

# Maximum transparency when honing

## Machine controller for honing with convenient graphic support

Honing with micrometre accuracy – that's what KADIA Produktion GmbH does. The Nürtingen-based company therefore equips its honing machines with components that represent everything that is technically feasible when it comes to precision and performance. In addition to the honing spindles with linear drives, high-precision measurement technology and reliable automation systems, this also includes the flexible machine controller HMC100.

Honing is a complex machining operation, with almost always two or more processes in succession, from pre-honing to finish-honing. The individual removal of material is monitored by measurements, sometimes to a tenth of a micrometre. This is a challenge for the machine controller. It must be able to map all honing procedures and individual processes. An optimised honing controller specifically designed for this purpose has for a long time not been available on the market.

Machine manufacturers usually resorted or do still resort to a standard solution with the corresponding adaptations. An unsatisfactory situation, especially if, as at KADIA, the focus is on high-precision honing. Specialists at Nürtingen therefore



The HMC100 control panel that has received the IF and Red Dot Design Awards, offers an oil-resistant and scratch-resistant 19" touchscreen. Numerical input is via a pop-up keypad



Operating the honing machine

decided to develop a controller themselves: the HMC100 (Honing Machine Control 100).

"Above all, we wanted a Human Machine Interface (HMI) that optimally presents the manifold processes during honing," says Henning Klein, managing director at KADIA, "All machine functions and all current working states and process qualities should be shown graphically. In short, we wanted a controller that offers the best possible transparency and ease of operation."

The hardware should also meet this requirement. The controller design engineers therefore opted for a control panel with a 19" touchscreen, a handy size for graphic presentations. In addition to this, the panel is suitable for all industrial purposes, i.e. oil-resistant, scratch-resistant and can be used while wearing gloves. Inside, there is also a powerful Intel-Core-i5 processor and a reliable SSD hard drive. The number of push buttons for external components was deliberately limited to the essential functions. The panel therefore looks tidy and user-friendly. Texts and numerical values can be entered via a pop-up keypad.

### Graphics show more than columns of figures

The software relays all that is happening on the machine onto the screen via self-explanatory symbols. KADIA experts

developed a unique picture language here. Machine operators, tool setters and service engineers played their part too. User navigation was also important to them and nested navigation structures and long click sequences were also avoided.

The operation of the machine essentially focuses on two levels. "The HMC100 is a key element of our Smart Dynamic honing technology. The motto of this concept is 'less complexity, more efficiency'," says Henning Klein. "The HMC100 implements this consistently by offering an intuitive operation of the machine. In doing so, we believe that we've set a new standard." Even the less experienced operator can get to know his system more quickly, and operating errors are reduced to a minimum. As a result, there are less machine downtimes, thus greater efficiency.

Independent experts confirm that the HMC100 has successfully created a coherent interface between man and machine. The control panel was awarded two of the most important design prizes: the IF Design Award and the Red Dot Design Award. Both awards go way beyond the optical aspects. They also rate the ergonomics, innovation content and benefits of a technical product.

According to KADIA, roughly a hundred of these high-end controllers are now being used around the world. "As the

requirements of our users continue to increase, we will also continue to enhance the range of functions of the HMC100," emphasises Henning Klein.

Two interesting functional extensions were added last year: a statistics module and a scan function for the entire bore. The statistics module provides the database for process analyses, in order to for instance promote continuous improvement processes (CIP). The module for example records the diameter values of several hundred workpieces on a control card. A histogram renders a numerical and graphical overview on the frequency distribution. The operator can then run a statistical process control. Any weak points in the process are immediately obvious.

### New standards for quality assurance

The scan function for bores lifts quality assurance to an unprecedented level. With the pneumatic gauge probe, it is possible to record a multitude of diameter values per measuring path so that the controller can then display a continuous measurement value chart. By way of comparison, according to the previous standard, it is standard practice to use three to five



E line Eco honing machine with the HMC100. KADIA now supplies every honing machine with the high-end controller

gauging levels. "Scanning the entire bore achieves a significantly higher level of reliability of the measurement. This is a world first, of which we are particularly proud," summarises Henning Klein."

### A specialist in honing and deburring for more than 50 years

KADIA Produktion GmbH + Co develops

and manufactures honing and deburring machines and tools.

The cornerstone of the successful company history of KADIA GmbH + Co. was laid in the founding year, 1959. KADIA started its business by manufacturing honing tools.

It wasn't long until in 1969 the first honing machine was developed at KADIA and the company started to expand. In 1981, the company then manufactured the first deburring machine.

Contract manufacturing has also been added to the portfolio. The company focuses on bores within the size range of 1 to approximately 60 mm. The main customers are from the automotive supplier industry, hydraulics industry, aviation and aerospace, tooling and machine construction. A central product area are honing solutions for injection systems for gasoline and diesel engines.

**KADIA Produktion GmbH + Co**

**Tel: 0049 7022 60060**

**Email: [henning.klein@kadia.de](mailto:henning.klein@kadia.de)**

**[www.kadia.de](http://www.kadia.de)**

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