



**VCP 600/800**  
**UCP 600**

# Mikron - All in one



**A Mikron machining center is an excellent investment. Because you have a right to expect the best solutions from the world's leading specialist in cutting technology. With Mikron you know you are getting the ultimate measure of technology, efficiency, quality, and service available in the market today.**

**Mikron's pioneering role in high-speed machining and spindle technology means that when you buy from Mikron, you are buying into the future.**

**The VCP 600/800, UCP 600 is a perfect example. The intelligent concept of this most compact of all Mikron machining centers is based on a modular system of components, which have all been tested over time and standardized. This guarantees functionality and a high degree of availability. The robust machine base allows you to choose a variety of worktables, motor spindles, control systems and accessories, exactly according to your specifications. Even where space is limited, you can achieve top performance in productivity, accuracy, and long-term reliability.**

# The right choice...

## ...for long-lasting success

In the business of making and selling machining centers, lasting success requires constant observation of the market while always paying attention to customers' needs. This results in developments that are innovative and set new standards for the entire market. Long-term success is guaranteed not by following fashion trends, but by trend-setting, one-of-a-kind product lines.

Known for its innovative spirit, Mikron has set many new standards in recent years:

- HSC technology
- Robot system
- Compact tool changer

As early as eight years ago, Mikron proved that, with the right concept, it is possible to build machine tools of the future. Mikron did just that with the market launch of three standard machining centers, the VCP 600, VCP 800 and UCP 600. A number of unique features set this line of products apart from rest:

- Compactness
- Selection of the spindle speed (including 42,000 RPM)
- Accessibility
- Chip management

The development of the machine has continued over the last few years. Mikron has added other significant features to this extraordinarily successful line of products:

- smart machine: the future is built in

The result is a mature and reliable line of products with satisfied customers around the world. What was true eight years ago still holds true today:

**When our customers buy a VCP 600, VCP 800 or UCP 600, they choose the product that will give them lasting economic success.**



# Precision machining with the VCP 600/800, UCP 600



## Fast

Today's machining technology places great demands on machinery in terms of both speed and accuracy: power is required in addition to stability and compactness. These two features are combined in the VCP 600/800, UCP 600.



## Universal

Whether for small batches or high-volume production, everyone wants a new machine with the highest possible performance, occupying the smallest possible amount of space! This challenge is easily met by the VCP 600/800, UCP 600 machining center.

# Powerful performance



## Compact

Powerful performance requiring no more than 4 m<sup>2</sup> floor space: the cubical, sturdy base ensures maximum stability and comfort.

# Compact performance three times

**The foundation for long-term reliability and accuracy:**

- **solid machine base**
- **digital drive systems**
- **proven components**

**User-friendly and safe**

Ergonomic design, easy handling, good visibility. The two sliding doors at the front and side can be opened wide for good access to the moveable worktable and for easy work-piece loading by crane. Large windows allow unobstructed viewing from three sides.

Easily accessible even in tight spaces.



VCP 600

UCP 600

VCP 800



# Rigid, accurate, dynamic – for a long service life

## Polymer concrete absorbs vibration six times better than cast iron

The cubical, polymer concrete machine base is designed for performance and accuracy in compact size:

- no special foundations are required, immediately operational
- solid construction and inherent rigidity for high acceleration
- ideal distribution of the moments of inertia on the tool and the workpiece leads to long-term reliability
- polymer concrete base with excellent damping characteristics – better surface finish and longer tool life
- thermal stability: absolute accuracy without temperature compensation

## Designed for accuracy throughout

Machine column, X-axis and the 2-axis unit, everything is designed for highly accurate machining:

- interface is screwed onto the top of the column – the mechanical and thermal symmetric design provides additional support
- movement of the worktable, only in the X-axis, guarantees accuracy
- direct measurement system with linear glass scales in all axes
- motor spindle in the compact, two-axis unit integrated in the cross-section area and centered: stable, torsion-proof, no jamming even under heavy machining force



Compact package:  
Tool changer, electronic unit and accessories are integrated, space-saving, well protected and easily accessible.



