THE STANDARD IN T OP PERFORMANCE

The new compact LM 2000 machine platform expands the innovative Bihler machine pool by introducing a high-performance system for small to large batch sizes. It is fully compatible with modular linear tools and stands out for its ease of access, simple operation and optimized maintenance.

At EuroBLECH 2022, Otto Bihler Maschinenfabrik will be presenting the new LM 2000 machine platform live for the first time. This platform is used to manufacture stamped and bended parts from strip material using linear tool technology and also supports the integration of further operating processes. It is equipped as standard with a feeder module, press module and central mandrel module that have been designed for all speed ranges. The LM 2000 platform is electrically pre-installed for maximum occupancy and for easy subsequent installation of further bending modules and central mandrels. Two variants of the LM 2000 are available: the LM 2000-KT and LM 2000-NC. These differ in the modules used for bending in the linear area. A bending module equipped with cam technology (LM 2000-KT) is used for the production of medium-sized to large batches. A bending module based on spindle technology (the LM 2000-NC variant) is used to manufacture small to medium-sized runs in order to permit the shortest possible setup times. All the modules (feeder, press, central mandrel, bending) are servo controlled.

Important role The LM 2000 plays a new and important role in Bihler's standardized machine concept because, in the same way as the NC variant, the Bihler LM 2000-KT is fully compatible with uniformly designed bending tool modules – for example, LEANTOOL Linear, parts taken from LEANTOOL Linear or or with compatible tool solutions of the user. It is also possible to use cutting tools from the Meusburger standard modular system. This means that every system can be operated using simplified and highly standardized tools. This in turn ensures shorter times to market, increased cost-efficiency and faster production. But above all, the Bihler LM 2000-KT and -NC offer greater flexibility in component production. This is because all the stamping and bending tools are compatible without any adaptations and can be ported between various Bihler systems: Bihler GRM-NC, Bihler LM 2000-NC, Bihler LM 2000-KT and Bihler BIMERIC Modular. The tools can be used throughout the entire product lifecycle, meaning that the most suitable production system can be chosen as the batch sizes increase or decrease and value-added grows.

Maximum performance The Bihler LM 2000-KT is ideal for medium and large batch sizes with few variants. It controls the movements of the tools with one cam disk each, achieving cycle rates of up to 500 rpm. At these speeds, smooth running and stability are crucial. This is why the Bihler LM 2000-KT has a solid, robust machine bed. It effectively absorbs vibrations, which also has a positive impact on the service life of the tools and the productivity of the system. The system also has a particularly simple structure. This makes the machine easier to understand and operate. What is more, the developers of the Bihler LM 2000-KT placed particular emphasis on energy efficiency and reducing CO_2 emissions.

Standardized modules The compact machine body comprises the feeder module, the central mandrel module, the press module and five module positions in the bending area, each with movement from above, below and the third plane. Other standardized modules that can be fitted at the module locations for operating processes such as contact welding, thread cutting and assembly are under development. For technical reasons, the retooling time for the cam-driven Bihler LM 2000-KT is longer than for the servo-driven NC variant, but it is possible to switch out six cams within 90 minutes. A convenient quick-change system for the cams was therefore developed to achieve this. The Bihler LM 2000-KT will be available from the beginning of 2023. ●

THE NEW BIHLER LM 2000 PLATFORM

Highly standardized machine platform for the production of stamped and bended parts from strip material using linear tool technology and cycle rates up to 500 rpm.

1 LM 2000 platform

- machining length of 2,000 mm for punching, bending, stamping and other processes
- machine body with integrated electrics and control system
- press, central mandrel and material feed designed for all speed ranges
- pre-installed electrics for subsequent expansion of machining components in the linear area
- can be expanded with additional processing modules for contact welding, thread cutting and screw insertion for further added value
- electrically pre-installed for maximum occupancy, for easy subsequent installation of further bending modules and central mandrels.

