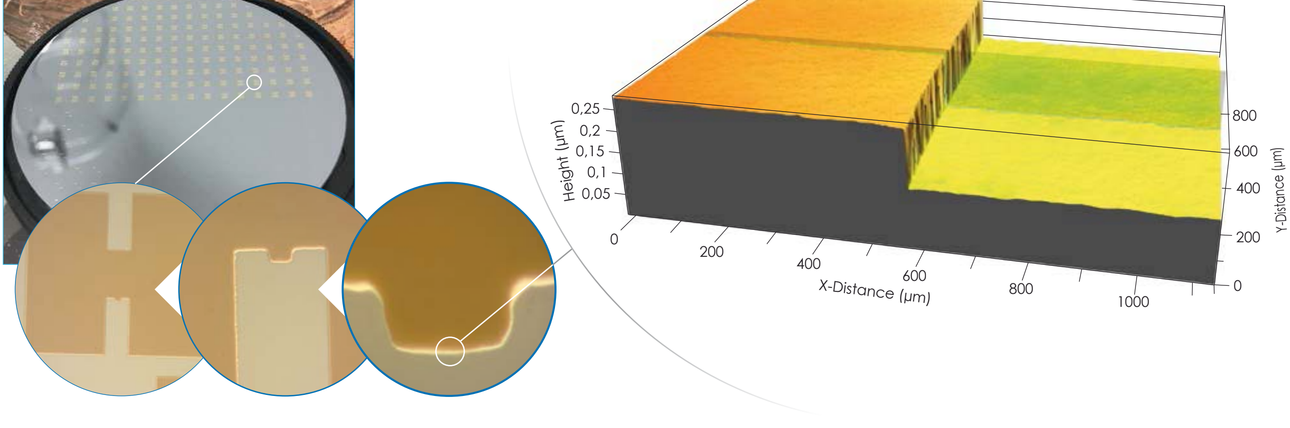


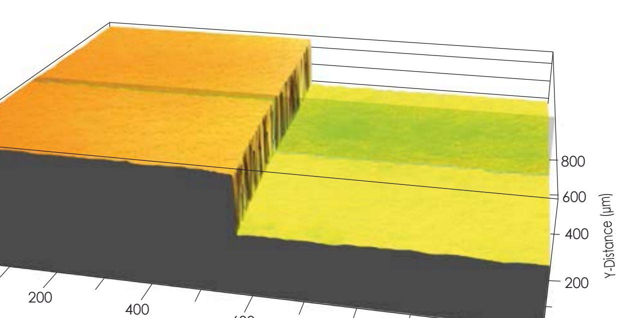
APPLICATIONS

Applications	examples
Single and multilayer metal conductor films (for microelectronics and semiconductor devices)	Al, Mo, Mo/Au, Ta, Ta/Au
Barrier layers for semiconductors metallizations	TiN, W-Ti
Magnetic films	Fe, Co, Ni, Fe-Al-Si, Co-Nb-Zr, Co-Cr, Fe-Ni-Mo, Fe-Si, Co-Ni-Cr,Co-Ni-Si
Optical coatings - metallic (reflective)	Cr, Al, Ag
Optical coatings - dielectric	MgO, TiO_2, ZrO_2
Photomasks	Cr, Mo, W
Transparent gas/vapor permeation barriers	Al_2O_3
Transparent electrical conductors	InO_2, SnO_2, In-Sn-O (ITO)

Substrate holder after the lift-off process.

Homogeneous layer growth example.





HMI DEVICE FOR HARDWARE CONTROLLING

A human-machine interface (HMI) device is the primary tool by which operator read and control the main parameters of system and deposition process. The parameters and current status exhibited on HMI display are organized into groups on pages, corresponding to particular functions, controlled by PLC unit.