Hand-held coolant washdown gun for fast cleaning of workpiece

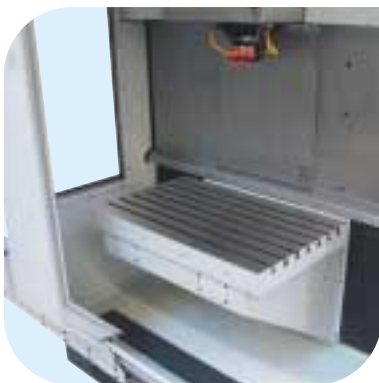


Ball-bearing linear guides with zero backlash and no-leakage, long-term grease lubrication.



Monitoring accuracy:  
laser measurement can be installed.

# Three axes VCP 600/800



## Angle table

3-axis machining "at its best" with the VCP 600 / 800: ideal distribution of the moments of inertia on the workpiece and tool

- easy loading and setup
- generously dimensioned table



## VCP 600

Ultimate accuracy in 3- or 4-axis machining

Two linear movements are performed with the tool, one with the workpiece. The perfectly dimensioned two-axis cross-slide on the machine bed warrants very high geometric accuracy – with a minimum of space and a maximum of movement: X = 600 mm, Y = 450 mm, Z = 450 mm. The cleverly designed cabin permits mounting a fourth axis all the while maintaining the large travel path.

The machine base made of polymer concrete and used in all the machining centers, is the first priority for perfect surface quality and less tool wear.



VCP 600





## VCP 800

### High precision machining of larger workpieces

The VCP 800 has all the same features as the VCP 600 but in an expanded dimension: the longer travel path in the X-axis (table axis) of 800 mm means that the machining of larger components or multi loading can be achieved. Even voluminous workpieces can be machined efficiently to a high surface finish.

The longer clamping range makes it possible to mount a vise on the table in addition to a 4th axis. Together with specially selected speed ranges of spindles, a powerful machining center for tool and die making and for exact series production can be assembled according to the individual requirements.



Multiple clamping increases the profitability of the production center



The large clamping surface allows flexible and versatile use of clamping equipment.



VCP 800

# Five axes UCP 600

## Rotary tilting table

- 5-axis simultaneous machining: driven by AC motors, toothed belt and worm drive
- optimal hydraulic clamping in relation to the moved mass
- direct incremental shaft encoder on each axis
- central positioning of rotational axis in relation to the tilting axis
- no backlash, good transfer of power
- wide tilting range for machining under cuts
- high rotating ( $30 \text{ min}^{-1}$ ) and tilting speed ( $20 \text{ min}^{-1}$ )
- also available: versions for automatic robot loading

## 5-side/axis machining in one set-up

The sturdy construction of the UCP 600 allows the most demanding type of machining: from complete 5-axis machining in one setup, to simultaneous 5-axis machining, anything is possible. The large variety of configurations available, such as tables  $\varnothing 280$  or  $\varnothing 400$  mm, ITS or UPC pallets, HSK 63, ISO 40 and short cone 5, is a predominant feature of this high performance machining center.

The wide range of applications of the UCP 600 can be expanded even further by replacing the rotary tilting table with a fixed worktable, easily changed using a special lifting mechanism. The 5-axis machining center can thus be transformed into a 3-axis one with the work surface area of the VCP 600.



It is possible to produce even sophisticated workpieces by selecting the right machining strategy and spindle.



Even with high-support clamping equipment, the UCP 600 has an exceptionally wide tilt range.



UCP 600









# Core components high-tech spindles

## Powerful high-performance spindles

Whichever machine configuration you select, with a VCP/UCP 600 or VCP 800 you get the latest in Mikron motor spindle technology: vector controlled, high-stability spindle bearings, spindle cooling jacket for thermo-statically controlled temperature throughout the entire period of operation.

At higher speeds, you can rely on APS, the standard sophisticated smart machine module for the reliable capture and display of the milling vibrations.