2 LM 2000-KT slide unit

- designed for a maximum speed of 500 rpm.
- runs using a positive control cam
- manual quick-lift function for reaching the setup/ maintenance position without changing the cam
- newly designed rapid change system for easy and convenient replacement of the cam
- overload sensor system and recirculating oil lubrication as standard for maximum service life
- sealed, fully encapsulated housing for greater cleanliness in the tool area

2 LM 2000-NC slide unit

- designed for a maximum speed of 250 rpm.
- operated using spindle technology
- continuous stroke and stroke position adjustment
- machine setup at the touch of a button, resulting in very short setup times
- sealed, fully encapsulated housing for greater cleanliness in the tool area

3 Central mandrel

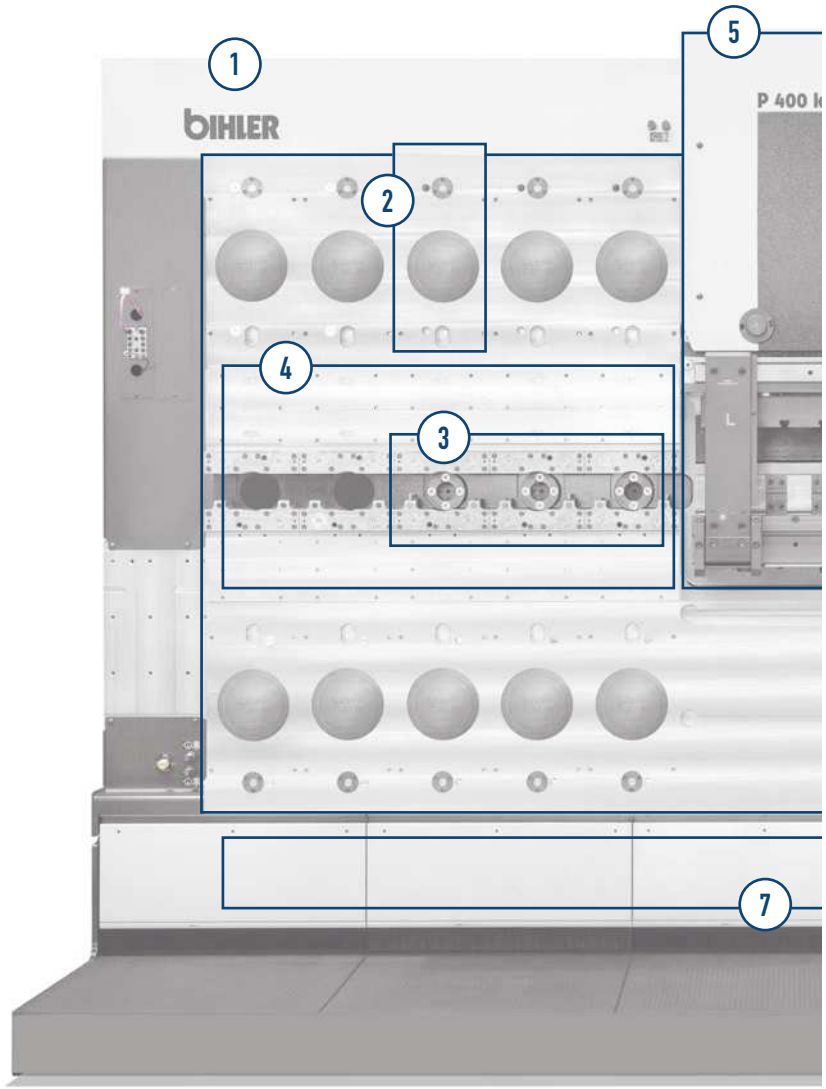
- servo-driven central mandrel, designed for all speed ranges
- integrated manual positioning system to move the central mandrel to any of the five mandrel positions quickly and accurately
- up to five central mandrels can be easily retrofitted

