

# HERZOG- XRD-automation



**HERZOG**



HP-PD6 with conveyor belt system

HERZOG provides optimum sample preparation for x-ray diffractometry (XRD) processes for the phase analysis of polycrystalline sample material. The combination of the HP-MA pulverizing mill and the HP-PD6 press is the ideal automation with which to create a suitable and effective diffraction surface for the XRD analysis.

The XRD automation by HERZOG has been especially designed to suit the requirements of the raw materials industry.

**Typical areas of application are investigations of:**

- Samples from the mining industry for exploration and process control
- Flotation products, e.g. in copper mining
- Bath samples in the aluminum industry
- Samples from the cement industry





Temperature sensors with cooling of the pulverising vessel



Sample input magazine for 30 cups

- Station 1**  
Sample input  
Putting correct dosage of sample in ring.
- Station 2**  
Wiping off of residual material from the ring.
- Station 3**  
Pressing of sample material into the ring.
- Station 4**  
Ring output onto conveyor belt.
- Feeding for buttons, metal pans.
- Station 5**  
Cleaning of pressure plate.
- Station 6**  
Input of empty rings.
- Conveyor belt for pressed pellets.
- Conveyor belt for empty rings.

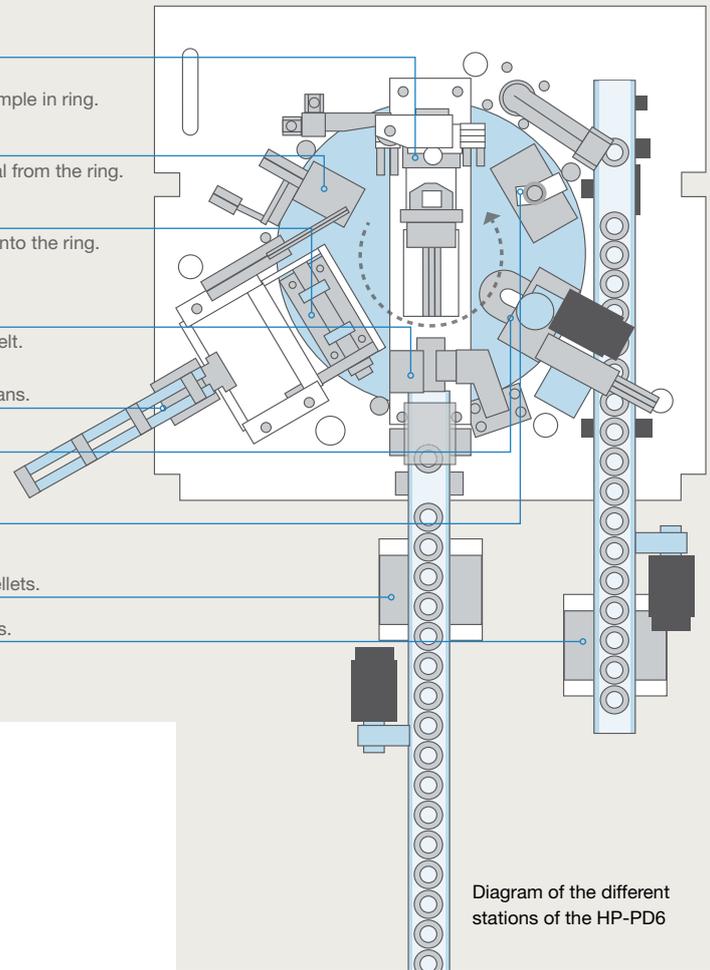


Diagram of the different stations of the HP-PD6

# Pulverising with HP-MA

The HP-MA has been designed in such a way as to ensure that the pulverizing of the material complies perfectly with the requirements of the XRD analysis. The pulverizing parameters have been optimized to minimize undesirable phenomena such as grain size effect, preferred orientation of particles and heterogeneity. Furthermore, oxidation and amorphisation of the sample material are avoided.

- Following input of the sample material, the pulverizing process takes place fully automatically and can be adjusted to an optimum setting via the motor speed (infinite regulation from 500 to 1500 rpm). Use of a special pulverizing tool, as well as application of frequency converters, guarantee gentle processing of the material.