The HMI device can read and control e.g.:

- vacuum level
- gate valves
- switch box
- opening/closing the shutters
- manipulator motion/positioning
- substrate transferring
- substrate heating
- gas dosing
- safety Interlocks

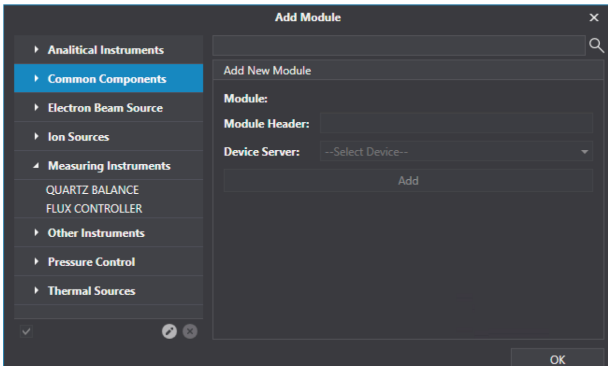
As standard, the HMI is mounted in an electronic rack, but can also be mounted as an additional, large touchscreen on a rotary arm.

For convenience of use the HMI device can be integrated with system frame, e.g. right next to the process chamber.

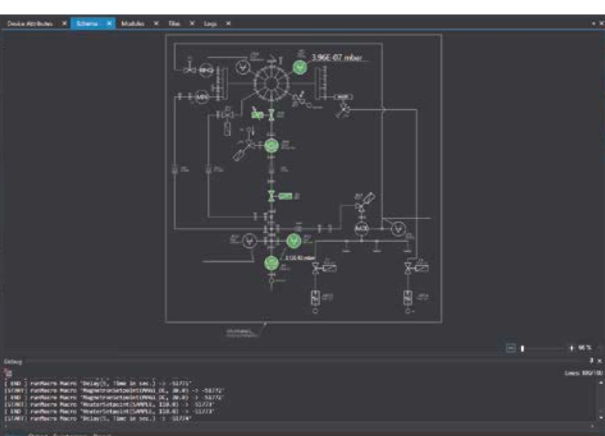
FULLY AUTOMATED PROCESS CONTROL

Innovative software tool optimized for easy and complete control over the entire deposition process and all components in the system.

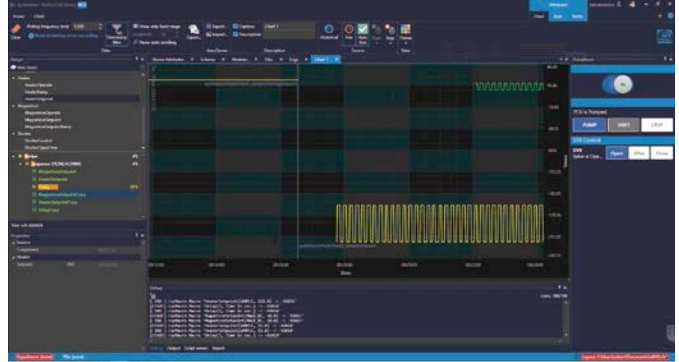
Synthesium comprises a convenient and intuitive graphical user interface allowing two general modes of operation: automated control by predefined recipes or manual control of all system elements.



- **Automatic process of sequences**
  e.g. macros, loops, calibrations, pauses
- **Graphical modules representing status of system elements**
  e.g. sources, substrates, pumps, valves
- **Adjusting parameters of all system components**
  e.g. MFC, valves, pumps, gauges, power supplies
- **Recipe Editor (XManager) with drag&drop operation**
- **Extended recipes with subrecipes (macros) within python script**
- **Password protected access rights using 1 of 9 levels**
  e.g. engineer, scientist, operator
- **Process data stored in MySQL database archiver**
- **Generation of text protocol files with all process information**
- **Remote access by VNC protocol**
- **Multi-level logging** functionality which allows to analyse the source of the problem.



Schema represents graphical diagram of all system components in one place.



The system offers additional, **extended chart module** (also available as an stand alone application).

RELATED EQUIPMENT

THICKNESS MONITORING

Thickness Monitor Controller TMC13 is the latest technology electronics designed for monitoring and controlling any coating and deposition processes. Up to six channel inputs and two additional vacuum gauge channels together with 7" TFT display makes this unit really unique and universal.

