MIKRON VCE Pro Series

MIKRON VCE Pro series machining centers - more robust, more reliable, more efficient and more ergonomic.
MIKRON VCE Pro-X Series

MIKRON VCE Pro-X series MIKRON VCE Pro-X - ideal machines for increased machining demand. 16,000 min⁻¹ inline spindle, fast feeds and direct measuring systems.
Applications

Wide range of parts...

There is no limit to the possible applications of the MIKRON VCE Pro and MIKRON VCE Pro-X machines. Here is a die forming application that uses a ball end mill for finishing. Due to the high speed of the MIKRON VCE Pro-X spindle of 16,000 min⁻¹, the required cutting speeds can be achieved even with small tools.
The MIKRON VCE Pro is versatile for all work orders

**Highlights MIKRON VCE Pro**

- Compact construction
- Optional linear measuring scales
- Almost all options can be retrofitted
- Ethernet and USB interface included
- Optional mobile or stationary hand wheel

- Double arm gripper for fast tool change times
- Tool magazine outside the work area
- The machining process can be viewed from 3 sides
- Cooling through the tool up to 42 bar
- Working area lighting from two sides
- Operating condition display
- User-friendly Heidenhain control system with smarT.NC

- Side chip washing as standard (MIKRON VCE 600 to 1400 Pro)
- The coolant tank can be rolled out from under the machine for cleaning
- Integrated band filter without additional space requirements (Optional)
- Compressed air connection for zero point clamping systems

**Further highlights**
- Compact construction
- Optional linear measuring scales
- Almost all options can be retrofitted
- Ethernet and USB interface included
- Optional mobile or stationary hand wheel
The MIKRON VCE Pro series:
It encompasses a large program of
tried and tested and exceptionally re-
liable vertical machining centers.
From this series you can select the
right size of machine and the equip-
ment individually suited to you in
order to attain high machining perfor-
mannces under economic conditions.
Your workpiece dimensions determine
the type of MIKRON VCE Pro machine.

A complete program

Clean cabin due to outstanding chip
management
The spiral conveyor automatically
removes the chips. In this way its
load is controlled and if overloading
occurs, an unblocking cycle is started
automatically. Massive telescope
covers made of sheet steel completely
protect the three linear axes from
chips and dirt. The cabin design
prevents chips from piling up.

Belt spindle 6,000 min⁻¹, 10,000 min⁻¹
and 14,000 min⁻¹
The robust belt spindle always has
enough power available for all com-
mon machining jobs. With the ISO 50
version for the MIKRON VCE 1600 Pro
even up to 350 Nm. For drilling,
where the highest performance is
required, the power of modern tools
can be fully exploited. Spindles for
universal machining have 10,000 min⁻¹
as standard or 14,000 min⁻¹ as an
option.
These also offer high torque of 96 to
over 200 Nm. For durability, hybrid
ball bearings are exclusively used.
No compensation chuck is needed for
tapping.

The outstanding feature of Mikron
machining centers is their exceptional
ergonomics. What is impressive about the
MIKRON VCE Pro is its unrivalled acces-
sibility, which is not dependent on the
machine’s configuration.

Side tool changer for still shorter
non-productive time.
The side-mounted tool changer with
integrated double arm gripper
enables still faster tool change times
to be achieved. All tools are optimally
protected since the tool changer is
turned away from the working area.
Furthermore, this construction, which
is free from interfering edges,
enables machining of high parts or
applications on one dividing head.
With its inline spindle, fast feeds and direct measuring systems, the MIKRON VCE Pro-X is the ideal machine for increased machining demand.

For increased machining demand

- High speeds with inline spindle
- Cooling through the tool, 18 bar, as standard
- Double spindle cooling:
  - Spindle head
  - active cooling circuit for the bearing system of the inline spindle

For machining with HSC technology
Optional minimum quantity lubrication with software-supported consumption indicator for process optimization with minimum possible oil consumption. For this purpose, oil mist extraction is recommended.

Central lubrication on all axes guideways and ball screws

Scissor-guided axis covers for best workpiece surfaces for quick feed motions on the X and Y-axes up to 36 m/min

Further highlights
- Heidenhain linear measuring scales as standard on all axes
- Optional tool measurement with lasers or probes

Oil mist extraction (optional)
Block execution times from 3.6 to 0.5 ms

Integrated band filter not requiring additional space (Optional)
MIKRON VCE 800 Pro-X and 1000 Pro-X
Inline spindle
A particular highlight of the MIKRON VCE Pro-X is the inline-motor spindle, developed at great effort and carefully manufactured by the Swiss Step-Tec company. This spindle reaches speeds of up to 16,000 min⁻¹ with a power of 14.75 kW (40% ED). Due to the vector control, no compensation chuck is needed for tapping.

Feed rate of up to 36 m/min [X+Y]
To achieve the high dynamic required in the machining of free-form surfaces, the MIKRON VCE Pro-X has feed motors that enable it to operate at up to 36 m/min in fast feed. This pays off when approaching new milling positions and during tool changes.