- After pulverizing has finished, the grinding vessel is completely emptied and cleaned. The pneumatic or wet cleaning process (available as an optional extra) guarantee that even the most minute sample residue is removed. This prevents any contamination of subsequent samples.
- The ground material is put into the cup at the output position and subsequently transferred to the HP-PD6.

## Options for the HP-MA:

- Dosing for grinding resources in tablet form
- Dosing for powder-type cleaning agents
- Wet cleaning for grinding vessel
- Cooling for grinding vessel
- Sample dosing with pre-sample disposition

## Technical specifications

<b>Color</b>	Blue/white, RAL 5009/9018
<b>Labeling</b>	English
<b>Operating manual</b>	1 copy, English
<b>Dimensions L x W x H</b>	850 x 900 x 1,558 mm
<b>Machine weight</b>	610 kg
<b>Powersupply and consumption</b>	Voltage: 200 – 600V/50 or 60Hz 3 Phases Electrical equipment cabinet (integrated) Neutral wire: not required Connected load: 2.5 kVA
<b>Compressed air supply and consumption</b>	Pressure: min. 5 bar, max. 10 bar Consumption: ca. 1,500 l/sample Hose aconnection: ND 13 mm
<b>Waste connections</b>	Location: back of machine Diameter: OD 50 mm
<b>Processing parameters</b>	Duration grinding cycle: 0–999 s Processing time: approx. 2 min + preset grinding cycle number programs: 8
<b>Material</b>	Grain size: 5 mm Hardness: max. 9 Mohs Temperature: max. 100°C



Interior of HP-PD6 with cleaning equipment (front left) and ring input (front right)

# Pressing with HP-PD6

The HP-PD6 has been designed especially for the XRD and prepares the samples perfectly for the analysis. The distribution of different functions at individual stations enables fast and simultaneous processing of samples:

- After automatic input of the ring, a new ring immediately becomes available for entry into the system. This permits the user to utilize the maximum capacity of the system.
- Precise dosing of the sample material into the ring takes place at the dosing station. A special cleaning mechanism guarantees residue-free cleaning of the dosing system and prevents subsequent samples from contamination.
- Excess sample material is removed from the ring using a wiper. The material is pressed under application of low pressing forces using the back loading technology. The sample material is

pressed against the pressure plate positioned underneath via a button. The button has been previously inserted into the ring from above. This method guarantees effective pressing of the material and at the same time maximum conservation of the surface to be analyzed. The inserted button also stabilizes the sample material in the ring.

Careful cleaning of the pressure plate prevents contamination of subsequent samples. Our special back loading technology also guarantees that a minimum amount of binding agent can be used in order to avoid any signal attenuation.

- At the output station the pressed pellet is turned around so that the analysis surface faces upwards and can be conveyed into the analyzer.



Ring input



Press aggregate

## Technical specifications

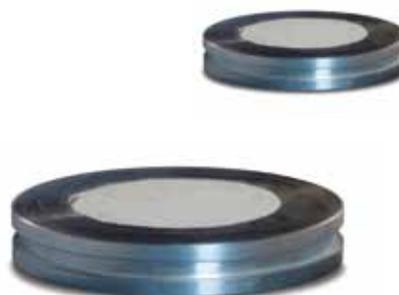
<b>Color</b>	White, RAL 7035
<b>Labeling</b>	English
<b>Operating manual</b>	1 copy, English
<b>Dimensions L x W x H</b>	2,130 x 1,100 x 1,500 mm
<b>Machine weight</b>	550 kg
<b>Press Tool</b>	Pressing into steel rings 51.5 x 31.5 x 8.6 mm
<b>Power supply and consumption</b>	Voltage: 200 – 600V/50 or 60 Hz 3 Phases Electrical equipment cabinet (integrated) Neutral wire: not required Connected load: 2 kVA
<b>Compressed air supply and consumption</b>	Pressure: min. 5 bar, max. 10 bar Consumption: ca. 1,700 dm <sup>3</sup> N/sample Hose aconnection: ND 13 mm
<b>Stud for external dust collector</b>	Location: underneath Diameter: OD = 80 mm
<b>Material</b>	Dry powder, grain 90 µm

