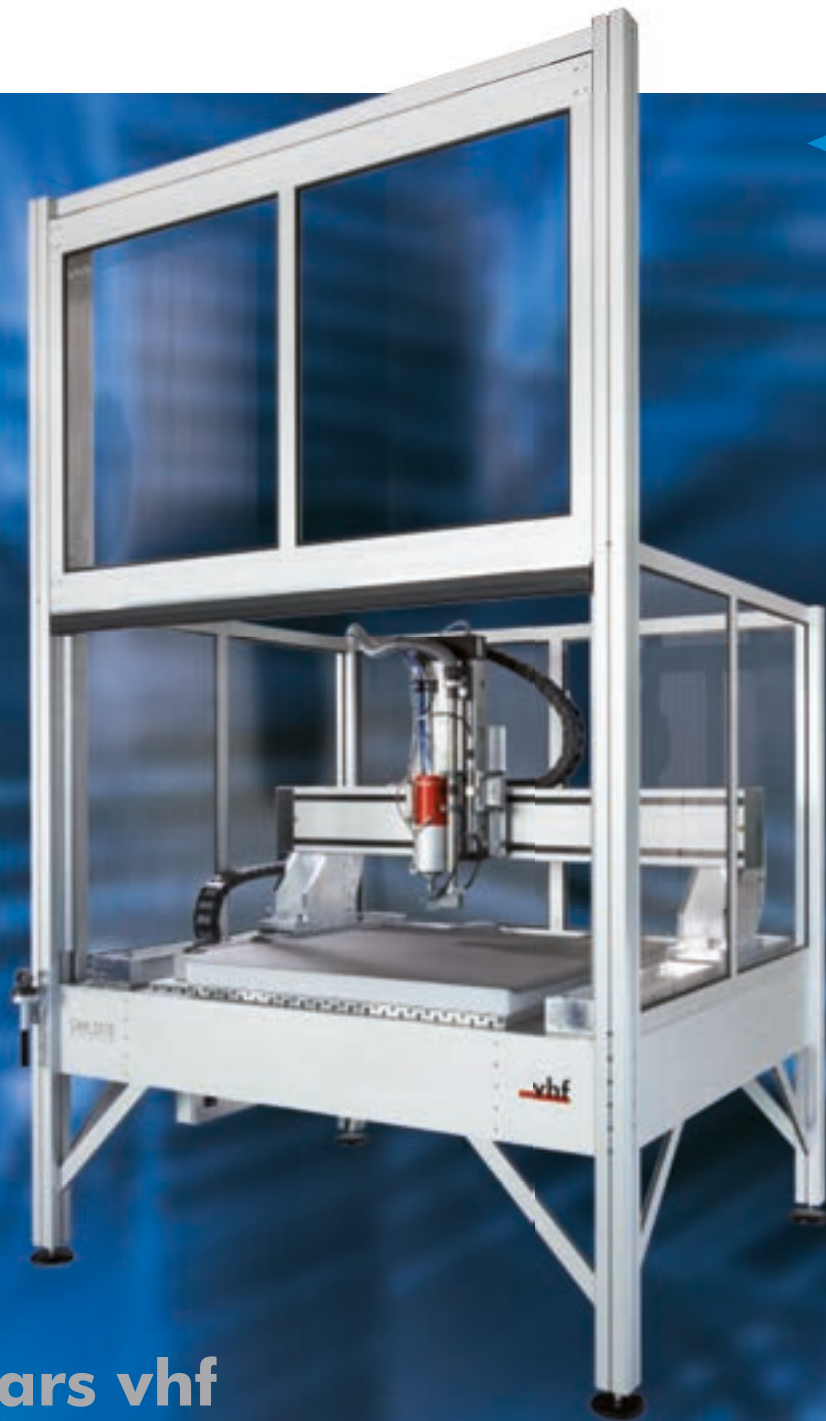


# CNC Milling Machines

Update  
01/2015



> 25 years vhf

**vhf**

# A machine for each application



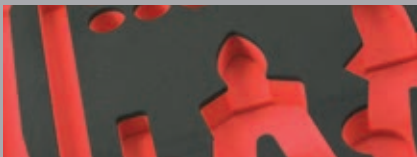
## ► Aluminium processing

Machining all kinds of non-ferrous metals like aluminium, brass or copper, but also steel and stainless steel.



## ► Sign making

Outdoor advertising signs, print & cut or shop and exhibition stand constructions can be produced quickly and nearly without size limits.



## ► Plastics processing

Thermoplastics, thermosetting plastics or composites – thanks to the offered machine sizes also large plates can be processed in one whole piece.



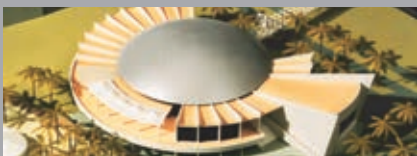
## ► Electronics

Manufacturing front plates, housings and mechanical parts as well as production of prototypes and small lots of printed circuit boards.



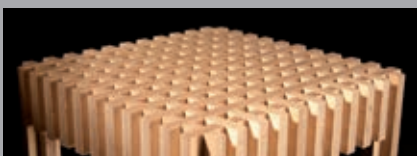
## ► Rapid prototyping & mould making

With a vhf milling machine you can produce three-dimensional moulds and models from a solid block – using quite different kinds of materials.



## ► Model making

No matter whether you have to produce ship, train, plane or architectural models – a vhf milling machine always ensures premium quality.



## ► Wood processing

Milling contours or pockets in solid wood, multilayer plates, MDF/HDF; cutting veneers or producing sophisticated inlay or relief works.



## ► Engraving

Everything that is done in an engraving studio, from nameplates up to sophisticated relief works – of course with highest precision.



## ► Dental technology

Comfortable machining of PMMA, wax, zirconium oxide, composites, non-precious alloys or glass ceramics for producing crown and bridge works.



#### **Welcome to vhf!**

*The time that has passed since we have published the last issue of our catalogue has been characterized by a steady expansion. Having about 70 employees in the beginning of 2011, in the middle of 2014 there are already more than 170. This growth of vhf has only become possible because we are able to convince our customers with our concept: more than 25 years of experience, all products are Made in Germany and everything comes from one source – from the development and manufacturing of the machines over the controllers and the control software up to the tools.*

*And as always: If you should have any questions or need a detailed offer – our friendly vhf team would be glad to assist you. Of course we would be especially happy if we could show you our machines during an individual presentation.*

Frank Benzinger  
Chief Executive Officer

---

By using 100% recovered paper for the complete edition of these catalogues, the following resources have been saved:



#### **Wood**

approx. 95,000 kg  
more than 3,000  
trees for fresh fibre  
paper



#### **Electricity**

approx 50.000 kWh  
consumption of a  
family of four in over  
10 years



#### **Water**

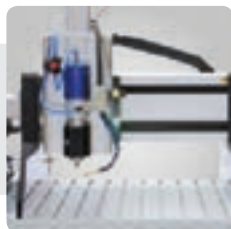
approx. 500,000 l  
consumption for  
more than 3,000  
full baths



#### **Waste**

approx. 25,000 kg  
amount of a family  
of four in over 10  
years

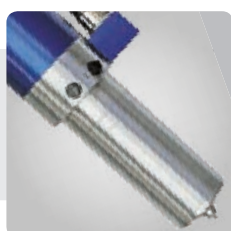
**100%  
recycled**

Classic  
Line

The **Classic line** offers precise and robust systems for each kind of application. It covers small to medium-sized positioning ranges. ► **Page 20**

Premium  
Line

The **Active Pro line** has the largest machines which will be chiefly used in the sectors of sign making or processing of large plates. ► **Page 28**

Active Pro  
LineActive Mold  
Line

In the chapter **machining units** you will find powerful and precise spindles as well as devices for cutting, folding and embossing. ► **Page 35**

Machining  
UnitsFixing  
Devices

Our **measuring devices** can simplify the adjustment of your workpieces or they can be used for levelling material tolerances. ► **Page 59**

Measuring  
DevicesPeripheral  
Equipment

Do you need a universal **manufacturing software**, a 3-D CAM program for mould making or a special solution for PCB prototyping? ► **Page 79**

Software

Accessories

## Table of contents

### General information

Competence in CNC milling machines	6
Easy financing	8
Delivery and installation service	8
2 years warranty	8
Free support	8
In-house production of tools	9
Manufacturing software	9
Who is vhf?	10
Great variety of trade fairs	10
Everything from one source	11
Test us!	12
Transparent Factory	12
Stable machine construction	13
All model ranges at a glance	14

### System modules

1. CAM basic systems	19
Classic line	20
Controller CNC 680+/980+	23
Premium line	24
Active Pro line	28
Active Mold line	32
2. Machining units	35
Rotary current spindles	36
High frequency spindles	38
Standard spindle	40
Dot embossing unit	41
Tangential cutting head	44
Oscillating tangential cutting head	45
Multi unit	46
Drag knife unit	49
3. Fixing devices	51
Special vacuum tables	52
Grid vacuum tables	53
T-slot fixing sets	54
Polystyrene surfaces	55
Rotary axes	56
Rotary axis for profiles	57
4. Measuring devices	59
Workpiece levelling unit	60
Automatic z adjustment unit	61
Line laser unit	62
Optical workpiece recognition	63
5. Peripheral equipment	65
Automatic tool changer	66
Dust extraction unit	68
Cooling/spraying unit	70
Minimum quantity lubrication	71
Housings	72
Safety devices	74
Control panel	75
System rack	76
Tool sets	77

### Manufacturing software

Cenon	80
Cenon CCD	82
Cenon PCB	84
3-D machining	86
Engraving fonts	88



## Table of contents

<b>Accessories</b>	91
Spindles (collet chucks, etc.)	
Standard spindle	92
SPC 650	92
SPC 1000	92
SPC 1500, SPC 2000P, SPC 4000P	93
SPC 1500P and 2300P	93
SPC 3800P, SPC 5500P, SPC 6000	93
High frequency spindles, manual	94
High frequency spindles, pneumatic	94
Fittings for tool change stations	95
Fixing devices	
Fixation bars	95
Clamping devices	95
Clamp	96
Pneumatic clamping devices	96
Vises	96
Slide nuts	97
Polystyrene stripes	97
Sealing cord for grid vacuum tables	97
Vacuum suction units	97
Vacuum adaptor mats	98
Vacuum fleece	98
Special adhesive film	98
Dust extraction	
Suction shoes and vacuum cleaners	99
Miscellaneous	
Reducing bushes	99
Stop rings	100
Coolants	100
Lubricants	101
Cleaners	101
Switching unit	101
3-D measuring sensor	101
<b>Appendix</b>	
We are looking forward to your visit!	102
vhf submits you an offer	103
Order form	105
Your contacts	106
vhf tool catalogue	107

All prices exclude VAT, customs duties and transportation/packaging fees • Deliveries are always subject to our Terms of Sale; we would be glad to send them to you on request and you will find them on the internet at [download.vhf.de](http://download.vhf.de) • All trade and product names mentioned in this catalogue belong to their owners • Technical modifications and errors excepted.

The **Premium line** distinguishes itself by highest rigidity and precision. And it offers the greatest spectrum of possible configurations. ► **Page 24**



The **Active Mold line** has been developed for large-scale mould making. Its most characteristic feature is its great passage height. ► **Page 32**



Which **fixing device** would you like to use to hold your workpieces – vacuum table, different kinds of clamping devices or adhesive film? ► **Page 51**



The **peripheral equipment** contains components which further improve your results or make the working process more comfortable. ► **Page 65**



Please check the chapter **accessories** if you already own a vhf milling machine and you need some spare or accessory parts. ► **Page 91**

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

# Competence in CNC milling machines

## vhf camfacture AG

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

### ✓ Milling machines from vhf – highly precise, robust and quick

Stable construction of high-tensile aluminum profiles, precise steel linear guides and powerful High-Torque drive units. A deliberately generous dimensioning of all moveable components ensures a high workpiece quality. You'll find background information on the usage of this universal material with its outstanding features on ► **Page 13.**

### ✓ Over 25 years Made in Germany

vhf develops and manufactures milling machines of highest quality in Germany and delivers them to all relevant branches of business.



### ✓ Everything from a single source

Own development and production of machines, CNC controllers, control software and carbide tools – so everything will fit together and we can react quite flexibly to special wishes. More information about the companies of the vhf group ► **Page 11.**

### ✓ Modular, very flexible design

CNC milling machines from vhf will be assembled of perfectly matching system modules. Our competent sales staff would be glad to be on hand with help and advice to configure a machine which will exactly suit your demands. The modules are described in detail – beginning with the basic systems – from ► **Page 14.**

✓ **More than 1,000 machines per year**

Convinced vhf customers buy more than thousand milling machines every year – a number that speaks for itself.

✓ **Financing options**

If you want to save your liquidity, we can offer you leasing as an alternative to buying the machine.

✓ **Free delivery**

All machines will be delivered and installed ready to use on your premises – free of extra charges within Germany, Austria and Switzerland. On top of that you'll get an introduction into the operation of the machine.

✓ **Free support**

Our customers appreciate the comprehensive advice and the competent and personal vhf support without further expenses.

✓ **24 months warranty**

You get a warranty of two full years on all components of your machine according to our terms of warranty.

✓ **In-house production of tools**

With more than 1,000 different cutting edge geometries, you will find the proper tool for each kind of application. Please see our separate ► **Tool catalogue**.



**We would be glad to give you advice. Just call us:  
+49 (0) 7032 97097-700**





## Delivery and installation service

Having ordered a new milling machine, you profit from the vhf delivery and installation service:

- Free delivery, setup and commissioning in Germany, Austria and Switzerland.
- Graded rates for all other countries.
- Well-priced lump sums within the European Union.
- Constricted access conditions? No problem – just use our on-site assembly service. Your machine will be delivered unassembled and will then be assembled at the installation site.

For using your new machine productively right away, you will also get a comprehensive introduction into its usage.



## 2 years warranty

A vhf milling machine is made of high-quality system modules which harmonize well with each other. Prior to the delivery, it will be tested in an extensive trial run. The reliability of our machines has proven to be great, even under high load and in everyday-use. That's why all components of a new machine have a warranty period of two full years according to our terms of warranty.



*vhf exclusively uses certified green power of 100 % hydroelectricity.*

## Free support

It is a self-evident part of the vhf philosophy to give you best support – also after the purchase. Thus our support staff would be glad to answer all of your questions via phone, fax or e-mail without further expenses for you. Together with our experts a solution will be quickly found.



## In-house production of tools

vhf is manufacturer of a wide assortment of first-class carbide and diamond tools for any task – milling, engraving, chamfering, cutting, polishing and thread cutting.

- With more than 1,000 cutting edge geometries you will always find the proper tool – hence you will achieve higher rates of feed, a longer endurance and a better quality of the treated surfaces.
- More than 100,000 tools are always on stock, this means in most cases: order today – use it tomorrow.
- Free delivery for all orders up to 31 kg via the vhf shop (shop.vhf.de).

The complete assortment of vhf tools can be found either in our shop or in our separate tool catalogue.



## Manufacturing software

The manufacturing software Cenon has originated from vhf and is being constantly further improved. It is distinguished not only by its wide variety of functions.

- You will get a perfect interaction with the controller and the machine.
- Intelligent algorithms perfectly process your CAD data for the output.
- The ergonomic design of the user interface makes your daily work more efficient.
- Cenon is a really easy to use manufacturing software that convinces with many features, thus no prior knowledge of Computer Aided Manufacturing is necessary.

Everything about the software ► **Page 79**

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories



*vhf – more than 25 years in Computer Aided Manufacturing.*

## Who is vhf?

The company vhf camfacture AG which was founded in 1988 is a manufacturer of highly precise, fast and robust CNC milling machines. In addition vhf offers a wide range of carbide and diamond tools. vhf is expanding steadily:

- Since 1999 vhf has its seat in Ammerbuch (about 30 kilometres southwest of Stuttgart). At that time vhf only had approximately ten employees.
- In the meantime, vhf has more than 180 employees and six buildings in the industrial park of Altingen.
- Currently vhf manufactures more than 1,000 milling machines per year.

This impressive development in growth continues in all sectors.



*Welcome to vhf camfacture AG!*



Photo: Innovation und Technik

*vhf presents machines and tools at many trade fairs.*

## Great variety of trade fairs

The vhf trade fair schedule covers nearly all topics that have to do with chip-removing processing of all kinds of materials. It extends from A like aluminium to Z like zirconium.

- live production of samples on the vhf milling machines presented there
- exhibition of the relevant vhf tools for the respective trade fair focus
- presence with own stand at many trade fairs in Germany, representation at fairs in other countries by our resellers

You can find our comprehensive trade fairs schedule at [www.vhf.de](http://www.vhf.de).





Machine building at vhf camfacture AG.



Milling of machine parts at vhf camfacture AG.

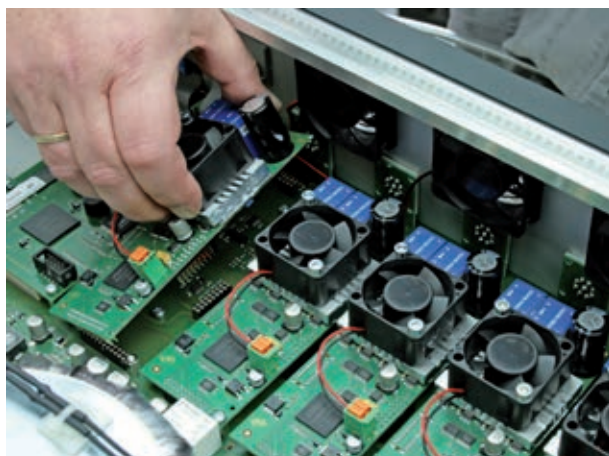
## Everything from one source – and one manufacturer

With vhf you benefit from the fact that you not only get everything from one source, but that there is just one manufacturer for all products (machine, controllers, control software, tools and service) – namely the vhf group with its different companies. The vhf companies develop and manufacture their respective products completely in Germany:

- everything around machine building – vhf camfacture AG
- control electronics and control software – vhf elektronik GmbH
- carbide tools of the vhf assortment – vhf tools AG

Finally, the vhf camfacture AG assembles all development works of the single members of the group to a finished product. This means for you...

- all components do optimally harmonize with each other
- highest flexibility to realize special designs for you
- only one single contact for all questions concerning all products which are presented in this catalogue



Manufacturing of controllers at vhf elektronik GmbH.



Tool production at vhf tools AG.

Classic  
Line

Premium  
Line

Active Pro  
Line

Active Mold  
Line

Machining  
Units

Fixing  
Devices

Measuring  
Devices

Peripheral  
Equipment

Software

Accessories



*We are looking forward to your visit at vhf!*

## Test us!

We would be glad to welcome you for an individual presentation. In our demonstration area we show you at least one machine of each model range which is ready for the individual sample production. You cannot only see various spindles, cutting devices and fixing devices in action, but also the extensive range of peripheral equipment. In the course of the presentation...

- we talk about your application
- we find out which system will suit best to your requirement profile
- we finally produce your sample under practical conditions

Just bring along a file (for example EPS, DXF and different 3-D formats) that you have created with your favoured design program and if you like also the material which has to be machined.

So, after the presentation you can be sure that the machine will really be suitable for your application.



*In our demonstration area at least one machine of each series is available for the individual sample production.*

## Transparent Factory

It is self-evident for us to produce the complete machine construction of new machines always on vhf milling machines and with vhf tools. We would be glad to show you this proof of their quality and practicability during your visit.

Thus the Transparent Factory is directly adjacent to our demonstration area. There about a dozen milling machines from different series mill profile and sheet materials of aluminium, plastics and steel.



*Insight into the transparent factory with its various milling machines.*



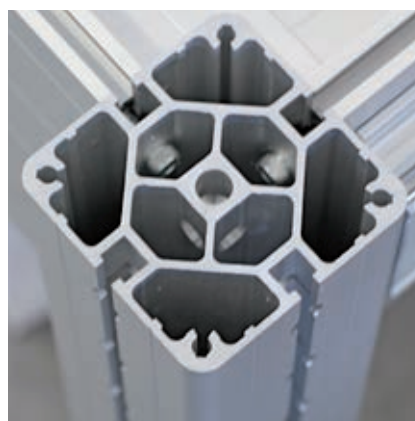
## Stable machine construction

vhf has always been using high-tensile aluminium profiles for constructing their CNC milling machines. As aluminium is well malleable in hot state, profile bars with internal structures that are optimised for different kinds of applications can be produced with/at very little tolerances. It is considerably more difficult to make/create such structures in other materials. The internal honey-comb structure of the extruded aluminium profiles ensures more rigidity and keeps their weight low. Especially the distortion and bending stability will be increased by the numerous bracings inside the profiles.

As the machine profiles are screwed together, also a big vhf milling machine can be delivered with rather little extra effort in separate parts for assembling it at a place which is difficult to access. Thanks to the low total weight you normally do not have to bother about issues like maximum floor loading. On top of that the aluminium is protected by its hard anodic coating; there is no additional surface treatment like varnishing necessary.

### Intelligent design for more stability

An intelligent design means that the material will be used where it contributes most to stabilisation – as well in the internal structure of the profiles as in the machine construction itself. The bending experiments of a reinforced profile and a hollow profile with approximately the same weight which are shown in the image below prove this. Where more material leads just to little more stability, it can be omitted in order to save weight. So the construction combines an optimal relation between weight and rigidity which facilitates the highest possible dynamic of the moveable components.

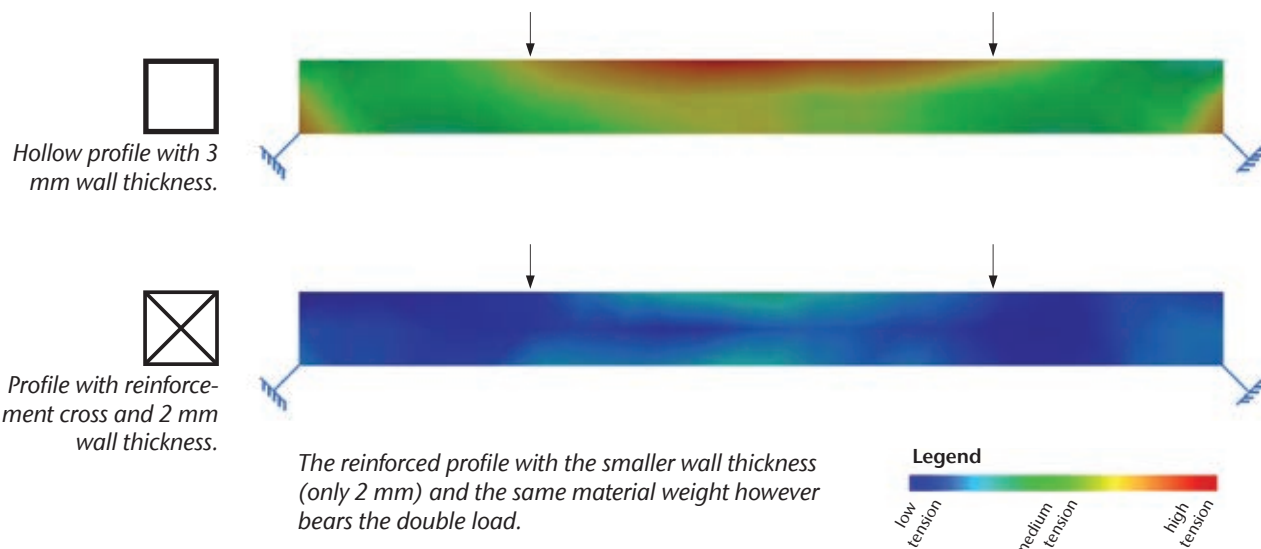


The high-tensile column profiles with their honey-comb structure are very rigid. So the machine can bear high loads.

Internal view of the portal bridge of an Active Pro machine: hollow chamber construction of panel profiles for saving a maximum of weight.



The same concept applies to the fixing brackets of the portal bridge of a Premium machine: the milled holes save weight, but do not affect the rigidity, so that a low-vibration machining is ensured.



## CNC milling machines – all model ranges at a glance

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories



### CLASSIC

C  
Classic

Page 20

#### Compact, precise and agile

The machines of our established Classic line are robust and highly precise. They cover the small to medium sized workpiece formats. Their stable basic mechanics is one of the key features. Their low-vibration construction with precise steel linear guides and highly accurate hybrid motor drives make these systems universally applicable.

- for precise milling works and finest engravings
- high rigidity and little weight
- ball screw spindles free from backlash for all axes
- positioning range: 290 x 335 – 1,040 x 1,250 mm
- z axis lift: 70 – 460 mm
- repetition accuracy:  $\pm 0.01$  mm
- our classic: successfully on the market since 1992, continuous adaptation to the latest technical state-of-the-art



### PREMIUM

P  
Premium

Page 24

#### For tough industrial usage

We have developed the Premium line especially for challenging industrial applications. It distinguishes itself particularly by its more stable construction and more powerful drive units. This means high rates of feed and best results even in materials which are difficult to machine.

- industrial machining of plastics, metal and wood
- especially rigid substructure made of panel profiles
- very smooth operation, first-class quality of the cut edges
- optionally with front and rear clamping range
- greatest choice of equipment varieties
- ball screw spindles for all axes, 2 axes in y direction
- pos. range: 550 x 510 – 2,050 x 3,010 mm, z axis lift: 190 – 490 mm
- repetition accuracy:  $\pm 0.01$  mm



### ACTIVE PRO

AP  
Active Pro

Page 28

#### XXL plate processing

Due to its price-performance ratio, the Active Pro line fascinates especially sign makers and shop or exhibition stand constructors as well as industrial customers who want to quickly machine large-format plates. Its low-weight construction of high-tensile aluminium profiles enables very high acceleration dynamics.

- the quick and flexible all-rounder
- optimal for large to very large workpieces
- special vacuum table integrated in machine table
- rack-and-pinion drives for x and y axes, ball screw spindles for z axis, 2 axes in y direction
- pos. range: 1,020 x 1,020 – 3,020 x 8,020 mm, z axis lift: 70 – 260 mm
- repetition accuracy:  $\pm 0.05$  mm
- optionally with additional multi unit for cutting works

## ACTIVE MOLD



Page 32

## Milling voluminous moulds

The Active Mold machines have been constructed for large-scale mould making. Thanks to their stable construction, the load will be evenly spread and you can machine very large workpieces.

- especially suitable for rapid prototyping and mould making, e. g. for models or casting moulds
- for styrofoam, model making materials, plastics or wood
- stable framework construction with numerous crossbars and many stand supports, thus heavy workpieces can be loaded
- additionally reinforced z axis
- rack-and-pinion drives for x and y axes, ball screw spindles for z axis, 2 axes in y direction
- pos. range: 1,020 x 1,600–2,520 x 8,200 mm, z axis lift: 700 mm
- repetition accuracy:  $\pm 0.05$  mm



## IMPRESSION



## Multiaxial micro-machining

These **milling and grinding machines** have been developed for the **dental technology** and are momentarily offered in three different product lines.

- 4 or 5 simultaneously working axes; very compact housings
- suitable for dry or wet machining
- high degree of automation due to tool and blank changer
- machining of wax, plastics, zirconium oxide, composites, non-precious alloys on cobalt chrome basis and glass ceramics

Please note that our Impression machines are exclusively sold **via OEM partners and specialised trade**. Our sales partners will provide you with further details. We would be glad to inform you about buying sources.



## The basic systems at a glance

	<b>C</b> Classic	<b>P</b> Premium	<b>AP</b> Active Pro	<b>AM</b> Active Mold
<b>Model range</b>	Classic	Premium	Active Pro	Active Mold
<b>x/y positioning range</b>	290 x 335 mm – 1,040 x 1,250 mm	550 x 510 mm – 2,050 x 3,010 mm	1,020 x 1,020 mm – 3,020 x 8,020 mm	1,020 x 1,600 mm – 2,520 x 8,200 mm
<b>z axis lift</b>	70 – 460 mm	190 – 490 mm	70 – 260 mm	700 mm
<b>Repetition accuracy</b>	$\pm 0.01$ mm	$\pm 0.01$ mm	$\pm 0.05$ mm	$\pm 0.05$ mm
<b>Drives</b>	ball screw spindles for all axes	ball screw spindles for all axes, 2 y axes	z axis: ball screw spindle, x/y axis: rack-and-pinion drive, 2 y axes	z axis: ball screw spindle, x/y axis: rack-and-pinion drive, 2 y axes
<b>Controller</b>	CNC 680+ 3–5 axes	CNC 980+ 4 or 5 axes	CNC 980+ 4 or 5 axes	CNC 980+ 4 or 5 axes
<b>Standard fixing device</b>	T-slot table (standard), special vacuum table (optional)	T-slot table (standard), special vacuum table (optional)	special vacuum table (standard), T-slot table (optional)	cross bars with 100 mm edge length
<b>Front clamping range</b>	no	optional: 250 and 500 mm	optional: 500 mm	no
<b>Housing</b>	optional	optional	no	no
<b>Max. spindle power (S1/P<sub>max</sub>)</b>	1.5 kW/4,1 kW	6 kW/12 kW	6 kW/8.6 kW	6 kW/12 kW
<b>Max. shank Ø</b>	10 mm	20 mm	20 mm	20 mm

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories





# System Modules

CNC milling machines from vhf are made of single system modules. So a system which exactly meets your specifications can be assembled according to the modular design principle. Of course our sales team will assist you with help and advice. All modules harmonize with each other so that you can choose from any of the following five categories. You start your assembly with the basic system and continue with different machining units, fixing devices, measuring devices and further peripheral equipment.

