

Computerized Numerical Control

OPTIMUM[®]
MASCHINEN - GERMANY

CNC METAL WORKING MACHINERY
THE OPTIMUM IN TERMS OF QUALITY, PRICE-PERFORMANCE AND SERVICE



MAIN CATALOGUE 2024/25

OFFER FOR OUR CUSTOMERS WHO ARE ENTREPRENEURS AND NOT CONSUMERS

1. August 2024, 1:20 PM

PREFACE



The OPTIMUM in terms of quality, price-performance and service

Dear Customer,

to enable many applications in metalworking, our OPTIMUM CNC catalogue offers you a wide range of products covering many areas with the corresponding machines. Each of our products impresses with its quality, precision, long service life and value stability.

Your requirements are our target

For more than 30 years, we have focused on the design, development and production of OPTIMUM machines, and for more than 15 years on CNC machines. We work unceasingly on continually optimising our machines. One important point here is also production, which is of great importance to us. This is why we made a careful choice of manufacturers to supplement our own production facilities. We set great store by the fact that these manufacturers meet our internal quality requirements. Besides our own manufacturing operations, OPTIMUM exclusively produces with manufacturers who meet our requirements. This means that we can offer you metalworking machines that impress on many scores.

OPTIMUM has built up a good reputation in the course of the years on what is a continually changing and developing tool and machine market. We are proud to say that we combine expertise, experience and a balanced price-performance ratio. Our utmost priority is you as a satisfied customer. With our motivated and expert personnel we strive to complete OPTIMUM's know-how and deliver it to you our customers.



Kilian Stürmer
Managing Director



DISCOVER OUR PRODUCT VIDEOS NOW!

All of our product videos are available for you to watch on our YouTube channel OPTIMUM Maschinen Germany GmbH. Subscribe to our YouTube channel to make sure you don't miss any of the new videos.





On-site for you: in Europe and worldwide

For many years, OPTIMUM Maschinen Germany has been synonymous with the development, design and production of metalworking machines and CNC machines characterised by high quality standards. In the course of the years, we have continually expanded our sales and service network.

In the meantime, the German company OPTIMUM Maschinen Germany GmbH works globally with expert partners from its headquarters in Hallstadt near Bamberg: OPTIMUM is represented all over Europe by retailers with great performance. Our international sales network extends well beyond Germany's borders to many countries all over the world. This helps us to ensure that our customers can rely on the fast, uncomplicated and service-oriented expertise and quality standards of OPTIMUM thanks to our extensive sales organisation. We have established a responsible market position that you can trust in the course of the years!



WE ARE ON-SITE FOR YOU



CUSTOMER ADVISORY SERVICE

When advising customers, our CNC experts and sales staff will work out individual machine and service solutions for you. In close collaboration with the customer, our staff analyse the fields of application to clearly identify the requirements. Our meaningful, detailed production information makes it easier for you to find your "dream machines".

INSTALLATION, COMMISSIONING AND INSTRUCTION

Our service ensures you not only telephone support from specially trained staff, but also on-site support. Whether it's a planned service appointment or quick help after a sudden machine failure: In the event of service, our intensively trained OPTIMUM technicians are at your disposal with their sound knowledge and many years of experience. They quickly and reliably take care of repairing your CNC machines. With our carefully considered service solution we help to keep your OPTIMUM CNC machine working in a trouble-free way

MAINTENANCE AND REPAIRS

On request, our service technicians perform set-ups as well as professional commissioning and briefings so that the new machines and systems run reliably right away. Our trained staff help the user to get to grips with the new machine in the shortest possible time and to use it efficiently. This service saves our customers time and therefore reduces costs. In addition, these services help to avoid application errors and queries.

SERVICE

Trained service personnel carry out one-off maintenance or - agreed by maintenance contract - regular maintenance. Our expertly performed maintenance ensures that machines run trouble-free for a long time! Repair costs are minimised and operational safety is maintained. In addition, our experts detect possible defects and wear at an early stage. In this way, we save our customers from unnecessary repair costs and avoidable downtime. Should a repair nevertheless be necessary, it will be carried out immediately in consultation with the customer.

COST TRANSPARENCY

Working time and travel shall be charged according to the agreed flat rate plus agreed material costs. The services of our service field service are charged fairly and favourably for the customer.

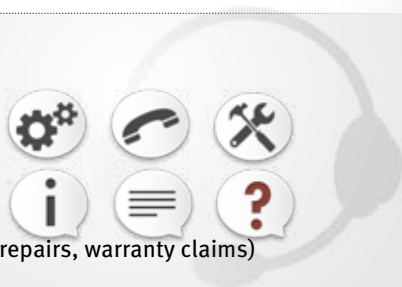
**MORE SERVICE - FAST EXECUTION - DIRECTLY ON SITE:
We ensure customer satisfaction!**



EVERY MACHINE NEEDS
 SERVICE ONCE -
 WE OFFER THIS!

- › Maintenance work after a defined operating period
- › Service in the event of malfunctions
- › Competent advice and information
- › Spare parts supply
- › Complaint processing
- › Service in the CNC workshop or - if necessary - also at the customer's site

CUSTOMER REQUIREMENTS
 ARE SOLVED QUICKLY AND
 PURPOSEFULLY!



Service hotline (repairs, warranty claims)

Quick acceptance & status enquiry: write us an e-mail: CNC_service@stuermer-maschinen.de



**SALE
 DEMONSTRATION CENTRE**

- +49 (0)951 96555-513
- BERATUNG@OPTIMUM-MASCHINEN.DE



**SERVICE HOTLINE
 (REPAIRS, WARRANTY CASES)
 SPARE PARTS / SERVICE**

- +49 (0)951 96555-129
- CNC_SERVICE@STUERMER-MASCHINEN.DE
(SERVICE)
- E.CNC@STUERMER-SERVICE.DE
(SPARE PARTS)

You can contact us as follows:

Monday to Thursday: 7.00 am–4.30 pm
 Friday: 7.00 am–1.30 pm



DISCOVER OUR PRODUCT VIDEOS NOW!

All our product videos are available on our YouTube channel.
Subscribe to our YouTube channel to not miss any of the new videos.

DEMONSTRATION CENTRE

You can experience many of our highlights live on a floor space of some 2 000 m² in our demonstration centre at our main facility in Hallstadt, near Bamberg, Germany. Four customer advisors are available to help you with their expert knowledge.

What you can look forward to:

- approx. 2 000 m² of training and exhibition floor space
- 150 machines from all fields of application are permanently available as demonstrators
- an excerpt of the most important machines from each sector of our product portfolio

OPTIMUM also provides product training for its retail partners at our company headquarters in Hallstadt. At our specially equipped training and presentation rooms, retailers learn the key facts about OPTIMUM products, and the unique selling points compared with third-party products.

Many machines are presented, demonstrated and explained in our exhibition space. Hands-on training is guaranteed.



MAKE AN APPOINTMENT DEMONSTRATION CENTRE

For faster and less complicated registration
Send us an e-mail with complete data
to: beratung@optimum-maschinen.de



DISCOVER THE VIDEO ABOUT OUR
DEMONSTRATION CENTRE

On our YouTube channel



TRAINING

OPTIMUM offers dealer training and product training such as Sinumerik Operate training, 3-D printing basic training, 3-D printing advanced seminar at the company location in Hallstadt and Pettstadt for its trade partners. Please note the training courses offered from Seite 316

Our aim is to give you a practical and technical understanding of our products so that you can advise and sell more expertly to your customers on site.

In the specially equipped training and demonstration rooms, the specialist dealers are given important specialist knowledge about the OPTIMUM products as well as the differences to competitor products.

You and your employees will benefit from being able to experience our machines live.



Practice-oriented training



The company's own bistro for a cosy end to meetings, discussions and training sessions.

DISTRIBUTION SYSTEM



PRODUCTION OF CNC MACHINES FOR CRAFTSMAN

Our customers are our focus

To implement these goals in the best possible way, we liaise directly with the customer. This proximity puts in a position to identify strategic topics in good time and find the right response. Thanks to decades of experience, high quality and reliability in manufacture and delivery, we can guarantee mature engineering to our customers.

Our engineers in Germany plan and develop new and innovative CNC machines driven by the experience of our customers. Always with the premise of optimising machines and existing solutions down to the final detail. Our products are manufactured at the OPTIMUM factory in Yangzhou China. To monitor the quality process end-to-end, are machines are first accepted by our expert CNC team after their arrival in Germany. An OPTIMUM CNC machine is not delivered to the customer until strict checks have been completed.

We also manufacture on our own CNC machines

The OPTIMUM machine factory in China is the first to put our new developments through their paces. Due to the wide variety of tasks in manufacturing drilling and milling machines, and lathes of all types, the required performance spectrum is unrivalled. We do not release the newly developed CNC machines for sale on the market until they have been successfully deployed in our OPTIMUM factory. Because we constantly use our own machines, we are continually discovering new approaches and potentials for improvement.

The CNC machines on the market right now have a level of maturity that reflects the current state of the art.



Only original with the pink stripe



PREMIUM

PRODUCTION OF CNC INDUSTRIAL MACHINES

Strictest requirements

WE SET THE HIGHEST STANDARDS FOR THE PRODUCTION OF OPTIMUM PREMIUM CNC MACHINES, WHICH HAVE TO WITHSTAND THE HARSH REALITY OF THREE-SHIFT OPERATION. [i](#)

Our partner company has more than 35 years' experience in the CNC field and thus offers the best conditions for fulfilling the tasks set by the market in collaboration with us.

Our end customers' experiences are analysed by our CNC specialists. This information is adopted into the production process. While doing so, we also influence the most important components of each machine. Of course, only brand-name components by manufacturers of international repute are used for our machines. In the sensitive area of industrial bearings, linear guides, rotating spindles and main spindles in particular, we set great store by meeting the continually increasing requirements of the market. This is what characterises our machines and sets us apart from our competitors.

Demand-oriented stock management enables the permanent availability and prompt delivery of a large number of the required spare and wear parts. Thanks to an on-going training process, the CNC team both guarantees orderly processing of repairs or maintenance, while at the same time training your staff for future tasks. We spell Service with a capital S.

Original only with the blue PREMIUM stripes



CIVIL/MILITARY OCCUPATIONAL TRAINING CENTRE IN TUNISIA

GERMANY'S FEDERAL GOVERNMENT DEPLOYS OPTIMUM CNC MACHINES IN DEVELOPMENT PROJECT IN TUNISIA

The Federal Ministry of Defence requested a total of five OPTIMUM machines from Hallstadt-based Stürmer Maschinen for a development project in Tunisia. Now the machines have been successfully commissioned at the Military Vocational Training Centre in Northern Tunisia under the meticulous supervision of Stürmer technicians.

The scope of delivery included both CNC-controlled and conventional Optimum milling and turning machines as well as an OPTIdrill drilling machine and a METALLKRAFT metal band saw. The order also included a large volume of accessories. Stürmer has already implemented many projects on a similar scale. However, due to the SIEMENS NX CAD system integrated on this occasion, and the fact that virtual twins were created, this technology project is extraordinary in every respect and will be trend-setting for the future. This is because the advanced technology supplied by Stürmer will in future prevent tool collisions and thus damage of up to €10,000 that can occur on running in the programs. This is made possible by software that imitates the machines with all their controllers and drive units 1:1 and visualises them on a PC.

The installation of the machines at the civil-military occupational training centre has now been completed and the machines can be used in future for training purposes for Tunisian armed forces. In January 2020, training courses were held by Stürmer and SIEMENS to instruct local personnel in the use of the machines. The official inauguration and commissioning ceremony also took place within this framework.



OPTIMUM PREMIUM CNC slant bed lathe S 620 with counter spindle.



OPTIMUM CNC technician



Three-axis OPTIMUM PREMIUM F150 HSC milling machine

TRAINING WORKSHOP AT THE TYRE MANUFACTURER MICHELIN

RAPID TECHNOLOGICAL PROGRESS PRESENTS TRAINERS WITH MAJOR CHALLENGES AND MANY COMPANIES AND VOCATIONAL SCHOOLS ARE STILL TEACHING ON OUTDATED MACHINE TOOLS.



From left to right: Alois Penzkofer (SIEMENS AG), Witali Reischich (Michelin Reifenwerke AG & Co. KGaA), Martin Trebesch (Optimum Maschinen Germany GmbH)

Modern car tyres are high-tech products. Manufactured in complex production processes, they ensure traction and short braking distances in all weather conditions, are extremely resilient and help to save fuel. More than 22 000 tyres in sizes ranging from 16 to 18 inches leave the Michelin plant in Hallstadt near Bamberg, Franconia, every day, employing over 900 people. In order to meet the demand for skilled personnel, 45 young women and men are currently undergoing their three-and-a-half year training as industrial mechanics and electronics technicians in the training workshop. "We train for our own needs and, if possible, take on all trainees.

CNC technology has been of little importance here so far. It was only part of the vocational school education, but not relevant to the examinations in careers where we offer apprenticeships. However, we wanted to strengthen this part in order to better prepare our trainees for the future and to keep Michelin competitive as a training company in the long term," explains trainer Witali Reischich. But, there is one obstacle on the way to this goal: money.

Special leasing solution for training workshops

The central workshop in Hallstadt, manufactures precision knives on a toolmaking machine equipped with a Sinumerik 840D sl; the tool are used in tyre production. The programs - both for series production and for the many prototypes - are developed in a tool chain with SolidWorks and Sinumerik. On this machine, the trainees occasionally created smaller programs and workpieces such as cups. However, the machine's increasing degree of utilisation no longer permitted this. "We then examined the investment in a 3-axis milling machine for the training workshop. However, this could not be realised at first for economic reasons.



Our biggest fear was that the technology would rapidly become obsolete. Because training on an outdated machine is counterproductive," says Witali Reischich summing up. "Fortunately for us, we then held talks with machine tool manufacturer Optimum. We were thus able to benefit from its solution for schools and training workshops." Optimum Maschinen offers machine commissioning, initial training and multiple-day training courses for instructors and users. Optimum Maschinen Germany GmbH has agreed a cooperation partnership with SIEMENS for CNC training and can therefore also issue SIEMENS certificates to trained customers.



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CUSTOMISED MACHINE CONFIGURATION POSSIBLE ON REQUEST
OTHER CONTROLLER TYPES/MANUFACTURERS ON REQUEST



01
STANDARD



02
PRODUCTION MACHINES



03
5-AXIS MACHINES



04
PORTAL MILLING MACHINES



05
TRAINING MACHINES



06
ROBOTS



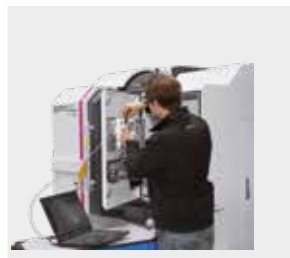
07
3-D PRINTING



08
ACCESSORIES



09
SOFTWARE



10
SERVICE



11
TRAINING

01 - MILLING STANDARD MACHINES



OPTImill F 150E



OPTImill F 50



OPTImill F 105

F 50

Ideal for training and prototyping, minimal space requirement

SIEMENS CONTROL SINUMERIK 808D ADVANCED

- Machine with cast stand design for good stiffness values
- Carousel tool changer with eight tool stations
- All linear guides with stainless steel covers
- Automatic centralised lubrication
- .SIEMENS main spindle motor
- .SIEMENS servo drives on all axes (closed control circuit)
- Maximum spindle speed of 10,000 rpm
- The portable, electronic handwheel with enabling switch and emergency stop pushbutton makes it much easier to run in programmes.
- Coolant unit with 70 litre coolant tank
- Tool change occurs automatically or at the push of a button (electropneumatic tool clamping device)
- Massive, exact milling table - large dimensioned and precisely surface machined.
- Access doors very generously designed to reduce cleaning and maintenance times to a minimum
- LED machine lamp for complete illumination of the workspace
- Additional package SIEMENS material liability for defects and free on-site service OSS see page 19
- For information on maintenance contracts see Seite 309



TECHNICAL DATA

Model	F 50
Article no.	3501050
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	10 kVA
Milling spindle	
Drive motor S1 operation	3.7 kW
Drive motor torque S1 operation	24 Nm
Drive motor S6 30 % operation	5.5 kW
Drive motor torque S6 30 % operation	36 Nm
Spindle seat	BT 30
Cooling lubricant system	
Coolant pump output	450 W
Tank capacity	70 litres
Milling precision	
Repeat accuracy	0.015 mm
Positioning accuracy	0.015 mm
Tool changer	
Type	Carousel
Number of tool slots	8 slots
Max. tool diameter	100 mm
Tool length	200 mm
Max. tool weight	6 kg
Tool change time according to VDI 2852	7 seconds
Travel	
X axis	330 mm
Y axis	220 mm
Z axis	320 mm
Feed drive	
Rapid traverse X/Y/Z axis	15 m/min.
Motor torque	
X axis	3.5 Nm
Y axis	6 Nm
Z axis	6 Nm
Speed range	
Speeds*	10 000 rpm
Pneumatics	
Compressed air	6 bar
Milling table	
Clearance spindle to table	90 - 410 mm
Spindle - column distance	280 mm
Table length x width	690 x 225 mm
T-slot size / amount / distance	14 mm / 3 / 63 mm
Maximum payload	150 kg
Dimensions	
Length x width x height	1845 x 1,680 x 1,480
Overall weight	1 900 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

SINUMERIK 808 ADVANCED

CNC technology from the technology leader

- The SINUMERIK 808D ADVANCED control is a panel-based CNC control. The compact and user-friendly entry-level solution is deployed in simple milling applications. Features such as easy operation, commissioning and maintenance are the perfect basis for equipping CNC machines.
- With its technology-specific variants, the SINUMERIK 808D ADVANCED control is perfectly preconfigured for milling. And with its hardware and software enhancements, the SINUMERIK 808D ADVANCED also offers sufficient performance for simple milling functionalities in mould and tool making.

SINUMERIK 808D ON PC

- Control-identical software package that further simplifies handling of the machine tool. Download free of charge at <https://xcelerator.siemens.com/global/en/industries/machinebuilding/machine-tools/cnc4you/808d-on-pc.html>

COMPACT AND ROBUST

- Thanks to a panel-based CNC design with very few interfaces and an IP65 protected control panel, the SINUMERIK 808D ADVANCED is perfectly prepared for deployment in tough environments.



OVERALL PACKAGE

- RJ45 Ethernet port
- Ready for remote maintenance
- AST function gives users an easy optimisation option in case of stricter dynamic and precision requirements
- Absolute encoder / no referencing move required
- Greater precision

CONTROL

- 8.4" LCD colour display with a resolution of 800x600

ADDITIONAL PACKAGE SIEMENS OSS

- 12 months; Article no. 3589010
- 36 months; Article no. 3589012

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal
 - Siemens WW



LINEAR GUIDE



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

HANDWHEEL



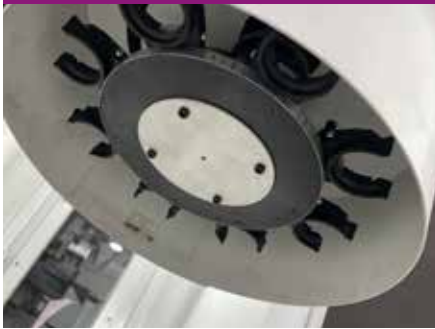
- Portable
- Electronic
- Substantially facilitates running in of programs
- Emergency stop button
- Confirm button

SIGNAL LIGHT



- Visually displays the machine status
- Very bright and with a long service life

TOOL CHANGER



- Carousel tool changer
- 8 tool slots
- Tool change time: 7 seconds

CONTROL CABINET



- Clearly-arranged
- Standards-compliant setup
- Drives by **SIEMENS**

CENTRAL LUBRICATION SYSTEM



- Automatic
- Prevents wear, repair costs and unnecessary downtime to a major extent

SINUMERIK 808D ON PC



- With SINUMERIK 808D on PC, **SIEMENS** offers a software package that is identical to the control and thus further simplifies machine tool handling. Use as a hands-on training software program to program and simulate workpieces offline.
Download for free on <https://xcelerator.siemens.com/global/en/industries/machinebuilding/machine-tools/cnc4you/808d-on-pc.html>

Training and learning

- SINUMERIK Operate BASIC operations can be explored on a PC without additional hardware
- Simple and convenient learning experience with a user interface identical to that of the control

Offline CNC programming:

- Boosts productivity by programming directly on a PC
- Test sub-routines on the PC with the integrated simulator

Professional CNC presentations:

- Present the SINUMERIK Operate BASIC user interface on the PC – at any time and anywhere without additional hardware
- Covers the comprehensive SINUMERIK Operate BASIC feature set incl. programGUIDE BASIC

TOOL MEASURING SYSTEM

Article no.

350108580*

**RENISHAW
Primo set**



- Tool measuring probe Radio Part Setter
- Tool probe
- Radio 3D Tool
- Primo Interface
- GoProbe Software
- Collet BT 30
- Guarantee protection for a secure feeling
- License for six months

➔ Information on the Primo set also available ex warehouse Germany, see Seite 278

3-D PRINTING PREPARATION

Article no.

350108590*

**Motor upgrade
3-D PRINTING**



- Main spindle motor with high-resolution encoder
- 20 bit absolute value encoder instead of incremental encoder

350108591*

3-D printing interface



- Plug connector on milling head for printing head
- Power supply is installed in control cabinet
- Prepared for connecting open circuit monitoring
- Filament holder

➔ Information on 3-D printing ab Seite 253

STARTER SET

Article no.

3536107

**Starter set
BT 30**



- 1 pc. cutter head tool holder
- 1 pc. drill chuck
- 2 each Weldon 6 mm and 20 mm
- 1 each Weldon 8 / 10 / 12 / 16 mm
- 1 pc. Adapter BT 30
- 4 pcs. Collet chuck holder ER 32
- 1 pc. Collet chuck spanner ER 32
- 18-part collet chuck set ER 32
- 1 pc. Height-adjuster
- 1 pc. Assembly and tool adjustment gauge
- 14 pcs. pull stud
- 1 pc. taper squeegee

➔ Information on the starter set Seite 268

New

F 80

Ideal for part production, prototype and jig building

SIEMENS CONTROL SINUMERIK 808D ADVANCED

- Machine with cast stand design for good stiffness values
- Carousel tool changer with 12 tool places
- All linear guides with stainless steel covers
- Automatic centralised lubrication
- .SIEMENS main spindle motor
- .SIEMENS servo drives on all axes (closed control circuit)
- Maximum spindle speed of 10,000 rpm
- The portable, electronic handwheel with enabling switch and emergency stop pushbutton makes it much easier to run in programmes.
- Coolant unit with 80 litre coolant tank
- Tool change occurs automatically or at the push of a button (electropneumatic tool clamping device)
- Massive, exact milling table - large dimensioned and precisely surface machined.
- Access doors very generously designed to reduce cleaning and maintenance times to a minimum
- LED machine lamp for complete illumination of the workspace
- Additional package SIEMENS material liability for defects and free on-site service OSS see page 25
- For information on maintenance contracts see Seite 309



Subscribe



TECHNICAL DATA

Model	F 80
Article no.	3501081
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	12 kVA
Milling spindle	
Drive motor S1 operation	3.7 kW
Drive motor torque S1 operation	24 Nm
Drive motor S6 30 % operation	5.5 kW
Drive motor torque S6 30 % operation	36 Nm
Spindle seat	BT 40
Cooling lubricant system	
Coolant pump output	450 W
Tank capacity	80 litres
Milling precision	
Repeat accuracy	± 0.005 mm
Positioning accuracy	± 0.005 mm
Tool changer	
Type	Carousel
Number of tool slots	12
Max. tool diameter	95 mm
Tool length	300 mm
Max. tool weight	8 kg
Time tool change chip to chip	7 seconds
Travel	
X axis	450 mm
Y axis	260 mm
Z axis	450 mm
Feed drive	
Rapid traverse X/Y/Z axis	20 m/min.
Motor torque	
X axis	6 Nm
Y axis	6 Nm
Z axis	11 Nm
Speed range	
Speeds*	50 - 10 000 rpm
Pneumatics	
Compressed air	7 bar
Milling table	
Clearance spindle to table	100 - 550 mm
Spindle - column distance	370 mm
Table length x width	800 x 260 mm
T-slot size / amount / distance	16 mm / 5 / 50 mm
Maximum payload	200 kg
Dimensions	
Length x width x height	1,995 x 1,930 x 1,640 mm
Overall weight	2,300 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

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COMPACT AND ROBUST

- Thanks to a panel-based CNC design with very few interfaces and an IP65 protected control panel, the SINUMERIK 808D ADVANCED is perfectly prepared for deployment in tough environments.



OVERALL PACKAGE

- RJ45 Ethernet port
- Ready for remote maintenance
- AST function gives users an easy optimisation option in case of stricter dynamic and precision requirements
- Absolute encoder / no referencing move required
- Greater precision

CONTROL

- 8.4" LCD colour display with a resolution of 800x600

ADDITIONAL PACKAGE SIEMENS OSS

- 12 months; Article no. 3589010
- 36 months; Article no. 3589012

Information on this additional package and conditions for utilisation can be found at:
Liability for material defects and on-site service - SiePortal
- Siemens WW



LINEAR GUIDE



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

HANDWHEEL



- Portable
- Electronic
- Substantially facilitates running in of programs
- Emergency stop button
- Confirm button

SIGNAL LIGHT



- Visually displays the machine status
- Very bright and with a long service life

TOOL CHANGER



- Carousel tool changer
- 12 tool slots
- Tool change time: 7 seconds

CONTROL CABINET



- Clearly-arranged
- Standards-compliant setup
- Drives by **SIEMENS**

CENTRAL LUBRICATION SYSTEM



- Automatic
- Prevents wear, repair costs and unnecessary downtime to a major extent

SINUMERIK 808D ON PC



- With SINUMERIK 808D on PC, **SIEMENS** offers a software package that is identical to the control and thus further simplifies machine tool handling. Use as a hands-on training software program to program and simulate workpieces offline.
Download for free on
<https://xcelerator.siemens.com/global/en/industries/machinebuilding/machine-tools/cnc4you/808d-on-pc.html>

Training and learning

- SINUMERIK Operate BASIC operations can be explored on a PC without additional hardware
- Simple and convenient learning experience with a user interface identical to that of the control

Offline CNC programming:

- Boosts productivity by programming directly on a PC
- Test sub-routines on the PC with the integrated simulator

Professional CNC presentations:

- Present the SINUMERIK Operate BASIC user interface on the PC – at any time and anywhere without additional hardware
- Covers the comprehensive SINUMERIK Operate BASIC feature set incl. programGUIDE BASIC


TOOL MEASURING SYSTEM

Article no.			
350108580*	RENISHAW Primo set		<ul style="list-style-type: none"> • Tool measuring probe Radio Part Setter • Tool probe • Radio 3D Tool • Primo Interface • GoProbe Software • Collet BT 30 • Guarantee protection for a secure feeling • License for six months
<p>➤ Information on the Primo set also available ex warehouse Germany, see Seite 278</p>			

3-D PRINTING PREPARATION

Article no.			
350108590*	Motor upgrade 3-D PRINTING		<ul style="list-style-type: none"> • Main spindle motor with high-resolution encoder • 20 bit absolute value encoder instead of incremental encoder
350108591*	3-D printing interface		<ul style="list-style-type: none"> • Plug connector on milling head for printing head • Power supply is installed in control cabinet • Prepared for connecting open circuit monitoring • Filament holder
<p>➤ Information on 3-D printing ab Seite 315</p>			

STARTER SET

Article no.			
3536108	Starter set BT 40		<ul style="list-style-type: none"> • 1 pc. cutter head tool holder • 1 pc. quick clamping drill chuck 1 - 13 mm • 2 each Weldon 6 mm and 20 mm • 1 each Weldon 8 / 10 / 12 / 16 mm • 1 pc. Adapter BT 40 to MT 3 • 4 pcs. Collet chuck holder ER 32 • 1 pc. Collet chuck spanner ER 32 • 18-part collet chuck set ER 32 • 1 pc. Height-adjuster • 1 pc. Assembly and tool adjustment gauge • 15 pcs. pull stud • 1 pc. taper squeegee
<p>➤ For Information on the starter set, see Seite 269</p>			

FOURTH AXIS

Article no.			
350108502*	Preparation for the fourth axis		
350108503*	Fourth axis Complete set		<ul style="list-style-type: none"> • Rotary indexing table Ø 80 mm • Three-jaw lathe chuck 75 mm • Including installation
350108504*	Swivel bridge		<ul style="list-style-type: none"> • Size 160 x 85 mm • with counterholder • Enables multi-sided machining with multiple clamping
<p>➤ You can find information on the fourth axis rotary dividing table on Seite 264</p>			

*Delivered ex works. The option must be ordered with the basic machine. Cannot be retrofitted.

F 105

The compact solution for small batch production in medium-sized companies

SIEMENS CONTROL SINUMERIK 808D ADVANCED

- Rugged design
- Carousel tool changer with 12 tool slots
- All linear guides with stainless steel covers
- Automatic centralised lubrication
- **SIEMENS** main spindle motor
- **SIEMENS** servo drives on all axes (closed control circuit)
- Maximum spindle speed of 10,000 rpm
- The portable, electronic handwheel with enabling switch and emergency stop pushbutton makes it much easier to run in programmes.
- Coolant unit with 120 litre coolant tank
- Tool change occurs automatically or at the push of a button (electropneumatic tool clamping device)
- Solid, precision milling table, generously dimensioned with precision surface finish
- Access doors very generously designed to reduce cleaning and maintenance times to a minimum
- LED machine lamp for complete illumination of the workspace
- Additional package SIEMENS material defects liability and free on-site service OSS see page 31
- For information on maintenance contracts see Seite 309



Follow this for the video presentation of our Optimum milling machine F 105

Subscribe to our YouTube channel, to avoid missing any of the new videos: www.youtube.com/user/OptimumMaschinen



Fig. with optional accessories
(vice, milling cutter, chuck)

TECHNICAL DATA

Model	F 105
Article no.	3501100
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	15 kVA
Milling spindle	
Drive motor S1 operation	7.5 kW
Drive motor torque S1 operation	48 Nm
Drive motor S6 30 % operation	11 kW
Drive motor torque S6 30 % operation	70 Nm
Spindle seat	BT 40
Cooling lubricant system	
Coolant pump output	650 W
Tank capacity	120 litres
Milling precision	
Repeat accuracy	± 0.008 mm
Positioning accuracy	± 0.008 mm
Tool changer	
Type	Carousel
Number of tool slots	12
Max. tool diameter	70 mm
Max. tool length	300 mm
Max. tool weight	6 kg
Tool change time	7 seconds
Travel	
X axis	550 mm
Y axis	305 mm
Z axis	460 mm
Feed drive	
Rapid traverse X/Y/Z axis	15 m/min.
Motor torque	
X axis	8 Nm
Y axis	8 Nm
Z axis	11 Nm
Speed range	
Speeds*	10 - 10 000 rpm
Pneumatics	
Compressed air	7 bar
Milling table	
Clearance spindle to table	100 - 600 mm
Table length x width	800 x 320 mm
T-slot size / amount / distance	14 mm / 3 / 100 mm
Maximum payload	300 kg
Dimensions	
Length x width x height	2 164 x 1 860 x 2 200 mm
Overall weight	2 800 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

SINUMERIK 808 ADVANCED

CNC technology from the technology leader

- The SINUMERIK 808D ADVANCED control is a panel-based CNC control. The compact and user-friendly entry-level solution is deployed in simple milling applications. Features such as easy operation, commissioning and maintenance are the perfect basis for equipping CNC machines.
- With its technology-specific variants, the SINUMERIK 808D ADVANCED control is perfectly preconfigured for milling. And with its hardware and software enhancements, the SINUMERIK 808D ADVANCED also offers sufficient performance for simple milling functionalities in mould and tool making.

SINUMERIK 808D ON PC

- Control-identical software package that further simplifies handling of the machine tool. Download free of charge at <https://xcelerator.siemens.com/global/en/industries/machinebuilding/machine-tools/cnc4you/808d-on-pc.html>

COMPACT AND ROBUST

- Thanks to a panel-based CNC design with very few interfaces and an IP65 protected control panel, the SINUMERIK 808D ADVANCED is perfectly prepared for deployment in tough environments.



OVERALL PACKAGE

- RJ45 Ethernet port
- Ready for remote maintenance
- AST function gives users an easy optimisation option in case of stricter dynamic and precision requirements
- Absolute encoder / no referencing move required
- Greater precision

CONTROL

- 8.4" LCD colour display with a resolution of 800x600

ADDITIONAL PACKAGE SIEMENS OSS

- 12 months; Article no. 3589010
- 36 months; Article no. 3589012

Information on this additional package and conditions for utilisation can be found at:
Liability for material defects and on-site service - SiePortal
- Siemens WW



LINEAR GUIDE



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

HANDWHEEL



- Portable
- Electronic
- Substantially facilitates running in of programs
- Emergency stop button
- Confirm button

MAIN SPINDLE



- Spindle speed from 10 to 10 000 rpm

TOOL CHANGER



- Carousel tool changer
- 12 tool slots
- Tool change time: 7 seconds

CONTROL CABINET



- Clearly-arranged
- With SIEMENS servo drive
- Standards-compliant setup

CENTRAL LUBRICATION SYSTEM



- Automatic
- Prevents wear, repair costs and unnecessary downtime to a major extent

SINUMERIK 808D ON PC



- With SINUMERIK 808D on PC, SIEMENS offers a software package that is identical to the control and thus further simplifies machine tool handling. Use as a hands-on training software program to program and simulate workpieces offline.
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- Boosts productivity by programming directly on a PC
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Professional CNC presentations:

- Present the SINUMERIK Operate BASIC user interface on the PC – at any time and anywhere without additional hardware
- Covers the comprehensive SINUMERIK Operate BASIC feature set incl. programGUIDE BASIC

TOOL MEASURING SYSTEM

Article no.

350110080*	RENISHAW Primo set		<ul style="list-style-type: none"> • Tool measuring probe Radio Part Setter • Tool probe • Radio 3D Tool • Primo Interface • GoProbe Software • Collet BT 40 • Guarantee protection for a secure feeling • License for six months
<p>➔ Information on the Primo set also available ex warehouse Germany, see Seite 278</p>			

3-D PRINTING PREPARATION

Article no.

350110090*	Motor upgrade 3-D PRINTING		<ul style="list-style-type: none"> • Main spindle motor with high-resolution encoder • 20 bit absolute value encoder instead of incremental encoder
350110091*	3-D printing interface		<ul style="list-style-type: none"> • Plug connector on milling head for printing head • Power supply is installed in control cabinet • Prepared for connecting open circuit monitoring • Filament holder
<p>➔ Information on 3-D printing ab Seite 253</p>			

STARTER SET

Article no.

3536108	Starter set BT 40		<ul style="list-style-type: none"> • 1 pc. cutter head tool holder • 1 pc. quick clamping drill chuck 1 - 13 mm • 2 each Weldon 6 mm and 20 mm • 1 each Weldon 8 / 10 / 12 / 16 mm • 1 pc. Adapter BT 40 to MT 3 • 4 pcs. Collet chuck holder ER 32 • 1 pc. Collet chuck spanner ER 32 • 18-part collet chuck set ER 32 • 1 pc. Height-adjuster • 1 pc. Assembly and tool adjustment gauge • 15 pcs. pull stud • 1 pc. taper squeegee
<p>➔ For Information on the starter set, see Seite 269</p>			

FOURTH AXIS

Article no.

350110002*	Preparation for the fourth axis		
350110003*	Fourth axis Complete set		<ul style="list-style-type: none"> • Rotary indexing table Ø 125 mm • Three-jaw lathe chuck 100 mm • Tailstock with MT 2 quill • Including installation
350110004*	Swivel bridge	<p>Illustration similar and with optional fourth axis</p> 	<ul style="list-style-type: none"> • Size 260 x 130 mm • with counterholder • Enables multi-page editing
<p>➔ You can find information on the fourth axis rotary dividing table on Seite 262</p>			

F 150E

The compact solution for small batch production in medium-sized companies

SIEMENS CONTROL SINUMERIK 808D ADVANCED

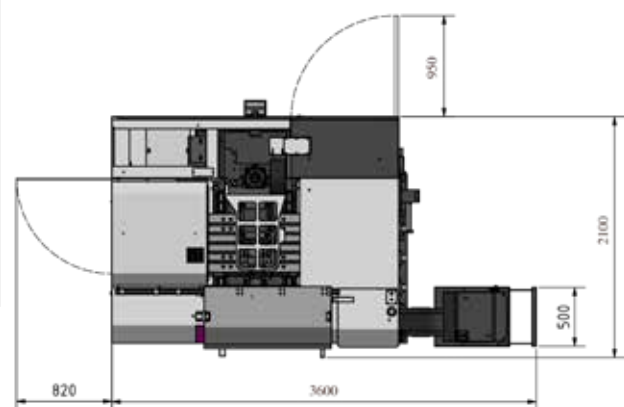
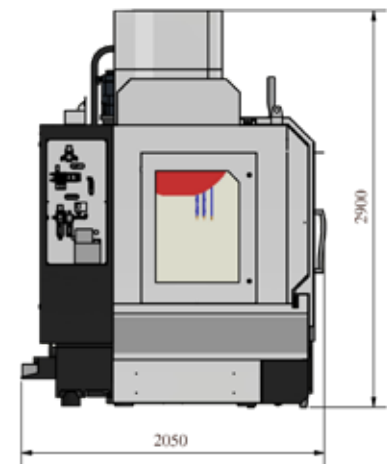
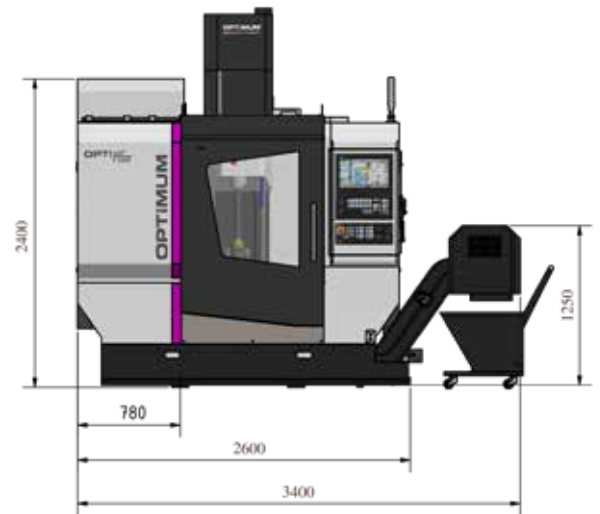
- Carousel tool changer with 16 tool slots
- All linear guides with stainless steel covers
- Automatic centralised lubrication
- SIEMENS main spindle motor
- SIEMENS servo drives on all axes (closed control circuit)
- Chip conveyor, belt type ensures efficient chip discharge
- Chip carriage
- Maximum spindle speed of 10,000 rpm
- The portable, electronic handwheel with enabling switch and emergency stop pushbutton makes it much easier to run in programmes.
- Coolant unit with 190 litre coolant tank
- Tool change occurs automatically or at the push of a button (electropneumatic tool clamping device)
- Solid, precision milling table, generously dimensioned with precision surface finish
- Access doors very generously designed to reduce cleaning and maintenance times to a minimum
- Six levelling feet
- LED machine lamp for complete illumination of the workspace
- Additional package SIEMENS material defects liability and free on-site service OSS see page 37
- For information on maintenance contracts see Seite 309



Fig. with optional accessories
(milling cutter, chuck)

TECHNICAL DATA

Model	F 150E
Article no.	3501150
Drive	Belt drive
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	15 kW
Milling spindle	
Drive motor S1 operation	7.5 kW
Torque drive motor S1 operation	48 Nm
Drive motor S6 30 % operation	11.25 kW
Torque drive motor S6 30 % operation	72 Nm
Spindle seat	BT 40
Cooling lubricant system	
Coolant pump output	370 W
Tank capacity	190 litres
Milling precision	
Repeat accuracy	± 0.008 mm
Positioning accuracy	± 0.008 mm
Tool changer	
Type	Carousel
Number of tool slots	16
Max. tool diameter	90 mm
Max. tool diameter (tools slots beside not occupied)	180 mm
Max. tool length	250 mm
Max. tool weight	8 kg
Time tool change chip to chip	20 seconds
Travel	
X axis	750 mm
Y axis	500 mm
Z axis	500 mm
Feed drive	
Rapid traverse X/Y/Z axis	20 m/min.
Motor torque	
X, Y, Z axis	9.55 Nm / 9.55 Nm / 16.7 Nm
Speed range	
Speeds*	10 - 10 000 rpm
Pneumatics	
Compressed air	6 bar
Milling table	
Clearance spindle to table	100 - 600 mm
Table length x width	900 x 500 mm
T-slot size / amount / distance	18 / 5 / 80 mm
Maximum payload	350 kg
Dimensions	
Length x width x height	3 420 x 2 050 x 2 400 mm
Overall weight	4 500 kg



* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

SINUMERIK 808 ADVANCED

CNC technology from the technology leader

- The SINUMERIK 808D ADVANCED control is a panel-based CNC control. The compact and user-friendly entry-level solution is deployed in simple milling applications. Features such as easy operation, commissioning and maintenance are the perfect basis for equipping CNC machines.
- With its technology-specific variants, the SINUMERIK 808D ADVANCED control is perfectly preconfigured for milling. And with its hardware and software enhancements, the SINUMERIK 808D ADVANCED also offers sufficient performance for simple milling functionalities in mould and tool making.

SINUMERIK 808D ON PC

- Control-identical software package that further simplifies handling of the machine tool. Download free of charge at <https://xcelerator.siemens.com/global/en/industries/machinebuilding/machine-tools/cnc4you/808d-on-pc.html>

COMPACT AND ROBUST

- Thanks to a panel-based CNC design with very few interfaces and an IP65 protected control panel, the SINUMERIK 808D ADVANCED is perfectly prepared for deployment in tough environments.



OVERALL PACKAGE

- RJ45 Ethernet port
- Ready for remote maintenance
- AST function gives users an easy optimisation option in case of stricter dynamic and precision requirements
- Absolute encoder / no referencing move required
- Greater precision

CONTROL

- 8.4" LCD colour display with a resolution of 800x600

ADDITIONAL PACKAGE SIEMENS OSS

- 12 months; Article no. 3589010
- 36 months; Article no. 3589012

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal
 - Siemens WW



CONTROL CABINET



- Closed, uncluttered switch cabinet with integrated heat exchanger ensures optimal temperature
- With **SIEMENS** servo drive
- Standards-compliant setup

HANDWHEEL



- Portable
- Electronic
- Substantially facilitates running in of programs
- Emergency stop button
- Confirm button

BALL SCREW



- Ball screws for high rapid traverse speeds in all axes.
- High positioning and repeat accuracy
- Less wear

TOOL CHANGER



- Carousel
- 16 tool slots
- Tool change time: 6 seconds

CENTRAL LUBRICATION



- Prevents wear, repair costs and unnecessary downtime to a major extent

LINEAR GUIDE



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

CHIP CONVEYOR/CHIP CARRIAGE



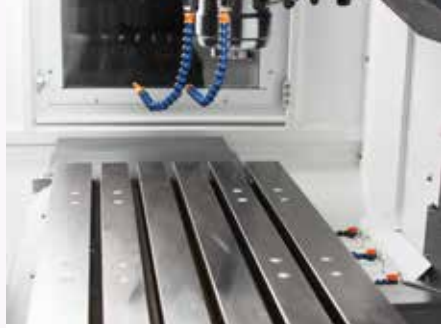
- Conveyor version
- For efficient chip discharge

OIL SEPARATOR











- Reliably removes floating tramp oils and finest chip abrasion from cooling lubricants.
- Collection container easily removable

MILLING TABLE



- Solid, precision milling table with five T-grooves, generously dimensioned with precision surface finish

TOOL MEASURING SYSTEM			
Article no.			
350110080*	RENISHAW Primo set		<ul style="list-style-type: none"> • Tool measuring probe Radio Part Setter • Tool probe • Radio 3D Tool • Primo Interface • GoProbe Software • Collet BT 40 • License for six months
➔ Information on the Primo set also available ex warehouse Germany, see Seite 278			
3-D PRINTING PREPARATION			
Article no.			
350115090*	Motor upgrade 3-D PRINTING		<ul style="list-style-type: none"> • Main spindle motor with high-resolution encoder • 20 bit absolute value encoder instead of incremental encoder
350115091*	3-D printing interface		<ul style="list-style-type: none"> • Plug connector on milling head for printing head • Power supply is installed in control cabinet • Prepared for connecting open circuit monitoring • Filament holder
➔ Information on 3-D printing ab Seite 253			
MISCELLANEOUS			
Article no.			
350115010*	Spindle oil cooler	 Image similar	<ul style="list-style-type: none"> • Continuous precision • Optimal heat dissipation and dimensional stability • Prevents deviation of the spindle centre line or thermal deformation of the machine • Extends the machine's service life • Higher productivity
STARTER SET			
Article no.			
3536108	Starter set BT 40		<ul style="list-style-type: none"> • 1 pc. cutter head tool holder • 1 pc. quick clamping drill chuck 1 - 13 mm • 2 each Weldon 6 mm and 20 mm • 1 each Weldon 8 / 10 / 12 / 16 mm • 1 pc. Adapter BT 40 to MT 3 • 4 pcs. Collet chuck holder ER 32 • 1 pc. Collet chuck spanner ER 32 • 18-part collet chuck set ER 32 • 1 pc. Height-adjuster • 1 pc. Assembly and tool adjustment gauge • 15 pcs. pull stud • 1 pc. taper squeegee
➔ For Information on the starter set, see Seite 269			
FOURTH AXIS			
Article no.			
350115001*	Preparation for the fourth axis		
350110003*	Fourth axis Complete set		<ul style="list-style-type: none"> • Rotary indexing table Ø 125 mm • Three-jaw lathe chuck 100 mm • Tailstock with MT 2 quill • Including installation
350110004*	Swivel bridge		<ul style="list-style-type: none"> • Size 260 x 130 mm • with counterholder • Enables multi-page editing
➔ Illustration similar and with optional fourth axis ➔ You can find information on the fourth axis rotary dividing table on Seite 262			

*Delivered ex works. The option must be ordered with the basic machine. Cannot be retrofitted.

01 - TURNING STANDARD MACHINES



OPTIturn L 50E



OPTi turn L 34HS

OPTi turn[®]
L 34HS

OPTIMUM[®]
MASCHINEN - GERMANY

OPTIMUM

L 34HS

CNC-controlled lathe with linear guide

SIEMENS CONTROL SINUMERIK 808D ADVANCED

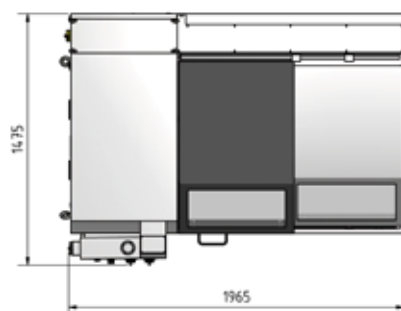
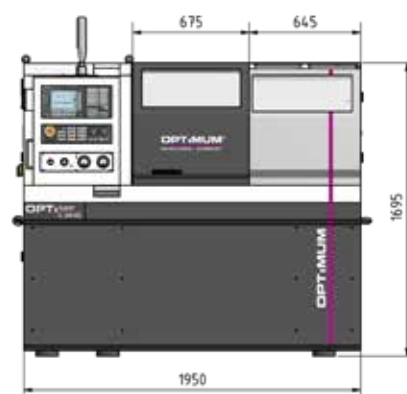
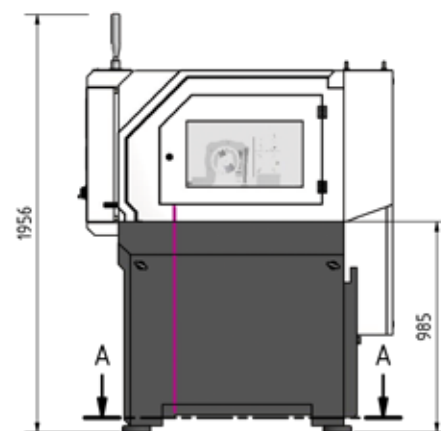
- Precise workmanship
- Spindle and servo motors by **SIEMENS**
- Braced machine bed made from grey cast-iron
- Maintenance-friendly protective housing
- Ground ball screw spindles
- Complex spindle bearing
- Linear guides on both axes
- Emergency stop button
- Central lubrication
- Access flap on rear for maintenance
- Safety switch on front sliding door
- Turret located behind the lathe centre (left turning tool)
- Additional package SIEMENS material defects liability and free on-site service OSS on Seite 45
- For information on maintenance contracts see Seite 309



OPTITURN L 34HS

TECHNICAL DATA

Model	L 34HS
Article no.	3504232
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	6.5 kVA
Spindle	
Drive motor S1 operation	3.7 kW
Drive motor torque S1 operation	23.6 Nm
Torque at the spindle	40 Nm
Spindle seat	ISO 702-1 No. 4 form A2
Spindle bore	Ø 46 mm
Chuck passage	Ø 42 mm
Lathe chuck	Ø 160 mm
Cooling lubricant system	
Coolant pump output	95 W
Tank capacity	75 litres
Pump delivery rate max.	6 l/min
Max. delivery head	3 m
Machine data	
Centre height	165 mm
Centre width	540 mm
Swing Ø above cross slide	146 mm
Swing Ø above machine bed	350 mm
Bed width	208 mm
Speed range	
Speeds*	30 - 3 500 rpm
Tool changer	
Type	electrical
Number of tool slots	6
Mounting height x width of square max.	16 x 16 mm
Max. chuck diameter drilling rod	16 mm
Tool change time	
Tool to tool in the spindle	1.5 seconds
Accuracy	
Repeat accuracy	± 0.01 mm
Positioning accuracy	± 0.01 mm
Travel	
X axis	185 mm
Z axis	750 mm
Feed speed	
X axis	6 m/min.
Z axis	8 m/min.
Motor torque	
X axis	4 Nm
Z axis	6 Nm
Tailstock	
Shank	MT 3
Spindle sleeve diameter	45 mm
Spindle sleeve stroke	120 mm
Dimensions	
Length x width x height	1 950 x 1 475 x 1 956 mm
Overall weight	



SINUMERIK 808 ADVANCED

CNC technology from the technology leader

- The SINUMERIK 808D ADVANCED control is a panel-based CNC control. The compact and user-friendly entry-level solution is used for simple turning applications. Features such as easy operation, commissioning and maintenance are the perfect basis for equipping CNC machines.
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SINUMERIK 808D ON PC

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Communicative:
 - USB front panel (IP65)

Communicative:
 - RJ45 Ethernet on the rear

User-friendly:
 - Technology-specific keyboard layout
 - Hard keys with protective membrane

Easy to maintain:
 - No battery. Continuous data buffering based on NV-RAM technology
 - IP65 protection class on the front

OVERALL PACKAGE

- RJ45 Ethernet port
- Ready for remote maintenance
- AST function gives users an easy optimisation option in case of stricter dynamic and precision requirements
- Absolute encoder / no referencing move required
- Greater precision

CONTROL

- 8.4" LCD colour display with a resolution of 800x600

ADDITIONAL PACKAGE SIEMENS OSS

- 12 months; Article no. 3589010
- 36 months; Article no. 3589012

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal
 - Siemens WW



TOOL CHANGER



- For 6 tool places

SPINDLE



- Incremental encoder for spindle positioning (thread tapping)
- Large spindle bore

LINEAR GUIDE



- High permissible load and high stiffness
- Low coefficient of friction
- Greater precision of the machine

COOLANT SYSTEM



- Pulls out
- Easy chip disposal

MACHINE LAMP



- Full illumination of the workspace

CENTRAL LUBRICATION SYSTEM



- Guarantees regular and automatic lubrication
- Lubricating points that are connected to the central lubricating system have a longer service life

SINUMERIK 808D on PC



- Software package identical to control
- Facilitates the handling of the machine tool
- The workpieces can be programmed and simulated offline.

Training and learning

- SINUMERIK Operate BASIC operations can be explored on a PC without additional hardware.
- Easy and convenient learning experience with a user interface identical to that of the control





Offline CNC programming:




- Boosts productivity by programming directly on a PC
- Testing of part programmes on the PC with the integrated simulation

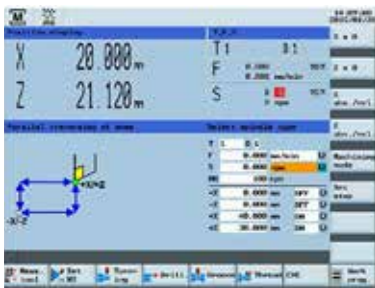
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LATHE CHUCK			
Article no.			
3450232	Bison Three-jaw lathe chuck		<ul style="list-style-type: none"> • Cast, Ø 160 mm DIN 6350 • Hard jaws, single-part, with outside-inside clamping • Chuck key • Runout accuracy: 0.03 mm
3450412	Bison monobloc jaw set, soft		<ul style="list-style-type: none"> • for three-jaw lathe chuck Ø 160 mm
3450236	Bison Four-jaw lathe chuck		<ul style="list-style-type: none"> • Cast, Ø 160 mm DIN 6350 • Hard jaws, single-part, with outside-inside clamping • Chuck key • Runout accuracy: 0.03 mm
3450422	Bison monobloc jaw set, soft		<ul style="list-style-type: none"> • for four-jaw lathe chuck Ø 160 mm
3450241	Chuck flange		<ul style="list-style-type: none"> • for lathe chuck Ø 160 mm • for collet chuck 16C (Article no. 3450245)
3450245	Collet chuck 16C		<ul style="list-style-type: none"> • Ø 160 mm • Chuck flange needed (Article no. 3450246) • Manually operated chuck for distortion-free clamping of workpieces • Steel chuck body

MISCELLANEOUS			
3441215	Lathe tool set HM 16 mm		<ul style="list-style-type: none"> • 4-part
3535170	Cylindrical seat Ø16 mm		<ul style="list-style-type: none"> • for drill chuck B16
350422010	Boring bar holder round, up to 20 mm		<ul style="list-style-type: none"> • for tool changer • Info: The hole is to be drilled by the user himself
350422011	Lathe tool holder crosswise up to 16 mm		<ul style="list-style-type: none"> • for tool changer

SOFTWARE			
3584150*	SIEMENS Manual Machine Plus (MM+) Simple cycle control		<p>The software enables the transition from conventional machines to CNC programming. The machine can be operated by means of hand wheels like a conventional machine, but with the advantages of CNC-supported technology cycles.</p> <p>Functions:</p> <ul style="list-style-type: none"> • Axis-parallel traverse, taper turning, radius turning, centre drilling, tapping, groove cycle, tapping, pre-turning of contours

➔ For more information, see auf Seite 301

L 50E

OPTIMUM Universal CNC Lathe

Complete solution - Diverse possibilities

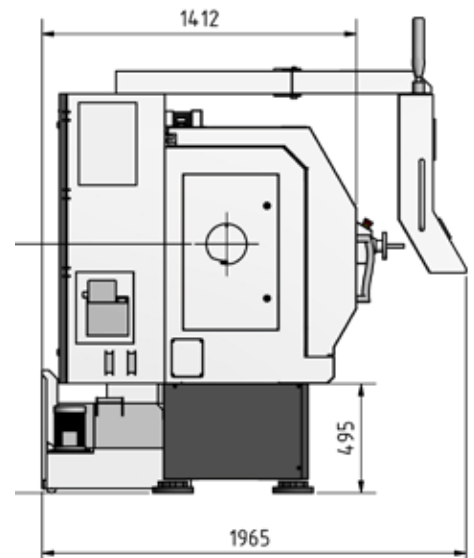
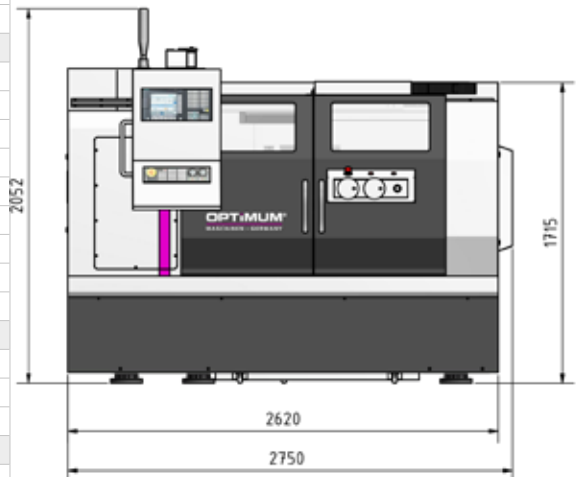
SIEMENS CONTROL SINUMERIK 808D ADVANCED

- Precision workmanship
- Spindle and servo motors by [SIEMENS](#)
- Fully cladded with safety device
- Maximum spindle speed of 3 000 rpm as standard
- Hydraulic lathe chuck
- Ball screws for high rapid traverse speeds in all axes
- Linear guides on all axes
- Automatic centralised lubrication
- Servo-hydraulic VDI 30 tool changer with 8 tool stations
- Swivelling operating unit
- Electronic handwheels for the X and Z axis
- Coolant unit with 110 litre coolant tank
- RJ45 plug-in connection, USB connection and power connection 230 V
- EMC Electromagnetic compatibility
- Six levelling feet
- Operating tool
- Additional package SIEMENS material defects liability and free on-site service OSS on Seite 51
- For information on maintenance contracts see Seite 309



TECHNICAL DATA

Model	L 50E
Article no.	3504240
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	11 kW
Spindle	
Drive motor S1 operation	7.5 kW
Torque drive motor S1 operation	48 Nm
Drive motor S6 30 % operation	11.25 kW
Torque drive motor S6 30 % operation	72 Nm
Spindle seat	ISO 702-1 No. 6 form A2
Hydraulic lathe chuck	Ø 210 mm
Chuck passage	Ø 52 mm
Spindle bore*	Ø 66 mm
Torque at the spindle	86 Nm
Cooling lubricant system	
Cleaning pump output	1 kW
Coolant pump output	450 W
Tank capacity	110 litres
Hydraulic system	
Hydraulic pump power	2.2 kW
Tank capacity	50 litres
Machine data	
Turning length	618 mm
Centre height	245 mm
Swing Ø above cross slide	280 mm
Swing Ø above machine bed	490 mm
Bed width	400 mm
Speed range	
Spindle speeds	3 000 rpm
Tool changer	
Shank	VDI 30
Type	Hydraulic
Number of tool slots	8
Mounting height x width of square max.	20 mm
Max. chuck diameter drilling rod	32 mm
Accuracy	
Repeat accuracy	±0.005 mm
Positioning accuracy	±0.008 mm
Travel	
X axis	300 mm
Z axis	800 mm
Feed speed	
X axis fast motion	12 m/min.
Z axis fast motion	15 m/min.
Motor torque	
X axis	6 Nm
Z axis	11 Nm
Tailstock	
Shank	MT 5
Spindle sleeve diameter	75 mm
Spindle sleeve stroke	150 mm
Dimensions	
Length x width x height	2 750 x 1 965 x 2 052 mm
Overall weight	4 200 kg



* depending on installed chuck

SINUMERIK 808 ADVANCED

CNC technology from the technology leader

- The SINUMERIK 808D ADVANCED control is a panel-based CNC control. The compact and user-friendly entry-level solution is used for simple turning applications. Features such as easy operation, commissioning and maintenance are the perfect basis for equipping CNC machines.
- With its technology-specific variants, the SINUMERIK 808D ADVANCED control is perfectly preconfigured for turning. And with its hardware and software enhancements, the SINUMERIK 808D ADVANCED also offers sufficient performance for simple turning functionalities in mould and tool making.

SINUMERIK 808D ON PC

- Control-identical software package that further simplifies handling of the machine tool. Download free of charge at <https://xcelerator.siemens.com/global/en/industries/machinebuilding/machine-tools/cnc4you/808d-on-pc.html>



Communicative:
 - USB front panel (IP65)

Communicative:
 - RJ45 Ethernet on the rear

User-friendly:
 - Technology-specific keyboard layout
 - Hard keys with protective membrane

Easy to maintain:
 - No battery. Continuous data buffering based on NV-RAM technology
 - IP65 protection class on the front

OVERALL PACKAGE

- RJ45 Ethernet port
- Ready for remote maintenance
- AST function gives users an easy optimisation option in case of stricter dynamic and precision requirements
- Absolute encoder / no referencing move required
- Greater precision

CONTROL

- 8.4" LCD colour display with a resolution of 800x600

ADDITIONAL PACKAGE SIEMENS OSS

- 12 months; Article no. 3589010
- 36 months; Article no. 3589012

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal
 - Siemens WW



TOOL CHANGER



- Servo-hydraulic VDI30 tool changer for eight tool stations
- Max. mounting height 20 mm
- Max. chuck diameter 32 mm

LINEAR GUIDE



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

SIGNAL LIGHT



- Visually displays the machine status
- Very bright and with a long service life

HANDWHEELS



- Handwheel for moving the X axis and Z axis manually
- Emergency stop button

CONTROL CABINET



- Clear-cut layout of the control cabinet
- Standard-compliant
- Drives by **SIEMENS**

CENTRAL LUBRICATION SYSTEM



- Guarantees regular and automatic lubrication
- Lubricating points that are connected to the central lubricating system have a longer service life

SINUMERIK 808D on PC



- Software package identical to control
- Facilitates the handling of the machine tool
- The workpieces can be programmed and simulated offline.

Training and learning

- SINUMERIK Operate BASIC operations can be explored on a PC without additional hardware.
- Easy and convenient learning experience with a user interface identical to that of the control



Offline CNC programming:

- Boosts productivity by programming directly on a PC
- Testing of part programmes on the PC with the integrated simulation

Professional CNC presentations:

- Present the SINUMERIK Operate BASIC user interface on the PC – at any time and anywhere without additional hardware
- *Download free of charge at <https://xcelerator.siemens.com/global/en/industries/machinebuilding/machine-tools/cnc4you/808d-on-pc.html>*

LATHE CHUCKS AND ACCESSORIES			
Article no.			
350424014*	Four-jaw lathe chuck Ø 210 mm		• for the > three-jaw lathe chuck Ø 210 mm - included in the standard equipment
3519712	Soft jaw (1 pc.) Autogrip		• for lathe chuck Ø 210 mm
3519732	Set of hard top jaw (3 pc.) Autogrip		• for the - in the standard equipment > three-jaw lathe chuck Ø 210 mm
3519733	Set of hard top jaw (4 pc.) Autogrip		• for the optional four-jaw lathe chuck Ø 210 mm

MISCELLANEOUS			
3536115	Starter set VDI 30		<ul style="list-style-type: none"> • 3 pcs. square cross adapter • 1 pc. square cross adapter overhead • 1 pc. square longitudinal adapter • 5 pcs. boring bar holder Ø 10/12/16/20/25 mm • 3 pcs. closing lid • 1 pcs. Collet chuck holder ER 25 • 1 pc. Collet chuck spanner ER 25 • 15-part collet set ER 25 • 1 pc. Tool holder • 1 pc. drill chuck
3544190	Lathe tool set Carbide 20 mm		<ul style="list-style-type: none"> • 6-part • see Seite 282
350424004	Chip conveyor with chip trolley		• Conveyor version
350424003	Oil separator / oil skimmer		<ul style="list-style-type: none"> • Oil skimmer reliably removes floating tramp oils and finest chip debris from cooling lubricants • Longer service life of the cooling lubricants
350424002	High performance coolant pump 1 kW		• instead of the - in the standard equipment > coolant pump 450 W
350424001	Lifting device		• a lifting device is required to unload the machine.

SOFTWARE			
3584150*	SIEMENS Manual Machine Plus (MM+) Simple cycle control		<p>The software enables the transition from conventional machines to CNC programming.</p> <p>Functions:</p> <ul style="list-style-type: none"> • Axis-parallel traverse, taper turning, radius turning, centre drilling, tapping, groove cycle, tapping, pre-turning of contours
 For more information, see auf Seite 301			

*Delivered ex works. The option must be ordered with the basic machine. Cannot be retrofitted.

02 - MILLING PRODUCTION MACHINES

OPTImill F 600HSC



OPTImill F 110HSC



F 120X

CNC Drilling and thread tapping machine with full milling capability

SIEMENS CONTROL 828D with PPU 290

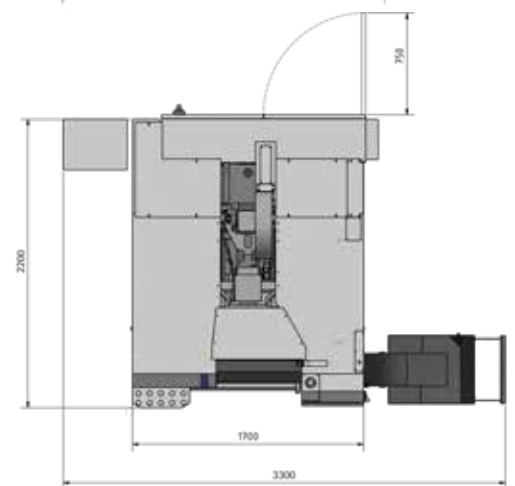
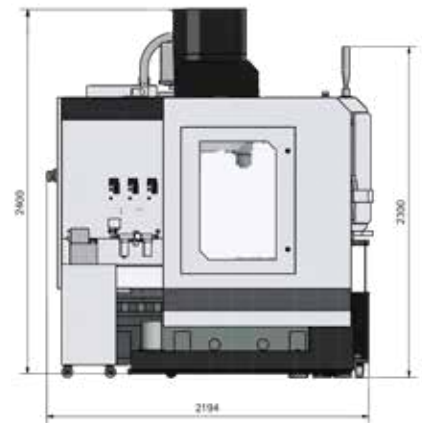
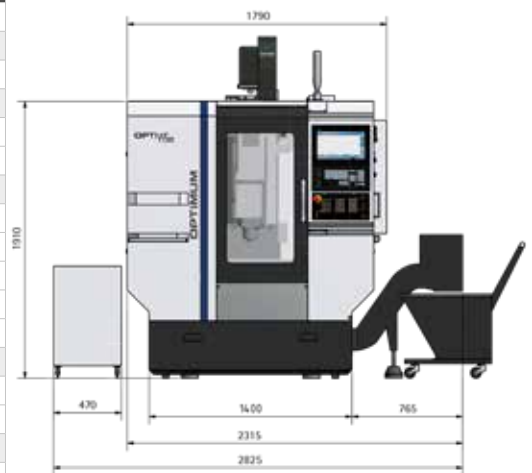
- Rugged design
- Servo tool changer with 21 tool slots
- All linear guides with stainless steel covers
- Automatic centralised lubrication
- SIEMENS main spindle motor
- SIEMENS servo drives on all axes (closed control circuit)
- Inline spindle with max. spindle speed of 16 000 rpm
- Hardened and precision ground ball screws for high rapid traverse speeds in all axes
- Portable, electronic handwheel with enabling switch and emergency stop button that significantly facilitates the running-in of programmes
- Coolant unit with 120 litre coolant tank
- Solid, precision milling table with precision surface finish
- Access doors very generously designed to reduce cleaning and maintenance times to a minimum
- Chip conveyor, belt type ensures efficient chip discharge
- Chip carriage
- Oil cooler ensures thermal stability of the spindle
- LED machine lamp for complete illumination of the workspace
- Additional package SIEMENS material liability for defects and free online/on-site service OSS Plus see page 65
- For information on maintenance contracts see Seite 309



Fig. with optional accessories
(vice, milling cutter, chuck)

TECHNICAL DATA

Model	F 120X
Article no.	3515120
Spindle	Inline spindle
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	45 kVA
Milling spindle	
Drive motor S1 operation	12 kW
Torque drive motor S1 operation	38 Nm
Drive motor S6 30 % operation	22.8 kW
Torque drive motor S6 30 % operation	116 Nm
Spindle seat	BT 30
Cooling lubricant system	
Coolant pump output	370 W
Tank capacity	120 litres
Milling accuracy according to ISO 230-2	
Repeat accuracy	± 0.006 mm
Positioning accuracy	± 0.005 mm
Tool changer	
Type	Servo
Number of tool slots	21
Max. tool diameter	80 mm
Max. tool length	80 mm
Max. tool weight	3 kg
Time tool change chip to chip	7.33 seconds
Travel	
X axis	500 mm
Y axis	400 mm
Z axis	300 mm
Feed drive (X / Y / Z axis)	
Rapid traverse	40 m/min.
Acceleration	2 m/s ²
Motor torque (X / Y / Z axis)	
Drive motor S1 operation	2.32 / 2.32 / 3.3 kW
Torque drive motor S1 operation	7.4 / 7.4 / 10.5 Nm
Drive motor S6 30 % operation	4.1 / 4.1 / 6.5 kW
Torque drive motor S6 30 % operation	14 / 14 / 21 Nm
Speed range	
Speeds*	16,000 rpm
Pneumatics	
Compressed air	6 bar
Milling table	
Spindle centre to Z axis cover	400 mm
Clearance spindle to table	150 - 450 mm
Table length x width	650 x 400 mm
T-slot size / amount / distance	14 mm / 3 / 125 mm
Maximum payload	250 kg
Dimensions	
Length (with chip conveyor) x width x height	2 315 x 2 194 x 2 325 mm
Overall weight	3 800 kg



* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

SINUMERIK 828D

The power pack in the compact class of CNC controls

Robust hardware architecture and intelligent control algorithms as well as top-class drive and motor technology ensure the highest dynamics and precision during machining. Advanced software-controlled compensation functions ensure additional quality in surface machining and high availability of the machine tool. With SINUMERIK Operate, all machining technologies, from standard to complex, can be operated intuitively and with a uniform "look & feel".



Multi-touch operation with PPU 290:
 The 15.6" panel is robust even in harsh environments. The SINUMERIK Operate user interface is optimised for touch-sensitive operation

Proximity/distance sensor for smart display control

Rugged and maintenance-free
 Front panel made of die-cast magnesium with scratchproof glass front
 Can be operated while wearing gloves

Easy data transfer thanks to IP65 protected front interfaces (USB 2.0, RJ45 Ethernet)

SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!

Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- Capacitive 15.6" color display, 16:9 format
- Configurable side screen
- Intuitive Multitouch operation
- Full QWERTY keyboard
- Soft key selection via touch function

SYSTEM SOFTWARE

SW 28x

- 10 MB CNC memory
- 1 ms Block change time
- 150 Look Ahead
- 512 tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording
- System software SW 28x

ADDITIONAL PACKAGE SIEMENS OSS PLUS

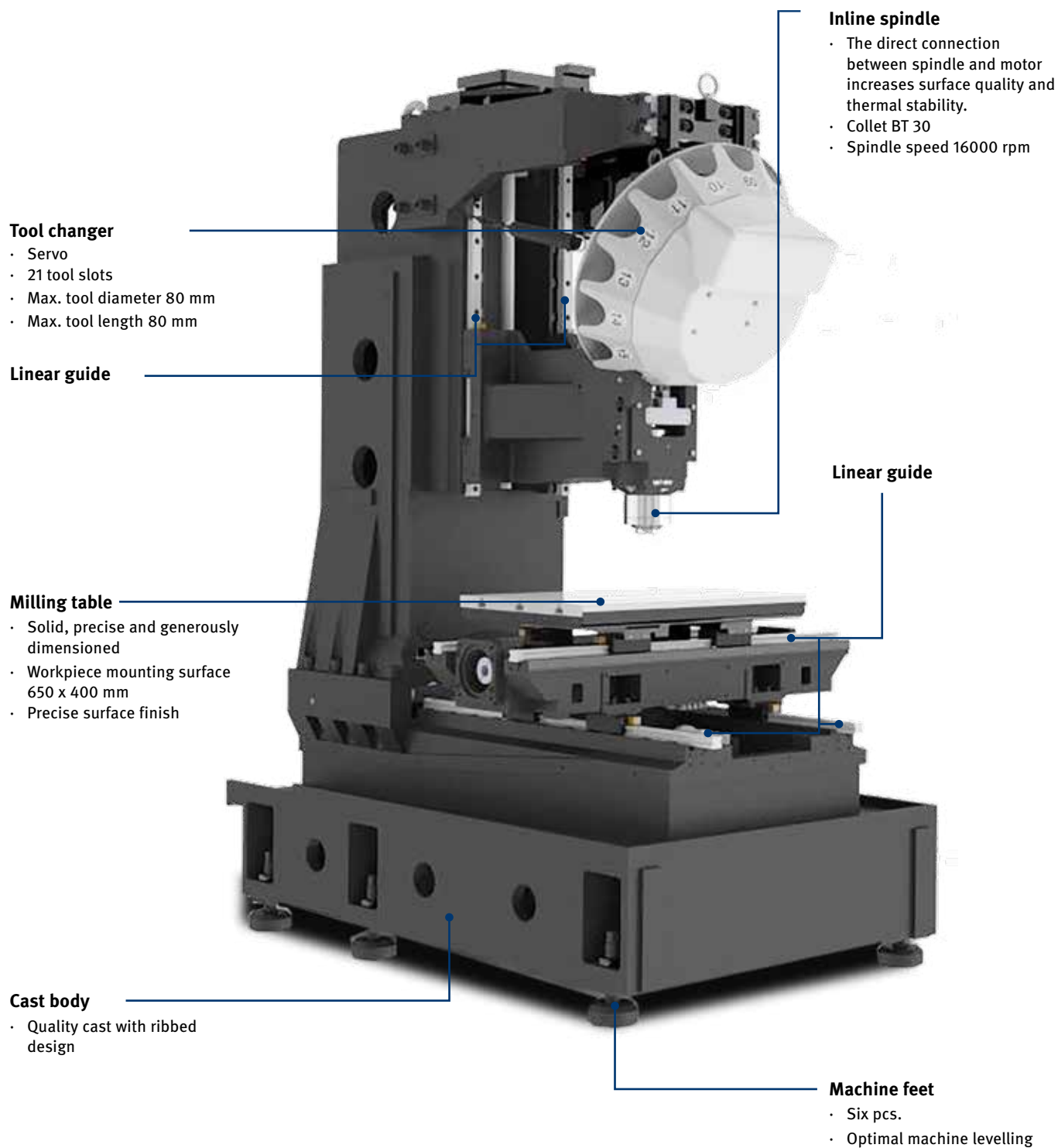
- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



RUGGED DESIGN

Dynamics, precision and ergonomics



COOLANT PUMP



- Powerful 370 W coolant pump
- Tank capacity 120 litres
- Maximum flow rate 4 m³/h (66 litres per minute)

HANDWHEEL



- Portable electronic handwheel
- Substantially facilitates running in of programs
- Emergency stop button
- Confirm button

SPINDLE OIL COOLER



- Prevents deviation of the spindle centre line or thermal deformation of the machine
- Optimal heat dissipation and dimensional stability
- Extends the machine's service life

TOOL CHANGER SYSTEM



- Servo
- 21 tool slots
- Tool change time, tool to tool in the spindle: 0.5 seconds

CONTROL CABINET



- With **SIEMENS** servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

LINEAR GUIDE



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

COMPARTMENTS



- Storage compartment
- Tool compartment for clean and clear-cut storage of tools
- Within reach on the machine

INLINE SPINDLE



- Spindle speed up to 16 000 rpm
- The direct connection between spindle and motor increases surface quality and thermal stability.

CENTRAL LUBRICATION SYSTEM



- Prevents wear, repair costs and unnecessary downtime to a considerable extent.

TOOL MEASURING / WORKPIECE MEASURING

➔ For information on tool/workpiece measurement ex warehouse Germany, see Seite 275.

MISCELLANEOUS

3536107	1	Starter set BT 30	➔ Informations auf Seite 268	
351512010*	3	Coolant through spindle (CTS)	<ul style="list-style-type: none"> • Pump pressure 30 bars • Integrated unit 	we recommend a suction
351512011*			<ul style="list-style-type: none"> • Pump pressure 70 bars • External power unit • Tank capacity 168 litres 	
351512016*	2	Double contact spindle system BIG-PLUS® BT 30	<ul style="list-style-type: none"> • BIG-PLUS® is an extremely stable connection between the machine spindle and the tool holder, which is achieved by simultaneous taper and face contact of the tool holder in the machine spindle. 	

FOURTH AXIS

351512002*	4	Fourth axis rotary indexing table	<ul style="list-style-type: none"> • Preparation
351512003*			<ul style="list-style-type: none"> • Rotary indexing table Ø 120 mm • Three-jaw lathe chuck 100 mm • Tailstock • Installation
350110004*	5	Swivel bridge	<ul style="list-style-type: none"> • 260 x 130 mm • with counterholder • Enables multi-sided machining with multiple clamping • With a quadruple clamping, the proportion of tool change time per workpiece is therefore only a quarter compared to a single clamping.

➔ For details on the fourth axis for the rotary indexing table, see Seite 264

SOFTWARE

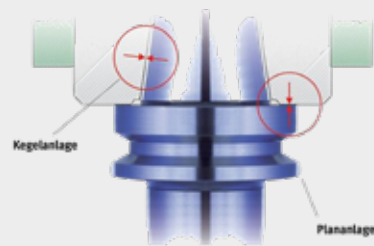
3584014	6	DXF Reader for SIEMENS SINUMERIK controls	<ul style="list-style-type: none"> • from version 4.7 • For importing DXF files • Hiding graphics layers • Automatic contour tracking • Arbitrary workpiece zero point per contour/drilling point
3584012	7	Top surface for SIEMENS SINUMERIK control	<ul style="list-style-type: none"> • The NC data from the CAM system are optimised online during processing • The result is excellent surface quality while milling complex free-form surfaces. This is particularly beneficial for geometrically complex mould parts in automobile or aerospace applications or in power generation

1 STARTER SET BT 30



- Milling head holder 1
- 13 mm quick-action drill chuck 2
- 2 each Weldon 6 mm and 20 mm 3
- 1 each Weldon 8/12/16 mm 4
- Adapter BT 30 5
- 4 pcs. Collet chuck holder 6
- ER 32 Collet 7
- 18-part collet chuck set ER 32 8
- Height-adjuster 9
- Assembly and tool adjustment gauge 10
- 14 pcs. pull stud 11
- Taper squeegee 12

2 DOUBLE CONTACT SPINDLE SYSTEM BIG-PLUS®



The advantages

- Improve surface quality and dimensional accuracy
- Longer service life of the tools
- Prevents fretting corrosion during heavy machining
- Maximum change accuracy with the tool changer
- No axial offset at high speeds
- Improved concentricity in drilling work
- Improved flat surface contact (BT 30: BIG-PLUS Ø 46 mm - conventional Ø 31.75 mm)

3 COOLANT THROUGH SPINDLE



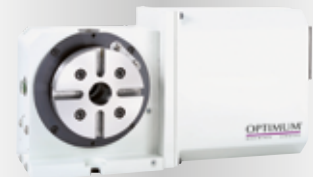
- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone

4 PREPARATION



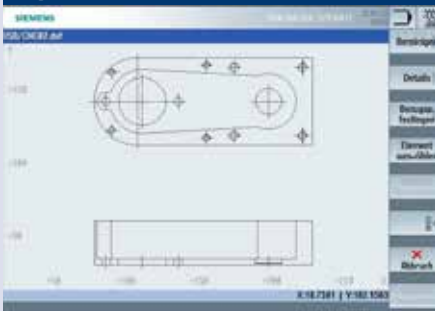
- Preparation for fourth axis

5 FOURTH AXIS



- Rigid design thanks to single-part front plate and spindle design
- A combination of high-precision worm wheel and bronze/nickel housing. The screw made of hardened steel

6 DXF READER



- DXF data can be converted into NC programs for drilling patterns and contours.

7 TOP SURFACE



The SINUMERIK Top Surface function produces the finest surfaces, largely independent of the quality of the CAD/CAM data. At the same time, the machine is protected thanks to harmonious tool guidance and minimised vibration excitation.



- Excellent surface quality and form precision
- Fast and precise machining thanks to new technology
- Complete machining fully integrated in Sinumerik Operate

F 110HSC

Excellent precision, solid design, effectiveness and efficiency

SIEMENS CONTROL SINUMERIK 828D mit PPU 290 and 15.6 inch touch display

- Heavy duty version
- High productivity
- High reliability
- Torsion free machine base thanks to strong ribbing
- Profile rail with ball screw for fast rapid motion speeds on all axes
- High-torque servo drives on all three axes
- Telescopic guide rail covers on all three axes
- Automatic lubrication
- Solid, precise milling table with three T-slots, large dimensions and precision-ground
- The portable, electronic handwheel with enabling switch and emergency stop push button makes it much easier to run in programmes.
- Coolant device with chip flushing system and cleaning gun
- Chip conveyor, belt type ensures efficient chip discharge
- Chip carriage
- RJ45 connection and 230 V power connection
- Closed switch cabinet with integrated heat exchanger; ensures optimal temperature even in case of high ambient temperatures; prevents dirt particle penetration
- Machine lamp in the workspace
- Additional package SIEMENS material liability for defects and free online/on-site service OSS Plus see page 67
- 1 year maintenance contract Basic included in DE/A/CH see Seite 309



TECHNICAL DATA

Model	F 110HSC
Article no.	3511410
Milling spindle	Inline spindle
Machine data	
Electrical connection	400 V / ~50 Hz
Total connected load	15 kVA
Milling spindle	
Drive motor S1 operation	9 kW
Torque drive motor S1 operation	57 Nm
Drive motor S6 30 % operation	21.2 kW
Torque drive motor S6 30 % operation	135 Nm
Spindle seat	SK 40 / DIN 69871
Coolant through spindle Option**	
Drive motor S1 operation	10.5 kW
Torque drive motor S1 operation	50 Nm
Drive motor S6 30 % operation	26.4 kW
Torque drive motor S6 30 % operation	125 Nm
Cooling lubricant system	
Coolant pump power, 2 pieces	900 W
Delivery rate max.	35 l/min.
Tank capacity	116 litres
Cleaning pump	
Cleaning pump output	530 W
Milling precision	
Repeat accuracy	± 0.005 mm
Positioning accuracy	± 0.005 mm
Tool changer	
Type	Double arm gripper
Number of tool stations	20
Max. tool diameter	78 mm
Max. tool diameter (tools slots beside not occupied)	120 mm
Tool length	300 mm
Max. tool weight	8 kg
Tool change time: Tool to tool	2.5 seconds
Travel	
X axis	650 mm
Y axis	400 mm
Z axis	500 mm
Feed drive	
Rapid traverse X-, Y-, Z axis	48 / 48 / 32 m/min.
Motor torque	
X / Y / Z axis	11 Nm / 11 Nm / 20 Nm
Feed forces	
X / Y / Z axis	3.67 kN / 3.67 kN / 6.68 kN
Speed range	
Speeds*	12 000 rpm
Pneumatics	
Compressed air	6 bar
Air consumption per hour	6 - 8 kg/m ³
Milling table	
Clearance spindle to table	100 - 600 mm
Table length x width	850 x 400 mm
T-slot size / amount / distance	18 mm / 3 / 100 mm
Maximum payload	400 kg
Dimensions	
Length x width x height	2,100 x 2,300 x 2,750 mm
Overall weight	4,300 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

** The option must be ordered with the basic machine. Cannot be retrofitted.

SINUMERIK 828D

The power pack in the compact class of CNC controls

Robust hardware architecture and intelligent control algorithms as well as top-class drive and motor technology ensure maximum dynamics and accuracy during machining. Advanced software-controlled compensation functions ensure additional quality in surface machining and high machine tool availability. With SINUMERIK Operate, all machining technologies, from standard to complex, can be operated intuitively and with a uniform "look & feel".



Multi-touch operation with PPU 290:
The 15.6" panel is robust even in harsh environments. The SINUMERIK Operate user interface is optimised for touch-sensitive operation

Proximity/distance sensor for smart display control

Rugged and maintenance-free
Front panel made of die-cast magnesium with scratchproof glass front
Can be operated while wearing gloves

Easy data transfer thanks to IP65 protected front interfaces (USB 2.0, RJ45 Ethernet)

SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- Capacitive 15.6" color display, 16:9 format
- Configurable side screen
- Intuitive Multitouch operation
- Full QWERTY keyboard
- Soft key selection via touch function

SYSTEM SOFTWARE

SW 28x

10 MB CNC memory
1 ms Block change time
150 Look Ahead
512 tools

OVERALL PACKAGE

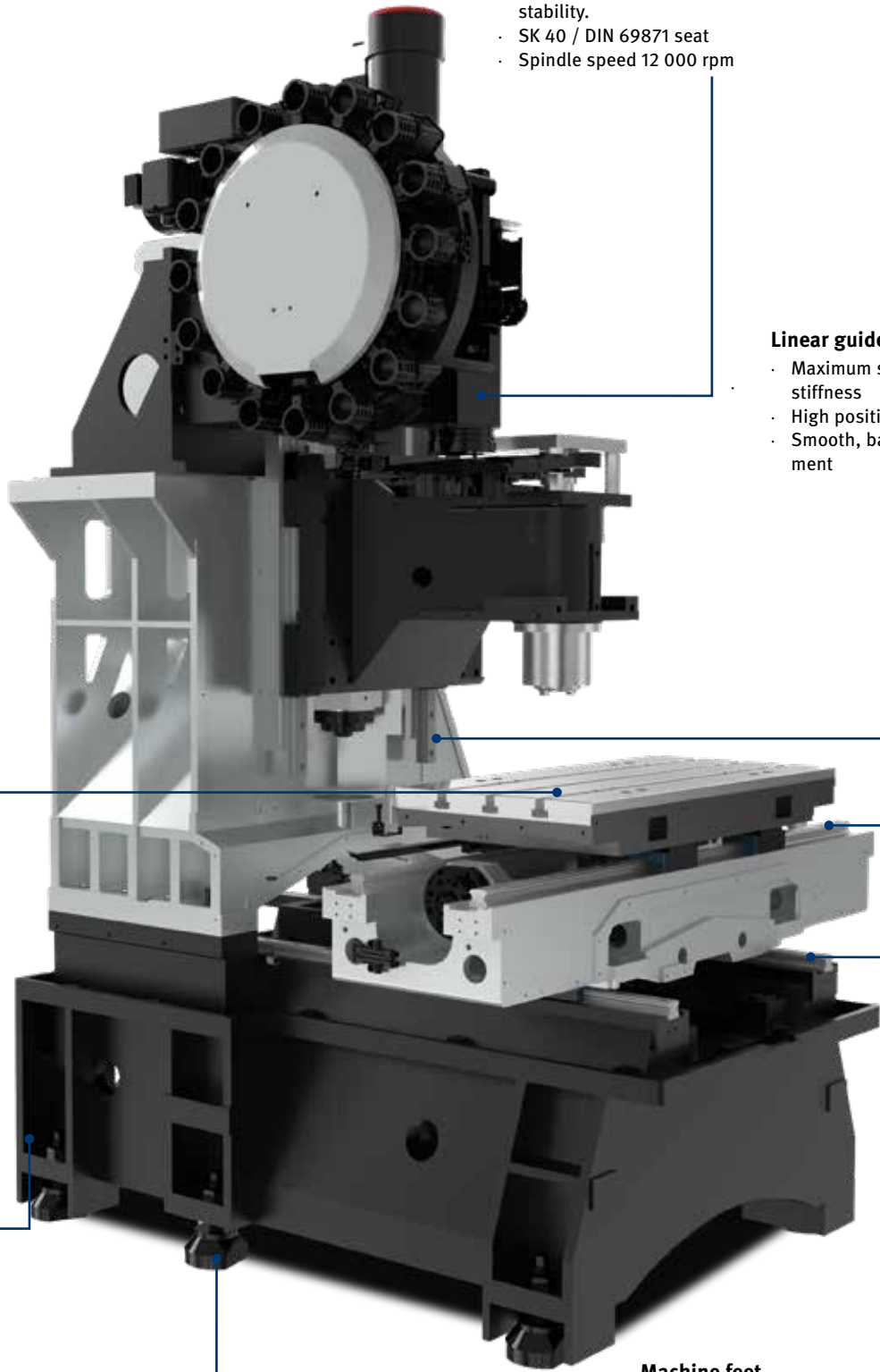
- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording
- System software SW 28x

ADDITIONAL PACKAGE SIEMENS OSS PLUS

12 months; Article no. 3589020
24 months; Article no. 3589021
36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
Liability for material defects and on-site service - SiePortal - Siemens WW





Inline spindle

- The direct connection between spindle and motor increases surface quality and thermal stability.
- SK 40 / DIN 69871 seat
- Spindle speed 12 000 rpm

Linear guide

- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement

Milling table

- Solid, precise and generously dimensioned
- Workpiece mounting surface 850 x 400 mm
- Precisely surface-finished

Cast body

- Quality cast with ribbed design

Machine feet

- Six pcs.
- Optimum alignment of the machine

CLEANING GUN



- Easy cleaning of the workspace

BALL SCREWS AND LINEAR GUIDEWAYS FROM THK



- Accuracy class C3
- For high positioning and repeat accuracy
- Less wear
- Ball screw with servo motor

TOOL CHANGER SYSTEM



- Double arm grab with 20 tool slots
- Maximum tool length 300 mm
- Tool-to-tool change in 2.5 seconds

COOLANT



- Adjustable and individually switchable coolant nozzles direct the coolant specifically into the machining area to be lubricated and remove the chips produced during machining at the same time

CONTROL CABINET



- Closed, clearly arranged control cabinet
- With **SIEMENS** servo drive
- Standards-compliant setup

CHIP CONVEYOR



- Belt design
- For efficient chip discharge

COOLING LUBRICANT SYSTEM



- Two coolant pumps with 900 W each
- Max. flow rate 35 l/min.
- A cleaning pump

SPINDLE OIL COOLER



- for the longevity of the spindle

TOOL MEASURING / WORKPIECE MEASURING			
3511409 080		BLUM TC52IR Universal measuring prober	<ul style="list-style-type: none"> Switching point repetition accuracy from 0.3µm 2 at 2 m/ min. measuring speed Wear-free and durably stable Very compact probe with 40 mm diameter
3511409 081		BLUM ZX-Speed 3-D probe	<ul style="list-style-type: none"> Universal 3-D probe for toolmaking and tool break monitoring
3584010	5	Siemens Measuring cycle	<ul style="list-style-type: none"> Measurement cycles are general sub-programmes for solving specific measurement tasks that can be adapted to the specific problem using parameters.
<p>➔ Only necessary for measuring system from manufacturer Information on Blum workpiece/tool measurement also ex stock Germany can be found in the Seite 275</p>			

3-D PRINTING			
3562411		3-D printing interface	<ul style="list-style-type: none"> Plug connector on milling head for OPTImill 3X/5X printing head Power supply is installed in control cabinet Preparation for wire breakage monitoring and filament holder
<p>➔ Information on 3-D printing and accessories can be found on Seite 253</p>			

MISCELLANEOUS			
3536109	1	Starter set SK 40 / DIN 69871	➔ For Information on the starter set, see Seite 270
3511409010	2	Coolant through spindle (CTS)	<ul style="list-style-type: none"> Unit 20 bar integrated Motor is changed to 10.5 kW
3511409011			<ul style="list-style-type: none"> Unit 70 bar external tank Motor is changed to 10.5 kW
3511409012			<ul style="list-style-type: none"> Internal motor preparation is changed to 10.5 kW
3511409013			<ul style="list-style-type: none"> Upgrade from 20 bar internal to 70 bar external
3511409031	3	Air conditioner	<ul style="list-style-type: none"> Instead of the standard equipment > heat exchanger
3511409030	4	Oil Separator	<ul style="list-style-type: none"> Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

FOURTH AXIS AND 5-AXIS ROTARY/SWIVEL TABLE			
3511409040	5	Fourth axis rotary indexing table complete set	<ul style="list-style-type: none"> Preparation
3511409050			<ul style="list-style-type: none"> Three-jaw lathe chuck Ø 120 mm and tailstock
3511409041	6	5-axis rotary/swivelling table	<ul style="list-style-type: none"> Preparation
3511409052			<ul style="list-style-type: none"> Three-jaw lathe chuck 100 mm
<p>➔ For details on the fourth axis for the rotary indexing table and 5-axis rotary/swivelling table, see Seite 262</p>			

SOFTWARE			
3584014	7	DXF Reader for SIEMENS SINUMERIK controls	<ul style="list-style-type: none"> From version 4.7 For importing DXF files Hiding graphics layers Automatic contour tracking
3584012	8	Top surface for SIEMENS SINUMERIK control	<ul style="list-style-type: none"> The NC data from the CAM system is optimised online during processing. The result is a high surface quality when milling complex free-form surfaces.

1 STARTER SET SK 40 / DIN 69871



- Cutter head holder with 27 mm receptacle 1
- Quick-action drill chuck 1- 13 mm 2
- 2 each Weldon 6 mm and 20 mm 3
- 1 each Weldon 8/10/12/16 mm 3
- Adapter SK 40 to MT 3 4
- 4 pcs. Collet chuck holder ER 32 5
- Collet spanner ER 32 6
- 18-part collet set ER 32 7
- Assembly and tool adjustment gauge 8
- Height-adjuster 9
- Taper squeegee 10
- Pull stud 11

2 COOLANT THROUGH SPINDLE



- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- 25µ filter accuracy

3 AIR CONDITIONER



- Instead of heat exchanger
- The air conditioner permanently and constantly cools the control cabinet to the set temperature.

4 OIL SEPARATOR



- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

5 FOURTH AXIS



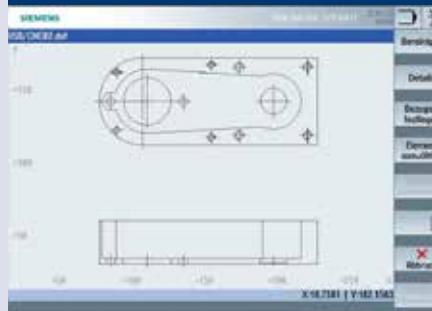
- Table diameter 120 mm
- Vertical table centre height 115 mm
- Total vertical height without motor cover 193 mm
- Horizontal table height 170 mm

6 FIFTH AXIS



- Compact design
- Possible machining \varnothing 120 mm
- Vertical table centre height 150 mm
- Vertical table overall height 235 mm
- Through hole diameter 30^{H7}mm
- Slot nut width 14^{H7}mm

7 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours.

8 TOP SURFACE



- Excellent surface quality and form precision
- Fast and precise machining thanks to new technology
- Complete machining fully integrated with Sinumerik Operate

New

F 200HSC

Excellent precision, solid design, effectiveness and efficiency

SIEMENS CONTROL SINUMERIK 828D mit PPU 290 and 15.6 inch touch display

- Heavy duty version
- High productivity
- High reliability
- Torsion free machine base thanks to strong ribbing
- Profile rail with roller recirculation for high rapid traverse speeds in all axes
- High-torque servo drives on all three axes
- Telescopic guide rail covers on all three axes
- Automatic lubrication
- Solid, precision milling table with five T-grooves, generously dimensioned with precision surface finish
- The portable, electronic handwheel with enabling switch and emergency stop push button makes it much easier to run in programmes.
- Coolant device with chip flushing system and cleaning gun
- Coolant Through Spindle with 20 bars
- Chip conveyor, belt type ensures efficient chip discharge
- Chip carriage
- RJ45 connection and 230 V power connection
- Closed switch cabinet with integrated heat exchanger; ensures optimal temperature even in case of high ambient temperatures; prevents dirt particle penetration
- Machine lamp in the workspace
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see Seite 75
- 1 year maintenance contract Basic included in DE/A/CH see Seite 309



PREMIUM

OPTIMILL F 200HSC

TECHNICAL DATA

Model	F 200HSC
Article no.	3511420
Milling spindle	Inline spindle
Machine data	
Electrical connection	400 V / ~50 Hz
Total connected load	20 kVA
Milling spindle	
Drive motor S1 operation	10.5 kW
Drive motor torque S1 operation	50 Nm
Drive motor S6 30 % operation	26.4 kW
Drive motor torque S6 30 % operation	125 Nm
Spindle seat	SK 40 / DIN 69871
Cooling lubricant system	
Coolant pump power, 3 pieces	1 kW
Pump capacity	35 l/min.
Tank capacity	200 litres
Cleaning pump	
Cleaning pump output	530 W
Milling precision	
Repeat accuracy	± 0.005 mm
Positioning accuracy	± 0.005 mm
Tool changer	
Type	Double arm gripper
Number of tool stations	24
Max. tool diameter	78 mm
Max. tool diameter (tools slots beside not occupied)	120 mm
Tool length	300 mm
Max. tool weight	8 kg
Tool change time: Tool to tool	2.5 seconds
Travel	
X axis	850 mm
Y axis	500 mm
Z axis	550 mm
Feed drive	
Rapid traverse X/Y/Z axis	48 m/min.
Motor torque	
X / Y / Z axis	16 Nm / 16 Nm / 20 Nm
Feed forces	
X / Y / Z axis	5.34 kN / 5.34 kN / 6.68 kN
Speed range	
Speeds*	12 000 rpm
Pneumatics	
Compressed air	6 - 8 bar
Air consumption per hour	6 - 8 kg/m ³
Milling table	
Clearance spindle to table	100 - 650 mm
Table length x width	1 000 x 500 mm
T-slot size / amount / distance	18 mm / 5 / 100 mm
Maximum payload	500 kg
Dimensions	
Length x width x height	2,400 x 2,355 x 2,860 mm
Overall weight	5,500 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

SINUMERIK 828D

The power pack in the compact class of CNC controls

Robust hardware architecture and intelligent control algorithms as well as top-class drive and motor technology ensure maximum dynamics and accuracy during machining. Advanced software-controlled compensation functions ensure additional quality in surface machining and high machine tool availability. With SINUMERIK Operate, all machining technologies, from standard to complex, can be operated intuitively and with a uniform "look & feel".



Multi-touch operation with PPU 290:
 The 15.6" panel is robust even in harsh environments. The SINUMERIK Operate user interface is optimised for touch-sensitive operation

Proximity/distance sensor for smart display control

Rugged and maintenance-free
 Front panel made of die-cast magnesium with scratchproof glass front
 Can be operated while wearing gloves

Easy data transfer thanks to IP65 protected front interfaces (USB 2.0, RJ45 Ethernet)

SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- Capacitive 15.6" color display, 16:9 format
- Configurable side screen
- Intuitive Multitouch operation
- Full QWERTY keyboard
- Soft key selection via touch function

SYSTEM SOFTWARE

SW 28x

- 10 MB CNC memory
- 1 ms Block change time
- 150 Look Ahead
- 512 tools

OVERALL PACKAGE

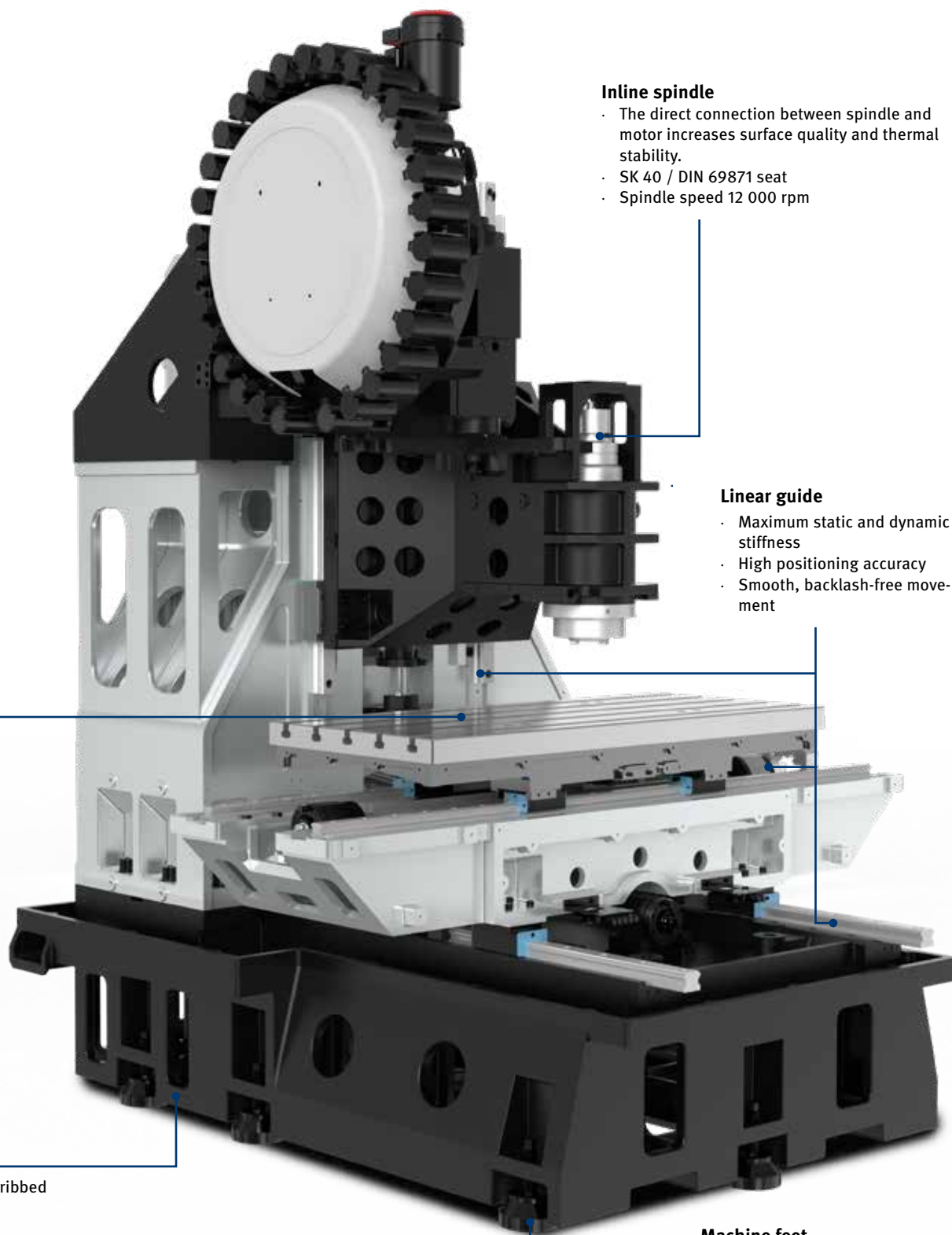
- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording
- System software SW 28x

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW





Inline spindle

- The direct connection between spindle and motor increases surface quality and thermal stability.
- SK 40 / DIN 69871 seat
- Spindle speed 12 000 rpm

Linear guide

- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement

Cast body

- Quality cast with ribbed design

Machine feet

- Eight pcs.
- Optimised alignment of the machine

COOLANT PUMPS



- Powerful coolant pumps

BALL SCREW SCREWS AND LINEAR GUIDEWAYS FROM THK



- Accuracy class C3
- For high positioning and repeat accuracy
- Less wear
- Ball screw drive with Servomotor

TOOL CHANGER SYSTEM



- Double arm grab with 24 tool slots
- Maximum tool length 300 mm
- Tool-to-tool change in 2.5 seconds

COOLING



- Adjustable and individually switchable coolant nozzles direct the coolant specifically into the machining area to be lubricated and remove the chips produced during machining at the same time

CONTROL CABINET



- Closed, clearly arranged control cabinet
- With **SIEMENS** servo drive
- Standards-compliant setup

CHIP CONVEYOR



- Conveyor version
- For efficient chip discharge

SPINDLE COOLER



- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- 25µ filter accuracy

CENTRAL LUBRICATION SYSTEM



- Prevents wear, repair costs and unnecessary downtime to a major extent

TOOL MEASURING / WORKPIECE MEASURING			
3511409080		BLUM TC52IR Universal measuring probe	<ul style="list-style-type: none"> • Switching point repetition accuracy from 0.3µm 2 at 2 m/ min. measuring speed • Wear-free and durably stable • Very compact probe with 40 mm diameter
3511409081		BLUM ZX-Speed 3-D probe	<ul style="list-style-type: none"> • Universal 3-D probe for toolmaking and tool break monitoring
3584010		Siemens Measuring cycle	<ul style="list-style-type: none"> • Measurement cycles are general sub-programmes for solving specific measurement tasks that can be adapted to the specific problem using parameters.
<p>➡ Only necessary for measuring system from manufacturer Information on Blum workpiece/tool measurement also ex stock Germany can be found in the Seite 275</p>			

3-D PRINTING			
3562411		3-D printing interface	<ul style="list-style-type: none"> • Plug connector on milling head for OPTImill 3X/5X printing head • Power supply is installed in control cabinet • Preparation for wire breakage monitoring and filament holder
<p>➡ Information on 3-D printing and accessories can be found on Seite 253</p>			

MISCELLANEOUS			
3536109	1	Starter set SK 40 / DIN 69871	➡ For Information on the starter set, see Seite 270
3511409013	2	Internal spindle cooling CTS 70 bar external	<ul style="list-style-type: none"> • Instead of the standard equipment › Internal spindle cooling 20 bar internal
3511409031	3	Air conditioner	<ul style="list-style-type: none"> • Instead of the standard equipment › heat exchanger
3511409020		Tool changer 30 tools	<ul style="list-style-type: none"> • Instead of standard equipment › tool changer 24 tools
3511409030	4	Oil Separator	<ul style="list-style-type: none"> • Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

FOURTH AXIS AND 5-AXIS ROTARY/SWIVEL TABLE			
3511409040	5	Fourth axis rotary indexing table complete set	• Preparation
3511409050			• Three-jaw lathe chuck Ø 120 mm and tailstock
3511409041	6	5-axis rotary/swivelling table	• Preparation
3511409052			• Three-jaw lathe chuck 100 mm
<p>➡ For details on the fourth axis for the rotary indexing table and 5-axis rotary/swivelling table, see Seite 262</p>			

SOFTWARE			
3584014	7	DXF Reader for SIEMENS SINUMERIK controls	<ul style="list-style-type: none"> • From version 4.7 • For importing DXF files • Hiding graphics layers • Automatic contour tracking
3584012	8	Top surface for SIEMENS SINUMERIK control	<ul style="list-style-type: none"> • The NC data from the CAM system is optimised online during processing. The result is a high surface quality when milling complex free-form surfaces.

1 STARTER SET SK 40 / DIN 69871



- Cutter head holder with 27 mm receptacle **1**
- Quick-action drill chuck 1- 13 mm **2**
- 2 each Weldon 6 mm and 20 mm **3**
- 1 each Weldon 8/10/12/16 mm **3**
- Adapter SK 40 to MT 3 **4**
- 4 pcs. Collet chuck holder ER 32 **5**
- Collet spanner ER 32 **6**
- 18-part collet set ER 32 **7**
- Assembly and tool adjustment gauge **8**
- Height-adjuster **9**
- Taper squeegee **1 0**
- Pull stud **1 1**

2 COOLANT THROUGH SPINDLE



- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- 25µ filter accuracy

3 AIR CONDITIONER



- Instead of heat exchanger
- The air conditioner permanently and constantly cools the control cabinet to the set temperature.

4 OIL SEPARATOR



- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

5 FOURTH AXIS



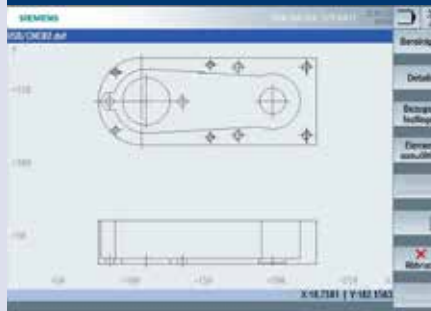
- Table diameter 120 mm
- Vertical table centre height 115 mm
- Total vertical height without motor cover 193 mm
- Horizontal table height 170 mm

6 FIFTH AXIS



- Compact design
- Possible machining \varnothing 100 mm
- Slot nut width 14^{H7}mm

7 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours.

8 TOP SURFACE



- Excellent surface quality and form precision
- Fast and precise machining thanks to new technology
- Complete machining fully integrated with Sinumerik Operate

F 300HSC

Power, speed, precision and a long service life

SIEMENS CONTROL SINUMERIK 828D mit PPU 290 and 15.6 inch touch display

- Heavy duty version
- High productivity
- High reliability
- Torsion free machine base thanks to strong ribbing
- Profile rail with recirculating rollers on all axes for high load bearing capacity
- High-torque servo drives mounted directly on the ball screws on all three axes
- Precision-ground, preloaded high-performance ball screw for high rapid traverse speeds in all axes
- Telescopic guide rail covers on all three axes
- Main spindle SK40 with spindle speed up to 15 000 rpm with inline spindle
- Solid, precision milling table with five T-grooves, generously dimensioned with precision surface finish
- The portable, electronic handwheel with enabling switch and emergency stop pushbutton makes it much easier to run in programmes.
- Tool changer, double arm grab with 30 tool slots
- Coolant device with chip flushing system and cleaning gun
- 20 bars Coolant Through Spindle
- Chip conveyor, belt type ensures efficient chip discharge
- Chip carriage
- RJ45 connection and 230 V power connection
- Closed switch cabinet with integrated heat exchanger; ensures optimal temperature even in case of high ambient temperatures; prevents dirt particle penetration
- Oil Separator
- Machine lamp in the workspace
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see Seite 83
- 1 year maintenance contract Basic included in DE/A/CH see Seite 309



OPTIMILL F 300HSC

TECHNICAL DATA

Model	F 300HSC
Article no.	3511430
Spindle	Inline spindle
Machine data	
Electrical connection	400 V / ~50 Hz
Total connected load	30 kVA
Milling spindle	
Drive motor S1 operation	20 kW
Drive motor torque S1 operation	96 Nm
Drive motor S6 30 % operation	52.4 kW
Drive motor torque S6 30 % operation	250 Nm
Spindle seat	SK 40 DIN 69871
Cooling lubricant system	
Coolant pump power, 3 pieces	1 kW
Delivery rate max.	35 l/min.
Tank capacity	260 litres
Cleaning pump	
Cleaning pump output	530 W
Milling precision	
Repeat accuracy	± 0.005 mm
Positioning accuracy	± 0.005 mm
Tool changer	
Type	Double arm gripper
Number of tool stations	30
Max. tool diameter	78 mm
Max. tool diameter (tools slots beside not occupied)	120 mm
Tool length	300 mm
Max. tool weight	8 kg
Tool change time: Tool to tool	2.5 seconds
Travel	
X axis	1,000 mm
Y axis	620 mm
Z axis	630 mm
Feed drive	
Rapid traverse X, Y, Z axis	36 / 36 / 32 m/min.
Motor torque	
X / Y / Z axis	20 Nm / 20 Nm / 36 Nm
Feed forces	
X / Y / Z axis	6.68 kN / 6.68 kN / 12.01 kN
Speed range	
Speeds*	15 000 rpm
Pneumatics	
Compressed air	6 bar
Air consumption per hour	6 - 8 kg/m ³
Milling table	
Clearance spindle to table	120 - 750 mm
Table length x width	1 200 x 600 mm
T-slot size / amount / distance	18 mm / 5 / 100 mm
Maximum payload	800 kg
Dimensions	
Length x width x height	2,856 x 2,300 x 2,850 mm
Overall weight	6,500 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

SINUMERIK 828D

The power pack in the compact class of CNC controls

Robust hardware architecture and intelligent control algorithms as well as top-class drive and motor technology ensure maximum dynamics and accuracy during machining. Advanced software-controlled compensation functions ensure additional quality in surface machining and high machine tool availability. With SINUMERIK Operate, all machining technologies, from standard to complex, can be operated intuitively and with a uniform "look & feel".



Multi-touch operation with PPU 290:
 The 15.6" panel is robust even in harsh environments. The SINUMERIK Operate user interface is optimised for touch-sensitive operation

Proximity/distance sensor for smart display control

Rugged and maintenance-free
 Front panel made of die-cast magnesium with scratchproof glass front
 Can be operated while wearing gloves

Easy data transfer thanks to IP65 protected front interfaces (USB 2.0, RJ45 Ethernet)

SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- Capacitive 15.6" color display, 16:9 format
- Configurable side screen
- Intuitive Multitouch operation
- Full QWERTY keyboard
- Soft key selection via touch function

SYSTEM SOFTWARE

SW 28x

- 10 MB CNC memory
- 1 ms Block change time
- 150 Look Ahead
- 512 tools

OVERALL PACKAGE

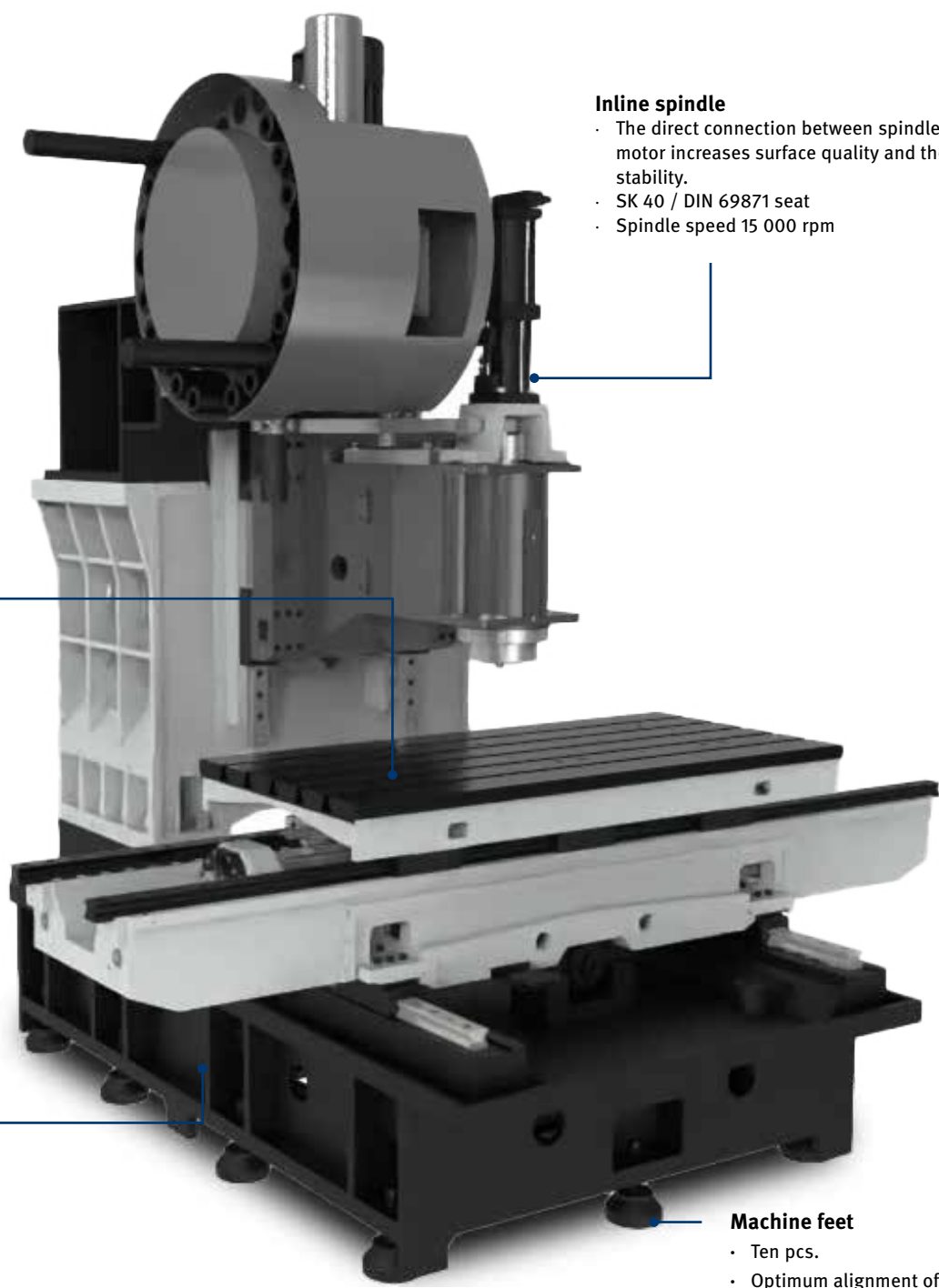
- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording
- System software SW 28x

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW





Inline spindle

- The direct connection between spindle and motor increases surface quality and thermal stability.
- SK 40 / DIN 69871 seat
- Spindle speed 15 000 rpm

Milling table

- Solid, precise and generously dimensioned
- Workpiece mounting surface 1 200 x 600 mm
- Precise surface finish

Cast body

- Quality cast with ribbed design

Machine feet

- Ten pcs.
- Optimum alignment of the machine

HEAT EXCHANGER



- Closed switch cabinet with smart cooling management
- Optimal temperature even in case of high ambient temperatures

THK BALL SCREW



- Accuracy class C3
- For high positioning and repeat accuracy
- Less wear
- Ball screw drive with servo motor

COOLANT THROUGH SPINDLE



- Filter accuracy 25 μ with external tank
- 20 bar pressure

TOOL CHANGER SYSTEM



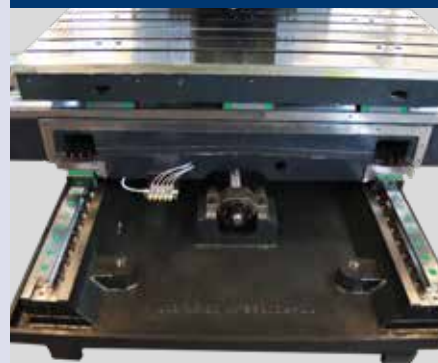
- Double-arm gripper with 30 tool stations (*Img. with 25 tools*)
- Maximum tool length 300 mm
- Tool-to-tool change in 2 seconds

MAIN SPINDLE



- Inline spindle 15 000 rpm
- Powerful
- SK40 DIN 69871
- Spindle from OKADA

LINEAR GUIDE FROM THK



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

CHIP CONVEYOR



- Conveyor version
- For efficient chip discharge

COOLING LUBRICANT SYSTEM



- Two coolant pumps with 1 010 Watt each
- Coolant device with chip flushing system and cleaning gun

CENTRAL LUBRICATION SYSTEM



- Prevents wear, repair costs and unnecessary downtime to a major extent

TOOL MEASURING / WORKPIECE MEASURING

3511409080		BLUM TC52IR Universal measuring probe	<ul style="list-style-type: none"> • Switching point repetition accuracy from 0.3µm 2 at 2 m/ min. measuring speed • Wear-free and durably stable • Very compact probe with 40 mm diameter
3511409081		BLUM ZX-Speed 3-D probe	<ul style="list-style-type: none"> • Universal 3-D probe for toolmaking and tool break monitoring
To 3584010	5	Siemens Measuring cycle	<ul style="list-style-type: none"> • Measurement cycles are general sub-programmes for solving specific measurement tasks that can be adapted to the specific problem using parameters.
<p>➡ Only necessary for measuring system from manufacturer Information on Blum workpiece/tool measurement also ex stock Germany can be found in the Seite 275</p>			

3-D PRINTING

3562411	1	3-D printing interface	<ul style="list-style-type: none"> • Preparation
<p>➡ Information on 3-D printing and accessories can be found on Seite 253</p>			

MISCELLANEOUS

3536109	2	Starter set SK 40 / DIN 69871	<ul style="list-style-type: none"> ➡ For Information on the starter set, see Seite 270 	
3511409013	3	Internal spindle cooling CTS 70 bar external	<ul style="list-style-type: none"> • Instead of the standard equipment › Internal spindle cooling 20 bar internal 	An extraction unit is required
3511409 031	4	Air conditioner	<ul style="list-style-type: none"> • Instead of the standard equipment › heat exchanger 	
3511409030		Oil Separator	<ul style="list-style-type: none"> • Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants 	
3511409060		Grease lubrication		
3511409061		Heidenhain glass scales	<ul style="list-style-type: none"> • Heidenhain glass scales 3 axes 	

FOURTH AXIS AND 5-AXIS ROTARY/SWIVEL TABLE

3511409040		Fourth axis rotary indexing table complete set	<ul style="list-style-type: none"> • Preparation 	
3511409050	6		<ul style="list-style-type: none"> • Three-jaw lathe chuck Ø 120 mm, tailstock 	
3511409051			<ul style="list-style-type: none"> • Three-jaw lathe chuck Ø 200 mm, tailstock, drive, 	
3511409041	7	5-axis rotary/swivelling table	<ul style="list-style-type: none"> • Preparation 	
3511409052			<ul style="list-style-type: none"> • Three-jaw lathe chuck 100 mm 	
3511409042		Axes licence	<ul style="list-style-type: none"> • For the 4. and 5. axis 	
<p>➡ For details on the fourth axis for the rotary indexing table and 5-axis rotary/swivelling table, see Seite 262</p>				

SOFTWARE

3584014	8	DXF Reader for SIEMENS SINUMERIK controls	<ul style="list-style-type: none"> • From version 4.7, Import of DXF files • Hiding graphics layers • Automatic contour tracking
3584012		Top surface for SIEMENS SINUMERIK control	<ul style="list-style-type: none"> • The NC data from the CAM system is optimised online during processing. The result is a high surface quality when milling complex free-form surfaces.

1 3-D PRINTING INTERFACE



- Plug connector on milling head for OPTmill 3X/5X printing head
- Power supply is installed in control cabinet
- Preparation for wire breakage monitoring and filament holder

2 STARTER SET SK 40 / DIN 69871



- Cutter head holder with 27 mm receptacle 1
- 1- 13 mm quick-action drill chuck 2
- 2 each Weldon 6 mm and 20 mm 3
- 1 each Weldon 8/10/12/16 mm 4
- Adapter SK 40 to MT 3 5
- 4 pcs. Collet chuck holder ER 32 6
- Collet spanner ER 32 7
- 18-part collet set ER 32 8
- Assembly and tool adjustment gauge 9
- Height-adjuster 10
- Taper squeegee 11
- Pull stud 11

3 EXTERNAL CTS



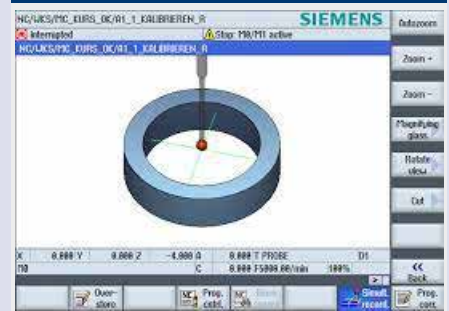
- With 70 bar pressure
- 25µ filter accuracy

4 AIR CONDITIONER



- Instead of heat exchanger
- The air conditioner permanently and constantly cools the control cabinet to the set temperature.

5 SIEMENS MEASURING CYCLE



- Measurement cycles are general sub-programmes for solving specific measurement tasks that can be adapted to the specific problem using parameters.

6 FOURTH AXIS



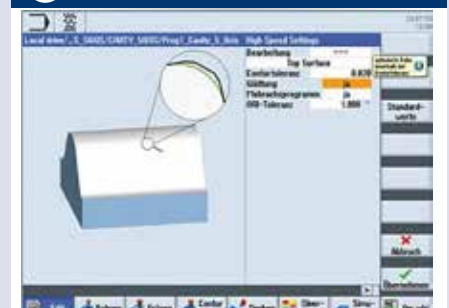
- Table diameter 120 mm
- Vertical table centre height 115 mm
- Total vertical height without motor cover 193 mm
- Horizontal table height 170 mm
- Workpiece weight horizontal / vertical max. 75 / 35 kg

7 FIFTH AXIS



- Possible machining Ø optionally 100 mm
- Slot nut width 14^{H7}mm

8 TOP SURFACE



- Excellent surface quality and form precision
- Fast and precise machining thanks to new technology
- Complete machining fully integrated with Sinumerik Operate

F 500HSC

Top quality and an excellent price-performance ratio; an investment that keeps its value

SIEMENS CONTROL SINUMERIK 828D mit PPU 290 and 15.6 inch touch display

- Heavy duty version
- High productivity
- High reliability
- Torsion free machine base thanks to strong ribbing
- Profile rail with recirculating rollers on all axes for high load bearing capacity
- High-torque servo drives mounted directly on the ball screws on all three axes
- Precision-ground, preloaded high-performance ball screw for high rapid traverse speeds in all axes
- Telescopic guide rail covers on all three axes
- Main spindle SK40 up to 12 000 rpm with inline spindle
- Solid, precision milling table with five T-grooves, generously dimensioned with precision surface finish
- The portable, electronic handwheel with enabling switch and emergency stop push button makes it much easier to run in programmes.
- Tool changer double arm gripper for 30 tool stations
- Coolant device with chip flushing system and cleaning gun
- 20 bars Coolant Through Spindle
- Chip conveyor with two augers and belt conveyor ensure efficient chip removal. Chip trolley
- RJ45 connection and 230 V power connection
- Closed switch cabinet with integrated heat exchanger; ensures optimal temperature even in case of high ambient temperatures; prevents dirt particle penetration
- Oil Separator
- Machine lamp in the workspace
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see Seite 91
- 1 year maintenance contract Basic included in DE/A/CH see Seite 309



OPTIMILL F 500HSC

TECHNICAL DATA

Model	F 500HSC
Article no.	3511450
Drive	Inline spindle
Machine data	
Electrical connection	400 V / ~50 Hz
Total connected load	35 kVA
Milling spindle	
Drive motor S1 operation	20 kW
Drive motor torque S1 operation	96 Nm
Drive motor S6 30 % operation	52.4 kW
Drive motor torque S6 30 % operation	250 Nm
Spindle seat	SK 40 DIN 69871
Cooling lubricant system	
Coolant pump power, 3 pieces	1 kW each
Delivery rate max.	65 l/min.
Tank capacity	460 litres
Cleaning pump	
Cleaning pump output	530 W
Milling precision	
Repeat accuracy	± 0.005 mm
Positioning accuracy	± 0.005 mm
Tool changer	
Type	Double arm gripper
Number of tool stations	30
Max. tool diameter	80 mm
Tool length	300 mm
Max. tool weight	8 kg
Tool change time: Tool to tool	3.5 seconds
Travel	
X axis	1,400 mm
Y axis	700 mm
Z axis	700 mm
Feed drive	
Rapid traverse X, Y, Z axis	24 / 24 / 20 m/min.
Motor torque	
X / Y / Z axis	36 Nm / 36 Nm / 48 Nm
Feed forces	
X / Y / Z axis	16 kN / 16 kN / 21.7 kN
Speed range	
Speeds*	12 000 rpm
Pneumatics	
Compressed air	6 bar
Air consumption per hour	6 - 8 kg/m ³
Milling table	
Clearance spindle to table	150 - 850 mm
Table length x width	1,600 x 700 mm
T-slot size / amount / distance	18 mm / 5 / 125 mm
Maximum payload	1,100 kg
Dimensions	
Length x width x height	5,050 x 2,965 x 3,350 mm
Overall weight	10,000 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

SINUMERIK 828D

The power pack in the compact class of CNC controls

Robust hardware architecture and intelligent control algorithms as well as top-class drive and motor technology ensure maximum dynamics and accuracy during machining. Advanced software-controlled compensation functions ensure additional quality in surface machining and high machine tool availability. With SINUMERIK Operate, all machining technologies, from standard to complex, can be operated intuitively and with a uniform "look & feel".



Multi-touch operation with PPU 290:
 The 15.6" panel is robust even in harsh environments. The SINUMERIK Operate user interface is optimised for touch-sensitive operation

Proximity/distance sensor for smart display control

Rugged and maintenance-free
 Front panel made of die-cast magnesium with scratchproof glass front
 Can be operated while wearing gloves

Easy data transfer thanks to IP65 protected front interfaces (USB 2.0, RJ45 Ethernet)

SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- Capacitive 15.6" color display, 16:9 format
- Configurable side screen
- Intuitive Multitouch operation
- Full QWERTY keyboard
- Soft key selection via touch function

SYSTEM SOFTWARE

SW 28x

- 10 MB CNC memory
- 1 ms Block change time
- 150 Look Ahead
- 512 tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording
- System software SW 28x

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



Spindle

- Directly coupled
- High positioning accuracy

Inline spindle

- The direct connection between spindle and motor increases surface quality and thermal stability.
- ISO 40 / DIN 69871 seat
- Spindle speed 12 000 rpm

Linear guide

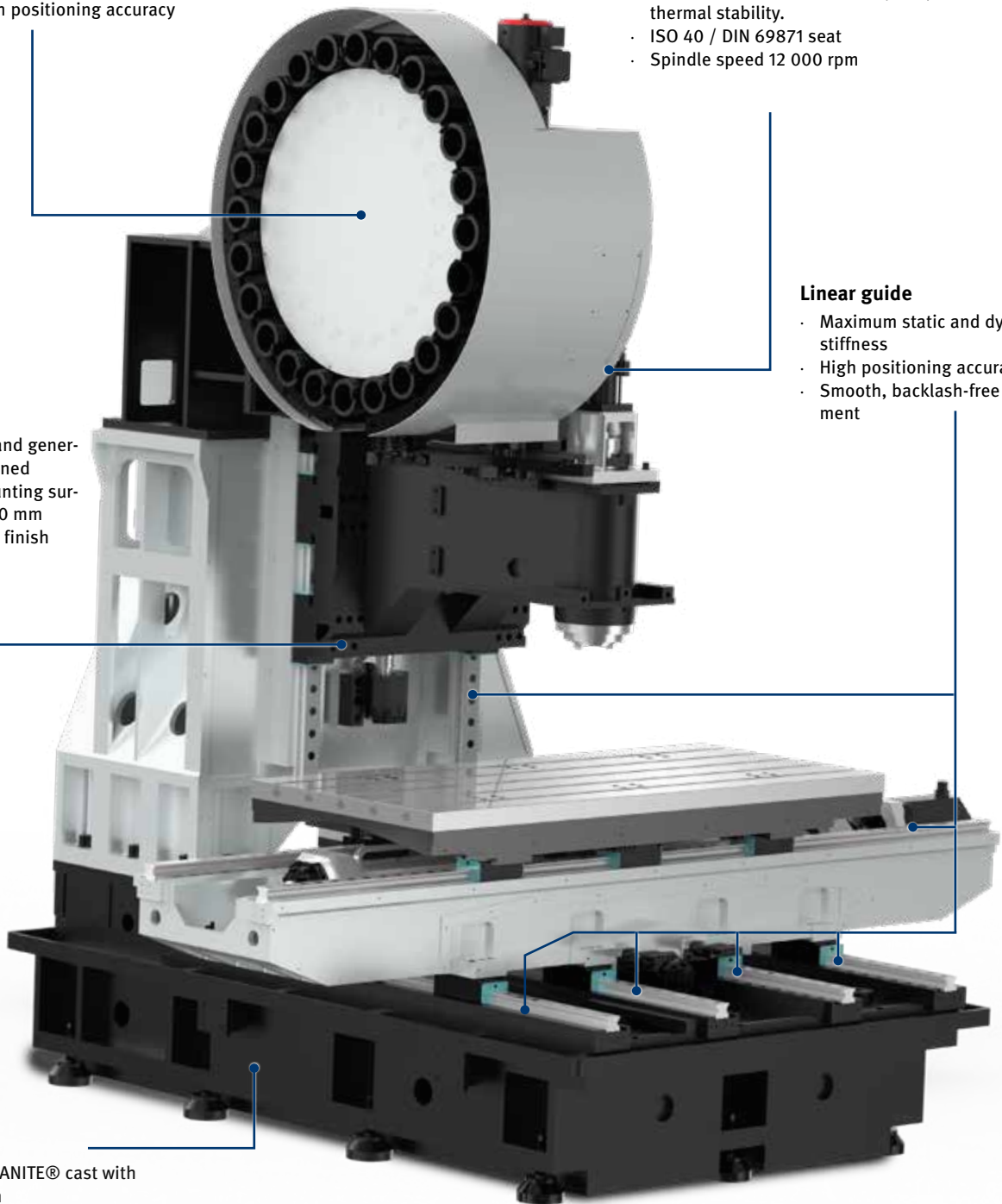
- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement

Milling table

- Solid, precise and generously dimensioned
- Workpiece mounting surface 1 600 x 700 mm
- Precise surface finish

Cast body

- Quality MEEHANITE® cast with ribbed design
- Excellent rigidity for maximum load

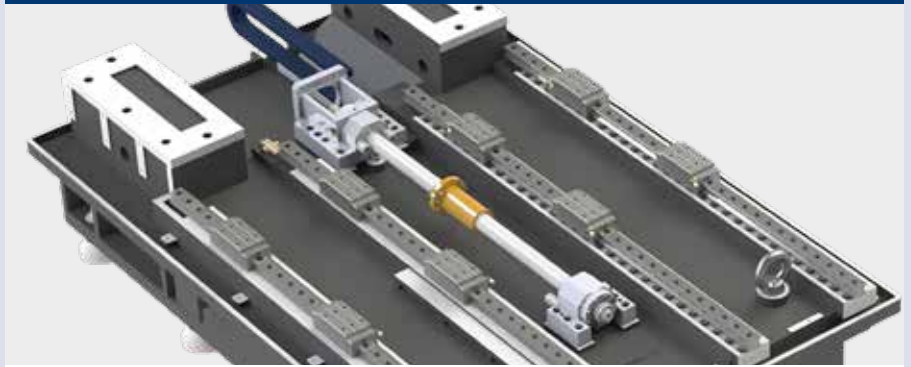


HEAT EXCHANGER



- Closed switch cabinet with smart cooling management
- Optimal temperature even in case of high ambient temperatures

BALL SCREWS FROM THK



- Accuracy class C3
- High rapid traverse speeds in all axes
- Less wear
- For high positioning and repeat accuracy

TOOL CHANGER SYSTEM



- Double arm grab with 30 tool slots
- Maximum tool length 300 mm
- Tool-to-tool change in 3.5 seconds

COOLING



- Adjustable and individually switchable coolant nozzles direct the coolant specifically into the machining area to be lubricated and remove the chips produced during machining at the same time

LINEAR GUIDE FROM THK



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

CHIP CONVEYOR



- Conveyor version
- For efficient chip discharge

COOLING LUBRICANT SYSTEM



- Three coolant pumps with 1 kW each

CENTRAL LUBRICATION SYSTEM



- Prevents wear, repair costs and unnecessary downtime to a major extent

TOOL MEASURING / WORKPIECE MEASURING			
3511409080		BLUM TC52IR Universal measuring probe	<ul style="list-style-type: none"> • Switching point repetition accuracy from 0.3µm 2 at 2 m/ min. measuring speed • Wear-free and durably stable • Very compact probe with 40 mm diameter
3511409081		BLUM ZX-Speed 3-D probe	<ul style="list-style-type: none"> • Universal 3-D probe for toolmaking and tool break monitoring
3584010	5	Siemens Measuring cycle	<ul style="list-style-type: none"> • Measurement cycles are general sub-programmes for solving specific measurement tasks that can be adapted to the specific problem using parameters.
<p>➡ Only necessary for measuring system from manufacturer Information on Blum workpiece/tool measurement also ex stock Germany can be found in the Seite 275</p>			

3-D PRINTING			
3562411	1	3-D printing interface	<ul style="list-style-type: none"> • Plug connector on milling head for OPTImill 3X/5X printing head • Power supply is installed in control cabinet • Preparation for wire breakage monitoring and filament holder
<p>➡ Information on 3-D printing and accessories can be found on Seite 253</p>			

MISCELLANEOUS			
3536109	2	Starter set SK 40 / DIN 69871	➡ For Information on the starter set, see Seite 270
3511409013	3	Internal spindle cooling CTS 70 bar external	<ul style="list-style-type: none"> • Instead of the standard equipment › Internal spindle cooling 20 bar internal <p>An extraction unit is required</p>
3511409031	4	Air conditioner	<ul style="list-style-type: none"> • Instead of the standard equipment › heat exchanger
3511409030		Oil Separator	<ul style="list-style-type: none"> • Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

FOURTH AXIS AND 5-AXIS ROTARY/SWIVEL TABLE			
3511409040	6	Fourth axis rotary indexing table complete set	• Preparation
3511409051			• Three-jaw lathe chuck Ø 200 mm and tailstock
3511409053			• Three-jaw lathe chuck Ø 250 mm and tailstock
3511409041	7	5-axis rotary/swivelling table	• Preparation
3511409052			• Three-jaw lathe chuck 100 mm
3511409055			• Three-jaw lathe chuck 200 mm
<p>➡ For details on the fourth axis for the rotary indexing table and 5-axis rotary/swivelling table, see Seite 262</p>			

SOFTWARE			
3584014	8	DXF Reader for SIEMENS SINUMERIK controls	<ul style="list-style-type: none"> • From version 4.7 • For importing DXF files • Hiding graphics layers • Automatic contour tracking
3584012		Top surface for SIEMENS SINUMERIK control	<ul style="list-style-type: none"> • The NC data from the CAM system is optimised online during processing. The result is a high surface quality when milling complex free-form surfaces.

1 3-D PRINTING INTERFACE



- Plug connector on milling head for OPTmill 3X/5X printing head
- Power supply is installed in control cabinet
- Preparation for wire breakage monitoring and filament holder

2 STARTER SET SK 40 / DIN 69871



- Cutter head holder with 27 mm receptacle 1
- Quick-action drill chuck 1- 13 mm 2
- 2 each Weldon 6 mm and 20 mm 3
- 1 each Weldon 8/10/12/16 mm 4
- Adapter SK 40 to MT 3 5
- Collet spanner ER 32 6
- 18-part collet set ER 32 7
- Assembly and tool adjustment gauge 8
- Height-adjuster 9
- Taper squeegee 10
- Pull stud 11

3 EXTERNAL CTS



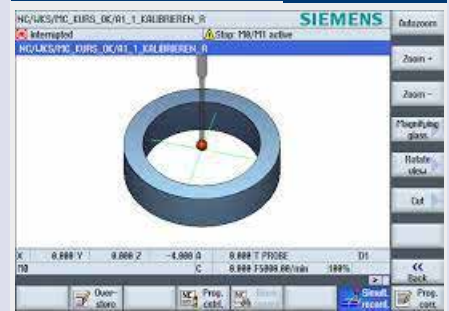
- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- 25µ filter accuracy

4 AIR CONDITIONER



- Instead of heat exchanger
- The air conditioner permanently and constantly cools the control cabinet to the set temperature.

5 SIEMENS MEASURING CYCLE



- Messzyklen sind allgemeine Unterprogramme zur Lösung bestimmter Messaufgaben, die über Parameter an das konkrete Problem angepasst werden können.

6 FOURTH AXIS



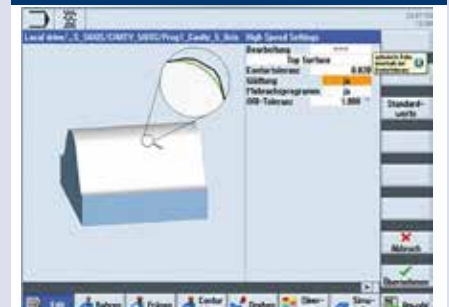
- Table diameter optionally 200 mm or 250 mm
- Tailstock

7 FIFTH AXIS



- Possible machining Ø optionally 100 mm or 200 mm
- Vertical overall height 235 resp. 360 mm
- Through hole diameter 30^{H7}mm resp. 35^{H7}mm
- Slot nut width 14^{H7}mm

8 TOP SURFACE



- Excellent surface quality and form precision
- Fast and precise machining thanks to new technology
- Complete machining fully integrated with Sinumerik Operate

F 600HSC

Top quality and an excellent price-performance ration; an investment that keeps its value

SIEMENS CONTROL SINUMERIK 828D mit PPU 290 and 15.6 inch touch display

- Heavy duty version
- High productivity
- High reliability
- All components and the entire machine frame were analysed with ANSYS Mechanical (= Finite Element Analysis (FEA) tool) to solve difficult mechanical problems in the complex product architecture
- Profile rail with recirculating rollers on all axes for high load bearing capacity
- High-torque servo drives mounted directly on the ball screws on all three axes
- Precision-ground, preloaded high-performance ball screw for high rapid traverse speeds in all axes
- Telescopic guide rail covers on all three axes
- Solid, precision milling table with five T-grooves, generously dimensioned with precision surface finish
- The portable, electronic handwheel with enabling switch and emergency stop pushbutton makes it much easier to run in programmes.
- Tool changer, double arm grab with 30 tool slots
- The machine hood is opened to load the machine with a crane
- Chip conveyor with two augers and belt conveyor ensure efficient chip removal.
- RJ45 connection and 230 V power connection
- Coolant device with chip flushing system and cleaning gun
- 20 bars Coolant Through Spindle
- Closed switch cabinet with integrated heat exchanger; ensures optimal temperature even in case of high ambient temperatures; prevents dirt particle penetration
- Machine lamp in the workspace
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see Seite 99
- 1 year maintenance contract Basic included in DE/A/CH see Seite 309



OPTIMILL F 600HSC

TECHNICAL DATA

Model	F 600HSC
Article no.	3511460
Spindle	Inline spindle
Machine data	
Electrical connection	400 V / ~50 Hz
Total connected load	35 kVA
Milling spindle	
Drive motor S1 operation	20 kW
Drive motor torque S1 operation	96 Nm
Drive motor S6 30 % operation	52.4 kW
Drive motor torque S6 30 % operation	250 Nm
Spindle seat	SK 40 DIN 69871
Distance spindle to Z axis	887 mm
Cooling lubricant system	
Coolant pump output	3 x 1 kW each
Delivery rate max.	70 l/min.
Tank capacity	640 litres
Cleaning pump	
Cleaning pump output	530 W
Milling precision	
Repeat accuracy	± 0.005 mm
Positioning accuracy	± 0.005 mm
Tool changer	
Type	Double arm gripper
Number of tool stations	30
Max. tool diameter	78 mm
Max. tool diameter (tools slots beside not occupied)	120 mm
Tool length	300 mm
Max. tool weight	8 kg
Tool change time	3.5 seconds
Tool to tool in the spindle	
Travel	
X axis	1 700 mm
Y axis	800 mm
Z axis	800 mm
Feed drive	
Rapid motion X, Y, Z axis	24 m/min.
Motor torque	
X / Y / Z axis	36 kN / 36 kN / 48 kN
Feed forces	
X / Y / Z axis	16 kN / 16 kN / 21.7 kN
Speed range	
Speeds*	12 000 rpm
Pneumatics	
Compressed air	6 bar
Air consumption per hour	6 - 8 kg/m ³
Milling table	
Clearance spindle to table	180 - 980 mm
Table length x width	1,900 x 800 mm
T-slot size / amount / distance	22 mm / 5 / 160 mm
Maximum payload	1,300 kg
Dimensions	
Length x width x height	5,500 x 3,250 x 3,500 mm
Overall weight	16,000 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

SINUMERIK 828D

The power pack in the compact class of CNC controls

Robust hardware architecture and intelligent control algorithms as well as top-class drive and motor technology ensure maximum dynamics and accuracy during machining. Advanced software-controlled compensation functions ensure additional quality in surface machining and high machine tool availability. With SINUMERIK Operate, all machining technologies, from standard to complex, can be operated intuitively and with a uniform "look & feel".