Linear measuring scales as standard
Linear measuring scales guarantee unvarying accuracy for machining, even in fluctuating temperatures. To get optimal protection from dirt, they are connected to a compressed air supply.

With linear measuring scales, fast feed rates and high speeds, the MIKRON VCE Pro-X is the best equipped for such free-form surfaces.
Even when making full use of the working ranges, there is still enough space left for the clamping elements.
MIKRON VCE 800 Pro-X:
Spacious working area in which even voluminous workpieces can be machined without any problem.

Effective washing away of the chips
The side-mounted washing device rinses away the chips lying in the cabin wall outlet directly to the chip conveyor.

There are further cleaning options with the available hand wash and compressed air pistols.

Compressed air connection on all tables
Each table is equipped with an air connection for pneumatically operated zero point clamping systems.

Further possible uses due to the 4th axis
The connection of a 4th axis is already set up on the MIKRON VCE Pro in the electric cabinet. Retrofitting of a dividing head is therefore problem-free and possible at any time. It is activated from the control system via parameters. Add-ons are available on a large scale.

For machining medium to large workpieces, the accurate dividing heads of the MIKRON VCE Pro series are the right solution. A small range of reliable products supplements the vertical machining center with the important 4th axis.

- Pneumohydraulic axis clamp with integrated relay valve
- Center heights of 150 mm, 180 mm, 250 mm
- Workpiece weights of up to 1,000 kg
**Machine design**

**Outstanding workpiece quality due to excellent machine design**

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**Lasting quality**

The machine design has a solidity which is a principle throughout the machining center. The generously sized cast iron construction stands out due to its excellent absorption properties with high stability and rigidity, even under full load and in continuous operation. The result is a stable milling process which ensures lasting quality and close workpiece tolerances.

**Strong spindle head**
The widely supported and strongly constructed spindle head enables a high-powered milling / drilling process on the Z-axis. A closed internal coolant system stabilizes and controls the temperature of the spindle head. The active spindle cooling system has an additionally positive effect on the ball bearings, durability and extension of the spindle (option with 6,000 / 10,000 min⁻¹, standard with 14,000 / 16,000 min⁻¹).

**Robust belt spindle**
The generously sized spindle motor enables uninterrupted production both with high torque and low speeds and with high power and high speeds. With a 14,000 spindle, the milling center is equipped for aluminum, non-ferrous metal and fine machining (Optional).

**Precise, dynamic, safe:**
Recirculating ball screw, linear guidance, automatic central lubrication

The pre-stressed and double anchored recirculating ball screw ensures high running precision - an important prerequisite for high workpiece precision. Linear guides, made of hardened steel with ball bearing packs, have the best dynamic properties with little energy expenditure. In operation, the linear guides and recirculating ball screws of the machining center, are automatically provided with the right quantity of lubricant through the central lubrication system.
Spectacular performance with conventional and high-speed milling

**Cooling**

**Programmed predictability**
Time-consuming and imprecise manual adjustments of the coolant supply are a thing of the past. The programmable coolant nozzle automatically directs the jet after each tool change exactly to the point of the operation [Optional].

**Cooling through the spindle, 18 or 42 bar**
The coolant is guided under high pressure through the work spindle directly to the cutting edges. The advantages are higher cutting speeds, problem-free peck drilling, blind hole milling and extended tool lives [Optional]. The supply unit consists of a large mobile coolant tank and can be supplemented with an optionally obtainable band filter. The system has 2 reversible filter cartridges for uninterrupted use in production.

**All-round cooling with spray ring**
Cooling is always ensured with the optional spray ring [Optional].

- Cooled spindle head
- Cleaning of the large coolant tank is facilitated, since it can be pulled out on rollers
- Hand wash pistols and air pistols
- Coolant nozzles and discharge nozzles on the spindle head
Control system

Suitable for the workshop and for all work orders

The Heidenhain control system can quickly be mastered. It has the approval of more than ten thousand operators - not only because of its outstanding performance in 3D contour control, but also due to its unique user-friendliness. The control system has many features that increase efficiency, such as the free contour program, calculator, organization of NC-programs and graphical support during cycles.

Programming made easy with smarT.NC
The alternative operating mode, smarT.NC, makes programming even easier. With the clear form input, the NC program can be generated in lightning-speed. Inputs are of course supported by graphical help images.

This operating panel is comprehensive
What is impressive about the clearly structured Mikron control panel is its overall user-friendliness. Fourteen function keys enable direct access to menu functions straight in front of, below and next to the 15” color TFT display. The height of the revolving panel can be adjusted and its monitor can be tilted to avoid reflections.

