HELITRONIC POWER DIAMOND 400

Two-in-one, high performance rotary eroding and grinding machine with grinding wheel/electrode changer as standard

Key features

Switching between rotary eroding of PCD/CBN tools and grinding of HM/HSS tools is the particular strength of the HELITRONIC POWER DIAMOND 400 with a grinding wheel/electrode changer within the HELITRONIC FAMILY. Tool diameter ranges from 3 to 380 mm, machine lengths can be up to 520 mm and each item may weigh up to 50 kg.
Walter Maschinenbau GmbH

WALTER has produced tool grinding machines since 1953. Today, our product range is supplemented by tool eroding machines and fully automated CNC measuring machines in the HELICHECK series for contactless complete measurement of tools and production parts.

Walter Maschinenbau GmbH is part of the UNITED GRINDING Group. Together with our sister company, Ewag AG, we consider ourselves to be a supplier of systems and solutions for the complete machining of tools and can offer a wide range of products, including grinding, rotary eroding, laser machining, measurement and software.

Our customer focus and our global sales and service network of company-owned locations and employees has been appreciated by our customers for decades.
The new generation of “Two-in-one” all-rounder: with electrode or wheel changer and motor spindle for max. 3 electrodes/grinding wheels. This tailoring to customer requirements shows how productive the HELITRONIC POWER DIAMOND 400 can be. Together with our FINE PULSE TECHNOLOGY, it is at the forefront for surface quality and precision in a wide range of materials.
# The HELITRONIC POWER DIAMOND 400 at a glance

<table>
<thead>
<tr>
<th>Application</th>
<th>Machine</th>
</tr>
</thead>
</table>
| - Rotary eroding and grinding of rotationally symmetrical tools for metalworking and woodworking industries  
- For production and/or regrinding  
- Fully automated, complete machining in a single clamping cycle  
- Materials include PCD, CBN, HSS, carbide, cermet, ceramic | - Low vibration, solid grey cast iron, gantry type construction  
- X, Y, Z linear axes with ball-type linear drive  
- A, C rotating axes with worm drives or optional torque motors  
- Motor spindle with a spindle end that can take up to 3 rotating electrodes or 3 grinding wheels  
- FINE PULSE TECHNOLOGY for highest surface quality  
- FANUC, the global standard for control equipment  
- Various loading systems  
- Numerous efficiency options |

HELITRONIC POWER DIAMOND 400 with “Top loader” and “Electrode/grinding wheel changer” (right) – uncompromising in productivity and precision
Software

- HELITRONIC TOOL STUDIO, CAD/CAM software for design, programming, simulation and production
- HELITRONIC TOOL STUDIO with licence erosion
- Walter Window Mode WWM
- Numerous software options to extend the system’s performance and to increase its efficiency

HELITRONIC POWER DIAMOND 400 with the "Robot loader 25" (left) and "Electrode/grinding wheel changer” (right) options – the ultimate configuration for high performance
Efficient and easy to use

Example tools (from left to right):
PCD end mill, PCD reamer, PCD stepped drill bit, rim drill, 2 x PCD multi-step tool, PCD drill, shaped lathe tool, ball nose tool, thread milling drill, drill
With FINE PULSE TECHNOLOGY, HELITRONIC POWER DIAMOND 400 is at the forefront when it comes to quality for PCD tools. It is an economic investment for both the production and resharpening of PCD/CBN tools in the diameter range of up to 315 mm.

It is possible to save time by machining complex geometries in a single clamping cycle. The combination of rotary eroding & grinding provides a real step forward in terms of flexibility and quality. Furthermore, thanks to its “Two-in-one” principle, the HELITRONIC POWER DIAMOND 400 can be used as a grinding machine for the production and resharpening of carbide tools. The changeover from PCD to carbide tools is “on the fly”, since it is possible to automatically change between PCD and carbide tools and back again.
Innovative WALTER grinding and rotary eroding equipment

Motor spindle
The powerful single-ended directly driven motor spindle is equipped with a liquid cooling system. Up to 3 electrodes or grinding wheels can be mounted per electrode/grinding wheel holder. In combination with the electrode/grinding wheel changer, up to 8 holders for 24 electrodes/grinding wheels can be used in the grinding process. The result is the highest levels of efficiency and productivity.
Electrode/grinding wheel changer