We deliver our milling machines free domicile with- in Germany, Austria and Switzerland. Moreover, our staff members will install and setup your new machine and give you an introduction so that you can start using it productively already at the day of delivery. You will also get a warranty for two full years on all components of your machine.

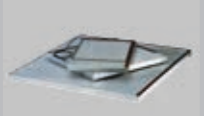
*Basic systems*



*Machining units*



*Fixing devices*



*Measuring devices*



*Peripheral equipment*





## Basic systems

The first step to your new milling machine is to choose a basic system which consists of the mechanics and the CNC controller. You can choose from four model ranges:

C

Classic

The systems of the **Classic line** are robust and highly precise. They cover the smaller and medium positioning ranges and are also available as pure table systems.

► Page 20

P

Premium

The **Premium machines** have been developed especially for challenging industrial applications. They distinguish themselves by a more stable construction and more powerful drive units. ► Page 24

AP

Active Pro

The **Active Pro line** is particularly suitable for sign making, but also for similar purposes. It offers the largest positioning ranges – and this for an extremely favourable price! ► Page 28

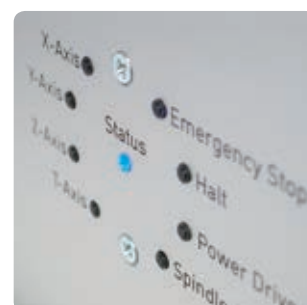
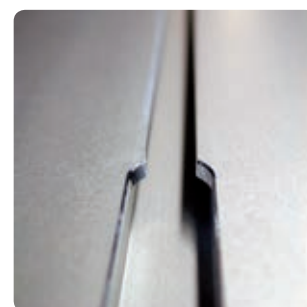
AM

Active Mold

For large-volume mould making we recommend the **Active Mold systems**. Thanks to a stable framework construction and a passage height of one metre you can machine voluminous workpieces. ► Page 32

It is common to all model ranges that they can be used for real three-dimensional works. All machines may be completed with further vhf system modules. The appropriate symbol shows you at one glance which module can be combined with which basic systems.

In addition to that vhf offers the compact Impression line for micro-machining. On request, we would be glad to provide you with further pieces of information.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
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DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## Classic line

vhf's Classic line has been successfully present on the market since 1992. Numerous detail improvements of the basic mechanics which has **proven its worth for more than thousand times** and a completely new developed controller guarantee the state of the art. The very stable basic mechanics is a key feature. Its **low-vibration construction** with **precise steel linear guides** and highly accurate hybrid motor drives makes the machines universally applicable for **powerful milling works** and **finest engravings**.

### Compact, precise and quick

We deliberately use **high-tensile aluminium profiles** for the construction of our milling machines. The honeycomb construction of these profiles guarantees **extreme stiffness** of the whole machine and **little weight**. One decisive advantage goes along with this fact: There is less mass to be moved around with the axes. This leads to **greater acceleration dynamics** and to **higher processing speeds**. On top of that, due to the protective anodic oxidation of the aluminium, your machine will always look as if it were new – even after years.

Due to a positioning range of up to 1,040 x 1,250 mm, the Classic systems are suitable for small to medium-sized workpieces. However, you can **push through larger workpieces** in machine direction **under the bridge**, so that they can be processed by stages. When you think of the required machine size, keep in mind that it may be especially in the industrial sector more economic when you choose a bigger basic system for little extra expenses. If you produce several **smaller workpieces on a larger panel**, you can considerably reduce time and costs for tool and workpiece changing.



The smallest vhf machine – CAM 100 Classic  
(positioning range: 290 x 335 x 70 mm).

## Technical data

- construction using high-strength aluminium profiles ensures extreme stiffness and low weight
- T-slot table for easily fastening workpieces and fixing devices
- precise steel linear guides driven by hybrid motors
- ball screw spindles free from backlash with flanged bearings; lead in x/y/z direction: 16 x 4 mm, for CAM 100 16 x 5 mm (other leads are available)
- dimensioning of x/z axis: 175 mm
- teflon-coated rubber seal protects the drive units from chips
- repetition accuracy  $\pm 0.01$  mm
- 3 end/reference switches, accuracy  $< 0.01$  mm
- cable drag chains for all cables
- easy-to-maintain construction

## What are hybrid motors?

Hybrid motors are brushless motors which are equipped with high-grade ball bearings. They have permanent magnets as well as electromagnets. We always use them for driving vhf milling machines because they offer a number of advantages:

- rotational speed stability even under load variations; this enables finer resolutions
- highest torque in the lower speed range, no complex and maintenance intensive gear units necessary
- lowest after-running and smallest transient response – micro step operation additionally increases the positioning accuracy considerably
- highest holding torque without brake during standstill which leads to a generally increased stiffness of the machine
- reduced risk of machine damage and injury at blockage
- longest lifetime and maintenance-free
- our HighTorque hybrid motors are the highest-quality version of stepper motors

## Scope of delivery

- CNC milling machine – see table
- controller CNC 680+
- manufacturing computer with flat screen
- separate emergency stop switch
- complete cable set
- machine documentation in German or English
- delivery, installation and introduction within Germany, Austria and Switzerland by a vhf staff member



## C L A S S I C

## Options

<b>Description</b>	<b>Article no.</b>
Underframe CAM 100 (standard from CAM 200)	CM01-UG-100
Passage 300, lift 260 mm	CM02-BS-DL300
Passage 500, lift 460 mm	CM02-BS-DL500

Please see page 72 for **covering caps** and  **housings** in different variants.

On request, we can equip these machines with a number of individual extras which are not listed in the following chapters. We would be glad to provide you with further details about:

- workpiece-specific fixation with pneumatic clamping devices
- multi-spindle solutions for a quick serial production of identical workpieces

## Order numbers

<b>Description</b>	<b>Article no.</b>
<b>Basic system</b>	
CAM 100 Classic	CM01-BT-CAM-100
CAM 200 Classic	CM01-BT-CAM-200
CAM 220 Classic	CM01-BT-CAM-220
CAM 250 Classic	CM02-BS-CAM-250
CAM 300 Classic	CM02-BS-CAM-300
CAM 450 Classic	CM02-BS-CAM-450

These machines are **robust and reliable**; thus they are very well suitable for every-day usage in a development laboratory, in a workshop or in the industrial production. Due to their modular construction, the machines are easy to maintain and meet all required safety standards.



CAM 220 Classic with serial underframe and optional covering cap.

## Dimensions

Model	x/y positioning range (mm)	Mounting area (mm)	z axis lift (mm)	z passage height (mm)	Ext. dimensions (W x D in mm)**
CAM 100 Classic	290 x 335	500 x 600	70	105	810 x 920
CAM 200 Classic	540 x 500	750 x 850	70	190	1,250 x 1,130
CAM 220 Classic	540 x 500	750 x 850	160, 260*, 460*	190, 300*, 500*	1,250 x 1,130
CAM 250 Classic	540 x 750	750 x 1,100	160, 260*, 460*	190, 300*, 500*	1,250 x 1,380
CAM 300 Classic	790 x 850	1,000 x 1,350	160, 260*, 460*	190, 300*, 500*	1,500 x 1,630
CAM 450 Classic	1,040 x 1,250	1,250 x 1,750	160, 260*, 460*	190, 300*, 500*	1,750 x 2,030

\* optional equipment

\*\* depending on the equipment of the machine, the external dimensions may slightly differ  
The height of the machine varies depending on passage height/z axis and a possible housing.

Classic Line

Premium Line

Active Pro Line

Active Mold Line

Machining Units

Fixing Devices

Measuring Devices

Peripheral Equipment

Software

Accessories

## Classic line

All machines from CAM 200 on are equipped as standard with a **stable underframe** which ensures a safe stand. The table system CAM 100 is so compact that it can be placed on every laboratory table. However, on request, it can also be equipped with an underframe.

A customer-specific **equipment of the machines with optional accessories** is also possible. For instance, we can manufacture special fixing devices for the serial production of identical workpieces. Just tell us your specific requirement profile.

Even if you plan to integrate a vhf milling machine into an existing system of production sequences (production line), we can offer you in most cases a practical solution.



*CAM 450 Classic with serial underframe and three-sided housing with pneumatic lift gate.*

## C L A S S I C

### Further advantages

- High-class, EMC-compatible connectors at the machine and the controller ensure a reliable operation.



- Everything is in best order: all connecting lines have been laid accurately in cable drag chains.



- Well protected from chips, the ball screw spindles and the linear guide slides for driving the y axis are under the T-slot table. Acrylic glass flanks which are right and left of the mounting area range offer additional protection.



## Technical data

### Common features CNC 680+/980+

- simultaneous control and interpolation of up to five axes
- real 3-D processing
- continuous velocity along the path, in 3-D and real-time with dynamic pre-calculation of path
- four-quadrant control of the motors for an especially smooth operation
- greater smoothness of running, more powerful and more accurate due to microsteps (1/64 step), automatic change-over to full step mode for greater rates of feed
- high processing speed, exponential acceleration ramps
- easy adaptation of different software packages via command set similar to DIN 66025 with many powerful features like automatic tool change and workpiece or tool measurement
- 4 digital outputs (24 V, together max. 3 A) for controlling process flows (e. g. clamping devices for workpiece feed) or peripheral devices
- 4 digital inputs (24 V) for safety appliances (light grids, etc.) or measuring devices
- spindle interface (digital and analog)
- connection for control panel
- connection to PC via USB or RS 232
- additional ethernet connection for updates
- halt function with continue or program termination
- status display via LEDs
- robust and isolated metal housing
- upgradable soft- and hardware

### Power data CNC 680+

- output power 40 V each, max. 4 A
- 4 additional digital in- and outputs each

### Power data CNC 980+

- output power 80 V each, max. 8 A

## Connection sockets

- spindle controller (from page 36)
- electronic workpiece levelling (page 60)
- automatic z adjustment (page 61)
- automatic tool changer (page 66)
- tool cooling (page 70/71)
- safety installations (page 74)
- control panel (page 75)



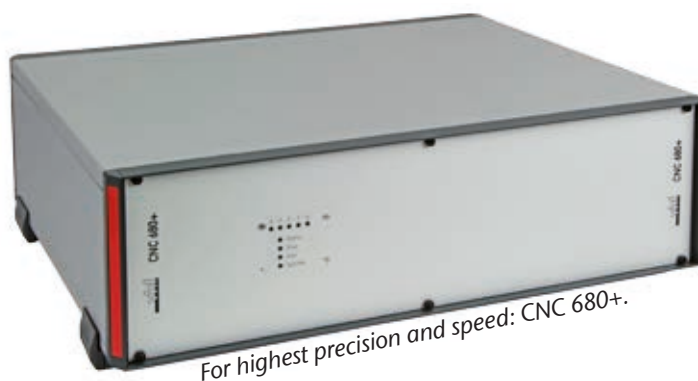
## Controllers CNC 680+/CNC 980+

A good controller is as decisive for good results as a good basic mechanics. However, this point is often being disregarded. CNC 680+/980+ is a **three-dimensional controller** for milling machines with up to five axes. It is the link between the manufacturing software and the basic mechanics. CNC 680+ is always part of the scope of delivery of all Classic systems. Due to their more powerful drive units, the Premium, Active Pro and Active Mold systems will always be delivered with CNC 980+.

### Real-time processing of up to five axes

The modern **real-time operating system** uses the potential of your CNC milling machine to full capacity. Due to **exponential acceleration ramps** and an automatic change-over to the full-step mode, the maximum speed will be reached quickly. The **continuous velocity along the path** and the resolution of 64 microsteps per step ensure clear edges of cut and a high working speed, even when there are very narrow radii to be processed. At least four **digital in- and outputs** each serve for measuring and control purposes, e. g. for the tool measuring key of the automatic tool change, for an electronically switched tool cooling unit or different pneumatically powered devices.

On request, **preceding models of the vhf milling machines** and also some machine types of other manufacturers **can be upgraded** to this new controller. You will see: there are poles apart whether you drive your machine with a simple controller or with a high end controller like CNC 680+/980+.



For highest precision and speed: CNC 680+.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## Premium line

The characteristics of the Classic model range apply also to the Premium line starting with CAM 0505: **high precision** due to ball screw spindles free from backlash and a **high machining speed** in three dimensions due to the intelligent controller CNC 980+. However, the Premium line offers considerably more on top of that.

### For tough industrial usage

A feature which has to be pointed out especially is the **greater stability** of the machine. The very stiff **construction of the substructure using panel profiles** offers great constructive advantages. The profiles that have been bolted against each other horizontally ensure an extremely stable machine table which is covered in addition with a 20 mm thick T-slot plate of massive aluminium. The internal honeycomb structure of the **high-tensile aluminium profiles** of which the whole machine is constructed is so resumed according to the same principle in a large scale. This results in a maximum stability at minimum weight and thus in **highest driving dynamics**.

Thanks to **more powerful drives** with **double linear guides** and **two y axes**, it is also possible to work at higher rates of feed on materials which are difficult to machine. A **very smooth operation** while machining the workpieces and therefore a first-class quality of the cut edges is a self-evident feature of the Premium line.

## Technical data

- substructure construction using high-strength aluminium profiles ensures extreme stiffness, low weight and highest load capacity
- massive T-slot table (thickness: 20 mm) for easily fastening workpieces and fixing devices using slide nuts or T-nuts
- precise steel linear guides driven by hybrid motors
- stable underframe as integral part of the machine
- ball screw spindles free from backlash with flanged bearings; lead in x/y direction 10 mm, in z direction 5 mm (other leads are available)
- 2 axes in y direction enable a better distribution of force and more flexible designs of custom-made systems
- dimensioning of x/z axis: 225 mm
- Teflon-coated rubber seal protects the drive units from chips
- repetition accuracy  $\pm 0.01$  mm
- 4 end/reference switches, accuracy  $< 0.01$  mm
- cable drag chains for all cables
- easy-to-maintain construction

## Scope of delivery

- CNC milling machine – dimensions and positioning ranges see table
- controller CNC 980+
- manufacturing computer with flat screen
- separate emergency stop switch
- complete cable set
- machine documentation in German or English



*CAM 1525 Premium, here with front clamping range (positioning range 1,550 x 2,510 x 190 mm).*

- delivery, installation and introduction within Germany, Austria and Switzerland by a vhf staff member



## P R E M I U M

## Options

Description	Article no.
Front clamp. range 250 mm	CM05-BP-FSB250
Front clamp. range 500 mm	CM05-BP-FSB500
Rear clamp. range 250 mm	CM05-BP-HSB250
Passage 300, lift 290 mm	CM05-BP-DL300
Passage 400, lift 390 mm	CM05-BP-DL400
Passage 500, lift 490 mm	CM05-BP-DL500

On request, there are individual extras available which are not listed in the following chapters:

- workpiece-specific fixation with pneumatic clamping devices
- multi-spindle solutions for a quick serial production of identical workpieces
- axis covering for the y guiding rails
- bridge support for the z axis
- enhanced drive motors 7 A

## Order numbers

Description	Article no.
<b>Basic system</b>	
CAM 0505 Premium	CM05-BP-CAM-0505
CAM 1005 Premium	CM05-BP-CAM-1005
CAM 1010 Premium	CM05-BP-CAM-1010
CAM 1015 Premium	CM05-BP-CAM-1015
CAM 1020 Premium	CM05-BP-CAM-1020
CAM 1510 Premium	CM05-BP-CAM-1510
CAM 1520 Premium	CM05-BP-CAM-1520
CAM 1525 Premium	CM05-BP-CAM-1525
CAM 2010 Premium	CM05-BP-CAM-2010
CAM 2015 Premium	CM05-BP-CAM-2015
CAM 2025 Premium	CM05-BP-CAM-2025
CAM 2030 Premium	CM05-BP-CAM-2030

## Maximum variety regarding size and equipment

The Premium line is also more flexible regarding the size of the machine. Starting with a positioning range of 550 x 510 mm, there are numerous machine sizes in 500 mm steps available. The standard z axis lift can be either 190, 290, 390 or 490 mm. In principle it is also possible to manufacture **special designs** or to integrate the machines into complex industrial production environments. The inputs and outputs of the controller allow the use of additional automation technology.

The machines can additionally be equipped with a housing for safety, cleanliness and noise protection reasons. The  **housings** are available in different variants, either partly or completely enclosed, and with different door solutions. For more information, please see page 72.



CAM 1010 Premium,  
here with half-height  
housing without a gate.

## Dimensions

Model	x/y positioning range (mm)	Mounting area (mm)	z axis lift (mm)	z passage height (mm)	Ext. dimensions (W x D in mm)**
CAM 0505 Premium	550 x 510	600 x 800	190, 290*, 390*, 490*	200, 300*, 400*, 500*	1,355 x 1,085
CAM 1005 Premium	1,050 x 510	1,100 x 800	190, 290*, 390*, 490*	200, 300*, 400*, 500*	1,855 x 1,085
CAM 1010 Premium	1,050 x 1,010	1,100 x 1,300	190, 290*, 390*, 490*	200, 300*, 400*, 500*	1,855 x 1,585
CAM 1015 Premium	1,050 x 1,510	1,100 x 1,800	190, 290*, 390*, 490*	200, 300*, 400*, 500*	1,855 x 2,085
CAM 1020 Premium	1,050 x 2,010	1,100 x 2,300	190, 290*, 390*, 490*	200, 300*, 400*, 500*	1,855 x 2,585
CAM 1510 Premium	1,550 x 1,010	1,600 x 1,300	190, 290*, 390*, 490*	200, 300*, 400*, 500*	2,355 x 1,585
CAM 1520 Premium	1,550 x 2,010	1,600 x 2,300	190, 290*, 390*, 490*	200, 300*, 400*, 500*	2,355 x 2,585
CAM 1525 Premium	1,550 x 2,510	1,600 x 2,800	190, 290*, 390*, 490*	200, 300*, 400*, 500*	2,355 x 3,085
CAM 2010 Premium	2,050 x 1,010	2,100 x 1,300	190, 290*, 390*, 490*	200, 300*, 400*, 500*	2,855 x 1,585
CAM 2015 Premium	2,050 x 1,510	2,100 x 1,800	190, 290*, 390*, 490*	200, 300*, 400*, 500*	2,855 x 2,085
CAM 2025 Premium	2,050 x 2,510	2,100 x 2,800	190, 290*, 390*, 490*	200, 300*, 400*, 500*	2,855 x 3,085
CAM 2030 Premium	2,050 x 3,010	2,100 x 3,300	190, 290*, 390*, 490*	200, 300*, 400*, 500*	2,875 x 3,594

\* optional equipment

\*\* depending on the equipment of the machine, the external dimensions may slightly differ

The height of the machine varies depending on passage height/z axis and a possible housing.

The Premium machines are available in more intermediate sizes – just ask us.

Classic Line

Premium Line

Active Pro Line

Active Mold Line

Machining Units

Fixing Devices

Measuring Devices

Peripheral Equipment

Software

Accessories

## Premium line

Due to its construction with two y axes left and right of the mounting area we can provide your system with **recesses in the machine table**. An already standardized variant of this is the so-called **front clamping range** where you can fix your workpieces vertically (see images on the opposite page and on page 24). The workpieces may reach nearly down to the ground while they are worked on at their top. This front clamping range has a depth of 250 or 500 mm and the width of the x positioning range (see table). For holding fixing devices, it is equipped with a T-slot plate.

### Front clamping range for very high workpieces

The front clamping range is very commonly used for the **housing production**, where longer housings or similar workpieces have to be machined also at their fronts. The rest of the mounting area of the machine can be used as usual for fixing and machining your workpieces. Especially for larger machines, an (additional) **rear recess** facilitates the loading and adjustment of workpieces in the rear area.



Detail view of the bridge with the z axis of a CAM 1525 Premium with high frequency spindle SF 650P.

## P R E M I U M

### Controller CNC 980+

- The scope of delivery of your basic system includes the controller CNC 980+ which can drive up to five axes simultaneously. Its powerful output stages always ensure a smooth machining process. You will find a detailed description of all features on page 23.



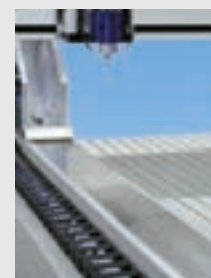
### Premium Pro package

For even **more reliability, rigidity and driving force** of your milling machine, we have compiled the Premium Pro package for an especially favourable price. It combines the following features:

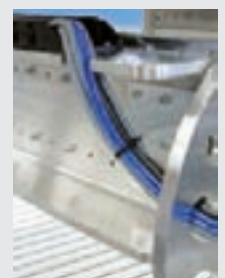
- The **axis covering** (photo below left) completely covers the rubber lip protected openings of the guide rails of the linear axes. So it effectively prevents that chips may impair the drive units – especially recommended when you are more often working without a suction unit.
- The **bridge support** (photo below right) stabilizes the x axis with an additional U-beam which is equipped with traction and pressure screws in order to enable an optimum fine adjustment – especially recommended for broader bridges.
- **Enhanced drive motors** with 7 A instead of 5 A current intensity facilitate an even more powerful machining of your workpieces.

**Description**  
Premium Pro package

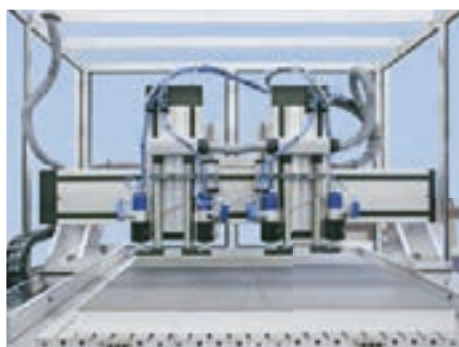
**Article no.**  
CM05-BP-PPP



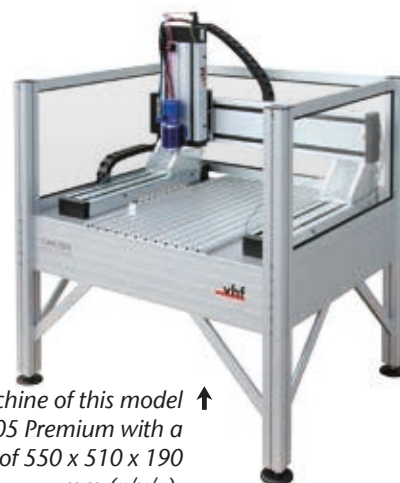
Axis covering



Bridge support



← Multiple spindle systems for processing several workpieces on a larger panel.



↑ The smallest machine of this model range: CAM 0505 Premium with a positioning range of 550 x 510 x 190 mm (x/y/z).

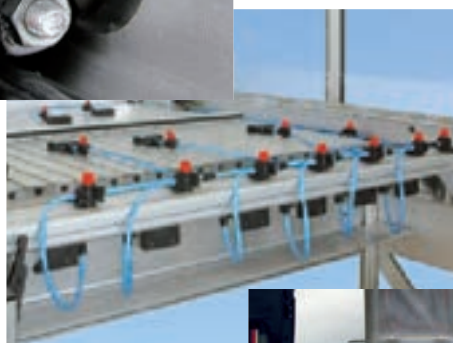
→ Detail view of the front clamping range of a CAM 1010 Premium – very practical for working on housings etc.



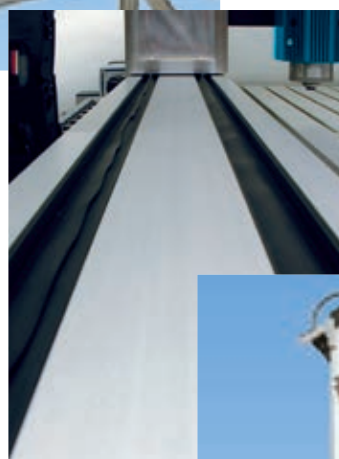
→ Ball screws of high alloy steel ensure stability, highest precision and a reliable power transmission from the High-Torque drives.



→ Just ask us if you need a special solution for fixing your workpieces – we offer many possibilities to minimize your setup times.



→ Two y axes with double linear guides each enable a low-vibration operation and thus guarantee clear-cut results when milling or engraving.



↑ The largest of its type: CAM 2030 Premium with a positioning range of 2,050 x 3,010 x 190 mm (x/y/z).

→ Extra high passage (here 500 mm) with long z axis.



Classic Line

Premium Line

Active Pro Line

Active Mold Line

Machining Units

Fixing Devices

Measuring Devices

Peripheral Equipment

Software

Accessories



## Active Pro line

The Active Pro series is the measure of all things for applications which demand a **large working area**. We build the machines with a **maximum width of 3 metres, its depth is nearly unlimited**. The CAM 2030 Active Pro displayed below with its positioning range of 2 x 3 metres has proven to be a real fast seller, especially for sign making applications.

### XXL plate processing

The low-weight aluminium construction enables very **high acceleration rates**; thanks to powerful hybrid motor drive units, it is possible to **mill materials of nearly all hardness grades**. A substructure made of panel profiles that are bolted against each other horizontally ensures high stability.

Its rack-and-pinion drive achieves a remarkable repetition accuracy of  $\pm 0.05$  mm. Thus such a vhf milling machine does not only produce **excellent milling results** for its size, it can even be used well for **engraving works**. The z axis is driven by ball screw spindles and complies with highest demands concerning precision.

### Technical data

- construction using high-strength aluminium profiles
- stable underframe as integral part of the machine
- reversed rack-and-pinion drive with precise double linear guides and hybrid motors for x and y axis
- high-revving hybrid motors with gearing for x- and y axis
- two axes in y direction enable a better distribution of force and a broader scope for special designs
- z axis with ball screw spindles free from backlash with flanged bearings
- special vacuum table – with suction units integrated into the substructure of the machine – makes it possible to exchange workpieces within seconds and offers high fixation force (e. g. suction power for CAM 2030 Active Pro 576 m<sup>3</sup>/h in four separately switchable chambers)
- dimensioning of x axis: 250 mm, dimensioning of z axis: 175 mm
- repetition accuracy in x and y direction:  $\pm 0.05$  mm; in z direction:  $\pm 0.01$  mm
- 4 end/reference switches, accuracy < 0.01 mm
- cable drag chains for all cables
- easy-to-maintain construction

### Scope of delivery

- CNC milling machine – dimensions and positioning ranges see table
- controller CNC 980+
- manufacturing computer with flat screen



*Large format system CAM 2030 Active Pro (positioning range: 2,020 x 3,020 x 160 mm) with integrated special vacuum table.*

- special vacuum table with suction units and vacuum fleece
- separate emergency stop switch
- complete cable set
- machine documentation in German or English
- delivery, installation and introduction within Germany, Austria and Switzerland by a vhf staff member

## ACTIVE PRO

## Options

## Description

Front clamp. range 500 mm  
passage 200, lift 160 mm  
passage 300, lift 260 mm

## Article no.

CM06-BA-FSB500  
CM06-BA-DL200  
CM06-BA-DL300

On request, there are individual extras available which are not listed in the following chapters. Please ask us for further details about:

- multi-spindle solutions for a quick serial production of identical workpieces
- single T-slot plates which are being held by the vacuum table are a useful supplement when you have to fix e.g. (clamp) attachments for the production of special parts



## Order numbers

## Description

## Article no.

## Basic system

CAM 1010 Active Pro	CM06-BA-CAM-1010P
CAM 1020 Active Pro	CM06-BA-CAM-1020P
CAM 1520 Active Pro	CM06-BA-CAM-1520P
CAM 1525 Active Pro	CM06-BA-CAM-1525P
CAM 2030 Active Pro	CM06-BA-CAM-2030P
CAM 2040 Active Pro	CM06-BA-CAM-2040P
CAM 2050 Active Pro	CM06-BA-CAM-2050P
CAM 2060 Active Pro	CM06-BA-CAM-2060P
CAM 3080 Active Pro	CM06-BA-CAM-3080P

A real highlight of this machine series is the **special vacuum table** which is **integrated into the machine table** and included with the vacuum suction units in the system price. As it has been trimmed by surface milling, you will achieve an **optimum plane parallelism**. Your workpieces can be exchanged within just a few seconds and will then be **fixed with high adhesive force**. During the milling process, the vacuum table itself is protected by a fleece so that the tool cannot damage its surface. Please see page 52 for further details.

## Serial special vacuum table

On request you can replace the serial vacuum table fully or partly by a **T-slot table**. Your machine can also be equipped with a **front clamping range** – as known from the Premium line – for machining very high workpieces at their front sides. Depending on your requirements, these different kinds of workpiece fixation can also be combined, as shown in the image below.



Different kinds of workpiece fixation on one machine: special vacuum table (left), front clamping range for high workpieces and a T-slot table behind.