- **Six channels for quartz balance**
- **2D real time chart module**
- Two inputs for most active vacuum gauges
- Up to 8 shutters and I/O reprogrammable
- Relay outputs
- Frequency resolution 0.1 Hz (for TM13) or 0.01 Hz (for TM14)
- Operation of up to two multi-crystal sensor heads (pneumatic or stepper motor)
- Two reprogrammable analog outputs for rate and thickness monitoring with 16 bits resolution

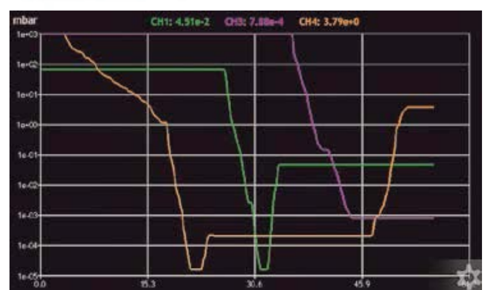
The **Quartz Balance QO 40A1** instrument provides a real-time, progressive indication of coating thickness during deposition, allowing the production of coatings of high accuracy and reproducibility. Customized insertion length 130 - 500 mm (other on request). Available with or without integrated manual/electro-pneumatic shutter.

- **Operation of up to two multi-crystal sensor heads**
- Operate your multi-crystal sensor head as easily as one single crystal
- **Control each single crystal separately**

PRESSURE MEASUREMENT

The **MG15 Ion Multi Gauge Controller** is able to support four active gauges and up to three passive gauges, extending the measurement range to 2×10^{-12} mbar. The unit is fully software controlled and can be remotely controlled via one of available interfaces.

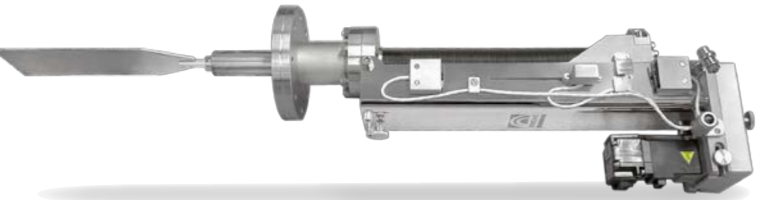
- **Measurement range from atmospheric to 2×10^{-12} mbar**
- Pressure plots
- Pressure trend graphs
- Measurement filtering (low, med, high)
- Supports Ir/W/Thoria filaments
- Bayard-Alpert overpressure protection
- Selectable measurement units: mbar, Torr, Pascal
- Gas specific correction with one customized setting
- Unit over-temperature protection
- Controls almost all commercially available Bayard-Alpert gauges
- Degassing of Bayard-Alpert with power and time limit
- 10 individually programmable set-points with threshold and hysteresis functions
- User-defined channel names
- Possibility of active gauges self-identification
- **Real time pressure charts** with data export possibility
- **Beam flux monitor**
- Black Box version available (option) - without 7" TFT display



Real time pressure charts

WEDGE SHUTTER / MASKS

Special shutter (wedge tool) for gradient film deposition. It helps preparing the specific patterns on the substrate during deposition process. The wedge plate can be equipped with a set of masks adapted to customer's requirements.



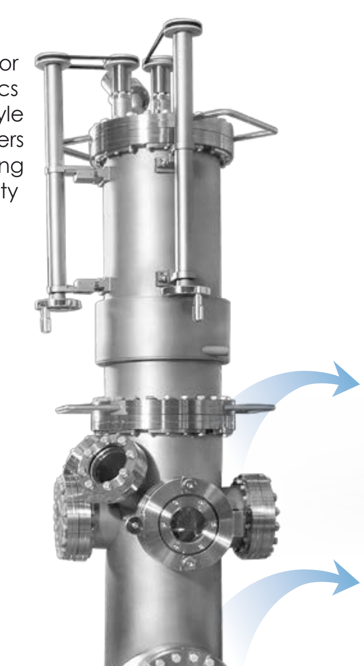
LOAD LOCK CHAMBER

Load lock chambers combined with our load lock chamber mechanisms provide a fast, clean and versatile method of introducing samples into UHV systems.