Multi-touch operation with PPU 290:
 The 15.6" panel is robust even in harsh environments. The SINUMERIK Operate user interface is optimised for touch-sensitive operation

Proximity/distance sensor for smart display control

Rugged and maintenance-free
 Front panel made of die-cast magnesium with scratchproof glass front
 Can be operated while wearing gloves

Easy data transfer thanks to IP65 protected front interfaces (USB 2.0, RJ45 Ethernet)

SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- Capacitive 15.6" color display, 16:9 format
- Configurable side screen
- Intuitive Multitouch operation
- Full QWERTY keyboard
- Soft key selection via touch function

SYSTEM SOFTWARE

SW 28x

- 10 MB CNC memory
- 1 ms Block change time
- 150 Look Ahead
- 512 tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording
- System software SW 28x

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



Spindle

- Directly coupled
- High positioning accuracy

Inline spindle

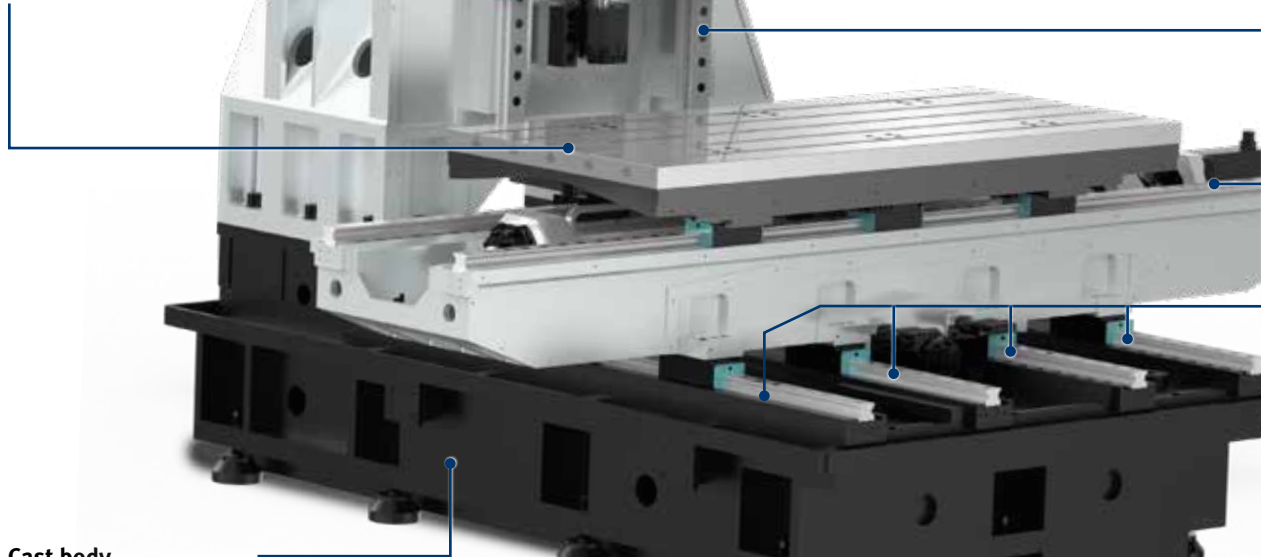
- The direct connection between spindle and motor increases surface quality and thermal stability.
- ISO 40 / DIN 69871 seat
- Spindle speed 12 000 rpm

Linear guide

- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement

Milling table

- Solid, precise and generously dimensioned
- Workpiece mounting surface 1,900 x 800 mm
- Precise surface finish



Cast body

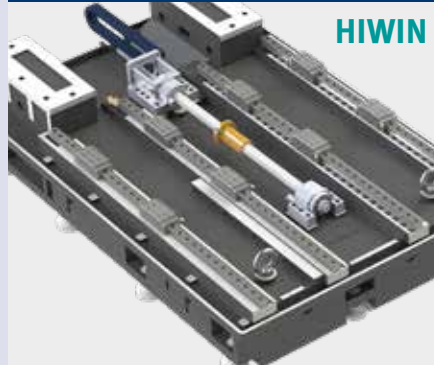
- Quality MEEHANITE® cast with ribbed design
- Excellent rigidity for maximum load

HEAT EXCHANGER



- Closed switch cabinet with smart cooling management
- Optimal temperature even in case of high ambient temperatures

BALL SCREWS



- Accuracy class C3
- For high positioning and repeat accuracy
- Less wear
- Ball screw with servo motor

OKADA MAIN SPINDLE



- High dynamic rotation accuracy
- Low vibration
- Easy to modularise
- High stability
- Short housing length, low inertia

CHIP FLUSHING SYSTEM



- Powerful chip flushing system for cleaning the workspace and workpiece

TOOL CHANGER SYSTEM



- Double arm grab with 30 tool slots
- Maximum tool length 300 mm
- Tool-to-tool change in 1.94 seconds

LINEAR GUIDE



- 4 linear guides on the Y axis to ensure maximum rigidity
- Profile rails with ball roller

CHIP CONVEYOR



- Conveyor version
- For efficient chip discharge

COOLING LUBRICANT SYSTEM



- Powerful 3 x 1 kW coolant pump with a large 980 litre tank

CENTRAL LUBRICATION SYSTEM



- Prevents wear, repair costs and unnecessary downtime to a major extent.

TOOL MEASURING / WORKPIECE MEASURING			
3511409080		BLUM TC52IR Universal measuring probe	<ul style="list-style-type: none"> Switching point repetition accuracy from 0.3µm 2 at 2 m/ min. measuring speed Wear-free and durably stable Very compact probe with 40 mm diameter
3511409081		BLUM ZX-Speed 3-D probe	<ul style="list-style-type: none"> Universal 3-D probe for toolmaking and tool break monitoring
3584010	5	Siemens Measuring cycle	<ul style="list-style-type: none"> Measurement cycles are general sub-programmes for solving specific measurement tasks that can be adapted to the specific problem using parameters.
<p>➔ Only necessary for machines with measuring system from manufacturer Information on Blum workpiece/tool measurement also ex stock Germany can be found in the Seite 275</p>			

3-D PRINTING			
3562411	1	3-D printing interface	<ul style="list-style-type: none"> Plug connector on milling head for OPTImill 3X/5X printing head Power supply is installed in control cabinet Preparation for wire breakage monitoring and filament holder
<p>➔ Information on 3-D printing and accessories can be found on Seite 253</p>			

MISCELLANEOUS			
3536109	2	Starter set SK 40 / DIN 69871	➔ For Information on the starter set, see Seite 270
3511409013	3	Internal spindle cooling CTS 70 bar external	<ul style="list-style-type: none"> Instead of the standard equipment › Internal spindle cooling 20 bar internal <p>An extraction unit is required</p>
3511409031	4	Air conditioner	<ul style="list-style-type: none"> Instead of the standard equipment › heat exchanger
3511409030		Oil Separator	<ul style="list-style-type: none"> Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

FOURTH AXIS AND 5-AXIS ROTARY/SWIVEL TABLE			
3511409040	6	Fourth axis rotary indexing table complete set	<ul style="list-style-type: none"> Preparation
3511409051			<ul style="list-style-type: none"> Three-jaw lathe chuck Ø 200 mm and tailstock
3511409054			<ul style="list-style-type: none"> Three-jaw lathe chuck Ø 320 mm and tailstock
3511409041	7	5-axis rotary/swivelling table	<ul style="list-style-type: none"> Preparation
3511409052			<ul style="list-style-type: none"> Three-jaw lathe chuck 100 mm
3511409056			<ul style="list-style-type: none"> Three-jaw lathe chuck 250 mm
<p>➔ For details on the fourth axis for the rotary indexing table and 5-axis rotary/swivelling table, see Seite 262</p>			

SOFTWARE			
3584014	8	DXF Reader for SIEMENS SINUMERIK controls	<ul style="list-style-type: none"> From version 4.7 For importing DXF files Hiding graphics layers Automatic contour tracking
3584012		Top surface for SIEMENS SINUMERIK control	<ul style="list-style-type: none"> The NC data from the CAM system is optimised online during processing. The result is a high surface quality when milling complex free-form surfaces.

1 3-D PRINTING INTERFACE



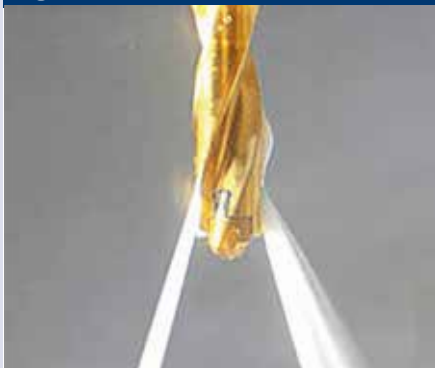
- Plug connector on milling head for OPTImill 3X/5X printing head
- Power supply is installed in control cabinet
- Preparation for wire breakage monitoring and filament holder

2 STARTER SET SK 40 / DIN 69871



- Cutter head holder with 27 mm receptacle 1
- Quick-action drill chuck 1- 13 mm 2
- 2 each Weldon 6 mm and 20 mm 3
- 1 each Weldon 8/10/12/16 mm 4
- Adapter SK 40 to MT 3 5
- 4 pcs. Collet chuck holder ER 32 6
- Collet spanner ER 32 7
- 18-part collet set ER 32 8
- Assembly and tool adjustment gauge 9
- Height-adjuster 10
- Taper squeegee 11
- Pull stud 11

3 EXTERNAL CTS



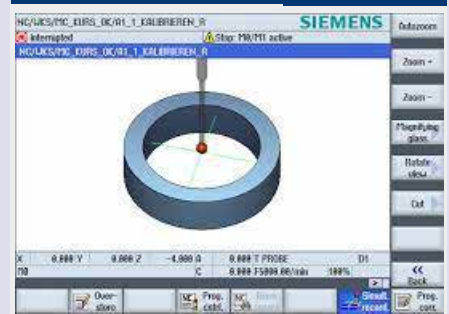
- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- 25µ filter accuracy

4 AIR CONDITIONER



- Instead of heat exchanger
- The air conditioner permanently and constantly cools the control cabinet to the set temperature.

5 SIEMENS MEASURING CYCLE



- Measurement cycles are general sub-programmes for solving specific measurement tasks that can be adapted to the specific problem using parameters.

6 FOURTH AXIS



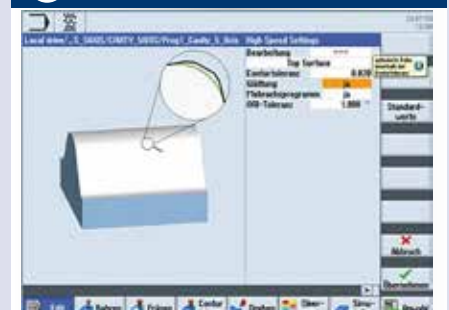
- Table diameter 120 mm
- Vertical table centre height 115 mm
- Total vertical height without motor cover 193 mm
- Horizontal table height 170 mm
- Workpiece weight horizontal / vertical max. 75 / 35 kg

7 FIFTH AXIS



- Possible machining Ø optionally 120 mm or 200 mm
- Vertical table centre height 150 resp. 355 mm
- Vertical overall height 235 resp. 360 mm
- Through hole diameter 30^{H7}mm resp. 35^{H7}mm
- Slot nut width 14^{H7}mm

8 TOP SURFACE



- Excellent surface quality and form precision
- Fast and precise machining thanks to new technology
- Complete machining fully integrated with Sinumerik Operate

02 - TURNING PRODUCTION MACHINES

OPTIturn S 400HSC





OPTiturn L44



OPTiturn S 600

L 44

OPTIMUM PREMIUM CNC lathe with cycle control

SIEMENS CONTROL SINUMERIK 828D

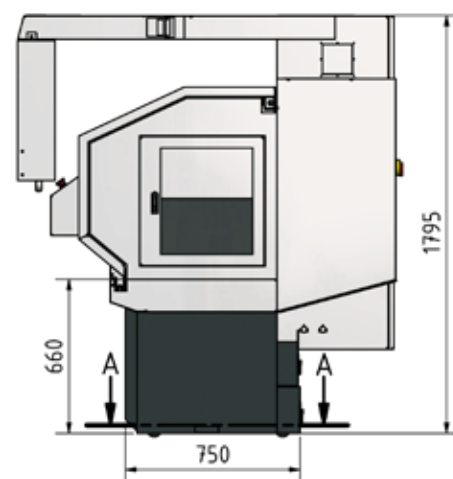
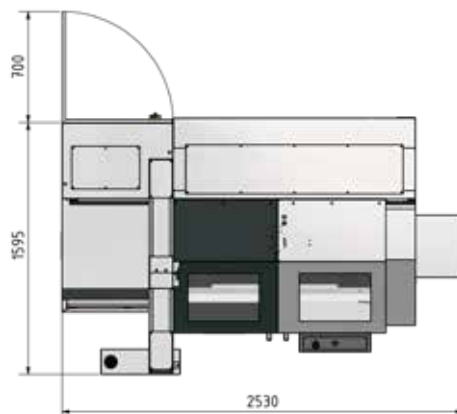
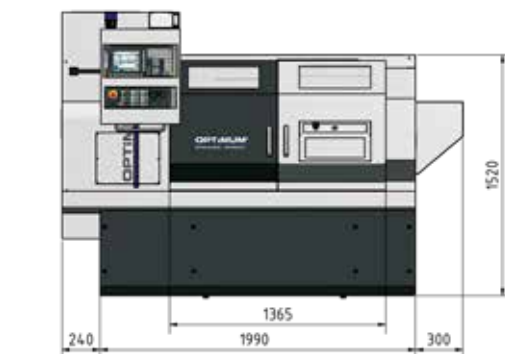
- Spindle and servo motors by **SIEMENS**
- Fully cladded with safety device
- Maximum spindle speed of 3 000 rpm as standard
- Automatic centralised lubrication
- Swivelling operating unit
- Tailstock cover
- Electronic handwheels for the X and Z axis
- Coolant unit with 90 litre coolant tank
- RJ45 plug-in connection, USB connection and power connection 230 V
- EMC Electromagnetic compatibility
- Six levelling feet
- Operating tool
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus on Seite 109
- For information on maintenance contracts see Seite 309



PREMIUM

TECHNICAL DATA

Model	L 44
Article no.	3514330
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	23 kVA
Spindle	
Drive motor S1 operation	7 kW
Drive motor torque S1 operation	33 Nm
Drive motor S6 30 % operation	16 kW
Drive motor torque S6 30 % operation	80 Nm
Spindle seat	DIN ISO 702-1 No. 5
Spindle torque	87 Nm
Spindle bore *	Ø 52 mm
Chuck passage	Ø 40 mm
Hydraulic lathe chuck	Ø 150 mm
Cooling lubricant system	
Coolant pump output	270 W
Tank capacity	90 litres
Hydraulic system	
Hydraulic pump power	750 W
Tank capacity	50 litres
Machine data	
Max. turning diameter	223 mm
Centre width	850 mm
Swing Ø above cross slide	240 mm
Swing Ø above machine bed	446 mm
Swing Ø in the bed bridge	520 mm
Bed width	300 mm
Speed range	
Rotational speeds	10 - 3,000 rpm
Tool changer	
Shank	VDI 30
Type	Hydraulic
Number of tool slots	8
Mounting height square max.	20 mm
Max. chuck diameter drilling rod	25 mm
Accuracy	
Repeat accuracy	± 0.005 mm
Positioning accuracy	± 0.005 mm
Travel	
X axis	250 mm
Z axis	760 mm
Feed speed	
X axis/Y axis	15 m/min.
Motor torque	
X/Z axis	6 Nm / 8.5 Nm
Feed forces	
X/Z axis	7.5 kN / 5.3 kN
Tailstock	
Shank	MT 4
Spindle sleeve diameter	52 mm
Spindle sleeve stroke, hydraulic	165 mm
Dimensions	
Length x width x height	2 530 x 1 595 x 1 795 mm
Overall weight	2 600 kg



* depending on installed chuck

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!

Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

PPU 271 SW 24

3 MB CNC memory
3 ms Block change time
50 Look Ahead
128 tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

12 months; Article no. 3589020
 24 months; Article no. 3589021
 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at: Material Defects Liability and On-Site Service - SiePortal - Siemens WW



Main spindle

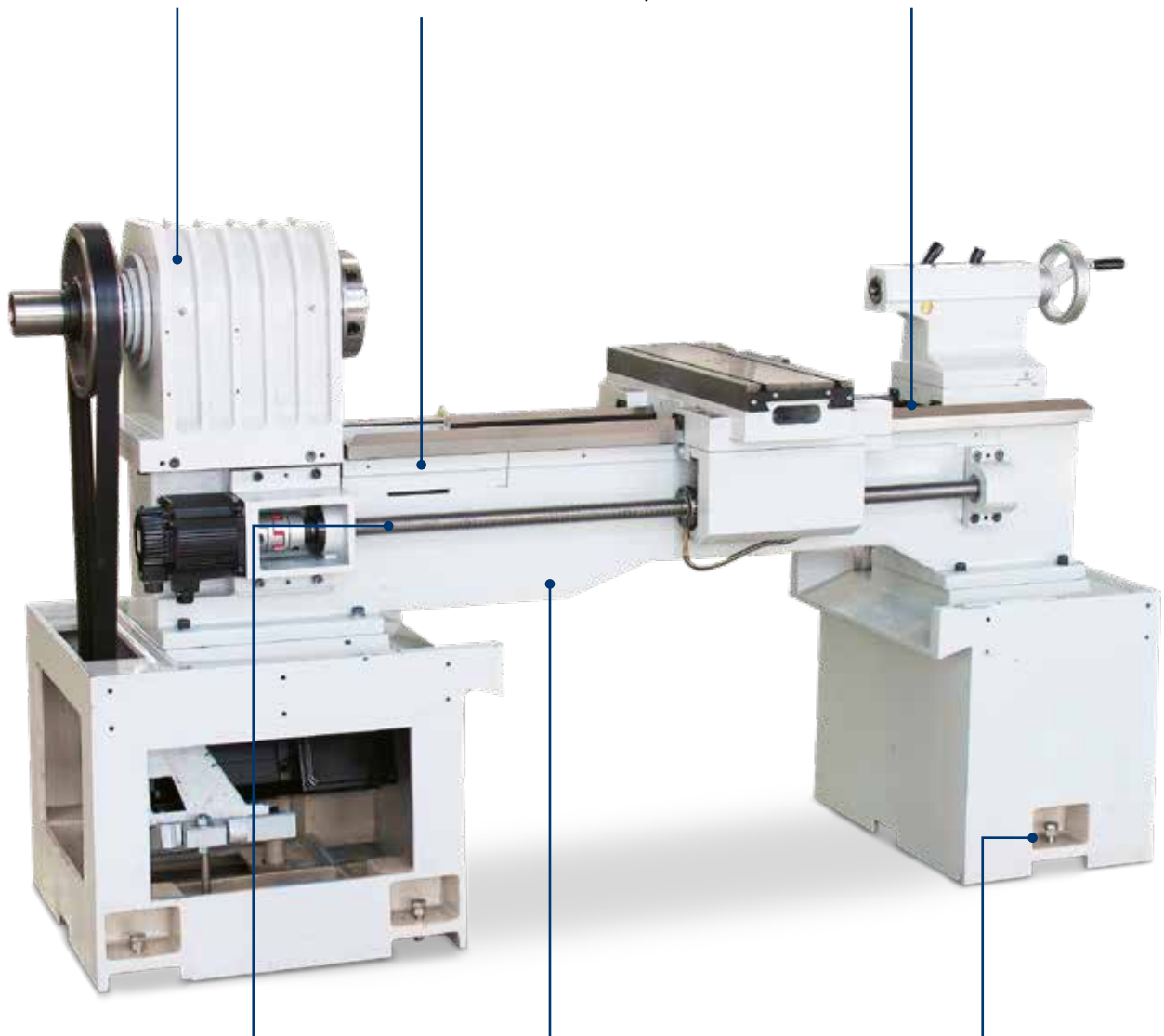
- Solid design

horizontal / vertical

- With pronounced ribbing
- Excellent stiffness and durability

Guides

- Rugged flat bed guide



Ball screw

- for high rapid traverse speeds in all axes
- Less wear
- For high positioning and repeat accuracy

Cast body

- Tempered HRC48-52 and heat-treated

Machine feet

- Six pcs.
- Optimal machine leveling

HEAT EXCHANGER



- Closed switch cabinet with smart cooling management
- Optimal temperature even in case of high ambient temperatures

TOOL CHANGER SYSTEM



- Eight tool slots
- Hydraulic VDI30 tool changer
- Max. mounting height 20 mm

TAILSTOCK



- Generously dimensioned
- Slide with ball screw and pre-stressed nut

HYDRAULIC POWER UNIT



- Motor power 750 W
- Tank capacity 50 litres
- Clamping pressure/operating pressure 2 500 - 2 942 kPa

THREE-JAW CHUCK



- Hydraulic three-jaw lathe chuck \varnothing 150 mm
- Hydraulic release and clamping via footswitch
- Easy workpiece clamping
- Hard and soft block jaws

CENTRAL LUBRICATION SYSTEM



- Automatic interval supply
- Reduces the wear on bearings, rails and ball screw drives
- With float switch. If the oil level is too low, an audible signal is output

HAND WHEELS



- Joystick for moving the X, Z axis
- Handwheel for moving the X axis and Z axis manually
- Emergency stop button
- Confirm button

COOLANT TANK



- Pull-out chip tray
- Pull-out cooling lubricant tank
- Level indicator
- Tank capacity 90 litres

FOOT PEDAL




- For releasing and clamping the lathe chuck
- Optional tailstock sleeve extends/retracts hydraulically

STEADY RESTS			
351433002*	1	Fixed steady rest	
351433003*		Follow steady rest	

BAR FEEDER			
351433026*		Bar feeder interface	
351433012*		Bar feeder Pro V 65E 1.2 metres	• Including bar feeder interface (article no. 351433026)
351433019*		Bar feeder Pro Conqueror 3 metres	• Including bar feeder interface (article no. 351433026)

➔ For information on bar feeders, and more bar feeders ex warehouse Germany, see Seite 284

MISCELLANEOUS			
3536115	2	Starter set VDI 30	• 3 pcs. square transverse holders, square transverse holder overhead, square longitudinal holder, 5 pcs. Boring bar holder Ø 10/12/16/20/25 mm, 3 locking covers, collet holder ER 25, collet spanner ER 25, 15-piece collet set ER 25 • 1 pc. Tool holder, 1 pc. Drill chuck
 3544190		Turning tool set left	• HM 20 mm / 6-parts
351433001*	3	Hydraulic tailstock quill	• for fast machining • Quill can be extended and retracted hydraulically
351433011*		Fast change tool holder Multifix 4	• Instead of standard equipment › hydraulic tool changer VDI30
351433009*		Portable electronic handwheel	• Instead of the standard equipment › Joystick
351433013*	4	Power transformer	• for custom voltage • Weight 147 kg
3511294601*	5	HPRA Renishaw High Precision Measuring Arm	• for the Ø 150 mm lathe chuck • Tool measurement and breakage control
	6		➔ Information on the measuring arm ex warehouse Germany can be found at Seite 290

LATHE CHUCK			
351433015*		Three-jaw lathe chuck manual Ø 200 mm	• Instead of standard equipment › three-jaw lathe chuck hydraulic Ø 150 mm
351433016*		Four-jaw lathe chuck manual Ø 250 mm	• Instead of standard equipment › three-jaw lathe chuck hydraulic Ø 150 mm
351433018*		Three-jaw lathe chuck hydraulic Ø 200 mm	• Instead of standard equipment › three-jaw lathe chuck hydraulic Ø 150 mm
351433020*		Hydraulic four-jaw lathe chuck Ø 200 mm	• Instead of standard equipment › three-jaw lathe chuck hydraulic Ø 150mm
3519706		Soft top jaw	• for the › hydraulic three-jaw lathe chuck Ø 150 mm - included in the standard equipment
3519726		Hard top jaw	• for the › hydraulic three-jaw lathe chuck Ø 150 mm - included in the standard equipment
3519712		Soft top jaw Autogrip	• for the three-jaw lathe chuck hydraulic Ø 200 mm (art. no. 351433018) • for the four-jaw lathe chuck hydraulic Ø 200 mm (art.no. 351433020)
3519732		Hard top jaw set Autogrip	• for the three-jaw lathe chuck hydraulic Ø 200 mm (art. no. 351433018)
3519733		Hard top jaw set Autogrip	• for the hydraulic four-jaw lathe chuck Ø 200 mm (art. no. 351433020)
351433024*		Collet chuck	• for the › hydraulic three-jaw lathe chuck Ø 150 mm - included in the standard equipment

SOFTWARE			
3584014	7	Software DXF Viewer/Reader	• from version 4.7 • For importing DXF files • Hiding of graphic layers, automatic contour tracking

1 STEADY RESTS



Fixed steady rest

- Passage Ø 10 mm to Ø 130 mm

Follow steady rest

- Passage Ø 10 mm to Ø 100 mm

2 STARTER SET



• 32-part

For more information see „VDI 30“ auf Seite 279

3 TAILSTOCK SPINDLE SLEEVE



- Retract and extend hydraulically via foot pedal

4 HANDWHEEL



- Portable, electronic
- Substantially facilitates running in of programs
- Emergency stop button
- Confirm button

5 POWER TRANSFORMER



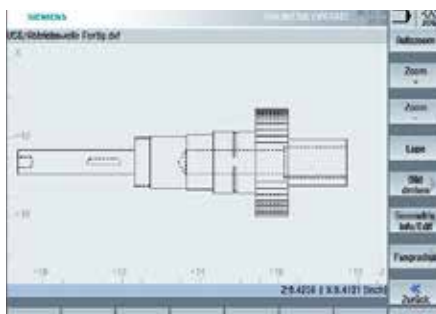
- For custom voltage
- Weight 147 kg

6 MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of 5 µm²
- LED displays the probe status and the operational readiness of the arm
- IPX8 protected (static)
- TSI2 Interface

7 SOFTWARE DXF VIEWER/READER



- **from version 4.7**

Imports eDrawings, 3-D objects as well as SolidWorks and AutoCad files in the formats DWG and DXF, EASM and PDM. The tool offers various functions for displaying, simulating and printing the drawings and 3D projects.

S 400HSC

OPTIMUM PREMIUM CNC slant-bed lathe that stands out for its high speed, performance, precision and durability

SIEMENS CONTROL SINUMERIK 828D

- Heavy duty version
- Compact design
- .SIEMENS servo motors on all axes
- Renishaw tool measuring arm for tool measuring
- All servomotors with integrated encoder for maximum precision
- Main spindle designed as motorised spindle
- 45° slant bed design for particularly large machining diameters and unhindered chip flow into the chip tray
- Hydraulic three-jaw lathe chuck Ø 170 mm with soft jaws
- Servo tool changer VDI 30 with 12 tool stations
- Hardened and precision ground ball screws for high rapid traverse speeds in all axes
- Faster tool change speed
- High hydraulic clamping force
- Heavy-duty machining without vibration, for realising machining automation and high efficiency in extreme cases
- Dimensionally stable linear guides ensure a long service thanks to maximum static and dynamic stiffness
- Device for manual tool measuring
- Heat exchanger
- Portable, electronic handwheel with enabling switch and emergency stop button that significantly facilitates the running-in of programmes
- Chip conveyor, belt type ensures efficient chip discharge
- Working light for complete illumination of the working area
- Coolant device with cleaning gun
- RJ45 and power interface
- EMC Electromagnetic compatibility
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see „Zusatzpaket SIEMENS OSS Plus“ auf Seite 117
- 1 year maintenance contract Basic included in D/A/CH see page 267



PREMIUM

OPTITURN S 400HSC

TECHNICAL DATA

Model	S 400HSC
Article no.	3515175
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	25 kVA
Spindle	
Drive motor S1 operation	11.6 kW
Drive motor torque S1 operation	65 Nm
Drive motor S6 30 % operation	14.4 kW
Drive motor torque S6 30 % operation	81 Nm
Spindle seat	A2-5
Spindle bore*	Ø 56 mm
Chuck passage	Ø 45 mm
Hydraulic lathe chuck	Ø 170 mm
Cooling lubricant system	
Coolant pump output	700 W
Tank capacity	160 litres
Hydraulic system	
Output of hydraulic pump	1.5 kW
Tank capacity	36 litres
Machine data	
Turning Ø max.	220 mm
Turning length	320 mm
Swing Ø above cross slide	300 mm
Swing Ø above machine bed	500 mm
Slant bed	45°
Speed range	
Spindle speeds*	30 - 6 000 rpm
Tool changer	
Type	Servo VDI 30
Number of tool stations	12
Accuracy	
Repeat accuracy	± 0.004 mm
Positioning accuracy	± 0.004 mm
Travel	
X axis	180 mm
Z axis	350 mm
Dynamic feed force	
X axis	3.6 kN
Z axis	3.6 kN
Feed speed	
X axis/Y axis	30 m/min.
Motor torque	
X axis/Y axis	6 Nm
Dimensions	
Length x width x height	2 000 x 2 250 x 1 550 mm
Overall weight	2 600 kg

* depending on the chuck installed ** other spindle bores and spindle speeds on request

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

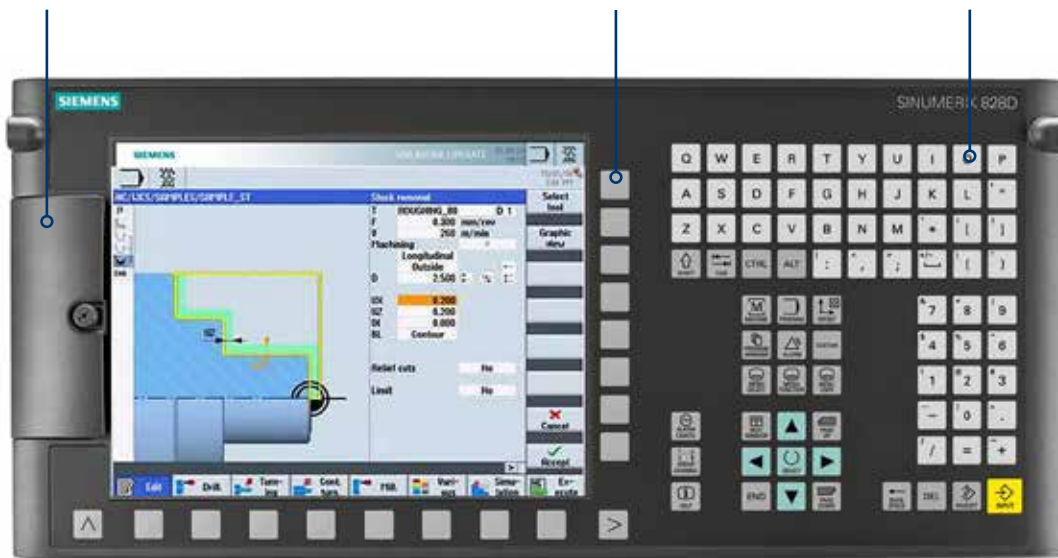
Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **PPU 271 SW 24**
- **3 MB** CNC memory
- **3 ms** Block change time
- **50** Look Ahead
- **128** tools

Finite element analysis (FEA)

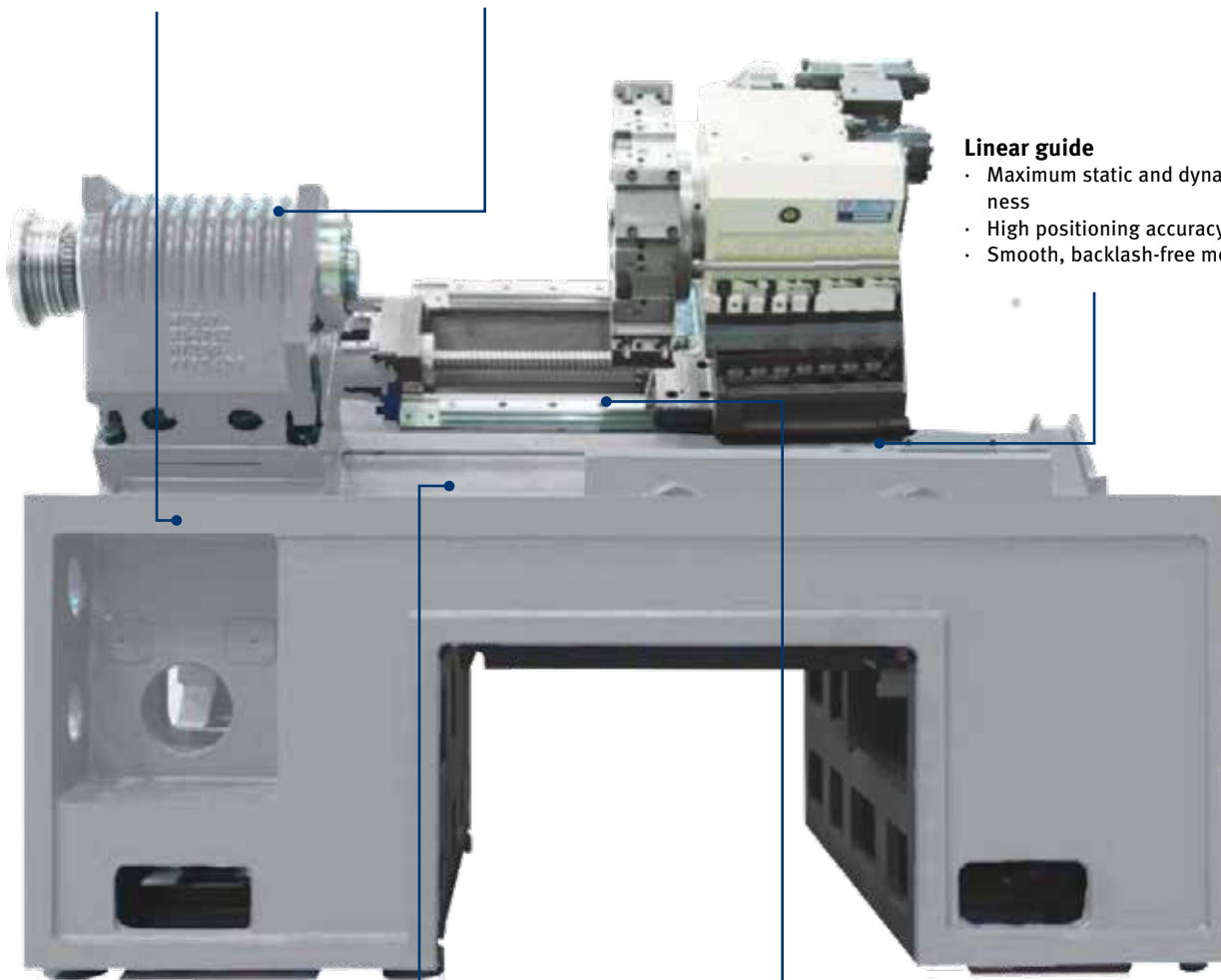
- for optimisation for excellent rigidity, heat dissipation and vibration damping

Spindle

- High spindle speed and stability
- All spindle bearings with grease lubrication, good precision retention, longer service life

Linear guide

- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement



Machine bed

- Pronounced ribbing
- 45-degree slope
- Excellent stiffness and durability

Linear guide

- Low maintenance
- Quiet and smooth operation
- Long system service life

LINEAR GUIDE



- High precision
- Increases the speed of the movement speed and improve the cutting performance

TOOL CHANGING SYSTEM



- 12 tool stations
- Servo VDI30

BALL SCREW SPINDLE



- The ball screw is fixed at both ends and is adjusted so that it runs as parallel as possible to the guideways. The ball screw nuts eliminate the backlash by means of a preload treatment.

DIRECTLY DRIVEN SERVOMOTOR



- The servomotor is connected directly to the ball screw via the coupling, which significantly improves the positioning accuracy.

SPINDLE MOTOR



- Direct drive
- Better running behaviour
- Smooth running as no belt

WATER COOLING



- for main spindle motor
- Better heat dissipation than air heat sinks

CHIP CONVEYOR



- For the disposal of chips
- rear-mounted

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of 5 μm 2
- LED displays the probe status and the operational readiness of the arm
- TSI2 Interface

STARTER SET			
3536115	1	Starter set VDI 30	· Information VDI 30, Seite 279
BAR FEEDER			
3511599093		Bar feeder interface	
3511599101	2	Bar feeder 3m Ø 26 mm	· Including bar feeder interface (351506011)
3511599102		Bar feeder 1.5m Ø 65 mm	· Including bar feeder interface (351506011)
3511599103		Bar feeder 1.25m Ø 65 mm	· Including bar feeder interface (351506011)
JAWS FOR LATHE CHUCKS			
3519739		Soft jaws Ø 160 mm 3 pieces	· for the hydraulic three-jaw lathe chuck Ø 160 mm - included in the standard equipment
3519749		Hard jaws Ø 160 mm 3 pieces	· for the hydraulic three-jaw lathe chuck Ø 160 mm - included in the standard equipment
MISCELLANEOUS			
3511599095*	4	Internal tool cooling	· External unit, 10 bar
3511599094*		Internal tool cooling	· External unit, 20 bar
3511599091	5	Oil Separator	· Longer service life of the cooling lubricants
3511599090		Part grippers	
3515175001	3	Heidenhain encoder ERM 2480	· Mounted directly on the main spindle
3544190		Lathe tool set Carbide 20 mm	· 6-part · see Seite 282
SOFTWARE			
3584014	7	Software DXF Viewer/Reader	· from version 4.7

1 STARTER SET VDI 30



- 3 pcs. square transverse holder 1
- 1 pc. square transverse overhead holder 2
- 1 pc. square longitudinal holder 3
- 5 pcs. drill rod holder \varnothing 10 / 12 / 16 / 20 / 25 mm 4
- 3 pcs. cap 5
- 1 pc. collet chuck holder ER 25 6
- 1 piece collet spanner ER 25 7
- 15-part collet chuck set ER 8
- 1 pc. tool holder 9
- 1 pc. chuck 10

2 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

3 ENCODER ERM 2480



- Incremental angle encoder with magnetic scanning - scanning head
- Continuous operation at high speeds
- Robust and dirt-resistant
- Pitch accuracy: $\pm 2.5''$ to $\pm 72''$

4 COOLANT THROUGH SPINDLE



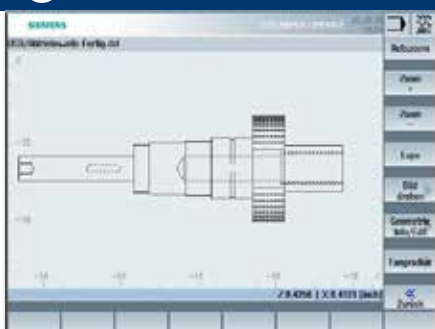
- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

5 OIL SEPARATOR



- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

7 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours

S 600

OPTIMUM PREMIUM CNC slant-bed lathe that stands out for its high speed, performance, precision and durability

SIEMENS CONTROL SINUMERIK 828D PPU 271

- Heavy duty version
- Compact design
- **SIEMENS** servo motors on all axes
- Renishaw measuring arm for manual tool measurement
- All servomotors with integrated encoder for maximum precision
- Slant bed design 45° for particularly large machining diameter
- Better unobstructed chip flow into the chip tray
- Sliding door easy to clean, no chip accumulation
- Swivelling control unit: Convenient rotation to the optimum viewing position
- Convenient reading and setting of pressure gauges
- Access window on the front of the headstock: easy to maintain and repair
- Inspection window: simple inspection of hydraulics and pneumatics.
- MPG with magnet: Attachment to any metal surface
- Renishaw measuring arm for manual tool measurement
- Hydraulic three-jaw lathe chuck Ø 200 mm with soft jaws
- Standard tool changer Hydraulic VDI 30 with 12 tool stations
- Hardened and precision ground ball screws for high rapid traverse speeds in all axes
- Dimensionally stable linear guides ensure a long service thanks to maximum static and dynamic stiffness. Tailstock with hydraulic quill
- Heat exchanger
- Portable, electronic handwheel with enabling switch and emergency-stop pushbutton, makes it much easier to run in programmes.
- Chip conveyor, belt type ensures efficient chip discharge
- Chip carriage
- Working light for complete illumination of the working area
- Coolant system
- EMC Electromagnetic compatibility
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see „Zusatzpaket SIEMENS OSS Plus“ auf Seite 125
- 1 year maintenance contract Basic included in D/A/CH see page 267



PREMIUM

TECHNICAL DATA

Model	S 600
Article no.	3515180
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	30 kVA
Spindle	
Drive motor S1 operation	11 kW
Drive motor torque S1 operation	140 Nm
Drive motor S6 30 % operation	14.3 kW
Drive motor torque S6 30 % operation	182 Nm
Spindle seat	DIN ISO 702-1 No. 6
Spindle bore*	Ø 76 mm
Chuck passage	Ø 65 mm
Chuck size	Ø 200 mm
Cooling lubricant system	
Coolant pump output	0.55 kW
Tank capacity	240 litres
Hydraulic system	
Output of hydraulic pump	1.5 kW
Tank capacity	20 litres
Machine data	
Turning diameter	320 mm
Turning length	550 mm
Swing Ø above cross slide	370 mm
Swing Ø above machine bed	550 mm
Slant bed	45°
Speed range	
Spindle speeds*	30 - 4 000 rpm
Tool changer	
Type	Hydraulic VDI 30
Number of tool stations	12
Accuracy	
Repeat accuracy	± 0.002 mm
Positioning accuracy	± 0.003 mm
Travel	
X axis	240 mm
Z axis	550 mm
Rapid traverse	
X axis	30 m/min.
Z axis	36 m/min.
Motor torque	
X axis/Y axis	12 Nm
Feed forces	
X axis/Y axis	6.75 kN / 5.652 kN
Tailstock	
Shank	MT 4
Spindle sleeve diameter	75 mm
Spindle sleeve stroke, hydraulic	80 mm
Dimensions	
Length x width x height	4 050 x 1 870 x 2 000 mm
Overall weight	3 800 kg

* depending on the chuck installed ** other spindle bores and spindle speeds on request

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

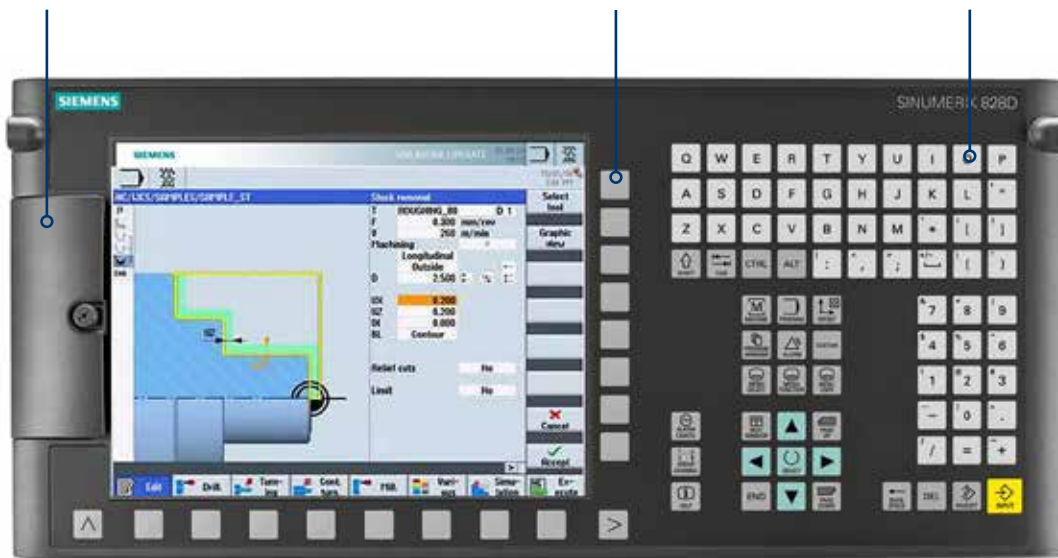
Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **PPU 271 SW 24**
- **3 MB** CNC memory
- **3 ms** Block change time
- **50** Look Ahead
- **128** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



Linear guide

- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement

Tool turret

- Standard tool changer Hydraulic VDI 30 with 12 tool stations

Spindle

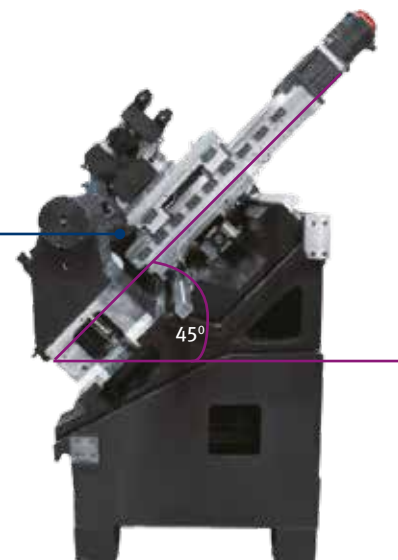
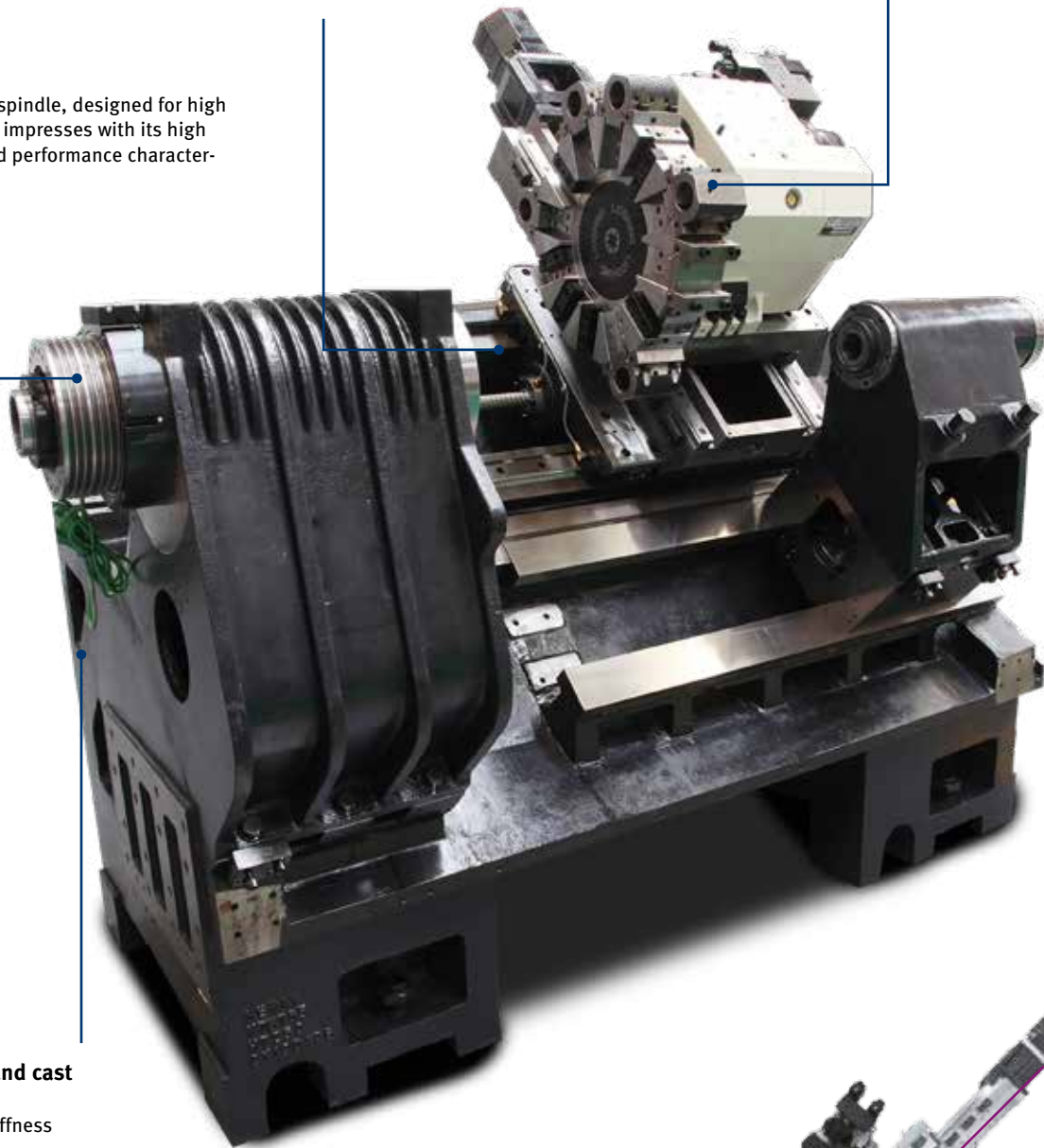
- The main spindle, designed for high precision, impresses with its high torque and performance characteristics

Components and cast parts

- Guarantee stiffness

Machine bed

- Pronounced ribbing
- 45-degree slope
- Excellent stiffness and durability
- Facilitates chip removal



LINEAR GUIDE



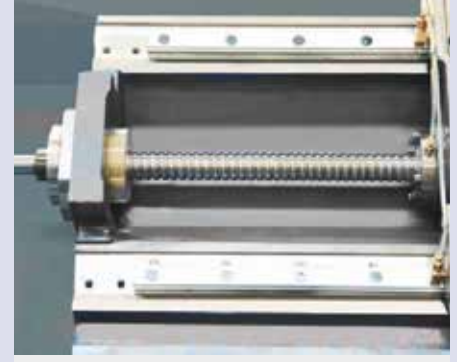
- High precision
- Increases the speed of the movement speed and improve the cutting performance

TOOL CHANGING SYSTEM



- 12 tool stations
- Hydraulic VDI 30 tool changer

BALL SCREW SPINDLE



- The ball screw is fixed at both ends and is adjusted so that it runs as parallel as possible to the guideways. The ball screw nuts eliminate the backlash by means of a preload treatment.

DIRECTLY DRIVEN SERVOMOTOR



- The servomotor is connected directly to the ball screw via the coupling, which significantly improves the positioning accuracy.

SPINDLE MOTOR



- Spindle is driven by a belt

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of 5 μm 2
- LED displays the probe status and the operational readiness of the arm
- TS12 Interface

CHIP CONVEYOR



- For the disposal of chips
- rear-mounted

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

CONTROL CABINET



- With SIEMENS servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

ENCODER			
3515180001	3	Heidenhain encoder ERM 2480	<ul style="list-style-type: none"> Scanning head for incremental modular encoder with magnetoresistive scanning Mounted directly on the main spindle
STARTER SET			
3536116	1	Starter set VDI 40	<ul style="list-style-type: none"> Information VDI 40, see Seite 287
BAR FEEDER			
3511599093	3	Bar feeder interface	
3511599101		Bar loader 3.0m Ø 26 mm	<ul style="list-style-type: none"> Including bar feeder interface (351506011)
3511599102		Bar loader 1.5m Ø 65 mm	<ul style="list-style-type: none"> Including bar feeder interface (351506011)
3511599103		Bar loader 1.25m Ø 65 mm	<ul style="list-style-type: none"> Including bar feeder interface (351506011)
CHUCK			
3515180010		Three-jaw lathechuck Ø 250 mm incl. cylinder	<ul style="list-style-type: none"> Instead of standard equipment › three-jaw lathe chuck hydraulic Ø 200 mm
3519740		Soft jaws Ø 200 mm 3 3 pieces	<ul style="list-style-type: none"> for the hydraulic three-jaw lathe chuck Ø 250 mm - included in the standard equipment
3519750		Hard jaws Ø 200 mm 3 pieces	<ul style="list-style-type: none"> for the hydraulic three-jaw lathe chuck Ø 250 mm - included in the standard equipment
3519741		Soft jaws Ø 250 mm 3 pieces	<ul style="list-style-type: none"> for the three-jaw hydraulic lathe chuck Ø 250 mm
3519751		Hard jaws Ø 250 mm 3 pieces	<ul style="list-style-type: none"> for the three-jaw hydraulic lathe chuck Ø 250 mm
MISCELLANEOUS			
3511599095	5	Internal tool cooling	<ul style="list-style-type: none"> External unit, 10 bar
3511599094		Internal tool cooling	<ul style="list-style-type: none"> External unit, 20 bar
3511599091	4	Oil Separator	<ul style="list-style-type: none"> Longer service life of the cooling lubricants
3511599090	6	Part grippers	
3511599092		Air conditioner	<ul style="list-style-type: none"> Instead of the standard equipment › heat exchanger
3544200		Lathe tool set Carbide 25 mm	<ul style="list-style-type: none"> 6-part see Seite 282
SOFTWARE			
3584014	7	Software DXF Viewer/Reader	<ul style="list-style-type: none"> from version 4.7

1 STARTER SET VDI 40



- 3 pcs. square transverse holder 1
- 1 pc. square transverse overhead holder 2
- 1 pc. square longitudinal holder 3
- 5 pcs. drill rod holder \varnothing 10 / 12 / 16 / 20 / 25 mm 4
- 3 pcs. cap 5
- 1 pc. collet chuck holder ER 25 6
- 1 piece collet spanner ER 25 7
- 15-part collet chuck set ER 25 8
- 1 pc. tool holder 9
- 1 pc. chuck 10

2 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

3 ENCODER ERM 2480



- Incremental angle encoder with magnetic scanning - scanning head
- Continuous operation at high speeds
- Robust and dirt-resistant
- Pitch accuracy: $\pm 2.5''$ to $\pm 72''$

4 OIL SEPARATOR



- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

5 COOLANT THROUGH SPINDLE



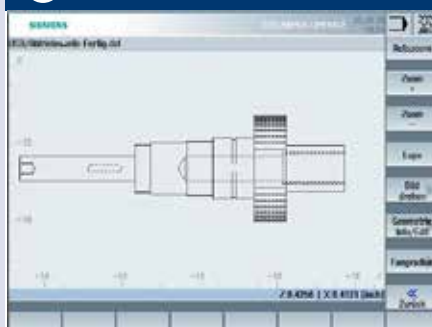
- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

6 AIR CONDITIONER



- Instead of heat exchanger
- The air conditioner permanently and constantly cools the control cabinet to the set temperature.

7 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours

S 600M

OPTIMUM PREMIUM CNC slant-bed lathe with C axis, that stands out for its high speed, performance, precision and durability

SIEMENS CONTROL SINUMERIK 828D PPU 270

- Heavy duty version
- Compact design
- Renishaw measuring arm for manual tool measurement
- The entire bed design has many reinforcing ribs that have been optimised through finite element analysis, ensuring high rigidity, better heat dissipation (thermal symmetry) and more precise machining
- Ball screw with improved accuracy, rigidity and heat resistance.
- **SIEMENS** servo motors on all axes
- All servomotors with integrated encoder for maximum precision
- The motor is located on the side of the machine and prevents heat transfer and vibrations caused by the motor.
- Slant bed design 45° for particularly large machining diameter
- Better unobstructed chip flow into the chip tray
- Hydraulic three-jaw lathe chuck Ø 200 mm with soft jaws
- Sauter tool changer VDI 40 with 12 tool positions and driven tool
- Hardened and precision ground ball screws for high rapid traverse speeds in all axes
- Dimensionally stable linear guides ensure a long service thanks to maximum static and dynamic stiffness
- Device for manual tool measuring
- Encoder mounted directly on main spindle for high accuracy
- Tailstock with hydraulic quill
- Heat exchanger
- Portable, electronic handwheel with enabling switch and emergency-stop pushbutton, makes it much easier to run in programmes.
- Chip conveyor, belt type ensures efficient chip discharge
- Working light for complete illumination of the working area
- Coolant device with cleaning gun
- RJ45 , power interface
- Tools Scope of delivery:
 - 2 axial driven tool holders,
 - Driven radial tool holder,
 - 3 pc. B1 tool holder
 - B3 tool holder
 - C1 tool holder
 - Collet chuck E2 Ø 20mm
 - Collet chuck E2 Ø 25mm
 - Collet chuck E2 Ø 32mm
 - ER 32 collet set (6 , 8 , 10 , 12 , 16 , 20 mm)
- EMC Electromagnetic compatibility
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see „Zusatzpaket SIEMENS OSS Plus“ auf Seite 133
- 1 year maintenance contract Basic included in D/A/CH see page 267



OPTITURN S 600M

TECHNICAL DATA

Model	S 600M
Article no.	3515185
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	40 kVA
Spindle	
Drive motor S1 operation	11 kW
Drive motor torque S1 operation	70 Nm
Drive motor S6 30 % operation	22 kW
Drive motor torque S6 30 % operation	140 Nm
Spindle seat	DIN ISO 702-1 No. 6
Spindle bore*	Ø 65 mm
Chuck passage	Ø 51 mm
Chuck size	200 mm
Cooling lubricant system	
Coolant pump output	0.55 kW
Tank capacity	300 litres
Hydraulic system	
Output of hydraulic pump	2.2 kW
Tank capacity	36 litres
Machine data	
Turning diameter	320 mm
Turning length	475 mm
Swing Ø above cross slide	400 mm
Swing Ø above machine bed	570 mm
Slant bed	45°
Speed range	
Spindle speeds*	30 - 4 000 rpm
Tool changer	
Type	Servo VDI 40 - DIN5480
Number of tool stations	12
Sauter tool changer with driven tools DIN5480	
Permissible speed at tool coupling	max. 6 000 rpm
Power of the tools	4.82 kW
Max. tool torque	20 Nm
Accuracy	
Repeat accuracy	± 0.002 mm
Positioning accuracy	± 0.004 mm
Angular accuracy of C-axis	51''
C axis repeat accuracy	20''
Travel	
X axis	235 mm
Z axis	530 mm
Rapid traverse	
X axis	24 m/min.
Z axis	30 m/min.
Motor torque	
X axis/Y axis	11 Nm
Feed forces	
X axis/Y axis	8.4 kN / 5.6 kN
Tailstock	
Shank	MT 5
Spindle sleeve diameter	100 mm
Spindle sleeve stroke, hydraulic	100 mm
Dimensions	
Length x width x height	4,570 x 1,845 x 1,955 mm
Overall weight	4 200 kg

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

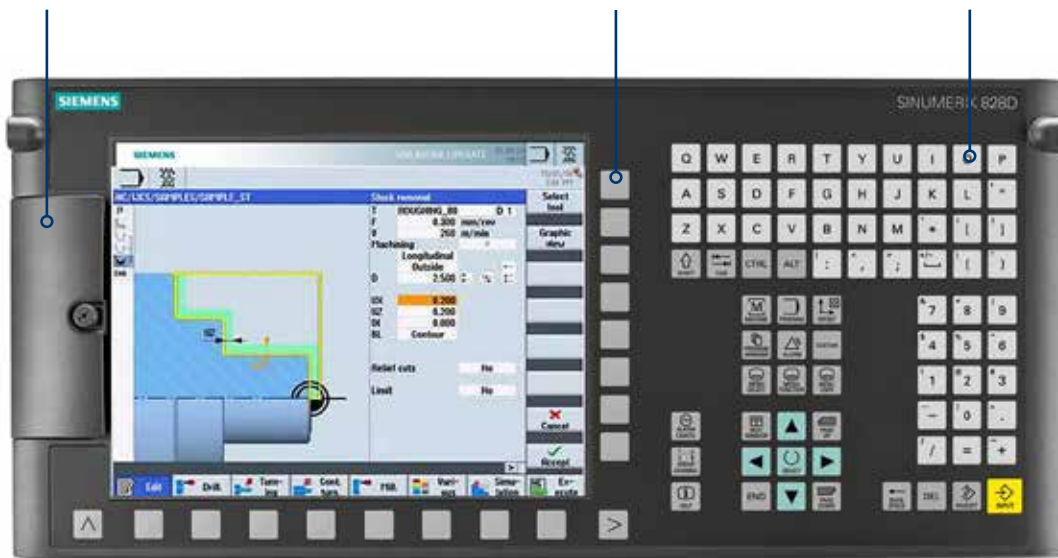
Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL PPU 270

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **PPU 271 SW 24**
- **3 MB** CNC memory
- **3 ms** Block change time
- **50** Look Ahead
- **128** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



Linear guide

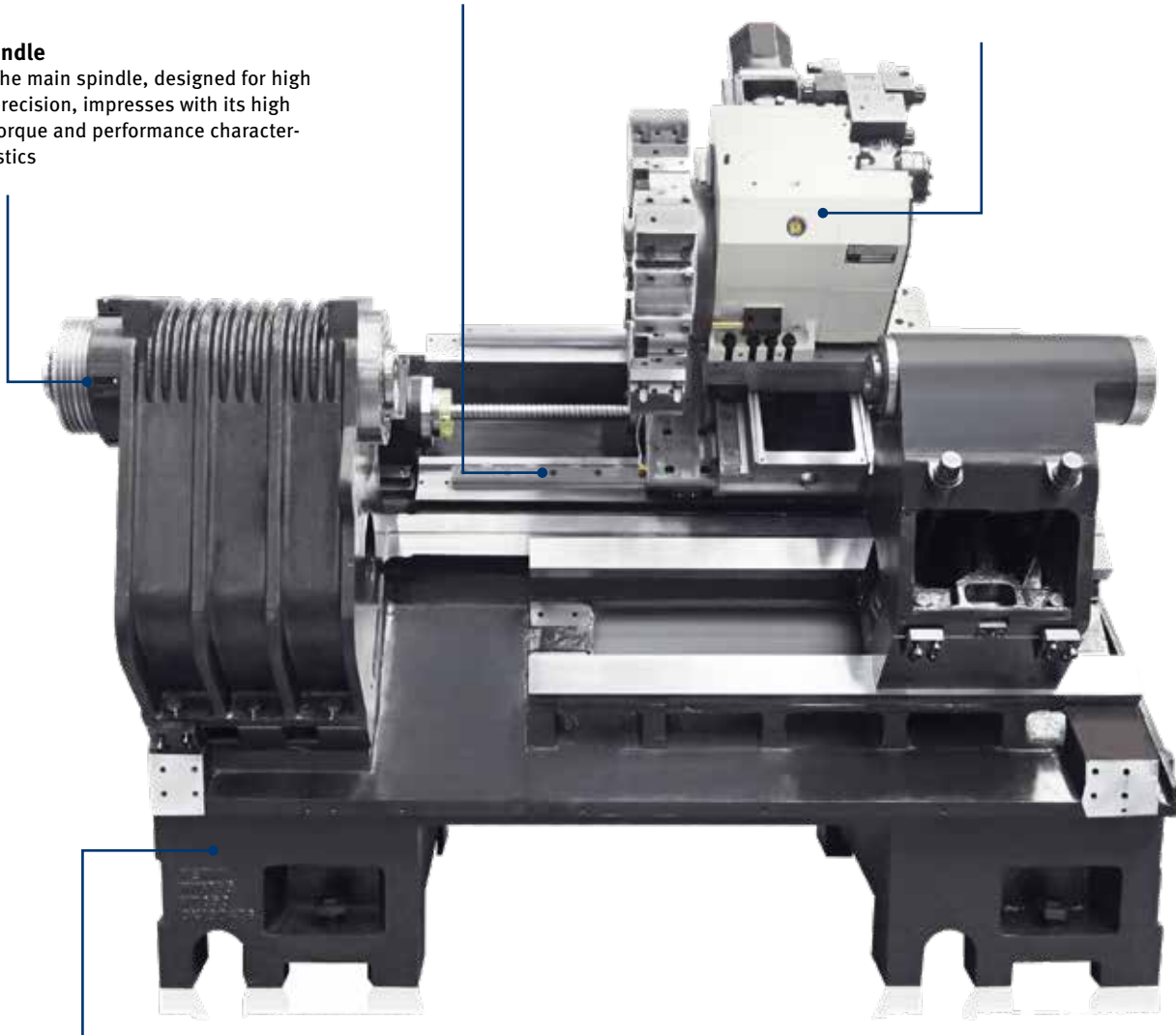
- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement

Tool turret

- VDI 30 Servo tool changer
- All 12 stations are driven by an integrated motor designed for speeds of up to 6 000 rpm .

Spindle

- The main spindle, designed for high precision, impresses with its high torque and performance characteristics

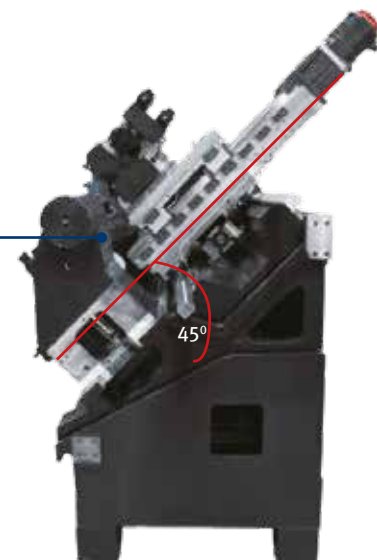


Components and cast parts

- Guarantee stiffness

Machine bed

- Pronounced ribbing
- 45-degree slope
- Excellent stiffness and durability
- Facilitates chip removal



LINEAR GUIDE AND BALL SCREW



- High precision
- Increases the speed of the movement speed and improve the cutting performance

TAILSTOCK



- with hydraulic quill

SAUTER TURRET HEAD WITH DRIVEN TOOL



- Equipped with a high-performance turret head with milling and drilling function.

TWO C-AXIS INDEX POSITIONING FUNCTION



- C-axis and driven turret can perform multiple functions such as turning, milling, drilling and tapping with high efficiency and precision

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of $5 \mu\text{m}^2$
- LED displays the probe status and the operational readiness of the arm
- TSI2 Interface

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

CENTRAL LUBRICATION



- Prevents wear, repair costs and unnecessary downtime to a considerable extent

CONTROL CABINET



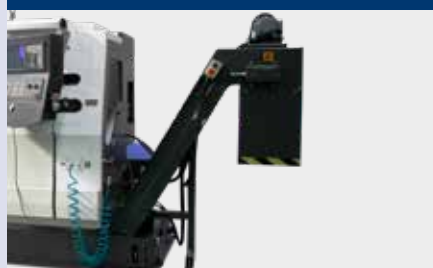
- With SIEMENS servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

HYDRAULIC UNIT



- Power of the hydraulic unit 2.2 kW

CHIP CONVEYOR



- Belt design
- for efficient chip discharge

STARTER SET				
3536116	1	Starter set VDI 40	· Information VDI 40, see Seite 287	
BAR FEEDER				
3511599093	2	Bar feeder interface	· Preparation	
On request		Short bar loader SL 80-S	· Information can be found on the Seite 284	
On request		Short bar loader XH 552	· Information can be found on the Seite 285	
On request		Bar loader DB-EVO	· Information can be found on the Seite 286	
LATHE CHUCK				
3519745		Soft jaws Ø300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm	
3519755		Hard jaws Ø300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm	
3515185010		Three-jaw lathe chuck Ø 250 mm including cylinder	· Instead of standard equipment › three-jaw lathe chuck hydraulic Ø 200 mm	
3519741		Soft jaws 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm	
3519751		Hard jaws 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm	
3515195011		Hydraulic four-jaw lathe chuck Ø 200 mm including cylinder	· Instead of standard equipment › three-jaw lathe chuck hydraulic Ø 200 mm	
3519740		Soft jaws Ø 200 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm	
3519750		Hard jaws Ø 200 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm	
3515195012		Hydraulic four-jaw lathe chuck Ø 250 mm including cylinder	· Instead of standard equipment › three-jaw lathe chuck hydraulic Ø 200 mm	
3519744		Soft jaws Ø 250 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm	
3519754		Hard jaws Ø 250 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm	
MISCELLANEOUS				
3511599095		3	Internal tool cooling	· External unit, 10 bar
3511599094			Internal tool cooling	· External unit, 20 bar
3511599091	4	Oil Separator	· Longer service life of the cooling lubricants	
3511599090		Part grippers		
3511599110		Tool holder VDI40 axially driven	· DIN5480	
3511599111		Tool holder VDI40 radially driven	· DIN5480	
3511599112		VDI40 tool holder, radially recessed	· DIN5480	
3544200		Lathe tool set Carbide 25 mm	· 6-part · see Seite 282	
SOFTWARE				
3584014	5	Software DXF Viewer/Reader	· from version 4.7	
3584030	6	Groove pushing	· Information can be found on the Seite 306	

1 STARTER SET VDI 40



- 3 pcs. square transverse holder 1
- 1 pc. square transverse overhead holder 2
- 1 pc. square longitudinal holder 3
- 5 pcs. drill rod holder \varnothing 10 / 12 / 16 / 20 / 25 mm 4
- 3 pcs. cap 5
- 1 pc. collet chuck holder ER 25 6
- 1 piece collet spanner ER 25 7
- 15-part collet chuck set ER 25 8
- 1 pc. tool holder 9
- 1 pc. chuck 10

2 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

3 COOLANT THROUGH SPINDLE



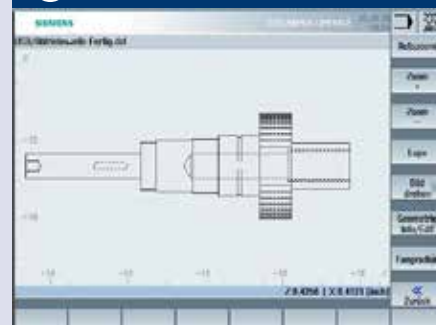
- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

4 OIL SEPARATOR



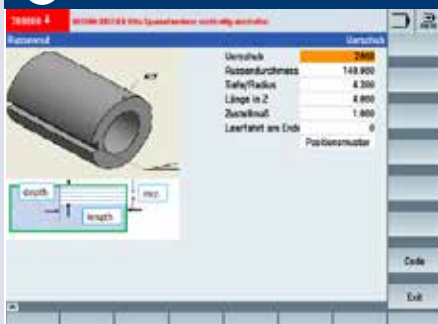
- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

5 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours

6 GROOVING



- Special processes such as broaching or grooving are generally used to produce internal and external profiles. Groove pushing can also be carried out economically on CNC lathes without special units.