## Dimensions

Model	x/y positioning range (mm)	Mounting area (mm)	z axis lift (mm)	z passage height (mm)	Ext. dimensions (W x D in mm)**
CAM 1010 Active Pro	1,020 x 1,020	1,000 x 1,000	70, 160*, 260*	100, 200*, 300*	1,574 x 1,710
CAM 1020 Active Pro	1,020 x 2,020	1,000 x 2,000	70, 160*, 260*	100, 200*, 300*	1,574 x 2,710
CAM 1520 Active Pro	1,520 x 2,020	1,500 x 2,000	70, 160*, 260*	100, 200*, 300*	2,074 x 2,710
CAM 1525 Active Pro	1,520 x 2,520	1,500 x 2,500	70, 160*, 260*	100, 200*, 300*	2,074 x 3,210
CAM 2030 Active Pro	2,020 x 3,020	2,000 x 3,000	70, 160*, 260*	100, 200*, 300*	2,574 x 3,710
CAM 2040 Active Pro	2,020 x 4,020	2,000 x 4,000	70, 160*, 260*	100, 200*, 300*	2,574 x 4,710
CAM 2050 Active Pro	2,020 x 5,020	2,000 x 5,000	70, 160*, 260*	100, 200*, 300*	2,574 x 5,710
CAM 2060 Active Pro	2,020 x 6,020	2,000 x 6,000	70, 160*, 260*	100, 200*, 300*	2,574 x 6,710
...	...	...	...	...	...
CAM 3080 Active Pro	3,020 x 8,020	3,000 x 8,000	70, 160*, 260*	100, 200*, 300*	3,574 x 8,710
...	...	...	...	...	...

\* optional equipment

\*\* depending on the equipment of the machine, the external dimensions may slightly differ

The height of the machine varies depending on passage height/z axis.

The Active Pro machines are available in many more sizes – just ask us.



## Active Pro line

The serial five axis controller CNC 980+ which can control up to five axes makes the Active Pro systems **real all-rounders**: **milling spindles** and **tangential cutting devices** can be used both. They can be **exchanged easily** – depending on the current application. So, for instance, it becomes possible to cut also digital prints, textile and synthetical fabrics or veneer into shape.

If you often change the machining procedure, we recommend the **multi unit**, which can be mounted on Active Pro machines **in addition to the milling spindle**. So you can perform also **cutting and creasing tasks** without having to change any devices. You'll find more details on this unit on page 46.

### Special sizes nearly unlimited

Please contact us when you need a **special design with specific dimensions**. The construction of these machines using panel profiles and rack-and-pinion drives for the x and y axis which can be extended to nearly any size grants as much freedom as possible. An example is a machine with a size of 3 x 14 metres which we have manufactured for the production of side plates of refrigerated trucks.



*A multi unit (mounted right of the suction unit) is recommended when you often have to use different machining techniques.*

## ACTIVE PRO

### Controller CNC 980+

- The scope of delivery of your basic system includes the controller CNC 980+ which can drive up to five axes simultaneously. Its powerful output stages always ensure a smooth machining process. You will find a detailed description of all features on page 23.



### Further options

- For occasionally realizing different processing techniques on one machine: an optional quick-change fixture allows to quickly exchange spindle and cutting unit.



- More rational serial production of identical workpieces due to multi-spindle solutions – depending on your application, the number and type of the spindles can be varied.





← Drive concept: The power transmission works over a rack-and-pinion drive. It can be accomplished in nearly any length, so that there are only few limitations regarding the machine size.

→ Accurately secured: The machine and spindle controllers can be embedded safely and space-savingly into the underframe.



→ For a low-maintenance operation: The sliding carriages of the linear guides will be kept clean by a chip protection roof and a chip wiper.



↑ The smallest specimen of this model range: CAM 1010 Active Pro with a positioning range of 1,020 x 1,020 x 260 mm (x/y/z).



↑ Multi-spindle solution with two independent z axes and eight spindles which have their own dust extraction each.



← A large-scale machine: CAM 2050 Active Pro with a positioning range of 2,020 x 5,020 x 260 mm (x/y/z) – however, the size limit of this model range is far from being reached.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## Active Mold line

With the Active Mold line we have developed a CNC milling machine on the basis of our popular Active Pro line. It is especially suitable for three-dimensionally milling large blocks. Due to an especially **stable framework construction of high-tensile aluminium profiles** with numerous crossbars and many stand supports, the load will be evenly spread. Thus you can load **very heavy workpieces** onto the Active Mold systems.

### Three-dimensional milling of voluminous moulds

Depending on their condition, you can either **fix the workpieces directly** or the crossbars can be covered with an **additional mounting surface**. This may be a T-slot table on which you can mount clamping devices for fixing the workpiece, but a vacuum table would be possible, too. The open construction of the machine and the little height of the workpiece support make it easy to exchange workpieces.

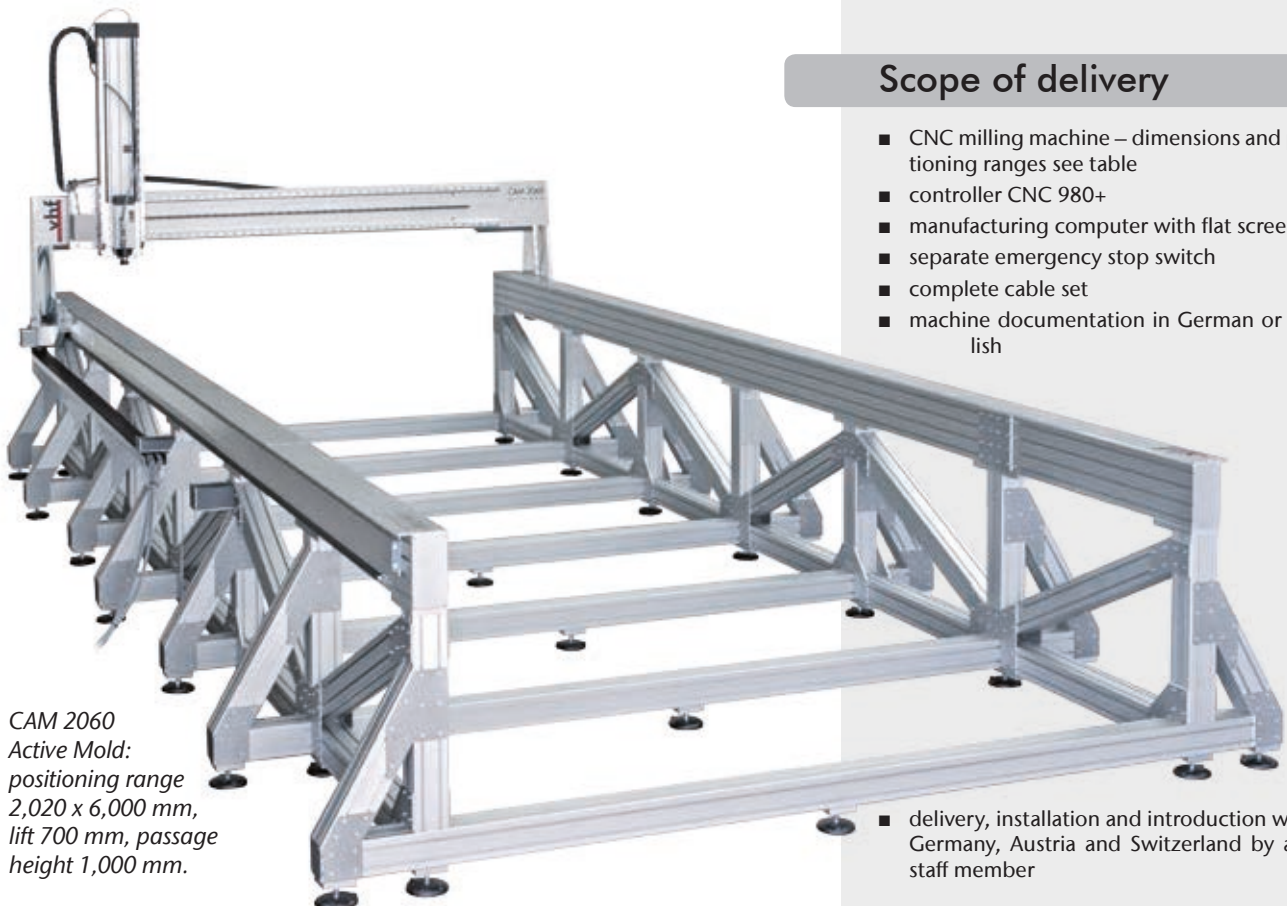
The Active Mold line is ideal for **rapid prototyping** and **mould making** where all kinds of voluminous objects of styrofoam, model making materials, plastics or wood have to be produced. Your possibilities are manifold: in the design phase of a product you can produce **functional or illustrative models**, for the serial production you can produce **casting moulds** or you can also produce **individually designed assembly parts**.

### Technical data

- maximum stability aluminium framework construction made of profiles with 100 mm edge length for great workpiece loads
- x positioning range selectable from 1,020 mm to 2,520 mm in steps of 500 mm each
- y positioning range selectable from 1,600 mm to 8,200 mm in steps of 1,100 mm each (larger special designs are possible)
- z axis lift 700 mm, passage height 1,000 mm
- reversed rack-and-pinion drive with precise double linear guides and double sliding carriages for x and y axis
- high-revving hybrid motors with gearing for x and y axis
- two axes in y direction enable a better distribution of force and a broader scope for special designs
- z axis with ball screw spindles free from backlash with flanged bearings
- mounting surface for workpieces (e. g. T-slot table) can be added
- dimensioning of x axis: 250 mm, dimensioning of z axis: 225 mm
- repetition accuracy in x and y direction:  $\pm 0.05$  mm; in z direction:  $\pm 0.01$  mm
- 4 end/reference switches, accuracy  $< 0.01$  mm
- cable drag chains for all cables
- easy-to-maintain construction

### Scope of delivery

- CNC milling machine – dimensions and positioning ranges see table
- controller CNC 980+
- manufacturing computer with flat screen
- separate emergency stop switch
- complete cable set
- machine documentation in German or English



CAM 2060  
Active Mold:  
positioning range  
2,020 x 6,000 mm,  
lift 700 mm, passage  
height 1,000 mm.

- delivery, installation and introduction within Germany, Austria and Switzerland by a vhf staff member



## ACTIVE MOLD

## Options

On request, there are individual extras available for this model range which are not listed in the following chapters. Please ask us for further details about:

- T-slot table or vacuum table which can be mounted completely or partly on the cross-bars as supporting area for the workpieces

## Order numbers

## Description

## Article no.

## Basic system

CAM 1016 Active Mold	CM07-BM-CAM-1016
CAM 1527 Active Mold	CM07-BM-CAM-1527
CAM 2027 Active Mold	CM07-BM-CAM-2027
CAM 2038 Active Mold	CM07-BM-CAM-2038
CAM 2049 Active Mold	CM07-BM-CAM-2049
CAM 2060 Active Mold	CM07-BM-CAM-2060
CAM 2571 Active Mold	CM07-BM-CAM-2571
CAM 2582 Active Mold	CM07-BM-CAM-2582



Extra high z passage height: 1,000 mm.



CAM 1016 Active Mold, the smallest machine of this model range: positioning range 1,020 x 1,600 mm, lift 700 mm, passage height 1,000 mm.



Detail view of the additionally reinforced z axis with a lift of 700 mm (here a rotary current spindle SPC 6000 is mounted).



The stable framework construction of aluminium profiles allows to load heavy workpieces and facilitates a low-vibration operation.

## Dimensions

Model	x/y positioning range (mm)	Mounting area (mm)	z axis lift (mm)	z passage height (mm)	Ext. dimensions (W x D in mm)*
CAM 1016 Active Mold	1,020 x 1,600	1,370 x 2,280	700	1,000	2,220 x 2,308
CAM 1527 Active Mold	1,520 x 2,700	1,870 x 3,380	700	1,000	2,720 x 3,408
CAM 2027 Active Mold	2,020 x 2,700	2,370 x 3,380	700	1,000	3,220 x 3,408
CAM 2038 Active Mold	2,020 x 3,800	2,370 x 4,480	700	1,000	3,220 x 4,508
CAM 2049 Active Mold	2,020 x 4,900	2,370 x 5,580	700	1,000	3,220 x 5,608
CAM 2060 Active Mold	2,020 x 6,000	2,370 x 6,680	700	1,000	3,220 x 6,708
CAM 2571 Active Mold	2,520 x 7,100	2,870 x 7,780	700	1,000	3,720 x 7,808
CAM 2582 Active Mold	2,520 x 8,200	2,870 x 8,880	700	1,000	3,720 x 8,908

\* depending on the equipment of the machine, the external dimensions may slightly differ  
The Active Mold machines are available in more sizes – just ask us.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories





## Machining units

In the second step, you choose an appropriate machining unit. Its quality determines that of your later results decisively. That's why we offer a great variety for each kind of application and each price segment:

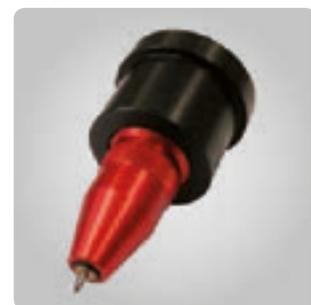
- **Rotary current spindles** – much power for great removal performance; they can also hold the biggest tool diameters. ► Page 36
- **High frequency spindles** – you will achieve best results with these precision spindles when you work at high rates of feed and high rotational speeds. ► Page 38
- **Standard spindle** – a plain spindle as starter model or for replacement purposes for a reasonable price. ► Page 40
- **Dot embossing unit** – ideal for inscriptions in very hard sorts of metal. ► Page 41
- **Cutting units** – by cutting instead of milling, some soft materials can be processed quicker and in better quality. ► Page 44

For selecting your suitable spindle, you can ask yourself some guiding questions. Of course, we would be glad to advise you in considering all relevant details.

When should one choose a **high frequency spindle**? Usually you can follow the principle “high rotational speed instead of high torque” for working on most kinds of plastics and non-ferrous metals with smaller tool diameters (diameter from **1 to 6 mm**).

A **high-revving rotary current spindle** is recommended for medium tool sizes (diameter from approximately **4 to 10 mm**). Using these spindles you have the greatest flexibility.

And when should one prefer a **low-revving rotary current spindle**? A spindle with much power and torque makes mainly sense when a high chip removal rate should be achieved with bigger tools (diameter from approximately **8 to 20 mm**).

Classic  
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LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## Rotary current spindles

These rotary current asynchronous motors are due to their high torque very well suitable for **powerful milling works** with bigger tool diameters in plastics, wood and metal. Maximum rotational speeds of up to 40,000 RPM allow high rates of feed even when you are using medium tool diameters. As standard we offer rotary current spindles with up to 6 kW nominal power respectively 12 kW maximum power.

A tempered and ground sleeve shaft with several bearings guarantees **high precision**. So even fine engravings can be done. The intelligent controller enables constant rotational speeds, even when the load is changing. On top of that, the spindles are fully software-controlled and integrated into the safety concept of the milling machine.

All P models have a pneumatic cone receptacle which is a prerequisite for an **automatic tool change**. Thus your machining process can go on in a highly automatized way and becomes very efficient. On page 66 you will find appropriate tool change devices.



Rotary current spindle SPC 2300P with pneumatic WK 19 cone change.

### Features

- see table with technical data for power, rotational speed and chucking capacity
- tool change: manual with special wrenches or with pneumatic cone change (see technical data)
- software-controlled frequency converter with monitoring functions (temperature, overload etc.) and status indication via LEDs
- compressor cooling unit for protecting the spindles from overheating under high load (see technical data)

### Requirements

Please note that you need a dry and oil-free **compressed air supply** for all rotary current spindles with pneumatic tool change or sealing air. You will need a constant pressure of 6 bar. The air consumption of the pneumatic tool change can be disregarded, the consumption of sealing air amounts to approximately 100 to 150 litres per minute. Depending on the whole equipment of your milling machine, it is possible to choose between different types of compressors. Several questions may lead you to the right model: how high is the consumption of sealing air, is there a cooling/spraying unit or a pneumatic tool change, how long are the hoses, what is the maximum noise level of the compressor?

The spindle types **SPC 2300P, SPC 3800P, SPC 5500P** and **SPC 6000** will be delivered with a frequency converter which has to be installed in a 19 inch system rack. The spindle type SPC 2300P will be delivered with an extra compressor cooling unit. For the installation of these components, an appropriate **19 inch system rack** is required (see page 76).

### Advantages

- ideal for heavy milling works, also with big tool diameters
- high precision
- long lifetime of spindle bearings
- adjustable rotational speed
- high-revving spindles with up to 40,000 RPM available
- high torque
- large clamping range
- software-controlled frequency converter with monitoring functions

## Scope of delivery

- rotary current asynchronous motor
- SPC 1000, SPC 1500 and SPC 1500P: frequency converter in table housing or 19 inch slide-in housing for integration into the underframe of the machine or for installation into a system rack; all models from SPC 2300P: frequency converter in 19 inch slide-in housing
- collet chucks: always 3, 4, 6 and 8 mm, additionally for SPC 1500, SPC 1500P and SPC 2300P: 10 mm, additionally for SPC 3800P, SPC 5500P and SPC 6000: 10, 12, 16 and 20 mm; spindles with manual tool change will be delivered additionally with hook/pin wrench, spindles with pneumatic cone change will be delivered additionally with one cone and a mounting device with an appropriate wrench
- all necessary connection cables
- compressor cooling device for SPC 2300P

## Order numbers

### Description

SPC 1000  
SPC 1500  
SPC 1500P  
SPC 2300P

### Article no.

CM12-SPC1000  
CM12-SPC1500  
CM12-SPC1500P  
CM12-SPC2300P

SPC 3800P  
SPC 5500P  
SPC 6000

CM12-SPC3800P  
CM12-SPC5500P  
CM12-SPC6000

### For re-orders

Collet chucks, cones  
and accessories

page 92



SPC 1000, the smallest rotary current spindle.



SPC 1500 with manual tool change.



SPC 3800P with pneumatic SK 30 cone change



Power pack: SPC 6000 with 6 kW nominal power.

## Technical data

Model	Power S1*	Power S6**	Power P <sub>max</sub> ***	Rotational speed (RPM)	Tool change	Seal. air	Cool. unit	Chucking capacity	Model range
<b>High-revving rotary current spindles</b>									
SPC 1000	1,000 W	○	○	3,000–30,000	manual	no	no	≤ 8 mm	C P AP AM
SPC 1500	1,500 W	1,900 W	4,100 W	5,000–30,000	manual	yes	no	≤ 10 mm	C P AP AM
SPC 1500P	1,500 W	1,900 W	4,100 W	5,000–30,000	pneum., WK 19	yes	no	≤ 10 mm	P AP AM
SPC 2300P	2,300 W	2,600 W	3,500 W	5,000–40,000	pneum., WK 19	yes	yes	≤ 10 mm	P AP AM
<b>Low-revving rotary current spindles</b>									
SPC 3800P	3,800 W	4,600 W	6,600 W	1,000–24,000	pneum., SK 30	yes	no	≤ 20 mm	P AM
SPC 5500P	5,500 W	6,600 W	12,000 W	1,000–20,000	pneum., SK 30	yes	no	≤ 20 mm	P AM
SPC 6000	6,000 W	7,200 W	8,600 W	2,000–18,000	manual	no	no	≤ 20 mm	P AP AM

\* S1 mechanical output power under continuous load of the spindle (100% machining time)

\*\* S6 mechanical output power during a simulated machining cycle (60% machining time, 40% positioning time)

\*\*\* P<sub>max</sub> maximum mechanical output power of the spindle

○ value not determined

Please ask us also for spindles with other power characteristics (output power, rotational speed range, torque, ...).

## High frequency spindles

You should always decide for an HF spindle when your workpieces have to be processed with **highest precision**. Their true running accuracy lies in the range of a few micrometres. Due to their power of up to 1.3 kW, these spindles are also suitable for medium tool diameters. The **high rotational speed** enables **amazing rates of feed** with small tool diameters.

The spindles are available with different kinds of **tool changing devices**. The smallest model, SF 170, for instance is available with a quick chucking device with which you can even manage a manual tool change comfortably and fast. On top of that there is also a **pneumatic chucking device** available. For all spindles with pneumatic chucking device, we recommend an automatic tool changer (see page 66), with which this process is being executed fully automatized within seconds. The model SF 300 is either available with a manual chucking device or a pneumatic chucking device. All spindles from SF 650P up are always equipped with a pneumatic chucking device.



Highly precise high frequency spindle SF 1300P with pneumatic tool change and liquid cooling.

### Features

- see table with technical data for power, rotational speed and chucking capacity
- tool change: manual (SF 170 with quick chucking device) or pneumatic
- connection for sealing air (except SF 160 and SF 170) which prevents entering of liquid and other foreign substances in the bearing area
- software-controlled frequency converter with monitoring functions
- displays for rotational speed, load, spindle overload etc. from SF 300 up
- compressor cooling unit with 600 W cooling power for spindles from SF 1000P on

### Requirements

Please note that you need a dry and oil-free **compressed air supply** for all high frequency spindles from SF 170P up. If the spindle has an pneumatic tool change, a constant pressure of 6 bar is required. The air consumption of the pneumatic tool change can be disregarded, the consumption of sealing air amounts, depending on the spindle size, to approximately 50 to 100 litres per minute. Depending on the whole equipment of your machine, it is possible to choose between different types of compressors. Several questions may lead you to the right model: how high is the consumption of sealing air, is there a cooling/spraying unit or a pneumatic tool change, how long are the hoses, what is the maximum noise level of the compressor?

The spindle types from SF 1000P up will be delivered with a compressor cooling unit. For its installation, an appropriate **19 inch system rack** is required (see page 76).

### Advantages

- high rotational speed, infinitely variable rotational speed spectrum
- great rotational speed stability, even under load
- very silent operation
- high efficiency at low weight and size
- precision bearing
- high reliability
- completely software-controlled
- quick chucking device respectively pneumatic chucking device available



## Scope of delivery

- HF spindle incl. motor cable and spindle carrier with cooling ribs
- frequency converter (power depending on spindle type) in table housing or 19 inch slide-in housing for integration into the underframe of the machine or for installation into a system rack
- all necessary connection cables
- cooling unit for heat abstraction of the spindle (from SF 1000P up)
- collet chucks: always 3 mm, additionally for SF 300 to SF 1300P: 4 and 6 mm

The spindle type SF 160 has an adjustable height compensator in its mounting device for levelling height tolerances of up to 5 mm mechanically. The device is lockable for milling works.



High frequency spindle SF 170 with quick chucking device.



SF 300P with pneumatic tool changer.

## Order numbers

### Description

SF 160  
SF 170  
SF 170P  
SF 300  
SF 300P  
SF 650P  
SF 1000P  
SF 1300P

### Article no.

CM13-SF0160-BK  
CM13-SF0170-BK  
CM13-SF0170-P  
CM13-SF0300-BK  
CM13-SF0300-P  
CM13-SF0650-P  
CM13-SF1000-P  
CM13-SF1300-P

### For re-orders

Collet chucks and other accessories

page 94



High frequency converter (included in scope of delivery).



Compressor cooling unit (from SF 1000P on).

## Technical data

Model	Power S1*	Power S6**	Power P <sub>max</sub> ***	Rotational speed (RPM)	Tool change	Seal. air	Cool. unit	Chucking capacity	Model range
SF 160	160 W	○	○	2,000–50,000	manual	no	no	≤ 3.175 mm	C
SF 170	170 W	240 W	240 W	5,000–60,000	quick chucking	no	no	≤ 3.175 mm	C
SF 170P	170 W	240 W	240 W	5,000–60,000	pneumatic	yes	no	≤ 3.175 mm	C
SF 300	300 W	340 W	360 W	5,000–60,000	manual	yes	no	≤ 6 mm	C P AP
SF 300P	300 W	340 W	360 W	5,000–60,000	pneumatic	yes	no	≤ 6 mm	C P AP
SF 650P	650 W	830 W	1,200 W	5,000–60,000	pneumatic	yes	no	≤ 6 mm	C P AP
SF 1000P	1,000 W	1,100 W	1,600 W	5,000–80,000	pneumatic	yes	yes	≤ 6 mm	C P AP
SF 1300P	1,300 W	1,500 W	2,500 W	5,000–60,000	pneumatic	yes	yes	≤ 6 mm	C P AP

\* S1 mechanical output power under continuous load of the spindle (100% machining time)

\*\* S6 mechanical output power during a simulated machining cycle (60% machining time, 40% positioning time)

\*\*\* P<sub>max</sub> maximum mechanical output power of the spindle

○ value not determined

The spindle types SF 170, SF 170P, SF 300 and SF 300P are optionally available with a rotational speed range up to 100,000 RPM.

## Standard spindle

We mainly recommend the standard spindle as a replacement spindle or as a starter model. This spindle has a nominal power of 560 watts and a speed range of 10,000 to 29,000 RPM. The selected rotational speed will be held constant even under load by an electronic circuit. This spindle is a **reasonably priced alternative** for all kinds of works which do not demand high precision. The main field of application lies in drilling and milling wood, plastics and aluminium.



*Standard spindle – a good-value alternative for tasks which do not demand high precision.*

C  
ClassicP  
PremiumAP  
Active ProAM  
Active Mold

### Technical data

- nominal power: 560 W
- power consumption: 1,050 W
- rotational speed range: 10,000–29,000 RPM
- electronic circuit for constant rotational speed
- chucking capacity: up to 8 mm

#### Optional

- spindle switchable (on/off) via software-controlled switching unit; integration into the emergency stop concept

### Advantages

- low-cost spindle
- well suitable as starter or replacement spindle

### Scope of delivery

#### Standard

- drilling and milling spindle incl. cables
- 4 collet chucks: 3 mm, 4 mm, 6 mm and 8 mm
- jaw wrenches
- mounting block

#### Optional

- switching unit for automatic control

### Order numbers

#### Description

Standard spindle  
Switching unit PSW 01

#### Article no.

CM11-STD1050  
page 101

#### For re-orders

Collet chucks & accessories page 92

C  
ClassicP  
PremiumAP  
Active Pro

## Technical data

- very high processing speed up to approximately 80 mm/s
- no rotating tool
- workpiece surface will be compressed punctiform by vertical oscillation of the inscription needle
- usable for nearly all kinds of workpieces (also tempered up to approximately 62 HRC)
- inscription needle nearly free from mechanical wear and tear
- small height differences on the workpiece will be levelled

## Requirements

Please note that you need a dry and oil-free **compressed air supply** which has to provide the dot embossing unit with 8 bar in continuous operation. Depending on the whole equipment of your machine, it is possible to choose between different types of compressors. Several questions may lead you to the right model: how high is the consumption of sealing air, is there a cooling/spraying unit or a pneumatic tool change, how long are the hoses, what is the maximum noise level of the compressor?

## Scope of delivery

- dot embossing unit
- compressed air hoses
- pressure control valve for regulating the compressed air between 4 and 8 bar

## Order numbers

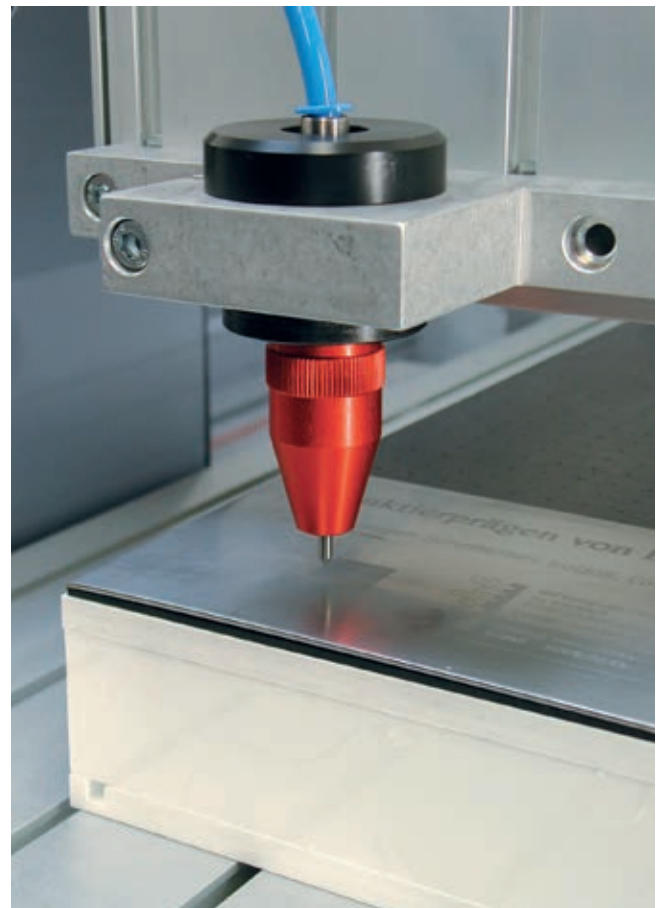
Description	Article no.
Dot embossing unit	CM14-PPK-GS

## Dot embossing unit

This unit has been especially designed for **lettering metal**. It is possible to work on very hard types of metal like **steel or stainless steel**. The tip of the tool is made of extremely hard metal and nearly free from mechanical wear and tear.

This method works **without chip removal** as it would be the case in the engraving or milling process. The dot embossing unit punctually compresses the surface of the workpiece by numerous little "hammer strokes" with a thin needlepoint. The needle oscillates with a frequency of about 300 Hertz so that the single dots adjoin each other very closely even at higher rates of feed. The inscriptions look as if they have been engraved.