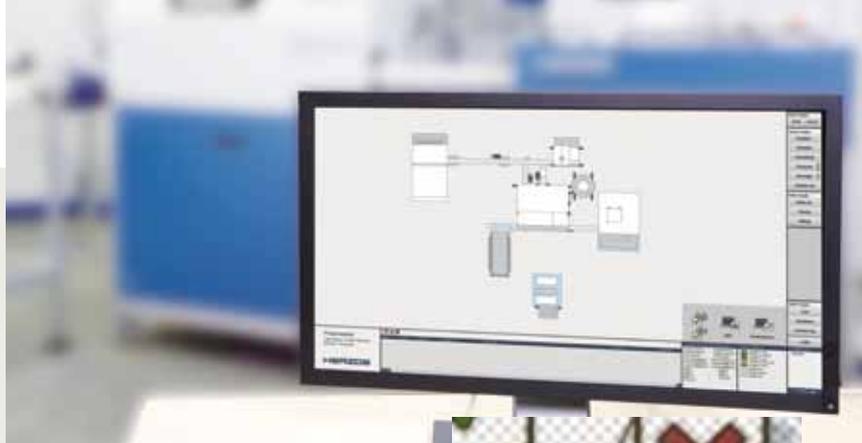
## The advantages of HERZOG-XRD-automation



Input of inlays by vibratory unit

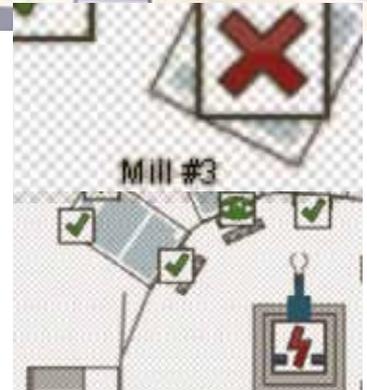
- **Gentle pulverising of the sample material:** XRD preparation is based on special programming of the HP-MA, electronic frequency converters and special pulverizing tools. This ensures that the sample is pulverized effectively but at the same time without damaging the material structure.
- **Gentle pressing of the sample material:** The pressing process is completely compatible with the requirements of the XRD analysis. Low pressing forces are applied so as to avoid any orientation of the crystals.
- **Application of the back loading process:** This special pressing process ensures careful handling of the sample without any adverse influence on the surface to be analyzed. This guarantees accurate structured analysis results.
- **High throughput:** The special design of the automation with simultaneous sample processing guarantees a high sample throughput whenever required.
- **Fully automatic connection to the analyzer:** Almost all XRD analyzers produced by leading manufacturers can be easily connected to the HERZOG automation.
- **Reproducibility, avoidance of contamination:** HERZOG's decades of experience combined with leading technology guarantee absolute precise reproducibility of the sample quality. The special focus on cleaning mechanisms prevents contamination of subsequent samples.
- **Compact design, compatibility, scalability:** The compact design enables optimum use of space without restricting machine maintenance. All components of the HERZOG automation are perfectly aligned and thus ensure optimum analysis results. The automation can be individually adjusted to suit customer specifications and requirements. In addition to the linear structure, the XRD equipment can be easily integrated into a robotic configuration.
- **Simple operation:** The control by our PrepMaster system with its easy-to-use graphic interface guarantees simple and completely flexible system control.
- **Robust design:** The robust construction and high-quality fabrication guarantee smooth and reliable operation for many years to come.





## Control via the PrepMaster system

Our SCADA-System PrepMaster with its easy-to-use surface enables simple and clear monitoring of the sample preparations. All parameters of the XRD automation can be controlled by the PrepMaster System subject to the type of sample. The PrepMaster includes functions like, e.g., registration of samples, integration of the sample preparation in a super-ordinate LIMS or communication with the analyzer. The PrepMaster can be individually adjusted to the customer's requirements and is easily scalable if the system needs to be expanded.



## Optional additions to the XRD system

**The following are available as optional extras:**

- Input magazine for 30 to 300 cups with sample material
- Output magazine for empty cups after transfer of material to the HP-PD6
- Automatic ring cleaning after analysis in the XRD analyzer. Control via the PrepMaster system.

**Further information is available under:  
[www.herzog-maschinenfabrik.de](http://www.herzog-maschinenfabrik.de)**

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