- Optionally 12'000, 20'000 or 42'000 rpm
- Precision high performance – ranging from the conventional through to the universal up to HSC machining
- Vector control for full torque in the lowest range

### Spindle speeds

## 12'000 rpm

for conventional tool designs and programming strategies:

- ISO 40 spindle taper
- continuous speed range – no drop-off in power
- acceleration and deceleration: 1 second
- ceramic hybrid bearings with “life lubrication”

## 20'000 rpm

for machining of a wide range of materials using HSC technology strategies:


- HSK 63 spindle taper
- high-power feed
- flange aligned tool taper for improved radial accuracy
- supplied with through spindle coolant for use in manufacturing
- ceramic hybrid bearings with oil-air lubrication

## 42'000 rpm

the alternative to the HSC machine: when used in conjunction with powerful control systems, this high-speed spindle enables to make the transition to HSC machining.

Special HSC machine tool technologies are:

- HSK 40 spindle taper
- perfectly balanced three-phase motors
- specific tool records – extremely accurate work
- optimum radial accuracy by virtue of flange alignment of tool holder
- ceramic hybrid bearings with oil-air lubrication



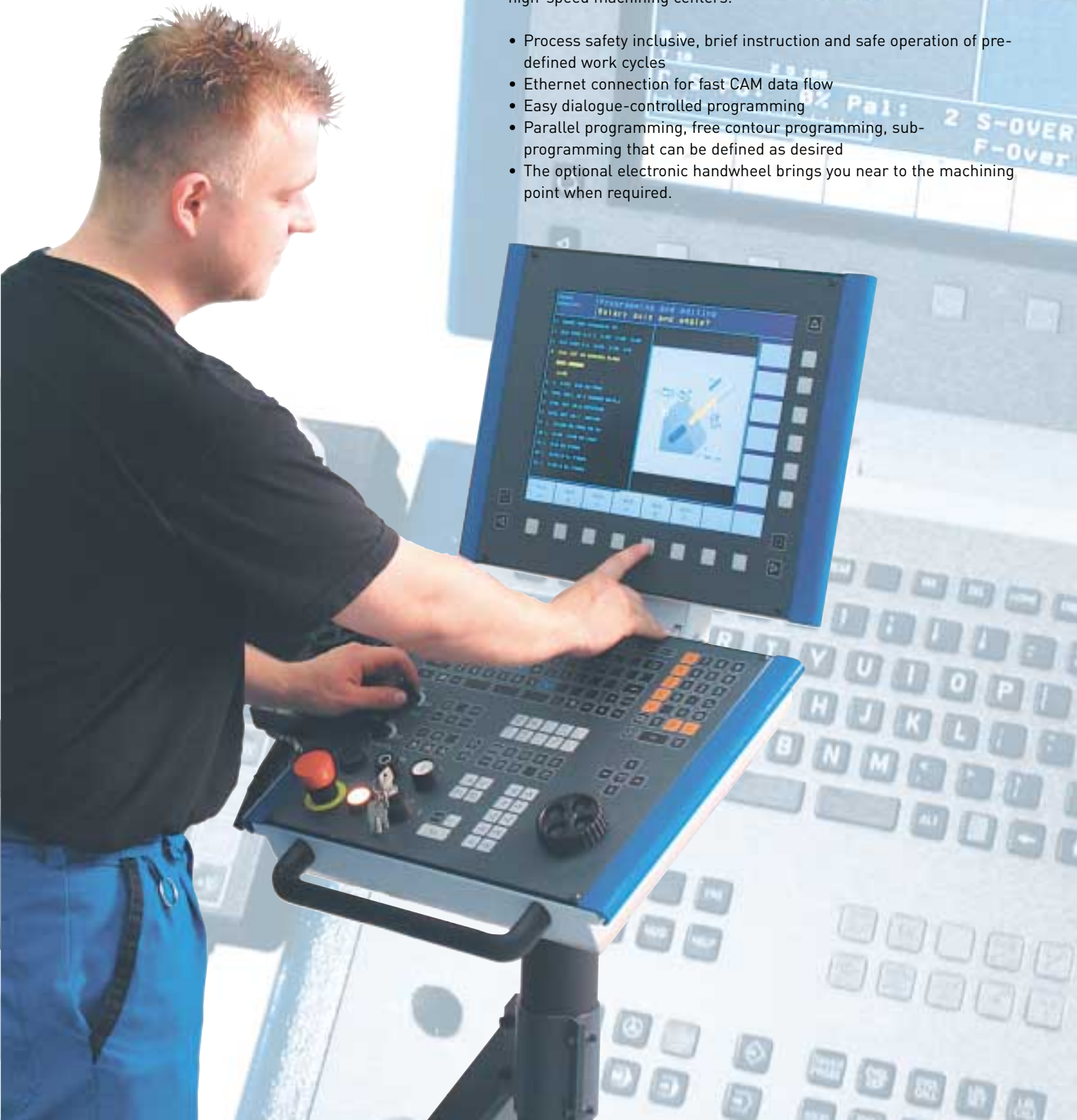
British Aerospace Airbus Ltd. and Boeing Aircraft Company use Mikron high-performance spindles for complex machining functions in milling technology.