S 600MY

OPTIMUM PREMIUM CNC slant-bed lathe with Y axis and C axis, that stands out for its high speed, performance, precision and durability

SIEMENS CONTROL SINUMERIK 828D PPU 270

- Heavy duty version
- Compact design
- Renishaw measuring arm for manual tool measurement
- Directly mounted main spindle encoder for higher accuracy
- Ball screw with improved accuracy, rigidity and heat resistance.
- .SIEMENS servo motors on all axes
- All servomotors with integrated encoder for maximum precision
- The motor is located on the side of the machine and prevents heat transfer and vibrations caused by the motor.
- Slant bed design 30° for particularly large machining diameter
- Better unobstructed chip flow into the chip tray
- Hydraulic three-jaw lathe chuck Ø 170 mm with soft jaws
- Hardened and precision ground ball screws for high rapid traverse speeds in all axes
- Dimensionally stable linear guides ensure a long service thanks to maximum static and dynamic stiffness
- Device for manual tool measuring
- Servo tailstock for optimised machining
- Heat exchanger
- Portable, electronic handwheel with enabling switch and emergency-stop pushbutton, makes it much easier to run in programmes.
- Chip conveyor, belt type ensures efficient chip discharge
- Working light for complete illumination of the working area
- Coolant device with cleaning gun
- RJ45 , power interface
- Tools Scope of delivery:
 - Driven axial tool holders,
 - 2 pieces driven radial tool holders,
 - 3 pieces drilling tool holder
 - 5 pieces OD-tool holder
 - Face tool holder
 - Boring bar Ø 20mm
 - Boring bar Ø 25mm
 - Boring bar Ø 32mm
- EMC Electromagnetic compatibility
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see „Zusatzpaket SIEMENS OSS Plus“ auf Seite 133
- 1 year maintenance contract Basic included in D/A/CH see page 267



OPTITURN S 600MY

TECHNICAL DATA

Model	S 600MY
Article no.	3515186
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	45 kVA
Spindle	
Drive motor S1 operation	11 kW
Drive motor torque S1 operation	105 Nm
Drive motor S6 30 % operation	14.3 kW
Drive motor torque S6 30 % operation	136 Nm
Spindle seat	DIN ISO 702-1 No. 6
Spindle bore*	Ø 56 mm
Chuck passage	Ø 44 mm
Chuck size	170 mm
Cooling lubricant system	
Coolant pump output	0.55 kW
Tank capacity	350 litres
Hydraulic system	
Output of hydraulic pump	2.2 kW
Tank capacity	36 litres
Machine data	
Turning diameter	300 mm
Turning length	550 mm
Swing Ø above cross slide	410 mm
Swing Ø above machine bed	620 mm
Slant bed	30°
Speed range	
Spindle speeds*	30 - 6 000 rpm
Travel	
X axis traverse path	210 mm
Y axis traverse path	± 52.5 mm
Z axis traverse path	600 mm
Z2 axis traverse path (tailstock)	550 mm
Tool changer	
Type	Servo BMT 55 - DIN1809
Number of tool stations	12
Permissible speed at tool coupling	max. 4 000 rpm
Power of the tools	2.8 kW
Max. tool torque	12 Nm
Accuracy	
Positioning accuracy X axis / Y axis / Z axis	± 0.008 mm
Repeat accuracy X axis / Y axis / Z axis	± 0.004 mm
Angular accuracy of C-axis	51''
C axis repeat accuracy	20''
Rapid traverse	
X axis	30 m/min.
Y axis	10 m/min.
Z axis	30 m/min.
Motor torque	
X axis / Y axis / Z axis	11 Nm
Feed forces	
X axis dynamic	6.7 kN
Y axis dynamic	8.4 kN
Z axis dynamic	6.7 kN
Tailstock	
Shank	MT 4
Travel	550 mm
Rapid traverse	10 m/min.
Traverse path with servo	550 mm
Dimensions	
Length x width x height	4,105 x 1,970 x 1,955 mm
Overall weight	4 200 kg

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

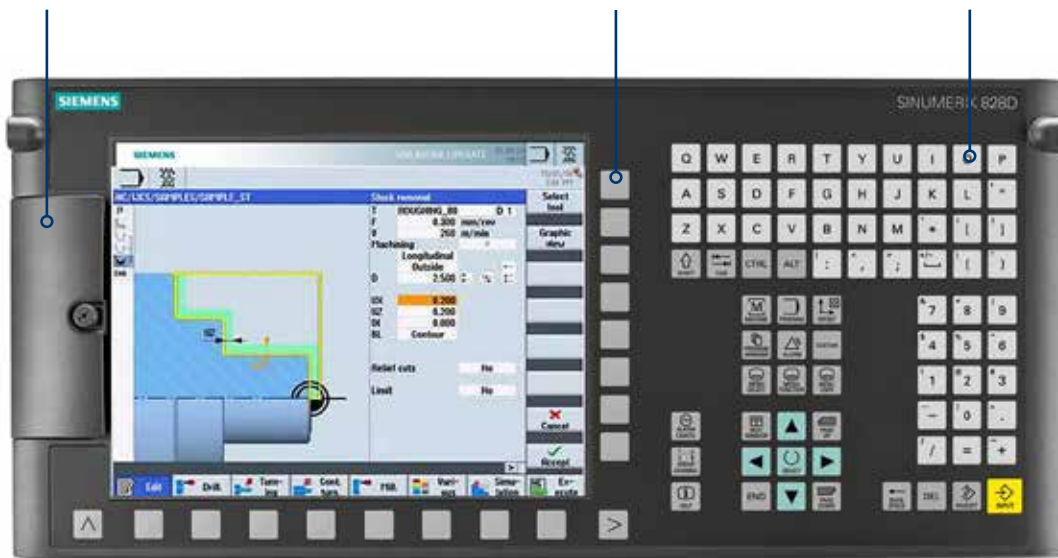
Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
- Hard buttons with protective film
- IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL PPU 270

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **PPU 271 SW 24**
- **3 MB** CNC memory
- **3 ms** Block change time
- **50** Look Ahead
- **128** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
Liability for material defects and on-site service - SiePortal - Siemens WW

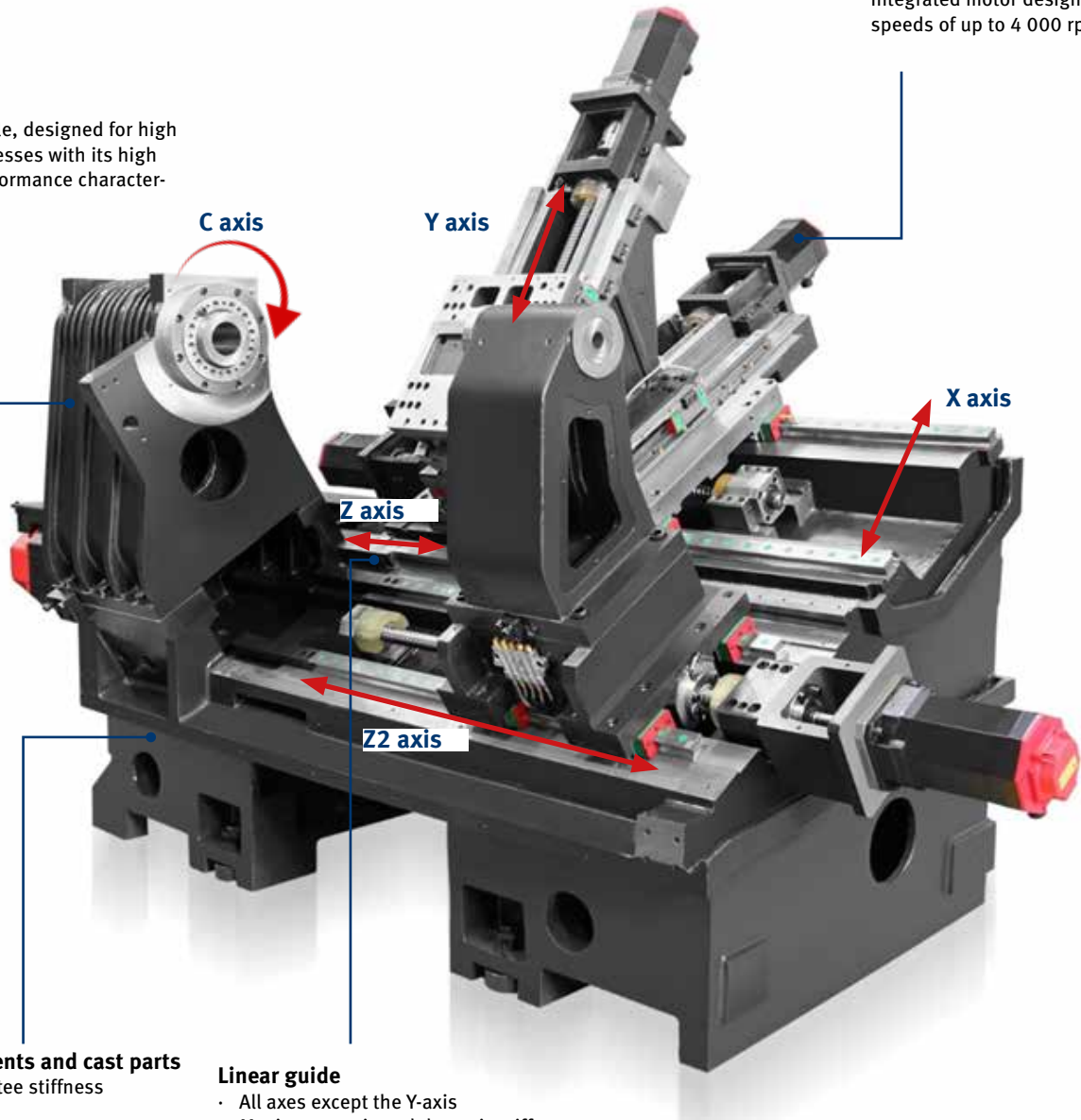


Tool turret

- Hydraulic tool turret BMT 55
- All 12 stations are driven by an integrated motor designed for speeds of up to 4 000 rpm .

Spindle

- The main spindle, designed for high precision, impresses with its high torque and performance characteristics



Components and cast parts

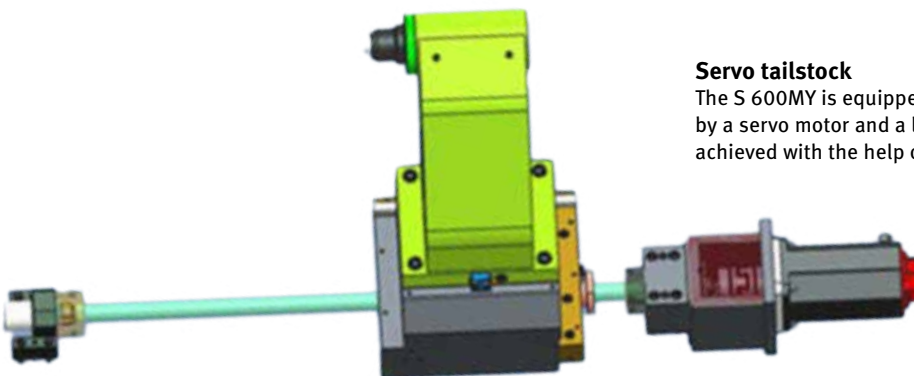
- Guarantee stiffness

Linear guide

- All axes except the Y-axis
- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Y-axis with box guide

Servo tailstock

The S 600MY is equipped with a servo tailstock, which is driven by a servo motor and a lead screw. High positioning accuracy is achieved with the help of the linear guide



LINEAR GUIDE AND BALL SCREWS



- High precision
- Increases the speed of the movement speed and improve the cutting performance

TAILSTOCK



- with hydraulic quill

SAUTER TURRET HEAD WITH DRIVEN TOOL



- Equipped with a high-performance turret head with milling and drilling function.

TWO C-AXIS INDEX POSITIONING FUNCTION



- C-axis and driven turret can perform multiple functions such as turning, milling, drilling and tapping with high efficiency and precision

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of $5 \mu\text{m} 2$
- LED displays the probe status and the operational readiness of the arm
- TS12 Interface

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

CENTRAL LUBRICATION



- Prevents wear, repair costs and unnecessary downtime to a considerable extent

CONTROL CABINET



- With SIEMENS servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

HYDRAULIC UNIT



- Power of the hydraulic unit 2.2 kW

CHIP CONVEYOR



- Belt design for efficient chip discharge

STARTER SET			
	1	Starter set	
BAR FEEDER			
3511599093		Bar feeder interface	· Preparation
On request	2	Short bar loader SL 80-S	· Information can be found on the Seite 284
On request		Short bar loader XH 552	· Information can be found on the Seite 285
On request		Bar loader DB-EVO	· Information can be found on the Seite 286
LATHE CHUCK			
3519745		Soft jaws Ø 300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm
3519755		Hard jaws Ø 300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm
MISCELLANEOUS			
3511599094	3	Internal tool cooling	· External unit, 10 bar
3511599095		Internal tool cooling	· External unit, 20 bar
3511599091	4	Oil Separator	· Longer service life of the cooling lubricants
3511599090		Part grippers	
3511599092	5	Air conditioner	· Instead of the standard equipment › heat exchanger
3544200		Lathe tool set Carbide 25 mm	· 6-part · see Seite 282
SOFTWARE			
3584014	6	Software DXF Viewer/Reader	· from version 4.7
3584030	7	Groove pushing	· Information can be found on the Seite 306

1 STARTER SET



- 3 pcs. square transverse holder 1
- 1 pc. square transverse overhead holder 2
- 1 pc. square longitudinal holder 3
- 5 pcs. drill rod holder Ø 10 / 12 / 16 / 20 / 25 mm 4
- 3 pcs. cap 5
- 1 pc. collet chuck holder ER 25 6
- 1 piece collet spanner ER 25 7
- 15-part collet chuck set ER 25 8
- 1 pc. tool holder 9
- 1 pc. chuck 10

2 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

3 COOLANT THROUGH SPINDLE



- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

4 OIL SEPARATOR



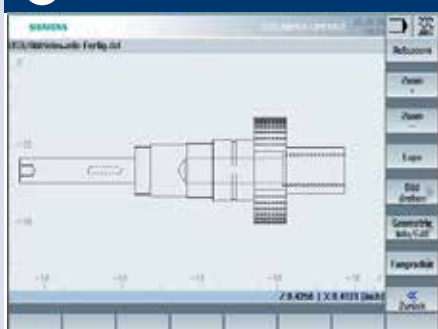
- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

5 AIR CONDITIONER



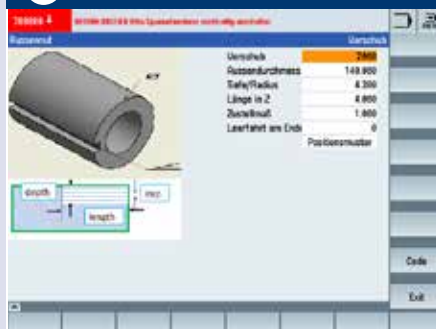
- Instead of heat exchanger
- The air conditioner permanently and constantly cools the control cabinet to the set temperature.

6 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours

7 GROOVING



- Special processes such as broaching or grooving are generally used to produce internal and external profiles. Groove pushing can also be carried out economically on CNC lathes without special units.

S 500

OPTIMUM PREMIUM CNC slant-bed lathe that stands out for its high speed, performance, precision and durability

SIEMENS CONTROL SINUMERIK 828D

- Heavy duty version
- Compact design
- Renishaw measuring arm for manual tool measurement
- The entire bed design has many reinforcing ribs that have been optimised through finite element analysis, ensuring high rigidity, better heat dissipation (thermal symmetry) and more precise machining
- Ball screw with improved accuracy, rigidity and heat resistance.
- .SIEMENS servo motors on all axes
- All servomotors with integrated encoder for maximum precision
- The motor is located on the side of the machine and prevents heat transfer and vibrations caused by the motor.
- Slant bed design 45° for particularly large machining diameter
- Better unobstructed chip flow into the chip tray
- Hydraulic three-jaw lathe chuck Ø 250 mm with soft jaws
- Servo tool changer VDI 40 with 12 tool stations
- Hardened and precision ground ball screws for high rapid traverse speeds in all axes
- Dimensionally stable linear guides ensure a long service thanks to maximum static and dynamic stiffness
- Part grippers
- Device for manual tool measuring
- Tailstock with hydraulic quill
- Heat exchanger
- Portable, electronic handwheel with enabling switch and emergency-stop pushbutton, makes it much easier to run in programmes.
- Chip conveyor, belt type ensures efficient chip discharge
- Working light for complete illumination of the working area
- Coolant device with cleaning gun
- RJ45 , power interface
- EMC Electromagnetic compatibility
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see „Zusatzpaket SIEMENS OSS Plus“ auf Seite 173
- 1 year maintenance contract Basic included in D/A/CH see page 267



TECHNICAL DATA

Model	S 500
Article no.	3515190
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	25 kVA
Spindle	
Drive motor S1 operation	11 kW
Drive motor torque S1 operation	140 Nm
Drive motor S6 30 % operation	15 kW
Drive motor torque S6 30 % operation	210 Nm
Spindle seat	A2-6
Spindle bore*	Ø 65 mm
Chuck passage	Ø 51 mm
Hydraulic lathe chuck	Ø 250 mm
Cooling lubricant system	
Coolant pump output	550 W
Tank capacity	350 litres
Hydraulic system	
Output of hydraulic pump	1.5 kW
Tank capacity	20 litres
Machine data	
Turning Ø max.	510 mm
Turning length	1,000 mm
Swing Ø above cross slide	480 mm
Swing Ø above machine bed	650 mm
Slant bed	45°
Speed range	
Spindle speeds*	30 - 4 000 rpm
Tool changer	
Type	VDI 40 Servo
Number of tool stations	12
Accuracy	
Repeat accuracy	± 0.005 mm
Positioning accuracy	± 0.005 mm
Travel	
X axis	280 mm
Z axis	1,100 mm
Dynamic feed force	
X axis	8.4 kN
Z axis	5.6 kN
Rapid traverse	
X axis	24 m/min.
Z axis	30 m/min.
Motor torque	
X axis/Y axis	11 Nm
Tailstock	
Shank	MT 5
Spindle sleeve diameter	100 mm
Spindle sleeve stroke, hydraulic	100 mm
Dimensions	
Length x width x height	5,070 x 1,885 x 1,955 mm
Overall weight	4 600 kg

* depending on the chuck installed ** other spindle bores and spindle speeds on request

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

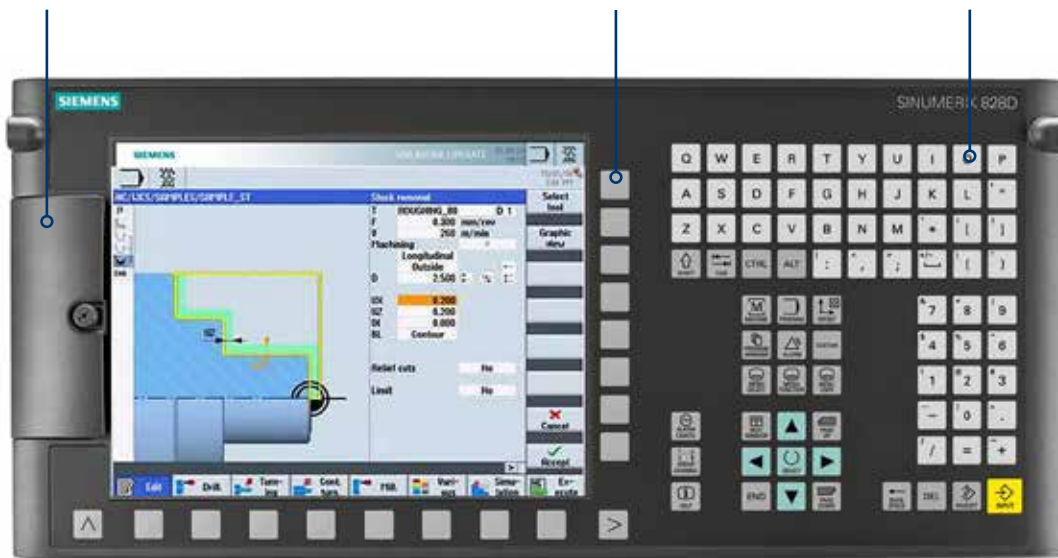
Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **PPU 271 SW 24**
- **3 MB** CNC memory
- **3 ms** Block change time
- **50** Look Ahead
- **128** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW

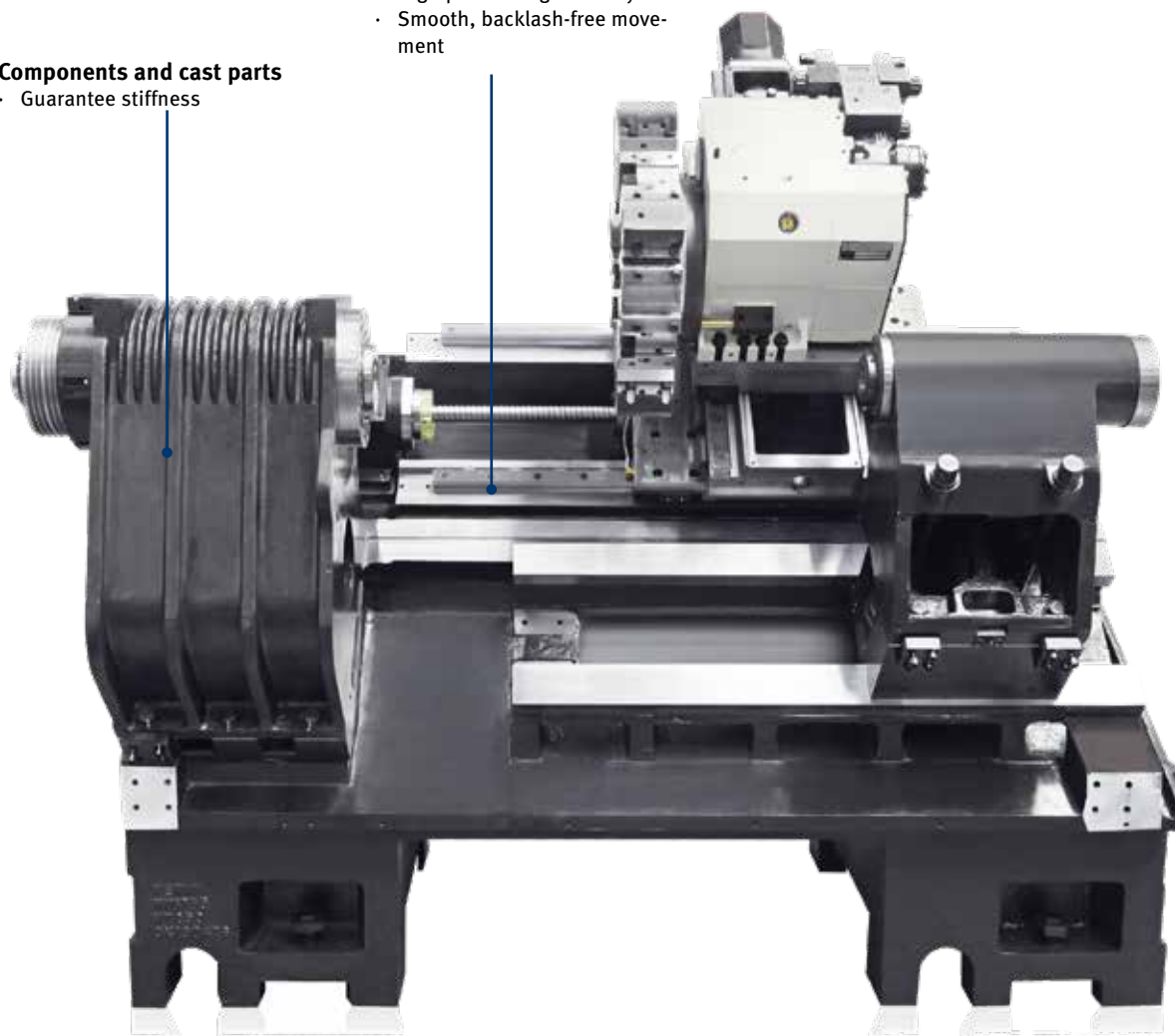


Components and cast parts

- Guarantee stiffness

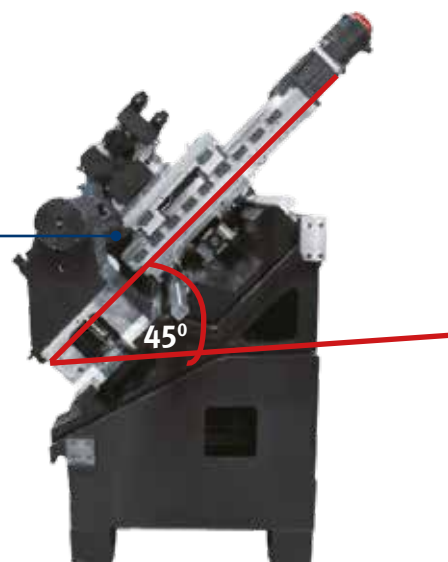
Linear guide

- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement



Machine bed

- Pronounced ribbing
- Excellent stiffness and durability
- Facilitates chip removal



LINEAR GUIDE AND BALL SCREW



- High precision
- Increases the speed of the movement and improve the cutting performance

TAILSTOCK



- with hydraulic quill

TURRET HEAD



- VDI 40
- Equipped with a high-performance turret head with milling and drilling function.

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

CENTRAL LUBRICATION



- Prevents wear, repair costs and unnecessary downtime to a considerable extent

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of $5 \mu\text{m}^2$
- LED displays the probe status and the operational readiness of the arm
- TSI2 Interface

HYDRAULIC UNIT



- Power of the hydraulic unit 1.5 kW

CHIP CONVEYOR



- Belt design
- for efficient chip discharge

CONTROL CABINET



- With SIEMENS servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

STARTER SET			
3536116	1	Starter set VDI 40	· Information VDI 40, Seite 287
BAR FEEDER			
3511599093	2	Bar feeder interface	
On request		Short bar loader SL 80-S	· Information can be found on the Seite 284
On request		Short bar loader XH 552	· Information can be found on the Seite 285
On request		Bar loader DB-EVO	· Information can be found on the Seite 286
LATHE CHUCK			
3515190010		Three-jaw lathechuck Ø 300 mm incl. cylinder	· Instead of standard equipment > three-jaw lathe chuck hydraulic Ø 200 mm
3519741		Soft jaws Ø 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519751		Hard jaws Ø 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519742		Soft jaws Ø 300 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 300 mm
3519752		Hard jaws Ø 300 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 300 mm
MISCELLANEOUS			
3511599094	5	Internal tool cooling	· External unit, 10 bar
3511599095		Internal tool cooling	· External unit, 20 bar
3511599091	4	Oil Separator	· Longer service life of the cooling lubricants
3511599090		Part grippers	
3515190001	3	Heidenhain encoder ERM 2480	· Mounted directly on the main spindle
3544200		Lathe tool set Carbide 25 mm	· 6-part · see Seite 282
3511599080		Grease lubrication	
SOFTWARE			
3584014	6	Software DXF Viewer/Reader	· from version 4.7

1 STARTER SET VDI 40



- 3 pcs. square transverse holder 1
- 1 pc. square transverse overhead holder 2
- 1 pc. square longitudinal holder 3
- 5 pcs. drill rod holder Ø 10 / 12 / 16 / 20 / 25 mm 4
- 3 pcs. cap 5
- 1 pc. collet chuck holder ER 25 6
- 1 piece collet spanner ER 25 7
- 15-part collet chuck set ER 25 8
- 1 pc. tool holder 9
- 1 pc. chuck 10

2 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

3 ENCODER ERM 2480



- Incremental angle encoder with magnetic scanning - scanning head
- Continuous operation at high speeds
- Robust and dirt-resistant
- Pitch accuracy: ±2.5" to ±72"

4 OIL SEPARATOR



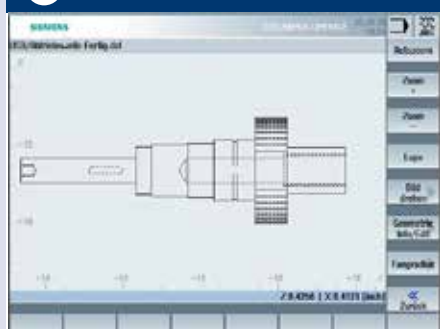
- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

5 COOLANT THROUGH SPINDLE



- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

7 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours

S 500M

OPTIMUM PREMIUM CNC slant-bed lathe that stands out for its high speed, performance, precision and durability

SIEMENS CONTROL SINUMERIK 828D PPU 270

- Heavy duty version
- Compact design
- Renishaw measuring arm for manual tool measurement
- The entire bed design has many reinforcing ribs that have been optimised through finite element analysis, ensuring high rigidity, better heat dissipation (thermal symmetry) and more precise machining
- Ball screw with improved accuracy, rigidity and heat resistance.
- .SIEMENS servo motors on all axes
- All servomotors with integrated encoder for maximum precision
- The motor is located on the side of the machine and prevents heat transfer and vibrations caused by the motor.
- Encoder directly on main spindle for increased accuracy
- Slant bed design 45° for particularly large machining diameter
- Better unobstructed chip flow into the chip tray
- Hydraulic three-jaw lathe chuck Ø 250 mm with soft jaws
- Sauter tool changer VDI 40 with 12 tool positions and driven tools
- Dimensionally stable box guide ensures a long service life thanks to maximum static and dynamic rigidity
- Device for manual tool measuring
- Tailstock with hydraulic quill
- Heat exchanger
- Portable, electronic handwheel with enabling switch and emergency-stop pushbutton, makes it much easier to run in programmes.
- Chip conveyor, belt type ensures efficient chip discharge
- Working light for complete illumination of the working area
- Coolant device with cleaning gun
- RJ45 , power interface
- Tools Scope of delivery:
 - 2 axial driven tool holders,
 - Driven radial tool holder,
 - 3 pieces B1 holder
 - B3 Holder
 - C1 Holder
 - Collet chuck E2 Ø 20mm
 - Collet chuck E2 Ø 25mm
 - Collet chuck E2 Ø 32mm
 - ER 32 collet set (6 , 8 , 10 , 12 , 16 , 20 mm)
- EMC Electromagnetic compatibility
- Additional package SIEMENS material liability for defects and free online/on-site service OSS Plus see page 135
- 1 year maintenance contract Basic included in D/A/CH see page 267



TECHNICAL DATA

Model	S 500M
Article no.	3515195
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	40 kVA
Spindle	
Drive motor S1 operation	11 kW
Drive motor torque S1 operation	140 Nm
Drive motor S6 30 % operation	15 kW
Drive motor torque S6 30 % operation	210 Nm
Spindle seat	DIN ISO 702-1 No. 6
Spindle bore*	Ø 65 mm
Chuck passage	Ø 51 mm
Chuck size	Ø 250 mm
Cooling lubricant system	
Coolant pump output	700 W 1.8 bar
Tank capacity	320 litres
Hydraulic system	
Output of hydraulic pump	2.2 kW
Tank capacity	36 litres
Machine data	
Turning diameter	430 mm
Turning length	1,000 mm
Swing Ø above cross slide	450 mm
Swing Ø above machine bed	600 mm
Slant bed	45°
Speed range	
Spindle speeds*	30 - 3 000 rpm
Tool changer	
Type	Servo VDI 40 - DIN5480
Number of tool stations	12
Permissible speed at tool coupling	max. 6 000 rpm
Power of the tools	2.7 kW
Max. tool torque	12 - 46 Nm
Accuracy	
X axis repeat accuracy	± 0.003 mm
Z axis repeat accuracy	± 0.005 mm
X axis positioning accuracy	± 0.005 mm
Z axis positioning accuracy	± 0.005 mm
Angular accuracy of the C-axis	51''
C axis repeat accuracy	20''
Travel	
X axis	295 mm
Z axis	1,050 mm
Rapid traverse	
X axis	12 m/min.
Z axis	16 m/min.
Motor torque	
X axis/Y axis	16 Nm
Feed forces	
X axis/Y axis	11 kN / 9.5 kN
Tailstock	
Shank	MT 5
Spindle sleeve diameter	100 mm
Spindle sleeve stroke, hydraulic	100 mm
Dimensions	
Length x width x height	4 750 x 1 880 x 1 030 mm
Overall weight	4 800 kg

* depending on installed lathe chuck

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
- Hard buttons with protective film
- IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **PPU 271 SW 24**
- **3 MB** CNC memory
- **3 ms** Block change time
- **50** Look Ahead
- **128** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

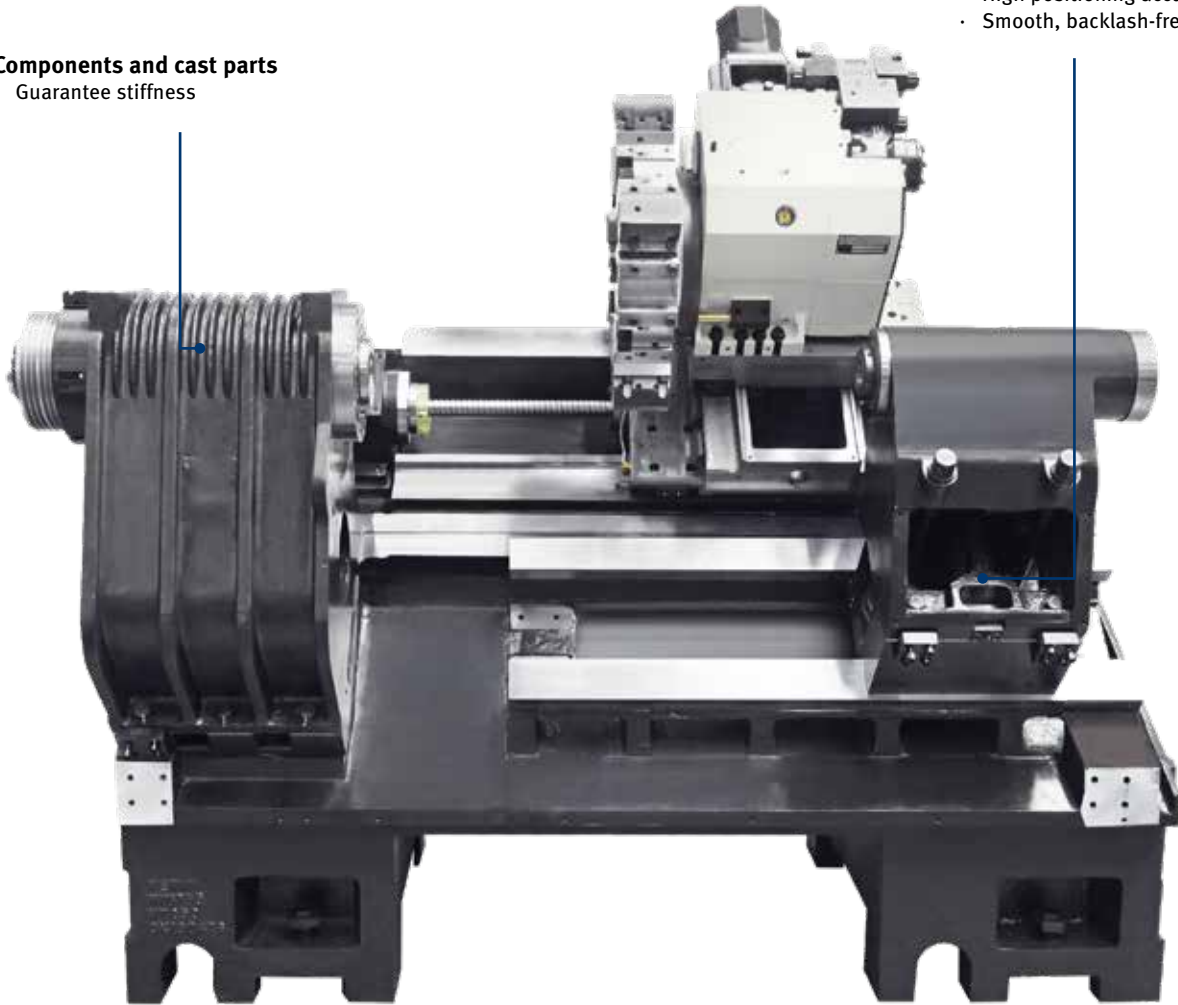
- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
Liability for material defects and on-site service - SiePortal - Siemens WW



Components and cast parts

- Guarantee stiffness

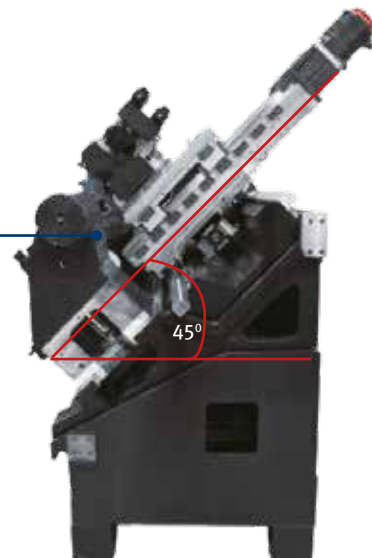


Box guide

- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement

Machine bed

- Pronounced ribbing
- 45-degree slope
- Excellent stiffness and durability
- Facilitates chip removal



BALL SCREW



- High precision
- Increases the speed of the movement speed and improve the cutting performance

TAILSTOCK



- with hydraulic quill

TURRET HEAD WITH DRIVEN TOOL



- Equipped with a high-performance turret head with milling and drilling function.

TWO C-AXIS INDEX POSITIONING FUNCTION



- C-axis and driven turret can perform multiple functions such as turning, milling, drilling and tapping with high efficiency and precision

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of 5 μm 2
- LED displays the probe status and the operational readiness of the arm
- TSI2 Interface

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

CENTRAL LUBRICATION



- Prevents wear, repair costs and unnecessary downtime to a considerable extent

CONTROL CABINET



- With SIEMENS servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

HYDRAULIC UNIT



- Power of the hydraulic unit 2.2 kW

CHIP CONVEYOR



- Belt design
- for efficient chip discharge

BAR FEEDER			
3511599093		Bar feeder interface	· Preparation
On request	1	Short bar loader SL 80-S	· Information can be found on the Seite 284
On request		Short bar loader XH 552	· Information can be found on the Seite 285
On request		Bar loader DB-EVO	· Information can be found on the Seite 286
LATHE CHUCK			
3519741		Soft jaws Ø250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519751		Hard jaws Ø250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3515195010		Three-jaw lathe chuck Ø 300 mm including cylinder	· Instead of standard equipment > three-jaw lathe chuck hydraulic Ø 250 mm
3519742		Soft jaws Ø 300 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 300 mm
3519752		Hard jaws Ø 300 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 300 mm
3515195011		Hydraulic four-jaw lathe chuck Ø 250 mm including cylinder	· Instead of standard equipment > three-jaw lathe chuck hydraulic Ø 250 mm
3519744		Soft jaws Ø 250 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm
3519754		Hard jaws Ø 250 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm
3515195012		Hydraulic four-jaw lathe chuck Ø 300 mm including cylinder	· Instead of standard equipment > three-jaw lathe chuck hydraulic Ø 250 mm
3519745		Soft jaws Ø 300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm
3519755		Hard jaws Ø 300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm
INTERNAL TOOL COOLING			
3511599094	2	Internal tool cooling	· External unit, 10 bar
MISCELLANEOUS			
3511599080	3	Grease lubrication	
3511599091	4	Oil Separator	
3511599110		Tool holder VDI40 axially driven	· DIN5480
3511599111		Tool holder VDI40 radially driven	· DIN5480
3511599112		VDI40 tool holder, radially recessed	· DIN5480
3544200		Lathe tool set HM 25 mm	· 6-part · see Seite 282
SOFTWARE			
3584014	5	Software DXF Viewer/Reader	· from version 4.7
3584030	6	Grooving	· Information can be found on the Seite 306

1 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

2 COOLANT THROUGH SPINDLE



- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

3 GREASE LUBRICATION



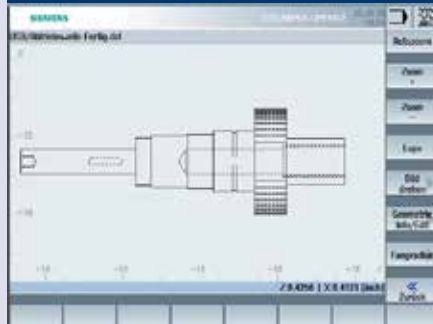
- Reduces wear
- High load-bearing capacity
- Excellent lubricant film
- Low maintenance
- Good adhesion properties

4 OIL SEPARATOR



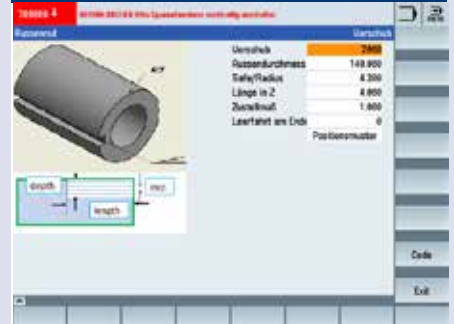
- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

5 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours

6 GROOVING



- Special processes such as broaching or grooving are generally used to produce internal and external profiles. Groove pushing can also be carried out economically on CNC lathes without special units.

S 500MY

The OPTIMUM PREMIUM CNC slant bed lathe with Y-axis and driven tools impresses with its high speeds, precision and efficiency

SIEMENS CONTROL SINUMERIK 828D PPU 270

- Heavy duty version
- Compact design
- Renishaw measuring arm for manual tool measurement
- Encoder on main spindle for increased accuracy
- The entire bed design has many reinforcing ribs that have been optimised through finite element analysis, ensuring high rigidity, better heat dissipation (thermal symmetry) and more precise machining
- Ball screw with improved accuracy, rigidity and heat resistance.
- .SIEMENS servo motors on all axes
- All servomotors with integrated encoder for maximum precision
- The motor is located on the side of the machine and prevents heat transfer and vibrations caused by the motor.
- Slant bed design 30° for particularly large machining diameter
- Better unobstructed chip flow into the chip tray
- Hydraulic three-jaw lathe chuck Ø 250 mm with soft jaws
- BMT55 tool changer with 12 tool stations and driven tools
- Hardened and precision-ground ball screws for high rapid traverse speeds in all linear guided axes, except Y-axis which has box guide
- Device for manual tool measuring
- Tailstock with hydraulic quill
- Heat exchanger
- Portable, electronic handwheel with enabling switch and emergency-stop pushbutton, makes it much easier to run in programmes.
- Chip conveyor, belt type ensures efficient chip discharge
- Working light for complete illumination of the working area
- Coolant device with cleaning gun
- RJ45 , power interface
- Tools Scope of delivery:
 - Driven axial tool holder
 - Driven radial tool holder
 - 3 pieces tool holder for boring bars
 - 4 pieces OD-tool holder
 - Tool holder for end faces
 - Collet chuck E2 Ø 20mm
 - Collet chuck E2 Ø 25mm
 - Collet chuck E2 Ø 32mm
- EMC Electromagnetic compatibility
- Additional package SIEMENS material liability for defects and free online/on-site service OSS Plus see page 135
- 1 year maintenance contract Basic included in D/A/CH see page 267



OPTITURN S 500MY

Model	S 500MY
Article no.	3515196
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	35 kVA
Spindle	
Drive motor S1 operation	15 kW
Drive motor torque S1 operation	268 Nm
Drive motor S6 30 % operation	19.5 kW
Drive motor torque S6 30 % operation	349 Nm
Spindle seat	DIN ISO 702-1 No. 8
Spindle bore*	Ø 86 mm
Chuck passage	Ø 74 mm
Chuck size	250 mm
Cooling lubricant system	
Coolant pump output	0.55 kW
Tank capacity	240 litres
Machine data	
Turning diameter	400 mm
Turning length	1,180 mm
Swing Ø above cross slide	480 mm
Swing Ø above machine bed	660 mm
Slant bed	30°
Speed range	
Spindle speeds*	30 - 3 500 rpm
Tool changer	
Type	Servo BMT 55 - DIN1809
Number of tool stations	12
Permissible speed at tool coupling	max. 4 000 rpm
Power of the tools	4.8 kW
Max. tool torque	20 Nm
Accuracy	
X axis repeat accuracy	± 0.004 mm
X axis positioning accuracy	± 0.008 mm
Y axis repeat accuracy	± 0.005 mm
Y axis repeat accuracy	± 0.0025 mm
Z axis repeat accuracy	± 0.004 mm
Z axis positioning accuracy	± 0.008 mm
Angular accuracy of the C-axis	51''
C axis repeat accuracy	20''
Travel	
X axis	280 mm
Z axis	1,280 mm
Y axis	± 50 mm
Rapid traverse	
X axis	24 m/min.
Y axis	10 m/min.
Z axis	30 m/min.
Motor torque	
X axis / Z axis / Y axis	17 Nm
Feed forces	
X axis dynamic	8.4 kN
Y axis dynamic	18 kN
Z axis dynamic	6.7 kN
Tailstock	
Shank	MT 5
Spindle sleeve diameter	100 mm
Spindle sleeve stroke, hydraulic	100 mm
Dimensions	
Length x width x height	5,040 x 1,880 x 1,990 mm
Overall weight	4,700 kg

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **PPU 271 SW 24**
- **3 MB** CNC memory
- **3 ms** Block change time
- **50** Look Ahead
- **128** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW

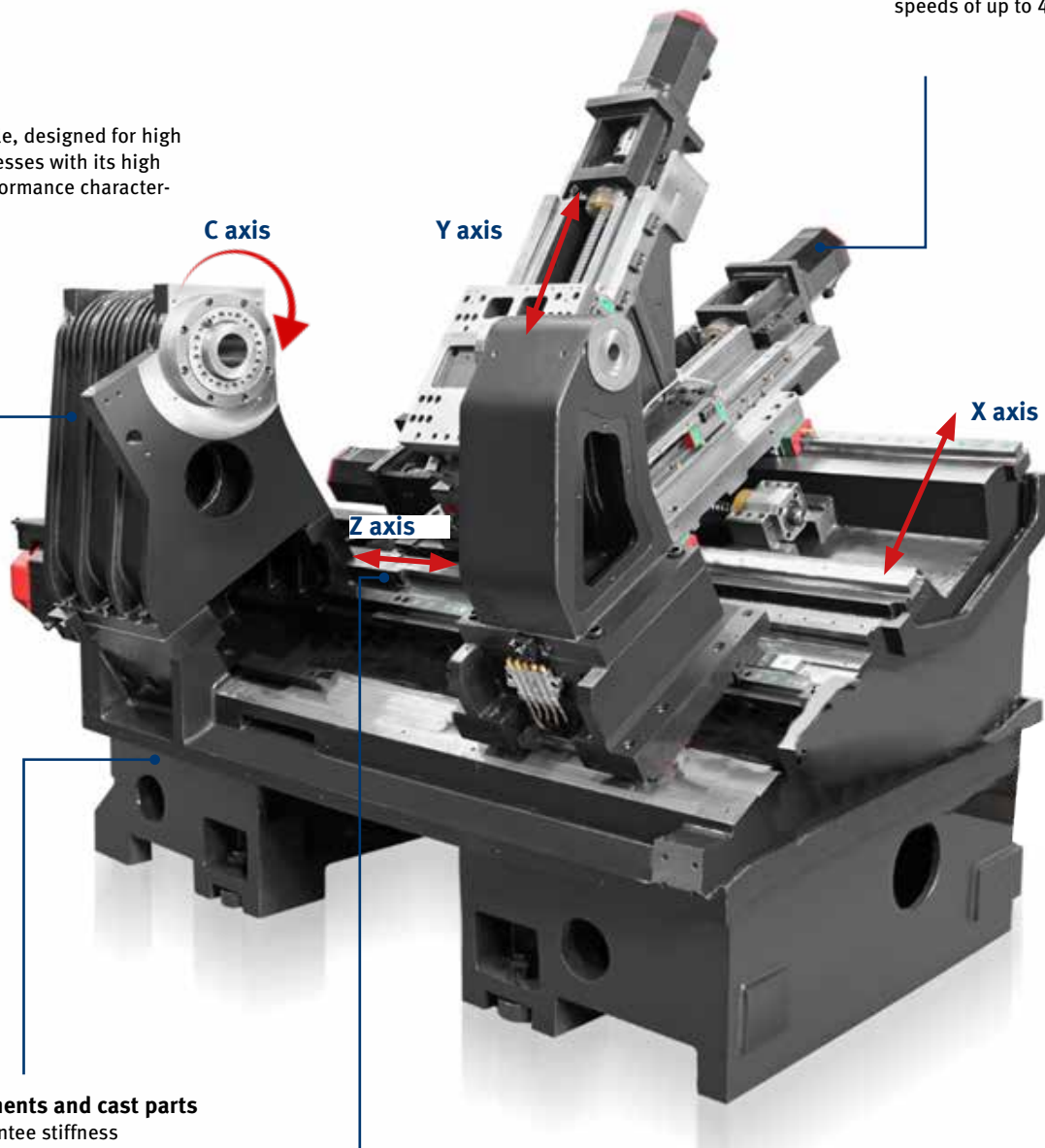


Tool turret

- Hydraulic tool turret BMT 55
- All 12 stations are driven by an integrated motor designed for speeds of up to 4 000 rpm .

Spindle

- The main spindle, designed for high precision, impresses with its high torque and performance characteristics



Components and cast parts

- Guarantee stiffness

Linear guide

- All axes except the Y-axis
- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Y-axis with box guide

LINEAR GUIDE AND BALL SCREWS



- High precision
- Increases the speed of the movement speed and improve the cutting performance

TAILSTOCK



- with hydraulic quill

TURRET HEAD WITH DRIVEN TOOL



- Equipped with a high-performance turret head with milling and drilling function

TWO C-AXIS INDEX POSITIONING FUNCTION



- C-axis and driven turret can perform multiple functions such as turning, milling, drilling and tapping with high efficiency and precision

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of $5 \mu m^2$
- LED displays the probe status and the operational readiness of the arm
- TSI2 Interface

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

CENTRAL LUBRICATION



- Prevents wear, repair costs and unnecessary downtime to a considerable extent

HYDRAULIC UNIT



- Power of the hydraulic unit 2.2 kW

CHIP CONVEYOR



- Belt design
- for efficient chip discharge

CONTROL CABINET



- With SIEMENS servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

BAR FEEDER			
3511599093		Bar feeder interface	· Preparation
On request	1	Short bar loader SL 80-S	· Information can be found on the Seite 284
On request		Short bar loader XH 552	· Information can be found on the Seite 285
On request		Bar loader DB-EVO	· Information can be found on the Seite 286
LATHE CHUCK			
3519741		Soft jaws Ø250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519751		Hard jaws Ø 200 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
MISCELLANEOUS			
3511599090		Part grippers	
3511599098		Hydraulic steady rest	
3511599092		Air conditioner	
3511599095	2	Coolant Through Spindle	· 20 bar CTS
3511599094	3	Coolant Through Spindle	· 10 bar CTS
3511599091		Oil Separator	· DIN5480
		Grooving	· Information can be found on the Seite 306
3544200		Lathe tool set HM 25 mm	· 6-part · see Seite 282
SOFTWARE			
3584014	4	Software DXF Viewer/Reader	· from version 4.7
3584030	5	Grooving	· Information can be found on the Seite 306

1 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

2 COOLANT THROUGH SPINDLE



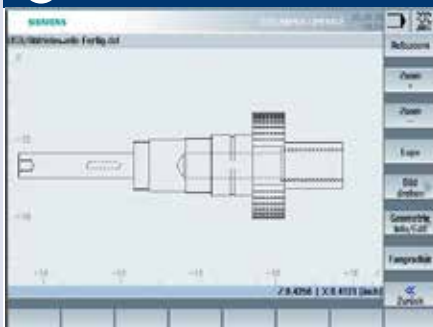
- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

3 OIL SEPARATOR



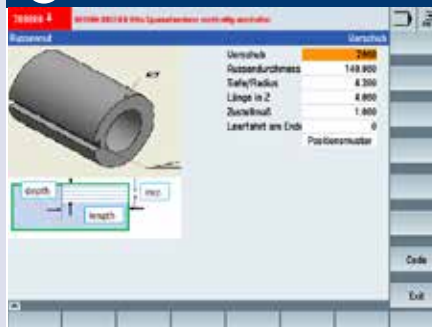
- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

4 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours

5 GROOVING



- Special processes such as broaching or grooving are generally used to produce internal and external profiles. Groove pushing can also be carried out economically on CNC lathes without special units.

S 750

OPTIMUM PREMIUM CNC slant-bed lathe that stands out for its high speed, performance, precision and durability

SIEMENS CONTROL SINUMERIK 828D

- Heavy duty version
- Compact design
- Renishaw measuring arm for manual tool measurement
- The entire bed design has many reinforcing ribs that have been optimised through finite element analysis, ensuring high rigidity, better heat dissipation (thermal symmetry) and more precise machining
- Ball screw with improved accuracy, rigidity and heat resistance.
- .SIEMENS servo motors on all axes
- All servomotors with integrated encoder for maximum precision
- The motor is located on the side of the machine and prevents heat transfer and vibrations caused by the motor.
- Slant bed design 30° for particularly large machining diameter
- Better unobstructed chip flow into the chip tray
- Hydraulic three-jaw lathe chuck Ø 250 mm with soft jaws
- Servo tool changer VDI 40 with 12 tool stations
- Hardened and precision ground ball screws for high rapid traverse speeds in all axes
- Dimensionally stable linear guides ensure a long service thanks to maximum static and dynamic stiffness
- Part grippers
- Device for manual tool measuring
- Tailstock with hydraulic quill
- Heat exchanger
- Portable, electronic handwheel with enabling switch and emergency-stop pushbutton, makes it much easier to run in programmes.
- Chip conveyor, belt type ensures efficient chip discharge
- Working light for complete illumination of the working area
- Coolant device with cleaning gun
- RJ45 , power interface
- EMC Electromagnetic compatibility
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see „Zusatzpaket SIEMENS OSS Plus“ auf Seite 173
- 1 year maintenance contract Basic included in D/A/CH see page 267



TECHNICAL DATA

Model	S 750
Article no.	3515200
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	35 kVA
Spindle	
Drive motor S1 operation	15 kW
Drive motor torque S1 operation	268 Nm
Drive motor S6 30 % operation	19,5 kW
Drive motor torque S6 30 % operation	349 Nm
Spindle seat	A2-8
Spindle bore	Ø 86 mm
Chuck passage	Ø 74 mm
Hydraulic lathe chuck	Ø 250 mm
<i>Spindle bore option</i>	Ø 103 mm
<i>Lathe chuck passage option</i>	Ø 90 mm (with 300 mm chuck)
<i>Spindle speeds option</i>	30 - 3 000 rpm
Cooling lubricant system	
Coolant pump output	700 W 1.8 bar
Tank capacity	320 litres
Hydraulic system	
Output of hydraulic pump	2.2 kW
Tank capacity	36 litres
Machine data	
Turning Ø max.	500 mm
Turning length	1,250 mm
Swing Ø above cross slide	480 mm
Swing Ø above machine bed	660 mm
Slant bed	30°
Speed range	
Spindle speeds*	30 - 3 500 rpm
Tool changer	
Type	VDI 40 Servo
Number of tool stations	12
Accuracy	
Repeat accuracy	± 0.008 mm
Positioning accuracy	± 0.004 mm
Travel	
X axis	280 mm
Z axis	1,280 mm
Dynamic feed force	
X axis	8.4 kN
Z axis	6.7 kN
Rapid traverse	
X axis	24 m/min.
Z axis	30 m/min.
Motor torque	
X axis/Y axis	12 Nm
Tailstock	
Shank	MT 5
Spindle sleeve diameter	100 mm
Spindle sleeve stroke, hydraulic	100 mm
Dimensions	
Length x width x height	5,040 x 1,880 x 1,840 mm
Overall weight	4 600 kg

* depending on the chuck installed ** other spindle bores and spindle speeds on request

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

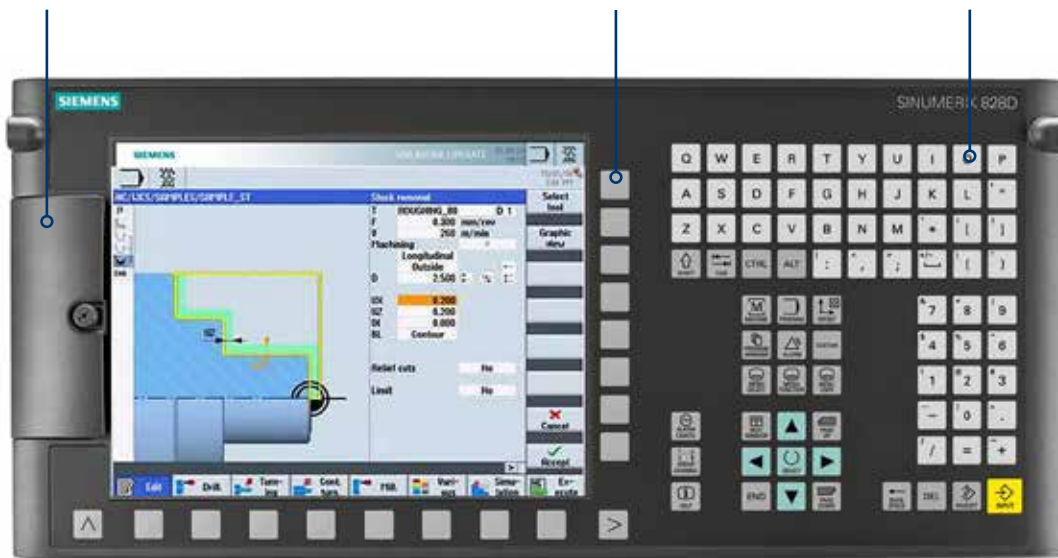
Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- PPU 271 SW 24
- 3 MB CNC memory
- 3 ms Block change time
- 50 Look Ahead
- 128 tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

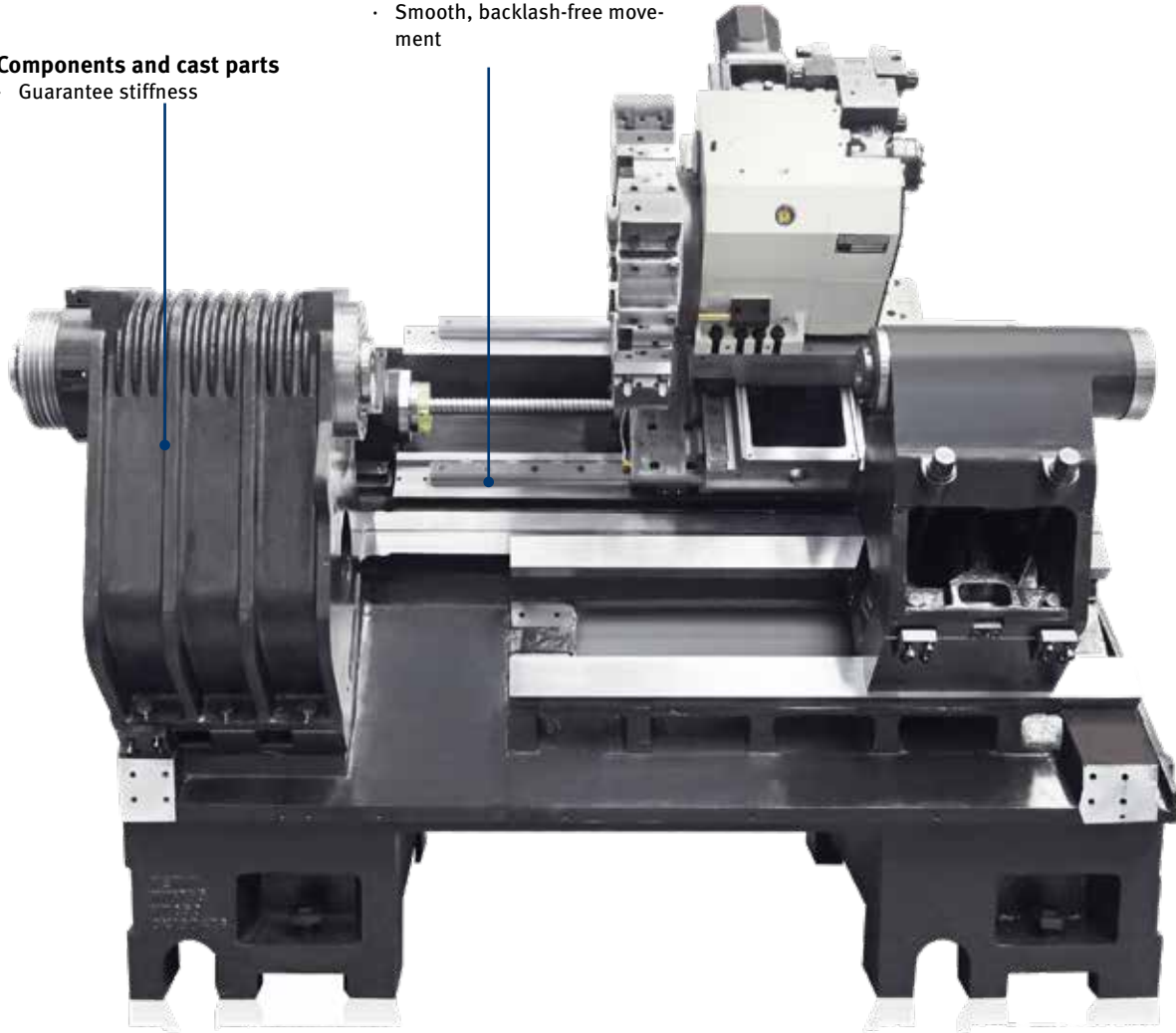
Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



Components and cast parts
· Guarantee stiffness

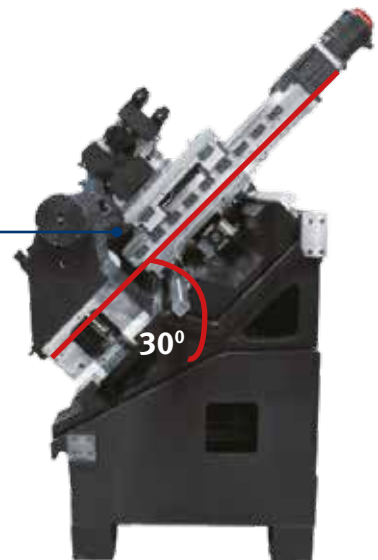
Linear guide

- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement



Machine bed

- Pronounced ribbing
- Excellent stiffness and durability
- Facilitates chip removal



LINEAR GUIDE AND BALL SCREW



- High precision
- Increases the speed of the movement and improve the cutting performance

TAILSTOCK



- with hydraulic quill

TURRET HEAD



- VDI 40
- Equipped with a high-performance turret head with milling and drilling function.

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

CENTRAL LUBRICATION



- Prevents wear, repair costs and unnecessary downtime to a considerable extent

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of $5 \mu\text{m}^2$
- LED displays the probe status and the operational readiness of the arm
- TSI2 Interface

HYDRAULIC UNIT



- Power of the hydraulic unit 1.5 kW (S 500) 2.2 kW (S 750)

CHIP CONVEYOR



- Belt design
- for efficient chip discharge

CONTROL CABINET



- With SIEMENS servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

STARTER SET			
3536116	1	Starter set VDI 40	· Information VDI 40, Seite 287
BAR FEEDER			
3511599101	2	Bar feeder 3 m Ø 260 mm	
3511599102		Bar feeder 1.5 m Ø 260 mm	
3511599103		Bar feeder 1.25 m Ø 260 mm	
LATHE CHUCK			
351520011	5	Four-jaw lathe chuck Ø 250 mm including jaws	· Instead of standard equipment › three-jaw lathe chuck hydraulic Ø 250 mm
351520012	4	Four-jaw lathe chuck Ø 250 mm including jaws	· In addition to the standard equipment
351520010		Three-jaw lathe chuck Ø 300 mm including jaws	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519741	3	Soft jaws Ø 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519751		Hard jaws Ø 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519742		Soft jaws Ø 300 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 300 mm
3519752		Hard jaws Ø 300 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 300 mm
MISCELLANEOUS			
	2	Internal tool cooling	· External unit, 10 bar
		Internal tool cooling	· External unit, 20 bar
3511599091	3	Oil Separator	· Longer service life of the cooling lubricants
3511599090		Part grippers	
3515190001		Heidenhain encoder ERM 2480	· Mounted directly on the main spindle
3544200	3	Lathe tool set Carbide 25 mm	· 6-part · see Seite 282
SOFTWARE			
3584014	6	Software DXF Viewer/Reader	· from version 4.7

1 STARTER SET VDI 40



- 3 pcs. square transverse holder 1
- 1 pc. square transverse overhead holder 2
- 1 pc. square longitudinal holder 3
- 5 pcs. drill rod holder Ø 10 / 12 / 16 / 20 / 25 mm 4
- 3 pcs. cap 5
- 1 pc. collet chuck holder ER 25 6
- 1 piece collet spanner ER 25 7
- 15-part collet chuck set ER 25 8
- 1 pc. tool holder 9
- 1 pc. chuck 10

2 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

3 ENCODER ERM 2480



- Incremental angle encoder with magnetic scanning - scanning head
- Continuous operation at high speeds
- Robust and dirt-resistant
- Pitch accuracy: ±2.5" to ±72"

4 OIL SEPARATOR



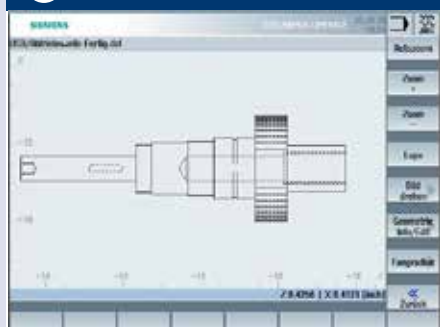
- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

5 COOLANT THROUGH SPINDLE



- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

6 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours

S 750M

OPTIMUM PREMIUM CNC slant-bed lathe that stands out for its high speed, performance, precision and durability

SIEMENS CONTROL SINUMERIK 828D PPU 270

- Heavy duty version
- Compact design
- Renishaw measuring arm for manual tool measurement
- The entire bed design has many reinforcing ribs that have been optimised through finite element analysis, ensuring high rigidity, better heat dissipation (thermal symmetry) and more precise machining
- Ball screw with improved accuracy, rigidity and heat resistance.
- .SIEMENS servo motors on all axes
- All servomotors with integrated encoder for maximum precision
- The motor is located on the side of the machine and prevents heat transfer and vibrations caused by the motor.
- Encoder directly on main spindle for increased accuracy
- Slant bed design 30° for particularly large machining diameter
- Better unobstructed chip flow into the chip tray
- Hydraulic three-jaw lathe chuck Ø 250 mm with soft jaws
- Sauter tool changer VDI 40 with 12 tool positions and driven tools
- Linear guides ensure a long service life thanks to maximum static and dynamic rigidity.
- Device for manual tool measuring
- Tailstock with hydraulic quill
- Air conditioner
- Portable, electronic handwheel with enabling switch and emergency-stop pushbutton, makes it much easier to run in programmes.
- Chip conveyor, belt type ensures efficient chip discharge
- Working light for complete illumination of the working area
- Coolant device with cleaning gun
- RJ45 , power interface
- Tools Scope of delivery:
 - Driven axial tool holders,
 - Driven radial tool holder,
 - Boring bar holder
 - OD-tool holder
 - End face tool holder
 - Boring bar Ø 20mm
 - Boring bar Ø 25mm
 - Boring bar Ø 32mm
- EMC Electromagnetic compatibility
- Additional package SIEMENS material liability for defects and free online/on-site service OSS Plus see page 135
- 1 year maintenance contract Basic included in D/A/CH see page 267



TECHNICAL DATA

Model	S 750M
Article no.	3515205
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	35 kVA
Spindle	
Drive motor S1 operation	15 kW
Drive motor torque S1 operation	268 Nm
Drive motor S6 30 % operation	19.5 kW
Drive motor torque S6 30 % operation	349 Nm
Spindle seat	A2-8
Spindle bore	Ø 86 mm
Chuck passage	Ø 74 mm
Chuck size	Ø 250 mm
<i>Spindle bore option</i>	Ø 103 mm
<i>Lathe chuck passage option</i>	Ø 90 mm (with 300 mm chuck)
<i>Spindle speeds option</i>	30 - 3 000 rpm
Cooling lubricant system	
Coolant pump output	700 W 1.8 bar
Tank capacity	320 litres
Hydraulic system	
Output of hydraulic pump	2.2 kW
Tank capacity	36 litres
Machine data	
Turning diameter	500 mm
Turning length	1,250 mm
Swing Ø above cross slide	480 mm
Swing Ø above machine bed	660 mm
Slant bed	30°
Speed range	
Spindle speeds*	30 - 3 500 rpm
Tool changer	
Type	Sauter VDI 40
Number of tool stations	12
Permissible speed at tool coupling	max. 4 000 rpm
Power of the tools	4.8 kW
Max. tool torque	20 Nm
Accuracy	
X axis repeat accuracy	± 0.004 mm
Z axis repeat accuracy	± 0.004 mm
X axis positioning accuracy	± 0.008 mm
Z axis positioning accuracy	± 0.008 mm
Angular accuracy of the C-axis	51''
C axis repeat accuracy	20''
Travel	
X axis	280 mm
Z axis	1,280 mm
Rapid traverse	
X axis	24 m/min.
Z axis	30 m/min.
Motor torque	
X axis/Y axis	12 Nm
Feed forces	
X axis/Y axis	8.4 kN / 6.7 kN
Tailstock	
Shank	MT 5
Spindle sleeve diameter	100 mm
Spindle sleeve stroke, hydraulic	100 mm
Dimensions	
Length x width x height	5,040 x 1,880 x 1,840 mm
Overall weight	4 600 kg

* depending on installed lathe chuck

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **PPU 271 SW 24**
- **3 MB** CNC memory
- **3 ms** Block change time
- **50** Look Ahead
- **128** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

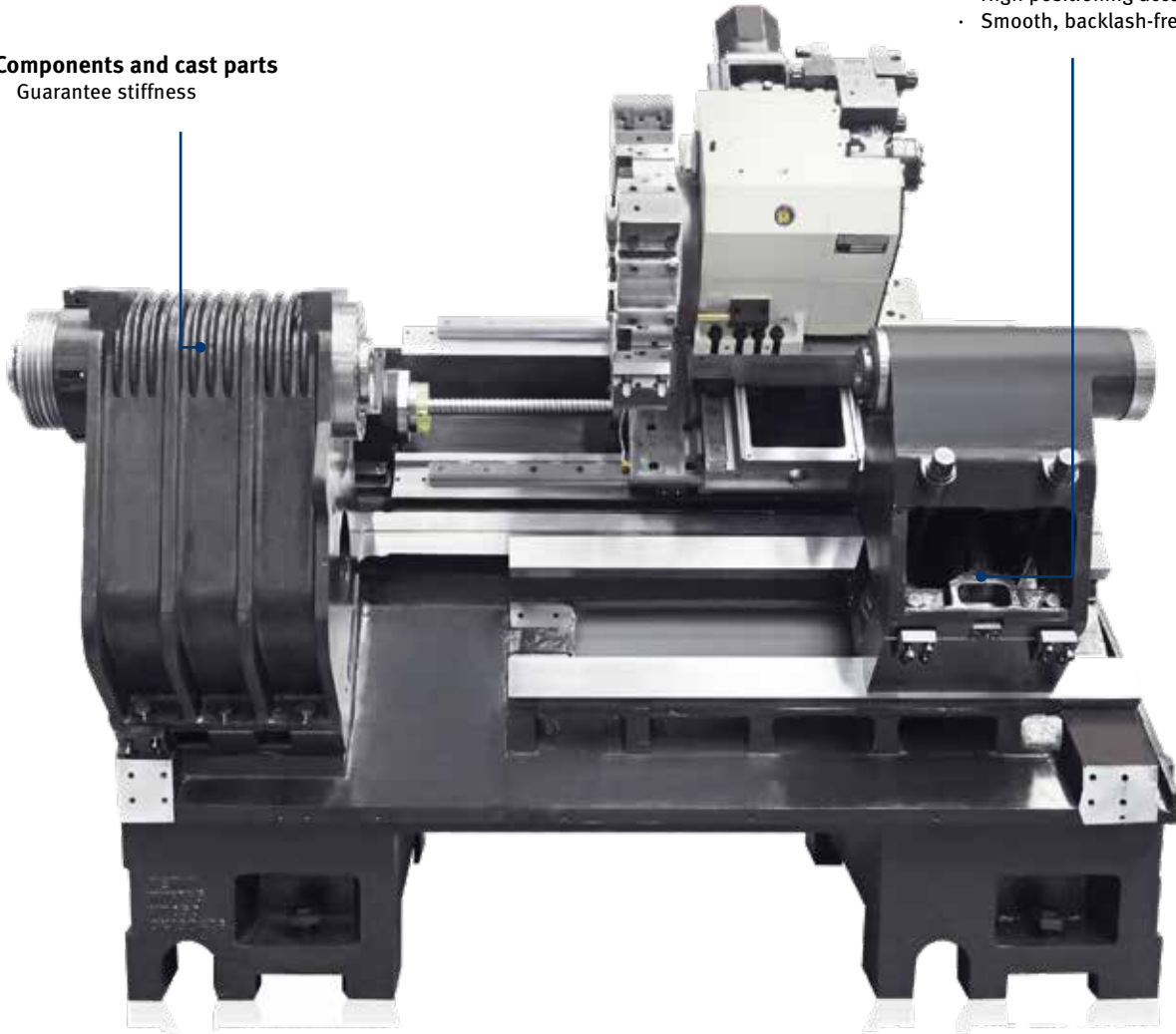
- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



Components and cast parts

- Guarantee stiffness

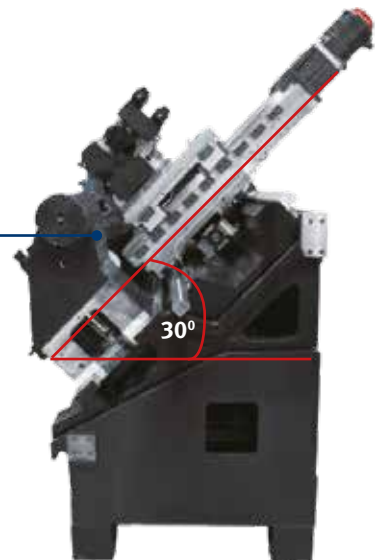


Box guide

- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement

Machine bed

- Pronounced ribbing
- 30-degree slope
- Excellent stiffness and durability
- Facilitates chip removal



BALL SCREW



- High precision
- Increases the speed of the movement speed and improve the cutting performance

TAILSTOCK



- with hydraulic quill

TURRET HEAD WITH DRIVEN TOOL



- Equipped with a high-performance turret head with milling and drilling function.

TWO C-AXIS INDEX POSITIONING FUNCTION



- C-axis and driven turret can perform multiple functions such as turning, milling, drilling and tapping with high efficiency and precision

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of $5 \mu\text{m}^2$
- LED displays the probe status and the operational readiness of the arm
- TSI2 Interface

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

CENTRAL LUBRICATION



- Prevents wear, repair costs and unnecessary downtime to a considerable extent

HYDRAULIC UNIT



- Power of the hydraulic unit 2.2 kW

CHIP CONVEYOR



- Belt design
- for efficient chip discharge

CONTROL CABINET



- With SIEMENS servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

STARTER SET			
3536116		Starter set VDI 40	· Information VDI 40, Seite 287
BAR FEEDER			
3511599101		Bar feeder 3 m Ø 260 mm	
3511599102	1	Bar feeder 1.5 m Ø 260 mm	
3511599103		Bar feeder 1.25 m Ø 260 mm	
LATHE CHUCK			
351525011		Four-jaw lathe chuck Ø 250 mm including jaws	· Instead of standard equipment > three-jaw lathe chuck hydraulic Ø 250 mm
351525012		Four-jaw lathe chuck Ø 250 mm including jaws	· In addition to the standard equipment
351520510		Three-jaw lathe chuck Ø 300 mm including cylinder	· Instead of standard equipment > three-jaw lathe chuck hydraulic Ø 250 mm
3519741		Soft jaws Ø 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519751		Hard jaws Ø 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519744		Soft jaws Ø 250 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm
3519754		Hard jaws Ø 250 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm
3519752		Soft jaws Ø 300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm
3519755		Hard jaws Ø 300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm
MISCELLANEOUS			
	2	Internal tool cooling	· External unit, 10 bar
		Internal tool cooling	· External unit, 20 bar
3511599091	3	Oil Separator	· Longer service life of the cooling lubricants
3511599090		Part grippers	
3511599098		Hydraulic steady rest	
3511599110		Tool holder VDI40 axially driven	· DIN5480
3511599111		Tool holder VDI40 radially driven	· DIN5480
3511599112		VDI40 tool holder, radially recessed	· DIN5480
3544200		Lathe tool set Carbide 25 mm	· 6-part · see Seite 282
SOFTWARE			
3584014	4	Software DXF Viewer/Reader	· from version 4.7
3584030	5	Grooving	· Information can be found on the Seite 306

*Delivered ex works. Must be ordered with the basic machine

1 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

2 COOLANT THROUGH SPINDLE



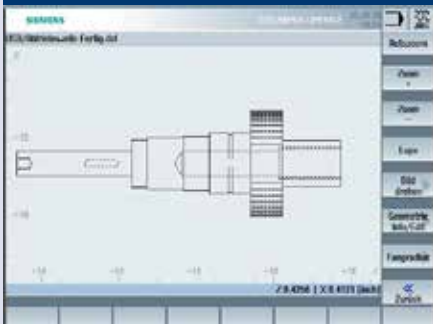
- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

3 OIL SEPARATOR



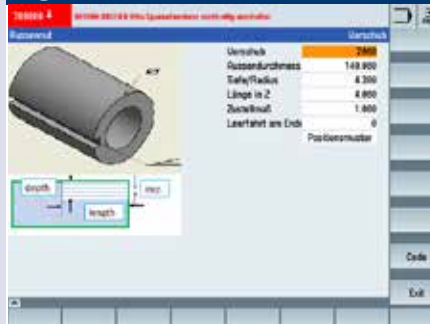
- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

4 DXF READER



- DXF data can be converted to NC programs for drilling patterns and contours

5 GROOVING



- Special processes such as broaching or grooving are generally used to produce internal and external profiles. Groove pushing can also be carried out economically on CNC lathes without special units.