Electrode/grinding wheel changer 4 x (option 8 x)
Affordable, compact, and flexible too. With a capacity of up to 24 electrode/grinding wheels, it quadruples the grinding wheel capacity of the HELITRONIC POWER DIAMOND 400. The max. grinding wheel diameter is 254 mm. The coolant supply and the grinding set form a single unit. This ensures reliable wheel set replacement and optimum coolant delivery.
Robot loader automation option

“Combi” equipment package for robot loaders
Gripper rapid replacement system for handling cylindrical tools and tools with HSK-63 mounting shank. The word “Combi” is an exact description of the contents of this equipment package: Namely the two equipment packages “Cylindrical tools” and “HSK” plus the rapid replacement interface for fast, user-friendly retooling.

Advantages of the “Combi” equipment package
• Rapid replacement sequence thanks to only one cylinder head screw
• Pallets that have already been taught do not need to be taught again when grippers are replaced
• Pneumatics and teaching cable need to be connected only once (installation)
• Retrofitting at existing robots possible (software must be adapted)
• Easy handling
• Ergonomic form

“Multi-Range” equipment package for robot loaders
The Multi-Range equipment package sets new standards in terms of flexibility. Large diameter coverages with a pair of gripper fingers and a collet replacement (Schunk bayonet) are possible with this equipment package.

Robot loader
The robot improves accessibility to the workpieces and makes special applications possible. Depending on the type of workpiece or the workpiece diameter, up to 7,500 workpieces can be loaded using the robot.
Robot loader 25 automation option

Robot loader 25
For tools in an HSK holder with a total weight of up to 20 kg and a tool diameter of up to 315 mm in combination with the HELITRONIC POWER DIAMOND 400. Thanks to the innovative, recently developed loader software, “chaotic” loading on up to 7 pallet levels is now possible. An automatic diameter determination is also optionally available and ensures a smooth, automated and flexible production sequence.

Capacity of the available pallets:
– 21 tools, max. diameter 320 mm
– 28 tools, max. diameter 220 mm
– 70 tools, max. diameter 105 mm
Top loader automation option

Top loader
This space-saving and inexpensive automation solution is integrated directly into the machine envelope. Automatic teaching enables short setup times. Depending on the tool diameter, the Top loader offers a maximum of 500 places for tools.

Tool capacity, max. (sample diameters):
- 500 tools: diameter 3 mm
- 42 tools: diameter 20 mm
- 20 tools: diameter 32 mm
Other options

“Grinding wheel dresser” option
When it comes to the conditioning/dressing of grinding wheels during the production process, with subsequent software-controlled compensation, the high-performance electrical grinding wheel dresser is the perfect solution.

“Sharpening stone holder” option
With the permanently installed sharpening stone holder, WALTER enables the automatic opening of the wheel bond during production. The HELITRONIC TOOL STUDIO software controls the process and enables the operator to open the bond at the appropriate time according to the grinding wheel condition.
Other options

1. **Automatic grinding wheel measurement**
   For even more efficient production. Normally the machine operator corrects the grinding wheel data in the production process manually so that the geometry of the tool can be maintained at its nominal dimension. With the automatic grinding wheel measurement, the wear on the bond of the grinding wheels can be determined automatically via tactile measurement, exactly documented and compensated for. The measurement is carried out during the production process. Diameter and length of the grinding wheel can be measured and compensated for. This means that the operator always has the optimum grinding wheel data at the desired time. Furthermore, the user can monitor the grinding wheel wear and thus influence the production process and optimise it.

   The probe for the tactile measurement is fitted on the tool carrier and is mounted in place of the electrical dresser.

2. **Automatic, electrical measurement of the machine reference**
   Now use the advantages of the automatic, electrical measurement of the machine reference in the grinding and eroding machines from WALTER.

   - Maximum precision of measurement results through exact positioning of the axes via electrical contact
   - Significant time savings with automatic operation in comparison to the manual measurement method
   - Valuable working time of the employees can be used for other tasks
   - Eliminates errors caused by the human factor
   - Short amortisation time for your investment
Automatic positioning and measurement system “Heli-Probe” (standard)
Heli-Probe records important tool parameters for a perfectly positioned tool in the shortest space of time. This is the best precondition for quick and accurate grinding, quality and productivity.

Calibration (standard)
Calibration consists of a calibration ball and software. It is used to automatically calibrate the X, Y and Z axes of the machine with a loader. The calibration frequency can be freely chosen in the loader program. Machines without a loading system can be calibrated manually.

Integrated Measuring System IMS
With the integrated IMS measurement system, the outside diameter, rake angle and core diameter can be measured using the probe ball without having to unclamp the tool. By setting the tolerances, HELITRONIC TOOL STUDIO can compensate for any deviation of the measured values, e.g. by thermal growth or wheel wear and tear, and adjust to the nominal measure and thus prevent scrap. The operator no longer needs to make active adjustments and the dressing cycle of the grinding wheels remains constant. Both increase the efficiency, especially when it comes to large-volume production.

- Determination of the rake angle, the outer diameter and the core diameter for cylindrical tools
- Tactile measurement system to position the tools fully automatically
- Fully automatic thermal profile compensation for the linear axes
New benchmarks for tool design in PCD tools
with HELITRONIC TOOL STUDIO

“What you see is what you grind” – This is the motto for grinding with the HELITRONIC TOOL STUDIO. If one would like to describe the advantages of Licence Erosion in a single sentence, then the best choice would be: “What you can grind, you can also erode”. Thanks to the wizard technology, the operator needs only a few mouse clicks for the production of a perfect PCD tool: Design, programming, simulation and production.
FINE PULSE TECHNOLOGY
New standard – new benchmark

- Greatly improved surface quality
- Perfect blade edge quality
- High process reliability even with difficult-to-erode PCD
- Maximum flexibility with different types of tools
- Short machining times
- Latest state-of-the-art technology
- Optimisation possibilities with all generator codes
- Savings potential in the production chain of PCD tools

FINE PULSE TECHNOLOGY –
Visible improvement with the naked eye

The new “FINE PULSE TECHNOLOGY” eroding concept sets new standards in terms of the surface quality, cutting edge roughness and process reliability of PCD tools. The basis for this is the new liquid-cooled generator with an increased pulsation frequency. It is now standard-installed in all “Two-in-one” eroding and grinding machines from WALTER.

The difference to the other tools on the market can even be seen with the naked eye on the most common PCD types with 10 µm grain size. A tool produced with “FINE PULSE TECHNOLOGY” on a WALTER eroding machine shines on its free surface, similar to a polished (ground) tool.
Global standard of control technology

- Multi-processor system – high system security
- FANUC bus for digital drives – fault-free communication
- CNC and robots from a single manufacturer – no interface problems
- 19-inch touchscreen as standard

With the FANUC control unit, WALTER relies on the global standard of control technology. For the user, this means the highest degree of reliability, availability and operating comfort.

WALTER, famous for tool machining, and FANUC, the No. 1 in CNC control units, together make an unbeatable team.
Customer Care

WALTER and EWAG deliver systems and solutions worldwide for all areas of tool machining. Our claim is based on ensuring maximum availability of our machines over their entire service life. For this we have thus bundled numerous services in our customer care program.

From "Start up" through "Prevention" to "Retrofit", our customers enjoy tailor made services for their particular machine configuration. Around the world, our customers can use helplines, which can generally solve a problem using remote service. In addition to that, you will also find a competent service team in your vicinity around the world. For our customers, this means:

- Our team is close by and can quickly be with you.
- Our team will support you to improve your productivity.
- Our team works quickly, focuses on the problem and its work is transparent.
- Our team solves every problem in the field of machining tools, in an innovative and sustainable manner.
Technical data, dimensions

Mechanical axes

<table>
<thead>
<tr>
<th>Axis</th>
<th>Dimension (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X axis</td>
<td>650 mm</td>
</tr>
<tr>
<td>Y axis</td>
<td>350 mm</td>
</tr>
<tr>
<td>Z axis</td>
<td>720 mm</td>
</tr>
<tr>
<td>C axis</td>
<td>± 200°</td>
</tr>
<tr>
<td>A axis</td>
<td>∞</td>
</tr>
</tbody>
</table>

Rapid traverse speed X, Y, Z: max. 15 m/min

Linear resolution: 0.0001 mm
Radial resolution: 0.0001°

Grinding spindle drive

Max. grinding wheel diameter: 254 mm
Grinding spindle speed: 0 – 10,500 rpm

<table>
<thead>
<tr>
<th>HELITRONIC POWER DIAMOND 400 with motor spindle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spindle ends: 1</td>
</tr>
</tbody>
</table>

Tool data

<table>
<thead>
<tr>
<th>Tool</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. tool diameter</td>
<td>3 mm</td>
</tr>
<tr>
<td>Max. tool diameter</td>
<td>315 mm</td>
</tr>
<tr>
<td>Max. workpiece length, peripheral grinding</td>
<td>520 mm</td>
</tr>
<tr>
<td>Max. workpiece length, end face grinding</td>
<td>380 mm</td>
</tr>
<tr>
<td>Max. workpiece weight</td>
<td>50 kg</td>
</tr>
</tbody>
</table>

Options

Coolant system

On request – several types are possible

Loading systems

Top loader, Robot loader, Robot loader 25

Others

Frequency-controlled pump: 80 – 120 l/min at 7 – 20 bar, torque motor A-axis 750 rpm, torque motor C-axis, glass scales, automation upper plate, software, automatic grinding wheel measurement, automatic electrical measurement of the machine reference, etc.

Tool data ¹)

Min. tool diameter: 3 mm
Max. tool diameter: 315 mm
Max. workpiece length, peripheral grinding: 520 mm
Max. workpiece length, end face grinding: 380 mm
Max. workpiece weight: 50 kg

Options

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¹) The maximum tool dimensions depend on the type of tool and its geometry, as well as the type of machining.

²) Starting from the theoretical taper diameter of the tool carrier.

Dimensions in mm, subject to modifications due to technical progress and errors. No guarantee is provided for this information.
Creating Tool Performance

WALTER and EWAG are globally acting market-oriented technology and service companies, and are system and solution partners for all areas of tool machining. Our range of services is the basis for innovative machining solutions for practically all tool types and materials typical for the market with a high degree of added value in terms of quality, precision, durability and productivity.

Grinding – Grinding of rotationally symmetrical tools and workpieces

<table>
<thead>
<tr>
<th>WALTER machines</th>
<th>Use</th>
<th>Materials</th>
<th>Tool dimensions ¹ max. length / diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELITRONIC ESSENTIAL</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>255 mm / Ø1 – 100 mm</td>
</tr>
<tr>
<td>HELITRONIC MINI POWER</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>255 mm / Ø1 – 100 mm</td>
</tr>
<tr>
<td>HELITRONIC MINI AUTOMATION</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>255 mm / Ø1 – 100 mm</td>
</tr>
<tr>
<td>HELITRONIC RAPTOR</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>280 mm / Ø3 – 320 mm</td>
</tr>
<tr>
<td>HELITRONIC POWER 400</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>520 mm / Ø3 – 315 mm</td>
</tr>
<tr>
<td>HELITRONIC VISION 400 L</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>420 mm / Ø3 – 315 mm</td>
</tr>
<tr>
<td>HELITRONIC VISION 700 L</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>700 mm / Ø3 – 200 mm</td>
</tr>
<tr>
<td>HELITRONIC MICRO</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>120 mm / Ø0.1 – 12.7 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EWAG machines</th>
<th>Use</th>
<th>Materials</th>
<th>Tool dimensions ¹ max. length / diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWAMATIC LINEAR</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>200 mm / Ø0.2 – 200 mm</td>
</tr>
<tr>
<td>PROFILE LINE</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>255 mm / Ø1 – 100 mm</td>
</tr>
<tr>
<td>RS 15</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>– / up to Ø25 mm</td>
</tr>
</tbody>
</table>

Grinding – Grinding of indexable inserts

<table>
<thead>
<tr>
<th>EWAG machines</th>
<th>Use</th>
<th>Materials</th>
<th>Indexable inserts ² inscribed / circumscribed circle</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWAMATIC LINEAR</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>Ø3 mm / Ø50 mm</td>
</tr>
<tr>
<td>PROFILE LINE</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>Ø3 mm / Ø60 mm</td>
</tr>
<tr>
<td>COMPACT LINE</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>Ø3 mm / Ø50 mm</td>
</tr>
<tr>
<td>INSERT LINE</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>Ø3 mm / Ø75 mm</td>
</tr>
<tr>
<td>RS 15</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>– / up to Ø25 mm</td>
</tr>
</tbody>
</table>