# The operator-friendly control system

## Digital control system Heidenhain

The state-of-the-art digital control system Heidenhain iTNC 530 and a clearly structured operator panel ensure that the VCP 600/800, UCP 600-Line of products are process-safe and operator-friendly high-speed machining centers:

- Process safety inclusive, brief instruction and safe operation of pre-defined work cycles
- Ethernet connection for fast CAM data flow
- Easy dialogue-controlled programming
- Parallel programming, free contour programming, sub-programming that can be defined as desired
- The optional electronic handwheel brings you near to the machining point when required.





# Keep it cool



Belt filter system for coolant filtering and 200 liters of coolant



Belt filter system for perfect coolant filtering and up to 70 bar of pressure for TSC



Flexible chip conveyor; can also be combined with interface for robot



Coolant basin, simple but effective solution for small quantities of chips



12,000 RPM spindle (ISO 40) with 4 adjustable coolant nozzles



20,000 RPM spindle (HSK 63) with 9 coolant nozzles (distributed around the spindle center) and 2 nozzles for minimum-quantity lubrication (optional)



42,000 RPM spindle (HSK 40) with 4 adjustable coolant nozzles and 2 nozzles for minimum-quantity lubrication (optional)



# Options



Tool measurement with laser control  
(UCP 600)



Portable electronic handwheel  
(VCP 600, VCP 800, UCP 600)



Expansion tool changer (ISO 40,  
HSK 63), total 58 positions  
(VCP 600, VCP 800, UCP 600)



Tool measurement with laser control  
(VCP 600, VCP 800)



Interface for robots  
(VCP 600, VCP 800, UCP 600)



Dividing head in two sizes  
(VCP 600, VCP 800)



Tool measurement with table  
probing system  
(UCP 600)



Rotating viewing window  
(VCP 600, VCP 800, UCP 600)



Minimum-quantity lubrication system  
(VCP 600, VCP 800, UCP 600)



Tool measurement with table  
probing system  
(VCP 600, VCP 800)



Optional complete machine enclosure  
(VCP 600, VCP 800, UCP 600)



Graphite dust extraction  
(VCP 600, VCP 800, UCP 600)

# Mikron - smart machine

## The new dimension in modern production

Bringing intelligence into the milling process is the intended aim of Mikron.

This includes a range of modules that are collectively referred to under the generic term "smart machine" and that fulfil various functions. In order to make the milling process "intelligent", various requirements have to be implemented. First of all, establishing comprehensive communication between operator and machine, which makes extensive information that the operator requires to assess the milling process available to him. Secondly, supporting the operator in the optimisation of the process, which considerably improves the performance. Thirdly, the machine optimises the milling process, which improves the process safety and the quality of the workpiece - above all in unmanned operation.



**smart  
machine**

## The facts

- Greater accuracy in shorter machining times
- Increase in the workpiece surface quality as well as the surface and shape accuracy
- Recognition of critical machining strategies
- Improvement in the process safety
- Reduction of cost (hourly rates) due to longer life time
- Higher availability
- Better operating comfort
- Considerable increase in reliability in unmanned operation

## smart machine construction kit system

Each of the modules of "smart machine" fulfils a specific task. Just like in a construction kit, the user can select the modules that seem to him to be the best option for improving his process.

## Your benefit

- Producing the workpieces in a process-secure and precise manner
- Increasing the reliability in unmanned operation
- Increasing the service life of the machine
- significantly reducing production costs.