The dot embossing unit is **powered by compressed air**, a modification of the air pressure modifies also the immersion depth of the needle. Although the **tip of the needle is nearly resistant to wear**, it can be regrind if necessary. A dot embossing unit is a good supplement for an engraving or milling spindle when harder materials have to be inscribed more frequently.



Dot embossing unit powered by compressed air – for marking and lettering without chip removal.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

Photo: Theis Werbung, Neuwied



← Signboards and nameplates without limitation of size.



← Precise engravings on brass plates – nothing easier than that.



→ Milling technical parts of aluminium.



→ You can achieve special effects by milling out letters or logos, if necessary they can be metres high.

Photo: foliendesign GmbH, Essen

→ You will create especially sophisticated signboards by using backlit letters or logos.



Photo: Harisch Werbetechnik, Bad Emstal



← Cutting wood parts for the furniture production.

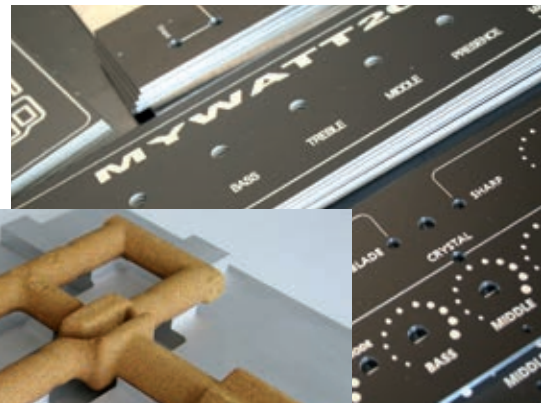
Photo: Postma &amp; Partner, Delft



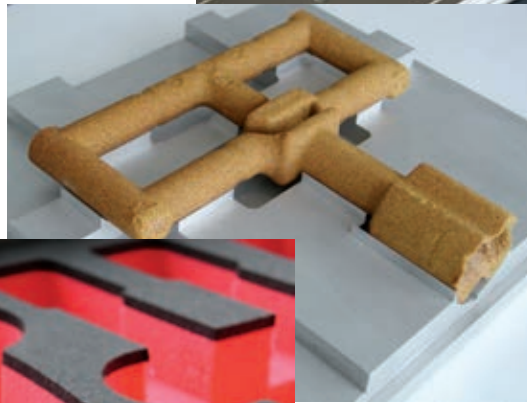
← Even complicated architectural models can be produced with highest precision.



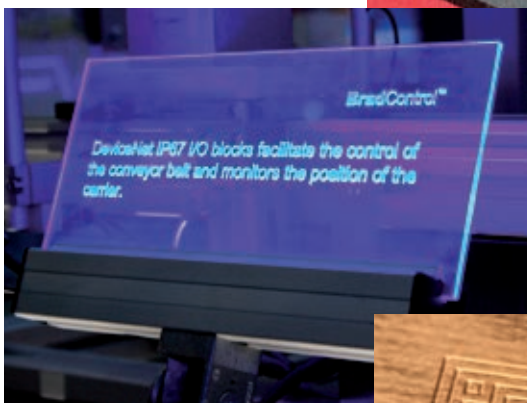
All kinds of front plates can be engraved, drilled and milled. →



Individual production of industrial workpiece fixtures. →



← Milling pockets in foam, e. g. for the customer-specific equipment of tool boxes.



← Milling and engraving illuminated signs of acrylic glass.

Ornaments and adornments for furniture and decorative items. →



Advertising sign with inlay works of plastics and acrylic glass. →



Comparison of the sizes: even most filigree model parts can be produced. →



Classic Line

Premium Line

Active Pro Line

Active Mold Line

Machining Units

Fixing Devices

Measuring Devices

Peripheral Equipment

Software

Accessories

C  
ClassicP  
PremiumAP  
Active Pro

## Tangential cutting head

By using a cutting head, you can considerably extend the range of applications of your CNC milling machine. This tangential cutting head is suitable for cutting plotter film and flock material where a bottom layer shall not be cut through. However, with its additional **actuating motor** which aligns the lance **tangentially into cutting direction**, the tangential cutting head offers a considerable extra benefit compared with a drag knife (see page 49). So it is possible to **precisely cut** also very narrow paths and small fonts.

With the **kiss-cut method** which is applied here, only the surface layer of a film will be cut through but not the bottom layer below. The lance is led in a **distance bush** which glides over the material. The length which the lance emerges from the distance bush is the immersion depth into the material at the same time and can be steplessly adjusted. If the immersion depth is increased accordingly, the tangential cutting head can also be used for cutting the surface layer together with the bottom layer. You can adjust the pressing force of the lance on the material with a thumb wheel so that a wide scope of materials can be cut.

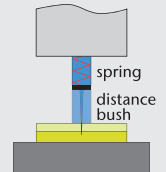


*Tangential cutting head with resilient cutting unit for film and flock material.*

### Technical data

- automatic tangential adjustment of the tool into machining direction to the working path
- kiss-cut method (see illustration) for cutting film, flock and similar materials where a surface layer has to be cut and a bottom layer below shall not be cut through
- steplessly adjustable cutting depth by a distance bush which glides over the material
- spring force can be finely adjusted over a latching thumb wheel; separate display of the set pressing force
- optionally available with quick-change fixture for a quick exchange with the spindle

tangential tool adjustment  
working path



*The lance emerges a little bit from the distance bush; the thumb wheel is used for setting the pressing force.*

### Scope of delivery

- tangential cutting head; for CNC 980+ controllers incl. additional axis card
- electric cables
- lance

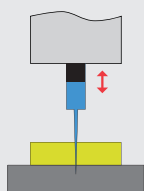
### Order numbers

Description	Article no.
Tangential cutting head	CM15-SK-TSK-EA
<b>For re-orders</b>	
Lances	see tool catalogue

C  
ClassicP  
PremiumAP  
Active Pro

## Technical data

- automatic tangential adjustment of the tool into machining direction to the working path
- lance oscillation electrically powered with a frequency of 100 Hertz (equals 6,000 strokes per minute), so it is becomes possible to cut even thicker materials without burrs
- lift approximately 3 mm
- lances available in lengths from 5 to 70 mm
- for burr-free cutting tasks, also in thicker materials, optimally suitable e. g. for sign making, packaging technology, model making, industry, ...
- for working on wallpapers, carpets, balsa wood, cardboard, rubber materials (sealings, mats), foamed plastics, many typical sign making materials (PVC foam, polystyrene, Kapa®, composite materials, capillary plates), textile fabrics, leather, sandblast foils, pool foils, truck tarpaulins, ...
- optionally available with quick-change fixture for a quick exchange with the spindle (for another image, please see page 30)



## Scope of delivery

- oscillating tangential cutting head; for CNC 980+ controllers incl. additional axis card
- electric cables
- lance

## Order numbers

Description	Article no.
Oscillating tangential cutting head	CM15-SK-OTSK100
<b>For re-orders</b>	
Lances	see tool catalogue

## Oscillating tangential cutting head

In this machining unit a thin carbide lance moves up and down with high speed. So it becomes possible to work on much **thicker materials** than just on film. Especially when cutting soft materials or materials which tend to fray easily, you get **burr-free and clean-cut edges**. Some materials like foam rubber, cardboard or composite materials can be better cut with an oscillating lance into the requested shape than be milled with a rotating tool. As the lance is automatically adjusted into the cutting direction, you will get very **precise results**.

The oscillating tangential cutting unit is **electrically powered** and has an oscillation frequency of **100 Hertz**. This equals approximately 6,000 strokes per minute. The thickness of the materials which you can cut depends only on the length of the lance (up to 70 mm). So the oscillating tangential cutting head is suitable for working on most common materials.



Oscillating tangential cutting head, mounted with a quick-change fixture.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

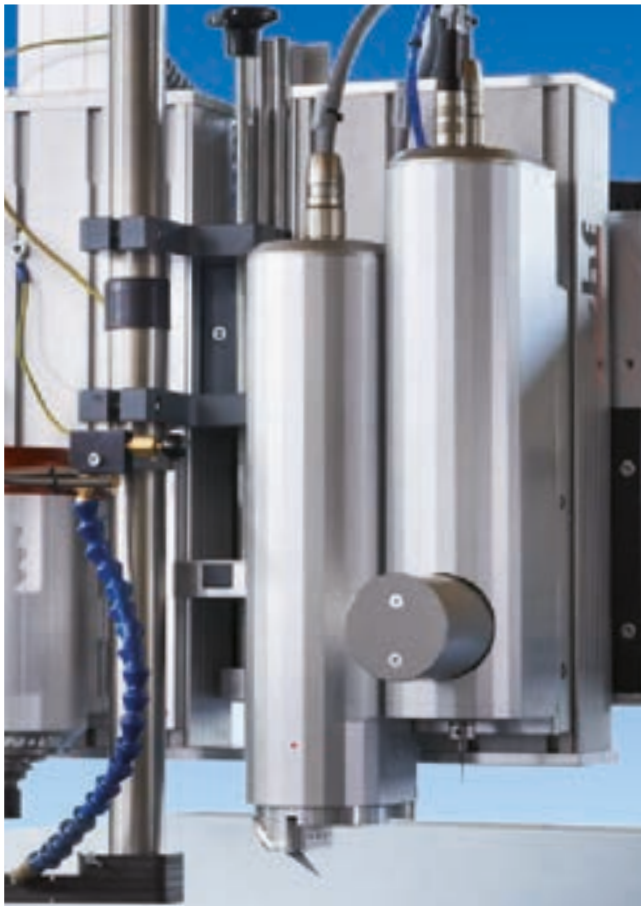


## Multi unit

There are always **two machining units** mounted on the multi unit: the oscillating tangential cutting head (see page 45) and a universal head which can be equipped with different attachments. The active head will be lowered with a **pneumatic lift cylinder** into its working position while the other head will be lifted into its home position at the same time. So a mutual interference can be excluded.

### straight cutting, diagonal cutting, creasing...

While machining your workpieces, the multi unit performs a separation of tasks: The **oscillating tangential cutting head** (to the right on the unit) is responsible for straight cuts into thicker materials. The **universal head** (to the left on the unit) manages the rest. Thanks to the **manifold selection of tool attachments** for this machining unit, it can be used for cutting straightly, for 45 degrees diagonal cutting and for creasing. During the machining process, an actuator automatically adjusts the tool tangentially to the working path.



Three machining units in use at the same time on an Active Pro machine: leftmost the milling spindle, next to it the multi unit.

## Technical data

### Multi unit in general

- Active Pro line: the machining units are mounted on a separate sliding carriage which is moved together with the z axis
- Premium line: the machining units are mounted on a plate, which can be exchanged with the spindle on the z axis
- the machining unit which is active is moved with pneumatic lift cylinders into working position
- automatic tangential adjustment of the tool into machining direction to the working path
- for working on wallpapers, carpets, balsa wood, cardboard, rubber materials (sealings, mats), foamed plastics, many typical sign making materials (PVC foam, polystyrene, Kapa®, composite materials, capillary plates), textile fabrics, leather, sandblast foils, pool foils, truck tarpaulins, ...



### Oscillating tangential cutting head

- electrically powered lance oscillation with a frequency of 100 Hertz (~ 6,000 strokes per minute); lift approximately 3 mm
- for burr-free cutting tasks, also in thicker materials (for details please see page 45)

### Universal head

- adaptable to different machining tasks by using easily exchangeable tool attachments for straight cutting, kiss-cutting, diagonal cutting (V-cut) and creasing (please turn over for more details)
- other tool attachments on request



The universal head with a creasing attachment.

## Please note

- when you use the multi unit on machines of the Active Pro line, it is mounted right of the spindle at the bridge, so the positioning range for the multi unit is reduced by up to 300 mm; for milling tasks there are no limitations
- for the pneumatic lift cylinders a dry and oil-free compressed air supply is required which has to provide the unit with 6 bar in continuous operation



P

Premium

AP

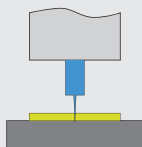
Active Pro

## Tool attachments

The (non-oscillating) **universal head** can be used for different kinds of machining tasks just by choosing the proper attachment:

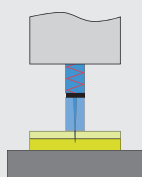
### ■ straight cutting attachment:

a straight knife for cutting thin materials (paper, cardboard, foil and similar things)



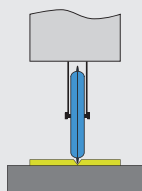
### ■ kiss-cut attachment:

this knife cuts only through the surface layer of a film, but not through the bottom layer below; the lance is led in a distance bush which glides over the material



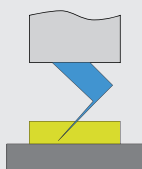
### ■ creasing attachment:

attachment with two different, exchangeable wheels: 1 creasing wheel for stronger materials like cardboard, solid board or plastics and 1 creasing wheel for softer materials like corrugated board



### ■ V-cut attachment:

knife with an angle of 45° for diagonal cutting; available in three lengths: from extra short for passe-partout production up to a long type for 16 mm thick materials



## Scope of delivery

- separate sliding carriage respectively mounting plate with pneumatic lift cylinders
- oscillating tangential cutting head including 1 lance
- universal head
- additional axis card for CNC controller

## Order numbers

Description	Article No.
Multi unit Active Pro	CM15-SK-MSA-AP
Multi unit Premium	CM15-SK-MSK

### Tool attachments for universal head

Straight cutting attachment:

- 2 mm cutting depth CM15-SK-UK-SC/2
- 5 mm cutting depth CM15-SK-UK-SC/5

Kiss-cut attachment CM15-SK-UK-KC

Creasing attachment incl. 2 wheels CM15-SK-UK-RA

V-cut attachment, 2.5 mm CM15-SK-UK-VC02

V-cut attachment, 10 mm CM15-SK-UK-VC10

V-cut attachment, 16 mm CM15-SK-UK-VC16

### For re-orders

Knives see tool catalogue

If the universal head is used with a **straight cutting attachment**, you ideally cut very thin materials like film or cardboard. A spring-mounted **kiss-cut attachment** is useful if you want to cut just through the surface layer of a film, but not through its bottom layer below. Moreover, the universal head can be equipped with a **creasing wheel** for applying folds to cardboard or similar materials.

The **V-cut attachment** is especially interesting for advertising and exhibition purposes. You can use it for **diagonally cutting** corrugated board or sandwich materials like Re-board®, Allison® or Kapa®. So you can produce stable three-dimensional objects like displays, trade fair and shop furnishings, packaging boxes or customer-specific samples. But you can also process thin materials like passe-partouts with this attachment.

The multi unit is available in two variants: Firstly, a **firmly fixed unit** for the Active Pro line which is mounted on a separate sliding carriage at the bridge. In this case the additional machining units are always right of the spindle. This variant opens up completely new possibilities to you: without any alterations on the machine there are always three different machining units at your disposal. Secondly, a **removable unit** for the Premium line which can be exchanged with a quick-change fixture against the spindle on the z axis.



The universal head is suitable for many applications – here it is equipped with a V-cut knife for 45 degrees diagonal cutting.

Classic Line

Premium Line

Active Pro Line

Active Mold Line

Machining Units

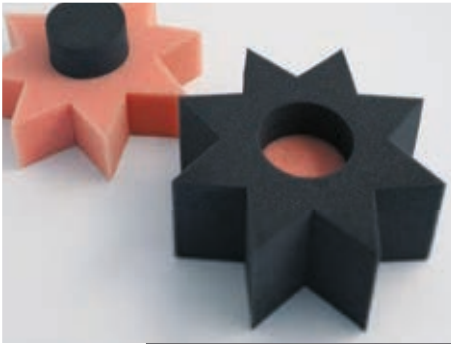
Fixing Devices

Measuring Devices

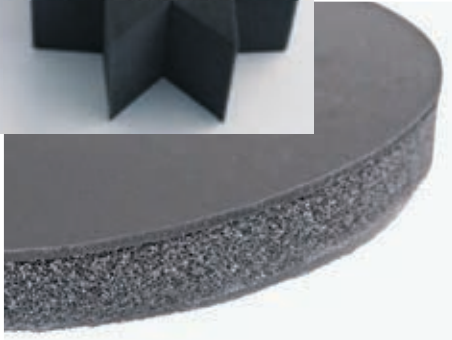
Peripheral Equipment

Software

Accessories



← With the oscillating tangential cutting head you are well prepared for a lot of cutting tasks: Here especially thick foam parts have been cut with a 70 mm lance.



← Cutting composites of different densities: here of hard rubber and foam rubber.



← Even especially soft and flexible materials like filter fleece can be reliably cut.

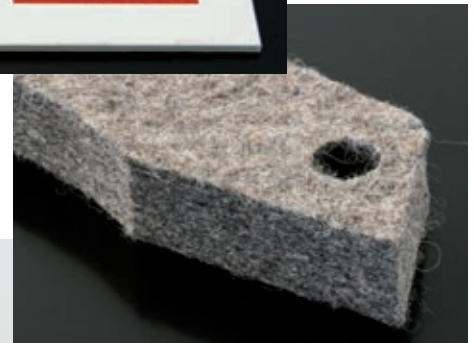


↑ Manufacturing stable objects of corrugated cardboard.

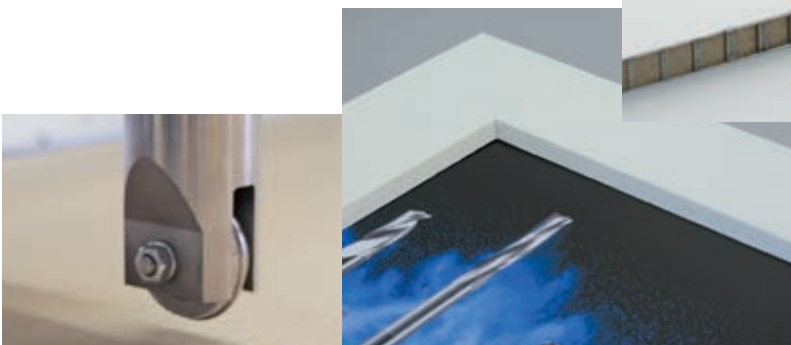
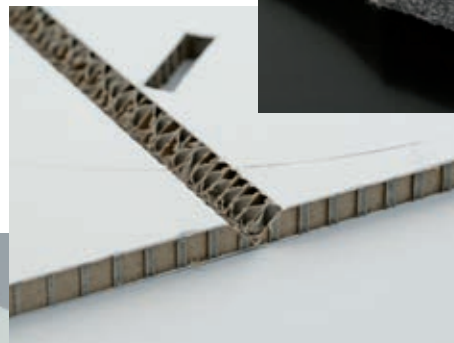
You can precisely cut cardboard and paperboard. →



Cutting felt parts – using the extra narrow vhf lances you can even cut very small contours. →



Combined cutting works in honeycomb sandwich boards with the multi unit: 45 degrees diagonal cutting with the V-cut attachment for the universal head and cutting the internal and external contours with the oscillating tangential cutting head. →



← Cutting passe-partouts with the short V-cut attachment of the universal head.



← Applying folds to cardboard with the creasing wheel attachment of the universal head.

**C**  
Classic**P**  
Premium**AP**  
Active Pro

## Technical data

- very good bearing of the knife
- adjustable cutting force
- kiss-cut method for cutting vinyl film letterings
- steplessly adjustable cutting depth by a distance bush which glides over the material
- can also be mounted next to other machining units

## Scope of delivery

- spring-mounted knife unit
- knife

## Order numbers

**Description**  
Drag knife unit

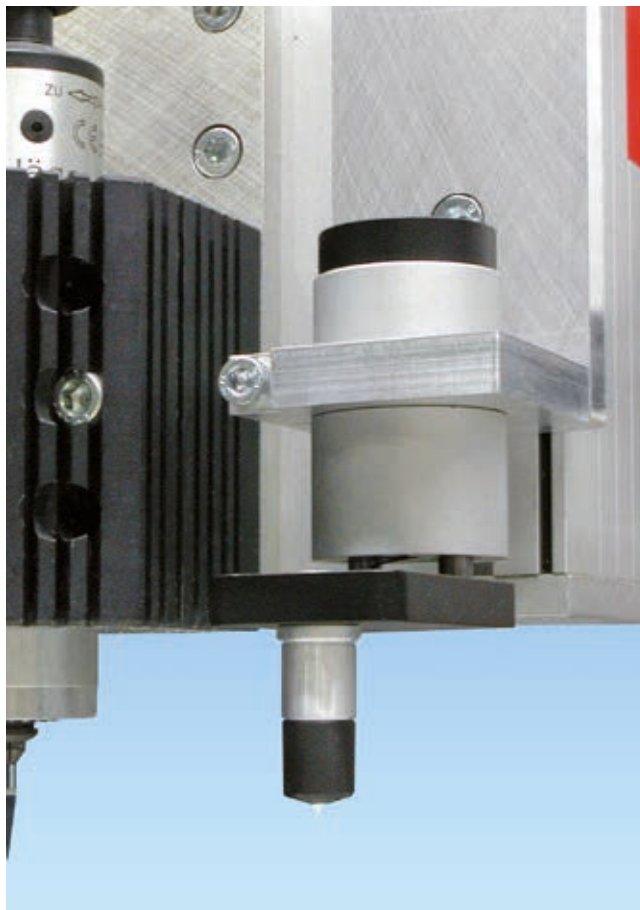
**Article no.**  
CM15-SK-SM

**For re-orders**  
Knives

HL-SM-STD  
see tool catalogue

## Drag knife unit

The drag knife unit is a good-value solution for **cutting vinyl film** which is typically processed by cutting plotters. During the cutting process, the knife quickly turns into the right direction due to its very good bearing. Possible inequalities of the material will be levelled by the spring-mounted knife.



*Spring-mounted drag knife unit, here mounted right of the spindle.*

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories



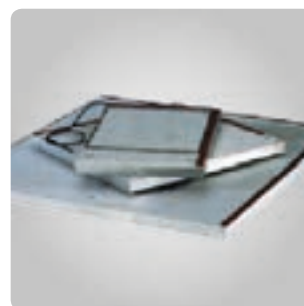


## Fixing devices

The third step is to find an appropriate device to fix your workpieces on the machine table. You can choose between various techniques:

- Quick workpiece exchange by sucking on **special vacuum table** ► Page 52
- Sucking on **grid vacuum table** ► Page 53
- Fixing by manual or pneumatic **clamping devices** ► Page 54
- **Gluings** with special adhesive film ► Page 55
- **Rotary axes** in different variants for multi-sided machining ► Page 56

On request, we can also produce customer-specific fixing devices for your application, e. g. for the serial production of workpieces.



## Special vacuum tables

A key feature of this special vacuum table is that it can also be used for **milling fretworks or outline contours**. With most vacuum tables, it is not possible to cut completely through the workpiece; time-consuming reworking measures like manual separation and deburring follow. However, this special vacuum table makes these measures obsolete, because it is protected by a **vacuum fleece** or a **perforated rubber mat**. They can be replaced from time to time.

Thanks to the large vacuum chamber, the workpiece will still be fixed reliably even if some areas of the table are not covered. The special vacuum table **reduces the time for the workpiece exchange to a few seconds**; you can't fix your workpieces in a more elegant way.



Single module of a special vacuum table on a CAM 250 Classic with appropriate adaptor mat.

C  
ClassicP  
Premium

### Technical data

- size: from 250 x 300 mm to 2,000 x 3,000 mm
- height: 63 mm
- more than 9,500 holes/m<sup>2</sup>
- vacuum fleece or adaptor mats for different kinds of applications available
- vacuum suction unit (1,200 W, suction volume 144 m<sup>3</sup>/h, 227 mbar negative pressure); number of necessary units depending on the size of the vacuum table
- table size and total suction volume:

Table size in mm	Volume in m <sup>3</sup> /h	Suitable for system
250 x 300	144	CAM 100 Classic
500 x 500	144	CAM 200/220 Classic
		CAM 0505 Premium
500 x 750	144	CAM 250 Classic
1,000 x 500	288	CAM 1005 Premium
1,000 x 1,000	288	CAM 1010 Premium
1,000 x 1,250	288	CAM 450 Classic
1,000 x 1,500	288	CAM 1015 Premium
1,000 x 2,000	288	CAM 1020 Premium
1,500 x 1,000	432	CAM 1510 Premium
1,500 x 2,000	432	CAM 1520 Premium
1,500 x 2,500	432	CAM 1525 Premium
2,000 x 1,000	576	CAM 2010 Premium
2,000 x 1,500	576	CAM 2015 Premium
2,000 x 2,500	576	CAM 2025 Premium
2,000 x 3,000	576	CAM 2030 Premium

### Scope of delivery

- special vacuum table with suction unit
- suction hose with connecting pieces
- basic equipment vacuum fleece

### Order numbers

Description	Article no.
Special vacuum table	
• 250 x 300 mm	CM23-SV-0203
• 500 x 500 mm	CM23-SV-0505
• 500 x 750 mm	CM23-SV-0507
• 1,000 x 500 mm	CM23-SV-1005
• 1,000 x 1,000 mm	CM23-SV-1010
• 1,000 x 1,250 mm	CM23-SV-1012
• 1,000 x 1,500 mm	CM23-SV-1015
• 1,000 x 2,000 mm	CM23-SV-1020
• 1,500 x 1,000 mm	CM23-SV-1510
• 1,500 x 2,000 mm	CM23-SV-1520
• 1,500 x 2,500 mm	CM23-SV-1525
• 2,000 x 1,000 mm	CM23-SV-2010
• 2,000 x 1,500 mm	CM23-SV-2015
• 2,000 x 2,500 mm	CM23-SV-2025
• 2,000 x 3,000 mm	CM23-SV-2030

#### For re-orders

Vacuum suction units, adaptor mats and fleece page 98

The Active Pro line is already equipped by standard with a special vacuum table.

C  
ClassicP  
Premium

## Technical data

- size approx. 290 x 335 mm for CAM 100 Classic and approx. 480 x 480 mm for CAM 200/220 Classic and CAM 0505 Premium; however, this vacuum table can also be mounted on the bigger machines
- grid size 3 mm
- trimmed by surface milling
- other table sizes and grid sizes on request

## Scope of delivery

- aluminium grid vacuum plate
- electric vacuum pump with accessories, 5 m<sup>3</sup>/h (850 mbar negative pressure)
- alternatively there is also a vacuum pump available which is powered by compressed air
- sealing cord for defining the vacuum area

## Order numbers

Description	Article no.
Grid vacuum table	
• for CAM 100 Classic	CM24-VT-100
• for CAM 200/220 Classic or CAM 0505 Premium	CM24-VT-200

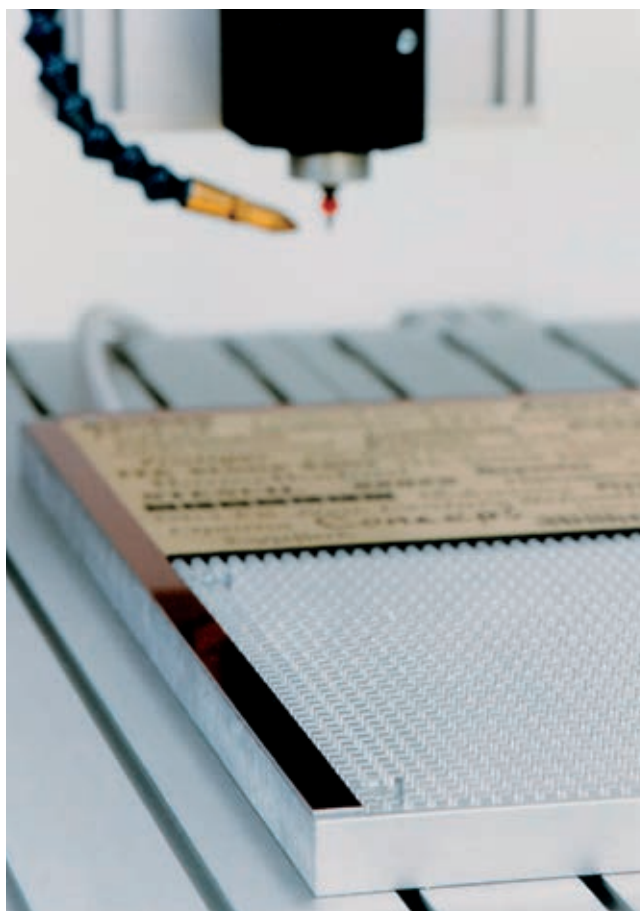
### For re-orders

Sealing cord page 97

## Grid vacuum tables

The grid vacuum table offers most advantages when you **engrave** or **mill pockets** predominantly (it is not possible to cut through the workpieces on this vacuum table). You just place the workpiece on the vacuum table at the stopper and switch on the pump; the workpiece will be adhered and cannot be moved any more.

These grid vacuum tables achieve **very high holding forces**, also against lateral movements. The vacuum area will be defined by a sealing cord which can be placed freely within the grid. These double-sided ground vacuum plates distinguish themselves by a very **high planar-parallelism** and are thus suitable for finest engravings without height adjustment. They will also be levelled on the appropriate milling machine.