Fast contour milling
Contours, which are described as splines by the CAD system, can be directly transferred to the control system. The control system has a spline interpolator, with which third degree polynomials can be executed. For feed adjustment, the control system performs a projection of the geometry. In this way turnarounds are recognized in time and the axes involved can be decelerated or accelerated. The control system mills smooth surfaces with the fastest possible feed and nevertheless keeps the contour dimensionally stable.
Send your programs at the press of a button
The control system is linked to PCs, external programming stations and networks via the Ethernet interface. Furthermore, the operating panel has a USB interface for storage media.

Automatic calculation of the cutting data
The control software automatically calculates the cutting data. The operator just needs to enter tool-specific data in a table and the control system uses these data to calculate default values for spindle speed and feed, which the skilled worker can of course subsequently change and adapt to his empirical values.

Digital drive technology
The digital control circuit for the drive motors produces an outstanding control dynamic. This results in contour accuracy and excellent surface quality.

- Programming in Heidenhain plain language or according to DIN/ISO
- Keyboard with alpha keys, numerical function keys, operating mode keys as well as a separate spindle and feed override potentiometer
- Free contour program from non-NC-compatible dimensioned workpieces
- Graphical support for cycle and contour programming; graphics to test the program and check constant workpiece machining
- Automatic calculation of the cutting data
- Management of 30,000 tools
- Heat exchanger in the electric cabinet cools the power components and the 2 separated cycles prevent outside dust from entering
Around the workpiece

The unusual design of the complete machine enclosure supports the operator in the important preparation of his work. He can also rely on the tried and tested options for workpiece and tool measurement. The MIKRON VCE Pro helps you to deal with the basic things without any problem, so that you can concentrate on what is important.

Outstanding view of the workpiece from 3 sides
The impressive window design of the two sliding doors at the front, as well as the large windows on both sides, allow unrestricted observation of the set-up and machining processes in the all-round closed complete machine enclosure. A further advantage is that the working area can be accessed from the side, and it also features a control panel to operate the tool magazine (Optional).

Efficient job preparation for less non-productive time

Easy crane loading for heavy workpieces
When constructing the cabin, great emphasis was laid on simple and safe crane loading, even with voluminous workpieces. The spacious machining area of every machine version is designed for efficient machining of large and unwieldy parts.
**Simpler set-up with workpiece probe OMP 40-2**
The infrared probe set into the spindle enables efficient set-up, recognition and measurement of the workpiece (Optional). It shortens set-up time considerably.

**Tool measurement with a laser**
When tools with small diameters need to be measured a laser can be used. Also contours of ball end mills can be checked, for example. The unit has an in-built discharge nozzle to remove contamination from the tool before measuring (Optional).

**Safe production with tool probe TS 27**
Accurate tool set-up, safe broken tool monitoring - length and diameter of the tools can be measured precisely with the probe mounted on the working table (Optional).
Options

Machines are geared up for a multitude of options. Consequently, they can be simply and optimally configured.

- TS 27 table touch system
- Tool laser measuring device
- OMP 40-2 preparation touch probe
- OMP 40-2 touch probe
- IKZ basic supply unit 18 bar
- IKZ 18 or 42-bar supply unit
- Band filter unit on coolant tank
- Integrated band filter Series 600 - 1000
- Spray ring
- Programmable coolant nozzle
- Minimum quantity lubrication
- Spray mist extraction system
- Mechanical oil/coolant separator
- Window guards
About GF AgieCharmilles

**Milling**
High-Speed and High-Performance Milling Centers
In terms of cutting speed, HSM centers are 10 times faster than conventional milling machines. Greater accuracy and a better surface finish are also achieved. This means that even tempered materials can be machined to a condition where they are largely ready to use. One essential advantage of HSM is that with systematic integration, the process chain can be significantly shortened. HSM has developed alongside EDM into one of the key technologies in mold and tool making.

**EDM**
Electric Discharge Machines
EDM can be used to machine conductive materials of any hardness (for example steel or titanium) to an accuracy of up to one-thousandth of a millimeter with no mechanical action. By virtue of these properties, EDM is one of the key technologies in mold and tool making. There are two distinct processes – wire-cutting EDM and die-sinking EDM.

**Laser**
Laser ablation
Laser ablation supplements and extends the technologies offered by GF AgieCharmilles. With our laser technology we enable you to produce texturizing, engraving, microstructuring, marking and labeling of 2D geometries right through to complex 3D geometries. Laser ablation, compared to conventional surface treatment using manual etching processes, offers economic, ecological and design advantages.

**Customer Services**
Operations, Machine and Business Support
Customer Services provides with three levels of support all kind of services for GF AgieCharmilles machines.
Operations Support offers the complete range of original wear parts and certified consumables including wires, filters, electrodes, resin and many other materials.
Machine Support contains all services connected with spare parts, technical support and preventive services.
Business Support offers business solutions tailored to the customer’s specific needs.

**Automation**
Tooling, Automation, Software
Tooling for fixing workpieces and tools; automation systems and system software for configuring machine tools and recording and exchanging data with the various system components.
We commit ourselves to a promise. That promise is “Achieve more.” It’s a commitment to create the right conditions for our customers to obtain competitive results. When our customers win, we win.