# Mikron - A strong partner

## Technology support

**The world newet is split**

The HSM Competence Centers are equipped with the newest machines from the various Mikron product series. With their well-trained engineers, they are able to offer cutting solutions from the test-cut through to turnkey solutions.

## User training courses

**from the basic course through to complex HSC or 5-axis training courses**

Qualified personnel are required in order to achieve the best results on state-of-the-art machines. Mikron offers a solution here too. You can have your employees trained into specialists at the HSM Competence Centers.

## Contract production

**from complex HSC or 5-axis parts**

If you do not want to produce your parts yourself or if the creation of complex programs causes you too much expense, why not let HSM Competence Centers handle the business: even the most difficult challenges are just business as usual for them.

## Hotline

Our local HSM Competence Centers offer a hotline service on the subject of milling during normal working hours. The aim of this service is practice-oriented support for milling users with individual solutions as a part of day-to-day work on the shop floor.

## Service

The Mikron Service Centers are located all over the world. This ensures that well-trained service engineers are quickly available.



**After-sales service –  
safety around the clock**







# VCP 600/800, UCP 600

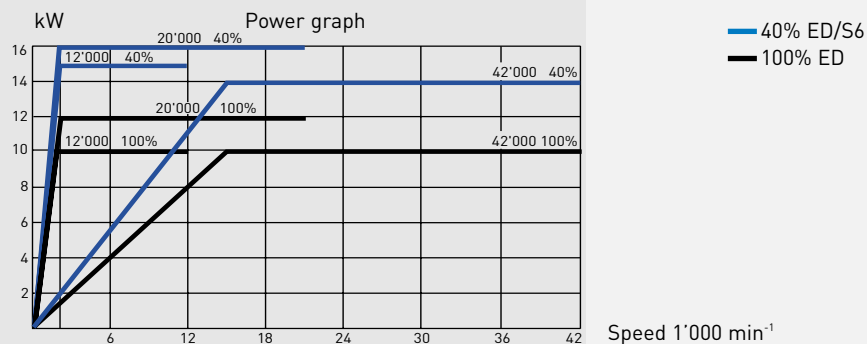
		VCP 600	VCP 800	UCP 600
<b>Work area</b>				
Longitudinal	X mm	600	800	530
Lateral	Y mm	450	450	450
Vertical	Z mm	450	450	450

## High-performance spindles

Spindle performance at 40% ED / S6	kW	15 / 16	15 / 16	15 / 16
Maximum rpm	min <sup>-1</sup>	12'000 / 20'000	12'000 / 20'000	12'000 / 20'000
Spindle water-cooling		•	•	•

## HSC spindle

Spindle performance at 44% ED / S6	kW	14	14	14
Maximum rpm	min <sup>-1</sup>	42'000	42'000	42'000
Spindle water-cooling		•	•	•



## Feed drives

Recommended max. working feed	m / min	15	15	15
Rapid traverse	m / min	22	22	22
Feed force X and Y/Z		5'000N	5'000N	5'000N

## Tool changer

Magazine tool capacity for 12 / 20'000	No.	30 (opt. 58)	30 (opt. 58)	30 (opt. 58)
Magazine tool capacity for 42'000	No.	36	36	36
Max. tool diameter for 12 / 20'000	mm	90	90	90
Max. tool diameter for 42'000	mm	16	16	16
Max. tool length for 12/20'000	mm	250 (350 manual)	250 (350 manual)	250 (350 manual)
Max. tool length for für 42'000	mm	100	100	100
Max. tool weight for 12 / 20'000	kg	6	6	6
Max. tool weight for 42'000	kg	1,5	1,5	1,5
Tool change time	sec	8	8	8
Chip-to-chip times to VDI	sec	10	10	10

## Quality data

Positional tolerance DIN / ISO 230-2/97	µm	8	8	8
---	----	---	---	---

## Control unit

with digital drives	iTNC 530	•	•	•
No. of axes	5 + spindle	•	•	•
Linear interpolation	5 axes out of 5	•	•	•
Circular interpolation	2 axes out of 5	•	•	•