S 750MY

The OPTIMUM PREMIUM CNC slant bed lathe with Y-axis and driven tools impresses with its high speeds, precision and efficiency

SIEMENS CONTROL SINUMERIK 828D PPU 270

- Heavy duty version
- Compact design
- Renishaw measuring arm for manual tool measurement
- Encoder on main spindle for increased accuracy
- The entire bed design has many reinforcing ribs that have been optimised through finite element analysis, ensuring high rigidity, better heat dissipation (thermal symmetry) and more precise machining
- Ball screw with improved accuracy, rigidity and heat resistance.
- .SIEMENS servo motors on all axes
- All servomotors with integrated encoder for maximum precision
- The motor is located on the side of the machine and prevents heat transfer and vibrations caused by the motor.
- Slant bed design 30° for particularly large machining diameter
- Better unobstructed chip flow into the chip tray
- Hydraulic three-jaw lathe chuck Ø 250 mm with soft jaws
- BMT55 tool changer with 12 tool stations and driven tools
- Hardened and precision-ground ball screws for high rapid traverse speeds in all linear guided axes, except Y-axis which has a box guide
- Device for manual tool measuring
- Tailstock with hydraulic quill
- Air conditioner
- Portable, electronic handwheel with enabling switch and emergency stop button that significantly facilitates the running-in of programmes
- Chip conveyor, belt type ensures efficient chip discharge
- Working light for complete illumination of the working area
- Coolant device with cleaning gun
- RJ45 , power interface
- Tools Scope of delivery:
 - Driven axial tool holders,
 - Driven radial tool holder,
 - Boring bar holder
 - OD-tool holder
 - End face tool holder
 - Boring bar Ø 20mm
 - Boring bar Ø 25mm
 - Boring bar Ø 32mm
- EMC Electromagnetic compatibility
- Additional package SIEMENS material liability for defects and free online/on-site service OSS Plus see page 135
- 1 year maintenance contract Basic included in D/A/CH see page 267



OPTITURN S 750MY

Model	S 750MY
Article no.	
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	35 kVA
Spindle	
Drive motor S1 operation	15 kW
Drive motor torque S1 operation	268 Nm
Drive motor S6 30 % operation	19.5 kW
Drive motor torque S6 30 % operation	349 Nm
Spindle seat	A2-8
Spindle bore*	Ø 86 mm
Chuck passage	Ø 74 mm
Chuck size	Ø 250 mm
<i>Spindle bore option</i>	<i>Ø 103 mm</i>
<i>Lathe chuck passage option</i>	<i>Ø 90 mm (with 300 mm chuck)</i>
<i>Spindle speeds option</i>	<i>30 - 3 000 rpm</i>
Cooling lubricant system	
Coolant pump output	700 W 1.8 bar
Tank capacity	320 litres
Machine data	
Turning diameter	500 mm
Turning length	1,250 mm
Swing Ø above cross slide	480 mm
Swing Ø above machine bed	660 mm
Slant bed	30°
Speed range	
Spindle speeds*	30 - 3 500 rpm
Tool changer	
Type	BMT55
Number of tool stations	12
Permissible speed at tool coupling	max. 4 000 rpm
Power of the tools	4.8 kW
Max. tool torque	20 Nm
Accuracy	
X axis repeat accuracy	± 0.004 mm
X axis positioning accuracy	± 0.008 mm
Y axis repeat accuracy	± 0.01 mm
Y axis repeat accuracy	± 0.005 mm
Z axis repeat accuracy	± 0.004 mm
Z axis positioning accuracy	± 0.008 mm
Angular accuracy of the C-axis	51''
C axis repeat accuracy	20''
Travel	
X axis	280 mm
Z axis	1,280 mm
Y axis	± 50 mm
Rapid traverse	
X axis	24 m/min.
Y axis	10 m/min.
Z axis	30 m/min.
Motor torque	
X axis / Z axis / Y axis	12 Nm
Feed forces	
X axis dynamic	8.4 kN
Y axis dynamic	18 kN
Z axis dynamic	6.7 kN
Tailstock	
Shank	MT 5
Spindle sleeve diameter	100 mm
Spindle sleeve stroke, hydraulic	100 mm
Dimensions	
Length x width x height	5,040 x 1,880 x 1,990 mm
Overall weight	4,700 kg

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with Shop-Turn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



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CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **PPU 271 SW 24**
- **3 MB** CNC memory
- **3 ms** Block change time
- **50** Look Ahead
- **128** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW

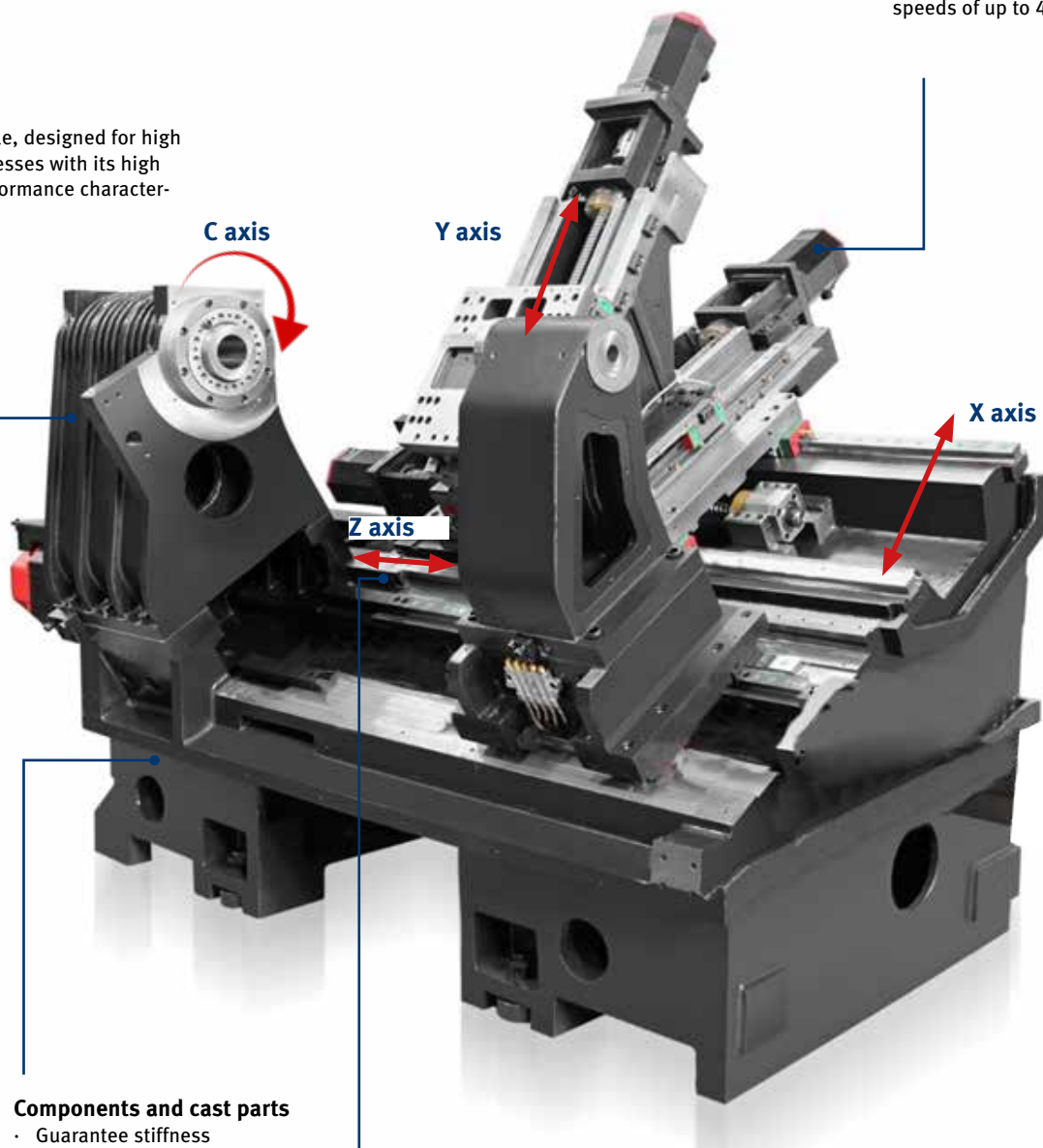


Tool turret

- Hydraulic tool turret BMT 55
- All 12 stations are driven by an integrated motor designed for speeds of up to 4 000 rpm .

Spindle

- The main spindle, designed for high precision, impresses with its high torque and performance characteristics



C axis

Y axis

X axis

Z axis

Components and cast parts

- Guarantee stiffness

Linear guide

- All axes except the Y-axis
- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Y-axis with box guide

LINEAR GUIDE AND BALL SCREWS I



- High precision
- Increases the speed of the movement speed and improve the cutting performance

TAILSTOCK



- with hydraulic quill

TURRET HEAD WITH DRIVEN TOOL



- Equipped with a high-performance turret head with milling and drilling function

TWO C-AXIS INDEX POSITIONING FUNCTION



- C-axis and driven turret can perform multiple functions such as turning, milling, drilling and tapping with high efficiency and precision

MEASURING ARM



- Up to 90 % faster tool measuring
- Typical positioning accuracy of $5 \mu m$
- LED displays the probe status and the operational readiness of the arm
- TSI2 Interface

AIR CONDITIONER



- Cools the control cabinet permanently and constantly to the set temperature.

CENTRAL LUBRICATION



- Prevents wear, repair costs and unnecessary downtime to a considerable extent

CONTROL CABINET



- With SIEMENS servo drive
- Standards-compliant setup
- Wiring with individual wire labelling and enclosed circuit diagram facilitates maintenance work and diagnostics

HYDRAULIC UNIT



- Power of the hydraulic unit 2.2 kW

CHIP CONVEYOR



- Belt design
- for efficient chip discharge

STARTER SET			
3519602	5	Starter set BMT 55	
BAR FEEDER			
3511599101	1	Bar feeder 3 m Ø 260 mm	
3511599102		Bar feeder 1.5 m Ø 260 mm	
3511599103		Bar feeder 1.25 m Ø 260 mm	
LATHE CHUCK			
351520611		Four-jaw lathe chuck Ø 250 mm including jaws	· Instead of standard equipment > three-jaw lathe chuck hydraulic Ø 250 mm
351520612		Four-jaw lathe chuck Ø 250 mm including jaws	· In addition to the standard equipment
351520610		Three-jaw lathe chuck Ø 300 mm including cylinder	
3519741		Soft jaws Ø 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519751		Hard jaws Ø 250 mm 3 pieces	· for the three-jaw hydraulic lathe chuck Ø 250 mm
3519744		Soft jaws Ø 250 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm
3519754		Hard jaws Ø 250 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 250 mm
3519752		Soft jaws Ø 300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm
3519755		Hard jaws Ø 300 mm 4 pieces	· for the four-jaw hydraulic lathe chuck Ø 300 mm
MISCELLANEOUS			
	2	Internal tool cooling	· External unit, 10 bar
		Internal tool cooling	· External unit, 20 bar
3511599091	3	Oil Separator	· Longer service life of the cooling lubricants
3511599090		Part grippers	
3515190001		Heidenhain encoder ERM 2480	· Mounted directly on the main spindle
3544200		Lathe tool set Carbide 25 mm	· 6-part · see Seite 282
SOFTWARE			
3584030	5	Grooving	· Information can be found on the Seite 306
3584014	4	Software DXF Viewer/Reader	· from version 4.7

1 BAR FEEDER



- The bar feeders are the ideal solutions for automatic loading of CNC lathes with short bars. They combine maximum productivity with a small footprint

2 COOLANT THROUGH SPINDLE



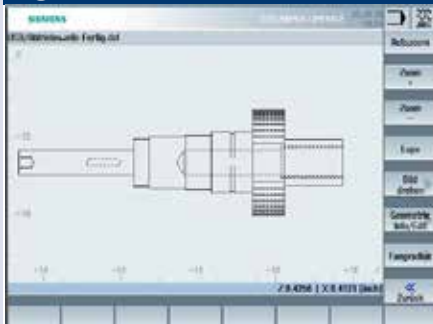
- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone
- Longer service life

3 OIL SEPARATOR



- Oil separator reliably removes floating foreign oils and the finest chip abrasion from cooling lubricants

4 DXF READER

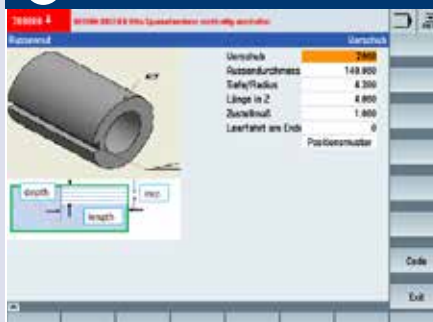


- DXF data can be converted to NC programs for drilling patterns and contours

5 STARTER SET BMT 55



5 GROOVING



- Special processes such as broaching or grooving are generally used to produce internal and external profiles. Groove pushing can also be carried out economically on CNC lathes without special units.

BALTEC IN KAUNAS

TRAINING AND PRODUCTION CENTRE IN LITHUANIA

CURRENTLY USES 35 OPTIMUM CNC MACHINES



Baltec CNC Technologies company headquarters in Kaunas

For eight years now, Baltec CNC Technologies, a manufacturer of precision mechanical components in Lithuania, has relied on OPTIMUM lathes and milling machines. Now the cooperation is being taken to a new level: Since March 2020, the company's own training centre has also been equipped with OPTIMUM machines.

The milled parts specialist, which was founded in 1995 in central Lithuania, currently has around 45 CNC machines in operation, all of which run in 2-shift and, if required, 3-shift operation. Two thirds of these are OPTIMUM brand machines. Under

the meticulous eye of highly qualified specialists, these machines produce around 36 000 milled parts a year, the majority of which are exported to Western and Northern Europe, e.g. to Germany, Sweden, Norway and Switzerland. The company also specialises in welding, CNC bending, flame cutting, powder coating and the assembly of subassemblies. Production is optimised for machining individual workpieces made of steel, aluminium, titanium and plastic.

Thus far, Baltec CNC Technologies has used OPTIMUM machines exclusively for the production processes. A total of **35 CNC-controlled**



OPTIMUM machinery at the Baltec CNC Technologies production facility



Turned and milled parts manufactured on OPTIMUM machines



OPTIMUM service technicians on site performing maintenance in Production

OPTIMUM machines are used to manufacture components for the automotive industry, universal mechanical engineering, printing machine technology and the energy sector. To achieve the best possible results, Baltec CNC Technologies is already working with the new 3D printing head 3X technology, which supports the production of medical components by means of 3D printing processes. Since March 2020, the company has not only been using OPTIMUM machines in its production facilities, but has also equipped its in-house training centre with OPTIMUM machines. The company uses this facility, which has an accredited training program, to serve professional development needs of its employees, who can take courses in CNC production techniques there.



Seven F150 CNC milling machines and two F310 HSC CNC milling machines in one of Baltec's production shops



Automatic production with robots

In order to further expand its leading position in the production of milled parts in Lithuania, Baltec has even developed its own automation cell featuring a robot for the OPTIMUM CNC machines in recent years. Parts are automatically provided to the robot on three levels; they are delivered from the workpiece table to the OPTIMUM CNC machine workpiece table. A Blum measuring system checks the part which is returned to the material workstation after completion. In the future, the company will not only be using these products for its own production but will also offer them to other companies using OPTIMUM CNC machines. The Lithuanian manufacturer of milled parts, which is also a reseller of CNC-controlled machines in the Baltic States, is thus extending its product range to include further innovative solutions.

OPTIMUM lathes and milling machines at Baltec CNC Technologies in Lithuania



Maintenance system for monitoring machine utilisation



OPTIMUM CNC machines coupled to robots

03

5-AXIS MACHINES

OPTImill FU 5HSC



FU 5 HSC

5-AXIS SIMULTANEOUS MACHINING CENTRE FOR MAXIMUM PRODUCTIVITY

SIEMENS CONTROL SINUMERIK ONE

- Heavy duty version
- High productivity
- Telescopic guideway cover
- Precision-ground, preloaded high-performance ball screws for high rapid traverse speeds
- Spindle borne on P5 precision bearings and permanently lubricated
- High-torque servo drives on all five axes
- Precision linear guides
- Heidenhain glass scales for higher accuracy
- Fast rapid motion speed of up to 36 m/min.
- C-axis with torque motor for maximum speed and lifetime accuracy
- A axis with screw drive for high torque during tilting actions
- Z-axis feed motor reinforced
- The portable, electronic handwheel with enabling switch and emergency stop pushbutton makes it much easier to run in programmes.
- Double arm gripper tool changer with 32 tool stations in standard scope of delivery
- Coolant unit with 380 litre coolant tank, including chip flushing system and cleaning gun
- Automatic centralised lubrication
- RJ45 plug-in connection, USB connection and 230 V power connection
- Additional USB interface on the control panel
- Water circuit cooling unit for the main spindle and main spindle motor
- Chip conveyor, belt type ensures efficient chip discharge
- Chip carriage
- Collision Avoidance - Software for collision avoidance
- Internal spindle cooling 40 bar with internal tank (an extraction unit is required)
- Air conditioner
- TSC Thermal spindle compensation
- DCM Dynamic Collision Monitoring
- EMC Electromagnetic compatibility
- Two years' SIEMENS repair service contract included. Extension of the SIEMENS Supplementary Repair Service Contract (RSV) Seite 201
- Information on maintenance contracts, Seite 309



Follow this for the video presentation of our Optimum FU 5 milling machine

Subscribe to our YouTube channel, to avoid missing any of the new videos: www.youtube.com/user/OptimumMaschinen



Illustration with optional
SCHUNK vice

TECHNICAL DATA

Models	FU 5 HSC
Article no.	3521100
Spindle	Inline spindle
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	70 kVA
Milling spindle	
Drive motor S1 operation	25 kW
Drive motor torque S1 operation	105 Nm
Drive motor S6 30 % operation	40 kW
Drive motor torque S6 30 % operation	261 Nm
Spindle seat	SK 40 DIN 69871
Milling precision	
Repeat accuracy	± 0.004 mm
Positioning accuracy	± 0.008 mm
Tool changer	
Type	Double arm gripper
Number of tool stations	32 slots
Max. tool diameter	78 mm
Max. tool diameter (adjacent slots free)	120 mm
Tool length	300 mm
Max. tool weight	7 kg
Tool change time, chip to chip	9.33 seconds
Travel	
X axis	600 mm
Y axis	600 mm (+500 mm und -100 mm)
Z axis	500 mm
Feed drive	
Acceleration X, Y, Z axis	7 m/s ²
Rapid traverse X/Y/Z axis	36 m/min.
Motor torque	
X, Y axis	22 Nm
Z axis	27 Nm
Feed forces	
X, Y axis	10 kN
Z axis	13.5 kN
Speed range	
Speeds*	15 000 rpm
Pneumatics	
Compressed air	6 bar
Cooling systems	
Tank capacity cooling lubricant tank	380 litres
Tank capacity of external CTS unit	165 litres
Pump motor chip flushing/delivery rate	0.85 kW / 150 l/min
Pump motor front/left chip flushing/delivery rate	1.08 kW / 150 l/min
Pump motor cleaning gun/delivery rate	0.53 kW / 58 l/min
Inclining and rotating table	
Table diameter	600 mm
T-slot size / amount / distance	14 mm / 7 / 75 mm
Maximum payload	600 kg
Axis C	
Rotating axis	360°
Hydraulic clamping torque	1 200 Nm (at 50 bar hydraulic operating pressure)
Maximum rotational speed (worm gear)	max. 90 rpm
A axis	
Tilting axis	± 120°
Hydraulic clamping torque of tilting axis	2 900 Nm (at 50 bar hydraulic operating pressure)
Max. permissible torque (S1 operation/ S6 operation)	393 Nm / 707 Nm
Maximum tilting speed (torque motor)	max. 16.6 rpm
Dimensions	
Length x width x height	3 015 x 4 440 x 3 000 mm
Overall weight	9 150 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

SINUMERIK ONE

SINUMERIK ONE, the digital native CNC, brings your ideas to life. SINUMERIK ONE is the trendsetting CNC system for highly productive machine tools. For undreamt-of new possibilities, ideas and business models. For faster innovations through the seamless interaction of the virtual and real worlds. And: SINUMERIK ONE is much more than a powerful hardware innovation. Through its digital twin, it is the key element for digital transformation and helps to simulate and test work processes completely virtually.



THE ADVANTAGES OF SINUMERIK ONE AT A GLANCE

MAXIMISE PRODUCTIVITY

SINUMERIK ONE sets standards in machining speed and quality. The CNC system maximises machine tool productivity through the highest PLC and CNC performance. The integrated SIMATIC S7-1500F PLC enables up to 10 times faster PLC cycle times than the predecessor PLC. SINUMERIK ONE makes machine tools more productive - and thus more flexible, faster and more efficient.

PURSUE NEW WAYS OF THINKING- INSPIRE DIGITALLY

Run MyVirtual Machine, the digital twin of machining, optimises machine tool utilisation. Unproductive times at the machine are reduced to a minimum and consistently shifted to work preparation. This creates space for new ways of thinking. And with the right business model, the digital twin can generate additional business around the machine tool.

RSV warranty

With the warranty, you protect your machine against warranty damage for 24 or 36 months. (must be purchased with the purchase of the machine)

24 months; Article no. 3589036

36 months; Article no. 3589037

Siemens connection guarantee 12 months based on warranty RSV

24 or 36 months Article No. 3589038

Information on the warranty can be found at www.optimum-maschinen.de

RUN MYVIRTUAL MACHINE 3D

With its product Run MyVirtual Machine, Siemens AG has developed an ideal platform for creating and operating a digital twin. Especially in vocational training, training on virtual machines has proven its worth. The trainee can safely test and optimise his NC programs without causing damage to a real machine. Moreover, educational institutions often lack the resources to run more than one CNC machine. The decision to teach the machining process turning or milling is no longer necessary when training on the digital twin - almost every machine type and every kinematics can be simulated.

for school education only

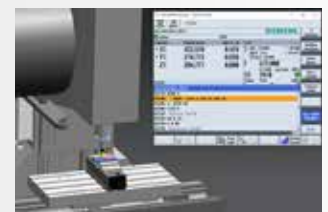
Article no.: 3584855 Operate

Article no.: 3584156 3 D-Machine

DIGITAL TWIN

in training and production- protects your machine from expensive damage.

The digital twin contains a virtual image of the machine from the original machine data with animated tool change and the VNCK (Virtual NC Core). Tools and set-ups can be managed by the machine user himself. On request



AN END-TO-END SOLUTION ALONG THE VALUE CHAIN RAISES NEW POTENTIAL FOR MACHINE OPERATORS

ELEGANT DESIGN

- ▶ Ergonomic, modern operating hardware in "Blackline plus" design
- ▶ Metal design provides a premium look and feel
- ▶ Operate intuitively and efficiently
- ▶ Attractive front design
- ▶ High-quality workmanship for smooth continuous operation

FEATURE / FUNCTION

- ▶ SINUMERIK blackline plus Panel
- ▶ Slim, robust aluminium housing
- ▶ Horizontally and vertically applicable
- ▶ Scratch-resistant, continuous glass front
- ▶ Projected capacitive multi-touch technology
- ▶ Recognise 5 fingers at the same time

BENEFITS

- ▶ Operate intuitively and efficiently
- ▶ Attractive front design
- ▶ High-quality workmanship for smooth continuous operation

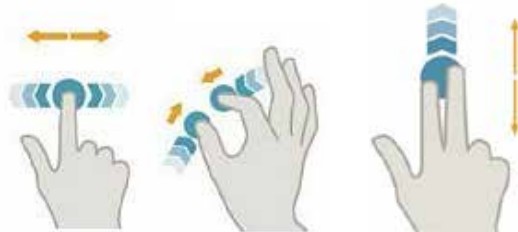
NCU 1760

- ▶ 31 Axes/spindles
- ▶ PLC S7-1500F



Excerpt from the gestures of multitouch operation
Intelligent gesture operation with touch panels, even with working gloves
Capacitive touch for industrial use
Palm recognition
Detection of liquids and impurities

21.5 inch
Full HD
1080



SINUMERIK ONE - 50% INCREASED NCK PERFORMANCE COMPARED TO 840D SL



Reduction of the block cycle time by 50%

Shortened production time of the component

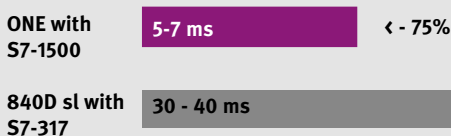
SINUMERIK ONE - 10 X INCREASED PLC PERFORMANCE COMPARED TO 840D SL



Significant reduction of non-productive time due to 10x faster PLC

Improved surface quality, as the milling paths are processed more cleanly

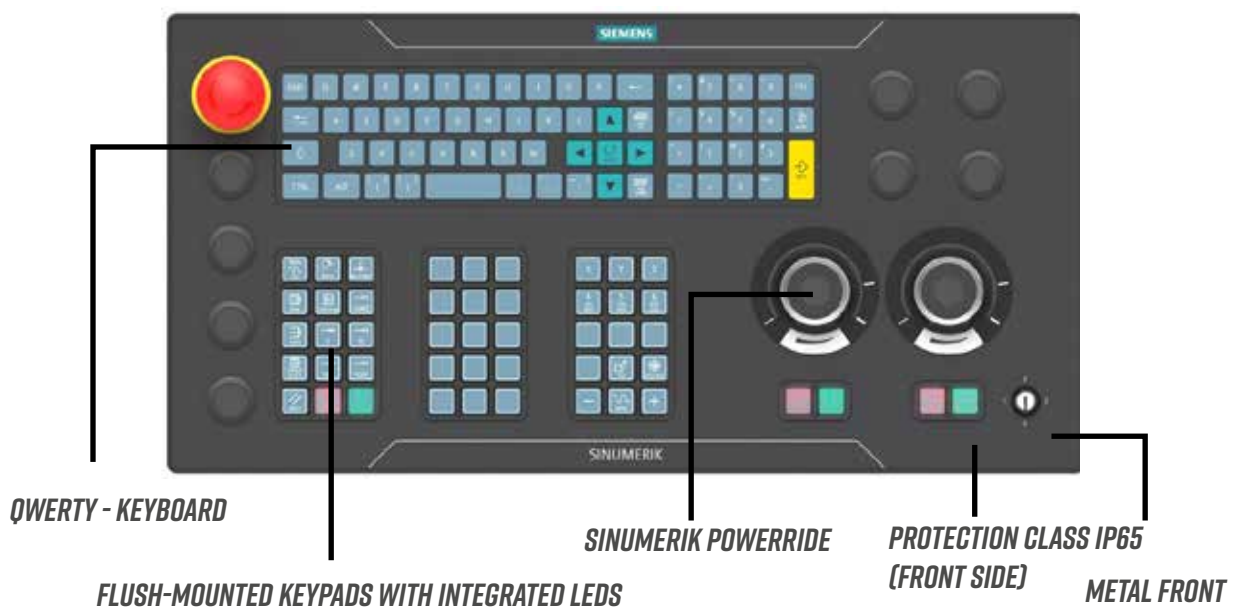
REDUCTION OF THE PLC CYCLE TIME BY UP TO 75%



SINUMERIK ONE MCP COMPONENT ARRANGEMENT

MCP

- ▶ Ergonomic and elegant design
- ▶ Robust and narrow metal front
- ▶ IP65 front
- ▶ Powerride as a standard component
- ▶ SINUMERIK Powerride combines override switch and NC start button in one operating component
- ▶ SINUMERIK Powerride rotary knob without end position with haptic feedback when defined limit value is exceeded
- ▶ Configurable hold
- ▶ Free installation spaces are prepared
- ▶ QWERTY keyboard as standard component
- ▶ Keypads with integrated RGB LED lighting



Standard layout optimised for SINUMERIK, based on US configuration
 Layout with 4 lines for complete alphabetical part and for numerical part

SINUMERIK POWERRIDE

INNOVATIVE TECHNOLOGY

- ▶ SINUMERIK Powerride as standard component
- ▶ Combines override switch and NC start button in one operating component
- ▶ Noble, innovative design
- ▶ Concave shape of the knob
- ▶ Integrated LED scale for visualisation of the current ACTUAL values
- ▶ Automatic reset of the feed after the end of the set only if configurable stop (CST) is selected
- ▶ Rotary knob without end position
- ▶ Haptic feedback when defined limit values are exceeded
- ▶ Configured stop



Feature / Function	Benefits
Combines override switch and NC start button in one operating component	Simple and efficient set-up
Noble, innovative design Concave shape of the knob	Realisation of innovative operating concepts Improving ergonomics
Integrated LED scale for visualisation of the current ACTUAL values Automatic reset of the feed after the end of the set only if configurable stop (CST) is selected	Faster recognition of the current actual value More effective and easier operation
Rotary knob without end position Haptic feedback when defined limit values are exceeded	Increased awareness of the defined limits Supports blind operation
Configured stop	No additional licence costs Fine tuning possible Configured stop (CST) Additional high safety during run-in in combination with SINUMERIK Powerride

STANDARD EQUIPMENT SINUMERIK ONE

SINUMERIK ONE "ONE DYNAMICS" INCLUDED

- ▶ 3D tool radius correction
- ▶ Measure kinematics
- ▶ Shopmill
- ▶ DXF Reader
- ▶ Residual material detection and processing
- ▶ 3D simulation
- ▶ Simultaneous recording
- ▶ TRANSMIT/cylinder surface transformation
- ▶ Advanced surface
- ▶ Top surface
- ▶ Top speed plus
- ▶ Measuring cycles
- ▶ HMI user memory, extended to SD card of the NCU/PPU
- ▶ Processing external memories EES
- ▶ Protect MyMachine S03

SINUMERIK ONE DYNAMICS

THE ALL-ROUND CAREFREE PACKAGES FOR THE MACHINE OPERATOR

- + Efficient programming in the workshop
- + Best surface quality from CAD-CAM chain generated NC programs
- + High dynamics and speed for a sustainable increase in productivity
- + Scalable and expandable by machine builders with machine-specific functions

SINUMERIK ONE Dynamics = Maximum comfort and productivity for the machine operator

PROTECT MyMACHINE

- ▶ Protect MyMachine
- ▶ Integrated collision avoidance with 3D primitives
- ▶ Machine protection
- ▶ Monitoring the minimum distance of protected areas from each other
- ▶ Describe protective areas by means of basic bodies
- ▶ Multi-channel capable
- ▶ Cost-effective entry to protect the machine
- ▶ Cross-channel protection of machine components
- ▶ Reduced computational load on the CNC, thus no loss of performance

PROTECT MYMACHINE/3D PRIMITIVES

S03

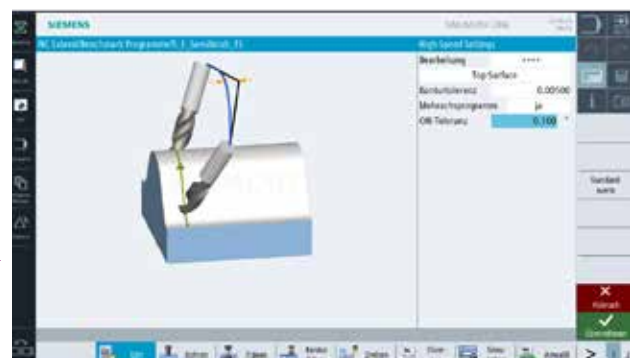
Machine protection

- ▶ Protected area elements
 - Cuboid, cylinder, sphere, truncated cone
 - Up to 34 elements
 - Up to 17 protected areas
 - Up to 10 collision pairs
- ▶ **Single-channel**
- ▶ HMI visualisation

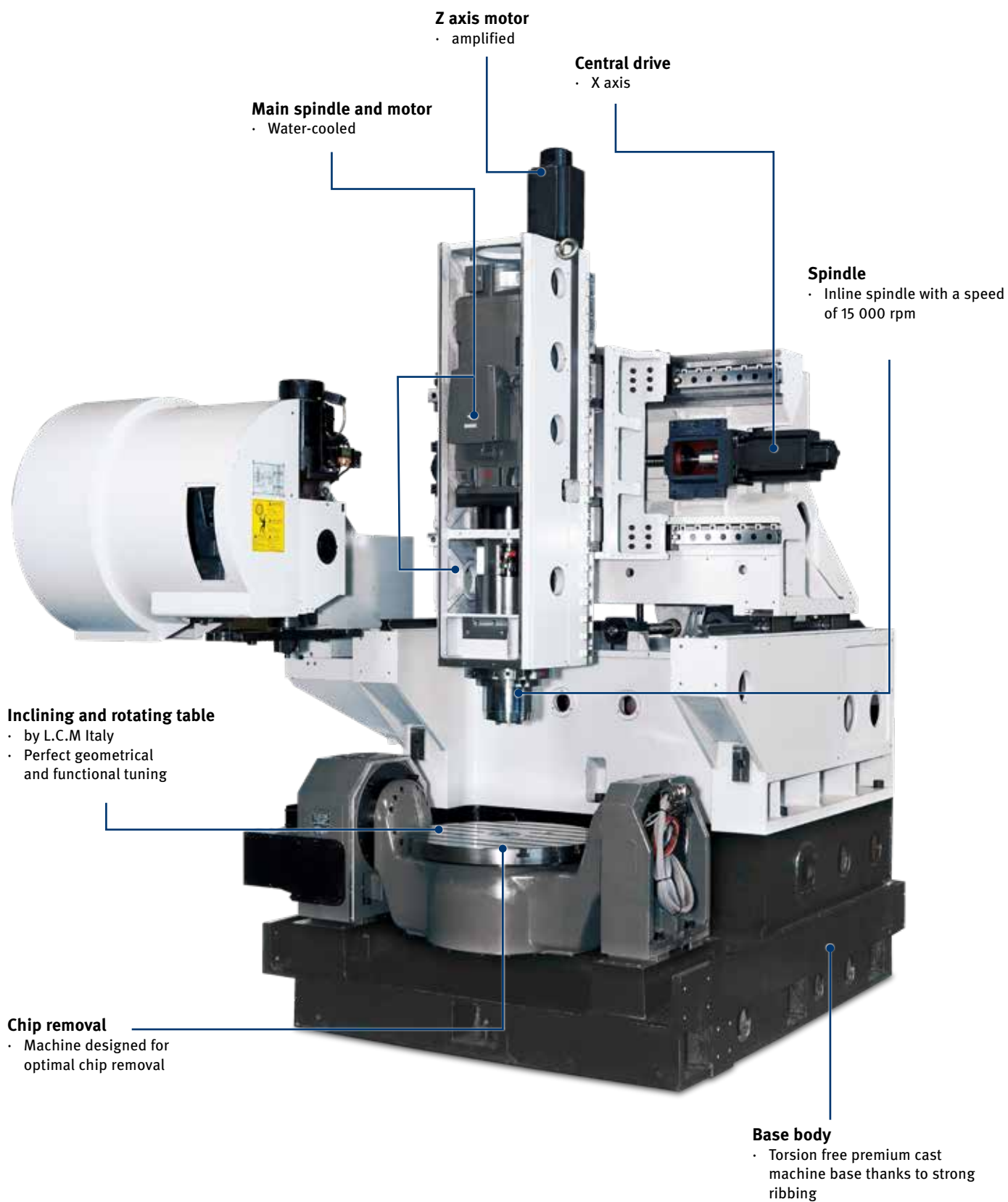
TOP SPEED PLUS

- ▶ Significant increase in machining speed in mould making
- ▶ "New, innovative filter technology allows higher jerk for each machine axis and thus an increase in dynamics for 3 / 5-axis simultaneous machining"
- ▶ High contour accuracy without excitation of machine vibrations

- Extension of technology G-Code group 59 by DYNPREC
- Expansion of technology G-Code Group 39 CPRECON and CPRECOF (programmable contour accuracy)



OPTIMILL FU 5 HSC STANDARD EQUIPMENT



Z axis motor
· amplified

Central drive
· X axis

Main spindle and motor
· Water-cooled

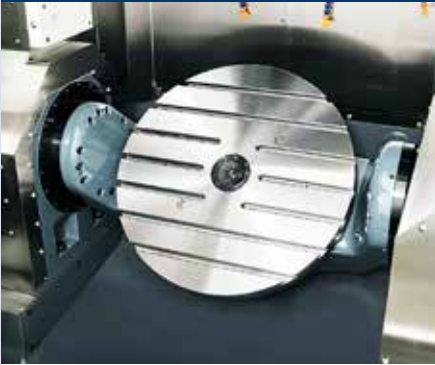
Spindle
· Inline spindle with a speed
of 15 000 rpm

Inclining and rotating table
· by L.C.M Italy
· Perfect geometrical
and functional tuning

Chip removal
· Machine designed for
optimal chip removal

Base body
· Torsion free premium cast
machine base thanks to strong
ribbing

INCLINING AND ROTATING TABLE



- Max. rotational speed 90 rpm
- Max. tilt speed 16.6 rpm
- 3x hydraulic and 1x pneumatic connections (without valves)
- High-precision A axis & C axis
- Maximum table load 600 kg

FEED AXES



- direct driven
- Rapid traverse X, Y, Z axis 36 m/min.

TOOL CHANGER



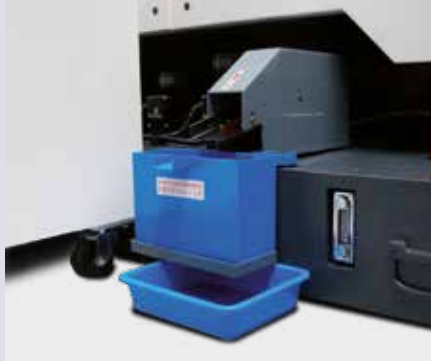
- Double arm gripper
- Drum magazine
- 32 tool slots

GREASE LUBRICATION



- Reduces wear
- High load-bearing capacity
- Excellent lubricant film
- Low maintenance
- Good adhesion properties

OIL SEPARATOR / OIL SKIMMER



- Oil skimmer reliably removes floating tramp oils and finest chip debris from cooling lubricants

GUIDES



- high-precision roller guides on all three axes
- Front linear guides contain additional guide carriages to ensure dynamic stability

CONTROL



- Next generation control panel with new machine control options
- Modern Multitouch screen interface

CHIP CONVEYOR



- Conveyor version
- for efficient chip discharge

WATER CIRCULATION UNIT



- Main spindle and main spindle motor cooling

TOOL MEASURING / WORKPIECE MEASURING			
352110020*	2	BLUM TC52IR Universal measuring probe	<ul style="list-style-type: none"> Switching point repeatability of 0.3µm 2σ at 2 m/min. Measuring speed Wear-free and durably stable Very compact probe with 40 mm diameter
352110021*		BLUM LaserControl LC50 -DIGILOG Laser measuring system	<ul style="list-style-type: none"> Highly dynamic measurements of all tool characteristics Non-contact measurement Detection of geometry changes, such as cutting edge wear
3582051		Kinematic reference sphere	<ul style="list-style-type: none"> High-precision reference ball made of stainless solid carbide

MISCELLANEOUS			
3536109	1	Starter set SK 40 / DIN 69871	➡ Information on the starter set can be found at Seite 276
3536110		Starter set HSK A-63	➡ Information on the starter set can be found at Seite 272
352110005	3	Spindle upgrade HSK 63	<ul style="list-style-type: none"> Instead of standard equipment › Instead of spindle SK40
352110015*		Coolant through spindle (CTS)	<ul style="list-style-type: none"> External power unit, pump pressure 70 bar, tank capacity 165 litres, delivery rate 30 l/min - an extraction unit is required
352110016*			<ul style="list-style-type: none"> External unit, Grundfos high pressure 70 bar, with paper filter and cooling unit
352110018*	4	Hood for machine work space	
352110017*		Air through spindle with valve for actuation	
351138017*		Valve control for table	
351138015		Motorex Coolant- Lubricant	<ul style="list-style-type: none"> for inline spindles
354590050		Grease cartridge LHL - X100-7	<ul style="list-style-type: none"> for grease lubrication - 700 ml / 680 g grease

TOOL CHANGER			
<ul style="list-style-type: none"> If the option tool changer with 60 tool magazine is selected, the tools can be easily changed from the left side during automatic operation to avoid idle times between the switch-on time. 			
352110011*		Double arm gripper tool changer with 60 tool stations for HSK spindle	<ul style="list-style-type: none"> Instead of the standard equipment › Double-arm gripper tool changer with 32 tool stations and SK spindle Required: Spindle upgrade HSK 63 - Article no.: 352110005
352110010*		Double arm gripper tool changer with 60 tool stations	<ul style="list-style-type: none"> Instead of standard equipment › Double-arm gripper tool changer with 32 tool stations

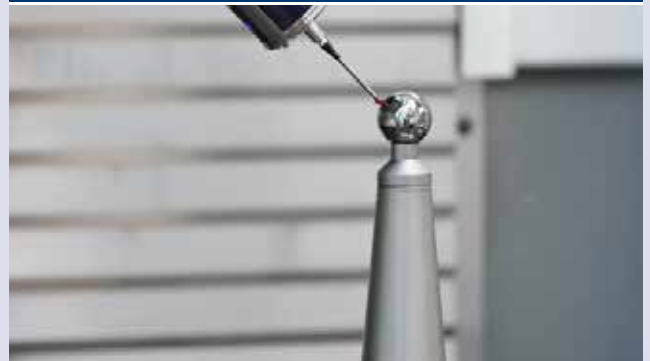
SOFTWARE			
352110080	5	Function S22 - Jerk adjustment	<ul style="list-style-type: none"> Jerk adjustment. Increase in axle dynamics outside machining combined with a reduction in non-productive time
352110081	6	Function S16- Spline interpolation	<ul style="list-style-type: none"> Spline interpolation (A, B and C splines)*

1 STARTER SET SK 40 / DIN 69871



- Milling head holder 27 mm seat 1
- Chuck 1 - 13 mm 2
- Pull stud 3
- 2 each Weldon 6 mm and 2 4 mm 4
- 2 each Weldon 8 / 10 / 12 / 16 mm 5
- Adapter SK 40 to MT 3 6
- Collet chuck holder ER 32 7
- Collet spanner ER 32 8
- Collet 7t ER 32 9
- Assembly and tool adjustment gauge 10
- Height-adjuster 11
- Taper squeegee 11

2 KINEMATIC REFERENCE SPHERE



- High-precision reference ball made of stainless solid carbide
- For exact calculation of the positions of the machine axes of the 5-axis machining centre. In order to be able to manufacture sustainably with the highest precision and to detect and rectify possible coordinate errors in the machine after collisions or any errors.

3 COOLANT THROUGH SPINDLE



- Guarantees optimal service life
- External unit
- Also with Grundfos high pressure pump
- Pump pressure 20 bars or 70 bars

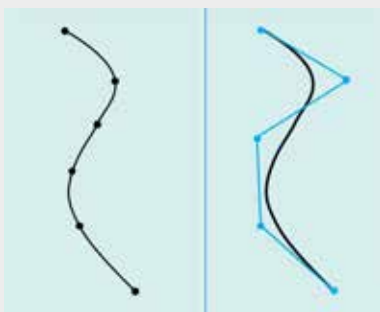
4 HOOD



- Easy loading and unloading of heavy and bulky workplaces with a crane
- Top machine space cover
- For oil mist extraction



5 FUNCTION S16- SPLINE INTERPOLATION



- With the COMPCAD compressor, it is possible to approximate such smooth curves within the compressor tolerance (parallel tool paths) and thus obtain optically high-quality surfaces even with larger tolerances.

6 FUNCTION S22 - JERK ADJUSTMENT



- Shorter processing times due to condition-dependent dynamic adjustment
- Automatic position setpoint filter switching at G00 with simultaneous dynamic increase
- Flexible and individual position setpoint filter switching through explicit programming

ENVIRONMENTAL CAMPUS BIRKENFELD

ENVIRONMENTAL CAMPUS BIRKENFELD

OPTIMUM PROVIDES NEW CNC MACHINE FOR RESEARCH AND DEVELOPMENT



Just in time for the start of the winter semester 2019, the Hallstadt-based company Stürmer Maschinen GmbH provided the students at the Environmental Campus Birkenfeld with a new, state-of-the-art type OPTIMUM FU 5 CNC machine. The Environmental Campus specialises in environmental planning, technology and economics and is among the top ten in the world ranking list in the current GreenMetricRanking. The new OPTIMUM FU 5 milling machine is used for development work in the field of Industry 4.0 in order to achieve an optimised learning effect for the students, who can now demonstrate their developments with this machine.

The modern 5-axis machine with a weight of 10 tons and a value of approx. 240 000 euros was initially made available to the Environmental Campus free of charge for nine months. It will help employees and students at the Institute of Operations and Technology Management (ITB) to develop new methods of 3-D printing and thus provide new impetus in the fields of Industry 4.0 and the Digital Factory. The OPTIMUM FU5 milling machine is the ideal companion for this, as it enables filament printing on a 3-axis machine tool in combination with a modern software solution that can control the CNC machine via a Sinumerik control.

This project sees Stürmer continue its close cooperation with the Environmental Campus enabling employees and students to advance their research work in the field of 3-D printing with state-of-the-art technology. "Constant modernisation of the equipment in our laboratories in this area cannot be financed with internal resources. The loan shows that we have our finger on the pulse with our education and research programs, and we hope that we can expand this form of cooperation further," says Prof. Dr.-Ing. Peter Gutheil, Dean of the Department of Environmental Planning and Environmental Technology. Project manager Dipl.-Ing. (FH) Stefan Hirsch also sees the advantages: "The learning effect for the students involved is enormous and can have an extremely positive impact when starting a career."

A new milestone in progressive digitalisation of industrial production can be set thanks to support from Stürmer.

In January 2020, the Optimum FU 5 CNC milling machine, which had been made available to the Environmental Campus Birkenfeld a few months ago



OPTIMILL FU 5 CNC MILLING MACHINE IMPRESSES IN TEST

for 3-D printing trials, was tested in the scope of a workshop. The 5-axis machining centre impressed across the board. Even under the camera microscope used in the workshop, it was virtually impossible to detect defects on the test workpieces milled by the Optimum machine.

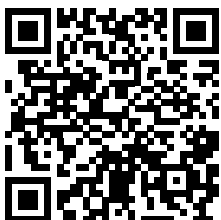
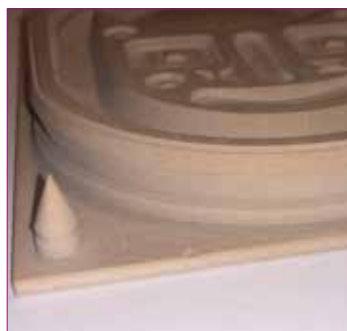
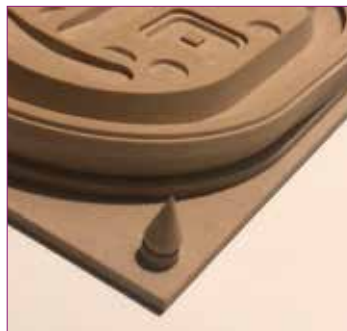
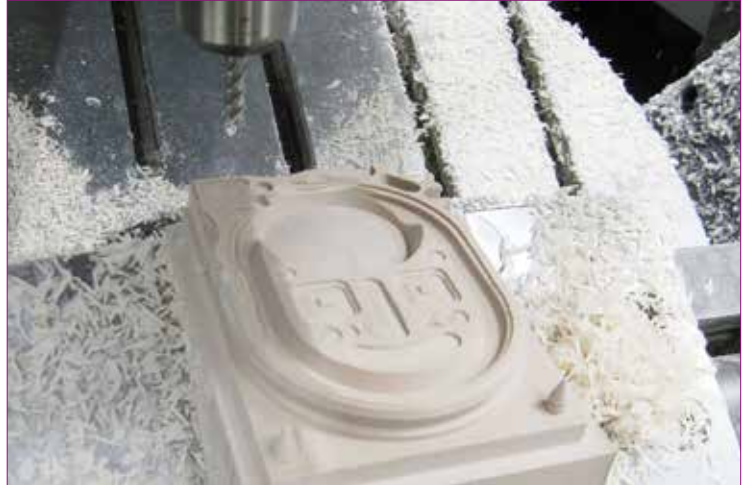
The CNC milling machine was tested using a test workpiece that the NC Gesellschaft e.V. had developed in 2005 to investigate the dynamic synchronisation of the machine axes and milling operations. The program data for this test part are now in the care of the Environmental Campus Birkenfeld, and were used to test the machine's machining precision. During a workshop with Hans Vogler, one of the developers of the test piece and a luminary in the field of NC control, the OPTImill FU5 was put through its paces at the Environmental Campus Birkenfeld in the presence of representatives from Optimum and SIEMENS AG. The many years of experience that Mr. Vogler has built up from his development and consulting activities from the beginnings of NC control to the present day proved to be massively beneficial for the participants.

In a first step, SIEMENS application engineer Wolfgang Reichert explained the special cycles for 5-axis programming on the SIEMENS 840 D control used. Subsequently, various adaptations of machine data and control parameters were tested directly on the machine and optimised to tune the test workpiece. Using these adapted parameters, Hans Vogler's team produced several test parts on the milling machine in a second step; the parts were then examined with regard to running time and potential geometric deviations.

Defects of the test pieces produced by the OPTImill FU5 were virtually undetectable, even using a camera microscope. To underline the precise operation of the OPTIMUM CNC machine, archive pictures with negative examples were finally used; this once again illustrated the outstanding results achieved by the OPTIMUM 5-axis machining centre.

Conclusions:

With this perfectly manufactured test workpiece, the OPTImill FU5 stands up to any comparison with market competitors in terms of quality, precision and price-performance ratio.



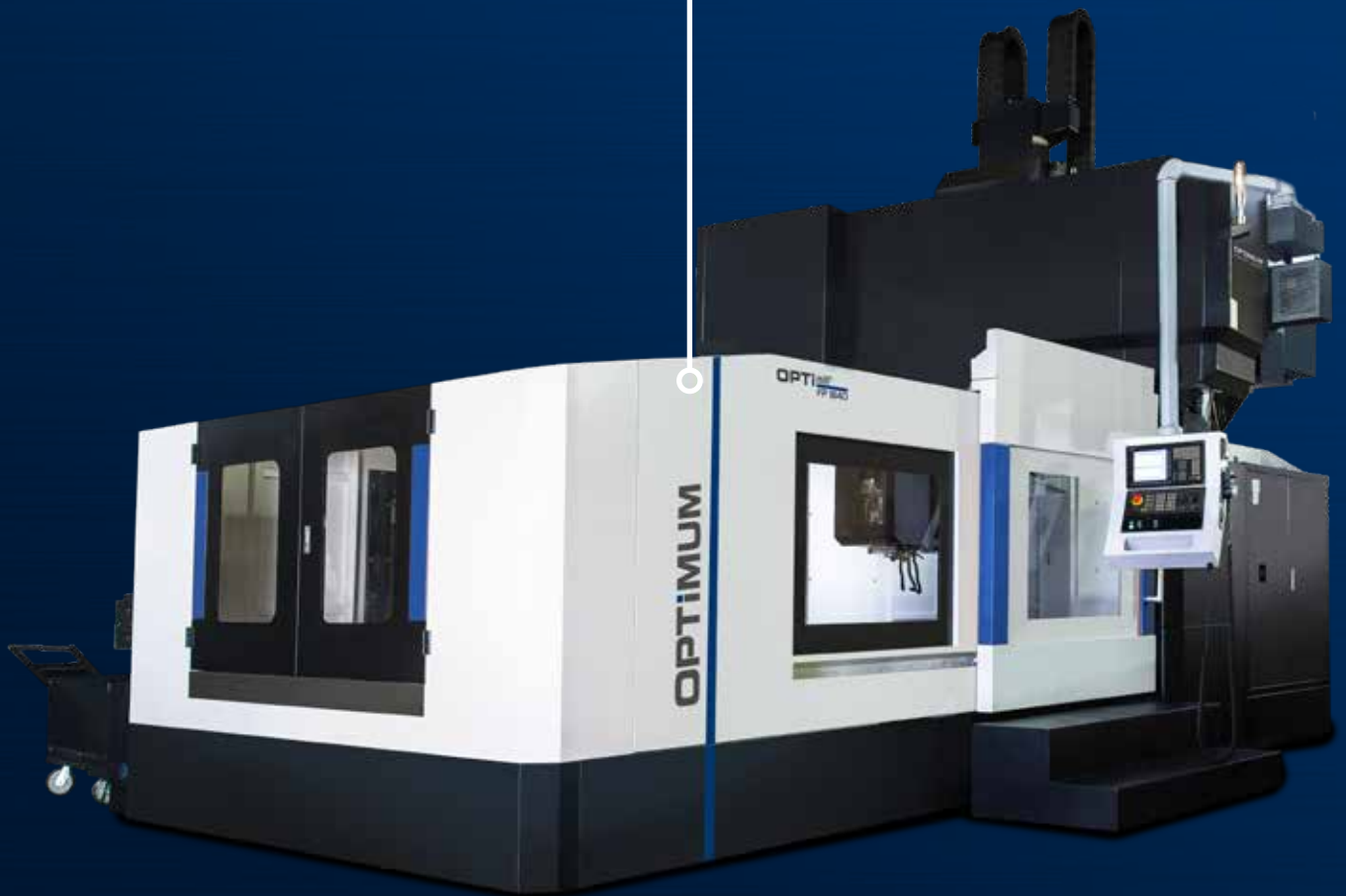
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04

PORTAL MILLING MACHINES

FP 1840



OTHER MACHINE SIZES AVAILABLE ON REQUEST

FP 1325



FP 1325 / FP 1530

OPTIMUM PREMIUM CNC Portal milling machines

SIEMENS CONTROL SINUMERIK 828D

- Perfect structures and a rugged design guarantee best possible rigidity and stability
- All main components - machine bed, worktable, machine column, crossbeam, saddle and head-stock are made of high quality MEEHANITE® cast iron.
- Generously dimensioned guides on the X, Y and Z axes
- All guide rails tempered and ground (HRC50 -HRC55)
- The X- and Y-axis are equipped with roller linear guides so that the axes move with the highest precision even at high speed
- Highest machining accuracy and high damping due to wide adjustable box way guides of the Z-axis for high drilling and milling performance with high spindle output torque
- Hardened and precision ground ball screws mounted in high precision bearings in all three axes for high rapid traverse speeds
- Cooling of the main spindle gearbox (gears, bearings, spindle) by means of an oil circulation system to reduce thermal expansion
- Operating status display (work end lamp)
- Axis covers
- Work lamp LED with alarm indicator
- Chip conveyor belt design with chip trolley
- Energy chain with strain relief and cable separation
- Spindle oil cooler
- Heat exchanger
- BT50 spindle mount with a maximum spindle speed of 6 000 rpm for high precision
- Pneumatic counterbalance of the Z-axis ensures very high reliability and stability while several axes are working simultaneously. The SCBS system does not need an additional power supply or drive. This balance system helps to achieve high speeds and excellent machining
- Complete machine enclosure with wide opening doors for ergonomic workpiece handling
- Automatic lubrication system with pressure control system
- Separating system for lubricating oil and coolant
- Set-up elements
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see Seite 217
- For information on maintenance contracts see Seite 309



OPTIMILL FP 1325/FP 1530

TECHNICAL DATA

Model	FP 1325	FP 1530
Article no.	3511650	3511660
Machine data		
Electrical connection	400 V / 3 Ph ~50 Hz	
Total connected load	60 KVA	
Milling spindle		
Drive motor S1 operation	17 kW	
Drive motor torque S1 operation	162 Nm	
Drive motor S6 30 % operation	32.3 kW	
Drive motor torque S6 30 % operation	330 Nm	
Spindle seat	SK50 DIN 69871	
Cooling lubricant system		
Number of coolant pumps / power	1 piece / 1.35 kW	
Tank capacity		
Tool changer		
Type	Double arm gripper	
Number of tool stations	24 (Option** 30/32/40/60n tools)	
Max. tool diameter	110 mm	
Max. tool diameter (tools slots beside not occupied)	220 mm	
Tool length	350 mm	300 mm
Max. tool weight	18 kg	
Tool change time according to VDI 2852	4.5 sec.	
Milling precision		
Repeat accuracy	± 0.015 mm	
Positioning accuracy	± 0.009 mm	
Travel		
X axis (linear guide)	2 600 mm	3 100 mm
Y axis (linear guide)	1 400 mm	1 650 mm
Z axis (flat guide)	800 mm (option ** 1 000 mm)	
Feed drive		
X axis fast motion	10 m/min.	16 m/min.
Y axis / Z axis rapid traverse	10 m/min.	
Motor torque		
X, Y axis	80 Nm	
Z axis	81 Nm	
Feed forces		
X / Y / Z axis		
Speed range		
Speeds*	6.000 min ⁻¹ (Option** 8 000 rpm)	
Pneumatics		
Compressed air		
Milling table		
Table length x width	2 500 x 1 300 mm	3 000 x 1 500 mm
T-slot size / amount / distance	22 / 7 / 160 mm	22 / 9 / 160 mm
Maximum payload	6 000 kg	7 000 kg
Spindle to table distance	160 - 960 mm	
Spindle to stand distance	460 mm	
Distance between the stands	1 400 mm	1 650 mm
Dimensions		
Installation area	7 800 x 5 000 x 5 000 mm	8 800 x 5 000 x 5 100 mm
Overall weight	22 500 kg	26 000 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

** The option must be ordered with the basic machine. Cannot be retrofitted.

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with ShopTurn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!

Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **SW 26X**
- **5 MB** CNC memory
- **2 ms** Block change time
- **100** Look Ahead
- **256** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

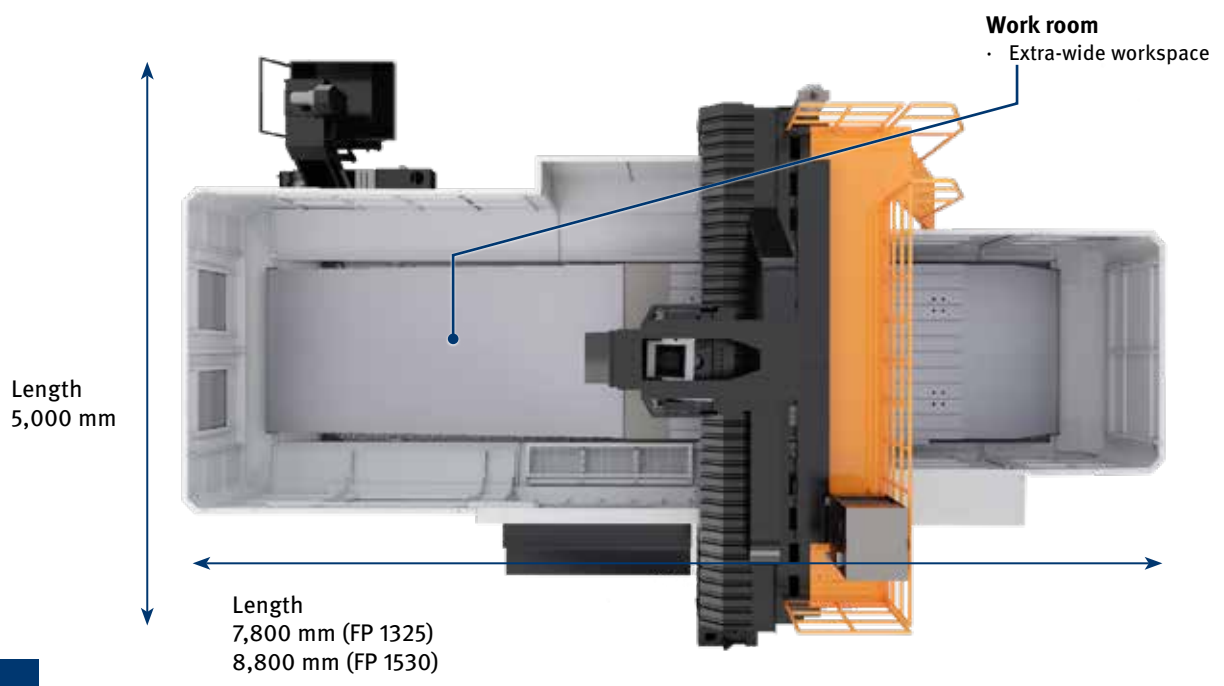
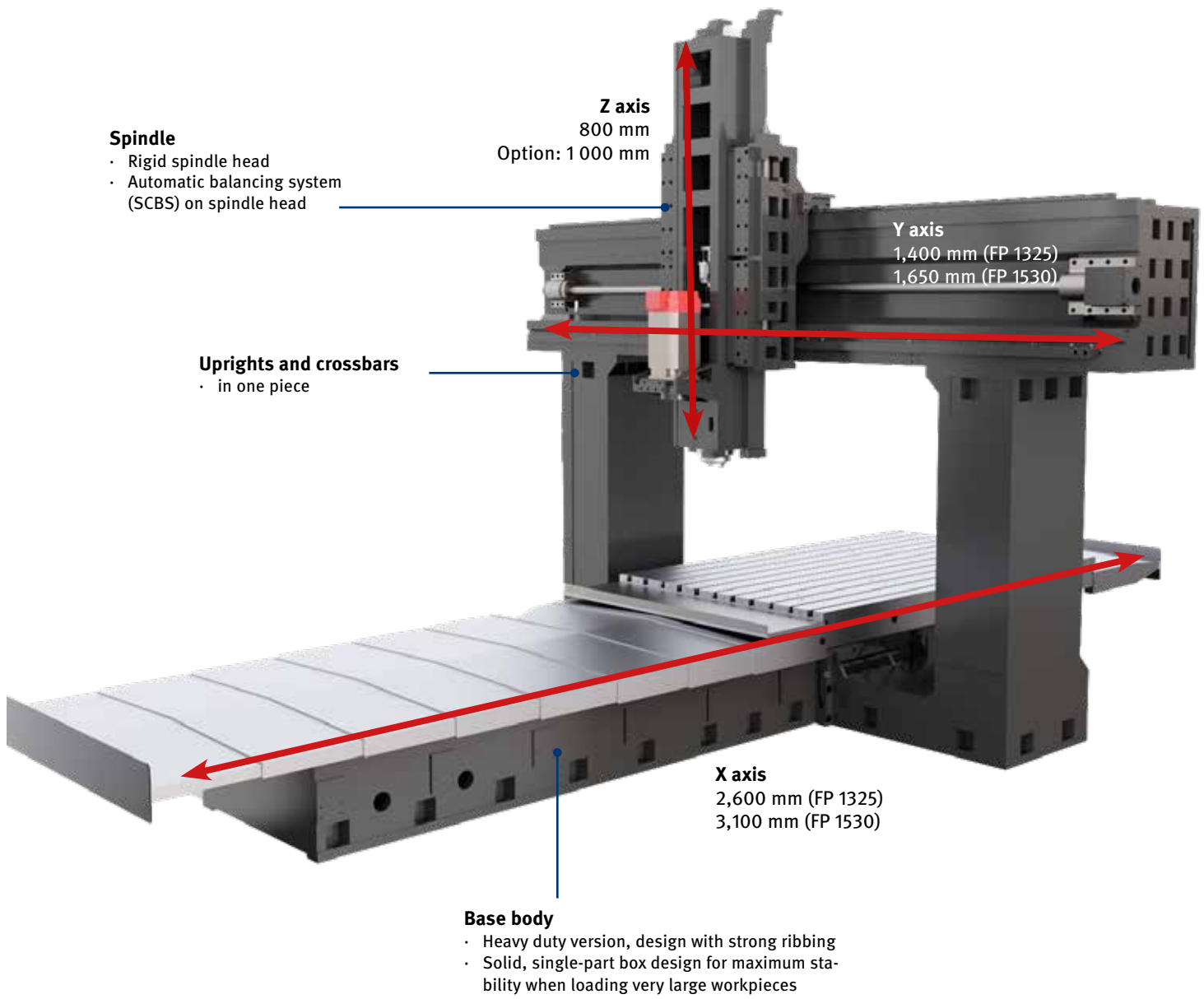
ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



OPTIMILL FP 1325/FP 1530
STANDARD EQUIPMENT



CHIP DISPOSAL



- Auger conveyors on both sides of the machine base transport high volumes of chips to the chip conveyor

GEARBOX



- Gearbox with high transmission ratio

LINEAR GUIDE



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

SPINDLE



- High torque spindle ideal for high performance cutting applications
- Wide speed range up to 8 000 rpm for heavy machining and precision machining
- Automatic oil lubrication of spindles with cooling
- Spindle SK 50
- Cam gear

TOOL MEASURING / WORKPIECE MEASURING			
3511652010*	1	BLUM TC52 Universal measuring probe	<ul style="list-style-type: none"> Switching point repeatability of 0,3µm 2σ at 2 m/min. Measuring speed Wear-free and durably stable Very compact probe with 40 mm diameter
3511652011*		BLUM ZX-Speed 3-D probe	<ul style="list-style-type: none"> Universal 3-D probe for toolmaking and tool break monitoring
<p>➡ For information on Blum workpiece/tool measuring, also ex warehouse Germany, see Seite 275</p>			
3511652041	2	Manual milling head 90°	
3511652042	3	Manual milling head two sides 90°	
3511652043		Universal milling head	
3511652044	4	90° milling head with automatic tool change and manual head	<ul style="list-style-type: none"> Installation

3-D PRINTING			
3562411	5	3-D printing interface	<ul style="list-style-type: none"> Plug connector on milling head for OPTImill 3X/5X printing head Power supply is installed in control cabinet Preparation for wire breakage monitoring and filament holder
<p>➡ For information on 3-D printing and accessories, see 253</p>			

MISCELLANEOUS			
3536111		Starter set SK50 DIN69871	
3511650010* (FP 1325)	6	Coolant through spindle	<ul style="list-style-type: none"> Integrated unit, 20 bar
3511660010* (FP 1530)			<p>We recommend a suction unit</p>
3511650011* (FP 1325)		<ul style="list-style-type: none"> External unit; tank capacity 165 litres, 70 bars pump pressure 	
3511660011* (FP 1530)	7		
3511652 005*		Air conditioner	<ul style="list-style-type: none"> Instead of the standard equipment › heat exchanger
351161005*		Linear guide	<ul style="list-style-type: none"> for Z axis
3511650020* (FP 1325)		Tool changer with 30 tool stations	<ul style="list-style-type: none"> Instead of the standard equipment › Tool changer with 24 tool stations
3511160020* (FP 1530)			
3511650021* (FP 1325)		Tool changer with 40 tool stations	<ul style="list-style-type: none"> Instead of the standard equipment › Tool changer with 24 tool stations
3511160021* (FP 1530)			
3511650022* (FP 1325)		Tool changer with 60 tool stations	<ul style="list-style-type: none"> Instead of the standard equipment › Tool changer with 24 tool stations
3511160022 *(FP 1530)			
3511652 001		Fourth axis preparation	
3511652 020		Fourth axis	<ul style="list-style-type: none"> Including lathe chuck 320 mm and tailstock (air clamping)
3511652 002		Fifth axis preparation	
3511652 022		Fifth axis	<ul style="list-style-type: none"> Including lathe chuck 250 mm and tailstock (air clamping)

1 BLUM TC52/ ZX-SPEED



- 3D measuring probe with infrared transmission
- Precise, directionally independent approach behaviour
- Constant deflection forces
- No detrimental 3-leg principle with lobing effect

2 SEMI-AUTOMATIC MILLING HEAD 90°



- 90°-angle head enables lateral processing of large workpieces without turning or repeated loading and unloading, which improves processing efficiency

3 AUTOMATIC UNIVERSAL MILLING HEAD



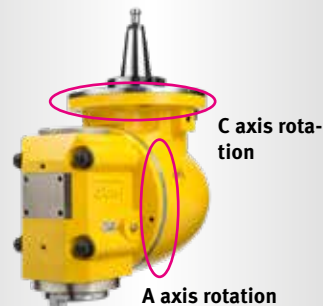
- The head is mounted on the spindle manually
- The head rotation with 5° indexing is realised by manual and hydraulic locking
- The tool is clamped and unclamped using the control knob

4 SEMI-AUTOMATIC UNIVERSAL MILLING HEAD



- Connects to the spindle part with an upper module, clamping and unclamping is automatically controlled by a CNC system. Angle indexing in the C axis is automatic. It is controlled by the CNC system. Standard indexing is 2.5°

5 AUTOMATIC UNIVERSAL MILLING HEAD



- Enables milling or drilling in any inclined plane
- The angle is adjusted by loosening the screws
- The tool is clamped/unclamped manually and is locked by a tension screw

6 COOLANT THROUGH SPINDLE



- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone

7 AIR CONDITIONER



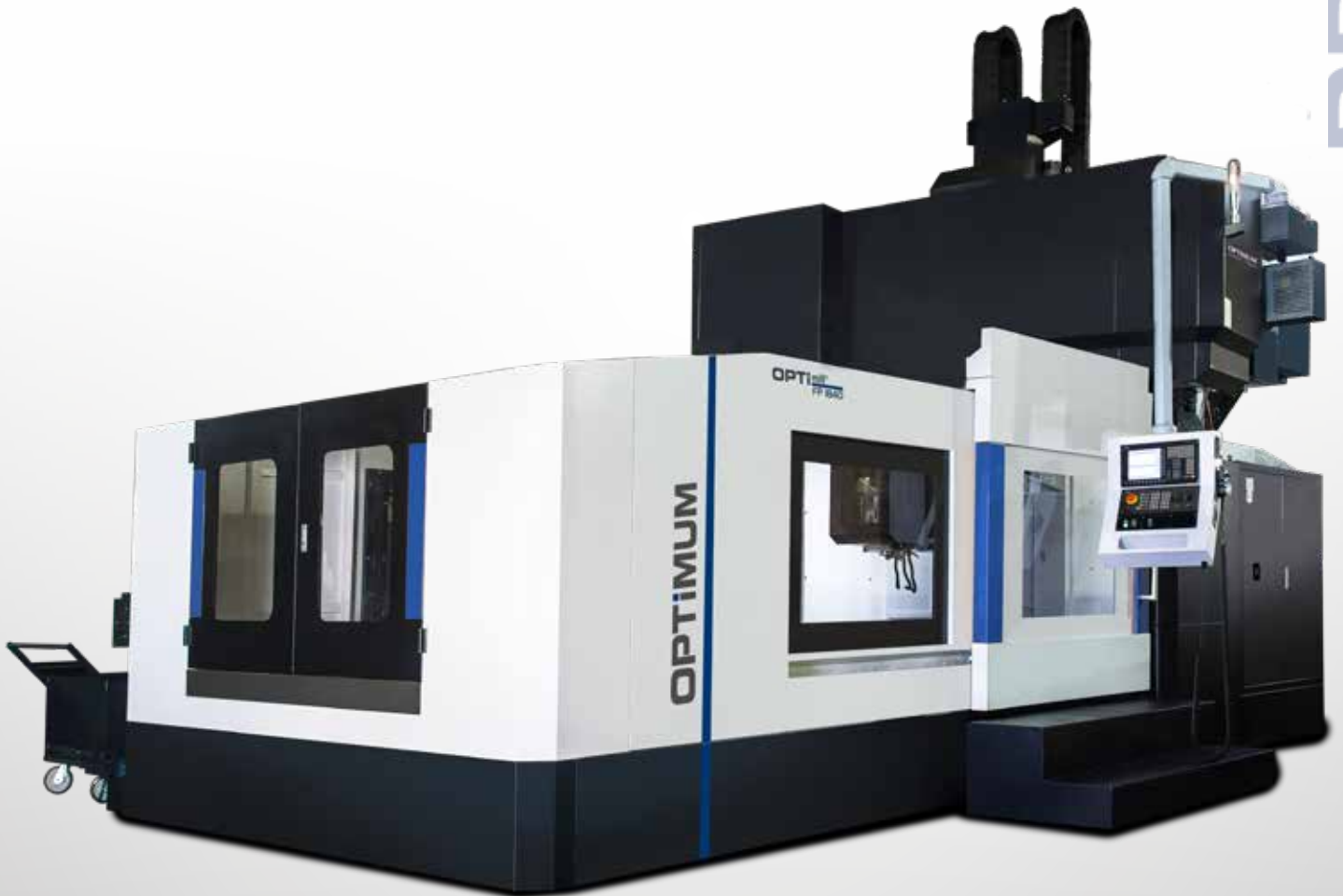
- Instead of heat exchanger
- The air conditioner permanently and constantly cools the control cabinet to the set temperature.