Load lock chambers are typically equipped with:
▪ load lock chamber mechanism
▪ pumping system
▪ viewports
▪ pressure gauges

The top port/entry door of the load lock chamber is usually sealed by a viton gasket. The chambers are equipped with UHV connecting flanges and additional ports for future expansion. Chambers are designed for base pressures ranges 10^{-7} - 10^{-9} mbar. A range of options exist, for e.g. LN_2 cooling or preliminary sample heating by halogens or heaters.

Load lock with door access for 5 pcs 6" PTS sample holders



Load lock with door access for 10 pcs 2" 4-pins plate style sample holders and halogen heating possibility

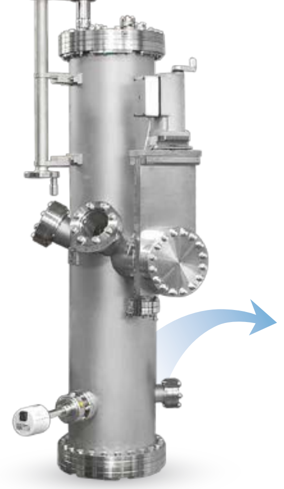
STORAGE CHAMBER

The standard storage chambers allow to store up to 10 sample holders under UHV conditions. The storage chamber mechanism combines with our range of storage chambers.

Storage chambers are usually pumped via the distribution chamber pumping set (independent pumping is also possible if requested) and may be equipped with options for cooling or heating.

Storage for 30 pcs 6" PTS sample holders

Storage for 6 pcs Flag sample holders



Storage for 12 pcs 2" 4-pins plate style sample holders

PREVAC **SPUTTERING SYSTEM** KEY POINTS

■ **Versatile, easy to extend** with other deposition or analytical techniques (by radial distribution or tunnel transferring system) and **low running operating cost** system design.

■ **Applications**: ideally suited for depositing metal and dielectric thin films in both, sputter-up and sputter-down arrangement. Operated in DC, RF and pulsed-DC modes.

■ Excellent sputtering deposition uniformity.

■ Operated singly or in co-deposition mode to produce a wide variety of film compositions.

■ Magnetron sputtering sources range in size from 1" to 6" in diameter.

■ In situ tilt option for fine adjustments of the deposition profile for maximum level of flexibility during process. Fast reconfiguration from planar to confocal without breaking the vacuum conditions.

■ Multiple sources supplied with single power supply and switching networks, or with multiple supplies for co-deposition processing,

■ Process chamber with fast entry door (basic version) or with load lock chamber for easy sample introduction to the processing chamber without breaking its vacuum.

■ Systems for **a wide range of substrate holders size** (from 10×10 mm to 6", other on request) and shape (also for other manufacturer's holders).

■ Standard **manipulator with stable, long-life heater** element made of solid SiC and receiving station to achieve high temperatures up to 1200 °C.

■ Manipulators with two-stage receiving station for substrate holders to meet the requirements of **confocal and planar magnetrons configuration.**

■ **Synthesium process control software** allows integration and perfect cooperation of sources of various types and manufacturers, and enables easy recipe writing, automated growth control and extensive data recording. Allows integrating new additional components based on Tango open source device.

■ Dedicated Human-Machine Interface (HMI) device for hardware easy controlling and monitoring.

■ The bottom flange with sources can be **fully accessed** or **replaced** using the dedicated **lifting trolley**.

■ Internal **liner/shield** for protecting the wall of process chamber against coating of evaporated materials.

■ Possibility for **In-situ characterisation tools**, e.g. plasma emission monitor (PEM), ellipsometer, reflectometer, quartz balance or pyrometer temperature measurement system.

■ **Fully automated transferring system** (option).

■ High-efficient pumping system adapted to the individual system configuration.

If you need any further information, please do not hesitate to contact our sales department

PREVAC sp. z o.o.
Raciborska Str. 61
PL44362 Rogów

sales@prevac.eu
+48 32 459 21 30
+48 32 459 20 01

Local Contact: