

PASO

Paso Made in German อีก Brand หนึ่งที่ สยาม เอลมาเทค เป็นตัวแทนจำหน่าย Paso เป็น High Speed milling machine เหมาะสำหรับงานที่ต้องการความละเอียด ความเที่ยงตรง ถูกต้องแม่นยำ และคุณภาพผิวงานบนงานที่ต้องการการกัดแบบ High Speed Milling Application จริงมีรอบสูงสุดให้เล็กลงถึง 100000 รอบต่อนาที

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Innovations and Know-How made in Germany

Over the past 21 years Paso Präzisionsmaschinenbau GmbH with its qualified employees has developed more than 30 types of machines successfully placing itself in the international market.

With "Unique" we are introducing a new product line this year. The "Unique" product line offers state of the art technology, combined with new in-house innovations from PASO, to our customers.

The founder-owned and managed company has continuously met market-demands in the ultra-precision-machining, micro-technology and other high-end markets. Paso's philosophy is to be flexible, offering "tailor-made" products, rather than off-the-shelf.

We are able to respond to any special application our customers have in mind, by customizing the machines according to their specific requirements. In particular, work areas from 300 x 300 mm up to 1500 x 3000 mm are possible, offering full flexibility on size constraints.

Our customer focused approach has allowed us to penetrate not only the demanding European market: PASO machines are put to work at top manufacturers in India, Iran, Israel, Thailand, South-Korea, Australia and South-Africa.

With exports generating over 50% of our sales, PASO is one of the world leaders in the manufacturing of high quality CNC machines.

Most notably, PASO has supplied machines to some of Europe's most important companies. References include: Airbus, Daimler, VW, Thyssen, Scania, Schneider-Elevisson and the German Aerospace Center, as well as Mitzelgastriebe (a Eurocopter unit).

The structures needed for micro-technology and ultra-precision-machining cannot be produced profitably by common machines anymore. PASO focuses on high-precision axis-systems, the highest machine-stiffness and infinitesimally small vibration.

Through accuracy of the controllers employed and the CNC-Control-Unit-dependent resolution (pico-interpolation) machining with an absolute precision of $\leq 0.2\mu\text{m}$ and re-run-precision of $\leq 0.4\mu\text{m}$ is possible.

Components crucial to achieve these demanding requirements are manufactured within our own production facility to ensure precision is met on time, every time.

Our in-house production philosophy and continued quality inspection guarantee the highest precision for years of uninterrupted use.

Outstanding items like controllers, spindles, etc. are manufactured in cooperation with first-class renowned German companies – ensuring highest quality from the ground up.

Many clients have multiple PASO-machines in use – proof indeed of the machine's high reliability. Furthermore the company's on-site service department assures the very best support.

Innovations and development in the last years:

MICRO-SERIES

- The Micro series is basically a very compact 3-up to 7-axis-machine with fixed working-space and special provisions for working with highly abrasive material like graphite, ceramic and zircon.
- With a 300 x 300 x 300mm working-space and a size of 800 x 1405 x 1900mm it can be transported through any door.
- The Micro-series is based on a variable-purpose concept, apt for special customer modifications.

- This series finds broad application like instance micro-cutting, watch-, jewelry-industries and dental technology.
- Without difficulty the series can be deployed for milling, Micro-engraving or electrodes into copper or graphite.

- In this configuration level the Micro decreed above
 - 3 linear axes
 - 2 axes in the revolving dovetail head
 - 1 axis for moving the work piece
 - 1 axis for open and close the jaw-chuck

PORTA LINEAR

- Conventional drive technology, using a rotating motor and mechanical transmission element, is of limited capability when requested to operate in high precision and position accuracy while keeping dynamic in its applications
- By docking the motor directly to the load any kind of mechanical transmission element can be omitted
- This concept has been carried out in the Porta series

- Due to the engaged linear motor technology work areas > 2000mm are possible

Air conditioning of machine interior:
New Paths to Accurate and Stable Manufacturing with Air Conditioning

Market requirements with regard to precision in milling operations increase from year to year. Whether it's in tool and mould making, micro-machining or medical technology, tolerances are getting increasingly tighter. The demands made on machine technology are therefore also more complex and costly. High-precision drive and control technology in conjunction with precision guides are certainly the basis for precision manufacturing but regrettably they are not always the perfect solution.

All users are aware of the issue of temperature drift on processing machines in their day-to-day work, especially with the precision manufacturing of parts with a tight tolerance and this is often a problem that is very difficult to solve.

There are many approaches both inside and outside the machine to control this temperature fluctuation. For example, machines for precision manufacturing are installed in air-conditioned rooms or temperature tables in the control system compensate for geometric shifts. Some claim to achieve a stable temperature through the use of appropriate base materials, such as granite, and are therefore resistant to fluctuations in the ambient temperature. It is often forgotten that the axes guide systems and their power trains are still made of steel and freely fixed to the base. Due to the unavoidable expansion / contraction of these steel parts, high and low or traversing movements may occur, rather than stable positioning. A costly and time-consuming alternative lies in stabilizing the ambient conditions. Usually, however, this approach does not account for the heat sources within the machine. There exist approaches and solutions which partially provide these heat sources (such as milling spindles, driven nuts, etc.) with cooling systems at various points, but fail to control all heat sources.

PASO is taking the opposite approach with its latest development. The machine itself is air-conditioned so there is no need for the machine environment to be air-conditioned or empirically determined compensation tables to offset the shifts. The basis for this is a climate system with a heating and cooling function that is integrated into the machine.

The entire machine body and working area are maintained at a constant temperature using sophisticated air and cooling channels. It's not just during the day that an increase in temperature is eliminated but the machine also remains at a constant temperature over night and on weekends, even if the room temperature drops. A static shift in the machine geometry as the greatest unknown factor is therefore ruled out and the machine requires no time-consuming warm-up phases.

Initial experiences with the HSC1250, most notably under heavily fluctuating ambient temperatures, demonstrate the accuracy of this approach and another example of the fact that PASO has paid attention to the demands of the market for many years and reacts to its requirements with innovative solutions. This once again underlines PASO's achievement potential and focus on its customers since its inception: we supply our customers with project-based solutions rather than an off-the-peg standard machine.

ROLLING MILL
For processing and manufacture of embossing rollers, rotary and cylinder stamping etc.

Current version:

- roller total length: max. 1500mm
- working area: 1300 mm
- roller diameter: max. 300 mm
- weight of workpieces: max. 400 kg
- other work areas on request

- 10-times tool changing system with integrated tool length sensor
- milling spindle with tool holder up to HSK 40 (tool diameter up to 16mm)
- top- and front-loading
- dimensions: 3200 x 1460 x 2330 mm (width/depth/height)
- weight: approx. 5500 kg
- all technically realizable options are possible

PROFUSED DOO

At this machine we implement special customer requirements:

- compact HSC-machine
- work area: 800 x 600 x 300mm
- Linear-motor-technology
- special solutions for wet processing
- chip disposal integrated in under frame
- 30-position frame ATC (slide in)

UNIQUE:

The Unique product line offers state of the art technology, combined with new in-house innovations from Paso to our customers.

- work area: 800 x 600 x 200mm
- complete closed under frame filled with mineral casting
- linear-motor-technology
- inside air conditioned
- special vacuum system, inside cooled
- Camera system for automatic optic finding of the reference marks (zero points)
- Laser tool measurement
- 3D probe
- linear encoder

More information under: www.paso-maschinenbau.com