FP 1840 / FP 2560

OPTIMUM PREMIUM CNC Portal milling machine

SIEMENS CONTROL SINUMERIK 828D

- Perfect structures and a rugged design guarantee best possible rigidity and stability
- All main components - machine bed, worktable, machine column, crossbeam, saddle and head-stock are made of high quality MEEHANITE® cast iron.
- Generously dimensioned guides on the X, Y and Z axes
- All guide rails tempered and ground (HRC50 -HRC55)
- The X- and Y-axis are equipped with roller linear guides so that the axes move with the highest precision even at high speed
- Highest machining accuracy and high damping due to wide adjustable box way guides of the Z-axis for high drilling and milling performance with high spindle output torque
- Hardened and precision ground ball screws mounted in high precision bearings in all three axes for high rapid traverse speeds
- Cooling of the main spindle gear (gears, bearings, spindle) by oil circulation system. Reduction of thermal expansion
- Operating status display (work end lamp)
- Axis covers
- Work lamp LED with alarm indicator
- Chip conveyor belt design with chip trolley
- Energy chain with strain relief and cable separation
- Spindle oil cooler
- Heat exchanger
- BT50 spindle mount with a maximum spindle speed of 6 000 rpm for high precision
- Pneumatic counterbalance of the Z-axis ensures very high reliability and stability while several axes are working simultaneously. The SCBS system does not need an additional power supply or drive. This balance system helps to achieve high speeds and excellent machining
- Complete machine enclosure with wide opening doors for ergonomic workpiece handling
- Automatic lubrication system with pressure control system
- Separating system for lubricating oil and coolant
- Set-up elements
- Additional package SIEMENS material defect liability and free online/on-site service OSS Plus see Seite 225



OPTIMILL FP 1840 / FP 2560

TECHNICAL DATA

Model	FP 1840	FP 2560
Article no.	3511670	3511680
Machine data		
Electrical connection	400 V / 3 Ph ~50 Hz	
Total connected load	60 KVA	
Milling spindle		
Drive motor S1 operation	17 kW	22 kW
Drive motor torque S1 operation	162 Nm	140 Nm
Drive motor S6 30 % operation	32.3 kW	41.8 kW
Drive motor torque S6 30 % operation	330 Nm	
Spindle seat	SK50 DIN 69871	
Cooling lubricant system		
Number of coolant pumps / power	1 piece / 1.35 kW	
Tank capacity		
Tool changer		
Type	Double arm gripper	
Number of tool stations	24 (Option** 30/32/40/60 tools)	
Max. tool diameter	110 mm	
Max. tool diameter (tools slots beside not occupied)	220 mm	
Tool length	350 mm	
Max. tool weight	18 kg	
Tool change time according to VDI 2852	4.5 sec.	
Milling precision		
Repeat accuracy	± 0.015 mm	
Positioning accuracy	± 0.009 mm	
Travel		
X axis (linear guide)	4 200 mm	6,200 mm
Y axis (linear guide)	2,400 mm	3,600 mm
Z axis (box way)	1 000 mm	
Feed drive		
X axis fast motion	15 m/min.	10 m/min.
Y axis fast motion	15 m/min.	
Z axis rapid traverse	10 m/min.	
Motor torque		
X axis	80 Nm	240 Nm
Y axis	100 Nm	180 Nm
Z axis	81 Nm	108 Nm
Feed forces		
X / Y / Z axis		
Speed range		
Speeds*	6 000 rpm (Option** 8 000 rpm)	
Pneumatics		
Compressed air		
Milling table		
Table length x width	4,000 x 1,800 mm	6,000 x 2,500 mm
T-slot size / amount / distance	22 / 9 / 200 mm	28 / 11 / 200 mm
Maximum payload	14,000 kg	25,000 kg
Clearance spindle to table	220 - 1 220 mm	
Spindle to stand distance	404 mm	
Distance between the stands	2,400 mm	3,600 mm
Dimensions		
Installation area	10 800 x 6 200 x 5 500 mm	16 000 x 7 400 x 5 700 mm
Overall weight	37,500 kg	54,000 kg

* Please note that the maximum spindle speed must be reduced by approx. 20 % in continuous operation

** The option must be ordered with the basic machine. Cannot be retrofitted.

SINUMERIK 828D

High-tech for the compact class

The use of two autonomously operating tools makes 4-axis turning - balance cutting - possible. New features include multi-channel capability with ShopTurn, which allows programmes to be synchronised with programSYNC, among others. The new software offers the possibility of running two channels simultaneously in turning and grinding machines.

SINUMERIK CNC control Sinumerik 828D Basic sets standards in all aspects of machining performance. Whether accuracy and speed, whether reduction of cycle times or energy efficiency and safety - the SINUMERIK sets the pace.

Communicative:

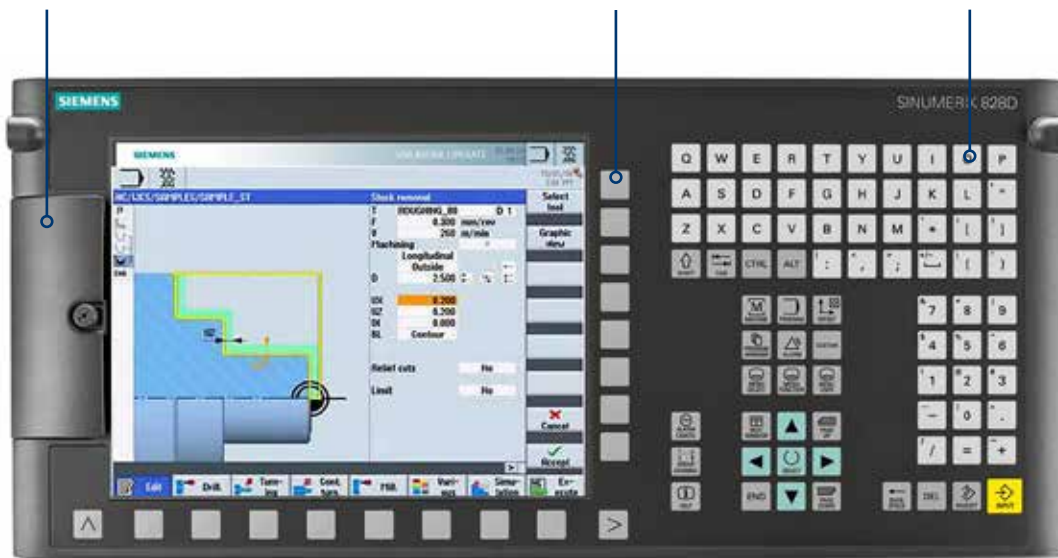
Front interfaces: Front USB 2.0, RJ45 Ethernet, Compact Flash (CF) Card

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Full QWERTY keyboard
 - Hard buttons with protective film
 - IP65 protection class



SIEMENS SAFETY INTEGRATED

SET UP WORK WITH OPEN DOORS

Functional safety also provides protection against high costs!
 Machine and plant safety is not only important because strict regulations must be observed. When everything runs safely, you benefit from time savings in engineering, higher system availability and more investment security.

CONTROL

- 10.4" colour display
- 4:3 format
- User-friendly SINUMERIK Operate software

SYSTEM SOFTWARE

- **SW 26X**
- **5 MB** CNC memory
- **2 ms** Block change time
- **100** Look Ahead
- **256** tools

OVERALL PACKAGE

- Safety Integrated
- Residual material detection and machining
- ShopMill work step programming
- Managing network drives
- 3-D simulation
- Simultaneous recording

ADDITIONAL PACKAGE SIEMENS OSS PLUS

- 12 months; Article no. 3589020
- 24 months; Article no. 3589021
- 36 months; Article no. 3589022

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal - Siemens WW



OPTIMILL FP 1840 / FP 2560 STANDARD EQUIPMENT

Tool changer

- Driven by precision cam for fast and accurate tool positioning
- The tools are transferred directly from the tool magazine to the spindle during the tool change by means of a double gripper
- Tool selection occurs bidirectionally via the shortest route.
- The tool magazine is located outside of the work area
- The cover on the tool magazine protects the tools against chips or coolant

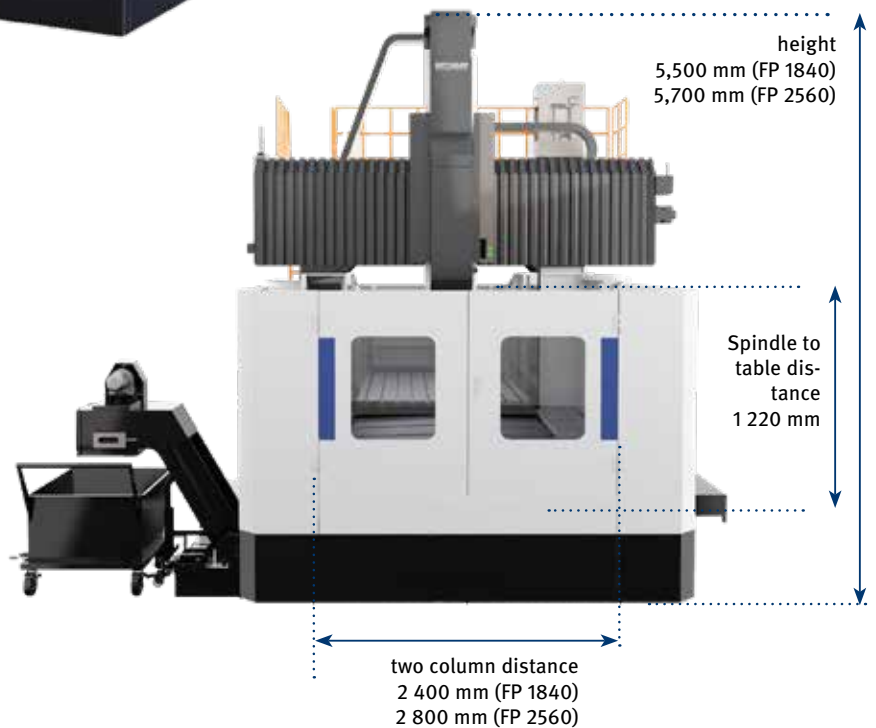
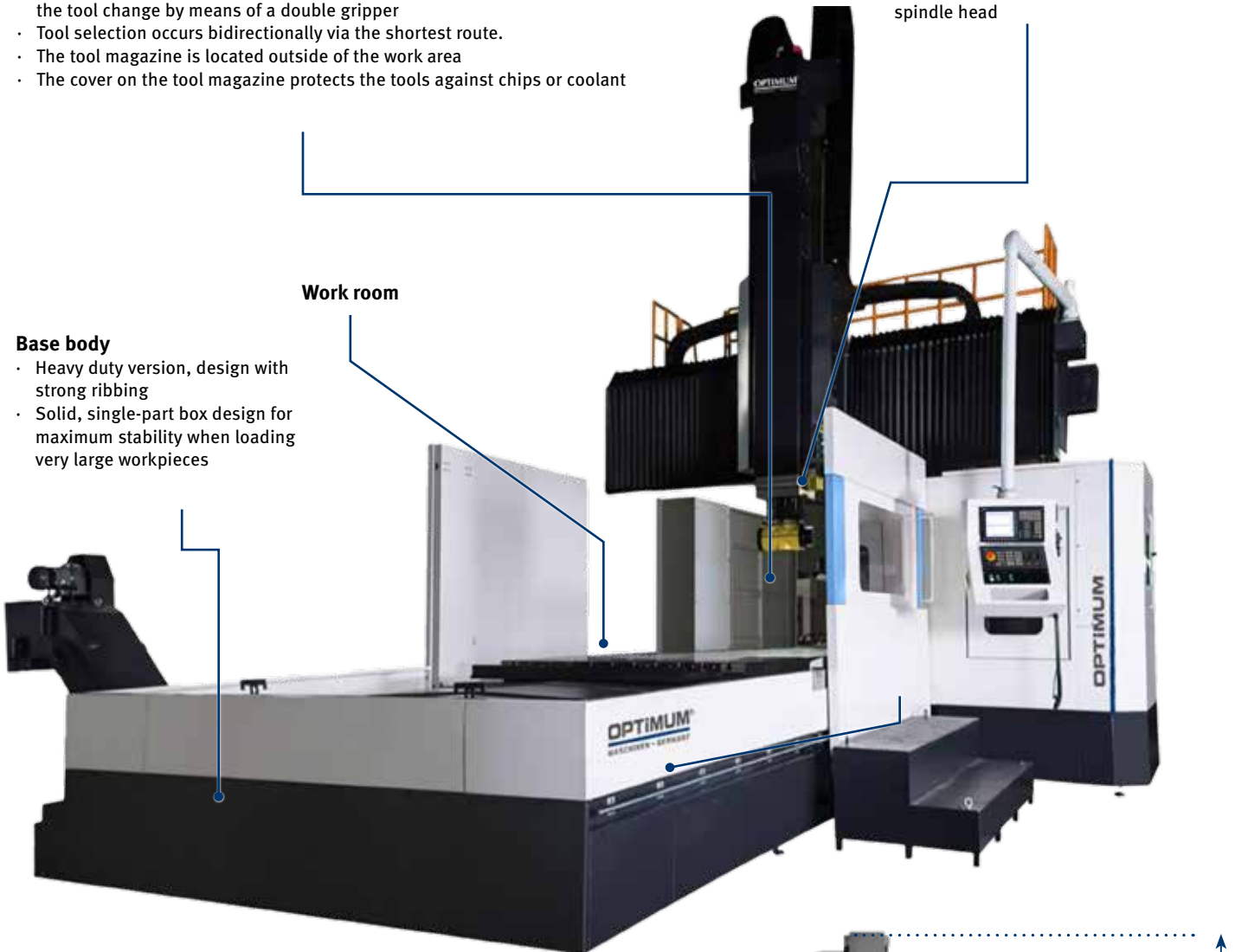
Spindle

- Rigid spindle head
- Automatic balancing system (SCBS) on spindle head

Work room

Base body

- Heavy duty version, design with strong ribbing
- Solid, single-part box design for maximum stability when loading very large workpieces



CHIP DISPOSAL



- Auger conveyors on both sides of the machine base transport high volumes of chips to the chip conveyor

GEARBOX



- Gearbox with high transmission ratio

LINEAR GUIDE

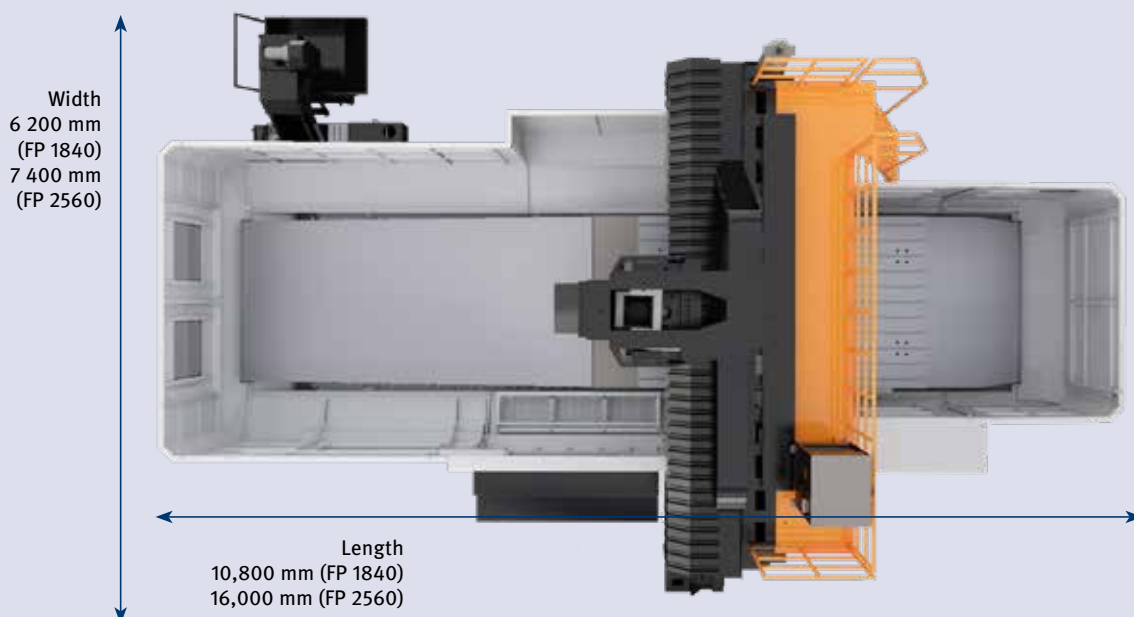


- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Consistent precision with long service life

SPINDLE



- High torque spindle ideal for high performance cutting applications
- Wide speed range up to 8 000 rpm for heavy machining and precision machining
- Automatic oil lubrication of spindles with cooling
- Spindle SK 50
- Cam gear



TOOL MEASURING / WORKPIECE MEASURING			
3511652 010*	1	BLUM TC52 Universal measuring probe	<ul style="list-style-type: none"> Switching point repeatability of 0,3µm 2σ at 2 m/min. Measuring speed Wear-free and durably stable Very compact probe with 40 mm diameter
3511652010		BLUM ZX-Speed 3-D probe	<ul style="list-style-type: none"> Universal 3-D probe for toolmaking and tool break monitoring
<p>➡ For information on Blum workpiece/tool measuring, also ex warehouse Germany, see Seite 275</p>			
3511652041	3	Manual 90° milling head	<ul style="list-style-type: none"> including flange
3511652042		Manual two way 90° milling head	<ul style="list-style-type: none"> including flange
3511652043		Manual universal milling head	<ul style="list-style-type: none"> including flange
3511652044	2	Semi-automatic 90° milling head	<ul style="list-style-type: none"> Automatic clamping tool, manual installation of the head and rotation (bracket on the table)
3511652045	4	Semi-automatic universal milling head	<ul style="list-style-type: none"> Holder on the table
3511652046	5	Automatic 90° milling head	<ul style="list-style-type: none"> Automatic tool magazine Direct and gearbox
3511652047	6	Automatic universal milling head	<ul style="list-style-type: none"> Automatic tool magazine Direct and gearbox

3-D PRINTING			
3562411		3-D printing interface	<ul style="list-style-type: none"> Plug connector on milling head for OPTImill 3X/5X printing head Power supply is installed in control cabinet Preparation for wire breakage monitoring and filament holder
<p>➡ For information on 3-D printing and accessories, see 253</p>			

MISCELLANEOUS				
3536111		Starter set SK 50 DIN69871		
3511670010* (FP 1840)	6	Coolant through spindle (CTS)	<ul style="list-style-type: none"> Integrated unit, 20 bar 	We recommend a suction unit
3511680010* (FP 2560)			<ul style="list-style-type: none"> External unit; tank capacity 165 litres, 70 bars pump pressure 	
3511670011* (FP 1840)				
3511680011* (FP 2560)				
3511652 005*	7	Air conditioner	<ul style="list-style-type: none"> Instead of the standard equipment > heat exchanger 	
351161005*		Linear guide	<ul style="list-style-type: none"> for Z axis 	
3511670020 (FP 1840)		Tool changer with 30 tool stations	<ul style="list-style-type: none"> Instead of the standard equipment > Tool changer with 24 tool stations 	
3511680020 (FP 2560)				
3511670021 (FP 1840)		Tool changer with 40 tool stations	<ul style="list-style-type: none"> Instead of the standard equipment > Tool changer with 24 tool stations 	
3511680021 (FP 2560)				
3511670022 (FP 1840)		Tool changer with 60 tool stations	<ul style="list-style-type: none"> Instead of the standard equipment > Tool changer with 24 tool stations 	
3511680022 (FP 2560)				
3511652001		Fourth axis preparation		
3511652020		Fourth axis	<ul style="list-style-type: none"> Including lathe chuck 120 mm and tailstock (air clamping) 	
3511652002		Fifth axis preparation		
3511652022		Fifth axis	<ul style="list-style-type: none"> Including lathe chuck 100 mm and tailstock (air clamping) 	

1 BLUM TC52/ ZX-SPEED



- 3D measuring probe with infrared transmission
- Precise, directionally independent approach behaviour
- Constant deflection forces
- No detrimental 3-leg principle with lobing effect

2 SEMI-AUTOMATIC MILLING HEAD 90°



- 90°-angle head enables lateral processing of large workpieces without turning or repeated loading and unloading, which improves processing efficiency

4 SEMI-AUTOMATIC UNIVERSAL MILLING HEAD



C axis rotation

- The head is mounted on the spindle manually
- The head rotation with 5° indexing is realised by manual and hydraulic locking
- The tool is clamped and unclamped using the control knob

5 AUTOMATIC 90° MILLING HEAD



C axis rotation

- The head is automatically installed on the spindle by the upper module and is hydraulically locked, head rotation 5° automatic indexing, hydraulically locked;
- The tool is clamped and released using a control knob

3 MANUAL TWO WAY 90° MILLING HEAD



C axis rotation

A axis rotation

- Enables milling or drilling in any inclined plane
- The angle is adjusted by loosening the screws
- The tool is clamped/unclamped manually and is locked by a tension screw

6 COOLANT THROUGH SPINDLE



- Guarantees optimal service life
- Higher cooling and lubrication effect at the cutting zone

7 AIR CONDITIONER



- Instead of heat exchanger
- The air conditioner permanently and constantly cools the control cabinet to the set temperature.

EYRING STAHL- UND METALLBAU UG

THURINGIAN METAL CONSTRUCTION COMPANY EXPANDS MACHINERY WITH OPTIMUM CNC PORTAL MILLING MACHINE

Eyring Stahl- und Metallbau, based in Römhild, Thuringia, has been a major player in the production of steel and metal structures made of aluminium, stainless steel and brass since 1981. Now the family-run company has expanded its machinery with the OPTIMUM CNC portal milling machine OPTImill FP 3200, raising its manufacturing process to a new technological level.

Portal milling machine OPTImill FP 3200

On a production area of approx. 1.500 m² the company combines a wide variety of metalworking machines in order to be able to react quickly to individual needs and to offer tailor-made, innovative solutions at any time. They include bending machines, hydraulic presses, welding equipment, painting cabins, grinding machines, circular saws and gate shears. They are used to manufacture external and internal stairways, railings, canopies, fences and gates, balcony railings and special constructions. Now that the new OPTIMUM FP 3200 CNC Portal milling machine

has been integrated into its machine line-up, the company can rely on state-of-the-art technology to automate its manufacturing processes in a sustainable manner and meet the increased precision requirements in an even better way in the future.

SIEMENS Control SINUMERIK 828D

The OPTIMUM CNC portal milling machine, which was presented to the market only a few months ago, is equipped with a SIEMENS Control 828D, which enables intelligent motion control. This makes the machine especially suitable for the production of workpieces with a high dimensional accuracy and surface quality. 3-D simulation allows the manufacturing processes to be optimally controlled and adjusted where necessary. Due to its rigid, rugged design, made of high-quality MEEHANITE® quality



cast iron, and the milling head mounted on a cross beam, the Portal milling machine guarantees maximum stability and is ideally suited for machining large surfaces such as panels. Roller linear guides on the X and Y axis as well as a balance system in the Z axis ensure highest precision and reliability even at high speeds. The ball screws are mounted in high-precision bearings and allow for absolutely unbalance-free rotation of the spindle. In order to set the highest standards in safety, the portal milling machine is also equipped with the **SIEMENS** Safety Integrated function, which prevents injuries to persons, resulting in higher machine availability and thus increased productivity.

High quality and reliable service

In addition to high quality and reliable service, the large dimensioned

clamping area was an important factor for the metal construction company Eyring when choosing the OPTIMUM CNC Portal milling machine. This is why the traditional Thuringian company will be using the machine especially for the production of large components such as welding frames in the future.



05 - MILLING

TRAINING MACHINES



05

TRAINING MACHINES

F 3Pro

Universal milling machines with servo drives

SIEMENS CONTROL SINUMERIK 808D ADVANCED

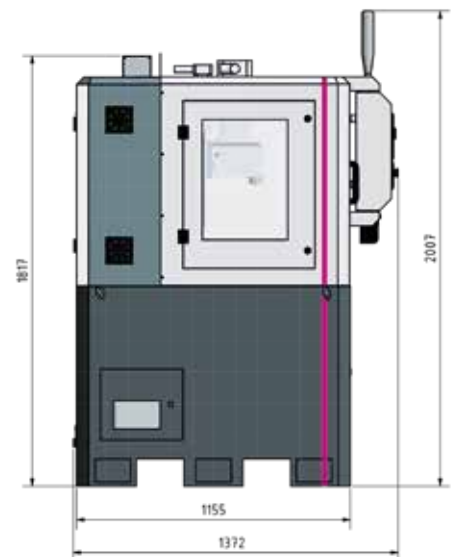
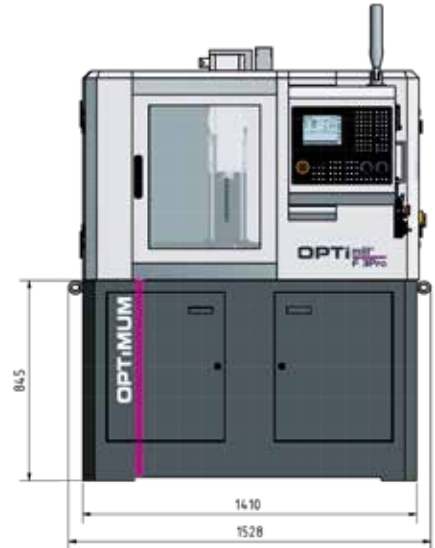
- Linear guides on all axes
- All axes with ball screws
- Servo drive on all axes (X, Y and Z axis)
- Tool change at the push of a button (electropneumatic tool clamping device)
- Coolant system
- Central lubrication
- Signal light
- Massive, exact milling table large dimensioned and precisely surface machined
- Swivelling control panel
- The portable, electronic handwheel with enabling switch and emergency stop push-button makes it much easier to run in programmes.
- Additional package SIEMENS material defects liability and free on-site service OSS see page 258
- For information on maintenance contracts, see page 258



OPTIMILL F 3PRO

TECHNICAL DATA

Model	F 3Pro
Article no.	3500415
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	5 kVA
Milling spindle	
Drive motor S1 operation	1.5 kW
Drive motor torque S1 operation	9.5 Nm
Drive motor S6 30 % operation	2.2 kW
Drive motor torque S6 30 % operation	14 Nm
Spindle seat	BT 30
Cooling lubricant system	
Coolant pump output	95 W
Tank capacity	30 litres
Milling cutter size	
Cutter head size max.	Ø 50 mm
End mill size max.	Ø 25 mm
Milling precision	
Repeat accuracy	± 0.02 mm
Positioning accuracy	± 0.01 mm
Travel	
X axis	355 mm
Y axis	190 mm
Z axis	245 mm
Feed speed	
X axis	10 m/min.
Y axis	10 m/min.
Z axis	10 m/min.
Speed range	
Speeds*	max. 4 000 rpm
Motor torque	
X axis	1.9 Nm
Y axis	3.5 Nm
Z axis	3.5 Nm
Milling table	
Throat	220 mm
Clearance spindle to table	50 - 295 mm
Table length x width	620 x 180 mm
T-slot size / amount / distance	12 mm / 3 / 50 mm
Maximum payload	30 kg
Dimensions	
Length x width x height	1 410 x 1 372 x 2 007 mm
Overall weight	1 000 kg



SINUMERIK 808D ADVANCED

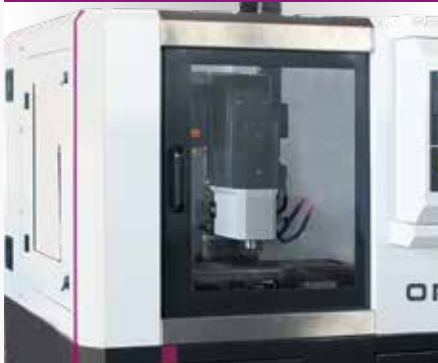
- RJ45 Ethernet port
- 8.4" LCD colour display with a resolution of 800x600
- Network function
- Ready for remote maintenance
- AST function gives users an easy optimisation option in case of stricter dynamic and precision requirements
- Closed-loop control circuit
- Greater precision
- Incremental encoder/referencing move required

Warranty

With the warranty, you protect your machine against warranty damage for 12, 24 or 36 months. (must be purchased with the purchase of the machine). Information on the warranty at www.optimum-machines.com
12 months; Art. no. 3589010; 36 months; Art. no. 3589012



WORK AREA



- Clearly visible from three sides
- Clear, resilient Makrolon panes

HANDWHEEL



- Portable
- Electronic
- Substantially facilitates running in of programs
- Emergency stop button
- Confirm button

SIGNAL LIGHT



- Visually displays the machine status
- Very bright and with a long service life

CONNECTIONS



- For easy access
- Easy to connect to the machine
- Data interfaces:
 - › Power connection
 - › RJ45 plug-in connection
 - › USB connection

LINEAR GUIDE



- Maximum static and dynamic stiffness
- High positioning accuracy
- Smooth, backlash-free movement
- Low coefficient of friction
- Excellent error compensation due to X layout

TOOL CHANGE



- Pneumatic with pushbutton (electropneumatic tool clamping device)
- BT 30 Spindle holder

OPTIONS

STARTER SET BT 30

Article no. 3536107

Comprises:

- 1 piece cutter head tool holder **1**
- 1 piece drill chuck **2**
- 2 pieces each Weldon 6 mm / 20 mm **3**
- 1 piece. each Weldon 8 mm / 10 mm / 12 mm / 16 mm **3**
- 1 piece BT 30 to MT 2 adapter **4**
- 4 pieces collet chuck holder ER 32 **5**
- 1 piece collet spanner ER 32 **6**
- 18-part collet set ER 32 **7**
- 1 piece height adjuster **8**
- 1 piece assembly and tool setting aid **9**
- 14 pcs. pull studs **10**
- 1 pc. taper squeegee **11**



➔ More information can be found on Seite 268

05 - TURNING TRAINING MACHINES



OPTi turn L 28HS

L 28HS

CNC-controlled flat bed lathe with linear guide

SIEMENS CONTROL SINUMERIK 808D ADVANCED

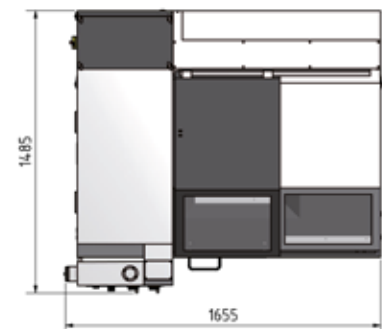
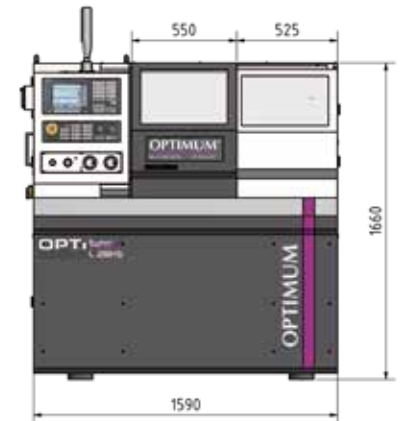
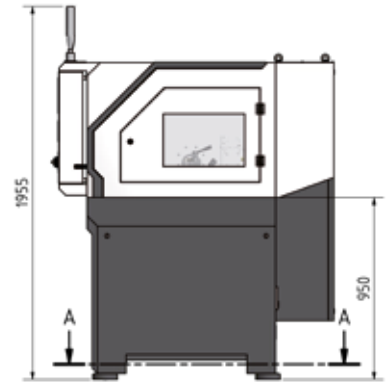
- Braced machine bed made from grey cast-iron
- Complex spindle bearing
- Emergency stop button
- Central lubrication
- Reference switch
- Maintenance-friendly protective housing
- Feed motors from **SIEMENS**
- Access flap on rear for maintenance
- Safety switch on front sliding door
- Turret located behind the lathe centre (left turning tool)
- Linear guide
- Additional package SIEMENS material defects liability and free on-site service OSS on Seite 243
- For information on maintenance contracts see Seite 309



OPTITURN L 28HS

TECHNICAL DATA

Model	L 28HS
Article no.	3504220
Machine data	
Electrical connection	400 V / 3 Ph ~50 Hz
Total connected load	3.75 kVA
Spindle	
Drive motor S1 operation	2.2 kW
Drive motor torque S1 operation	14 Nm
Torque at the spindle	28 Nm
Spindle seat	DIN 6350 A2-3
Spindle taper	5C
Spindle bore	Ø 30 mm
Cooling lubricant system	
Coolant pump output	95 W
Tank capacity	25 litres
Pump delivery rate max.	6 l/min
Max. delivery head	3 m
Machine data	
Centre height	169 mm
Centre width	430 mm
Swing Ø above cross slide	200 mm
Swing Ø above machine bed	300 mm
Speed range	
Spindle speeds	40 - 4 000 rpm
Tool changer	
Type	electrical
Number of tool slots	6
Mounting height x width of square max.	16 mm
Max. chuck diameter drilling rod	16 mm
Accuracy	
Repeat accuracy	± 0.01 mm
Positioning accuracy	± 0.01 mm
Travel	
X axis	145 mm
Z axis	465 mm
Feed speed	
X axis	10 m/min.
Z axis	12 m/min.
Motor torque	
X axis	1.3 Nm
Z axis	2.4 Nm
Tailstock	
Shank	MT 2
Spindle sleeve diameter	30 mm
Spindle sleeve stroke	120 mm
Dimensions	
Length x width x height	1 655 x 1 590 x 1 955 mm
Overall weight	832 kg



SINUMERIK 808 ADVANCED

CNC technology from the technology leader

- The SINUMERIK 808D ADVANCED control is a panel-based CNC control. The compact and user-friendly entry-level solution is used for simple turning applications. Features such as simple operation, commissioning and maintenance, but also an optimal cost position are the perfect basis for equipping entry-level CNC machines. With its technology-specific variants, the SINUMERIK 808D ADVANCED control is perfectly preconfigured for turning.

Intelligent machine optimisation

- With the proven Auto Servo Tuning (AST) function, users can easily optimise the machine. By selecting the tuning strategy, the CNC and drive parameters are automatically optimised according to the machine condition. This allows the simple optimisation of standard machines for applications that require high dynamics.

Communicative:

- USB front panel (IP65)

16 function keys:

The 8 horizontal and 8 vertical soft keys take the user to all control windows with just a few key presses

User-friendly:

- Technology-specific keyboard layout
- Hard keys with protective membrane



Communicative:

- RJ45 Ethernet on the rear

OVERALL PACKAGE

- RJ45 Ethernet port
- Ready for remote maintenance
- AST function gives users an easy optimisation option in case of stricter dynamic and precision requirements
- Greater precision
- Incremental encoder/referencing move required

CONTROL

- 8.4" LCD colour display with a resolution of 800x600
- SIMATIC S7-200 PLC-based
- MCP with rotary switch for feed and spindle override

ADDITIONAL PACKAGE SIEMENS OSS

- 12 months; Article no. 3589010
- 36 months; Article no. 3589012

Information on this additional package and conditions for utilisation can be found at:
 Liability for material defects and on-site service - SiePortal
 - Siemens WW

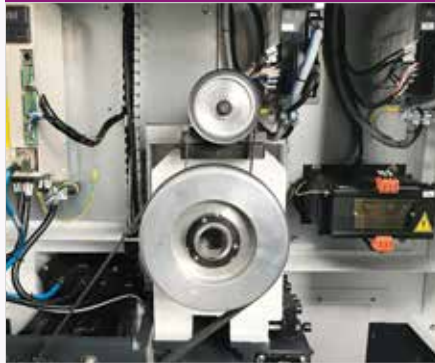


TOOL CHANGER



- For 6 tool slots

SPINDLE



- Incremental encoder for spindle positioning (thread tapping)
- Large spindle bore

LINEAR GUIDE



- High permissible load and high stiffness
- High repetition accuracy
- Low coefficient of friction

COOLANT SYSTEM



- Pulls out
- Easy chip disposal

MACHINE LAMP



- Full illumination of the workspace

CENTRAL LUBRICATION SYSTEM



- Guarantees regular and automatic lubrication
- Lubricating points that are connected to the central lubricating system have a longer service life

SINUMERIK 808D ON PC



- Software package identical to control
- Facilitates the handling of the machine tool
- The workpieces can be programmed and simulated offline.

Training and learning

- SINUMERIK Operate BASIC operations can be explored on a PC without additional hardware.
- Easy and convenient learning experience with a user interface identical to that of the control





Offline CNC programming:

- Boosts productivity by programming directly on a PC
- Testing of part programmes on the PC with the integrated simulation

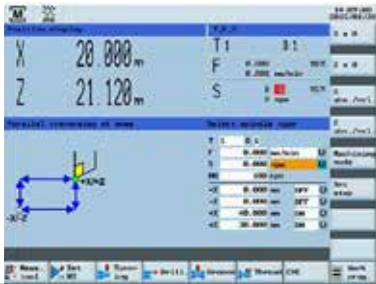
Professional CNC presentations:

- Present the SINUMERIK Operate BASIC user interface on the PC – at any time and anywhere without additional hardware

Download for free on
<https://xcelerator.siemens.com/global/en/industries/machinebuilding/machine-tools/cnc4you/808d-on-pc.html>

LATHE CHUCK			
Article no.			
3450230	Bison Three-jaw lathe chuck		<ul style="list-style-type: none"> • Cast, Ø 125 mm DIN 6350 • Hard jaws, single-part, with outside-inside clamping • Chuck key • Runout accuracy: 0.03 mm
3450410	Bison monobloc jaw set, soft		<ul style="list-style-type: none"> • for three-jaw lathe chuck Ø 125 mm
3450234	Bison Four-jaw lathe chuck		<ul style="list-style-type: none"> • Cast, Ø 125 mm DIN 6350 • Hard jaws, single-part, with outside-inside clamping • Chuck key • Runout accuracy: 0.03 mm
3450420	Bison monobloc jaw set, soft		<ul style="list-style-type: none"> • for four-jaw lathe chuck Ø 125 mm
3450240	Bison chuck flange		<ul style="list-style-type: none"> • for lathe chuck Ø 125 mm • for collet chuck 5C (Article no. 3450238)
3450238	Collet chuck 5C		<ul style="list-style-type: none"> • Size Ø 25 mm • Chuck flange needed (Article no. 3450240)
		Fig. with collet - not included in the scope of delivery	

MISCELLANEOUS			
Article no.			
3441215	Lathe tool set HM 16 mm		<ul style="list-style-type: none"> • 4-part
3535170	Cylindrical seat Ø16 mm		<ul style="list-style-type: none"> • for drill chuck B16
350422010	Boring bar holder round, up to 20 mm		<ul style="list-style-type: none"> • for tool changer • Info: The hole is to be drilled by the user himself
350422011	Lathe tool holder crosswise up to 16 mm		<ul style="list-style-type: none"> • for tool changer

SOFTWARE			
Article no.			
3584150*	SIEMENS Manual Machine Plus (MM+) Simple cycle control		<p>Enables the transition from conventional machines to CNC programming. The machine can be operated by means of hand wheels like a conventional machine, but with the advantages of CNC-supported technology cycles.</p> <p>Functions:</p> <ul style="list-style-type: none"> • Axis-parallel traverse, taper turning, radius turning, centre drilling, tapping, groove cycle, tapping, pre-turning of contours
➔ For more information, see auf Seite 301			

*Delivered ex works. The option must be ordered with the basic machine. Cannot be retrofitted.

06 ROBOTS



CNC holder

DIGI-OPTIMA



OPTIMILL F 150 CNC MILLING MACHINE

THE COMPLETE PACKAGE CENTRED ON THE PREMIUM CNC MILLING MACHINE OPTIMILL F 150 WITH SIEMENS SINUMERIK 828D CONTROL SYSTEM INCLUDING SCHUNK CLAMPING TECHNOLOGY, MEDIABLOC CFC AND THE ROBUST KCR SAFETY CAGE.



Product video
OPTimill F 150 CNC milling
machine with robot



More packages on request!

Image similar

Media package	3519013
<ul style="list-style-type: none"> • Monitor LCD TV 127 cm (50 inch) with HDMI connection • The monitor shows either the working area of the machine or the control system. Optionally also with split screen for displaying the working area and the control • Desktop computer • Splash water-protected camera • Multimedia table • Housing including holder • Installed SIEMENS Toolbox CD • Keyboard and mouse 	

WITH A HALTER LOADASSISTANT REALISE PROFIT DIRECTLY

A system with short changeover times and fast integration is required for small and medium batch sizes. HALTER CNC Automation has developed the HALTER LoadAssistant, which is based on many years of experience in the machining industry and in production automation. Compact, Premium and Big. All in a Universal (for turning and milling), TurnStacker (for turning) and MillStacker (for milling) version. Available with robots with 12, 25, 35 or 70 kg load capacity.

An intelligent and well thought-out system that does exactly what it is designed to do: Loading your CNC machine with small and medium batch sizes. The HALTER LoadAssistant is very fast and you don't need any robot knowledge to operate it. Would you like to increase your profits immediately, as many other companies in more than 25 countries around the world have already done? Do you want to invest in a system that will enable problem-free loading of your CNC machines for many years to come, even with smaller batch sizes? Then choose a HALTER LoadAssistant and contact us today!

SIMPLE LOADING SYSTEM WITH SHORT CHANGE OVER TIMES

COMPACT 12

UNIVERSAL COMPACT 12
TURNING/MILLING

TURNSTACKER COMPACT 12
TURNING

MILLSTACKER COMPACT 12
MILLING

- Minimum space requirement
- Simple relocation from one CNC machine to another
- Set up within 5 minutes
- Preparation of a new series while the robot is working



PREMIUM 25/35

UNIVERSAL PREMIUM 25/35
TURNING/MILLING

TURNSTACKER PREMIUM 25/35
TURNING

MILLSTACKER PREMIUM 25/35
MILLING

- Most versatile system on the market
- Simple relocation from one CNC machine to another
- Set up within 5 minutes
- Preparation of a new series while the robot is working



BIG 35/70

UNIVERSAL BIG 35/70
TURNING/MILLING

TURNSTACKER BIG 35/70
TURNING

MILLSTACKER BIG 35/70
MILLING

- High capacity for workpieces with large dimensions
- For loading heavy workpieces
- Set up within 5 minutes
- Preparation of a new series while the robot is working



SIMPLE AUTOMATION OF YOUR CNC MACHINE

ARE YOU INTERESTED?
 GET IN TOUCH WITH US!

+49 (0)951 96555-334
 BERATUNG@OPTIMUM-MASCHINEN.DE



1 HALTER SMARTCONTROL

- No robotics knowledge required
- New programme in 12 steps
- High flexibility: Simple addition of new functions
- Conversion in less than 5 minutes

2 ROTATING LOADING SYSTEM

UNIVERSAL:

- For turned and/or milled parts
- Grid plates are height-adjustable for workpieces
- Setting up a new series while the robot is working

MILLSTACKER:

- Stacking stations for milled parts
- High capacity on a small footprint, for flat workpieces
- Wendestation for double-sided processing of workpieces

TURNSTACKER:

- Stacking stations for turned parts
- High capacity on a small footprint, for flat workpieces
- Turning station for processing workpieces on both sides

3 EASY RELOCATION AND COUPLING TO ANOTHER CNC MACHINE

- Can be moved with a pallet truck
- Positioning through self-centring anchors
- Automatic recognition of the CNC machine

4 ACCESSIBLE AND SAFE

- CNC machine remains accessible for the machine operator, no safety fence required
- Floor scanner slows down and stops the robot
- No compromises when it comes to the safety of your operator

5 FANUC 6-AXIS ROBOT

- Maximum load capacity: 12 kg, 25 kg, 35 kg or 70 kg
- Suitable for industrial ambient conditions
- Stable, accurate and durable

6 UNIVERSAL GRIPPER SYSTEM

- 2- or 3-finger gripper
- Quickly adjustable gripper fingers
- Integrated safety sensors for end position monitoring
- Blow nozzle for blowing out the vice or chuck

7 SETTING UP A NEW SERIES WHILE THE ROBOT IS RUNNING

- Thanks to the rotating loading system, a new series can be loaded at the rear while the production process continues.

8 HIGH-QUALITY INDUSTRIAL COMPONENTS AND RELIABLE TECHNOLOGY

- Robust construction
- Industrial components exclusively from A-suppliers. Standardised and complete plug-and-play system.

CNC MACHINE AND ROBOCELL SET REALISE PROFIT DIRECTLY



User-friendly collaborative robot manipulator integrated with milling machine. The safest, most reliable and most compact solution for small and medium batch sizes.

- Enables the efficiency of production processes to be increased while maintaining the same number of employees
- Saves time and reduces production costs (less downtime)
- Tackling the problem of the shortage of skilled labour
- Exploited night work without an operator
- Reduces the influence of the human factor and increases accuracy and reliability
- Easier production planning due to the mobility of the robot (easy transport to work with other devices)
- Improved working conditions (easier work for the operator, higher motivation, cleanliness and working methods)
- Optimum ergonomics and accessibility to the work area and switch cabinet thanks to side loading
- Multi-job function: Various parts on the workpiece holder
- Can be retrofitted (connection to existing CNC machines possible)
- On request, it can be offered for lathes and with other robot arms
- Technical support



ARE YOU INTERESTED?

GET IN TOUCH WITH US!



+49 (0)951 96555-334



BERATUNG@OPTIMUM-MASCHINEN.DE



COMPLETE PACKAGE

GET STARTED RIGHT AWAY

- OPTIMUM CNC milling machines
- Automated pneumatic door DIGIO-MD-D
- Robot arm
- Work table with workpiece matrix DIGIO-MD1-M40 (optional: Drawer module with workpiece matrix DIGIO-MD3-M40 (100x100x100-15 places, 3 pieces)
- Pneumatic (SCHUNK KSP-Z plus 160)
- Reversible support jaws (SCHUNK TBA-D 160)
- Pneumatic gripper (SCHUNK PGN plus 125-1-KVZ)
- DIGIO MD-S jaws



The robot arm has 6 axis joints with a wide range of flexibility that mimic the range of movement of the human arm, so that everything is within a reach of up to 1700 mm. In this way, production staff have more time available for other production steps, resulting in time savings and added value.

The collaborative robot arm can be easily integrated into existing production environments. Robocell set can be easily integrated into a monitoring system

PROPERTIES

- User-friendly collaboration
- Easy to operate
- Long autonomous working hours without supervision
- Quick set-up (programme preparation for new workpiece in just 15 minutes)
- Interchangeable workpiece matrix for different part sizes
- Simple installation
- Graphic programming
- Programmes prepared for standardised part type
- Integrated into the milling machine
- Prepared for working with the SIEMENS Sinumeric 828D software package
- Compatible with multiple machines - mobile module



07

3-D PRINTING

OPTImill print head 3X



OPTIMILL PRINT HEAD 3X /5X

THE OPTIMILL 3X AND OPTIMILL 5X PRINT HEADS ENABLE THE PRODUCTION OF TANGIBLE OBJECTS FROM DIGITAL 3-D FILES CREATED BY A CAD SYSTEM

Printing instead of milling

Turn your CNC milling machine into a fully functional 3-D printer in just minutes.

The OPTIMUM OPTImill 3X and OPTImill 5X print heads turn your machine into a top class 3-D printer.

The supplied software can convert and load 3-D models and convert them into machine-compatible G-code. I.e. the components are programmed using the Cura Slice program and output to our machines using add-on software.

A very big advantage of our concept is that the wire feed is controlled by the spindle speed. So we can brake in corners and accelerate out, which leads to very good results. Thanks to the use of web preview and feed control, it is possible to print much faster than all other commercially available competitors while maintaining the same quality. More than three times the printing speed with the same or better print quality. The 5x print head can additionally print 5-axis on a 5-axis milling machine. The prerequisite for this is a CAD/CAM system that supports this function.

Setup times of maximum 20 minutes* - easy integration on the machine thanks to 3-D interface.

Think big – print big!

The installation space of your CNC machine allows you to print workpieces that commercial printers cannot produce. The advantage of our concept is that it is possible to machine on the CNC machine during the day, and convert your machine's normal downtime into cash by fully utilising the machine, for example, overnight.

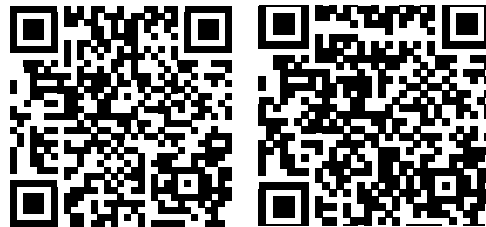
Thanks to the two heating elements on the print head of the Optimill 3x and the ring heater of the Optimill 5X, we achieve temperatures of up

to 300 °C, which means that a wide variety of filaments can be printed. Materials such as PA, PLA, ABS, nylon, and carbon are no problem for the printer.

The OPTIMUM print heads OPTImill 3X and OPTImill 5X offer unlimited possibilities

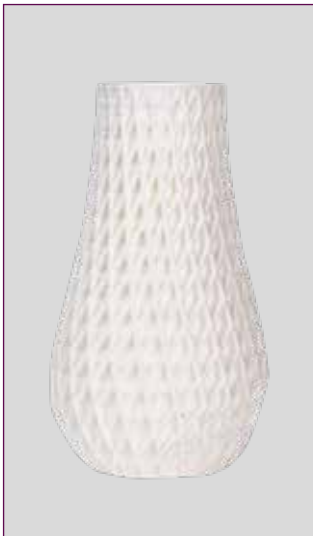
Whether you need large or small 3D prototypes or highly complex components, the flexibility and speed, together with the accuracy of your CNC machine, allows you to produce more cost-effectively and flexibly than ever before. For our programming we used the 3D software Cura, in the 5-axis machining we work with SIEMENS NX as programming software.

With the standard scope of supply filament with a thickness of 1.75 mm can be printed. A conversion kit for the print head is required for 2.85 mm filament. You will also benefit economically from our exchangeable printing nozzles. It is not necessary to replace the entire module, as is often the case with other manufacturers.



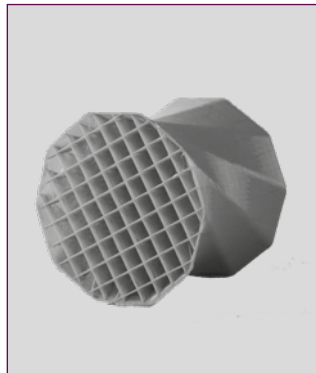
Product video showing the Optimum 3 X - 3-D Printer

AREAS OF APPLICATION



Models

Models are particularly useful for making designs tangible.



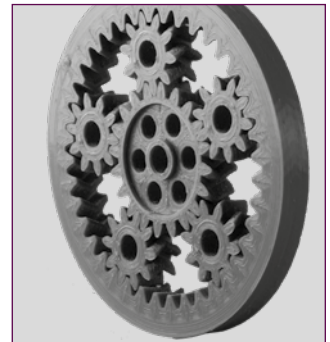
Prototypes

Prototyping enables companies to significantly shorten the development time of new products. This allows errors to be corrected at an early stage and improvements to be made.



Batch size one production

It is often only possible to produce components and models with complex geometries at very high cost or not at all using conventional, chip-removing manufacturing processes. Especially for small quantities, switching to additive production makes a lot of sense.



Spare parts

Printing spare parts is a popular and inexpensive solution with fast availability. Possible improvements can also be integrated to extend the durability or offer additional benefits.

* depending on the machine

OPTIMILL PRINT HEAD

CAN BE ATTACHED TO ANY OPTIMUM CNC MILLING MACHINE WITH SIEMENS CONTROL SINUMERIK 808D/828D/840D SL/ SINUMERIK ONE. OTHER CONTROLS ON REQUEST



Fig. 3X print head



Fig. 5X print head

OPTImill print head	3X	5X
Article no.	3560010	3560012
	Milling machines with 3 axes	Milling machines with 3 axes and 5 axes
Extruder drive mount	Ø 16 mm	
Heating	100 Watt at 24V	
Heating element	2 cartridge heaters	Ring heating
control temperature range	150° - 300 °C	
Temperature control	PID (Proportional, Integral and Differential)	
Extrusion speed	depending on the drive concept of the CNC milling machine ± 75 mm/s	
Ambient temperature	20 °C to 30 °C	
relative humidity	no condensation	

Scope of delivery:

- 2 feed rollers for filament 1.75 mm
- Filament holder
- Printing nozzle size 0.4 mm
- Print head with PID temperature control
- 230V Power supply unit/24V DC 15A
- Operating manual

Custom sizes on request

HEATER PLATES

PREVENT FAST COOLING OF THE OBJECTS, THUS IMPROVING ADHESION. INCREASE ADHESION ESPECIALLY WITH LARGE COMPONENTS

Heater plates	
Size 1	3560050
suitable for OPTIMUM CNC machines	F 80 / F 105 / F 120X / F 150E / F110 HSC / F 200 HSC
Worktop	600 x 245 mm
Output	500 W / 230 V ~50 Hz
control temperature range	0 °C to 120 °C
Size 2	3560051
suitable for OPTIMUM CNC machines	F 300HSC / F 400HSC / F500HSC / F 600 HSC
Worktop	980 x 500 mm
Output	2200 W / 230 V ~50 Hz
control temperature range	0 °C to 120 °C
Size 3	3560052
suitable for OPTIMUM CNC machines	FU 5
Worktop	370 x 410 mm
Output	500 W / 230 V ~50 Hz
control temperature range	0 °C to 120 °C



Includes separate temperature controller with magnetic holder



Feed roller transfer shaft

- 2 pcs.
- High-quality design
- Milled carrier grooves

Feed rollers for 1.75 mm filament	3562202
Feed rollers for 2.85 mm filament	3562204
• Without coating	
Feed rollers for 1.75 mm filament	3562212
Feed rollers for 2.85 mm filament	3562214
• with diamond coating	



Conversion kit to 2.85 mm Filament

- High-quality design

FOR Optimill 3X	3562220
FOR Optimill 5X	3562222

Including:

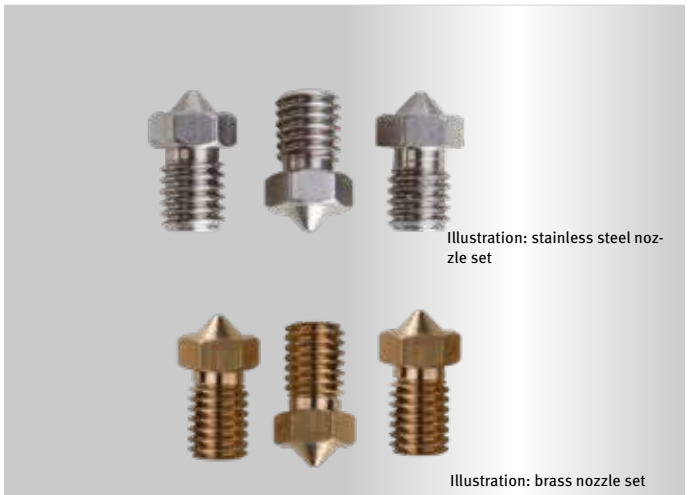
- Holder with press-on rollers
- Radiator body
- Screw connection for the insertion
- Two feed rollers with milled driving grooves for 2.85 mm filament
- Hotend bushing 2.85 mm
- Teflon hose
- Screwdriver



Extruder nozzle sets, 3 pieces

- rugged and durable

Stainless steel nozzle set for 1.75 mm filament	3562302
• for nozzle size 0.4 mm / 0.6 mm / 0.8 mm	
• suitable for PLA plastics or similar	
Stainless steel nozzle set for 2.85 mm filament	3562308
• for nozzle size 0.8 mm / 1.0 mm / 1.2 mm	
• suitable for PLA plastics or similar	
Titanium nozzle set for 1.75 mm filament	3562312
• for nozzle size 0.4 mm / 0.6 mm / 0.8 mm	
• suitable for carbon material	
Titanium nozzle set for 2.85 mm filament	3562318
• for nozzle size 0.8 mm / 1.0 mm / 1.2 mm	
• suitable for carbon material	
Brass nozzle set for 1.75 mm filament	3562322
• for nozzle size 0.4 mm / 0.6 mm / 0.8 mm	
• suitable for PLA material	
Brass nozzle set for 2.85 mm filament	3562328
• for nozzle size 0.8 mm / 1.0 mm / 1.2 mm	
• suitable for PLA material	



Hotend passageway

1.75 mm filament	3562401
2.85 mm filament	3562402



Tool holder set 3-D print head

BT 30	3562188
<ul style="list-style-type: none"> • Collet chuck holder ER32 / BT 30 • Collet chuck spanner ER32 • Collet chuck ER32/16 mm • Pull stud BT 30 	

BT 40	3562189
<ul style="list-style-type: none"> • Collet chuck holder ER32 / BT 40 • Collet chuck spanner ER32 • Collet chuck ER32/16 mm • Pull stud BT 40 	

SK40 DIN69871	3562190
<ul style="list-style-type: none"> • Collet chuck holder ER32/SK40 DIN69871 • Collet chuck spanner ER32 • Collet chuck ER32/16 mm 	



Cleaning scraper

3562430
<ul style="list-style-type: none"> • Material: Stainless steel • Colour: silver • Protection due to complete retraction of the blade • 40 mm blades • 5 blades included



Spare blades

3562431
<ul style="list-style-type: none"> • 10 blades

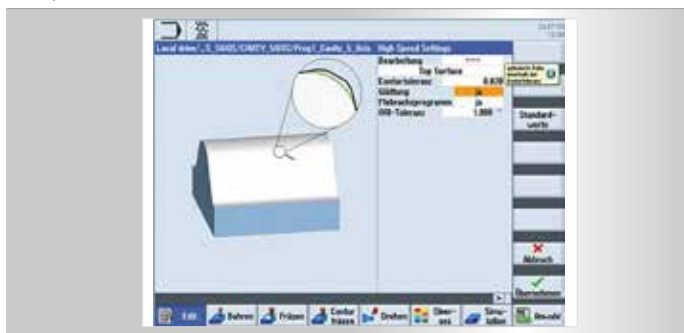
Software Cura 4.5

- <https://ultimaker.com/en/products/ultimaker-cura-software>
- Includes plugin via USB



Top surface for SIEMENS control

- | |
|---|
| 3584012 |
| <ul style="list-style-type: none"> • The NC data from the CAM system are optimised online during processing. • The result is excellent surface quality while milling complex free-form surfaces. • All new functions are system integrated and available with Sinumerik Operate. |



Torque supports

- for fastening on the main spindle
- Custom sizes on request

100 mm	3562522S
120 mm	3562511
125 mm	3562512
130 mm	3562513
140 mm	3562514
150 mm	3562521
155 mm	3562515
160 mm	3562516
200 mm	3562520



Nozzle cleaning kit

- Nozzle drill
- Cleaning drill

Nozzle cleaning kit small

3562342

- for nozzle size 0.4 mm / 0.6 mm / 0.8 mm

Nozzle cleaning kit large

3562344

- for nozzle size 0.8 mm / 1.0 mm / 1.2 mm



Fig. Nozzle cleaning kit, small

Fig. Nozzle cleaning kit, large

Wire break monitoring

3562410

- Machine stops in case of wire break or at end of wire
- Error message is displayed on the control



Infrared radiant heater

3562420

- Size: 600 x 600 x 17 mm
- Utilisation of complete construction area
- Optimisation of construction area temperature
- Heating output 300 Watt, protection type IP 44
- without fastener



GRP permanent printing plate set

- 2x permanent printing plate set
- Fastening material
- Glass fibre black
- The printed part is removed from the printer with the plate.
- Bends easily to make removal of printed parts easier in cold state.
- Very strong adhesion to printed part in heated state
- Printed parts have a very smooth bottom surface
- Plate can be easily and thoroughly cleaned and is very durable

Size: 600 x 245 mm

3562260

Size: 980 x 500 mm

3562262

Size: 370 x 410 mm

3562264



3-D printing interface

3562411

- Connector plug on the milling head for the OPTImill 3X printhead and the 5X printhead
- The power supply is installed in control cabinet
- Prepared for connecting wire break monitoring
- Filament holder installed
- including installation ex warehouse Germany



3D PRINTING ON 5 AXES

OPTIMILL 5X AS AN EXTENSION TO THE CNC MILLING MACHINE FU5

In cooperation with the University of Trier and a German engineering company, OPTIMUM Maschinen Germany GmbH has developed a new 3D print head that enables 5-axis 3D printing on the CNC milling machine OPTIMUM FU5 or another 5-axis milling machine with Siemens 840DSL control using Siemens NX software.

The new print head 5X is a further development of the well-known 3-axis print head Optimill 3X, which has already been successfully in use as a machine component for OPTIMUM's CNC milling machines since 2018. Compared to the 3-axis printing process, however, Optimill 5X offers a clear advantage: Printing on five axes not only saves time, but also achieves greater stability of the printed components. By adjusting the fourth and fifth axes, the Optimill 5X printhead eliminates the need for additional structures and allows the part to be printed in one piece without any additional supports. This improves the surfaces and avoids staircase effects.

Other components that have been optimised as part of this new development are the projection length of the hot end, which reduces interfering edges, and the heating, which in the toroidal core heating design now enables uniform and faster melting of the filament as well as large flow rates. This is necessary to speed up the printing process and/or to work with large nozzle diameters.

In order to exploit all the functionalities of the Optimill 5X printhead, it is recommended to use the Siemens NX software. In principle, however, other CAD/CAM systems are also capable of programming the complex 5-axis motion control.

Of course, you always have the option of performing ordinary 3-axis printing with the Optimill 5X printhead. To do this, you can use the Cura programming software.

5-axis printing using Siemens NX

In order to be able to carry out a complete simulation of the machine tool in Siemens NX, a 3D model of the machine tool must first be available,

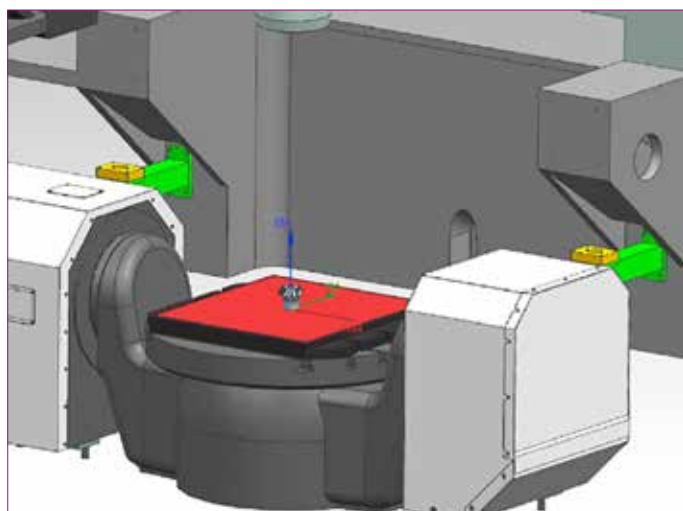
which has previously been kinematised and has a deposited postprocessor. In addition, the print head required for production must be stored as a model and the component to be printed must be created as a model. This can either be designed directly in NX or you can use alternative systems and file formats and then import the models into NX.

First, add both the print bed and the component to the machine in the production environment.

Then add the Optimill 5X 3D print head as a machine component.

Now load the nozzle with the appropriate diameter from the tool library into this machine component.

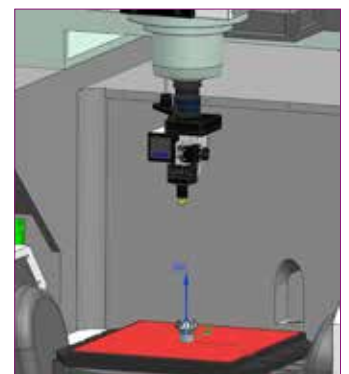
When printing



Example: Printing of a cylindrical body.

In the following example, we show you the individual work steps for producing a cylindrical body with the aid of the Optimill 5X 5-axis print head.

a cylindrical body, working with two operation

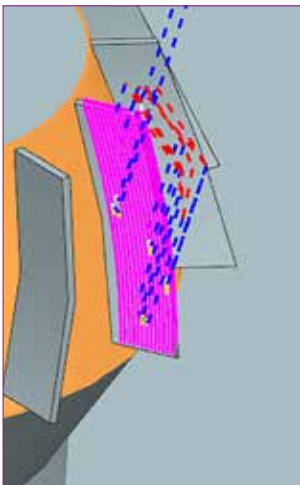
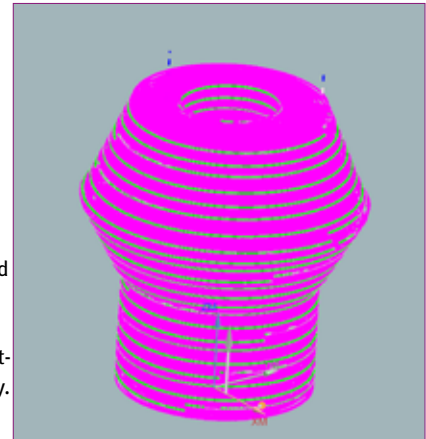


types is recommended. The operation "Planar Additive Spiral inwards and outwards" can be used for the basic body. This operation creates round toolpaths and is therefore ideal for cylindrical bodies. The picture opposite shows the toolpaths of the first operation.

For the sides of the part, a second operation is used, "freeform additive build", as the orientation of the machine tool table should be adjusted for this. The aim is that the tool always remains in its initial orientation.

In addition, many other types of operations are available. These include operations for zig-zag build-up, build-up movements and movements on free-form surfaces as well as special operations for the production of tubes.

The normal of the component surface can be selected for the output axis. After creation, the toolpaths are then displayed directly. In this operation, all other side surfaces can also be made after the check.



The simulation can now be carried out either as a whole or - as shown below - in individual steps.



Once the simulation process has run smoothly

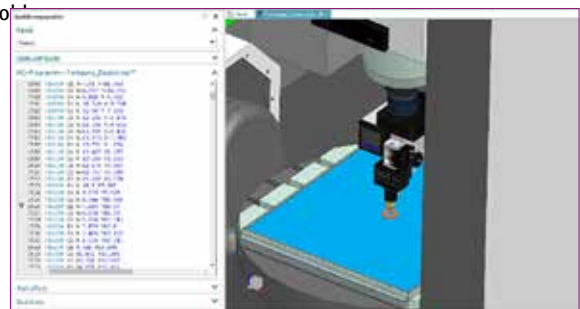
the po

been correctly integrated beforehand, the simulation process is immediately specified to match the machine. In this case, this results in a programme for the Sinumerik 828D or 840DSL.

The following illustration shows the simulation of the post-processor output. This eliminates any collisions that may occur later.

Afterwards, the created programme can be transferred to the machine without any problems.

The programme sequence is designed in such a way that the table is adjusted to a certain angle and also rotated. As the heating plate is connected to a cable, it is possible that a message will prompt you to briefly



disconnect the heating plate from the power supply so that the axis can swing over.



FRANCONIAN INNOVATION HELPS FIGHT CORONA

HALLSTADT-BASED COMPANY LAUNCHES PRODUCTION OF FACE SHIELDS FOR HOSPITALS USING INNOVATIVE 3-D PRINTING TECHNOLOGY

Optimum Maschinen Germany GmbH, in collaboration with a German engineering office and the University of Trier, has set up a 3-D print head that is ready for series production for industrial use in the production of urgently needed face shields. Since the end of last week, these visors, needed by doctors, hospital and nursing staff, can be produced using OPTIMUM brand CNC milling machines in a 3-D printing process. Starting next week, these visors will be made available free of charge to hospitals in the Bamberg area and northern Bavaria.

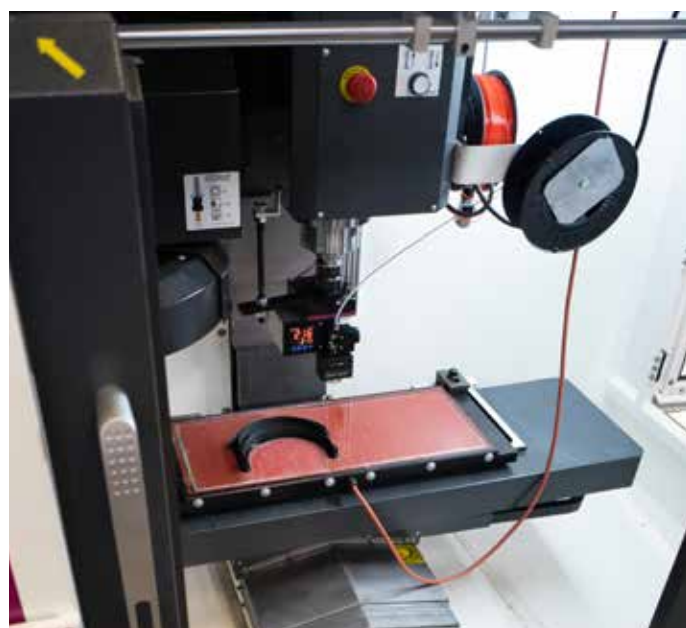
The great advantage of the technology used here is that such plastic parts can be additionally produced using the OPTIMUM OPTmill 3X 3-D print head in unmanned secondary shifts on standard CNC milling machines, which are used for other applications in the main shifts at the production plants. When the day shift starts, these parts, produced as a "positive side effect" can then be finished with very little manual effort and immediately distributed to the hospitals.

Although the quantities are not comparable to those achieved with conventional industrial plastics processing machines, for example, in injection moulding, the number of parts produced is still very high. However, there is no capital outlay for expensive moulds, and the additional costs for setup and machine operation are also extremely low. In addition, many different variants can be produced without any problems in line with individual requirements, even in the smallest batch sizes. All that is required is changes in the machine control programs, but no expensive plastics moulds, which would first have to be manufactured with a long lead time.

In the production of the plastic components, Optimum uses PLA filament,



Follow this for the video presentation



which is particularly suitable for the production of the required components due to its light weight and good flexibility. In addition, this material is obtained from renewable and natural raw materials and is therefore easily biodegradable.

Stürmer printed initial prototypes of these face shields on its OPTmill F 80 3-axis milling centre at its logistics centre in Pettstadt near Bamberg. The products are now being supplied to hospitals. The software required for this comes from Prusa Research a.s. in the Czech Republic, a company specialising in 3-D printing processes, which has made it available specifically for combating the corona pandemic. Kilian Stürmer, owner of the group, did not hesitate for a moment and was immediately enthusiastic about the idea of joining forces across national borders to tackle the pandemic and provide several milling machines for the production of these visors: "We are very happy to combine this great concept of our Czech neighbours with our know-how and decades of experience in the field of CNC milling and thus support those people who are currently working unconditionally for the health of all of us".

08 - ACCESSORIES



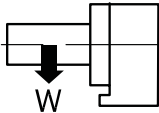
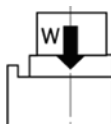
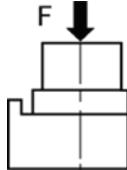
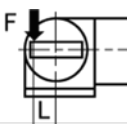
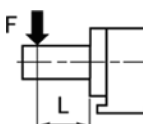
3D probe



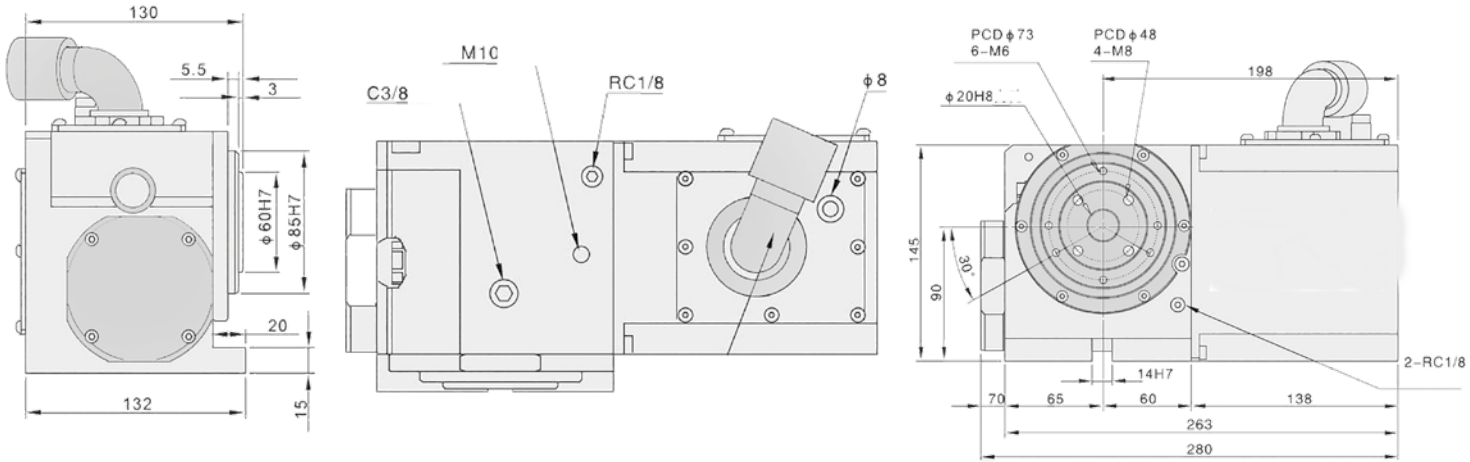
BAR FEEDER XH 552

FOURTH AXIS ROTARY INDEXING TABLE

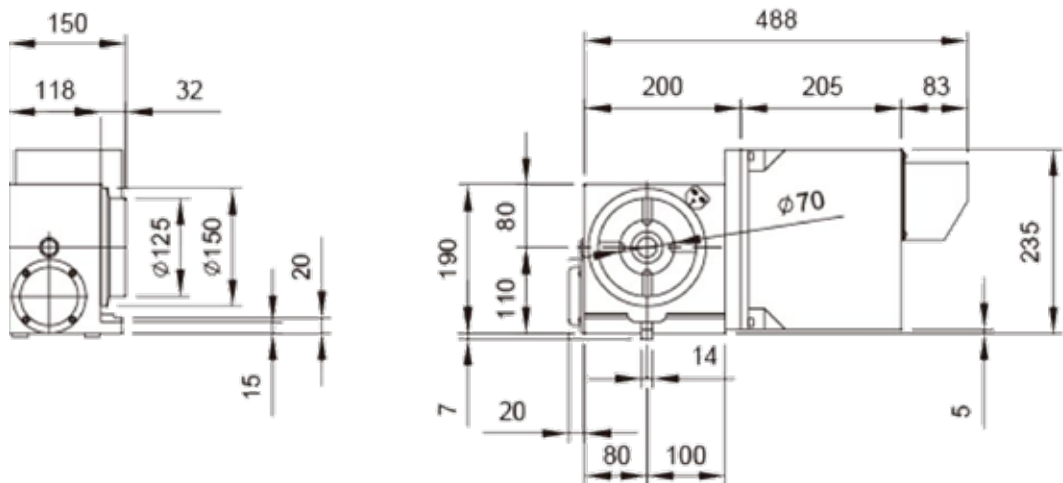


Model	F 80	F 105	F 120X	F 110HSC	F 200HSC	F 300HSC
	350108503	350110003	351512003	3511409050		
Technical data						
Table diameter	80 mm	120 mm	120 mm	120 mm		
Vertical table centre height	90 mm	110 mm	110 mm	115 mm		
Horizontal table height	130 mm	150 mm	150 mm	170 mm		
Total vertical height without motor cover	200 mm	190 mm	190 mm	193 mm		
Through bore	Ø 20 mm	Ø 30 mm	Ø 30 mm	Ø 30 mm		
T-slot width	14 H7	12 H7	12 H7	10 H7		
Slot nut width	14 H7	14 H7	14 H7	14 H7		
Servo motor type	SIEMENS	SIEMENS	SIEMENS	SIEMENS		
Transmission ratio	1:60	1:60	1:60	1:60		
Minimum step width	0.001°	0.001°	0.001°	0.001°		
Maximum speed	100 rpm	44.4 with motor 4000 rpm		33.3 rpm		
when connected to compressed air: pneumatic clamping force at 5 bar operating pressure	78 Nm	118 Nm		120 Nm		
when connected to hydraulics: hydraulic clamping force at 20 bar operating pressure				240 Nm		
Indexing accuracy	30''	60''	60''	30''		
Unidirectional repeatability	4''	+/- 2''		4''		
Bidirectional repeatability	490 Nm	118 Nm		12''		
Net weight	25 kg	38 kg		28 kg		
max. vertical tool weight		W = 20 kg	W = 50 kg		W = 35 kg	
max. vertical tool weight		W = 50 kg	W = 100 kg		W = 75 kg	
Max. radial load		F = 50 kg	F = 5.8 KN		F = 5.8 KN	
		F x L = 8 kg x m	F x L = 147 Nm		F x L = 78.5 Nm	
		F x L = 20 kg x m	F x L = 196 Nm		F x L = 176.5 Nm	

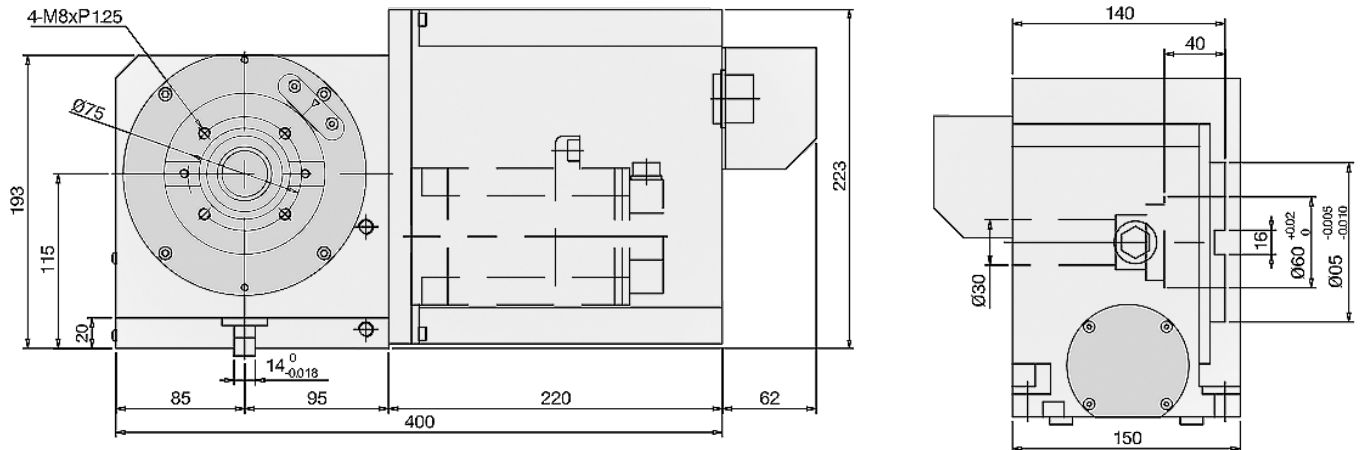
F 80



**F 105
 F 120X**

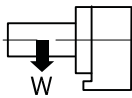
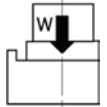
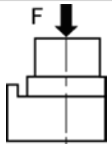
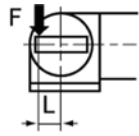
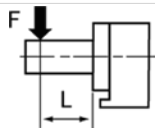


**F 110HSC
 F 200HSC
 F 300HSC**

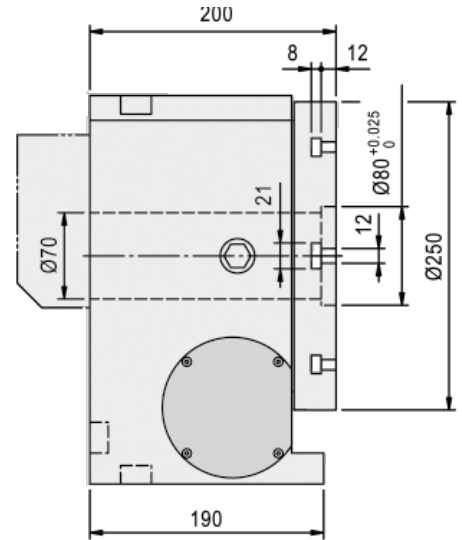
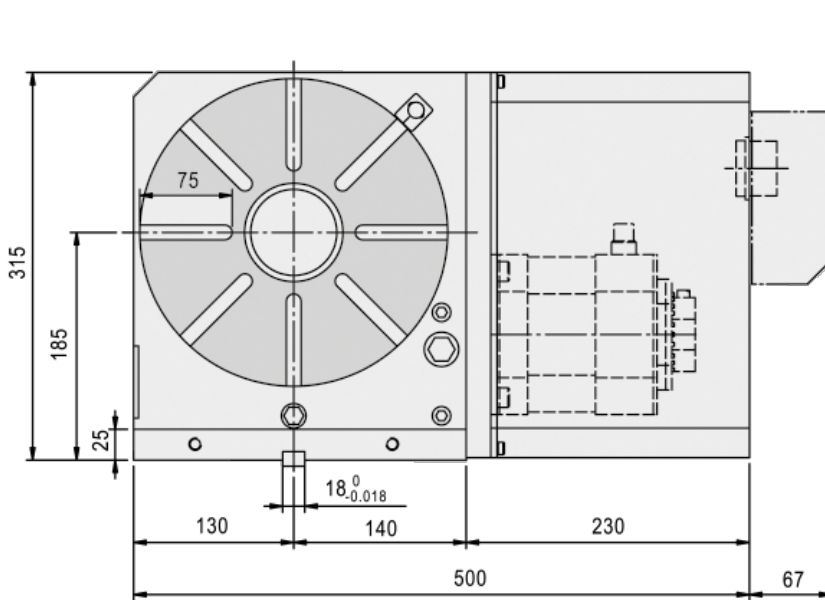


FOURTH AXIS ROTARY INDEXING TABLE

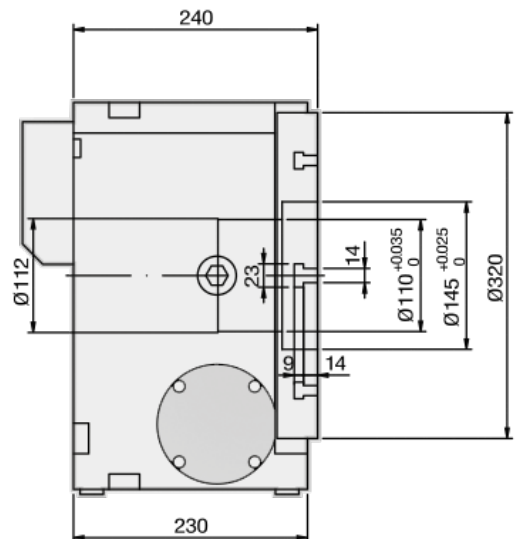
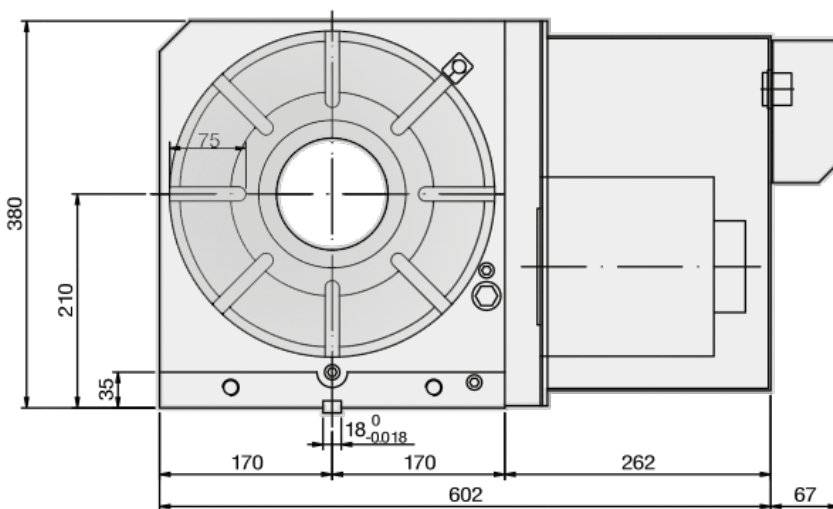


Model		F 400 HSC	F 500HSC
Article no.		3511290211	3511290212
Technical data			
Table diameter		250 mm	320 mm
Vertical table centre height		185 mm	210 mm
Horizontal table height		200 mm	240 mm
Total vertical height without motor cover		315 mm	380 mm
Through bore		Ø 70 ^{H7} mm	Ø 110 ^{H7} mm
T-slot width		12 ^{H7} mm	14 ^{H7} mm
Slot nut width		18 ^{H7} mm	18 ^{H7} mm
Servo motor type		SIEMENS 1FK7060	SIEMENS 1FK7083
Transmission ratio		1:180	1:180
Minimum step width		0.001°	0.001°
Maximum speed		11.1/22.2 rpm	11.1/22.2 rpm
when connected to compressed air: pneumatic clamping force at 5 bar operating pressure		250 Nm	
when connected to hydraulics: hydraulic clamping force at 20 bar operating pressure		500 Nm	
Indexing accuracy		15''	15''
Unidirectional repeatability		4''	4''
Bidirectional repeatability		50''	50''
Net weight		124 kg	210 kg
max. vertical tool weight		W = 150 kg	W = 175 kg
max. vertical tool weight		W = 300 kg	W = 350 kg
Max. radial load		F=1450 kg	F=2500 kg
		F x L = 922 Nm	FxL=142 kg x m
		F x L = 1770 Nm	FxL=200 kg x m

F 500HSC

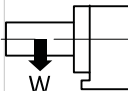
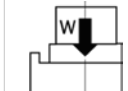
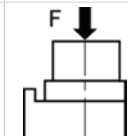
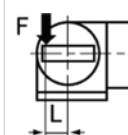
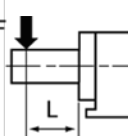


F 600HSC

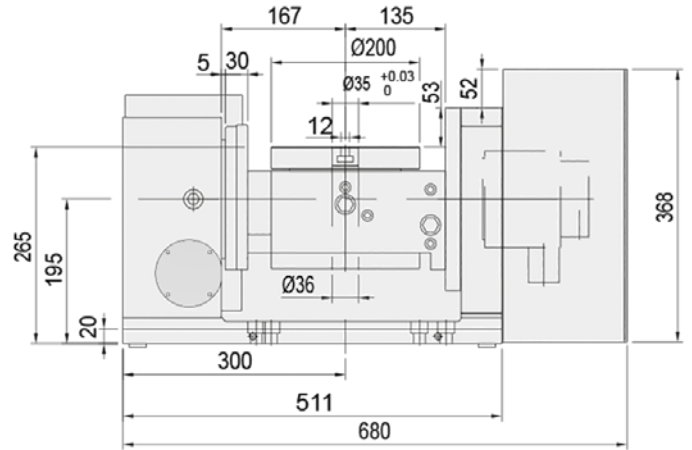
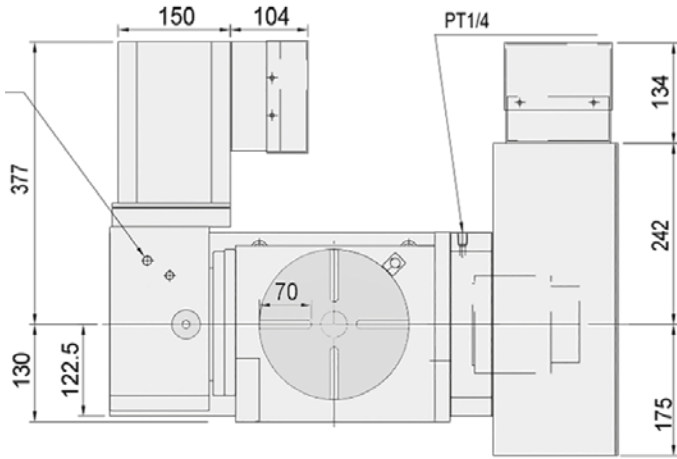


FIFTH AXIS ROTARY/SWIVELLING TABLE

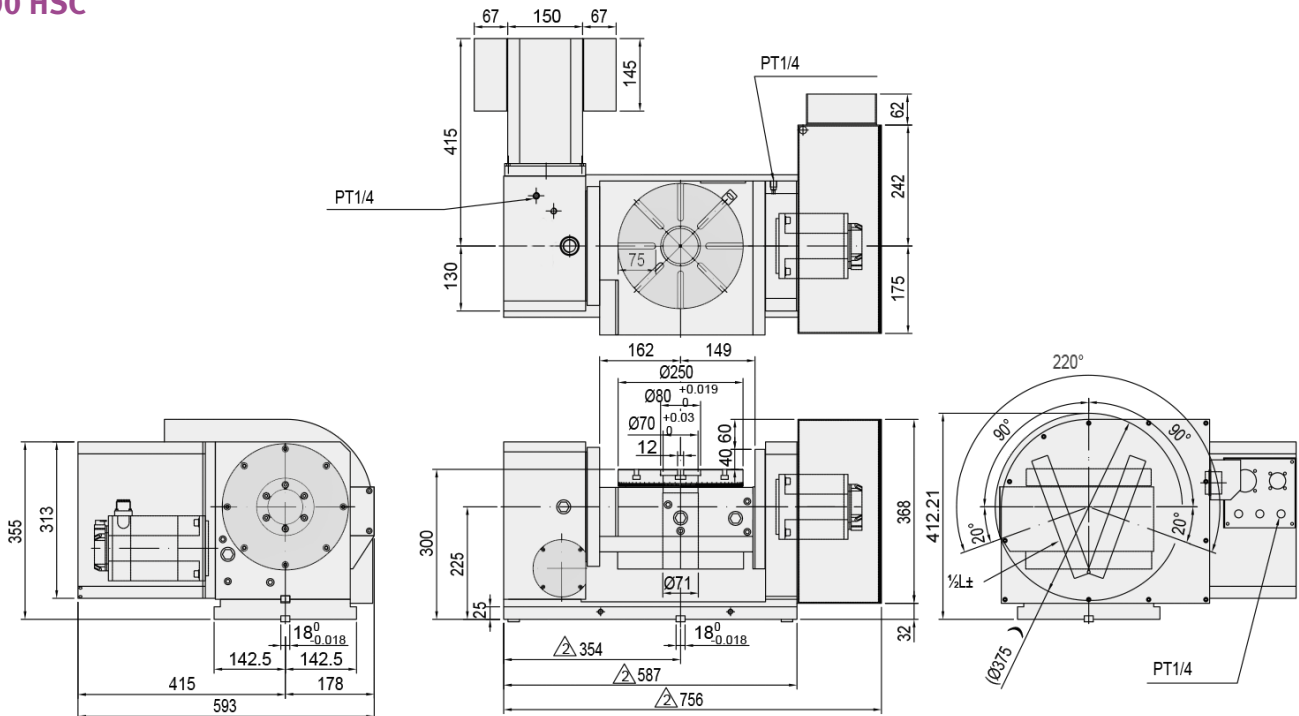


Model	F 110 HSC / F 200 HSC / F 300 HSC / F 600 HSC	F 600 HSC	
Article no.	3511409052	3511409056	
Technical data			
Possible machining diameter	200 mm	250 mm	
Height of the tilting centre	195 mm	225 mm	
Vertical overall height	360 mm	355 mm	
Passageway	Ø 35 ^{H7} mm	Ø 70 ^{H7} mm	
T-groove size	12 ^{H7} mm	12 ^{H7} mm	
Slot nut width	18 ^{H7} mm	18 ^{H7} mm	
Rotate servo motor types	SIEMENS 1FK7060	SIEMENS 1FK7060	
Tilting servo motor types	SIEMENS 1FK7063	SIEMENS 1FK7063	
Rotate transmission ratio	1:90	1:90	
Tilting transmission ratio	1:180	1:180	
Minimum step width	0,001°	0,001°	
Rotate / Tilting speed	max. 22.1 rpm / 11.1 rpm	max. 22.1 rpm / 11.1 rpm	
Tilt angle	-110° ~ 110°	-110° ~ 110°	
Rotate indexing accuracy	20''	15''	
Tilting indexing accuracy	50''	30''	
Net weight	240 kg	280	
max. vertical tool weight	 W	W = 50 kg	W=60 kg
max. vertical tool weight	 W	W = 100 kg	W=100 kg
	 F	F = 4.9 KN	F=1200 kg
Max. radial load	 F L	F x L = 161 Nm	F x L = 100 kg x m
	 F L	F x L = 147 Nm	F x L = 120 kg x m

F 110 HSC / F 200 HSC / F 300 HSC / F 600 HSC



F 600 HSC



STARTER SET

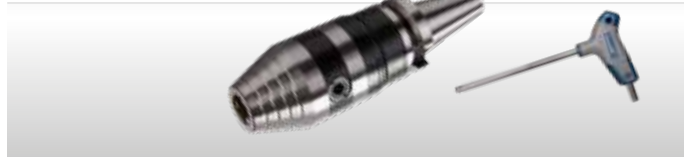
BT 30

Starter set BT 30	3536107
Comprises:	
· 1 piece cutter head tool holder	
· 1 piece quick-action drill chuck 1.5 - 16 mm	
· 2 pcs. each Weldon 6 mm / 20 mm	
· 1 pcs. each Weldon 8 mm / 10 mm / 12 mm / 16 mm	
· 1 pc. adapter BT 30 to MT 2	
· 3 pc. collet chuck holder ER 32	
· 1 piece collet spanner ER 32	
· 18-part collet set ER 32	
· 1 piece height adjuster	
· 1 piece assembly and tool setting aid	
· 14 pcs. pull studs	
· 1 pc. taper squeegee	

Milling head holder	3536306
· 22 mm seat	



Chuck	3536303
· Clamping range 1 - 13 mm	
· Concentricity 0.03 mm	
· Maximum speed 12 000 rpm	



Weldon holder	
Ø 6 mm	3536310
Ø 8 mm	3536311
Ø 10 mm	3536312
Ø 12 mm	3536313
Ø 16 mm	3536314
Ø 20 mm	3536315



Adapter	
BT 30 to MT 2	3536305
BT 30 to MT 3*	3536316

* not in starter set



Holder BT 30 - B16*	3353308
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* not in starter set



Collet chuck holder ER 32	3536304
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Collet chuck spanner ER 32	3536307
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Collet set ER 32	3441122
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· 18-part collet chuck set size Ø 1 - 16 mm



Height-adjuster	3536290
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· Analogue version
· For fast and easy determination of the reference point on the Z axis and/or for adjusting tools "to zero" (e.g., for milling or drilling) without damaging the workpiece



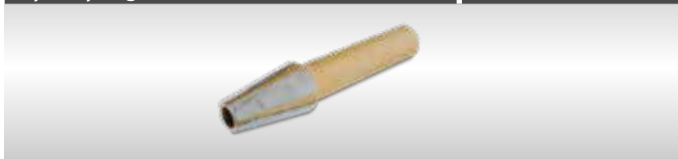
Assembly and tool adjustment gauge	3536206
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· For easy and precise adjustment of tools
· Vertical and horizontal collet for tools with a steep-angle taper



New

Taper squeegee	3536301
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Pull stud JIS B 6339	3536302
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· 30°



BT 40

08 ACCESSORIES

Starter set BT 40	3536108
Comprises:	
• 1 piece cutter head holder, 27 mm holder	
• 1 piece quick-action drill chuck 1.5 - 16 mm	
• 2 pieces each Weldon 6 mm / 20 mm	
• 1 piece each of Weldon 8 mm / 10 mm / 12 mm / 16 mm	
• 1 piece adapter BT 40 to MT 3	
• 4 pieces collet chuck holder ER 32	
• 1 piece collet spanner ER 32	
• 18-part collet set ER 32	
• 1 piece height adjuster	
• 1 piece assembly and tool setting aid	
• 15 pcs. pull studs	
• 1 pc. taper squeegee	

Milling head holder	3536336
• 27 mm seat	



Chuck	3536333
• Clamping range 1.5 - 16 mm	



Weldon holder	
Ø 6 mm	3536340
Ø 8 mm	3536341
Ø 10 mm	3536342
Ø 12 mm	3536343
Ø 16 mm	3536344
Ø 20 mm	3536345



Adapter	3536335
• BT 40 to MT 3	



Holder BT 40 - B16*	3353338
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Collet chuck holder ER 32	3536334
----------------------------------	----------------



Collet chuck spanner ER 32	3536307
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Collet set ER 32	3441122
• 18 collet chucks; sizes Ø 1 - 16 mm	



Height-adjuster	3536290
------------------------	----------------

- Analogue version
- For fast and easy determination of the reference point on the Z axis and/or for adjusting tools "to zero" (e.g., for milling or drilling) without damaging the workpiece
- Housing height 50 mm



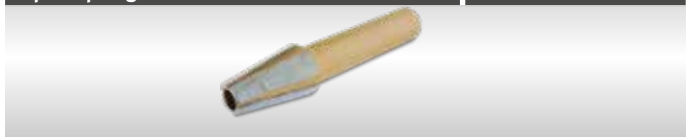
Assembly and tool adjustment gauge	3536205
---	----------------

- For easy and precise adjustment of tools
- Vertical and horizontal collet for tools with a steep-angle taper



New

Taper squeegee	3536331
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Pull stud JIS B 6339	3536332
• 30°	



STARTER SET

SK 40 / DIN 69871

Starter set SK 40 / DIN 69871 3536109

Comprises:

- 1 piece cutter head holder, 27 mm holder
- 1 piece quick-release drill chuck 1 - 13 mm
- 2 pieces Weldon 6 mm
- 1 pieces Weldon 8 mm
- 1 pieces Weldon 10 mm
- 1 pieces Weldon 12 mm
- 1 pieces Weldon 16 mm
- 2 pieces Weldon 20 mm
- 1 piece adapter SK 40 to MT 3
- 4 pieces collet chuck holder ER 32
- 1 piece spring collet spanner ER 32
- 18-part collet set ER 32
- 1 piece height adjuster
- 1 piece assembly and tool setting aid
- 1 piece taper squeegee
- 15 pieces pull studs

Milling head holder 3536366

- 27 mm seat



Chuck 3536363

- Clamping range 1 - 13 mm



Weldon holder

Ø 6 mm	3536370
Ø 8 mm	3536371
Ø 10 mm	3536372
Ø 12 mm	3536373
Ø 16 mm	3536374
Ø 20 mm	3536375



Adapter 3536365

- SK 40 to MT 3



Collet chuck holder ER 32 3536364



Collet chuck spanner ER 32 3536307



Collet set ER 32 3441122

- 18 collet chucks; sizes Ø 1 - 16 mm



Height-adjuster 3536290

- Analogue version
- For fast and easy determination of the reference point on the Z axis and/or for adjusting tools "to zero" (e.g., for milling or drilling) without damaging the workpiece
- Housing height 50 mm



Assembly and tool adjustment gauge 3536205

- For easy and precise adjustment of tools
- Vertical and horizontal collet for tools with a steep-angle taper



Taper squeegee 3536331



Pull stud DIN 69872 3536362



SK 50 / DIN 69871

Starter set SK 50 / DIN 69871	3536111
Comprises:	
· 1 piece cutter head holder, 27 mm holder	
· 2 pieces Weldon 6 mm	
· 1 pieces Weldon 8 mm	
· 1 pieces Weldon 10 mm	
· 1 pieces Weldon 12 mm	
· 1 pieces Weldon 16 mm	
· 2 pieces Weldon 20 mm	
· 1 piece adapter SK 50 to MT 3	
· 4 pieces collet chuck holder ER 32	
· 1 piece spring collet spanner ER 32	
· 18-part collet set ER 32	
· 1 piece height adjuster	
· 1 piece taper squeegee	
· 15 pieces pull studs	

Milling head holder	3536506
----------------------------	----------------

- 27 mm seat



Weldon holder	
Ø 6 mm	3536510
Ø 8 mm	3536511
Ø 10 mm	3536512
Ø 12 mm	3536513
Ø 16 mm	3536514
Ø 20 mm	3536515



Adapter	3536505
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- SK 50 to MT 3



Collet chuck holder ER 32	3536504
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Collet chuck spanner ER 32	3536307
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Collet set ER 32	3441122
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- 18 collet chucks; sizes Ø 1 - 16 mm



Height-adjuster	3536290
------------------------	----------------

- Analogue version
- For fast and easy determination of the reference point on the Z axis and/or for adjusting tools "to zero" (e.g., for milling or drilling) without damaging the workpiece
- Housing height 50 mm



Taper squeegee	3536501
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Pull stud DIN 69872	3536502
----------------------------	----------------



STARTER SET

HSK A-63

Starter set HSK A-63	3536110
Comprises:	
· 1 piece cutter head holder, 27 mm holder	
· 1 piece drill chuck 1 - 13 mm	
· 1 piece Weldon 6 mm	
· 1 pieces Weldon 8 mm	
· 1 pieces Weldon 10 mm	
· 1 pieces Weldon 12 mm	
· 1 pieces Weldon 16 mm	
· 1 pieces Weldon 20 mm	
· 1 pieces collet chuck holder ER 32	
· 18-part collet set ER 32	
· 1 piece spring collet spanner ER 32	
· 1 piece swivelling assembly block	
· 1 piece taper squeegee	

Milling head holder	3536414
· 27 mm seat	

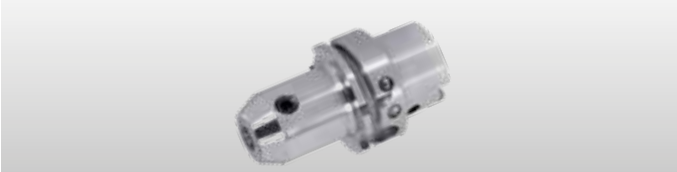


Chuck	3536411
· Clamping range 1 - 13 mm	
· Excellent precision and concentricity	
· Secure clamping of the workpiece thanks to mechanical clamping force booster	
· Avoids autonomous release of clamp while machining clockwise or anti-clockwise and in case of spindle stop	



Weldon holder	
· For clamping tools with a lateral carrier	
· Extremely smooth action	

Ø 6 mm	3536450
Ø 8 mm	3536451
Ø 10 mm	3536452
Ø 12 mm	3536453
Ø 16 mm	3536454
Ø 20 mm	3536455



Collet chuck holder ER 32	3536412
· For clamping tools with a cylindrical shank in ER collet chucks	
· Clamping range 0.5 - 10 mm	



Collet chuck spanner ER 32	3536307
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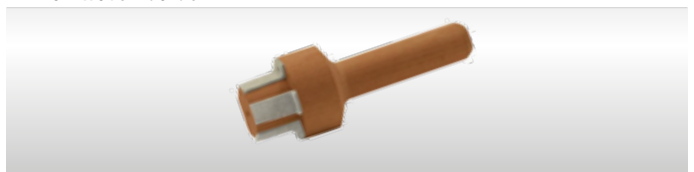
Collet set ER 32	3441122
· 18 collet chucks; sizes Ø 1 - 16 mm	



Assembly block	3536415
· For easy and precise adjustment of tools	
· Swivelling	



Taper squeegee	3536410
· For cleaning the machine taper to remove dust, chips and soiling	
· Non-woven border	



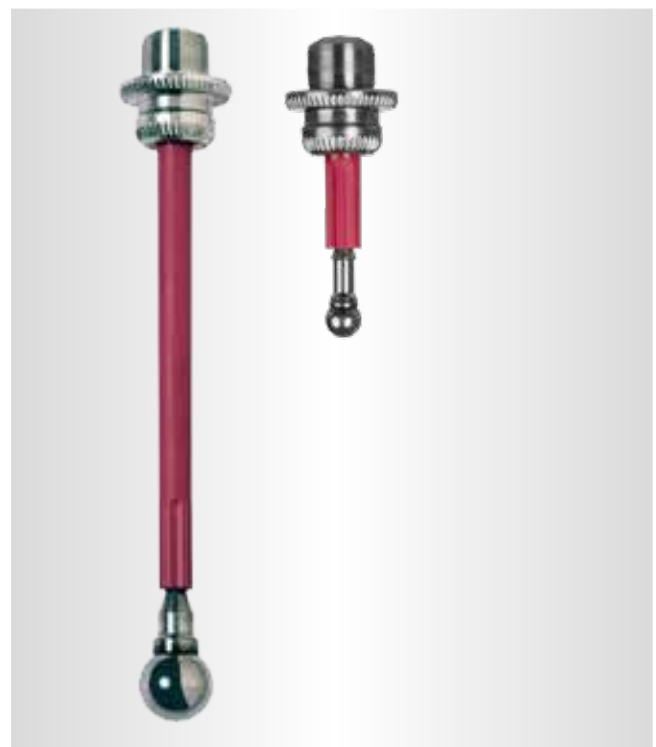
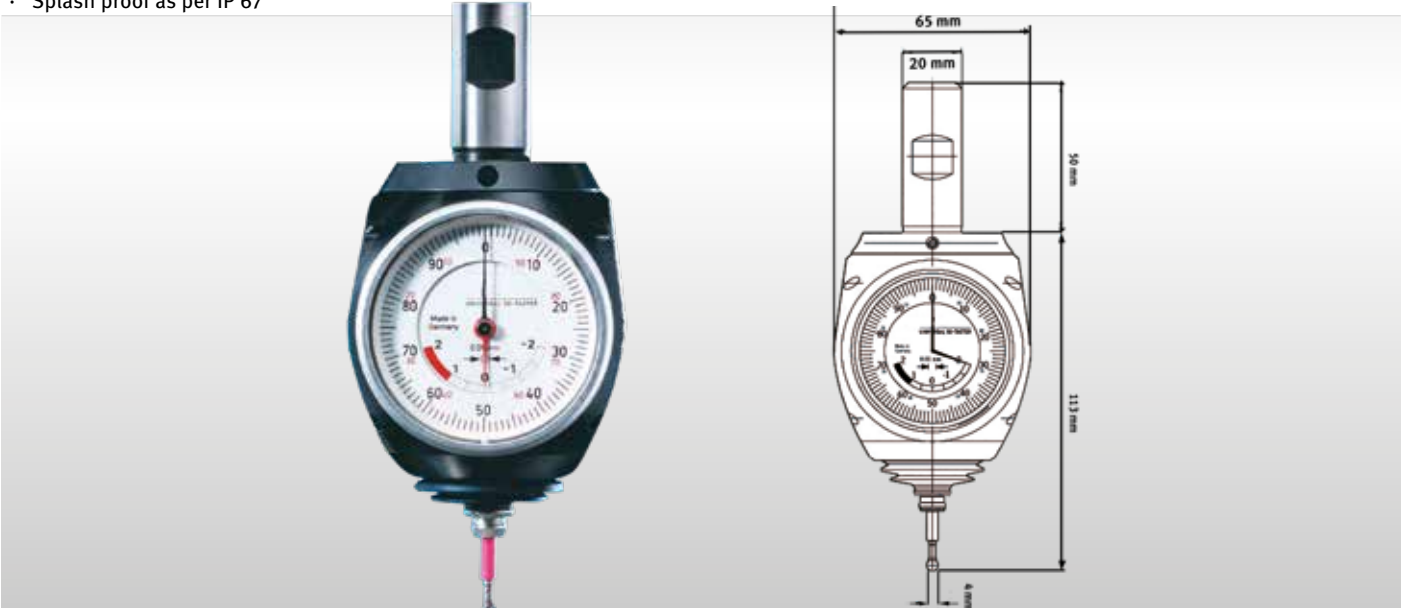
3D PROBE

08 ACCESSORIES

Universal 3D probe

Article no. 354700201

- High-precision, versatile measuring device for milling and erosion machines
- Reduces overheads, improves productivity and reduces staff workload
- For fast and easy setting of workpiece zero points and for length measurement
- This is clamped in the cutter spindle or the drilling head and supports precise positioning of the spindle axis on the workpiece or jig edges
- Arbitrary touch direction (X, Y, Z axis)
- Dial gauge shows the clearance between the spindle axis and the workpiece
- Including short probe insert Ø 4 mm
- Probe inserts of different lengths available, interchangeable without tools
- To maximise measuring accuracy and precision, all Universal 3D probes are individually measured and calibrated in installation
- Meets all currently applicable safety regulations
- Splash proof as per IP 67



Replacement tip for 3-D Haimer probe	Article no.
short Ø 4 mm	354700201S1
long Ø 8 mm	354700201S2

- › Short (ball Ø 4 mm) as well as long probe inserts (ball Ø 8 mm) are available for the probe, which can be changed without using tools.
- › After changing a probe insert, no recalibration of the probe is required.
- › The probe inserts are of course compatible with all HAIMER 3D probes.

BLUM

BLUM NOVOTEST FOR LC50-DIGILOG

PREMIUM LASER MEASURING SYSTEM FOR TOOL MEASUREMENT AND TOOL MONITORING



The most advanced laser measuring system worldwide

- Highly dynamic measurements of all tool characteristics
- Touchless measuring of all tool types, shapes and cutting materials
- Detection of geometry changes, such as cutting edge wear
- Continuously good part precision thanks to process-integrated temperature compensation
- Reliable compensation for spindle growth and orbital errors
- Automatic concentricity check detects poor tool holders and soiling
- Automated operation at low staffing levels



LC50-DIGILOG	3582116
• Blum LC50 Digilog length 200 mm	
• Smart Dock 1	
• Connecting cable 10 m	
• Spiral hose 3 m	
• Interface	
• Software Laser NT SIE	
• Max. tool diameter max. 80 mm	
• Including installation	
<i>Attention: Don't forget the reference tool</i>	

Laser control and measuring system	Article no.
TC 52IR and LC50-DIGILOG - Infrared transmission	3582117
TC 62RC and LC50-DIGILOG - BRC wireless technology	3582118
• for tools up to 80 mm diameter	
• SIEMENS license	
• Including installation	

Reference tool	Article no.
SK 40 spindle mount*	3582121
HSK-A63 spindle mount*	3582122

* ex stock Germany - for milling machines with **SIEMENS** SINUMERIK 828D control only.

BLUM

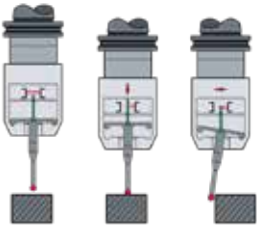
TC 52IR / TC 62RC WORKPIECE TOUCH PROBE

COMPACT HIGH SPEED MEASURING PROBE FOR WORKPIECE MEASUREMENT

Unrivalled precision and fast workpiece measuring thanks to modern, multidirectional measuring system with optical/electronic switching signal generation.

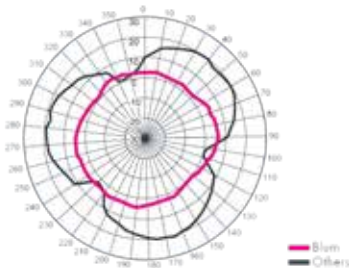
Wear-free, optical/electronic signal generation

- Switching signal generated by interrupting a miniature light barrier
- Switching point repeatability of $0.3\mu\text{m}$ at 2 m/min measuring speed
- Wear-free and durably stable
- Very compact probe with $\varnothing 40\text{ mm}$



High-precision, rotationally symmetrical measuring system

- Precise, directionally independent approach behaviour
- Constant deflection forces
- Spindle orientation not required
- No detrimental 3-leg principle with lobing effect



For machines with a **SIEMENS SINUMERIC 828D** control system only

Tool measuring probe TC	Article no. Ex warehouse Germany	Article no. ex works
TC 52IR - Infrared transmission	3582102	3511290604
TC 62RC - BRC wireless technology (without tool fitting)	3582103	-

- SIEMENS license
- Including installation



Reliable and proven transmission technology

- Sequential actuation of up to 2 measuring systems with one infrared receiver
- Switching on and off with M command



Ruby measuring insert	Article no.
Length 30 mm, $\varnothing 3\text{ mm}$ carbide	3582140
Length 30 mm, $\varnothing 5\text{ mm}$ carbide	3582141
Length 50 mm, $\varnothing 3\text{ mm}$ carbide	3582142
Length 50 mm, $\varnothing 5\text{ mm}$ carbide	3582143

Accessories for TC 52IR / TC 62RC	Article no.
SK 40 spindle mount*	3582125
HSK-A63 spindle mount*	3582126
BT 30 spindle mount*	3582124
BT 40 spindle mount*	3582127

*To be ordered according to the spindle holder

BLUM

ZX-SPEED TOOL TOUCH PROBE

UNIVERSAL 3-D PROBE HEADS FOR TOOL ADJUSTMENT AND TOOL BREAK MONITORING

Economical solutions for tool length and radius adjustment and tool break monitoring Precise and process-assured measurements due to state-of-the-art metrology equipment with optoelectronic switching signal generation

Wear-free, optical/electronic signal generation

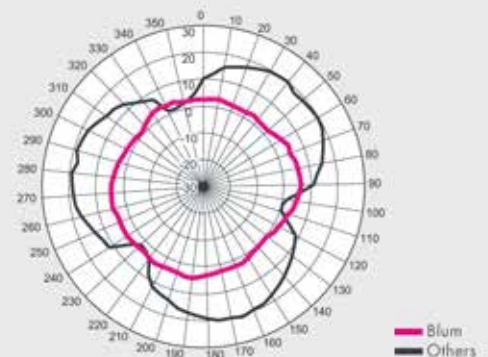
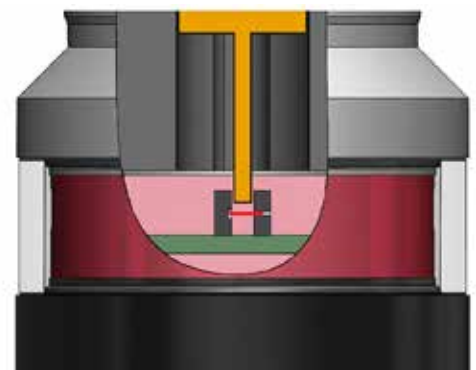
- Switching signal is generated by interrupting a miniature light barrier
- Allows for faster measuring speeds and measuring precision than comparable probes
- Reliable tool adjustment under the toughest conditions

High-precision state-of-the-art measuring equipment

- Precise, directionally independent switching behaviour
- Constant deflection forces
- Premium BLUM measuring equipment, latest generation
- No detrimental 3-leg principle
- No highly-sensitive switching elements

Latest transmission technologies

- ZX speed: Cable-connected
- ZX speed IR: Infrared transmission



Tool measuring probe ZX-Speed	Article no.
IR - Infrared transmission	3582104
RC - BRC wireless technology	3582105
<ul style="list-style-type: none"> • SIEMENS license • Including installation 	

Workpiece and tool measuring probe	Article no.
TC 52IR and ZX-Speed IR infrared transmission	3582108
TC 62RC and ZX-Speed RC BRC wireless technology (without tool fitting)	3582109
<ul style="list-style-type: none"> • SIEMENS license • Including installation 	

Reference tool	Article no.
• without pull stud	
BT 30	3582502
BT 40	3582504
SK 40	3582506



RENISHAW

OMP 40-2 /OMP 400 MEASURING PROBE

ULTRA-COMPACT WITH OPTICAL SIGNAL TRANSMISSION FOR WORKPIECE SET-UP AND TESTING

OMP 40-2 measuring probe

- The OMP40-2 transmits signals over 360° at an angle of 90° to the spindle axis and with a range of up to 5 m
- Modulated optical signal transmission is also resilient to malfunctions caused by light interference
- The repetition accuracy in one direction is 1.0 µm (determined with an approach speed of 480 mm/min and 50 mm probe insert).
- The probe can be switched off by an M command or via a configurable switch-off time
- Protection class IPX8, developed for tough deployment in machining centres.
- Visible LED display diagnostics

OMP 400 measuring probe

- Unrivalled 3D precision and repetition accuracy
- Reliably modulated, optical signal transmission
- Proven and patented Rengage technology
- Excellent resistance to light interference with modulated signal transmission
- 360° transmission range
- Ultra-compact design
- 3D measuring performance ideal for 5-axis machines
- Excellent 3D precision, specially for measuring 3D freeform surfaces
- High repetition accuracy independently of the probing direction
- Due to the very low probing force and probing uncertainty even long-

Renishaw OMP 40-2	Article no.
Ex warehouse Germany	3582010
• Including installation	

Workpiece and tool measuring probe	Article no.
OMP 40-2 and OTS	3582012
• Includes assembly	

- er probe inserts can be used
- Up to 10 times longer service life than with conventional switching probes
- Elimination of reset errors
- Switching on and off is possible in any spindle position

Renishaw OMP 400	Article no.
Ex warehouse Germany	3582020
• Including installation	



OTS - TACTILE 3-D TOOL MEASURING PROBE

FOR TOOL MEASURING AND TOOL BREAK MONITORING

Contact switching 3-D measurements

- Compact, tactile 3-D tool probe with optical signal transmission for tool breakage checking and fast measurement of the tool length and diameter on a variety of different tools
- Compatible with Renishaw receivers with modulated optical signal transmission

Benefits and features

- Proven kinematic design
- Excellent resistance to light interference with modulated signal transmission
- Directionally adjustable optical infrared module
- Cable-free for unrestricted machine movement and easy installation
- Repetition accuracy of 1.00 µm (2)



Touch probe	Article no.
OTS	3582011
• Including installation	

Workpiece and tool measuring probe	Article no.
OMP 40-2 and OTS	3582012
• Includes assembly	

RENISHAW

RENISHAW PRIMO SET* - Everything necessary is included.

START WITH AUTOMATIC WORKPIECE AND TOOL MEASUREMENT IN YOUR PRODUCTION ENVIRONMENT NOW AND ENJOY THE BENEFITS

Renishaw Primo Set	Article no.
with collet BT 30	3582030
with collet BT 40	3582031
<ul style="list-style-type: none"> • Radio Part Setter • Radio 3D Tool Setter • Primo Interface • GoProbe Software • Primo CREDIT-6 - Six month credit token including Primo Total Protect 	

Primo Credit Token	Article no.
Primo CREDIT-6 - Six months	3582040
<ul style="list-style-type: none"> • Includes Primo Total Protect (PTP) 	
Primo CREDIT-U - unlimited use	3582041

Primo™ Radio Part Setter (Tool measuring probe)

This probe automatically determines the workpiece reference point before machining and performs in-process measurements of the roughing or finishing workpiece dimensions.



Primo™ Radio 3D Tool Setter (Tool probe)

This measuring probe is used for automatic length and diameter measurement of a tool. It also enables tool breakage control during machining process.



Primo™ Interface (Interface)

The interface communicates with the workpiece and tool measuring probe and the machine tool control via Renishaw's highly reliable Frequency Hopping Spread Spectrum (FHSS) radio transmission.



Primo Credit Token (Credit token)

Each Primo Kit contains the first 6-month credit token. The 6-month credit token supports operation of the Primo System for six months. It offers flexibility in terms of credit payment, because you can postpone the purchase of a Primo credit token during quieter periods, until you need your Primo system back. The upgrade credit token - Primo CREDIT-U - offers unlimited use of the Primo system for a one-off payment.



GoProbe Software

supports cycles for workpiece and tool measurement and calibration. All cycles use a single line of code, making the software quick to learn and easy to use in daily operations.

Including:
Manual, programming disk, app, e-training, training workpiece, programming manual



Primo Total Protect (PTP)* (Primo total protection)

Primo Complete Protection is an extended guarantee to protect your investment when you have activated a credit token. If your Primo probe is accidentally damaged during this period, your Renishaw representative will supply you with a free replacement.

*Renishaw's terms and conditions apply



VDI 30

VDI 30 starter set 3536115

Comprises:

- 3 pcs. square transverse holder
- 1 pc. square transverse overhead holder
- 1 pc. square longitudinal holder
- 5 pcs. boring bar holder Ø 10 / 12 / 16 / 20 / 25 mm
- 3 pcs. cap
- 1 pc. collet chuck holder ER 25
- 1 piece collet spanner ER 25
- 15-part collet set ER 25
- 1 pc. tool holder
- 1 pc. chuck

Square transverse holder 3536231

- Right-hand type, short
- DIN 69880
- Large adjustable conical tipped nozzle



Square transverse holder 3536232

- For overhead work
- Right-hand type, short
- DIN 69880
- Large adjustable conical tipped nozzle



Square longitudinal holder 3536233

- Right-hand type
- Large adjustable conical tipped nozzle



Sealing cover 3536236

- Protects the tool changer against soiling



Collet chuck holder ER 25 3536237

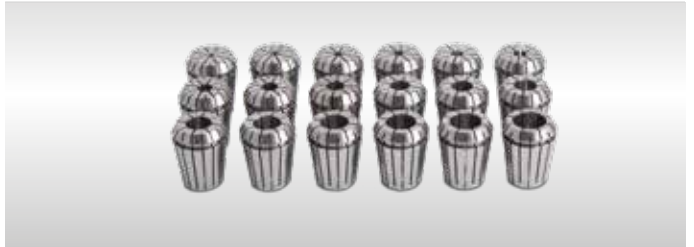


Collet spanner ER 25 3536240



Collet set ER 25 3441109

- 15 pcs.; sizes Ø 1 - 16 mm



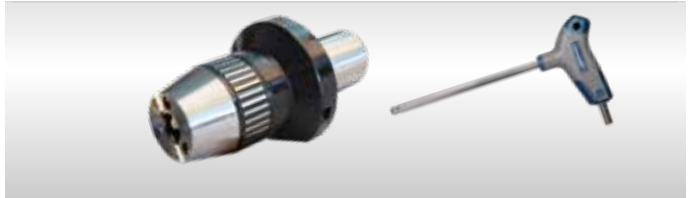
Tool holder 3536238

- Pre-worked
- Round blank



Chuck 3536239

- Clamping range 1 - 13 mm



Drill rod holder

- | | |
|---------|---------|
| Ø 10 mm | 3536241 |
| Ø 12 mm | 3536242 |
| Ø 16 mm | 3536243 |
| Ø 20 mm | 3536244 |
| Ø 25 mm | 3536245 |



STARTER SET

VDI 40

Starter set VDI 40 3536116

Comprises:

- 3 pcs. square transverse holder
- 1 pc. square transverse overhead holder
- 1 pc. square longitudinal holder
- 5 pcs. boring bar holder Ø 10 / 12 / 16 / 20 / 25 mm
- 3 pcs. cap
- 1 pc. collet chuck holder ER 25
- 1 piece collet spanner ER 25
- 15-part collet chuck set ER 25
- 1 pc. tool holder
- 1 pc. chuck

Square transverse holder 3536251

- Right-hand type, short
- DIN 69880
- Large adjustable conical tipped nozzle



Square transverse holder 3536252

- For overhead work
- Right-hand type, short
- DIN 69880
- Large adjustable conical tipped nozzle



Square longitudinal holder 3536253

- Right-hand type
- Large adjustable conical tipped nozzle



Sealing cover 3536256

- Protects the tool changer against soiling



Collet chuck holder ER 25 3536257



Collet spanner ER 25 3536260



Collet set ER 25 3441109

- 15 pcs.; sizes Ø 1 - 16 mm



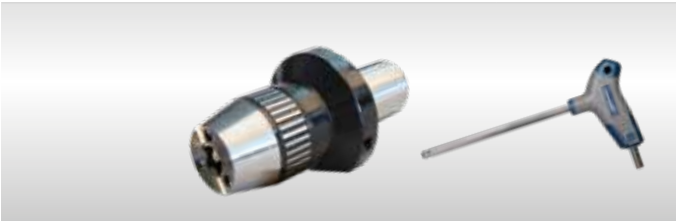
Tool holder 3536258

- Pre-worked
- Round blank



Chuck 3536259

- Clamping range 1 - 13 mm



Drill rod holder

- | | |
|---------|---------|
| Ø 10 mm | 3536261 |
| Ø 12 mm | 3536262 |
| Ø 16 mm | 3536263 |
| Ø 20 mm | 3536264 |
| Ø 25 mm | 3536265 |



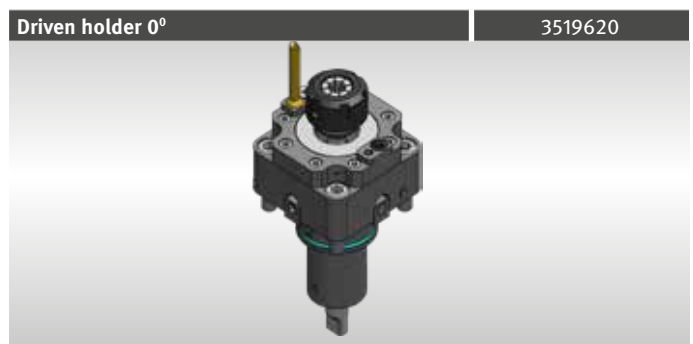
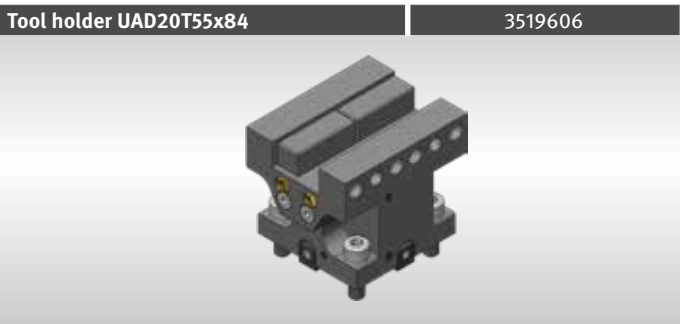
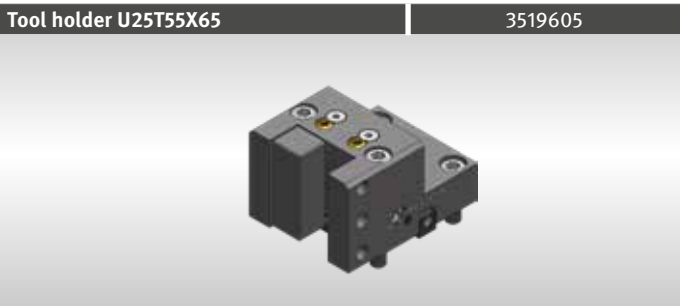
BMT 55

PREMIUM TOOL FROM  **ALGRA**

New

08 ACCESSORIES

Starter set BMT 55	3519602
Comprises:	
4 x tool holder U25T55X65	
2 x tool holder UAD20T55x84	
1 x tool holder B40T55X40	
1 x tool holder BN20T55X95	
1 x tool holder BN25T55X95	
1 x tool holder BN32T55X95	
1 x Adapter VDI 30/BMT 55	



PREMIUM TURNING TOOLS FROM YG-1

TURNING TOOL

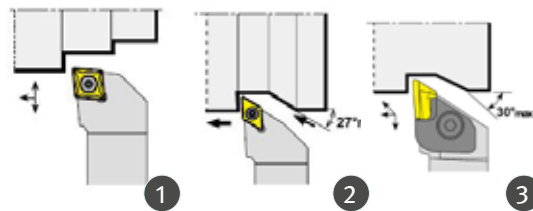
Lathe tool set left	Article no.
HM 20 mm / 6-parts (without plates)	3544190

Lathe tool set left	Article no.
HM 25 mm / 6-parts (without plates)	3544200



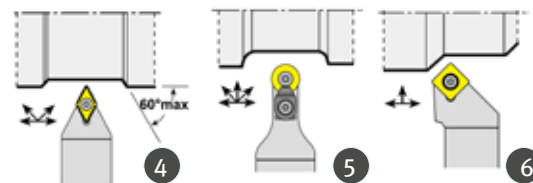
CARBIDE PLATES 20 MM

ISO				
①	SCLCL	20	K09	20 mm
②	SDJCL	20	K11	20 mm
③	CKJNL	20	K16	20 mm
④	SDNCN	20	K11	20 mm
⑤	SRDCN	20	K10C	20 mm
⑥	SSSCL	20	K12	20 mm



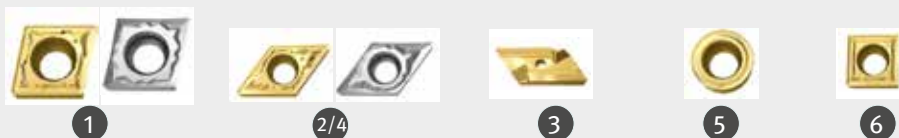
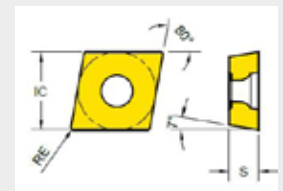
CARBIDE PLATES 25 MM

ISO				
①	SCLCL	25	M09	25 mm
②	SDJCL	25	M11	25 mm
③	CKJNL	25	M16	25 mm
④	SDNCN	25	M11	25 mm
⑤	SRDCN	25	M10C	25 mm
⑥	SSSCL	25	M12	25 mm



CARBIDE REPLACEMENT INSERTS

for DM no.	Article no.	PQ	ISO	RE	FN	Ap
①	3544210	10 pieces	CCMT 09T308-UG (Universal)	0.8	0.15-0.3	0.8-2.5
①	3544211	10 pieces	CCGT 09T308-AL (Aluminium)	0.8	0.1-0.35	1.0-1.0
②④	3544212	10 pieces	DCMT 11T308-UG (Universal)	0.8	0.05-0.25	1.0-2.0
②④	3544213	10 pieces	DCGT 11T308 AL (Aluminium)	0.8	0.1-0.3	1.0-2.5
③	3544214	10 pieces	RCMT 10T3M0 (Universal)	5.0	0.1-0.35	0.5-2.5
⑤	3544215	10 pieces	SCMT 120408-UG (Universal)	0.8	0.15-0.35	1.5-3.0
⑥	3544216	10 pieces	KNUX 160405L (Universal)	0.5	0.3-0.6	1.0-6.0



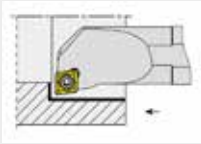
New

08 ACCESSORIES

PREMIUM TURNING TOOLS FROM YG-1

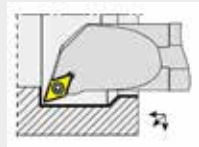
INTERNAL TURNING TOOL

Internal turning tool, roughing left (without plates)	Article no.
S08H-SCLCL/06	3544230
S10K-SCLCL/06	3544231
S12K-SCLCL/06	3544232
S16P-SCLCL/06	3544233
S20R-SCLCL/09	3544234
S25S-SCLCL/09	3544235

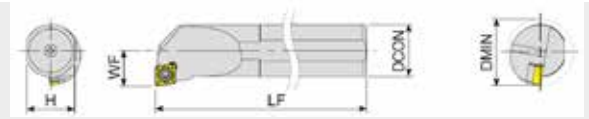


No.	Indexable inserts	Article no.
①	CCMT 060204-UG (Universal)	3544250
②	CCGT 060204-AL (Aluminium)	3544251

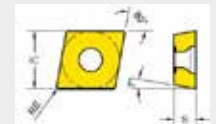
Internal turning tool for finishing left (without plates)	Article no.
S10K-SDQCL/07	3544240
S12K-SDQCL/07	3544241
S16P-SDQCL/07	3544242
S20R-SDQCL/07	3544243



No.	Indexable inserts	Article no.
③	DCMT 070208-UG (Universal)	3544252
④	DCGT 070204-AL (Aluminium)	3544253



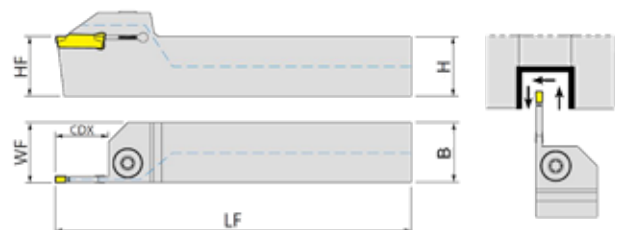
	DMIN	DCON	H	WF	LF
3544230	11	08	7.3	6	100
3544231	13	10	9	7	125
3544232	16	12	11	9	125
3544233	20	16	14.8	11	170
3544234	25	20	18.3	13	200
3544235	32	25	23	17	250
3544240	13	10	9	7	125
3544241	16	12	11	9	125
3544242	20	16	14.8	11	170
3544243	25	20	18.3	13	200



	RE	FN	Ap
3544250	0.4	0.10-0.25	0.5-2.0
3544251	0.4	0.02-0.15	0.5-1.0
3544252	0.8	0.10-0.25	0.8-2.0
3544253	0.4	0.02-0.15	0.1-2.0

CUT-OFF STEEL

Cut-off steel (without plates)	Article no.
YTEL2020-3T30-C left	3544220
YTEL2525-3T22-C left	3544221



	CW	CDX	H (HF)	B	LF	WF
3544220	3	30	20	20	125	20.4
3544221	3	25	25	25	150	25.4

Plate	Article no.
Rectangular plate (TDY3E-0.4-GM-YG602G) (VE10) Plate width 3 mm For external and internal turning and grooving First choice: Grooving and face turning For medium feed speed	3544225



Plate	Article no.
Radius plate (TDY3E-1.5-RG-YG602G) (VE10) Plate width 3 mm For external and internal turning and grooving Indexable insert with full radius for profiling	3544226



New

SHORT BAR LOADER SL 80-S

The SL80S is designed for the automatic loading of short bars. This machine is especially suitable for work in all standard applications.

Features:

- Commissioning and changing the bar diameter can be carried out in record time thanks to the intuitive control system.
- The user-friendly remote control ensures interaction between the bar loader and the CNC lathe.
- Advanced servo drive technology ensures precise rod control
- A standard retraction device for the X-axis enables easy replacement of the spindle bush and access to the rear of the lathe spindle.

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User-friendly remote control

- Offers maximum ease of use
- Simple parameter settings enable optional operation



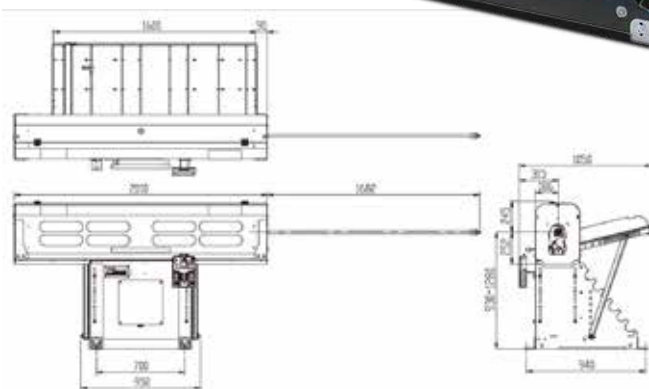
User-friendly remote control

- High-quality linear actuator offers precise and quiet operation
- All movements are controlled and monitored by the PLC, which operates with a high degree of reliability.



Quick changeover

- Extremely short cycle time for bar change, minimises unproductive time.
- Complete changeover from one diameter to another - quick and easy.



SL 80-S	
Bar diameter	6 - 80 mm With bar preparation for some maximum diameters
Magazine capacity	10 mm x 65 pieces
Bar length	360 - 1600 mm depending on the spindle length of the lathe
Spindle height	930~1280 mm
Weight	360 kg

New

08 ACCESSORIES

SHORT BAR LOADER XH 552

The LNS XH552 is an efficient and cost-effective bar feeder that ensures maximum productivity when feeding bars with diameters from 5 to 52 mm. High guide quality, low noise levels and effective vibration damping are guaranteed from start to finish.

- Locking points along the guide channels stabilise processing and increase productivity.
- The Power Booster overcomes tight sliding clamps or bar stock outside the tolerances to support insertion or extraction.
- Quick changeover of the bar diameter.
- Perfectly adapted design of the loading fingers supports smooth loading of the bars.



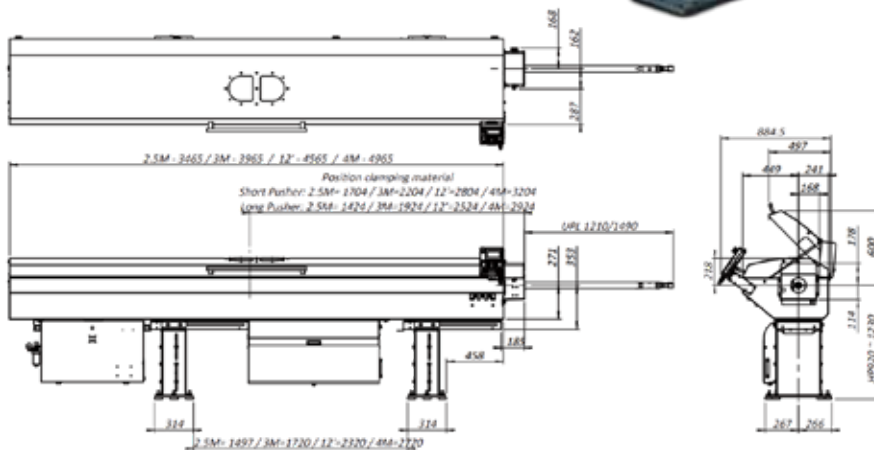
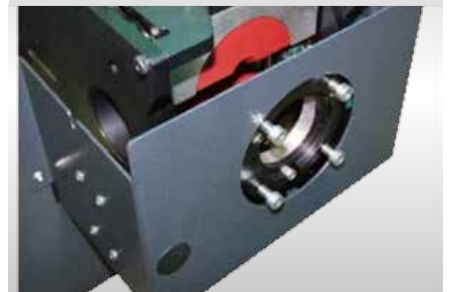
User-friendly remote control

- Offers maximum ease of use
- Simple parameter settings enable optional operation



Stability

- Greater stability of the bar material and fewer vibrations within the lathe



(Left to Right Front Bar Loader)

SL 80-S	
Bar diameter	5 - 52 mm With bar preparation for some maximum diameters
Magazine capacity	10 mm x 30 pieces
Bar length	893 - 4 200 mm depending on the spindle length of the lathe
Spindle height	920~1 230 mm
Weight	850 - 1 230 kg (depending on model)

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BAR FEEDER

New

BAR LOADER DB-EVO AUTOMATIC BAR FEEDER FOR CNC LATHES

EVolution in the field of automatic feeding! Constant and controlled guiding and loading of the bars without oil flooding. Suitable for bar and pipe material of any profile.

Bar material loading time: 3 to 6 seconds.

- Oriented loading of the bar material possible: e.g. top edge
- Dry-running: no oil flooding
- Unique design of the guide channel: significantly reduces vibrations even with material that is not perfectly straight
- Very high speeds with both round and profile material
- Short offcuts, as no clamping sleeve is used
- Very short loading time: Loading process during processing
- Stable construction
- Very low wear on the guide channel
- Low power consumption (start/stop function)



Conversion to other machining diameters can be carried out in just a few minutes by quickly replacing the rotating rod guide bushes



2 tool drawers for convenient storage of your tools and accessories



The guide bushes are mounted on movable and fixed carriages and do not require any lubrication to optimally guide the rotating bar material



On request

ARE YOU INTERESTED?

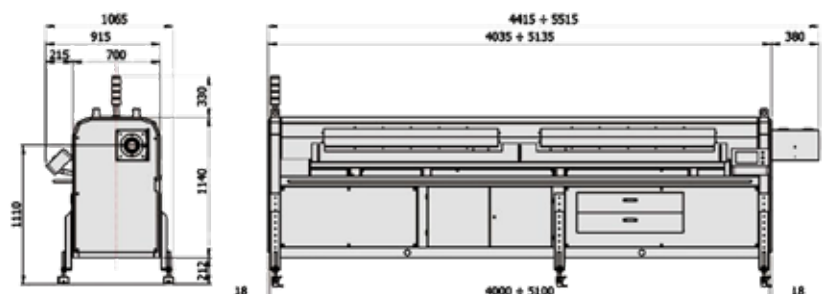
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Optionally available

- Magazine with bundle loading
- Loading device for short bars and offcuts
- Sliding device with rails fixed to the floor
- Device for position-orientated loading of the bar material, e.g. for square material
- Remote maintenance





AUTOMATIC BAR GRAB GRIPPEX LIGHTWEIGHT AND COMPACT

The Grippex bar grab boosts production and automation on your CNC lathe!

Only a small minority of all CNC lathes installed today is equipped with a bar feeder magazine. There are various reasons for this, such as the relatively high procurement costs or lack of space in the workshop. For small-batch production, however, a bar feeder that makes use of the existing conditions on the machine, such as hollow spindles and hollow clamping cylinders, is often sufficient. These devices only need to be supplemented with a guide tube and the GRIPPEX bar gripper. The Grippex bar gripper can be added to almost any lathe turret.

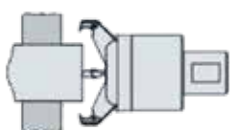
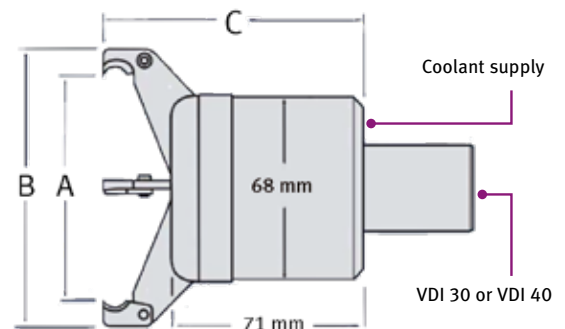
Benefits and main features of the GRIPPEX bar grab

- Fast and easy installation - the grab's work range can be fully utilised without conversion
- Lightweight and compact - thus allowing the turret to be fully occupied
- Resists high coolant pressure (20 bar). No need for a pressure reduction valve
- Works reliably as of 0.5 bar coolant pressure
- Clamps directly at the chuck - resulting in stable cutting of the turned parts.
- Clamps with 3 legs - thus ensuring trouble-free processing of hexagonal bars at any angle to the spindle.
- Equipped with robot clamping jaws, the device can also be used as a workpiece grab.

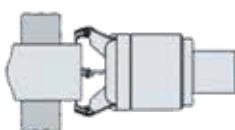


Grippex II	VDI 30	VDI 40
	Article no.	Article no.
Grab range 2-60 mm	354500100	354500103
Grab range 3-80 mm	354500101	354500104
Grab range 7-105 mm	354500102	354500105

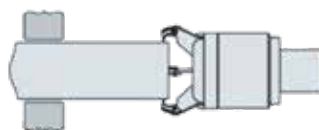
Gripping ranges	A	B	C
2 - 60 mm	64 mm	83 mm	89 mm
3 - 80 mm	83 mm	102 mm	94 mm
7 - 105 mm	110 mm	129 mm	108 mm



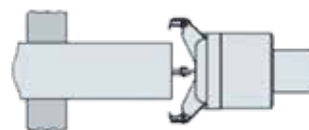
Call the turret position with the bar grab



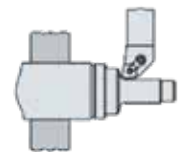
Move the grab to the grabbing position.
Coolant ON



Release the collet chuck or collet. Pull out the bar to the programmed Z position with a programmed feed



Clamp the collet chuck or collet.
Coolant OFF to release the bar



New machining
Getting started

New

AFS- AIR PURIFICATION DEVICES AND CENTRAL EXTRACTION SYSTEMS FOR OIL AND EMULSION MISTS

DECENTRALISED INDIVIDUAL DEVICES FOR USE ON OR AT A MACHINE TOOL



AFS 1100

Mechanical filters and separators for use with water-based cooling lubricants

- Preliminary decision: 5 stages, partially maintenance-free
- Post-filter: HEPA H13
- Separation performance: 99.95% for particles $> 0.3 \mu\text{m}$
- volume flow: $1100 \text{ m}^3/\text{h}$
- Connection: 3~, 380...480V, 50/60 Hz
- Power consumption 0.5 kW



AFS 1600

Mechanical filters and separators for use with water-based cooling lubricants

- Preliminary decision: 5 stages, partially maintenance-free
- Post-filter: HEPA H13
- Separation performance: 99.95% for particles $> 0.3 \mu\text{m}$
- volume flow: $1600 \text{ m}^3/\text{h}$
- Connection: 3~, 380...480V, 50/60 Hz
- Power consumption 0.95 kW



AFS 1000 E

Electrostatic 1-stage, for use with oil as cooling lubricant

- Pre-separation: 4 stages
- Main separation: Electrostatic
- volume flow: $500 - 1800 \text{ m}^3/\text{h}$
- Connection: 3~, 380...480V, 50/60 Hz
- Power consumption 0.2 kW at $1000 \text{ m}^3/\text{h}$
- GrindTec 2022 Innovation Award

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Central AFS extraction systems

are the sensible alternative when there are several machine tools in a hall and high hall temperatures and humidity put a strain on employees and machines.