Grid vacuum table for CAM 200 Classic – the vacuum area is defined by a sealing cord under the workpiece.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## T-Slot fixing sets

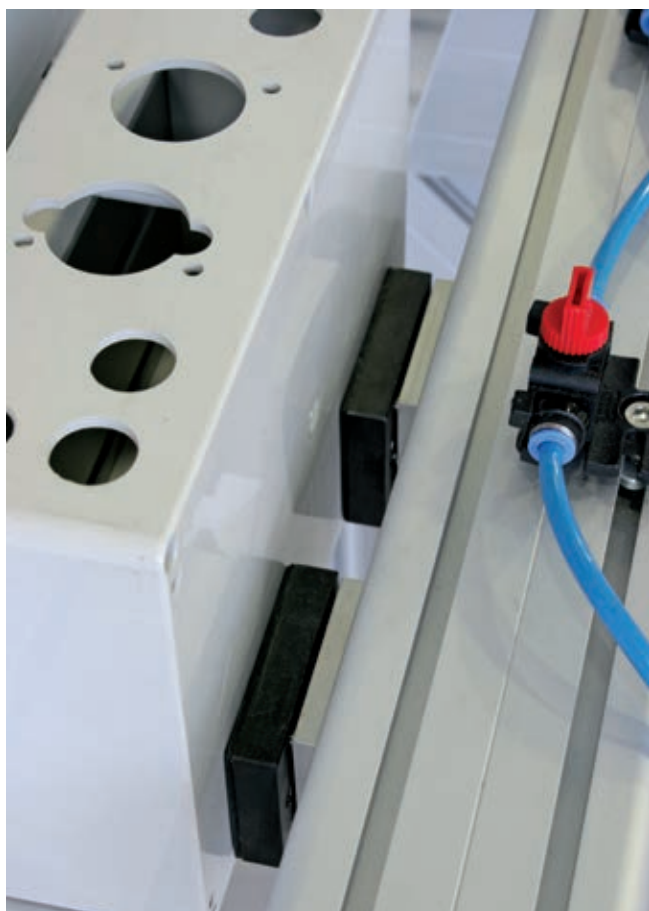
For fixing the workpieces directly over the T-slots of the machine's working table, there are different sets which contain manual and pneumatic fixing devices. The sets (see scope of delivery) are assembled of the following components:

The **clamps** press the workpieces with high force on the working table. The clamping height can be adapted to the height of the workpiece by an adjusting screw.

The **hand-lever clamping devices** achieve with a hand force of 100 N a clamping force of up to 2,000 N. By exerting the hand-lever, the clamping jaw will be extended and presses the workpieces horizontally against the fixation bars.

The **fixation bars** in three different lengths can be arranged freely on the working table. They help you to fix your workpieces equally and quickly.

The **pneumatic clamping devices** are available in two variants which distinguish themselves by their size and clamping force (for technical details see page 96). They are especially suitable for a serial production of the same work-piece type.



A housing is fixed with two pneumatic clamping devices SP 2 in the front clamping range of a Premium machine.

C  
ClassicP  
PremiumAP  
Active Pro

## Scope of delivery

### Manual T-slot fixing set

- 4 clamps
- 2 hand-lever clamping devices
- 6 fixation bars (length: 125, 175 and 225 mm)

### Pneumatic T-slot fixing set

- 2 pneumatic clamping devices SP 1
- 2 pneumatic clamping devices SP 2
- pneumatic accessories for connection to the compressed air supply

### Stop rails for front clamping range

- set of lower and front stop rail

## Order numbers

### Description

Manual T-slot fixing set  
Pneumatic T-slot fixing set

### Article no.

CM21-TNUT  
CM21-PNEU

### For re-orders

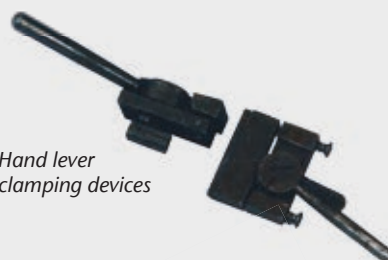
Clamps, hand levers,  
fixation bars

page 95

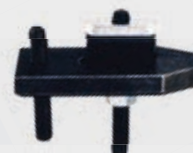
Fixation bars



Hand lever  
clamping devices



Clamp



Pneumatic clamp-  
ing device SP 1



Pneumatic clamp-  
ing device SP 2





C  
ClassicP  
Premium

## Scope of delivery

- polystyrene stripes, 6 mm thickness, trimmed by surface milling in size of the positioning range
- 1 roll of special adhesive film DX 2
- size of the polystyrene surface approx.:

### Area

280 x 335 mm  
500 x 500 mm

500 x 750 mm  
750 x 850 mm  
1,000 x 500 mm  
1,000 x 1,000 mm  
1,000 x 1,250 mm  
1,000 x 1,500 mm  
1,000 x 2,000 mm  
1,500 x 1,000 mm  
1,500 x 2,000 mm  
1,500 x 2,500 mm  
2,000 x 1,000 mm  
2,000 x 1,500 mm  
2,000 x 2,500 mm  
2,000 x 3,000 mm

### Suitable for system

CAM 100 Classic  
CAM 200/220 Classic  
CAM 0505 Premium  
CAM 250 Classic  
CAM 300 Classic  
CAM 1005 Premium  
CAM 1010 Premium  
CAM 450 Classic  
CAM 1015 Premium  
CAM 1020 Premium  
CAM 1510 Premium  
CAM 1520 Premium  
CAM 1525 Premium  
CAM 2010 Premium  
CAM 2015 Premium  
CAM 2025 Premium  
CAM 2030 Premium

## Order numbers

### Description

polystyrene surface

- 280 x 335 mm
- 500 x 500 mm
- 500 x 750 mm
- 750 x 850 mm
- 1,000 x 500 mm
- 1,000 x 1,000 mm
- 1,000 x 1,250 mm
- 1,000 x 1,500 mm
- 1,000 x 2,000 mm
- 1,500 x 1,000 mm
- 1,500 x 2,000 mm
- 1,500 x 2,500 mm
- 2,000 x 1,000 mm
- 2,000 x 1,500 mm
- 2,000 x 2,500 mm
- 2,000 x 3,000 mm

### Article no.

CM22-PS-0100  
CM22-PS-0505  
CM22-PS-0250  
CM22-PS-0300  
CM22-PS-1005  
CM22-PS-1010  
CM22-PS-0450  
CM22-PS-1015  
CM22-PS-1020  
CM22-PS-1510  
CM22-PS-1520  
CM22-PS-1525  
CM22-PS-2010  
CM22-PS-2015  
CM22-PS-2025  
CM22-PS-2030

### For re-orders

Single polystyrene stripes  
Special adhesive film

page 97  
page 98

## Polystyrene surfaces

The workpieces will be usually fixed with a special adhesive film on the polystyrene surface. However, an advantage of the polystyrene surface is that the **T-slots** of the working table **remain accessible**, so that you can also use the T-slot fixing attachment set or a vise within the area of this surface. We recommend to use the polystyrene surface as standard for machines without a vacuum table.

The polystyrene surface will be trimmed directly on the machine by surface milling so that an optimum planar-parallelism is being ensured. It can be **trimmed for several times**, thus you have to replace it only rarely. The single stripes have a width of 35 millimetres.



Trimmed polystyrene surface on the working table, the T-slots remain accessible here.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## Rotary axes

Using a rotary axis, you can **process your workpieces from all sides**. So it becomes possible to produce complex three-dimensional objects. The axis can be moved steplessly which means a real four-axis machining. For this kind of machining, you just need an appropriate CAM software (see page 86), as all vhf machines are already well prepared with their controllers.

This sort of rotary axis is available in **three different sizes**. Each rotary axis can be either implemented with or without a tailstock unit. A **tailstock unit with centre sleeve** is necessary when you have to process longer objects which cannot be held only with the jaw chuck of the rotary axis, but need additional support on the other side by the centre sleeve. The tailstock unit is positionable on sliding rails or a hole plate and can be adjusted with a setting screw exactly to the length of your workpiece.

If you need a very high machining precision, we recommend to use the rotary axis type XL. Considering the great number of possible implementations, we would like to ask you for your typical workpiece dimensions which you have to process with the rotary axis. So we can offer you an individual solution.



Rotary axis type L with three-jaw chuck, mounted in the rear clamping range of a Premium machine.

C  
ClassicP  
PremiumAP  
Active Pro

## Technical data

### All types

- steplessly rotatable rotary axis including axis module for controller CNC 680+ or CNC 980+
- by standard all rotary axes are equipped with a three-jaw chuck; optionally they can also be equipped with other fixing devices, e. g. a four-jaw chuck
- optional: tailstock unit with centre sleeve positionable on sliding rails or a hole plate



Rotary axis type S with three-jaw chuck (right) and tailstock unit with centre sleeve (left).

### Type S

- small size and affordable price
- low-backlash geared belt drive
- gear reduction 1:30
- nominal holding torque: 20 Nm
- three-jaw chuck with up to 80 mm chucking capacity

### Type L

- medium size and medium precision
- low-backlash geared belt drive
- gear reduction 1:54
- nominal holding torque: 48 Nm
- three-jaw chuck with up to 100 mm chucking capacity

### Type XL

- largest type and highest precision
- backlash-free precision gearing with great torsional stiffness
- gear reduction 1:101
- nominal holding torque: 108 Nm
- three-jaw chuck with up to 125 mm chucking capacity

## Order numbers

Here are lots of different implementations possible, so please ask us for an individual offer.

P  
PremiumAP  
Active Pro

## Technical data

- rotary axis steplessly rotatable by motor drive
- stable construction with rigid main beam; for heavy workpieces and very long workpieces which would possibly bend in a tailstock unit
- T-slot fixing area on the main beam for fixing clamping devices
- length of T-slot fixing area up to 6,000 mm, as a special design even greater lengths possible
- usage of clamping devices, pneumatic fixing devices and hand-lever fixing devices



Detail view of a rotary axis for profiles, based on type XL, with T-slot fixing area on a Premium machine.

## Requirements

- basic system of the Active Pro or Premium line with an appropriately increased passage height
- mountable adjacent to special vacuum table, T-slot mounting area or plane aluminium surface
- controller CNC 980+ with 5 axes

## Order numbers

Here are lots of different implementations possible, so please ask us for an individual offer.

## Rotary axis for profiles

Profile bars of different shapes made of metal, plastics or wood often have to be processed from more than just one side. Using this special rotary axis, you can **machine your profiles from three sides** without having to re-chuck them – even next to your regular machining area (vacuum or T-slot table). Your material will be supported by a stable main beam. The axis itself can be **steplessly rotated**. However, typically it will be rotated – depending of the type of the profile material – in fixed angles of 45 or 90 degrees.

So diversified as your profile material may look, so universally we may design your rotary axis: the cuboidal main beam which is available with a **length of up to six metres** already in the standard program has **T-slots** on all sides. So you can **fix or move all necessary clamping devices** for your profiles **without much effort**. For instance, the clamp levers which are shown in the picture are available in many different sizes (in our example for profiles up to 60 x 120 mm). In addition to this you can also mount pneumatic fixing devices and hand-lever fixing devices. Whether you can **drill, mill, engrave, chamfer or cut threads** into your material depends only on the other equipment of your machine.



Special design of a CAM 1040 Active Pro with rotary axis for profile. It has a T-slot fixing area on 3,800 x 200 x 100 mm and 4 special clamping units for profiles of up to 60 x 120 mm.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories





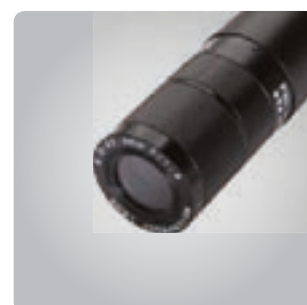
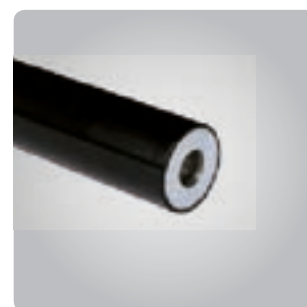
## Measuring devices

Due to different automatic measuring options for your workpieces you do not only save time for the setup. Much more important is the fact that possible inaccuracies will be compensated. They can occur in the material thickness or for example in the length and width of prints. In particular you can choose in the fourth step of the following modules:

- **Workpiece levelling unit** for levelling material tolerances ➤ Page 60
- **Automatic z adjustment unit** for determining the material height ➤ Page 61
- **Line laser unit** for an easier alignment of the workpieces ➤ Page 62
- **CCD camera system** for capturing register marks or workpiece edges ➤ Page 63

### Please note:

You will find a robust **3-D measuring sensor** for an affordable price in the chapter Accessories ➤ Page 101

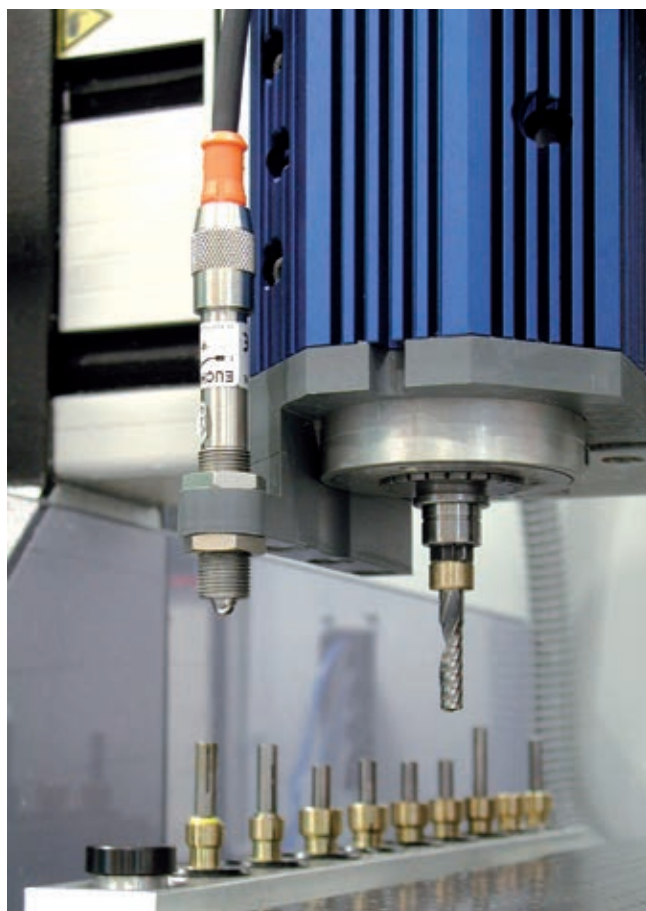


## Workpiece levelling unit

This **electronic measuring device** levels inequalities on the workpiece surface. The controller calculates the height profile and lifts respectively lowers the z-axis accordingly so that the **immersion depth will be consistent everywhere** on the workpiece.

This unit is especially useful for engraving acrylic glass which has a tolerance in the material thickness of about 10%. Engravings without a height levelling often become uneven due to the differing immersion depth of conic tools. The workpiece levelling unit finds a remedy here by three-dimensionally levelling out the immersion depth of the tool according to the surface condition. So the use of this unit leads to **even engravings**.

The disadvantages of a mechanical height adjustment (scratches on the surface of damageable workpieces) do not occur with this electronic solution. Furthermore you can use it on all kinds of materials because the surface will be measured by a precision measuring key. This also works on reflecting or transparent materials where an optical workpiece levelling may get into trouble.



Electronic workpiece levelling unit for levelling material tolerances (here mounted left of the spindle).

C  
ClassicP  
PremiumAP  
Active ProAM  
Active Mold

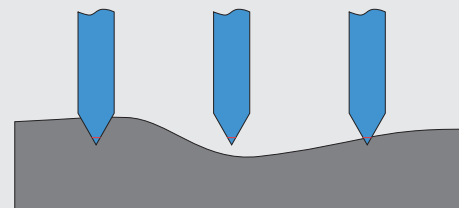
### Technical data

- precision measuring key, accuracy:  $\pm 0.01$  mm
- levels inequalities on the workpiece surface
- software definable number of measuring points in x and y direction
- calculation of height profile by controller
- no damaging of sensitive workpieces due to pointwise measurement
- combinable with all spindles ; as the measuring device is mounted in a little distance to the spindle, the measuring range is reduced accordingly

### Functional principle

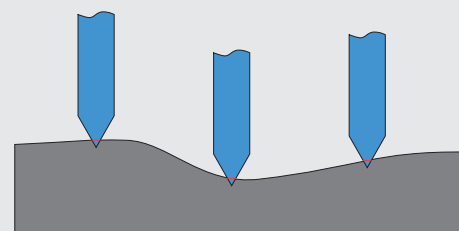
#### Without workpiece levelling

A fixed immersion depth leads in case of an uneven surface of the material to the effect that at elevated points, the graver dips too deep into the workpiece while at lower points, the workpiece will not even be touched any more.



#### With workpiece levelling

The height profile that has been measured prior to the machining process makes sure that the z axis will be appropriately lifted and lowered and thus at all points of the workpiece a consistent immersion depth is ensured.



### Order numbers

Description	Article no.
Workpiece levelling unit	CM32-HT-STD

**C**

Classic

**P**

Premium

**AP**

Active Pro

**AM**

Active Mold

## Technical data

- quick adjustment of the workpiece origin in z direction
- no scratching of workpiece necessary
- usable at any position of the workpiece
- accuracy of height adjustment independent of tool length and workpiece thickness within the range of a few hundredths millimetres

## Requirements

It is necessary for the measuring process that an **electrical contact** can be established between the tip of the tool and the adjustment unit. Requirements here are either an electrically conductive motor shaft or the manual attachment of an additional magnetic contact to the cap nut prior to the measuring process (this depends on the spindle type).

Be also careful when you select your tools: The tools have to be electrically conductive, too. In case of coated tools or diamond tools this may probably not be the case. So please do always check the electric conductivity of a tool before you start a measuring process with the automatic z adjustment unit.

In general, the automatic z adjustment unit is only suitable for machining spindles, so for instance not for cutting units or the dot embossing unit.

## Order numbers

Description	Article no.
Automatic z adjustment	CM35-AZJ-STD

## Automatic z adjustment unit

This handy tool is used to adjust the **workpiece origin** in z direction (i. e. the surface of the workpiece) within seconds with highest precision. The workpiece itself does not have to be accessed directly any more.

For **adjusting the z origin**, the adjustment unit has to be placed between tool and workpiece when lowering the z axis. As soon as a contact between the tip of the tool and the metal surface of the adjustment unit has been established, the z axis stops immediately and you have determined your workpiece surface. So it can be ensured that the **distance between the workpiece surface and the tip of the tool** always is **exactly the same** after the measuring process – independent of the thickness of the material and the length of the tool.



Adjustment of the z origin of a workpiece within seconds with the mobile measuring plate.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## Line laser unit

A **precise alignment of your workpieces** becomes easy when you use the **line laser unit** which projects two thin red lines in a right angle onto the machine table. So a mechanical stopper won't be necessary any longer which could possibly interfere with the machining process, moreover. And you can place your workpieces **at any position of the machine table** because the two line lasers are mounted in an angle of 90 degrees at the bridge of the machine.

Thanks to a **defined x/y offset to the spindle**, each requested workpiece origin can be precisely indicated. As soon as you have aligned your workpiece, you move back with the spindle to your starting position and begin the machining process.



The line laser unit (top left) projects lines onto the machine table – using them, you can align your workpieces easily.

C  
ClassicP  
PremiumAP  
Active ProAM  
Active Mold

### Technical data

- ideal for a precise alignment of workpieces when no sidewise stoppers can be used (zero point setting)
- defined x/y offset to the spindle
- line width approx. 1 mm in a distance of 1 m
- class 2 laser (the eye is protected here by the eyelid closure reflex, even when using optical instruments); wave-length 635 nm; power max. 1 mW (measured at the module)

### Scope of delivery

- 2 line lasers for x and y alignment
- fixture attachment for z axis
- controlled by CNC 680+/980+

### Order numbers

Description	Article no.
Line laser unit	CM41-LL-2L



C  
ClassicP  
PremiumAP  
Active Pro

## Technical data

- CCD camera system which can be mounted next to the machining unit for optical recognition of register marks – so you can mill, engrave or cut precisely fitting in printed workpieces
- capturing of workpiece corners so that the position and alignment of your workpieces on the machine table can be identified contact-free
- drill holes can be used as marks for precisely reversing your workpiece for a double-sided machining

### Requirements

- manufacturing software which supports the optical workpiece recognition, e. g. Cenon with the extension module Cenon CCD (from page 80 on)

## Scope of delivery

- bright CCD camera, focal width 9 to 22 mm, water-proof lens
- fixing arm for mounting the camera at the z axis of the machine
- cables to the computer
- Cenon CCD for processing the marks and adapting the output (see page 82)

## Order numbers

Description	Article no.
Camera system with Cenon CCD	SW-CE-CCD

## Optical workpiece recognition

With a **CCD camera** which is mounted at the z axis of the milling machine, you can **optically measure your workpieces** or **register marks** which are printed on it. However, you still need an appropriate software for this. We offer a bundle with Cenon CCD, an extension module for the manufacturing software Cenon. Please see page 82 for details.

Such a software independently adjusts the output graphics according to the captured position of the register marks, that means they will be **aligned** by rotating, proportionally **scaled** or **stretched/compressed** in one direction. This method is especially interesting when you want to **compensate inaccuracies of the printing process** on workpieces. The optical workpiece recognition nevertheless allows to mill, engrave or cut them precisely fitting. The appropriate register marks can be printed in the reject area of the workpiece. It is also possible to **recognize the edges of the material** if you want to identify the position of your workpiece on the machine table. On top of that your work becomes easier when you have to push through **oversized materials** in several steps under the bridge or when you have to process workpieces congruently from two sides.



The CCD camera system captures register marks on the workpiece or the edges of the workpiece itself.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories



## Peripheral equipment

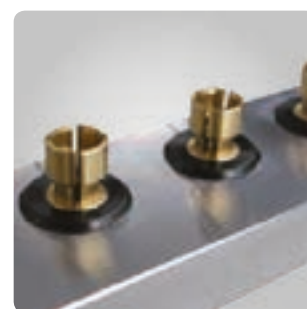
In the fifth and last step you can complete your machine with useful peripheral components. Each of these components either improves your results or makes your work more comfortable:

- **Automatic tool changer** for machining your workpieces without interruption ► Page 66
- **Dust extraction** unit for a clean working environment ► Page 68
- **Cooling/spraying unit** for an efficient tool cooling ► Page 70
- **Minimum quantity lubrication** with extremely low consumption ► Page 71
- **Housings/covering caps** for more safety, cleanliness and noise protection ► Page 72
- Additional **safety devices** ► Page 74
- **Control panel** for a comfortable setup of your machine ► Page 75
- **System rack** for practically storing all controllers ► Page 76
- **Tool sets** for a good start ► Page 77

### Please note:



For safety reasons, every machine has to be operated either with a dust extraction unit or with a housing/covering cap. However, we also offer individual safety concepts for your company.

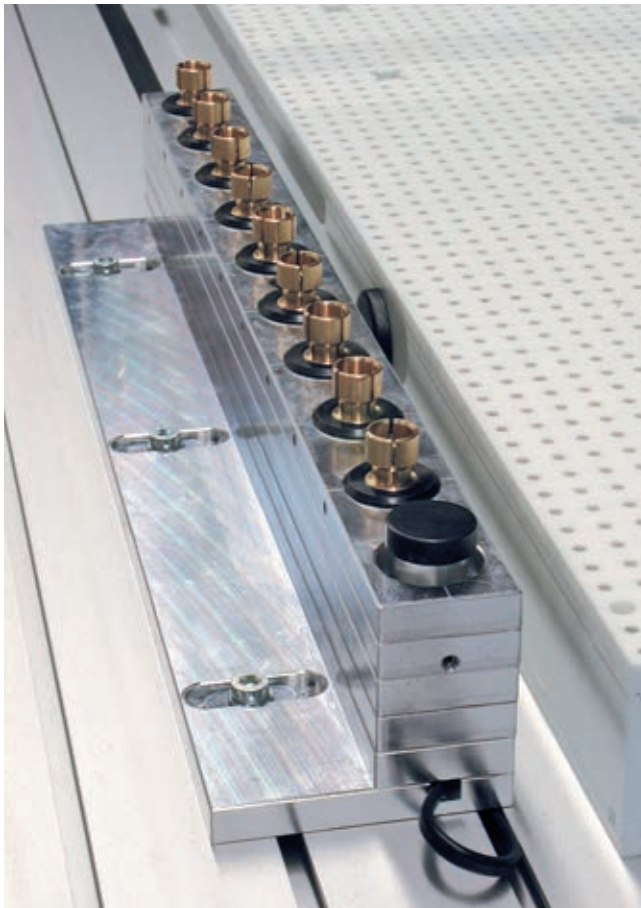


## Automatic tool changer

You can increase the speed of your whole production process by changing the tools automatically. Your milling machine will work with **greater effectiveness** when your jobs can be processed without interruption.

All pneumatic high frequency spindles and rotary current spindles (P models) can be equipped with an automatic tool change station. After a change, the length of each tool will be measured automatically with the **measuring key**. This procedure ensures that the **immersion depth** that has been set once, will be **applied exactly to all tools**, even if they differ in length.

If you have a **high frequency spindle**, only the tool itself will be exchanged. It has to be equipped with a stop ring and will be placed in an appropriate tool fitting. This solution is space-saving and enables a greater number of tools to be changed. If you have a **rotary current spindle**, a cone (WK 19/SK 30) will be exchanged. It holds the collet chuck which holds the tool. So there are no stop rings or reducing bushes necessary, but this solution demands more space. However, depending on the actual circumstances there are numerous individual solutions possible.



9-fold tool change station for high frequency spindles (in the front: measuring key).

### Technical data

#### For high frequency spindles

- usable with all high frequency spindles with pneumatic collet chuck (P models)
- 7, 9, 19, 29 or 39 resilient tool fittings for tools with up to 6 mm shank diameter and stop ring
- adaptation to other shank diameters with reducing bushes possible
- precise measuring key with an accuracy of 0.01 mm for exact determination of tool length (automatic interpretation by controller)

#### Optional for high frequency spindles

- automatically controlled pneumatic aluminium cap for protecting the tool fittings from chips and from oil mist when using lubricants

#### For rotary current spindles SPC 1500P and SPC 2300P (WK 19)

- pneumatically in z direction movable tool change station with 4, 9 or 14 resilient fittings for WK 19 cones; the full retractability into the machine table saves passage height
- protected by automatically controlled pneumatic cover
- tool diameter only depends on the inserted collet chuck (up to 10 mm)
- precise measuring key (see above)

#### For rotary current spindles SPC 3800P and SPC 5500P (SK 30)

- pneumatically in z direction movable tool change station with 4 or 9 resilient fittings for SK 30 cones; the full retractability into the machine table saves passage height
- protected by automatically controlled pneumatic cover
- tool diameter only depends on the inserted collet chuck (up to 20 mm)
- precise measuring key (see above)

### Requirements

Please note that the tool change station has to be mounted within the positioning range of your machine, so the usable area for machining will be limited. Depending on size and position of the tool change stations, these limitations will vary. Furthermore, its is not possible to use all tool change stations on all model ranges. Our basic systems are generally designed in a way that the positioning range is big enough so that a tool change station for high frequency spindles or WK 19 cones fits next to a vacuum table. The SK 30 cone change of SPC 3800P or SPC 5500P requires most space, so it will usually be placed in a separate tool change area. Please see also the adjoining table.



**C**  
Classic**P**  
Premium**AP**  
Active Pro**AM**  
Active Mold

## Scope of delivery

### For high frequency spindles

- station incl. measuring key with 7 to 39 tool fittings
- 5 stop rings each: 3 mm, 4 mm and 6 mm
- ringing set with pin punch

### For rotary current spindles

- fittings for cones incl. measuring key with pneumatically moved station
- number of provided cones (WK 19/SK 30) and collet chucks (size at your choice) corresponds with the number of fittings

## Order numbers

### Description Article no.

#### For high frequency spindles

7-fold station	CM36-WW-SF07/40
9-fold station	CM36-WW-SF09/40
19-fold station	CM36-WW-SF19/40
29-fold station	CM36-WW-SF29/40
39-fold station	CM36-WW-SF39/40
Protection cap for SF09	CM36-WW-SH-SF09/40
Protection cap for SF19	CM36-WW-SH-SF19/40

#### For SPC 1500P and 2300P

4-fold station WK 19	CM36-WW-WK19-PN04
9-fold station WK 19	CM36-WW-WK19-PN09
14-fold station WK 19	CM36-WW-WK19-PN14

#### For SPC 3800P and SPC 5500P

4-fold station SK 30	CM36-WW-SK30-PN04
9-fold station SK 30	CM36-WW-SK30-PN09

#### For re-orders

Fittings for tools and cones	page 95
Reducing bushes	page 99
Stop rings	page 100



Cone change station WK 19: During the tool change process, the station automatically moves to the top, during the machining process it is protected by the lid from chips and oil mist.



Cone change station SK 30: The station is located in a separate area outside the actual machine table.