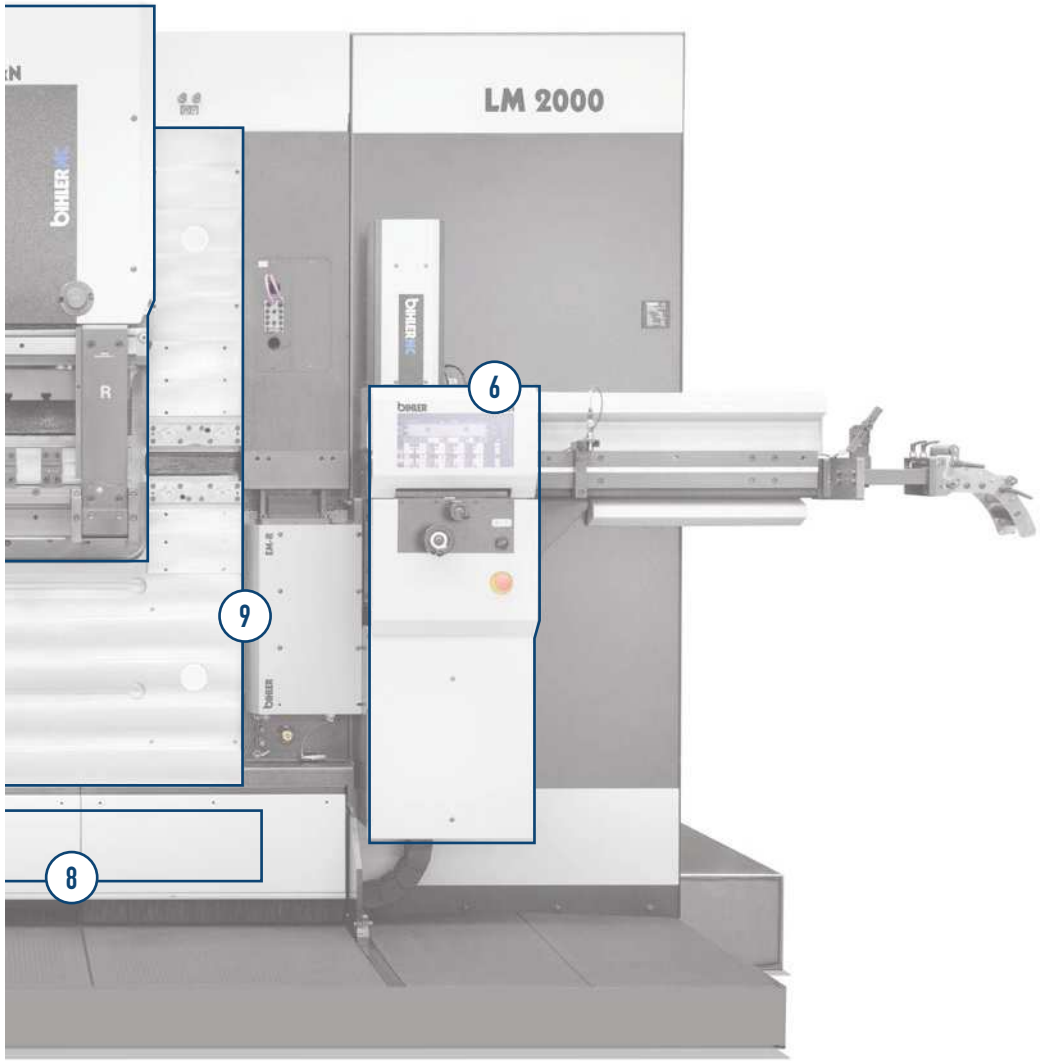
4 Linear area

- five module positions in the linear area, each with up to three independent movements from top, bottom and third plane
- standardized interfaces and zero-point clamping system with hydraulic clamping functions for fast and secure positioning and clamping of the tool modules
- stamping and bending tools fully compatible with machine types from the new, modular product line

5 Press module

- eccentric press with 400 kN nominal press force and 16 mm fixed stroke
- manual stroke position adjustment with digital travel measuring system and controller connection to compensate for tool wear and manufacturing tolerances
- integrated press force monitoring with overload protection, bearing temperature monitoring and connection to recirculating oil lubrication system
- press installation space compatible with Meusburger SBP 400 and SBH 400 die sets





6 Feeder module

- RZV 2.1 servo radial gripper feed for highly dynamic, slip-free feeding and positioning of the strip material
- designed for all speed ranges
- with adaptable components such as strip guards, strip oiler, straightener, standardized strip guide blanks