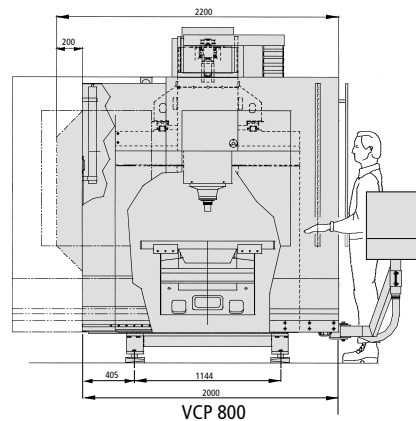
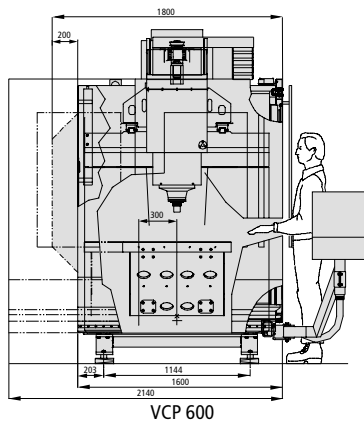
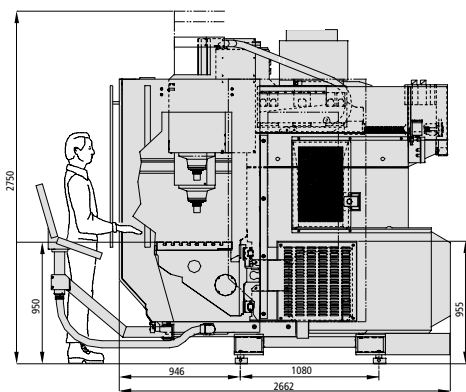
## Safety equipment

Machine enclosure/complete machine enclosure		•	•	•
Door opening to the front	mm	950	1200	950
Door opening to the side	mm	850	850	850

## Coolant

Coolant tank	l	120	140	120
Coolant flow	30 l / min – 2,5 bar	•	•	•

		VCP 600	VCP 800	UCP 600
<b>Weight</b>				
Approx. machine weight	kg	6'100	6'400	6'400
Transport dimensions	mm	1'600 x 2'500 x 2'650	2'000 x 2'500 x 2'650	1'600 x 2'500 x 2'650
<b>Accessories</b>				
Scraper chip conveyor		100 l – 2,5 bar	120 l – 2,5 bar	100 l – 2,5 bar
Coolant with chip conveyor and filter	580 l – 18, 40 or 70 bar	•	•	•
(for through tool coolant supply)				
Coolant washdown gun		•	•	•
Oil mist extraction		•	•	•
OMP 40 setup probe		•	•	•
Tool measurement (sensor or laser)		•	•	•
Oil mist coolant spray unit		•	•	•
Dividing head		•	•	
Graphite dust extraction		•	•	•
Small pallet changer for 24 small pieces/electrodes		•	•	
<b>Connection data</b>				
Rated power (average value)	kW	15	15	15
Total power requirements (maximum value)	kVA	44	44	44
Fuse protection	A	30	30	30
<b>Line voltage/Frequency</b>				
	3 x 400 V-50 / 60 Hz	•	•	•
Connection cross section	mm <sup>2</sup>	6	6	6
Control voltage	VDC	24	24	24
Pneumatic connection	200 l / min – 6 bar	•	•	•
Connection diameter	mm	12	12	12
<b>Work tables</b>				
Table surface area	mm	Work table 850 x 530	Work table 1050 x 590	Rotary tilting table Ø 280, Ø 400
Table load	kg	400	400	200
Clamping		14 – H12 (H7)	14 – H12 (H7)	various clamping systems
Space between slots	mm	63	63	
Tilt range	°			+122 / –100
Tilt speed (30% ED)	min <sup>-1</sup>			20
Rotary speed	min <sup>-1</sup>			30



Our designs are continuously updated to meet changing requirements.  
Changes can be made at any time. Details contained in this brochure are not binding

**MIKRON**  
Agie Charmilles Group  
**+GF+**

Mikron Agie Charmilles AG  
Ipsachstrasse 16  
CH-2560 Nidau

Tel. +41 (0)32 366 11 11  
Fax +41 (0)32 366 11 66  
info@mikron-ac.com  
[www.mikron-ac.com](http://www.mikron-ac.com)