## Overview Tool Changer

Model	Number and type of fittings	Suitable spindle types	Suitable machine model ranges		
			<b>C</b> Classic	<b>P</b> Premium	<b>AP</b> Active Pro
SF 07/40	7 tools with stop ring	HF spindles, all P models	CAM 100	—	—
SF 09/40	9 tools with stop ring	HF spindles, all P models	≥ CAM 200	all systems	all systems
SF 19/40	19 tools with stop ring	HF spindles, all P models	≥ CAM 300	≥ CAM xx10	all systems
SF 29/40	29 tools with stop ring	HF spindles, all P models	≥ CAM 450	≥ CAM xx15	≥ CAM xx15
SF 39/40	39 tools with stop ring	HF spindles, all P models	—	≥ CAM xx20	≥ CAM xx20
WK19-PN04	4 cones WK 19	SPC 1500P and SPC 2300P	—	≥ CAM xx10	all systems
WK19-PN09	9 cones WK 19	SPC 1500P and SPC 2300P	—	≥ CAM xx15	≥ CAM xx15
WK19-PN14	14 cones WK 19	SPC 1500P and SPC 2300P	—	≥ CAM xx15	≥ CAM xx15
SK30-PN04	4 cones SK 30	SPC 3800P and SPC 5500P	—	≥ CAM xx10*	—
SK30-PN09	9 cones SK 30	SPC 3800P and SPC 5500P	—	≥ CAM xx20*	—

\* with separate SK 30 tool change area

For the **Active Mold line** a special design of the SK 30 cone change can be manufactured. Other models on request.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## Dust extraction unit

Our dust extraction unit offers you an elaborated concept for the removal of coarse filings and fine dust particles. The suction pipe remains closely above the workpiece during the whole working process. There the tool is being surrounded completely by the suction shoe; however, for the tool change it will be released automatically. This **increases your safety** in practice due to a **protection against contact** with the tool without limitations in the ease of use. A **large cross-section** of the pipe without many windings guarantees **best results** during the engraving and milling process.

We also offer the appropriate **industrial vacuum suction units** for our dust extraction units. These suction units are dimensioned in a way that they can remove also large quantities of chips without problems. They are also available with a **fine filter** (necessary when you work on materials that may be damaging to the health).

For safety reasons (protection against contact with the rotating tool), a machine which is not equipped with a housing must be equipped and operated with a dust extraction unit. It can also be used in combination with an automatic tool changer.



Dust extraction unit, universal type (here with a high frequency spindle with pneumatic tool change).

## Technical data

### Dust extraction unit

- extraction of fine particles and coarse filings
- protection against contact during machining process
- adjustment only once necessary, even for different tool lengths; easy adjustment of the dust extraction unit
- dust extraction unit with grounded stainless steel tube (external diameter: 40 mm for universal and WK 19 type, 50 mm for SK 30 type), moveable in z direction by linear guides, with adjustable stops
- flexible hose connection for a rotatable link between the stainless steel tube and the suction hose, easily disconnectable (for universal and WK 19 type)
- easily disconnectable and exchangeable suction shoe
- universal type suitable for all high frequency spindles, the rotary current spindles SPC 1000 and SPC 1500 and the standard spindle
- WK 19 type suitable for the rotary current spindles SPC 1500P and SPC 2300P with pneumatic cone change
- SK 30 type suitable for the rotary current spindles SPC 3800P and SPC 5500P (both with pneumatic cone change) and the rotary current spindle SPC 6000.

### Industrial suction units for universal and WK 19 type

- industrial suction unit **CTL 36 AC** for dust category L (dusts with a maximum permissible concentration at the workplace  $> 1 \text{ mg/m}^3$ ) for extracting dusts that are non-explosive and non-hazardous to health: power consumption: max. 1,200 W, volume flow: max. 3,900 l/min, negative pressure: max. 0.24 bar, filter surface: 3,060  $\text{cm}^2$ , automatic main filter cleaning, container size 36 litres
- industrial suction unit **CTL 48 AC** for dust category L: power consumption: max. 1,200 W, volume flow: max. 3,900 l/min, negative pressure: max. 0.24 bar, filter surface: 6,318  $\text{cm}^2$ , automatic main filter cleaning, container size 48 litres
- industrial suction unit **CTM 48 AC** for dust category M (dusts with a maximum permissible concentration at the workplace  $> 0.1 \text{ mg/m}^3$ ) for extracting dusts of wood, ceramics, printed circuit boards etc.: power consumption: max. 1,200 W, volume flow: max. 3,900 l/min, negative pressure: max. 0.24 bar, filter surface: 6,318  $\text{cm}^2$ , automatic main filter cleaning, container size 48 litres

### Industrial suction unit for SK 30 type

- industrial suction unit **CTS 40 M** for dust category M for extracting flammable, explosive dusts in ATEX zone 22: power consumption: max. 4,000 W, volume flow: max. 7,000 l/min, negative pressure: max. 0.3 bar, filter surface: 19,500  $\text{cm}^2$ , container size 50 litres

**C**  
Classic**P**  
Premium**AP**  
Active Pro

## Scope of delivery

### Dust extraction unit

- dust extraction unit with linear guide
- removable suction shoe, fitting to the spindle diameter
- suction hose

### Industrial suction unit

- industrial suction unit as described above
- crevice nozzle and suction brush

### Optional: switching unit PSW 01

- switching unit for automatically switching the suction units CTL 36 AC, CTL 48 AC and CTM 48 AC via the controller

## Order numbers

Description	Article no.
<b>Dust extraction unit</b>	
• universal type	CM33-SA-WW
• for rotary current spindles with WK 19 change	CM33-SA-WK19
• for rotary current spindles with SK 30 change	CM33-SA-SK30
<b>Industrial suction unit</b>	
• CTL 36 AC	CM33-SA-F36AC
• CTL 48 AC	CM33-SA-F48AC
• CTM 48 AC	CM33-SA-F48MAC
• CTS 40 M	CM33-SA-CTS40M
Switching unit PSW 01	page 101
<b>For re-orders</b>	
Suction shoes, filter bags and more accessories	page 99



Dust extraction unit for the rotary current spindle SPC 2300P with WK 19 cone change.



Suction unit CTL 36 with 36 litres capacity.



Suction unit CTS 40 M with side channel blower.



Flexible hose connection, rotatable in all directions.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories



## Cooling and spraying unit

Cooling the tools is required for machining many kinds of materials. So you will benefit from **better edges of cut** and a **longer life of your tools**. Here we offer two different concepts: the cooling and spraying unit and the minimum quantity lubrication (see opposite page). If you mainly process **softer sorts of metal** like aluminium, you could choose between both alternatives; if you mainly process steel, you should decide for the minimum quantity lubrication. In this case, the lubricating effect determines a successful machining process.

The cooling and spraying unit creates **fine spray of cooling liquid** under high pressure which ensures especially at high rotational speeds that the cooling liquid will **reach the cutting edge directly**. Optionally, it is also possible to switch the cooling and spraying unit automatically with a magnetic valve by the manufacturing software, so that there will not be used more cooling liquid than necessary.



Manually controlled cooling/spraying unit (right of the high frequency spindle).

C  
ClassicP  
PremiumAP  
Active ProAM  
Active Mold

### Technical data

#### Cooling and spraying unit

- fine spray, thus little consumption of coolant
- regulable discharge of coolant
- 1 spray nozzle

#### Optional

- model with magnetic valve for automatically switching the cooling spray after start and end of work

### Requirements

Please note that you need a **compressed air supply** for the operation of the cooling/spraying unit. The average consumption of air amounts to approximately 50 litres per minute. Depending on the whole equipment of your machine, it is possible to choose between different types of compressors. Several questions may lead you to the right model: how high is the consumption of sealing air, is there a pneumatic tool change, how long are the hoses, what is the maximum noise level of the compressor?

### Scope of delivery

- cooling and spraying unit with 1 nozzle incl. tubes for liquid and air

### Order numbers

Description	Article no.
Cooling and spraying unit	CM34-MC-BK
Electrically switched	
cooling and spraying unit	CM34-MC-EG

#### For re-orders

Cooling liquids	page 100
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C  
ClassicP  
PremiumAP  
Active ProAM  
Active Mold

## Technical data

### Standard

- finely dispensable, electronically controlled system for finest liquid particles without any viewable spray
- minimum consumption of cooling liquid (depending on the adjustment only a few millilitres per hour)
- 2 spray nozzles which can be adjusted independently from each other
- tank size 1 litre, recommended for lubricants like the special minimum quantity lubricant WST 20

### Optional

- model with tank size 4 litres, recommended for alcohol etc.; here the tool will be cooled by a fine spray mist – according to the principle of the cooling/spraying unit, however with a considerably reduced liquid consumption

## Requirements

Please note that you need a **compressed air supply** for the operation of the minimum quantity lubrication. The average consumption of air amounts to approximately 80 litres per minute. Depending on the whole equipment of your machine, it is possible to choose between different types of compressors. Several questions may lead you to the right model: how high is the consumption of sealing air, is there a pneumatic tool change, how long are the hoses, what is the maximum noise level of the compressor?

## Scope of delivery

- liquid tank with controls and instruments
- 2 spray nozzles with capillary hoses
- 1 litre special lubricant WST 20

## Order numbers

Description	Article no.
Minimum quantity lubrication, 1 litre	CM34-MC-MM-MKS
Minimum quantity lubrication, 4 litres	CM34-MC-MM-MKS-4L

### For re-orders

Coolants/lubricants page 100

## Minimum quantity lubrication

The technically most perfect solution for cooling the tools is an electronically controlled minimum quantity lubrication unit which reduces the required amount of lubricants to a **few millilitres per hour**. We strongly recommend this unit for working regularly on **steel**.

This technique combines the advantages of dry processing with those of flood lubrication: The **necessity of cleaning** machines and workpieces is **reduced** as well as disposal problems. On top of that, the **workplace exposure** to harmful vapors or skin contact to cooling liquids will be **reduced** considerably. The tools, however, remain within their optimum temperature range during the machining process.

The primary goal of this method is not to dissipate heat with cooling liquid, but to **prevent the generation of heat by lubrication**. The lubricant will be **atomized** so finely by a **precise dosing technology** that there is no spray viewable. Altogether, these droplets have an **extraordinary big surface**. The resulting **very thin lubricating film** remains there even under high pressure and reduces the friction energy during the machining process. This reduced stress of the tool leads to clean edges of cut and an increased endurance at high rates of feed.



Minimum quantity lubrication with two flexible spray nozzles; top left: liquid tank with controls and instruments.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## Housings

A housing especially improves the **safety** of the machine and the **cleanliness** of its surroundings. It gives you a protection against touching moveable machine parts accidentally and prevents greater amounts of chips from spreading around in your workroom. By standard, the housing is made of fixed side and rear panels which have polycarbonate windows. For the front side there are solutions with different security levels available. A basic protection will be established by a **dense grid of light barriers**. If someone intervenes into the danger zone, the machine will stop. A housing with **folding doors** or **covering cap** prevents nearly completely that chips or cooling liquid pollute the surroundings of the machine. It is also a **protection against parts which may fly around** and **lowers the noise level**. If someone opens the door, the machine will stop. The housing with **pneumatic lift gate** ensures the best protection against unwanted interventions as the lift gate remains always closed during the working process and cannot be opened manually.

Starting from the basic types shown here, it is possible to construct a **multitude of different customer-specific housings**. So just tell us the exact circumstances at the installation site of the machine and we can offer you the appropriate housing construction. For safety reasons, machines that are not equipped with a dust extraction unit have to be equipped with a housing.



CAM 1010 Premium with three-sided housing and pneumatic lift gate.

C  
ClassicP  
Premium

## Technical data

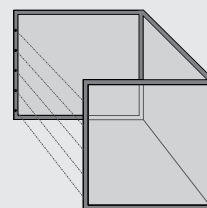
### Basic types

- basically the housings for the bigger Classic and all Premium machines consist of a stable aluminium profile construction with polycarbonate panes; the height of the side panels is 111 cm (except the covering cap for Classic systems)
- this three-sided housing can be combined with different optical and mechanical safeguards:

#### Light grid

when entering the secured area, the machine switches to the halt mode

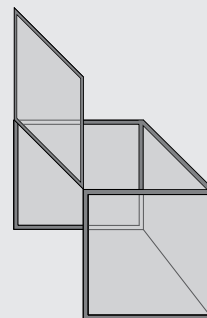
for CAM 300, CAM 450 Classic and all Premium machines



#### Pneumatic lift gate

the gate closes automatically before the working process

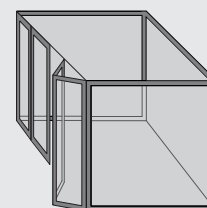
for CAM 450 Classic and all Premium machines  $\geq$  CAM 10XX



#### Folding doors

either with safety contact or with locking

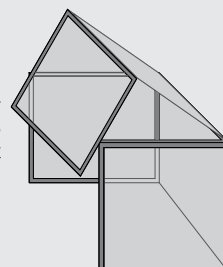
for CAM 300, CAM 450 Classic and all Premium machines



#### Covering cap

closed on 3 sides, covering cap with gas operated compression springs and safety contact (optionally with locking)

for CAM 100, 200, 220 and 250 Classic



### Variations

- there is a great scope of individual variations; so, among other possibilities, we can equip the housing of your milling machine with:
  - double gates for alternately loading workpieces from the front and back
  - additional doors for maintenance and workpiece loading
  - roof construction
  - additional safety devices



← Three-sided housing of a CAM 1020 Premium with folding doors at its front and two more folding doors at both sides in the rear area of the machine. With the two rear doors it will be made easier for you to load and adjust your workpieces. The front doors are open in our image, the two rear doors are shut.



← Four-sided protection of the machine by a light grid, without an additional housing with panes. If someone intervenes during the machining process in the range of the light grid, the machine switches to the halt mode. We recommend this especially for larger machines, which shall remain freely accessible for loading the workpieces.



CAM 1010 Premium three-sided housing → and pneumatic lift gate; here with extra option: back-tilting gate for installation in low-ceilinged rooms.



Three-sided housing of a CAM 450 Classic with → pneumatic lift gate. The height of the side panels is 111 cm. The door will be automatically closed before the machining process.



Housing with covering cap on a CAM 220 Clas- → sic. The covering cap will be opened by hand; it has a safety contact which switches the machine to the halt mode when it is opened during the machining process.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

C  
ClassicP  
PremiumAP  
Active ProAM  
Active Mold

## Safety devices

The machine safety is a topic which must not be neglected, especially when the operating personnel changes frequently or when semi-skilled employees work at the machine. Without a housing with lift gate or an appropriate locking at its access doors, the machine may only be operated by personnel that has been introduced by vhf. Moreover, only these persons may work in the setup mode.

While the machine is working, there is a risk of injury when the operator interferes with the range of the rotating tool. Different concepts may increase the safety: If the machine itself is not protected by a housing, you can define a protected area around it by a **mobile light grid system**. As soon as someone steps into the secured area, the machine as well as the spindle will stop. Here a basic rule is that the safety devices are not activated during the setup operation of the machine. So you may step into the secured area for setting up workpiece and tools. Only after you have started the output process (and thus the spindle), the safety devices will be activated.

The emergency stop switch always stops the machine immediately, also during the setup operation. So, **extra emergency stop switches** at different locations increase the safety, too.



Two columns of the mobile light grid system: if one of the numerous light beams is interrupted, the machine will stop.

## Technical data

### Additional safety devices

- light grid at the housing of the machine (protection by a dense grid of light barriers – as soon as one interferes with the positioning range of the machine, it switches into the halt mode)
- secured area by light grid system which is set up around the machine (especially recommendable for bigger machines without housing – as soon as one interferes with the protected area, it switches into the halt mode)
- flexible safety fence which will be installed around the machine as protection against touching moveable machine parts during the machining process and as protection against parts which may fly around
- safety lock for covering cap or door
- signal light which indicates machine operation/standstill
- additional emergency stop switches
- lighting for housings with roof construction; in case of open machines, the lighting is a matter of the local conditions
- more safety devices on request – we would be glad to develop a safety concept according to your specific situation



## Order numbers

Description	Article no.
Additional emergency stop switch with 10 m cable	CM-SE-NA-10M
<b>Mobile multi-beam light grid system</b>	
protection for one side:	
1 sender, 1 receiver	CM-SE-LS-1S
protection for two sides:	
1 sender, 1 receiver, 1 mirror	CM-SE-LS-2S
protection for three sides:	
1 sender, 1 receiver, 2 mirrors	CM-SE-LS-3S
protection for four sides:	
1 sender, 1 receiver, 3 mirrors	CM-SE-LS-4S



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Active Mold

## Technical data

- mountable directly at the machine
- approaching workpiece origin and changing rotational speed of spindle and feed rate with control wheel
- choice of 2 speed levels
- integrated emergency stop switch and halt button
- splash-proof metal housing
- import of current position in Cenon and CNC Term

## Order numbers

**Description**  
Control panel

**Article no.**  
CM31-HSB-CP

## Control panel

The control panel makes the **setup of your milling machine easy and comfortable**. The long cable gives you a lot of **free moving space**. Thus settings like accessing the starting position do not have to be made in the manufacturing software on the computer any more, but can be set quickly and accurately with a **precise control wheel**. The current position can be imported afterwards into the programmes Cenon or CNC Term at the push of a button.

The control panel can be mounted at the front of the machine, so you will have a **good view on the workpiece surface while positioning the axes**. The control panel also has an **emergency stop switch** and can interrupt and continue the output process. During the output process, the **rotational speed** and the **feed rate can be modified**.



Comfortable setup of your machine with the control panel (here on its retaining plate).

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## System rack

All controller components (CNC controller, frequency converter and – if necessary – the compressor cooling unit) are also available as **19 inch plug-in units**. So they can be installed in a lockable 19 inch system rack. The computer with monitor which is included in the scope of delivery of the basic system can be integrated, too. This means protection against unauthorised operation of the machine. On top of that, a system rack is **space saving** and you will get an **optimum clearness of the operating elements**. Some spindle types even demand a system rack in order to be able to integrate all necessary components.

If installed on your machine, you can use lighted switches for turning on and off the vacuum tables. Computer system and controllers may be turned on and off by **central switches**. An additional **emergency stop** switch increases the machine safety additionally. The components which are installed in the system rack will be cooled – depending on the equipment – by one or two **powerful fan(s)**.



*All controllers clearly arranged.*

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Active ProAM  
Active Mold

### Technical data

- stable metal housing with powerful fan
- lockable
- space for all controller components in 19 inch plug-in housings
- central switch for controller and computer system (separate fuse protection possible)
- lighted switches for vacuum tables (if installed)
- extensible keyboard drawer, separate placement area for mouse
- emergency stop switch at central position

### Order numbers

**Description**  
19 inch system rack

**Article no.**  
CM39-SYS-FT

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PremiumAP  
Active ProAM  
Active Mold

## Technical data

### Tool start set, 4–6 mm\*

10 parts, 4 resp. 6 mm shank diameter

Article number: CM40-WS-S6S

- 1 graver (90°/0.20 mm)
- 1 engraver's milling cutter (60°/0.50 mm)
- 4 single tooth cutters Varius® (1 x 3.00 mm;  
1 x 4.00 mm; 1 x 5.00 mm; 1 x 6.00 mm)
- 3 single tooth cutters with polished flute  
(1 x 6.00 mm; 2 x 4.00 mm)
- 1 router bit (long hole slot cutter: 16.00 mm)

### Tool start set, 3 mm\*

20 parts, 3 mm shank diameter

Article number: CM40-WS-S3S

- 5 gravers (1 x 15°/0.30 mm; 1 x 36°/0.20 mm;  
1 x 36°/0.40 mm; 1 x 60°/0.20 mm;  
1 x 90°/0.20 mm)
- 1 engraver's milling cutter (60°/0.20 mm)
- 4 single tooth cutters Varius® (1 x 1.00 mm;  
1 x 2.00 mm; 2 x 3.00 mm)
- 2 single tooth cutters with polished flute  
(2 x 3.00 mm)
- 2 single tooth cutters with hawk beak profile  
(2 x 3.00 mm)
- 6 double tooth cutters with fishtail  
(2 x 1.00 mm; 2 x 2.00 mm; 2 x 3.00 mm)

### Tool start set electronics\*

20 parts, 3 mm shank diameter

Article number: CM40-WS-ELS

- 2 gravers (2 x 36°/0.20 mm)
- 5 double tooth cutters with fishtail  
(3 x 2.00 mm; 2 x 3.00 mm)
- 6 isolation engraving tools
- 4 rub out cutters (2 x 0.50 mm; 2 x 1.00 mm)
- 3 PCB cutters (1 x 1.00 mm; 1 x 2.00 mm;  
1 x 3.00 mm)

### Drill set electronics\*

50 parts, 3 mm shank diameter

Article number: CM40-WS-BOS

- 4 x each diameter 0.50–1.00 mm, 2 x each  
diameter 1.10–1.50 mm, 1 x each diameter  
1.60–2.90 mm, 2 x 3.00 mm

\* The dimensions indicate the cutting edge diameter (in case of the gravers also the top angle). For more detailed information concerning the tool geometries, please see our separate tool catalogue. There you will find also tools for re-ordering and tools which are not included in these sets.



## Tool sets

These tool sets contain collections of commonly used **high-quality carbide tools** from our extensive assortment for different kinds of applications. Please visit also our separate tool shop, respectively see our tool catalogue for details, sizes, cutting edge geometries, etc.

A tool set is an **ideal basic equipment**, so that you will be prepared for the majority of cases without having to study too much technical data of tools. When we deliver a complete machine, you will also get an introduction in the proper use of the tools, i. e. which tool has to be used for which kind of material and which is the proper rotational speed or feed rate.



Tools from vhf: great selection, high quality and a long endurance.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories





# Manufacturing Software

What would be a CNC milling machine without an appropriate software which can import your projects trouble-free from different layout programs of the CAD or DTP world?

- **Cenon** – the universal manufacturing software ➤ Page 80
- **Cenon CCD** – additional module for automatic workpiece recognition ➤ Page 82
- **Cenon PCB** – additional module for printed circuit board prototyping ➤ Page 84
- Several applications for the **3-D production** ➤ Page 86
- Special **engraving fonts** ➤ Page 88

Cenon



Cenon CCD



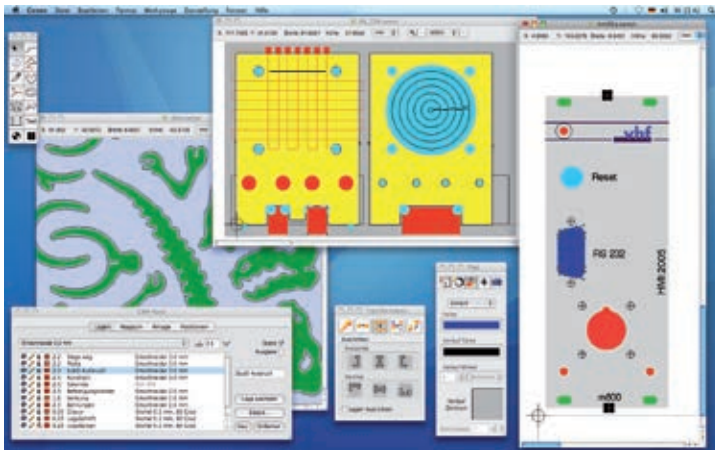
3-D software



Engraving fonts

*Script*





Cenon – the universal manufacturing software.



Give shape to your ideas – here an inlay work made of coloured acrylic.



Milling pockets on different height levels.



Manufacturing threads with or without countersinks.

## Cenon

Cenon is a **universal manufacturing software** for your CNC milling machine. You can either **import** your **projects** from your **favoured design software** (CorelDraw, AutoCAD, etc.) or you can edit them with Cenon. Using Cenon, you can concentrate on the important steps of the CAM output; intelligent algorithms perform the **exact conversion of the graphics** to your machine.

### Just a few steps from input to output

It doesn't matter whether you import **DXF** or **EPS files** or if you create your own graphics – the steps to the output are quite simple. You just have to assign the proper tool to each process step and start the machining right away. The **double-sided tool radius correction** ensures that your workpieces will become **exactly true to size**, regardless of whether you mill inline contours, pockets or outline contours.

In producing technical workpieces, you will benefit from powerful functions for making **threads, countersinks or chamfers**. The possibility to produce several **smaller items on a large panel** and the **serial number function** will help you when you produce some workpieces in larger quantities.

For **sign making** or **engraving** tasks where the work is focused on perfect letterings, graphics or logos, functions for **well-fitting inlays** or for thinning the letters of stamps quickly turn out to be indispensable. Moreover, thanks to the **PostScript technology**, you can use **all fonts** of your computer or software. It is no longer necessary to use special engraving fonts (except when you want to achieve a very high working speed).

### Well-equipped for all tasks

If you should want to re-edit an imported graphics: just use Cenon's **comfortable editing functions** to make all necessary changes.

On top of that Cenon bursts the limits of your milling machine. Even if a workpiece does not fit completely on the working table of your machine – no problem: With the pushing through function you can **split the job** into different working cycles and thus produce also very large advertising signs or compound logos.

C  
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PremiumAP  
Active Pro

## Cenon at a glance

### Import

- high-quality import filters for all important file formats (see list of import formats) with automatic file format recognition
- automatic assignment of colours from the imported graphics to layers in Cenon; DXF layer recognition
- automatic merging and filling of paths

### Graphics and editing functions

- easy and ergonomic to use
- exact preview with zoom function
- editing functions, also for re-editing the imported graphics (lines, arcs, rectangles, Bézier curves, text)
- removal of hidden areas
- usage of type 1 and true type fonts
- function for aligning elements
- undo and redo for several steps
- many machining functions (threads, countersinks, pushing through too long workpieces, bars, inlay works, etc.)
- serial number function
- panel production
- font editor

### Path calculation

- tool radius correction (vectorial algorithm and halftone algorithm) for internal and external contours guarantees exact results
- 3-D halftone image handling without vectorization (darker grey tones lead to deeper immersion depths)
- standard and contour filling algorithms
- angular approach in a spiral movement along the output path
- thinning function for 3-D effects in the production of stamps, signs, etc.
- algorithm for path optimization

### Output

- high output quality due to floating point accuracy and completely vector-oriented processing
- individual parameter settings for each tool (diameter, feed, immersion depth etc.), comfortable administration of the tools in magazines
- position memories with parking position for quick approach to different workpiece origins and fixing devices
- wide range of possible tasks (milling, engraving, drilling, chamfering, countersinking, cutting, plotting, etc.)
- stepwise working possible, optional finishing step
- embedded CNC commands for initiating defined machining steps
- control and surveillance of all important functions and peripheral devices

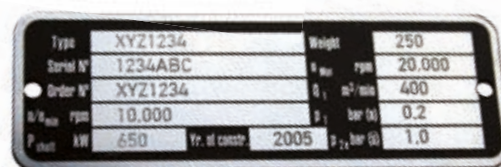


Thinned fonts – for instance for the stamp production.



← Thanks to the PostScript technology you can use all fonts that are installed on your computer.

↓ The serial number function supports the quick production of type plates.



## Import formats

- PostScript (EPS, PS)
- DXF (including 3-D areas)
- SVG (Scalable Vector Graphics)
- HPGL
- Gerber (Extended and Standard)
- halftone images (TIFF, GIF, JPG, etc.)
- ASCII (e. g. text lists for serial production)
- drill data (Excellon, Sieb & Meyer)

## Order numbers

Description	Article no.
Cenon	SW-CE-MX
Updates from previous versions on request.	

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

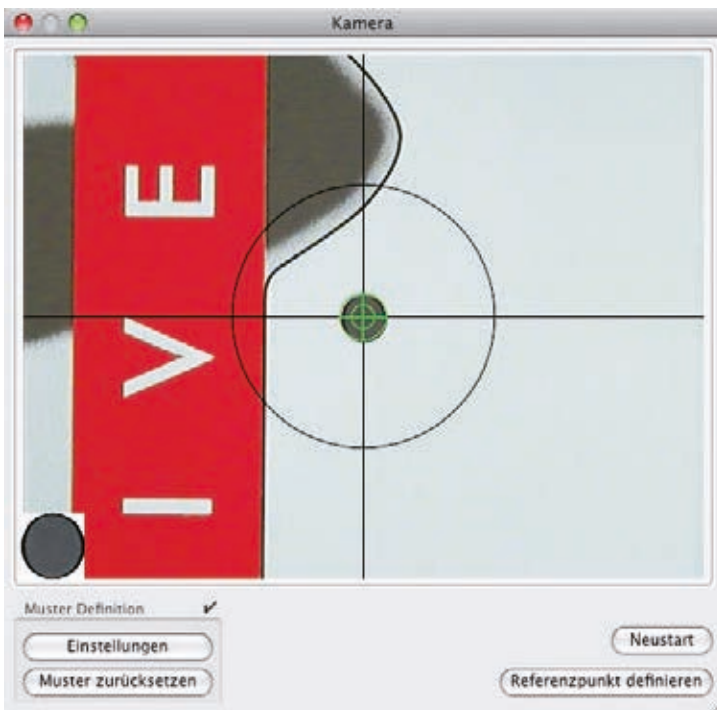
Software

Accessories





Cenon CCD captures the printed register marks and uses them for calculating the required rotation and scaling of the output paths.