Eroding – Electrical discharge machining and grinding of rotationally symmetrical tools

<table>
<thead>
<tr>
<th>WALTER machines</th>
<th>Use</th>
<th>Materials</th>
<th>Tool dimensions ¹ max. length / diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELITRONIC DIAMOND EVOLUTION</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>185/255 mm / Ø1 – 165 mm</td>
</tr>
<tr>
<td>HELITRONIC RAPTOR DIAMOND</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>270 mm / Ø3 – 400 mm</td>
</tr>
<tr>
<td>HELITRONIC POWER DIAMOND 400</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>520 mm / Ø3 – 380 mm</td>
</tr>
<tr>
<td>HELITRONIC VISION DIAMOND 400 L</td>
<td>F  E</td>
<td>HSS TC CC CBN</td>
<td>420 mm / Ø3 – 315 mm</td>
</tr>
</tbody>
</table>

Laser – Laser machining of indexable inserts and/or rotationally symmetrical tools

<table>
<thead>
<tr>
<th>EWAG machines</th>
<th>Use</th>
<th>Materials</th>
<th>Tool dimensions ¹ max. length / diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>LASER LINE ULTRA</td>
<td>F  E</td>
<td>HSS PCD CVD-D</td>
<td>250 mm / Ø0.1 – 200 mm</td>
</tr>
<tr>
<td>LASER LINE PRECISION</td>
<td>F  E</td>
<td>HSS PCD CVD-D MCD/ND</td>
<td>250 mm / Ø0.1 – 200 mm</td>
</tr>
<tr>
<td>LASER LINE ULTRA</td>
<td>F  E</td>
<td>HSS PCD CVD-D</td>
<td>Ø3 mm / Ø50 mm</td>
</tr>
<tr>
<td>LASER LINE PRECISION</td>
<td>F  E</td>
<td>HSS PCD CVD-D MCD/ND</td>
<td>Ø3 mm / Ø50 mm</td>
</tr>
</tbody>
</table>

Measuring – Contactless measurement of tools, workpieces and grinding wheels

<table>
<thead>
<tr>
<th>WALTER machines</th>
<th>Use</th>
<th>E1-Value</th>
<th>Tool dimensions ¹ max. length / diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELICHECK ADVANCED</td>
<td>M</td>
<td>(1.8 + L/300) µm</td>
<td>420 mm / Ø1 – 320 mm</td>
</tr>
<tr>
<td>HELICHECK PRO</td>
<td>M</td>
<td>(1.2 resp. 1.4 + L/300) µm</td>
<td>300 mm / Ø1 – 200 mm</td>
</tr>
<tr>
<td>HELICHECK PRO LONG</td>
<td>M</td>
<td>(1.2 resp. 1.4 + L/300) µm</td>
<td>730 mm / Ø1 – 200 mm</td>
</tr>
<tr>
<td>HELICHECK PLUS</td>
<td>M</td>
<td>(1.2 resp. 1.4 + L/300) µm</td>
<td>300 mm / Ø1 – 200 mm</td>
</tr>
<tr>
<td>HELICHECK PLUS LONG</td>
<td>M</td>
<td>(1.2 resp. 1.4 + L/300) µm</td>
<td>730 mm / Ø1 – 200 mm</td>
</tr>
<tr>
<td>HELICHECK 3D</td>
<td>M</td>
<td>(1.8 + L/300) µm</td>
<td>420 mm / Ø3 – 80 mm</td>
</tr>
<tr>
<td>HELISET PLUS</td>
<td>M</td>
<td>-</td>
<td>400 mm / Ø1 – 350 mm</td>
</tr>
<tr>
<td>HELISET</td>
<td>M</td>
<td>-</td>
<td>400 mm / Ø1 – 350 mm</td>
</tr>
</tbody>
</table>

Use: ₁ Production ₂ Re grinding ₃ Measuring
Materials: ₄ HSS High speed steel ₅ TC Tungsten carbide ₆ CC Cermets/ceramics ₇ CBN Cubic boron nitride ₈ TCD Polycrystalline diamond ₉ CVD Chemical vapour deposition ₁₀ C/C Cermet/ceramics

¹ Maximum tool dimensions are dependent on the tool type and geometry, as well as the type of machining.
² From the theoretical taper diameter of the workpiece holder.