7 Recirculating oil lubrication

- freely accessible recirculating oil lubrication to lubricate and cool all processing components
- electronic monitoring of oil temperature, filling level and contamination
- temperature-controlled cooling of the lubricant and flow-dependent monitoring of each individual lubrication point
- considerable oil savings and cost reduction thanks to filtering, cleaning and preparation of the lubricant

8 Central lubrication system

- freely accessible central lubrication system for tool and application fitted as standard
- two differently timed and independently programmable lubrication circuits, e.g. for bending area and press
- with electronic lubrication pressure monitoring

9 Maintenance

- freely accessible machine elements, electrical components and connection elements
- all components clearly structured
- rapid maintenance, reduced machine downtimes and increased machine availability

10 VariControl VC 1

- VC 1 machine controller (version 2.0) for controlling, regulating and monitoring all machine and process functions
- with freely programmable digital and analog I/O bus modules integrated on the machine side
- clearly structured, very easily operated control interface
- tailored menu interfaces for the machine, process and tool areas
- clear display of machine statuses, functional areas (e.g. process module, feed mechanism and tool clamping) and production overview

11 OPC UA interface

- OPC UA interface integrated as standard
- for transferring machine statuses to the Bihler Analysis Tool or to MES or EAP systems
- acts as interface and basis for IoT, M2M and Industry 4.0.

12 Condition monitoring

- all parameters and system statuses are measured, evaluated and monitored in real time
- allows evaluation of the machine status and individual components
- notification via machine controller if thresholds are exceeded

THE BIHLER LM 2000-NC

The Bihler LM 2000-NC sets new standards in the Bihler portfolio for flexible production with frequent tool changes. But it is also ideal for developing tools and processes and opens up new manufacturing benefits for users of traditional linear tool technology.

The new servo-controlled Bihler LM 2000-NC is ideal for developing tools and processes as well as for producing small to medium batch sizes.

The Bihler LM 2000-NC is the servo-controlled counterpart to the cam-controlled LM 2000-KT. This machine also fits perfectly into Bihler's standardized machine park strategy and is compatible with all uniformly produced linear tools. This means, for example, that a newly developed tool, initially designed to run on the Bihler GRM-NC to produce samples and smaller batch sizes, can be moved to the Bihler LM 2000-NC without any difficulty. This is ideal for batch sizes that require frequent tool changes, as the Bihler LM 2000-NC allows extremely fast retooling.
Its versatile bending modules with spindle technology and the controller offer a particularly wide range of options for fine-tuning of the travel profiles to generate the perfect sequence of movements. In contrast to the cam-driven machine, this can be done within a few minutes at the push of a button on the Bihler LM 2000-NC. Consequently, the Bihler LM 2000-NC is also ideal for developing tools and processes and/or for producing small to medium batch sizes. The tool can subsequently be mounted on the Bihler LM 2000-KT if larger batch sizes are to be manufactured or on the BIMERIC Modular if additional value-added processes are required. The system combines this high degree of flexibility with a production output of up to 250 strokes per minute. But the future may see even higher performance figures thanks to the ongoing development of the controller and software technology.

Robust and compact Like the KT variant, the Bihler LM 2000-NC has a particularly robust and simple design, reduced to the essential functions. The machine body is designed to be compact and space-saving. The side-operated standalone system does not require an additional control cabinet, because the electrical hardware, the drive elements and the VC 1 control system are already integrated in the machine. Unlike the Bihler GRM-NC, the Bihler LM 2000-NC only supports linear operation, and not radial operation. However, although the two systems are the same size, the LM 2000-NC possesses more module positions.

New manufacturing benefits The standardized tools, the linear production principle and the fact that the carrier strip does not have to be lifted out also make the Bihler LM 2000 platform interesting for customers who are already using traditional linear tool technology - and produce a relatively large amount of waste material, for example in the form of stamping strips. The Bihler LM 2000-KT or -NC, on the other hand, only require one stamping strip and can thus achieve material savings of up to 30 percent. Bihler's standardized portfolio of solutions, which are fully compatible with each other and are available from a single source, thus opens up new, unique manufacturing benefits even for users who previously relied on classic linear tool technology. ●