The camera window shows a preview image while measuring. The green cross-hairs signalise that a register mark has been recognized.

## Cenon CCD

The additional module Cenon CCD **optically measures printed workpieces**. Thus a common annoyance will become obsolete in future – a workpiece has been elaborately printed and then the contours will not be hit exactly when the workpiece is milled later on. In the worst case, the whole plate has to be discarded then. Reasons for this are inaccuracies of the printing process and while manually adjusting the workpiece on the CNC milling machine.

Cenon CCD offers a remedy here by capturing with the camera **register marks** which are printed on the workpiece or the **edges of the workpiece** itself. A new shape of the register marks can be easily taught to the software.

### Scaling in all directions

The software independently adjusts the machining paths for the output according to the captured positions of the register marks with the help of a flexible transformation grid. That means they will be **aligned by rotating**, proportionally **scaled** or they will be **stretched** respectively **compressed** in one direction. So all kinds of inaccuracies of the printing process can be compensated. The result will be an accurately machined outline which is exactly next to the printed contour.

### Accurately fitting outlines

This method is suitable for **milling, engraving and drilling** as well as for **cutting** with a tangential knife. Furthermore, it can be used for quite different kinds of applications: for instance an **industrial manufacturer** may want to process silk-screen printed front plates or plastic foil keyboards. And due to the more and more powerful and inexpensive large-format printers, the field of **sign making** constantly offers new possibilities and applications under the keyword **print & cut**. It is also possible to recognize the edges of the material if you want to identify the position of your workpiece on the machine table. Another useful field of application is processing **over-sized workpieces**: If they don't fit completely on the machine table, they can be moved in several steps under the bridge and then they will be machined stage by stage. And finally, you can use drill holes as marks for **precisely reversing** your workpiece for a double-sided machining.



C  
ClassicP  
PremiumAP  
Active Pro

## Cenon CCD at a glance

### Features

- optical recognition of register marks on the workpiece with a CCD camera system
- import of i-cut data with register marks and outline path
- comparison of the captured actual values with the saved reference values
- automatic positioning and alignment or scaling (including stretching/compressing in one direction) of the output graphics by the software
- alternatively operation in positioning and scaling mode or only in positioning mode (if the final product shall have an exactly defined size)
- capturing of workpiece corners so that the position and alignment of your workpieces on the machine table can be identified contact-free
- drill holes can be used as marks for precisely reversing your workpiece for a double-sided machining
- machining of oversized workpieces by stages possible
- camera preview where the capturing process of the marks can be followed

### Scope of delivery Cenon CCD Bundle

- CAM software module Cenon CCD for interpretation of the marks and scaling of the output
- CCD camera system (for technical data see page 63)

### Requirements

- manufacturing software Cenon version 3.9 or higher

## Order numbers

Description	Article no.
Camera system with Cenon CCD	SW-CE-CCD



Photo: foliendesign GmbH, Essen

↑ Typical sign making samples: printed rigid foam plates with  
↓ milled images.



Photo: foliendesign GmbH, Essen

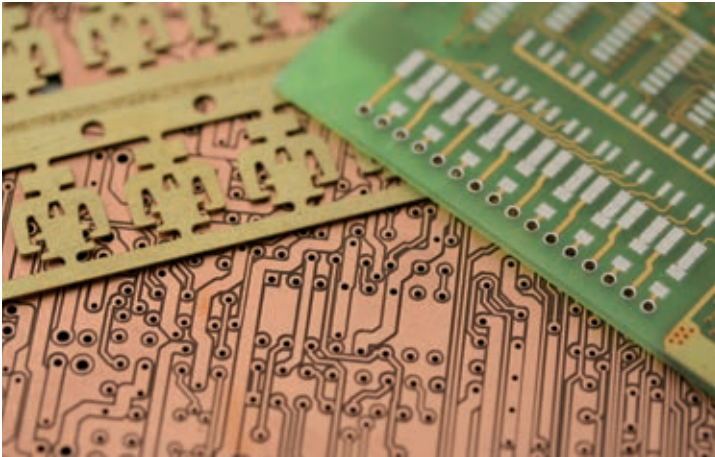


An example for an industrial application: accurately cut plastic foil keyboard.

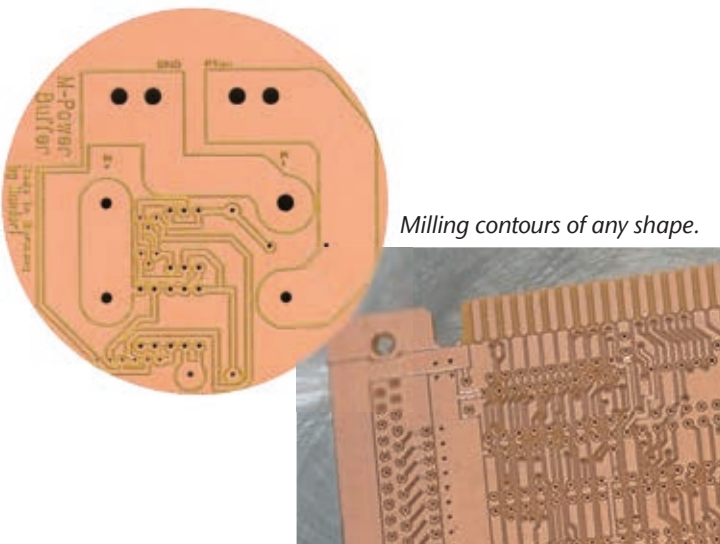
Classic  
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LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

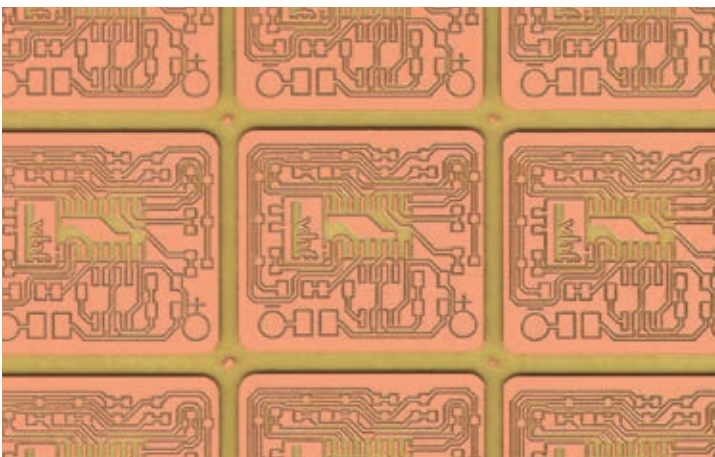
Accessories



Cenon PCB – everything around printed circuit board prototyping.



Milling contours of any shape.



Automatic generation of panels for the quick production of small lots.

## Cenon PCB

Cenon PCB is an additional module with which you can produce **prototypes** and **small series** of **printed circuit boards quickly and easily**. Due to the use of the standardized formats **PostScript** and **Extended Gerber**, Cenon PCB opens you a new dimension of quality and openness: **environmentally friendly** prototypes directly from the computer without the usual steps like exposing or etching!

### Immediately usable prototypes

Producing prototypes with the **outline method** makes you **independent from waiting times** and high costs for prototypes that come from your PCB manufacturer. Cenon PCB is the new **link between your PCB design system and the prototype**. As usual, you design your PCB layouts until they are in the prototype stadium, and then you create the appropriate layout and drill data files. But now you don't send them to your PCB manufacturer any more, but import them in Cenon PCB where **intelligent algorithms** prepare them for the output process.

Cenon PCB calculates around soldering points, tracks or ground areas **isolation channels** which ensure an **electric separation of the potentials** during the engraving process. Common working steps like exposing, developing and etching the PCB become dispensable just like the environmentally hazardous disposal of the chemicals. Of course, the **drillings** and **outline contours** will be interpreted and processed, too.

You just have to fix the base material on your CNC milling machine and after a short while you will get a **ready-to-assembly PCB** with **engraved isolation channels** and **fitting drill holes**. With this method, your developments are ready for marketing quicker and less expensive.

**C**  
Classic**P**  
Premium**AP**  
Active Pro

## Cenon PCB at a glance

### Operation

- special layers for text, logos and rub out
- layer administration for separating different working steps
- editing functions: lines, rectangles, circles, text, drill markers
- modification of imported layouts
- adjustable register marks for a precise turn-over of the PCB for double-sided production

### Path calculation

- generation of isolation channels
- blow up of isolation channels
- rub out calculation of definable copper areas, e. g. for HF applications
- automatic tool radius correction
- high quality due to floating point accuracy and fully vectorised processing
- intelligent optimising algorithm for quick output
- support of user-defined area fillings with different tools
- removal of remaining copper
- panel generation for small-lot production

### Import formats

- PostScript (EPS, PS)
- DXF
- HPGL
- drill data (Excellon, Sieb & Meyer)
- Extended Gerber (RS 274X) and Standard Gerber (RS 274D)
- ASCII (e. g. text lists for serial production)

### Requirements

- manufacturing software Cenon

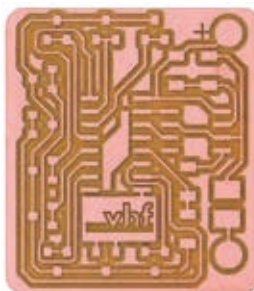
## Import advantages

One of the key features of Cenon PCB is the usage of PostScript and Extended Gerber. Their main advantage lies in the uncritical handling:

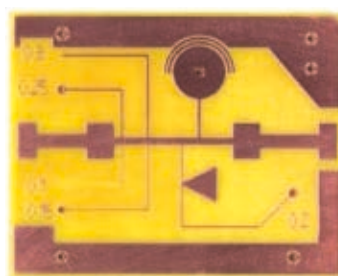
- no errors due to wrongly assigned or missing apertures (every Extended Gerber output file also contains all necessary aperture data)
- no limitations concerning special soldering point forms (e. g. heat traps)
- ground areas will not be prepared with numerous lines for the output process; this reduces the time for the calculation considerably

## Order numbers

Description	Article no.
Cenon PCB	SW-CE-PCB
Updates from previous versions on request.	



← For making soldering easier, the isolation channels can be broadened artificially with the so-called blow up function (very useful for SMD boards).

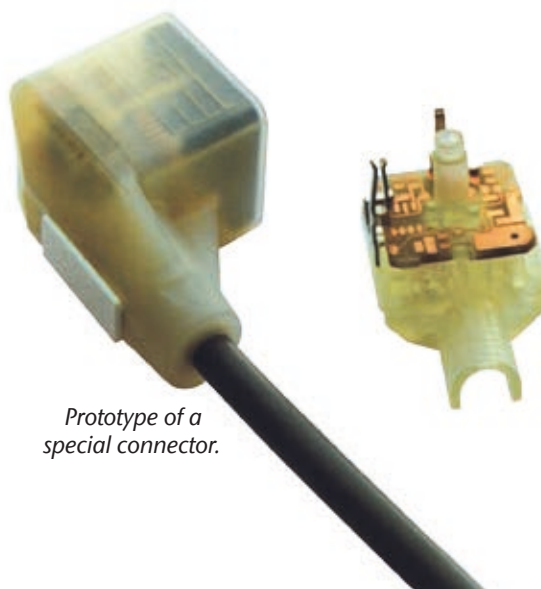
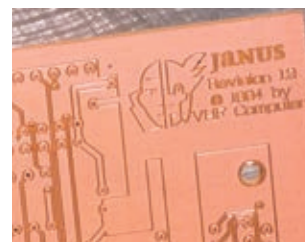


← Very convenient for HF applications is the rub out function. Here the whole PCB or parts of it can be freed from copper rests – for true to original results.

For milling the outside or inside contours of special PCBs, Cenon automatically performs the appropriate tool radius correction.



You can label your PCBs with logos which you can import from any DTP program.



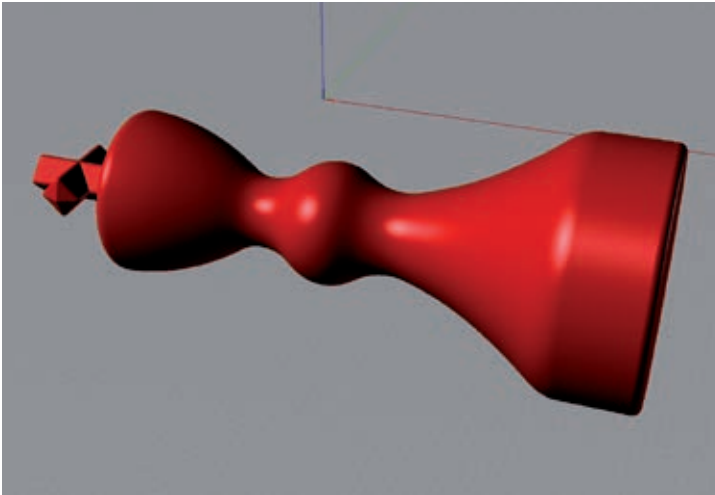
Prototype of a special connector.

Classic  
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LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

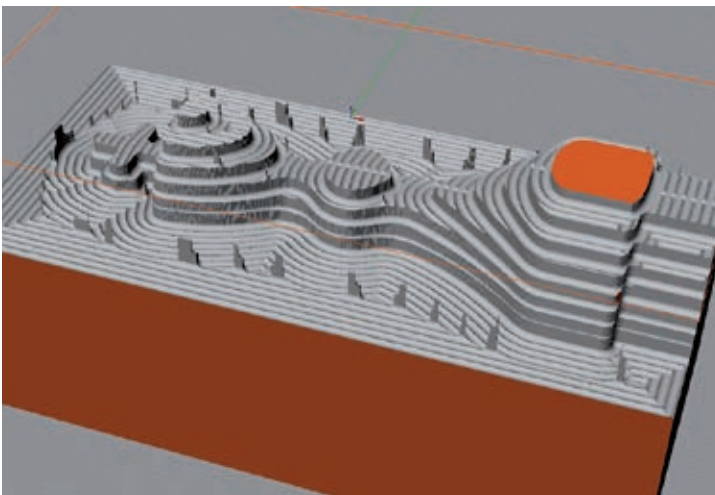
Software

Accessories





Three-dimensional view of a workpiece in the CAD software.



Simulation of the roughing process by the CAM software...



... and the milled results of massive aluminium.

## 3-D machining

For reaching the third dimension in processing your workpieces, we offer different software packages which are optimised for special applications in each case. We will give you here some hints which should help you to decide which program suits your needs.

**Tool and mould making** as well as **rapid prototyping** in the **technical sector** creates a high demand to the production software. Here the focus lies on the production of models and prototypes, injection moulds for plastics, die cast moulds, deformation tools or moulds for technical parts, etc. For designing three-dimensional objects, there are **CAD programs** like SolidWorks, CATIA or Rhino 3D. The first two of these CAD programs rather belong to the constructive sector, with appropriate functions for creating parametric models. Whereas the functionality of SolidWorks covers the classical range of mechanical engineering, CATIA also offers functions for product design and advanced features for the requirements of the automobile and aerospace industry. Rhino 3D – with its NURBS technology that can be compared with the handling of Bézier curves – is rather specialised on design tasks like industrial, product or packaging design.

Your projects will be imported via standardised file formats like IGES, STL or STEP to the **CAM software**. With it you will generate the workpiece-specific tool paths. Programs that can be used here are for example RhinoCAM or VisualMILL (some of them may also run as plugins within other programs). These programs have to be able to realize different machining strategies with different tool geometries. Finally, the CAM software creates with a **post processor** machine-specific data sets which contain all necessary data and parameters for the machining process.

For **setting up the CNC milling machine** and **for a secured transmission of the data** that has been generated by the post processor before, you need the control software **CNC Term**. After you have imported the data, you can access the workpiece origin or measure the workpiece surface or the z origin if your machine should have the appropriate equipment. Moreover, a position memory makes it easier to handle different workpieces. Switching accessory components (dust extraction, cooling/spraying unit, ...) can be done by a simple keystroke.



**C**  
Classic**P**  
Premium**AP**  
Active Pro**AM**  
Active Mold

## Which CAM software?

### RhinoCAM

- CAM plugin for CAD software Rhino

### VisualMILL für SolidWorks

- CAM plugin for CAD software SolidWorks

### VisualMILL

- standalone CAM software

The listed programs can control from three to five axes, depending on their configuration level. vhf can provide a post processor for any of these programs. For controlling the machine, you need the software CNC Term (see bottom). If you are not sure which software is right for you, please tell us your common applications.

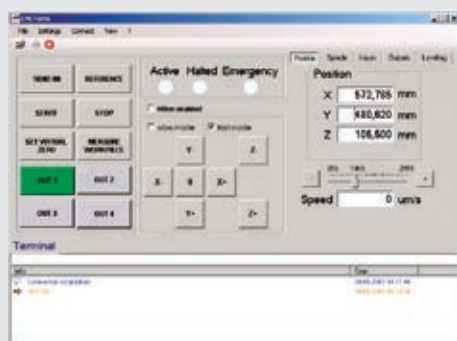
### Please note:

Functions for 3-D effects which are usually necessary for sign making (thinning, grey scale engraving, thread cutting, ...) are already part of the universal manufacturing software Cenon (see page 80).

## Control software CNC Term

### Key features CNC Term

- link between post processor and CNC milling machine
- setting all necessary output parameters
- setting the start position and administrating position memories, changing the feed rate even during the machining process
- switching machine component (dust extraction, cooling liquid supply, lift gate, etc.)
- performing automatic z adjustment and automatic tool measurement
- direct communication with controller, status information via terminal window



## Order numbers

### Description

CNC Term full version

### Article no.

SW-CNCTERM-W

You will find a detailed list of the abovementioned CAM software in our price list.



Three-dimensionally milled model of oak wood.



Milling cast moulds or 3-D models.



Production model out of the model making material Ureol.

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

C  
ClassicP  
PremiumAP  
Active ProAM  
Active Mold

## Engraving fonts

These engraving fonts are high-quality **single or multi-line fonts** that have been developed especially for engraving. They have **no fillings**, so they do not have to be cleared out time-consumingly. Moreover, there is no tool radius correction necessary for these fonts which reduces the calculation times. You can get the engraving fonts separately or as a package.

All fonts are available in the modern, cross-platform **Open-Type format** and can thus be used under Windows (from Windows 2000 on), Mac OS X or Linux. The vhf fonts are additionally available in **TrueType** and **Type 1** (PostScript) format.

The vhf fonts are available as single or double-line variant. The OEM engraving fonts partly consist of considerably more lines and offer a **great variety of typefaces**. The multi-line fonts achieve – depending on scaling and use of the proper tool – **typographically high-grade results**.

## Order numbers

Description	Article No
<b>vhf engraving fonts</b>	
• single font	SW-FN-F-V1
• each additional font	SW-FN-F-V2
• complete package (13 fonts)	SW-FN-F-VK
<b>OEM engraving fonts</b>	
• single font	SW-FN-F-O1
• each additional font	SW-FN-F-O2
• complete package	SW-FN-F-OK
<i>Please indicate the font name(s) in your order.</i>	

Garamond	4 Line (Ant0103)
<b>Garamond Medium</b>	6 Line (Ant0104)
<i>Garamond Italic</i>	4 Line (Ant0133)
Century	4 Line (Ant0203)
<b>Nimbus Roman</b>	4 Line (Ant0303)
<b>Nimbus Roman</b>	8 Line (Ant0303)
Antiqua American	4 Line (Ant0403)
Antiqua English	4 Line (Ant0503)
Antiqua Italian	4 Line (Ant0603)
Souvenir	4 Line (Ant0703)
<i>Souvenir Italic</i>	4 Line (Ant0733)
DEKO	1 Line (Dek0103)
DERO	1 Line (Dek0203)
<i>Bernhard Tango</i>	4 Line (Dek0303)
DEKO	1 Line (Dek0403)
DEKO	1 Line (Dek0503)
BUSORAMA	4 Line (Dek0603)
Deko	1 Line (Dek0703)
Premier	1 Line (Dek0803)
Blauw Sinter	4 Line (Dek0903)
<i>Script English</i>	1 Line (Scr0103)
<i>Script English</i>	4 Line (Scr0103)
<i>Script American</i>	1 Line (Scr0203)
<i>Script</i>	4 Line (Scr0303)
<i>Script Bordeaux</i>	4 Line (Scr0403)
Hadfield	4 Line (Scr0503)
<i>Script</i>	4 Line (Scr0603)
<i>Park Avenue</i>	4 Line (Scr0703)
<b>Old English</b>	6 Line (Fra0103)
<b>Marriage</b>	4 Line (Fra0203)
<b>Fraktur American</b>	6 Line (Fra0303)

Sans Nimbus	1 Line (San0103)
<b>Sans Nimbus</b>	4 Line (San0103)
Sans Nimbus Condensed	1 Line (San0143)
<b>Sans Nimbus Condensed</b>	4 Line (San0143)
Sans Classico	1 Line (San0203)
<b>Sans Classico</b>	4 Line (San0203)
Sans Humanistic	1 Line (San0303)
<b>Sans Humanistic</b>	4 Line (San0303)
Futura	1 Line (San0403)
<b>Futura</b>	4 Line (San0403)
Sans Modern	1 Line (San0503)
<b>Sans Modern</b>	4 Line (San0503)
Sans Machine	1 Line (San0603)
<i>Sans Machine Italic</i>	1 Line (San0633)
Sans Machine Condensed	1 Line (San0643)
<i>Sans Machine Cond. Italic</i>	1 Line (San0653)
<b>Sans Construct</b>	4 Line (San0703)
Kabel	4 Line (San0803)
Goudy	4 Line (San0903)
<b>URW Classico</b>	4 Line (San1003)
Chelmsford	4 Line (San1103)
Eurostile	1 Line (San1203)
<b>Eurostile</b>	4 Line (San1203)
<b>Eurostile Ext.</b>	1 Line (San1283)
<b>Eurostile Ext.</b>	4 Line (San1283)
Fette Din Eng	1 Line (San1303)
<b>Fette Din Eng</b>	4 Line (San1303)
Fette Din Mittel	1 Line (San1403)
<b>Fette Din Mittel</b>	4 Line (San1403)
Memphis	1 Line (Sla0103)
<b>Memphis</b>	4 Line (Sla0103)

Alternate 1 Line

Arcade 1 Line

HuntJudy 1 Line

*Civotype 1 Line*

DIN Engschrift 1 Line

DIN Mittelschrift 1 Line

GEORGE 1 LINE

*Kaufmann 1 Line*

*Madeleine Italic 1 Line*

*Paintbrush 1 Line*

*Romantique 1 Line*

Standard 1 Line

*Surf 1 Line*

*Single-line vhf engraving fonts  
(each also available as double-line  
font).*

OEM engraving fonts with different numbers of lines (please indicate in your order the font name, the number of lines and the code in brackets).

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories



# CNC Milling Cutters

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> 100,000 tools on stock  
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# Accessories

This chapter contains expendable items and accessories for everybody who already owns a vhf milling machine. Among others you will find here accessories for:

- **Spindles** – collet chucks and cones as well as tool fittings for the automatic tool changers ➤ Page 92
- **Fixing devices** – T-slot fixing attachments, vises, polystyrene stripes, vacuum suction units and fleece as well as adhesive film ➤ Page 95
- **Dust extraction** – suction shoes, filters bags and nozzles ➤ Page 99
- **Miscellaneous** – reducing bushes, stop rings, coolants and lubricants, but also a switching unit and a 3-D measuring pin ➤ Page 99

If you should need any other accessory part which you cannot find in this chapter – just contact us. We can help you in most cases.

You can order all expendable items and tools via the **vhf shop** ([shop.vhf.de](http://shop.vhf.de)) with **free shipment**.

*Spindles*



*Fixing devices*



*Dust extraction*



*Miscellaneous*





Collet chucks for manual tool change



Hook wrench



Cap nut

## Spindles

### Standard spindle

Description	Article no.	Price
Collet chuck 2 mm	ET-STD-20	€ 59.00
Collet chuck 3 mm	ET-STD-30	€ 39.00
Collet chuck 1/8 inch	ET-STD-31	€ 49.00
Collet chuck 4 mm	ET-STD-40	€ 39.00
Collet chuck 5 mm	ET-STD-50	€ 39.00
Collet chuck 6 mm	ET-STD-60	€ 39.00
Collet chuck 8 mm	ET-STD-80	€ 39.00
Cap nut (for 1,050 W model)	ET-STD-UM1050	€ 29.00
Jaw wrench, size 14 (for 1,050 W model)	ET-STD-MS-14	€ 2.50
Jaw wrench, size 17 (for 1,050 W model)	ET-STD-MS-17	€ 2.50
Set cap nut incl. 2 jaw wrenches 14 + 17 (for 1,050 W model)	ET-STD-UMS1050	€ 32.00
Cap nut (for 900 W model)	ET-STD-UM900	€ 29.00
Jaw wrench, size 14 (for 900 W model)	ET-MS-14	€ 2.50
Jaw wrench, size 22 (for 900 W model)	ET-MS-22	€ 5.50
Set cap nut incl. 2 jaw wrenches 14 + 22 (for 900 W model)	ET-STD-UMS900	€ 35.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

### SPC 650

Description	Article no.	Price
Collet chuck 2 mm	ET-SPC650-20	€ 59.00
Collet chuck 3 mm	ET-SPC650-30	€ 39.00
Collet chuck 1/8 inch	ET-SPC650-31	€ 49.00
Collet chuck 4 mm	ET-SPC650-40	€ 39.00
Collet chuck 5 mm	ET-SPC650-50	€ 39.00
Collet chuck 6 mm	ET-SPC650-60	€ 39.00
Cap nut	ET-SPC650-UM	€ 34.00
Jaw wrench, size 15	ET-MS-15	€ 2.50
Hook wrench for cap nut	ET-HS-16-20	€ 7.50
Set cap nut, jaw wrench and hook wrench	ET-SPC650-UMS	€ 42.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

### SPC 1000

Description	Article no.	Price
Collet chuck 2 mm	ET-SPC1000-20	€ 59.00
Collet chuck 3 mm	ET-SPC1000-30	€ 39.00
Collet chuck 1/8 inch	ET-SPC1000-31	€ 49.00
Collet chuck 4 mm	ET-SPC1000-40	€ 39.00
Collet chuck 5 mm	ET-SPC1000-50	€ 39.00
Collet chuck 6 mm	ET-SPC1000-60	€ 39.00
Collet chuck 8 mm	ET-SPC1000-80	€ 39.00
Cap nut	ET-SPC1000-UM	€ 39.00
Jaw wrench, size 17	ET-MS-17	€ 2.50
Hook wrench for cap nut	ET-HS-25-28	€ 7.50
Set cap nut, jaw wrench and hook wrench	ET-SPC1000-UMS	€ 45.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

## SPC 1500, SPC 2000P and SPC 4000P

Description	Article no.	Price
Collet chuck 2 mm	ET-SPC2000P-020	€ 44.00
Collet chuck 3 mm	ET-SPC2000P-030	€ 34.00
Collet chuck 1/8 inch	ET-SPC2000P-031	€ 44.00
Collet chuck 4 mm	ET-SPC2000P-040	€ 34.00
Collet chuck 5 mm	ET-SPC2000P-050	€ 34.00
Collet chuck 6 mm	ET-SPC2000P-060	€ 34.00
Collet chuck 8 mm	ET-SPC2000P-080	€ 34.00
Collet chuck 10 mm	ET-SPC2000P-100	€ 34.00
HSK 25 cone for collet chucks from 1 – 10 mm (SPC 2000P/SPC 4000P)	ET-SPC2000P-WZA	€ 189.00
Cap nut	ET-SPC2000P-UM	€ 34.00
Jaw wrench, size 24 (SPC 1500)	ET-MS-24	€ 5.50
Jaw wrench, size 17 (SPC 2000P/ SPC 4000P)	ET-MS-17	€ 2.50
Pin wrench for cap nut	ET-SSL-ER16	€ 34.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%



Collet chuck for  
SPC 1500, SPC  
2000P and SPC  
4000P



Pin  
wrench



HSK25 cone  
for  
SPC 2000P/4000P



Cap nut  
HSK 25

## SPC 1500P and 2300P

Description	Article no.	Price
Collet chuck 2 mm	ET-SPC2300P-020	€ 59.00
Collet chuck 3 mm	ET-SPC2300P-030	€ 45.00
Collet chuck 1/8 inch	ET-SPC2300P-031	€ 55.00
Collet chuck 4 mm	ET-SPC2300P-040	€ 45.00
Collet chuck 5 mm	ET-SPC2300P-050	€ 45.00
Collet chuck 6 mm	ET-SPC2300P-060	€ 45.00
Collet chuck 8 mm	ET-SPC2300P-080	€ 45.00
Collet chuck 10 mm	ET-SPC2300P-100	€ 45.00
WK 19 cone for collet chucks from 1 – 10 mm	ET-SPC2300P-WZA	€ 189.00
Cap nut	ET-SPC2300P-UM	€ 39.00
Jaw wrench, size 14	ET-MS-14	€ 2.50
Hook wrench for cap nut	ET-HS-30-32	€ 7.50
Set mounting device with rolls and roller bearing wrench for cap nut	ET-SPC2300P-MVS	€ 185.00
Service set for collet chuck maintenance	ET-SPC2300P-SET	€ 29.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

WK 19 cone



WK19 mounting  
device with rolls  
for attachment  
at the machine

## SPC 3800P, SPC 5500P and SPC 6000

Description	Article no.	Price
Collet chuck 3 mm	ET-SPC3800P-030	€ 34.00
Collet chuck 4 mm	ET-SPC3800P-040	€ 34.00
Collet chuck 5 mm	ET-SPC3800P-050	€ 34.00
Collet chuck 6 mm	ET-SPC3800P-060	€ 34.00
Collet chuck 8 mm	ET-SPC3800P-080	€ 34.00
Collet chuck 10 mm	ET-SPC3800P-100	€ 34.00
Collet chuck 12 mm	ET-SPC3800P-120	€ 34.00
Collet chuck 16 mm	ET-SPC3800P-160	€ 34.00
Collet chuck 18 mm	ET-SPC3800P-180	€ 34.00
Collet chuck 20 mm	ET-SPC3800P-200	€ 34.00
SK 30 cone for collet chucks from 1 – 20 mm (SPC 3800P/SPC 5500P)	ET-SPC3800P-WZA	€ 109.00
Cap nut	ET-SPC3800P-UM	€ 34.00
Jaw wrench, size 32	ET-MS-32	€ 7.50
Pin wrench for cap nut	ET-SSL-ER32	€ 34.00
Set mounting device with rolls and roller bearing wrench for cap nut	ET-SPC3800P-MVS	€ 185.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

Collet chuck  
for SPC 3800P,  
SPC 5500P and  
SPC 6000



Roller bearing wrench

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories



Collet chuck for  
SF 170



Collet chuck for  
SF 300



Collet chuck for SF 300P-SF 1300P



Service set for  
SF 300P -  
SF 1300P



Collet chuck for  
SF 1600P

## High frequency spindles, manual

Description	Article no.	Price
<b>SF 170</b>		
Collet chuck 3 mm	ET-SF170-30	€ 118.00
Collet chuck 1/8 inch	ET-SF170-31	€ 138.00
<b>SF 300</b>		
Collet chuck 3 mm	ET-SF300-30	€ 85.00
Collet chuck 1/8 inch	ET-SF300-31	€ 95.00
Collet chuck 4 mm	ET-SF300-40	€ 85.00
Collet chuck 5 mm	ET-SF300-50	€ 85.00
Collet chuck 6 mm	ET-SF300-60	€ 85.00
Cap nut	ET-SF300-UM	€ 59.00
Jaw wrench, size 12	ET-MS-12	€ 2.50
Hook wrench for cap nut	ET-HS-16-20	€ 7.50
Set cap nut, jaw wrench and hook wrench	ET-SF300-UMS	€ 67.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

## High frequency spindles, pneumatic

Description	Article no.	Price
<b>SF 170P</b>		
Collet chuck 3 mm	ET-SF170P-30	€ 98.00
Collet chuck 1/8 inch	ET-SF170P-31	€ 118.00
Service set for collet chuck maintenance	ET-SF170P-SET	€ 28.00
<b>SF 300P-SF 1300P</b>		
Collet chuck 3 mm	ET-SF300P-30	€ 98.00
Collet chuck 1/8 inch	ET-SF300P-31	€ 118.00
Collet chuck 4 mm	ET-SF300P-40	€ 98.00
Collet chuck 5 mm	ET-SF300P-50	€ 98.00
Collet chuck 6 mm	ET-SF300P-60	€ 98.00
Service set for collet chuck maintenance	ET-SF300P-SET	€ 28.00
<b>SF 1600P</b>		
Collet chuck 3 mm	ET-SF1600P-30	€ 128.00
Collet chuck 1/8 inch	ET-SF1600P-31	€ 158.00
Collet chuck 4 mm	ET-SF1600P-40	€ 128.00
Collet chuck 5 mm	ET-SF1600P-50	€ 128.00
Collet chuck 6 mm	ET-SF1600P-60	€ 128.00
Collet chuck 8 mm	ET-SF1600P-80	€ 128.00
Service set for collet chuck maintenance	ET-SF1600P-SET	€ 28.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

When using an automatic tool changer, please regularly check the collet chuck for concentricity deviations because it will be scraped out gradually after numerous tool changes. Due to the high rotational speeds of a high frequency spindle, this effect becomes especially noticeable. We recommend to change the collet chuck at least once a year.



## Fittings for tool change stations

During an automatic tool change either single tools with stop ring or cones which hold a tool will be stored in and fetched from the appropriate fittings.

Description	Article no.	Price
-------------	-------------	-------

### Tool fittings for automatic tool change of SF 170P–SF 1600P

Complete tool fitting, resilient, for 10.6 mm ring diameter	ET-AWS-WA6	€ 39.00
Brass bush for above tool fitting, for 10.6 mm ring diameter	ET-AWS-ES10	€ 19.00

### Fittings for WK 19 cone change of SPC 1500P/SPC 2300P

Complete fitting for WK 19 cone, resilient	ET-AWS-WS19	€ 79.00
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### Fittings for SK 30 cone change of SPC 3800P/SPC 5500P

Complete fitting for SK 30 cone, resilient	ET-AWS-WS30	€ 159.00
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Scale of quantity discount:  $\geq 2$  pieces 5 %,  $\geq 5$  pieces 10 %,  $\geq 10$  pieces 15 %,  $\geq 20$  pieces 20 %



Tool fitting for high frequency spindles



Fitting for WK 19 cone

## Fixing devices

### Fixation bars

The fixation bars are made of stable cast aluminium and can be fixed on the T-slots of the working table (distance between the holes: 50 mm). They ensure a proper lateral fixation.

Description	Article no.	Price
Fixation bar, 125 mm	ET-AM-AS-125	€ 32.00
Fixation bar, 175 mm	ET-AM-AS-175	€ 36.00
Fixation bar, 225 mm	ET-AM-AS-225	€ 44.00

Packaging unit: 2 pieces each

Scale of quantity discount:  $\geq 2$  packaging units 5 %,  $\geq 5$  packaging units 10 %,  $\geq 10$  packaging units 15 %

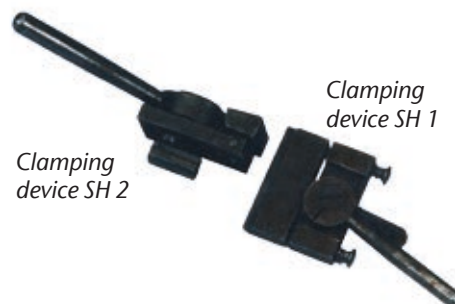


### Clamping devices

The workpiece is pressed via hand lever to a fixation bar. With a hand force of 100 N, a clamping force of 2,000 N will be exerted.

Description	Article no.	Price
Hand lever clamping device SH 1 for workpieces $\geq 1$ mm	ET-AM-SH-1	€ 44.00
Hand lever clamping device SH 2 for workpieces $\geq 10$ mm	ET-AM-SH-2	€ 49.00

Scale of quantity discount:  $\geq 2$  pieces 5 %,  $\geq 5$  pieces 10 %,  $\geq 10$  pieces 15 %



Clamping device SH 2

Clamping device SH 1

Classic Line

Premium Line

Active Pro Line

Active Mold Line

Machining Units

Fixing Devices

Measuring Devices

Peripheral Equipment

Software

Accessories



## Clamp

The clamp presses the workpiece with high force on the working table. The clamping height can be adapted to the height of the workpiece by an adjusting screw.

Description	Article no.	Price
Clamp with adjusting screw	ET-AM-SE-1	€ 29.00

Packaging unit: 2 pieces

Scale of quantity discount:  $\geq 2$  packaging units 5%,  $\geq 5$  packaging units 10%,  $\geq 10$  packaging units 15%



Clamping device SP 1



Clamping device SP 2

## Pneumatic clamping devices

Pneumatic clamping devices offer great advantages, especially for the serial production. These clamping devices consist of a moveable and a fixed clamping jaw and a lifting cylinder. In combination with the fixation bars, it is possible to fix workpieces of any size quickly and hold them reliably. The two models offered here differ mostly in their size and clamping force. On request, the pneumatic clamping devices may also be switched automatically by the controller electronics.

Description	Article no.	Price
Pneumatic clamping device SP 1 lift 10 mm, clamping force 0–90 N, size clamping jaw 65 x 20 mm	ET-AM-SP-1	€ 115.00
Pneumatic clamping device SP 2 lift 5 mm, clamping force 0–630 N, size clamping jaw 65 x 50 mm	ET-AM-SP-2	€ 185.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%,  $\geq 10$  pieces 15%



Vise,  
big type

## Vises

The vises can be fixed over the T-slots directly on the working table. They are available in two sizes and made of cast iron. Vises are recommended for fixing smaller workpieces or objects with a special form which cannot be fixed with other devices. They are also well suitable if you want to process the narrow sides of objects.

Description	Article no.	Price
Vise, small type length x width x height: 150 x 142 x 61 mm; span width: 65/72 mm; jaw width: 80 mm; jaw height: 30 mm	ET-AM-SS-S1	€ 65.00
Vise, large type length x width x height: 222 x 180 x 66 mm; span width: 112/120 mm; jaw width: 120 mm; jaw height: 30 mm	ET-AM-SS-S2	€ 115.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

## Slide nuts

For usage in the T-slots of the machine table (width for Classic systems: 10 mm; width for Premium systems: 12.8 mm).

Description	Article no.	Price
10 slide nuts M 6 (25 x 10 x 3.4 mm)	ET-AM-GM-10-10	€ 3.00
25 slide nuts M 6 (25 x 10 x 3.4 mm)	ET-AM-GM-10-25	€ 6.00
50 slide nuts M 6 (25 x 10 x 3.4 mm)	ET-AM-GM-10-50	€ 10.00
10 slide nuts M 6 (25 x 12.8 x 4.9 mm)	ET-AM-GM-13-10	€ 5.00
25 slide nuts M 6 (25 x 12.8 x 4.9 mm)	ET-AM-GM-13-25	€ 10.00
50 slide nuts M 6 (25 x 12.8 x 4.9 mm)	ET-AM-GM-13-50	€ 18.00

Scale of quantity discount:  $\geq 2$  packaging units 5%,  $\geq 5$  packaging units 10%



## Polystyrene stripes, self-adhesive

The polystyrene stripes (width: 35 mm each) will be fixed directly on the working table and can be trimmed by surface milling. The T-slots of the working table remain accessible, however, so that your workpieces may also be fixed with the T-slot fixing material. It is also possible to mount a vacuum table over the polystyrene surface.

Description	Article no.	Price
Polystyrene stripes 350 mm	ET-PS-350	€ 2.50
Polystyrene stripes 500 mm	ET-PS-500	€ 3.50
Polystyrene stripes 750 mm	ET-PS-750	€ 4.50
Polystyrene stripes 850 mm	ET-PS-850	€ 5.50
Polystyrene stripes 1,000 mm	ET-PS-1000	€ 6.50
Polystyrene stripes 1,250 mm	ET-PS-1250	€ 9.00
Polystyrene stripes 1,500 mm	ET-PS-1500	€ 10.00
Polystyrene stripes 2,000 mm	ET-PS-2000	€ 14.00

Polystyrene stripes in other lengths are available on request.

Scale of quantity discount:  $\geq 10$  pieces 5%,  $\geq 20$  pieces 10%



## Sealing cord for grid vacuum tables

The sealing cord limits the area on the grid vacuum table where the vacuum is effective.

Description	Article no.	Price
Sealing cord, per linear metre	ET-MG3	€ 1.00

Scale of quantity discount:  $\geq 2$  linear metres 5%,  $\geq 5$  linear metres 10%,  $\geq 10$  linear metres 15%



## Vacuum suction units

For achieving their high degree of efficiency, the vacuum suction units for the special vacuum table work according to the turbine principle and thus with high rotational speeds. Their endurance amounts to approximately 1,000 hours.

Description	Article no.	Price
Motor unit of vacuum suction unit incl. filter. volume flow 144 m³/h, negative pressure 0.22 bar, power consumption 1,200 W	ET-ZVT-ZB-ME-144	€ 280.00
Motor protection filter	ET-ZVT-ZB-MSF	€ 26.00
Extracted air filter (pack. unit: 2 pieces)	ET-ZVT-ZB-AF	€ 16.00
Filter bags, 12 litres (pack. unit: 5 pieces)	ET-ZVT-ZB-SB12	€ 16.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%,  $\geq 10$  pieces 15%



Motor unit



Filter bag

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories



## Vacuum adaptor mats

Depending on the size of the workpieces that you usually process (respectively the size of the area of the vacuum table that remains uncovered), you can use perforated rubber adaptor mats with different hole diameters for the special vacuum table (hole grid: 10 mm).

Description	Article no.	Price
<b>Format: 250 x 500 mm</b>		
Adaptor mat without holes	ET-SV-VM-250-00	€ 3.00
Adaptor mat 0.7 mm hole diameter	ET-SV-VM-250-07	€ 12.00
Adaptor mat 1.0 mm hole diameter	ET-SV-VM-250-10	€ 12.00
Adaptor mat 1.2 mm hole diameter	ET-SV-VM-250-12	€ 12.00
Adaptor mat 1.5 mm hole diameter	ET-SV-VM-250-15	€ 12.00
<b>Format: 500 x 500 mm</b>		
Adaptor mat without holes	ET-SV-VM-500-00	€ 6.00
Adaptor mat 0.7 mm hole diameter	ET-SV-VM-500-07	€ 24.00
Adaptor mat 1.0 mm hole diameter	ET-SV-VM-500-10	€ 24.00
Adaptor mat 1.2 mm hole diameter	ET-SV-VM-500-12	€ 24.00
Adaptor mat 1.5 mm hole diameter	ET-SV-VM-500-15	€ 24.00

Adaptor mats for special table sizes are available on request.

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%,  $\geq 10$  pieces 15%,  $\geq 20$  pieces 20%

## Vacuum fleece

The vacuum fleece is made of a special, foamed material which is permeable to air. Your workpieces will still be fixed safely even if some areas of the table remain uncovered. The extra thin type with a thickness of 1 mm distinguishes itself by an especially great holding force and is particularly suitable for machining smaller workpieces. The other type with a thickness of 2 mm is characterized by a longer durability and is ideal for almost any case.

Description	Article no.	Price
Vacuum fleece from the roll, charged per linear metre:		
• 1 mm thickness, 1 m width	ET-SV-VV-01-R1	€ 12.00
• 2 mm thickness, 0.5 m width	ET-SV-VV-02-R05	€ 9.00
• 2 mm thickness, 1 m width	ET-SV-VV-02-R1	€ 18.00
Vacuum fleece, cut into squares:		
• 2 mm thickness, 500 x 500 mm packaging unit 5 pieces	ET-SV-VV-02-05	€ 34.00

Scale of quantity discount:  $\geq 2$  linear metres/packaging units 5%,  $\geq 10$  linear metres/packaging units 10%,  $\geq 15$  linear metres/packaging units 15%,  $\geq 30$  linear metres/packaging units 25%

## Special adhesive film

This especially thin and plane film (thickness 80  $\mu$ m) is used for fixing workpieces directly on the polystyrene surface or a similar surface. The film can be easily and completely removed after use.

Description	Article no.	Price
Special adhesive film DX 1, 25 m x 50 cm regular adhesive force	ET-XF-DX1	€ 135.00
Special adhesive film DX 2, 25 m x 50 cm double adhesive force	ET-XF-DX2	€ 135.00

Scale of quantity discount:  $\geq 2$  units 5%,  $\geq 5$  units 10%,  $\geq 10$  units 15%



## Dust extraction

### Suction shoes and vacuum cleaners

The suction shoes will be put on the suction tube of the dust extraction unit and enclose the tool during the machining process. So an efficient exhaust airstream will be achieved.

Description	Article no.	Price
<b>Suction shoes</b>		
Suction shoe for high frequency spindles and standard spindle	ET-SA-S-SF	€ 29.00
Suction shoe for SPC 650 and SPC 1500	ET-SA-S-S6	€ 29.00
Suction shoe for SPC 1000	ET-SA-S-S10	€ 29.00
Suction shoe for SPC 2000P and SPC 4000P	ET-SA-S-S20	€ 59.00
Suction shoe for SPC 1500P and SPC 2300P	ET-SA-S-S23	€ 79.00
Suction shoe for SPC 3800P/5500P/6000	ET-SA-S-S38	€ 89.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

#### Accessories for Festool dust extractors

Crevice nozzle, plastic, 300 mm length	ET-FS-FD	€ 8.00
Suction brush, plastic, 70 mm diameter	ET-FS-SP	€ 12.00

Long-life filter bag (polyester fleece), robust and re-usable (for dusts that are not dangerous to health):

• 22 litres	ET-FS-LFS22	€ 154.00
• 26 litres	ET-FS-LFS26	€ 154.00
• 33 litres	ET-FS-LFS33	€ 164.00
• 36 litres	ET-FS-LFS36	€ 164.00
• 44 litres	ET-FS-LFS44	€ 174.00
• 48 litres	ET-FS-LFS48	€ 174.00
• 55 litres	ET-FS-LFS55	€ 174.00

Standard filter bags (paper), 5 pieces:

• 22 litres	ET-FS-SB22	€ 43.00
• 26 litres	ET-FS-SB26	€ 43.00
• 33 litres	ET-FS-SB33	€ 47.00
• 36 litres	ET-FS-SB36	€ 47.00
• 44 litres	ET-FS-SB44	€ 52.00
• 48 litres	ET-FS-SB48	€ 52.00
• 55 litres	ET-FS-SB55	€ 52.00

On request, there are also more accessories available for the dust extractors.

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%

## Miscellaneous

### Reducing bushes

Reducing bushes are used to clamp tools with a smaller shank diameter into a larger collet chuck. So it becomes for instance possible to clamp a tool with a shank diameter of 4 mm into a collet chuck with a diameter of 6 mm when you use the reducing bush RH-46.

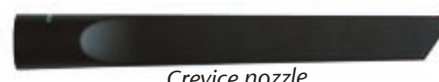
Intern. Ø	Extern. Ø	Length	Article no.	Price
3 mm	6 mm	20 mm	RH-36	€ 16.00
4 mm	6 mm	20 mm	RH-46	€ 16.00

Scale of quantity discount:  $\geq 2$  pieces 5%,  $\geq 5$  pieces 10%,  $\geq 10$  pieces 15%



Suction shoe for SPC 1500P and SPC 2300P

Suction shoe for SPC 1000



Crevice nozzle



Suction brush



Long-life filter bag



Standard filter bag



Classic Line

Premium Line

Active Pro Line

Active Mold Line

Machining Units

Fixing Devices

Measuring Devices

Peripheral Equipment

Software

Accessories



## Stop rings

The **stop rings** made of brass are designed for the receptacles of a high frequency spindle tool changer, the plastic stop rings are suitable for changing the tools manually. You can equip those tools with stop rings by yourself which are not already delivered with a ring.

Material: plastics (AR-300K) respectively brass (AR-...N)

Int. Ø	Ext. Ø	Height	PU	Article no.	Price
3 mm	7.7 mm	4.85 mm	20 pcs.	AR-300K	€ 2.00
3 mm	10.6 mm	6.5 mm	5 pcs.	AR-300N	€ 9.00
4 mm	10.6 mm	6.5 mm	5 pcs.	AR-400N	€ 9.00
5 mm	10.6 mm	6.5 mm	5 pcs.	AR-500N	€ 9.00
6 mm	10.6 mm	6.5 mm	5 pcs.	AR-600N	€ 9.00

Using our **ringing set**, you can equip your 3 mm, 4 mm and 6 mm tools with stop rings by yourself. The set consists of a ringing plate and a steel pin punch. You will need nothing more, but a little hammer.

Description	Article no.	Price
Ringing set with pin punch	AR-BP-SET	€ 9.50

Scale of quantity discount:  $\geq 2$  packaging units/pieces 5%,  $\geq 5$  packaging units/pieces 10%,  $\geq 10$  packaging units/pieces 15%

## Cooling lubricants

If you use a special cooling lubricant for milling or engraving, you will achieve better results and the tool life will be extended. For some kinds of materials it is even absolutely necessary to use a cooling lubricant.

Description	Article no.	Price
Cooling lubricant AquaTec® (1 litre) for milling and drilling steel; for usage in the cooling and spraying unit; water soluble, concentration 6–7 %	ET-MK-AT	€ 12.00
Spray lubricant ALU-N (1 litre) for milling and drilling non-ferrous met- als and steel; for usage in the cooling and spraying unit	ET-MK-ALUN	€ 7.50
Special lubricant WST 20 (1 litre) for working on non-ferrous metals and steel; only for usage in the minimum quantity lubrication unit	ET-MK-WST20	€ 24.00
Cutting oil spray Alpha 93 (300 ml) universal cutting oil from a pressurised dispenser; for all types of steel	ET-MK-AL93	€ 10.00

Scale of quantity discount:  $\geq 5$  litres/cans 10%,  $\geq 10$  litres/cans 15%,  $\geq 20$  litres/cans 20%

## Lubricants

EP plus is a strongly penetrating lubricant with long-term effect for very high pressure loads. It has excellent penetration qualities, cleans and is dust and dirt repellent. It is suitable for lubricating toothed racks and linear guides. For lubricating ball screw bearings we offer another special lubricant.

Description	Article no.	Price
Universal lubricant Lube EP+ (pressurised dispenser, 500 ml)	ET-SM-FLEP	€ 38.00
Lubricant for ball screw bearings (tube, 900 gr.)	ET-SM-KGS	€ 18.00

Scale of quantity discount:  $\geq 5$  pieces 5%,  $\geq 10$  pieces 10%

## Cleaners

Metal Cleaner is an efficient cleaner and degreaser. You can use it for the daily and time-saving cleaning of machine parts. It efficiently removes oil, grease and other kinds of dirt and evaporates quickly and residue-free. Foam Cleaner is used for the striation-free cleaning of glass, acrylic glass, plastics and many other water-resistant surfaces.

Description	Article no.	Price
Metal cleaner (press. dispenser, 500 ml)	ET-SM-FLMC	€ 20.00
Foam cleaner (press. dispenser, 500 ml)	ET-SM-FLFC	€ 15.00

Scale of quantity discount:  $\geq 5$  pieces 5%,  $\geq 10$  pieces 10%

## Switching unit

Using the switching unit PSW 01 you can switch any consumer load with a power input of up to 230 V/10 A via the controller CNC 550/580/680/800/950/980. So you can automatize your workflow. You just have to connect PSW 01 to one of the switched outputs of the controller.

Description	Article no.	Price
Switching unit PSW 01 (230 V/10 A)	CM-IO-SE230	€ 190.00

## 3-D measuring sensor

In order to quickly and easily set workpiece origins in x and y direction we recommend to use a 3-D measuring sensor. Its analog gauge always points into the same direction and shows the distance between the spindle axis and the workpiece. When it points to zero, the spindle axis is exactly at the edge of the workpiece.

The 3-D measuring sensor with its 10 mm shank will be directly inserted into the spindle. Thus it is suitable for all rotary current spindles from SPC 1500 on. The measuring direction is arbitrary (x, y, z axis). Its length (without shank) up to the probe tip is 96 mm. Of this distance, the short probe tip which is inserted by default has a length of 25 mm and a ball diameter of 4 mm. A long probe tip with a length of 65 mm and a ball diameter of 8 mm is included in the scope of delivery, too.

Description	Article no.	Price
3-D measuring sensor	MV-3D-MT	€ 360.00
Probe tip, short	MV-3D-MT-TE25	€ 32.00
Probe tip, long	MV-3D-MT-TE65	€ 65.00

Classic  
LinePremium  
LineActive Pro  
LineActive Mold  
LineMachining  
UnitsFixing  
DevicesMeasuring  
DevicesPeripheral  
Equipment

Software

Accessories

## We are looking forward to your visit!



View of the vhf main building in Lettenstraße 10 with showroom and Transparent Factory.



## vhf gladly submits you an offer

We make you a detailed offer for a CNC milling machine which really suits your demands. For doing so, we just need a little basic information about your application and you will receive in return the offer – of course free of charge and without any obligation.

### Request your offer:

- **by phone** **+49 (0) 7032 97097-700**
- **via fax** **+49 (0) 7032 97097-900**
- **by e-mail** **[sales@vhf.de](mailto:sales@vhf.de)**
- **or simply online** **[contact.vhf.de](mailto:contact.vhf.de)**



company/department	contact person
address	country/ZIP code/city
phone/fax	e-mail

### In which field of activity are you involved?

- ☐ aluminium processing
- ☐ sign making
- ☐ plastics processing
- ☐ electronics
- ☐ rapid prototyping and mould making
- ☐ model making
- ☐ wood processing
- ☐ engraving
- ☐ jewellery production
- ☐ \_\_\_\_\_

### What is the maximum size of your workpieces?

length \_\_\_\_\_ mm

width \_\_\_\_\_ mm

height \_\_\_\_\_ mm

### Possible specifics of your application:

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# Order form

## Place your order at vhf:

- **via fax** +49 (0) 7032 97097-490
- **by e-mail** order@vhf.de
- **in the shop** shop.vhf.de
- **writable PDF** download.vhf.de



company/department	contact person
address	country/ZIP code/city
phone/fax	e-mail
your order number	customer number (if known)

## Articles

quantity	article no.	description	price in €

**Total:**

## Payment

preferred way of payment

- ☐ invoice (to foreign countries only on appointment)
- ☐ prepayment
- ☐ PayPal (e-mail: [accounting@vhf.de](mailto:accounting@vhf.de))

☐ credit card (Mastercard/Visa)

As we are not allowed to store credit card data, we ask you to transmit them by phone.



in case of prepayment

bank: Commerzbank AG

IBAN: DE26 6008 0000 0929 8198 00, BIC/SWIFT: DRESDEFF600

in case of prepayment from Switzerland

bank: Commerzbank Schweiz

IBAN: CH21 0883 6120 1870 0010 0, BIC/SWIFT: COBACHZHXXX

VAT identification number (only for companies within the EU)

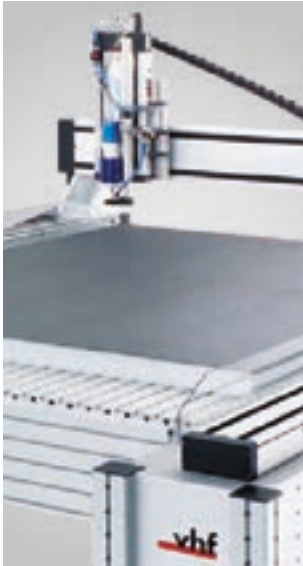
place/date

signature of customer/company stamp

Minimum order value for Germany: € 75; EU + Switzerland: € 150; worldwide: € 300 (for orders below these values we have to charge a minimum quantity surcharge for Germany: € 7.50; EU + Switzerland: € 15.-; worldwide: € 30.-). ■ Forwarding expenses for Germany: € 5.80; EU + Switzerland: € 12.80; worldwide: € 29.80; orders of up to 31 kg in the vhf online shop are free of shipping costs. ■ Expenses for express delivery and larger shipments on request. ■ Deliveries are always subject to our Terms of Sale; we would be glad to send them to you on request and you will find them on the internet at [download.vhf.de](http://download.vhf.de). ■ All prices mentioned exclude VAT and customs duties. ■ Registered office of vhf manufacture AG: Ammerbuch, Germany ■ Executive board: Dipl.-Ing. (FH) Frank Benzinger, Dipl.-Soz.Arb. (FH) Ria Brandenberger ■ Chairman of supervisory board: Dipl.-Finanzwirt (FH) Wolfgang Gsell ■ Amtsgericht Stuttgart – HRB 724223 ■ VAT identification number: DE 159661298

## Your contacts

### CNC milling machines



- **configuration of your new machine**
- **working out an offer**
- **technical advice**

#### **sales**

phone +49 (0)7032 97097-700  
e-mail [sales@vhf.de](mailto:sales@vhf.de)

- **retrofitting and modifying milling machines from vhf and other manufacturers**
- **training courses**
- **maintenance and software upgrades**

#### **customer management**

phone +49 (0)7032 97097-720  
e-mail [customer@vhf.de](mailto:customer@vhf.de)

### CNC milling cutters



- **ordering tools, accessories and spare parts**
- **order free of shipping costs via the vhf Shop**

#### **order hotline**

phone +49 (0)7032 97097-400  
fax +49 (0)7032 97097-490  
e-mail [order@vhf.de](mailto:order@vhf.de)  
shop [shop.vhf.de](http://shop.vhf.de)

- **advice concerning choice and usage of our tools**
- **information on cutting edge geometries**

#### **sales**

phone +49 (0)7032 97097-430  
e-mail [tools@vhf.de](mailto:tools@vhf.de)

### Main office



- **all other issues**

phone +49 (0)7032 97097-000  
fax +49 (0)7032 97097-900  
e-mail [info@vhf.de](mailto:info@vhf.de)  
internet [contact.vhf.de](http://contact.vhf.de)

- **business hours**

Monday to Friday 08:00 – 18:00



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