The systems can be designed as an exhaust air/recirculating air concept or in conjunction with a supply air system with heat recovery. Turnkey ready. AFS takes care of planning, design, installation and, if required, service.



FLEXCAT 378 EOT-PRO

SPECIAL VACUUM CLEANER FOR INDUSTRY WITH SPECIAL SIEVE INSERT FOR EXTRACTING COOLING LUBRICANTS, HIGHLY OILY LIQUIDS AND COARSE METAL CHIPS IN LARGE QUANTITIES

- › Removable strainer insert for separate disposal of the metal swarf
- › Ball valve for draining fluids
- › Motors equipped with copper windings and motor protection
- › For exacting machine cleaning in professional metalworking
- › The special seal between the head and the tank is resistant against oil and chemical residues without compromising on flexibility
- › Oil-resistant suction hose resilient to heavy loads and any kind of twisting
- › Stainless steel container is insensitive to sharp-edged metal chips.
- › Side hose connection for improved suction power
- › Metal hose connection on tank with locking mechanism prevent

- › hose coming loose during cleaning
- › Suction motors with noise damping to ensure quiet operation

Model	flexCAT 378 EOT-PRO
Article no.	7003380
Vacuum cleaner type	Wet & dry
Rating	3.3 kW 230 V ~50 Hz
Tank volume	78 l
Tank material	Stainless steel
Dimensions (L x W x H)	635 x 58 x 1 030 mm
Weight	34 kg

- › For exacting machine cleaning in professional metalworking
- › Stainless-steel tank is not sensitive to damage from sharp edged metal chips
- › Hose connection on side to improve vacuuming performance



FLEXCAT 3100 EOT-PRO

SPECIAL VACUUM CLEANER FOR OIL-CONTAINING LIQUIDS AND METAL CHIPS



- › Ball valve for draining fluids
- › Powder-coated steel frame as additional bump protection
- › Integrated screen strainer system
- › Stainless-steel tank is not sensitive to damage from sharp edged metal chips
- › Large swarf strainer for collecting dry metal swarf
- › Floatation switch for safe stop for full tank in wet vacuuming
- › Metal hose connection on tank with locking mechanism
- › With fill level display and visual fill level monitoring through transparent hose at side
- › Trolley with non-marking fixed rollers at rear, and steering rollers parking brake at front
- › With filter monitoring, power socket and automatic switch-on
- › The special seal between the head and the tank is resistant against oil and chemical residues without compromising on flexibility
- › Oil-resistant suction hose resilient to heavy loads and any

- › kind of twisting
- › Suction motors with noise damping to ensure quiet operation
- › Three motors can be separately engaged
- › Motors equipped with copper windings
- › Unit is supplied with 230V CEE plug

Model	flexCAT 3100 EOT-PRO
Article no.	7003382
Vacuum cleaner type	Wet & dry
Rating	3.3 kW 230 V ~50 Hz
Air volume	10 500 l/min
Tank volume	100 l
Hose diameter/length	50 mm / 3 m
Sound pressure level	76 dB(A)
Tank material	Stainless steel
Dimensions (L x W x H)	850 x 650 x 1 350 mm
Weight	65 kg

Hose and nozzle set
oil resistant Ø60mm



Nozzle set
7013423

3m oil resistant suction hose

Art no. 7013435

Floor nozzle

Art no. 7013436

Rubber lip insert for floor nozzle

Art no. 7013437

Rubber surface nozzle

Art no. 7013438

Adapter cable 230V Schuko - CEE

coupling 16A, 1.5m

Art no. 7013800

Adapter cable 400V CEE plug - CEE

coupling 16A, 1.5m

Art no. 7013805



HIGH-PRECISION MANUALLY PIVOTING HPPA ARM WITH PROBE

FOR TOOL MEASUREMENT, FEATURING A 3-AXIS RP3 TOOL PROBE

Why measure on the machine?

Your lathe represents a considerable investment. Fast machining of complicated workpieces is just one of the many benefits. However, this investment can only be profitable if your machines produce as many workpieces as possible.

But why do some machines stand still for hours? Quite simple: Tools are often set manually and workpieces are checked for dimensional accuracy outside the machine. In both cases an expensive piece of equipment is idle, and this inevitably leads to long, unprofitable and avoidable standstill periods.

Reduce downtimes, avoid scrap

Manual tool measurement, position detection of workpieces and dimensional checks take a lot of time. In addition, these work steps offer no repetition accuracy and susceptible to operating errors. The use of measuring probes eliminates the need for set-up workpieces and expensive clamping fixtures. The measuring software automatically determines the diameter and length of the tools, detects the position of the workpiece and identifies allowances and dimensions of workpiece blanks. The use of measuring probe systems avoids unprofitable standstill periods and scrap.



**Renishaw measuring arm with probe
for L44- Ø 150 mm lathe chuck**

**Article no.
3582080**

- Including installation
- TSI2 Interface
- User Manual

Arm/housing unit with probe

- The compact arm/housing unit is fully sealed.

Probe protection housing

- A separate probe protection housing protects the probe when not in use.

TSI2 Interface

- The interface processes signals between the probe and the machine control and thus supports easy integration. The unit is mounted on a DIN rail and has an "Easy Fit" installation mechanism. Two plugs are provided for easy wiring with the HPPA (3-pin) and machine control (25-pin SUB-D).

Benefits

- Up to 90 % faster tool measuring.
- Recommended OEM arm configurations for all standard chuck sizes.
- Robust Renishaw design guarantees trouble-free operation even under the toughest ambient conditions in a tool machine.
- IPX8 protected (static)
- LED displays the probe status and the operational readiness of the arm
- Use of a probe with a predetermined breaking section protects the probe if the max. probe overrun is exceeded.

System specification

Application	Tool measurement on CNC lathes	
Touch directions	Measuring probe	±X, ±Y, +Z
	Machine	±X, ±Z, +Y
Typical position accuracy (measuring speed 36 mm/min)	5 µm 2σ X/Z	
Protection against environmental influences	IPX8 (static)	
Temperature range for operation	5° C to 60° C	
Arm pivoting angle	91°/90° (if the probe protection housing by Renishaw is not use, the max. arm pivoting angle is 91°)	

Carbide end mill set

3352118

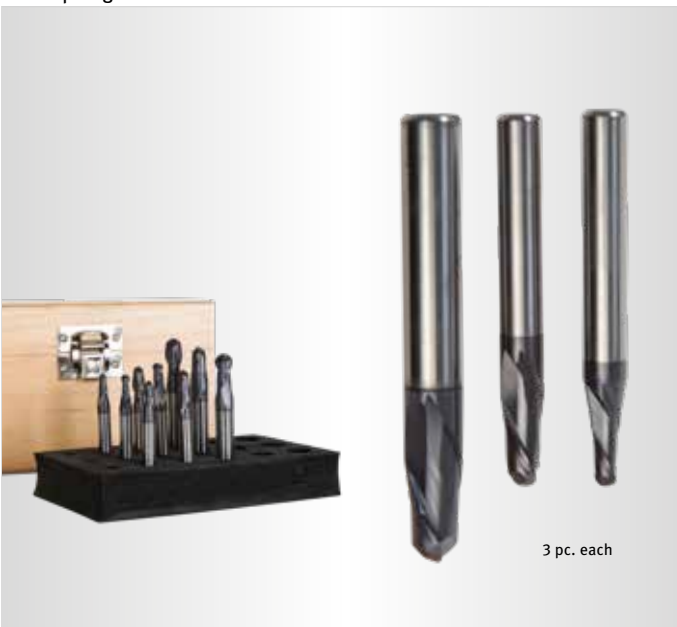
- › 18-part; 3 each in the sizes 3/4/6/8/10 and 12 mm
- › 4-cutting edge version
- › Coated solid carbide end mill (TiALN)
- › Centre cut for plunging
- › Chip angle 35 °



Radius end mill set

3352116

- › 9-part; 3 each in the sizes 4 mm / 6 mm / 8 mm
- › 2-cutting edge version
- › Coated solid carbide end mill (TiALN)
- › Face cutting geometry for plunging
- › Chip angle 30 °



Countersink set

3201050

- › As per standard DIN 335C
- › 6-part: 6/8/10/11.5/15/19 mm
- › Premium conical counterbores Burrs are nicely chamfered and removed without causing scratches
- › Compatible with popular battery-powered screwdrivers and drills, including upright drilling machines
- › Practical OPTIMUM plastic case



Drilling and thread tapping set

3202015

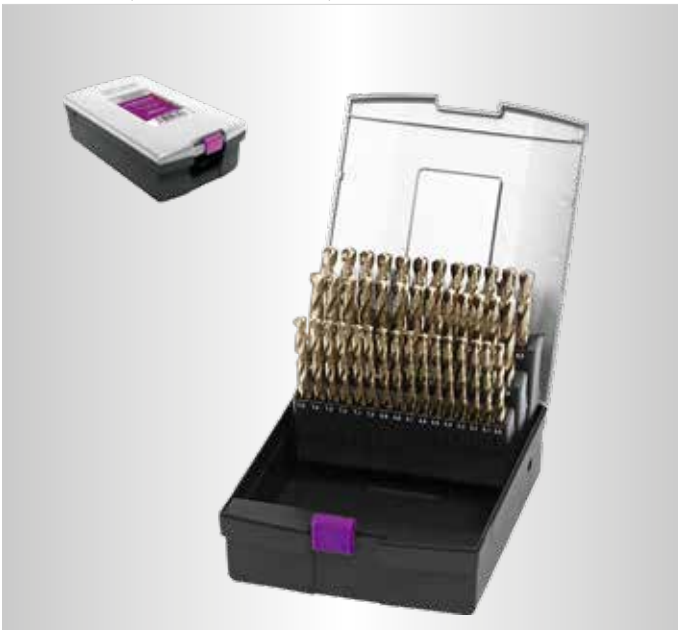
- › Through bore
- › 15-part
- › 7 pcs. thread taps: M3 / M4 / M5 / M6 / M8 / M10 / M12
- › 7 pcs. twist drills DIN 338: Ø2.5 mm / Ø3.3 mm / Ø4.2 mm / Ø5.0 mm / Ø6.8 mm / Ø8.5 mm / Ø10.2 mm
- › Tap wrench DIN 1814 size 1½
- › Practical OPTIMUM plastic case



HSS twist drill with morse taper	Article no.
<ul style="list-style-type: none"> > 9-part; 14.5/16/18/20/22/24/26/28/30 mm > Long service life > Good chip removal > Right handed 	
MT 2	3051002
MT 3	3051003



Twist drill set	Article no.
<ul style="list-style-type: none"> > As per DIN 338 HSS-CO 5 % > Tetrahedral 135° split point allows for excellent self-centring > High speed/feed properties > Strong core design optimises the structural strength of the bit and minimises the risk of bit breakage > Practical OPTIMUM plastic case 	
25-part	3201010
<ul style="list-style-type: none"> > 1- 13 mm 	
51-part	3201020
<ul style="list-style-type: none"> > 1 - 6 mm (in 0.1 mm increments) 	
41-part	3201021
<ul style="list-style-type: none"> > 6 - 10 mm (in 0.1 mm increments) 	



OPTIMUM Precision quick-action drill chuck	Article no.
Concentricity better than 0.06 mm	
1 - 8 mm; B16	3050608
1 - 10 mm; B16	3050610



Travelling centre point	Article no.
Maximum concentricity deviation 0.005 mm	
MT 2	3451002
<ul style="list-style-type: none"> > max. 7 000 rpm; 2 000 N max. radial load > NSK ball roller bearings and INA needle bearings 	
MT 3	3451003
<ul style="list-style-type: none"> > max. 5 000 rpm; 4 000 N max. radial load > NSK ball roller bearings and INA needle bearings 	
MT 4	3451004
<ul style="list-style-type: none"> > max. 3 800 rpm¹; 8.000 N max. radial load > NSK ball roller bearings and INA needle bearings 	
MT 5	3451005
<ul style="list-style-type: none"> > max. 3 000 rpm; 20 000 N max radial load > 2-row SKF angular contact bearings 	



Quick release chuck	Article no.
DKC13 / 0-13 mm 4 800 rpm	3050632
DKC16 / 0-16 mm 4 000 rpm	3050633



Clamping tool assortment SPW	Article no.
› Metric thread	
› 58-part: 24 pcs. tightening bolts, 6 pcs. T-nuts, 6 pcs. nuts, 4 pcs. extension nuts, 6 pcs. clamping punches, 12 pcs. clamping blocks	
Size 8	3352015
› T-slot nuts 10 mm; tightening thread M 8	
Size 10	3352016
› T-slot nuts 12 mm; tightening thread M 10	
Size 12	3352017
› T-slot nuts 14 mm; locking thread M12	
Size 14	3352018
› T-slot nuts 16 mm; tightening thread M 14	
Size 16	3352019
› T-slot nuts 18 mm; tightening thread M 16	



Clamping block set 16-05	Article no.
› 1 pc. clamping block SLTBN 16-05	3440653
› 1 pc. parting off tool SLIH 26-2	
› 1 pc. parting off tool SLIH 26-3	
› 5 pcs. cutting plates GTN2 (cutting width 2.2 mm)	
› 5 pcs. cutting plates GTN3 (cutting width 3.1 mm)	
› Aluminium box	

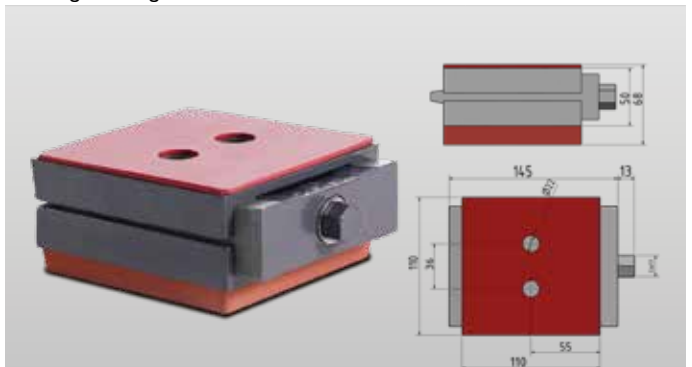
Clamping block set 20-05	Article no.
› 1 pc. clamping block SLTBN 20-05	3440654
› 1 pc. parting off tool SLIH 26-3	
› 1 pc. parting off tool SLIH 26-4	
› 5 pcs. cutting plates GTN3 (cutting width 3.1 mm)	
› 5 pcs. cutting plates GTN4 (cutting width 4.1 mm)	
› Aluminium box	

Clamping block set 25-05	Article no.
› 1 pc. clamping block SLTBN 25-05	3440655
› 1 pc. parting off tool SLIH 26-3	
› 1 pc. parting off tool SLIH 26-4	
› 5 pcs. cutting plates GTN3 (cutting width 3.1 mm)	
› 5 pcs. cutting plates GTN4 (cutting width 4.1 mm)	
› Aluminium box	



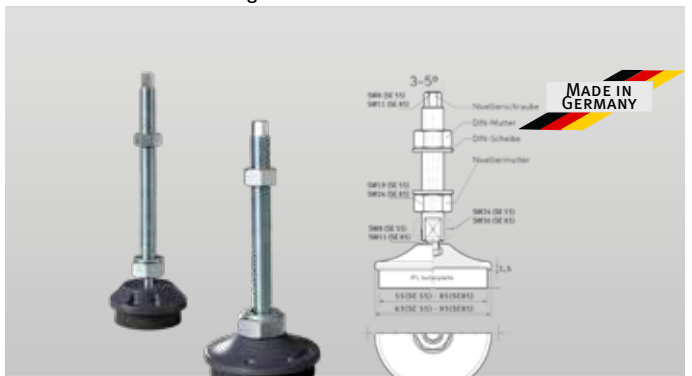
Replacement cutting insert set (10 pieces)	Article no.
for cutting inserts GTN 2	3440663
for cutting inserts GTN 3	3440664
for cutting inserts GTN 4	3440665

Precision machine shoe SEU1	3352985
› Patented double spindle bearing	
› With slip-protection plate at top	
› Maximum load 60 kN	
› Suitable for M16 threaded rod	
› Vibration-insulation plate for particularly loads. Good structure-borne noise insulation	
› Adjustment range +5 / -4 mm	
› High-precision, jerk-free levelling even of heavy machines	
› Installation time savings of up to 50 % thanks to precision levelling and freedom of installation.	
› Improves the dynamic behaviour of machines while reducing noise	
› Weight 3.7 kg	



Vibration damper machine foot	Article no.
› Excellent vibration and structure-borne noise insulation	
› Noise reduction	
› Eliminates floor unevenness up to 5°	
› Precision levelling by means of a regular threaded screw	
› Better distribution of impact-like axial forces due to the geometrically larger contact surface with the screw	
› No notching effect - like for example with conical screw tips	
› The levelling screw and the levelling disc are captively connected by a very simple system.	
› Problem-free changeover of the machine possible, as the complete levelling disc remains on the machine foot when the machine is lifted	

SE 55	3352981
› Jackscrew M12 x 1 x 150	
› Maximum load: 600 kg	
SE 85	3352982
› Levelling screw M16 x 150	
› Maximum load: 1 500 kg	



Thread repair assortment 3202010

- › 5 pcs. twist drill (5.2 mm/6.3 mm/8.3 mm/10.4 mm/12.4 mm)
- › 5 pcs. thread tap (M5 / M6 / M8 / M10 / M12)
- › 5 pcs. inserter for threaded inserts
- › 5 pcs. tang breaker
- › 100 pcs. threaded inserts: 25 pcs. each M5x0.8 mm / M6x1.0 mm / M8x1.25 mm / M10x1.5 mm
- › 10 pcs. threaded insert: M12x1.75 mm
- › For repairing defective threads
- › For reinforcing the thread on materials with a low shear strength
- › Practical OPTIMUM metal case



Flat countersink set 3201051

- › As per standard 373
- › 6-part: for M3 / M4 / M5 / M6 / M8 / M10 mm screws
- › HSS
- › Piloted counterbore size 6.5 x 3.2 mm / 8 x 4.3 mm / 10 x 5.3 mm / 11 x 6.4 mm / 15 x 8.54 mm / 18 x 10.5 mm
- › Fine grade for countersinking screws and nuts as per DIN 74
- › Practical OPTIMUM plastic case



Workpiece support Article no.

- Material S 45C
- | | |
|----------------------------|---------|
| WPS-1 height 40 mm | 3354261 |
| WPS-2 height 70 mm | 3354262 |
| WPS-3 height 150 mm | 3354263 |
| WPS-4 height 250 mm | 3354264 |



Shank 3535170

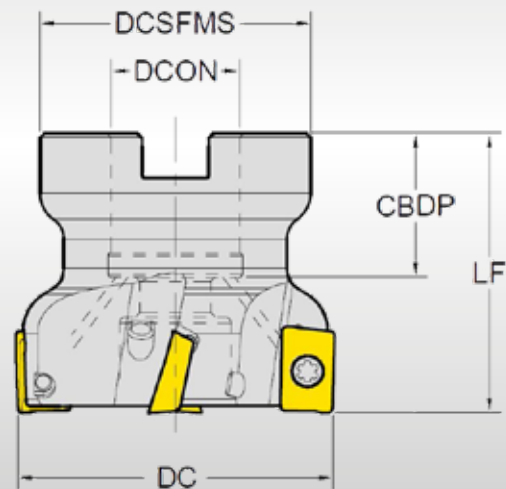
- cylindrical seat Ø16 mm for B16 drill chuck



Indexable insert milling cutter (without in New) Article no.

- | | |
|---------------------------|---------|
| 50mm- F90-APKT16-D50Z5S22 | 3544255 |
| 80mm- F90-APKT16-D80Z7S27 | 3544256 |

PREMIUM TURNING TOOLS FROM YG-1



Article no.	DC	Plates	LF	DCON	CBDP	DCSFMS
3544070	50	5	40	22	20	45
3544071	80	7	50	22	20	50

Indexable insert (10 pcs.) New Article no.

- | | |
|-----------------------------------|---------|
| AGPT160408-AL (Aluminium) | 3544260 |
| APKT160408PDTR (Universal) | 3544261 |



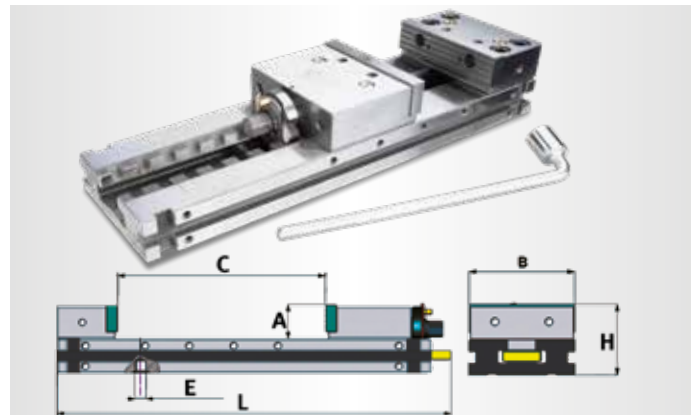
Fig.: AGPT160408-AL



Fig.: APKT160408PDTR

Modular machine vice	Article no.
MVSP 150x200	3530104
MVSP 150x300	3530108
MVSP 150x400	3530110
MVSP 175x300	3530114
MVMP 150x300	3530138

- Modular machine vice with high precision and repetition accuracy for series production and single-part machining on CNC milling machines and machining centres
- Modular machine vice made completely of NiCrMo steel with hardness HRC60, tolerance 0.0015 mm
- Mobile jaws with extra long guides to prevent lift-off and slingshot risk
- Guide surfaces tempered and polished
- Large clamping range due to lock bolts with various hole spacings
- Long service life thanks to high quality
- Includes spanner
- Model MVSP with fixed jaws, Model MVMP with pull-down jaws



Tech. data	A	C	E	L	B	H	kg
MVSP 150x200 mm	50	205	16	480	149	100	34
MVSP 150x300 mm	50	305	16	580	149	100	38.6
MVSP 150x400 mm	50	405	16	680	149	100	45
MVSP 175x300 mm	50	505	16	780	149	100	51.5
MVMP 150x200 mm	60	305	16	636	174	118	58.5

Clamping jaw set	Article no.
150 mm - smooth for MVSP	3530216
175 mm - smooth for MVSP	3530217
150 mm - smooth for MVMP	3530256



Clamping jaw set	Article no.
150 mm - knurled for MVSP	3530231
175 mm - knurled for MVSP	3530232
175 mm - knurled for MVMP	3530271



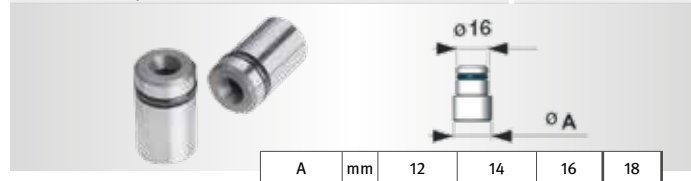
Side clamping blocks	Article no.
150 mm - soft (2 pcs.)	3530406
175 mm - soft (2 pcs.)	3530407



Cylindrical T-slot nuts	Article no.
Ø 12 mm (2 pcs.)	3530390
Ø 14 mm (2 pcs.)	3530391
Ø 16 mm (2 pcs.)	3530392
Ø 18 mm (2 pcs.)	3530393

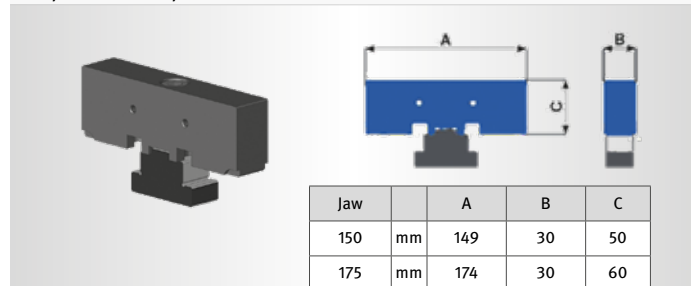


T-slot nuts	Article no.
Ø 12 mm (2 pcs.)	3530380
Ø 14 mm (2 pcs.)	3530381
Ø 16 mm (2 pcs.)	3530382
Ø 18 mm (2 pcs.)	3530383



Intermediate jaw	Article no.
150 mm - mobile	3530351
175 mm - mobile	3530352

For parallel workpieces



Jaw	A	B	C
150 mm	149	30	50
175 mm	174	30	60

Clamping jaw set	Article no.
150 mm for extending the clamping area	3530361
175 mm for extending the clamping area	3530362



Precision modular vices PNM	Article no.
PNM 100	3355551
PNM 125	3355553

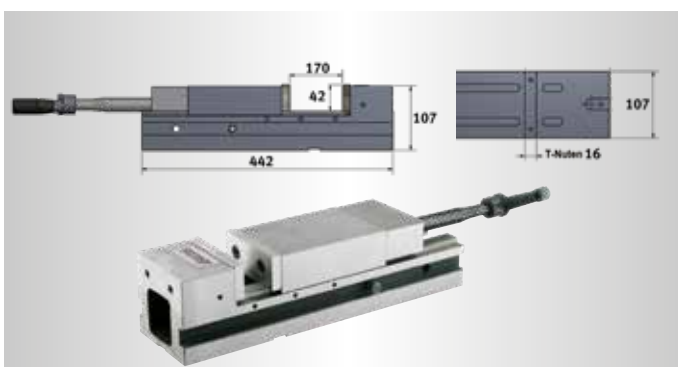
- Pull-down vice for series and single part machining on CNC milling machines and machining centres.
- Turntable
- Fast alignment via longitudinal and transverse grooves
- High precision
- High clamping force
- For horizontal and vertical use
- Low extension height
- Easy to use

Technical data	A	B	C	D	E	F	G	H	kg	
PNM 100	mm	180	100	270	85	20	30	95	35	10.3
PNM 125	mm	226	125	345	103	23	40	150	40	18.2



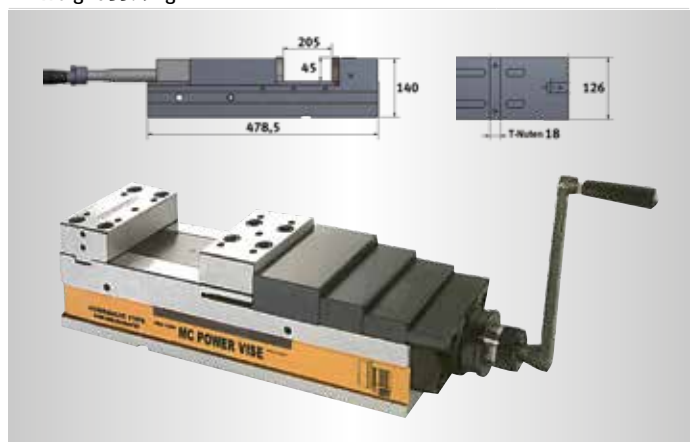
Hydraulic machine vice HCV 105	Article no.
HCV 105	3536210

- CNC hydraulic vice with high accuracy and repeatability for series and single part machining on CNC milling machines and machining centres.
- Robust design for milling
- Guide surfaces tempered and polished
- Booster system, requires little force, high pressure build-up during clamping
- Large clamping range due to lock bolts with various hole spacings
- Made of premium grade stainless steel
- Long service life thanks to high quality
- High clamping force
- Clamping pressure 24.5 Nm
- Clamping force 2 500 kg
- Weight 22 kg



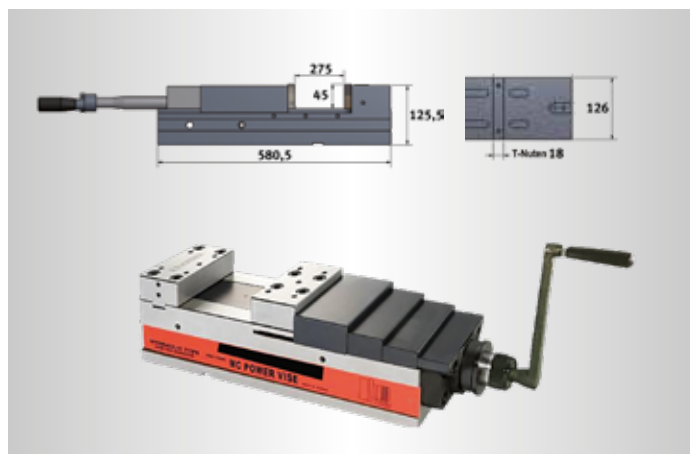
Hydraulic machine vice HCV 125	Article no.
HCV 125	3536214
Soft jaws 2 pcs.	3536221
L jaws 2 pcs.	3536222

- CNC hydraulic vice with high accuracy and repeatability for series and single part machining on CNC milling machines and machining centres.
- Robust design for milling
- Guide surfaces tempered and polished
- Booster system, requires little force, high pressure build-up during clamping
- Clamping pressure 40 Nm
- Clamping force 4 000 kg
- Weight 35.4 kg



Hydraulic machine vice HCV 160	Article no.
HCV 160	3536215
Soft jaws 2 pcs.	3536225
L jaws 2 pcs.	3536226

- CNC hydraulic vice for series and individual machining of workpieces on CNC milling centres and machining centres.
- Patented anti-lift mechanism
- Spindle is protected against soiling and chips
- Parallelism: 0.01/100 mm/ tolerance between bed and jaws: 0.02/100 mm
- Clamping pressure 60 Nm
- Clamping force 6 000 kg
- Weight 66 kg



ROTOCLEAR[®] S3

CLEAR VIEW AS ADHESION BONDING OR SCREW-TYPE VERSION

Clear view of all your production processes, proven at all times and under the toughest conditions wherever soiled panels prevent permanent monitoring of the work sequence. Suitable for all types of CNC milling machines and lathes, as well as machining centres and test beds.

Installation

The system is either integrated into the viewing glass by means of a screw-type flange or simply adhesion bonded without perforation. Untrained staff can do this without error thanks to a specially developed, process-assured adhesion bonding procedure assisted by a transparent step-by-step short guide. Installation can occur either during initial OEM installation or retroactively without any worries. We recommend the use of the screw-type version on milling machines (polycarbonate panels) and the adhesion bonded version on lathes (laminated safety glass panels).

The principle

A rotating panel spins off any water-miscible and non-water-miscible cooling lubricants and chips towards the outside. This gives the machine operator a permanently clear view of the machining workspace – operator safety is thus always ensured in line with currently applicable safety regulations..

The product

- The lowest installation depth worldwide - just 34 mm
- Maximises the clear view thanks to a larger view panel with a revolutionary drive concept
- Unobtrusive design
- Wear panel can be replaced with just one screw in less than 1 min without removing the entire device
- Easy assembly of the system thanks to screw-type or adhesion bonded version
- Improves functional safety thanks to integrate barrier air supply
- Low power consumption
- High torque for deployment under the toughest conditions






Rotoclear S3S	354700101	Rotoclear S3K	354700121
<ul style="list-style-type: none"> • Screw-type version 		<ul style="list-style-type: none"> • Adhesion bonded version 	
<ul style="list-style-type: none"> • 1 x Rotoclear[®] S3 - Basic 460 • Screw-type flange (6 - 17 mm pane) • Perforated positioning template • Hose 1.6 m • Compressed air hose 8.5 m • Cable 2 x 0.75 mm² shielded 10 m • Adapter electro-pneumatic for hose • Threaded fitting for hose • 2 x Threaded fitting for protective tube • Screw-in bracket 90° • Without installation 		<ul style="list-style-type: none"> • Rotoclear[®] S3 - Basic 460 • Adhesive flange with cover plate • 2-component adhesive for adhesive flange 50 ml • Dosing gun for 2-component adhesive • Perforated positioning template • Hose 1.6 m • Compressed air hose 8.5 m • Cable 2 x 0.75 mm² shielded 10 m • Adapter electro-pneumatic for hose • Threaded fitting for hose • 2 x Threaded fitting for protective tube • Screw-in bracket 90° • Primer for PC pane 25 ml • Swab for primer • Adhesion bonding guide • Without installation 	
Assembly Rotoclear S3S / S3K	354700129		
<ul style="list-style-type: none"> • Assembly kit including installation 			





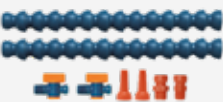











COOLANT ACCESSORIES

Motorex coolant for spindle cooling 354590005
 › 5 litre cannister

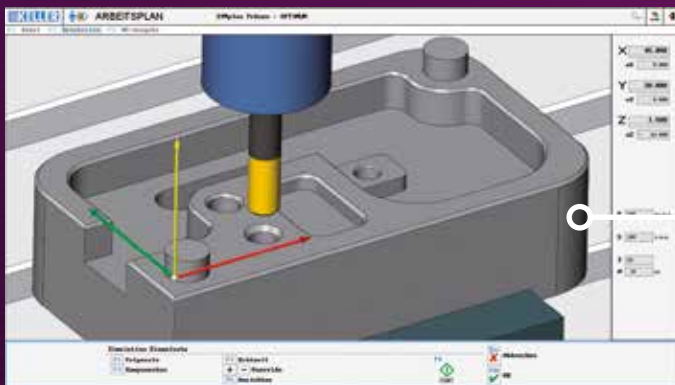
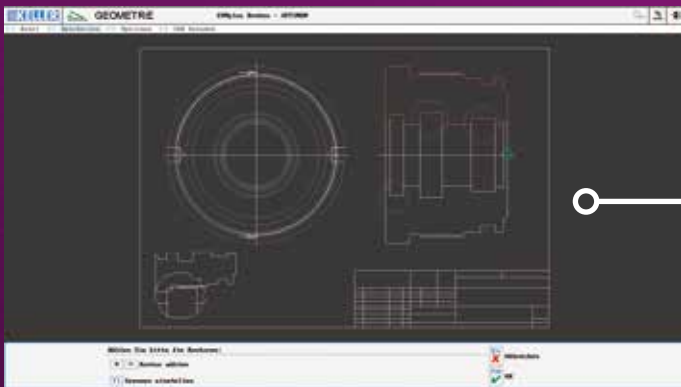
Distilled water 354590020
 › 25 litre cannister

Motorex CS Cleaner 354590010
 › 1 litres
 › System cleaner for CNC machines

	Designation	Size	Article no.
	<p>Coolant hoses basic equipment 1/4" - no. 1</p> <ul style="list-style-type: none"> › 8 pcs. articulated hose 150 mm › 2 pcs. each round nozzle 1/16" / 1/8" / 1/4" › 2 pieces NPT connection 1/4" and 1/8" › 1 piece flat nozzle › 1 piece Y-distributor › 2 pieces stopcocks inside and outside › 2 pieces shut-off valve inside - 1/4" › 2 pieces NPT extension › 1 pc. magnetic base › 1 piece Flex sealing tape 	1/4"	3356704
	<p>Coolant hoses basic equipment 1/4" - no. 2</p> <ul style="list-style-type: none"> › 6 pieces articulated hose 150 mm › 2 pieces each round nozzle 1/16" / 1/8" / 1/4" › 2 pieces each NPT connection 1/4" and 1/8" › 5 pieces flat nozzle › 4 pieces 90° nozzle › 1 piece Y-distributor › 1 piece stopcock inside and outside › 1 piece stopcock inside - 1/4" › 1 piece clamping tong 	1/4"	3356705
	<p>Coolant hoses basic equipment 1/2" - no. 1</p> <ul style="list-style-type: none"> › 6 pieces articulated hose 150 mm › 2 pieces each round nozzle 1/2" / 3/8" / 1/4" › 2 pieces each NPT connection 1/4" and 1/2" › 1 piece flat nozzle › 3 pieces 90° round nozzle 1/2" / 3/8" / 1/4" › 1 piece Y-distributor › 1 piece stopcock inside and outside › 1 piece shut-off valve, inside - 1/2" › 1 piece clamping tong 	1/2"	3356800

	Designation	Size	Article no.	
	Coolant hose set 2 pcs. articulated hose; 300 mm 2 pcs. round nozzles, 1 pc. shut-off valve 1 pc. magnetic base	1/4"	3356700	
		1/2"	3356801	
	Coolant hoses 4 pcs. articulated hose; 150 mm	1/4"	3356701	
	Coolant hose set 2 pcs. articulated hose; 150 mm 2 pcs. NPT connection 1/4" and 1/8" 3 pcs. round nozzle 1/16" / 1/8" / 1/4" 1 pc. flat nozzle	1/4"	3356702	
	Coolant hose set 2 pcs. articulated hose; 150 mm 2 pcs. NPT connection 1/4" and 1/8" 3 pcs. round nozzle 1/16" / 1/8" / 1/4"	1/2"	3356802	
	Coolant hose set 2 pcs. articulated hose; 150 mm 2 pcs. NPT connection 1/4" and 1/8" 2 pcs. round nozzle 1/8" / 1/4", 2 pcs. shut-off valve	1/4"	3356703	
	Grips	1/4"	3356710	
		1/2"	3356810	
	Articulated hose Hose roll 15 metres	1/4"	3356711	
		1/2"	3356811	
	Circular nozzles	1/4"	3356712	
		1/2"	3356812	
	Flat nozzles 5-hole 5 pcs.	1/4"	3356713	
		1/2"	3356820	
	Flat nozzles 5 pcs.	1/4"	3356714	
		1/2"	3356813	
	Flat nozzle 75 mm wide 2 pcs.	1/4"	3356715	
		1/2"	3356814	
	Connector Threaded connection RP3/8" 5 pcs.	1/4"	3356716	
		1/2"	3356815	
	Connector Threaded connection RP1/2" 5 pcs.	1/2"	3356816	
	Y connector 5 pcs. 1/4" 2 pcs. 1/2"	1/4"	3356717	
		1/2"	3356817	
	Cap 5 pcs.	1/4"	3356718	
		1/2"	3356818	
	Shut-off valve for articulated hose 2 pcs.	Thread connection RP 1/4"	1/4"	3356719
		Thread connection RP1/2"	1/2"	3356819

09 - SOFTWARE



SYMPLUS

SIEMENS MANUAL MACHINE PLUS (MM+) ENABLES THE TRANSITION FROM CONVENTIONAL MACHINES TO CNC PROGRAMMING. SIMPLE CYCLE CONTROL.

With the Manual Machine + (MM+) package, the SINUMERIK 808D offers you simple operation of the machine tool, in that all operating actions are supported by graphic help images and operation is as easy as with a conventional machine tool.

The functions provided give you a fast, practical machine setup for machining. This specifically includes determining the workpiece position in the machine and maintaining and measuring the tools used.

A comfortable DIN/ISO editor with complete GCode according to DIN66025 and ISO dialect is available for programming. Graphical input for technological machining cycles and contours supports you during programming.

With the SINUMERIK 808D, you have a powerful complete system at your disposal that covers all required applications without subsequent commissioning and training overhead:

- Intuitive user interface for all machine functions
- Flexible completion of individual machining actions without programming
- DIN/ISO programming on the machine
- DIN/ISO programming offline via CAD/CAM system
- Automatic measuring of the tool in setup mode

In Manual Machine operating mode, you can machine workpieces without having to create a part program. You have access to the following functions:

- Axis-parallel travel
- Taper turning
- Radius turning
- Centre drilling
- Thread tapping
- Grooving/Cutting off
- Thread tapping
- Machining of contours

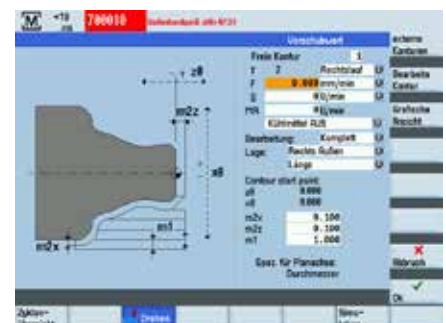
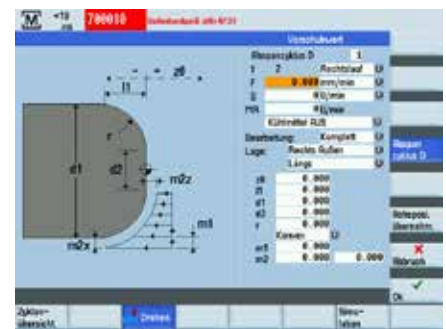
For the definition/parameterization of the function you are supported by comfortable input windows with images as an aid.

The cross slide is controlled via handwheels or axis direction switches/enabling switches or via the axis direction buttons. The spindle is controlled via spindle direction switches or via individual buttons for forward, stop and return.

Note: The machine manufacturer can define in which mode the start-up of the control should take place (MM+ or standard).

The advantages at a glance

- Save time with simple machining operations, e.g., repairs or reworking of individual pieces, because no parts program is necessary
- Flexible design of work steps
- No programming skills needed



Manual Machine Plus (MM+)

3584150

- User Manual
- for CNC lathes L 28HS / L 34HS / L 50E

SINUTRAIN FOR SINUMERIK OPERATE

THE NC PROGRAMMING WORKSTATION THAT IS IDENTICAL TO A CONTROL

SinuTrain, the NC programming workstation that is identical to a control, brings SINUMERIK Operate including a realistic animated machine control panel to the PC. This allows for convenient work preparation in your standard work environment. NC programs can be directly created and verified here thanks to the original SINUMERIK CNC kernel before they are uploaded to the physical machine. Users benefit from improved machine availability and safety. On top of this, SinuTrain is ideal for training users in SINUMERIK operations and programming, as well as for presentations and testing new SINUMERIK functions.



Features - Technology overview

- Identical NC programming language scope of the SINUMERIK: Standard ISO / DIN & SINUMERIK CNC code, ShopMill / ShopTurn, programSYNC for multi-channel
- Full graphical CNC simulation and plotting
- Tutorials and programming guides
- Software-based machine control panel – easy to control with mouse and keyboard
- Integrated DXF reader for importing DXF files
- Printing function for DIN/ISO and ShopMill/ShopTurn work step programming
- Program transfer via network and USB
- Preconfigured machine examples
- Option: Customisation to match your physical machine

To make it easier for newcomers and trainees to learn the machine's functions, the computer-based training includes programming tasks that have to be worked through in various modules. This means that trainees can familiarise themselves with details such as control, workspace and tool change in the best possible way..



For effective training

SinuTrain Software makes training more effective while substantially improving cost efficiency. In particular due to its excellent functionality and operational assurance, SinuTrain is appreciated by many training institutes as a top ranking solution for basic and on-going training. More than 25 000 licences are currently in use

The advantages at a glance

- **Safe:**
Virtually 100 percent offline verification/evaluation of NC programs thanks to the original CNC kernel
- **Tailor-made:**
Use as an optimal programming workplace thanks to adaptation to match the physical machine (e.g., by the machine manufacturer)
- **Flexible:**
Perfectly tailored packages for training and work preparation
- **Hands-on:**
Operations and programming exactly like the genuine SINUMERIK

	New	
SinuTrain for SINUMERIK Operate* SIEMENS SinuTrain Operate	V 4.8 Article no.	V 4.9 Article no.
SinuTrain Single	3584107	3584108
• Single station license		
• commercial use		
SinuTrain Trainer Package XL	3584113	3584114
• commercial use		
• 18 x single station license		
SinuTrain Trainer Package XL	3584131	3584132
• Only for schools (not for commercial use)		
• 18x single station licenses for students		

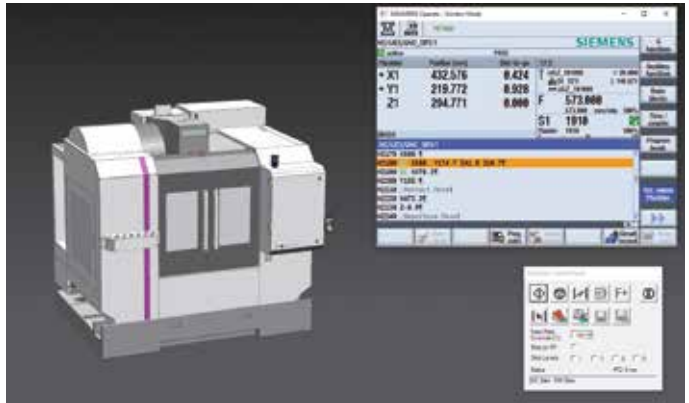
SINUMERIK 808D on PC Download free of charge at
<https://xcelerator.siemens.com/global/en/industries/machinebuilding/machine-tools/cnc4you/808d-on-pc.html>

CNC TECHNOLOGY IN TRAINING

CNC SIMULATION WITH THE DIGITAL TWIN

CAD/CAM/CNC PROCESS CHAIN - STEP BY STEP TO INDUSTRY 4.0

The CAD/CAM/CNC process chain combines component design, CNC programming and simulation as well as manufacturing on a CNC machine tool. In the CAM module, the production sequences are created, planned and simulated. If a machine model is available, the simulation can be used to check the generated NC program for errors or collisions. Through the combination of an integrated CAD/CAM system, the digital twin becomes a fully-fledged CAD/CAM-CNC process chain and offers you a solid basis for the practical implementation of Industry 4.0.



OPTImill F150 HSC with control simulation



OPTImill F150 HSC without protective housing

TRUE-TO-LIFE DIGITAL IMAGE OF THE MACHINE TOOL

The digital twin is the true-to-life digital image of the real machine tool used in the workshop. The digital image contains all geometries of the machine, fixtures, tools and the controls used, including the version and all parameter settings. There are two possibilities for creating a digital twin:

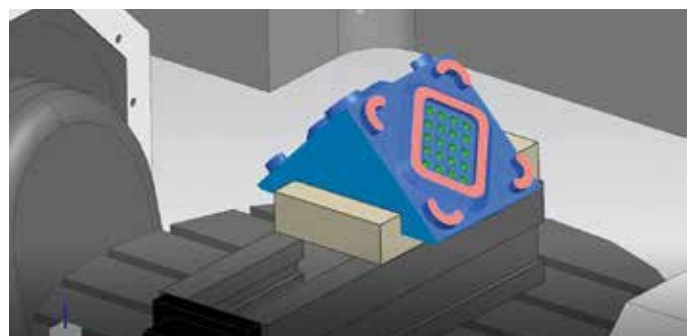
1. The functionality of the machine is simulated or reproduced by software (CSE driver). This can be implemented for any controls and machines
2. The real system software is used (VNCK). With this approach, the Sinumerik Operate user interface is fully available.

TRAINING ON VIRTUAL CNC MACHINES

But how do you teach trainees the fascinating technology and the individual process steps that are necessary? - The best way is to let them work with it!

In vocational training, training on virtual machines has proven to be advantageous. The trainee can safely test and optimise his NC programs without causing damage to a real machine.

Moreover, educational institutions often lack the resources to run more than one CNC machine. The decision to teach the machining process turning or milling is no longer necessary when training on the digital twin - almost any type of machine, any control and any kinematics can be simulated.



WE WILL BE HAPPY TO ADVISE YOU PERSONALLY AND ADAPT THE DIGITAL TWIN TO YOUR INDIVIDUAL NEEDS.

We create the digital twin on the basis of Siemens NX or SINUMERIK ONE Run MyVirtual Machine .

OUR SERVICE INCLUDES THE FOLLOWING POINTS:

- Creation of a machine model (real existing CNC machine is modelled or reproduced in CAD)
- Creation of the simulation or machine kinematics
- Creation of the postprocessor
- Commissioning and instruction

ARE YOU INTERESTED?

GET IN TOUCH WITH US!



+49 (0)951 96555-334



BERATUNG@OPTIMUM-MASCHINEN.DE

SYMPLUS PLUSCARE™ TURNING

IS THE IDEAL SOFTWARE SUPPLEMENT TO YOUR OPTIMUM CNC LATHE. WORKSHOP CAPABLE CAD/CAM SYSTEM WITH 802S TRAINING.

SYMplus with plusCARE™ is also available with the identical surface for turning technology (see left page).

Because you can work independently of a specific control, you only need to master one system to be able to flexibly spread the load across multiple machines. Integrated didactical components help you train new staff and prepare apprentices for their exams.

System requirements for the plus systems:

- Supported operating systems: Microsoft Windows® 7/8/10 (32/64 Bit)
- Screen resolution min. 1024 x 768
- OpenGL-compatible 3D graphics card, e.g. GeForce GT 210 (1024 MB)
- RAM: min. 2 GB
- Approx. 2 GB free disc space per technology for system data

Selection of licencing models:

- CodeMeter (licence is stored on USB dongle)
- CodeMeterWAN (licensing via internet connection, login with ID and password)

■ CAD - Geometry Creation

If you have a drawing in an electronic format, you can transfer the turning contour with just a few clicks or key presses.



You can precisely monitor the dimensional accuracy of the programming with the measuring function from within the 2D simulation (not shown). The cutting edge and tool holder are monitored for collisions. In the 3D simulation you can also monitor adjacent tools.

CNC software SYMplus turning plusCARE™	Article no.
Turning	3581012
<ul style="list-style-type: none"> • commercial use • Also available as a package for 2, 5, 10 or 20 users • Incl. post-processors for SINUMERIK 802C, 802D, 808D, 810D/840D, 840D sl/828D • Incl. 2 years plusCare 	

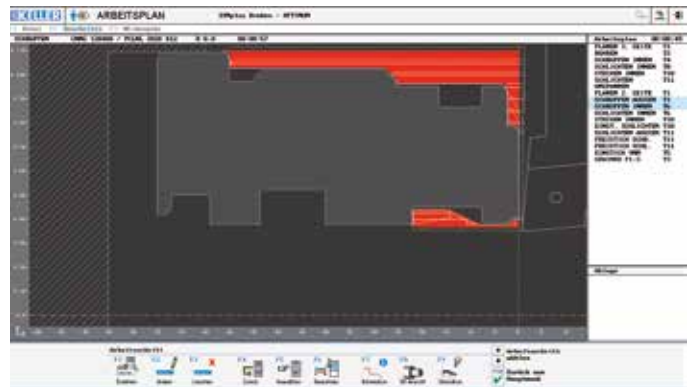
• For information on maintenance contracts see Seite 309

plusCARE™

- annual charge includes regular updates, telephone and email support, and remote maintenance by the manufacturer

■ CAM - work schedule generation

Like in milling, you define the work steps in a graphical interface and benefit from residual material detection throughout the entire production process (incl. re-clamping).



Finally, you select the post-processor for the machine on which you will be producing, and transfer the program.

Of course, there is also a dialogue-based contour computer for transferring hard copy drawings.

SYMplus plusCARE™ Milling runs under Windows 7, 8 and 10 Further information and additional modules on request.

SYMPLUS PLUSCARE™ MILLING

IS THE IDEAL SOFTWARE ADD-IN FOR ALL SIEMENS CONTROLLED OPTIMUM MILLING MACHINES. FOR LOW-COST, FAST AND ECONOMIC WORK.

SymPlus CARE is SYMplus with plusCARE™ a CAD/CAM system that is particularly easy to learn, with which you can save programming time, avoid crashes, reduce production time and also generate NC programs for different OPTIMUM machines or SIEMENS controls (802S, 808D, 828D, 840D, ...) with a uniform interface.

System requirements for the plus systems:

- Supported operating systems: Microsoft Windows® 7/8/10 (32/64 Bit)
- Screen resolution min. 1024 x 768
- OpenGL-compatible 3D graphics card, e.g. GeForce GT 210 (1024 MB)
- RAM: min. 2 GB
- Approx. 2 GB free disc space per technology for system data

Selection of licencing models:

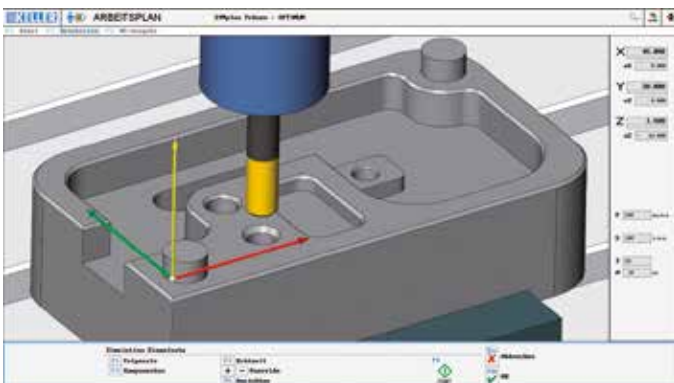
- CodeMeter (licence is stored on USB dongle)
- CodeMeterWAN (licensing via internet connection, login with ID and password)

■ CAD - Geometry Creation

Unmatched speed and simplicity allow you to graphically program workpieces with SYMplus with plusCARE™, even if the drawing is not NC-dimensioned.



2D simulation shows many details, such as allowances and the cutting path of every single milling run. You can also "capture" control dimensions (not shown). 3D simulation gives you the best possible overview of machining.



CNC software SYMplus milling plusCARE™	Article no.
Milling	3581010
<ul style="list-style-type: none"> · commercial use · Also available as a package for 2, 5, 10 or 20 users · Includes post-processors for SINUMERIK 802C, 802D, 808D, 810D/840D, 840D sl/828D · Incl. 2 years plusCare 	

- For information on maintenance contracts see Seite 309

plusCARE™

- annual charge includes regular updates, telephone and email support, and remote maintenance by the manufacturer

■ CAM - work schedule generation

Machining is also defined graphically using pictograms. You can conveniently compare production strategies and thus optimise machining. Timing computation helps you with costing.

The residual material detection refers to the entire process; the raw part is continuously tracked.



Alternatively, you can use CAD contours from DXF.

You create the NC program itself with just a few clicks and transfer it to the control, for example using a USB stick.

SYMplus plusCARE™ Milling runs under Windows 7, 8 and 10 Further information and additional modules on request.



GROOVE PUSHING

FOR OUR CNC LATHES S 600M , S 600MY , S 500M, S 500MY, S 750M AND S 750MY

Special processes such as broaching or grooving are generally used to produce internal and external profiles. Groove pushing can also be carried out economically on CNC lathes without special units.

PROFILE PROCESSING BY GROOVE PUSHER

Normally, the workpiece rotates on CNC lathes, while stationary tools such as turning tools or drills ensure chip removal. However, for special turned parts with internal or external profiles, for example toothed hubs with keyways or splines, a stationary workpiece and moving tools are required. Conventional methods, such as groove pushing or broaching, are preferred for this purpose.

The disadvantage: You have to change the machine during processing and have higher production costs.

OVERVIEW: CLASSIC METHODS FOR CREATING GROOVES

In large-scale production, optimised machines are used for each manufacturing process. For profile machining, a distinction is made between the four classic processes of grooving, slotting, broaching and wire EDM.

- The groove is drawn with a drawing knife, the shape and width of which is determined by the groove. The material is removed in several passes and is only suitable for through-holes.
- When grooving, the groove pusher chisel determines the shape and width of the groove. Here too, the material is removed in several passes and the process is also suitable for blind holes.
- The cutting tool used for broaching is a broach with several cutting edges arranged one above the other. The material is removed directly to the final dimension in a single stroke.
- Finally, wire erosion is carried out by means of spark erosion machining. This process is only suitable for electrically conductive materials.

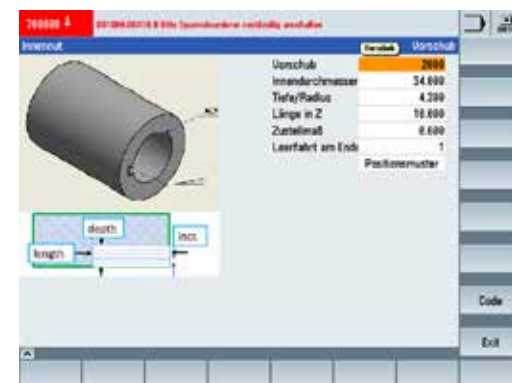
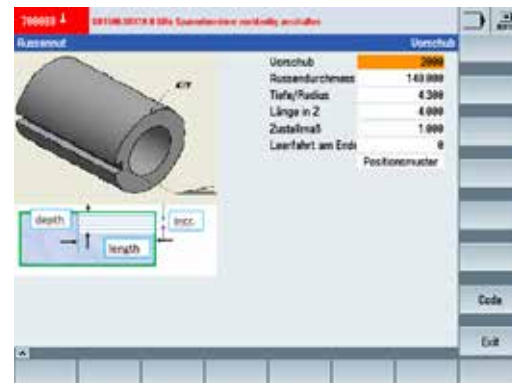
GROOVE PUSHING ON THE LATHE

A good alternative to the classic methods is to cut the grooves or splines directly on the CNC lathe - especially for small batches. It should be noted that special requirements must be met by the machine during the grooving process. Modern CNC lathes are adapted to these loads through rapid axis movements and constant changes of direction, which are similar to those in thread cutting and the high cutting forces in solid drilling.

The main cutting movement during grooving takes place in the Z direction and is carried out by the firmly clamped tool at the programmed feed rate. The tool lifts off the groove base at the end of the feed movement, the return movement takes place as an idle stroke. The workpiece spindle is clamped in place.

The depth of the groove is set via the infeed of the X-axis, the width of the groove correlates with the width of the groove pusher tool. For groove widths greater than the tool width, the C-axis (main spindle) must be rotated. If the groove base is also to be level, a Y-axis is required for lateral offset.

The machine requires a programmable C-axis to produce several grooves on the inside or outside diameter. The tool used is a push chisel, which is defined in the tool management as a grooving chisel for the face, for example. If grooves are often cut on the lathe, it is advisable to equip the tool turret with special grooving units. The rotary movement generated by the turret drive is converted into a linear movement with a lift-off function.



ARE YOU INTERESTED?

GET IN TOUCH WITH US!

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10- SERVICE & SUPPORT



SERVICE PACKAGES

FOR PREVENTION AND AN ASSURED SUPPLY OF SPARE PARTS

Functional CNC machines with comprehensive equipment features and an attractive price-performance ratio - that's what OPTIMUM Maschinen Germany stands for. Each one of our products impresses with its quality, precision, long service life and value stability. In addition to our own manufacturing facilities, we have now produced throughout the more than 23 years of our existence at manufacturers capable of meeting our high quality requirements.

Before purchasing a CNC machine, it is especially important to also consider the indirect costs in addition to the cost of purchasing. This means, for example, maintenance, repairs, or taking CNC machine downtime into consideration. To ensure the profitability of your OPTIMUM CNC machine, we offer you maintenance options to help prevent time-consuming repairs, check-ups and comprehensive service packages.

In the case of a repair, you benefit from our reliable spare parts supply: one of the basic premises of our customer orientated service solution is fast availability of spare parts. We match planning, coordination and provision of parts in a targeted way. This improves economy, after all, machines repaired quickly can be quickly re-deployed on your lines.



FAST & RELIABLE

WITH DECADES OF EXPERIENCE

Whether it's a planned service appointment or quick help after a sudden machine failure: In the event of service, our intensively trained OPTIMUM technicians are at your disposal with their sound knowledge and many years of experience. They quickly and reliably take care of repairing your CNC machines. With our carefully considered service solution we help to keep your OPTIMUM CNC machine working in a trouble-free way.

Know-how for satisfied customers: Our Engineering department has a well-coordinated team of specialists with excellent engineering qualifications. We view the clear, technical orientation of our staff as the basis for a high level of customer satisfaction. This is what you can expect of us:

- Fast and comprehensive advice
- Expert on site service
- Reliable help with maintenance, servicing and incidents

Our preventive maintenance options, check-ups and service packages ensure trouble-free and economic use of your CNC machines. Our staff handle all of this in an expert way. Big plus: Regular maintenance and servicing by our service department increases the functional reliability and thus extends the service life of the machines!



MAINTENANCE CONTRACTS

COMFORT, MEDIUM OR BASIC

The objective of our service is to make maintaining and repairing your OPTIMUM CNC machine as simple as possible. This is why OPTIMUM offers you a variety of maintenance contracts that you can tune to perfectly match your requirements and wishes.

You can choose between our Comfort, Medium and Basic maintenance contract options. You can be sure: Our technicians are there to help with any problem - whether on the phone, through remote maintenance via Teamviewer or in person.

The following options are available:

Options *	Comfort:	Medium	basic
	Article no.	Article no.	Article no.
with less than 5 axes	3589106	3589107	3589108
5 axes or more	3589120	3589121	3589122

Response to a problem	within 1 working day	Within max. 2 working days	Within max. 3 working days
Technical troubleshooting by phone	✓	✓	✓
Preventive maintenance measures	Every 6 months	Annually	Annually
Remote maintenance via teamviewer ⁽¹⁾	✓	✓	
Spare parts supply for non-wearing parts via express	✓		

- incl. 400 km total (200 km one way)
- each additional kilometre is invoiced at EUR 0.80
- plus travel expenses at EUR 120.00 per hour or part thereof
- Accommodation costs and expenses at cost



(1) On the customer side, the prerequisites for this must be created

MAINTENANCE WORK

PREVENTIVE MAINTENANCE FOR BETTER ECONOMY

Just like your car's annual service, preventive maintenance of CNC machines in the form of a service ensures that the individual parts are kept in good shape. Our preventive maintenance options include planning and handling of maintenance for your OPTIMUM CNC machine. At the same time, they include preventive repairs and preventive part replacement. We want your CNC machine to work perfectly and to ensure its long service life. In work package or around eight hours, our engineers, for example, inspect the coolant, lubrication and compressed air systems and check the electrical and mechanical systems. The biggest advantage is that any weak points can be immediately eliminated – before extensive repairs are needed. The cost of preventive maintenance is quickly amortised as your CNC machine's efficiency increases. Take a look at the many measures that our inspections include:

Lubrication system:

- Check and/or replace filter units
- Check lines and screw connections for leak tightness
- Performing an function test of the central lubrication system

Compressed air system:

- Perform pressure test
- Performing of maintenance unit check
- Check and/or replace filters

For CNC lathes

- Replace oil filter on hydraulic unit
- Check hoses and screw connections for leak tightness

Electrical system:

- Clean switch cabinet
- Check terminals and connections
- Replace air filter
- Check limit switches and safety equipment

DETAILS:

- Work package approx. 8 working hours
- incl. 400 km total (200 km one way)
- each additional kilometre is invoiced at EUR 0.80 plus travel expenses at EUR 120.00 per hour or part thereof
- Accommodation costs and expenses at cost

Preventive maintenance options	3589112
Lathes / Milling machines	

LIQUID COOLING MAINTENANCE

Maintenance of liquid cooling system	3589180
Including:	
• Motorex coolant concentrate 5 litres	
• Motorex CS Cleaner 1 litre	
• Distilled water 25 litres	

Mechanical system:

For CNC milling machines

- Geometric measurement of the machine with Renishaw QC20 test report
- Check and adjust levelling of machine
- Check reverse clearance of the X, Y, and Z axes and adjust electronically
- Check spindle positioning
- Check covers and scrapers
- Check concentricity of the spindle taper
- Check spindle taper for damage
- Check counterweight system or compressed air cylinders
- Check axis running noise
- Check spindle running noise
- Completely check/lubricate tool changer system
- Check drive belt on main spindle drive
- Visual check of lines and screw connections

For CNC lathes

- Check and adjust levelling of machine with Renishaw QC20 test report
- Check reverse clearance of the X, Y, and Z axes and adjust electronically, or adjust wedge rails
- Check covers and scrapers
- Measure concentricity of main spindle
- Check axis running noise
- Check main spindle running noise
- Completely check/lubricate tool changer system
- Check of main spindle belt drive and replace if needed
- Visual check of lines and screw connections
- Check and adjust turret alignment
- Check and adjust spindle alignment based on a sample part

Material for maintenance of liquid cooling system	3589200
if customer does not have material in stock	

Additional distilled water	354590020
• 25 litres	

SERVICE DATA BACKUP

WE OFFER VARIOUS SERVICE PACKAGES FOR MAINTAINING AND REPAIRING YOUR OPTIMUM CNC MACHINE. YOU CAN CHOOSE FROM VARIOUS OFFERS TO SUIT YOUR INDIVIDUAL REQUIREMENTS.

MACHINE TYPE:

Lathes/Milling machines

Our state-of-the-art data backup fully backs up your machine data. This includes axis compensation values, parameters, NC and PLC data, zero points and CNC programs. This saves a huge amount of time, and thus money, for re-entering the data in case of data loss. Thanks to a data backup, your information can be simply and quickly restored. While restoring the data, our technician also checks the memory buffer battery* and replaces it if needed.

FEATURES:

- Backup of all relevant data
- Backup to a storage medium
- Buffer battery* check and replacement if needed
- CNC program backup option

Service data backup

3589110

Lathes / Milling machines

YOUR BENEFITS:

- Prevents data loss as you have a backup of your machine data in case of a malfunction
- Avoids downtime

DETAILS:

- Duration individual
- incl. 400 km total (200 km one way)
- each additional kilometre is invoiced at EUR 0.80
- plus travel expenses at EUR 120.00 per hour or part thereof
- Accommodation costs and expenses at cost



SERVICE GEOMETRY CHECK

COMPLETELY CAREFREE!

MACHINE TYPE:

Lathes/Milling machines

During the Service Geometry Check, our engineers precisely and comprehensively verify your machine's geometry. The measuring results are documented, thus allowing conclusions on any anomalies to be drawn. In case of problems, our staff give you expert advice, showing you where the problems lie and providing an inexpensive solution. The Service Geometry Check is especially useful in the scope of preventive maintenance to discover and compensate for wear at an early stage. This avoids malfunctions and machine failures

FEATURES:

Geometry check

- Circular shape test with Renishaw QC20 (milling machines)
- Detailed test report of all measuring results
- Analysis and evaluation of the measuring results
- Quotation for eliminating any identified defects

Geometry check

3589111

Lathes / Milling machines

YOUR BENEFITS:

- Discovers wear at an early stage
- Machine maintenance can be scheduled in good time
- Boost production quality
- Plan your service costs
- Production assurance

DETAILS:

- incl. 400 km total (200 km one way)
- each additional kilometre is invoiced at EUR 0.80
- plus travel expenses at EUR 120.00 per hour or part thereof
- Accommodation costs and expenses according to expenditure



* if installed

POWER CHECK 2

IN ORDER TO BE ABLE TO GUARANTEE CONSISTENTLY PRECISE MACHINING RESULTS, MONITORING THE FEED FORCE IS AN ESSENTIAL PART OF QUALITY ASSURANCE IN MACHINE TOOL TECHNOLOGY

TOOL PULL-IN FORCE

The tool draw-in force is of essential importance for machining quality, machine availability and process reliability. If the force with which the tool is drawn into the spindle taper falls below a specified threshold value without being noticed, this can have far-reaching and cost-intensive consequences:

PRODUCTION SCRAP

- Vibrations leave ugly machining marks on the workpiece.

MACHINE FAILURE

- Malfunctions and repairs as a result of insufficient draw-in force cause unplanned downtimes.

TOOL WEAR

- Tool life decreases due to increased wear and tool breakage

SAFETY RISK

- Increasing risk potential for the operating personnel

SPINDLE DAMAGE

- Micromovements can lead to bearing damage and corrosion of the spindle cone



In the form of Power Check 2 we offer a reliable and highly accurate testing technology for monitoring the tool draw-in force of a clamping system. The intelligent measuring device is used to regularly query status information and thus enables early detection of a loss of clamping force. Power Check 2 is suitable for all tool standards and tool clamping systems.

- Exchangeable adapters for all common taper standards
- Adapter with gripper groove for use in tool magazines
- Automatic mode for self-activation during tool change
- Energy saving mode for long battery life
- Adjusting sleeve for simulation of tool tolerances
- Memory with capacity for 4000 individual measurements

LED display to show the measured data

- USB port for reading the memory and charging the battery
- Software for recording and further processing of the measured values

LONG-LIFE
CLAMPING
TECHNOLOGY
INSIDE



On request



Illustration: basic unit



Illustration: adapter

Power Check 2

Basic unit:

Measuring range 2.5 – 20 kN
Connection thread M16 x 1.5

Power Check Adapter:

BT 30 - DIN 69871/69872
BT 40 - MAS 403-30°
SK 40 - MAS 403-30°

11- TRAININGS



YOUR TRAINERS



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THOMAS LASCHIMKE
DEPARTMENT MANAGER CNC

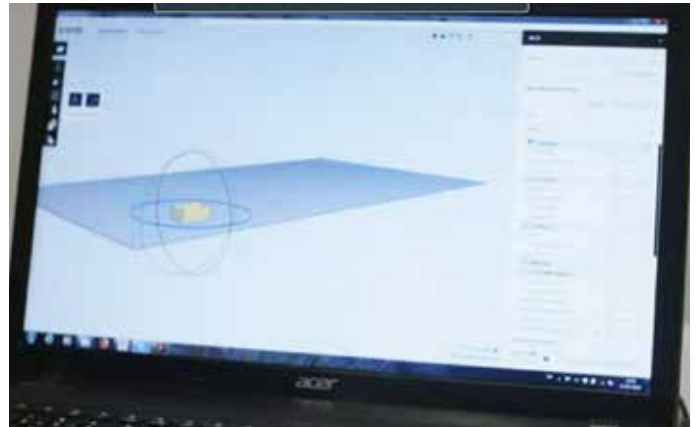
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3-D PRINTING BASIC TRAINING

3-DAY SEMINAR

Many companies have already recognised the great potential of 3-D printing and are benefitting from it. As materials and processing methods continue to evolve, industrial 3-D printing continues to qualify for an increasing number of applications.



INHALT

OVERVIEW

In this course you will discover the entire process chain of 3-D printing using concrete examples. From component preparation and machine operation to the production of your 3-D objects with final finishing, you will learn how to put your knowledge of industrial 3-D printing into practice.

CONTENT

- Part preparation
- Getting to know relevant 3-D printing technologies and systems
- Getting to know our 3-D printing system
- Component creation
- 3-D printer operation
- Optimising parts and troubleshooting with the help of CAD tools
- Part reworking

REQUIREMENT

- Basic knowledge of automation technology

OBJECTIVES

- Our 3-D printing workshop prepares you optimally for your own practical application by taking you through the process chain of additive manufacturing and creating industry-relevant components.
- After a short theoretical introduction to the equipment used, you will learn how to select the appropriate print head (3x and 5x print head) based on given component data and material properties.
- In the second step, you will create your part and become familiar with the operation of the selected 3-D printing device. At the end of the workshop, the group will analyse the parts for errors and make optimisations using CAD tools to identify design difficulties.

TARGET GROUP

- Parties interested in a purchase
- Engineers
- Technicians
- Industrial designers
- Professional 3-D printing users

Date

Course number

Subject to agreement

3D GS1

Trainers:

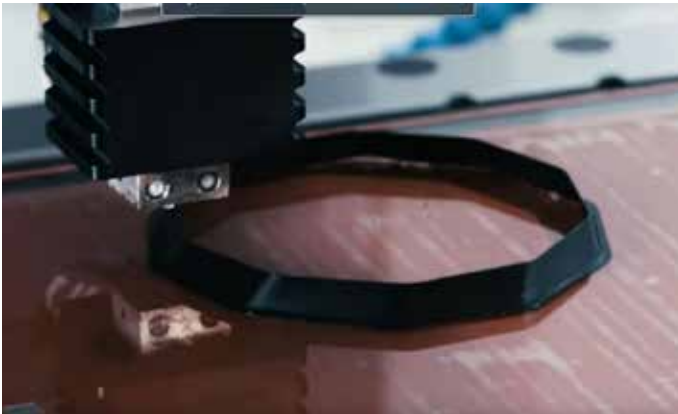
Martin Trepesch, Thomas Laschimke

3-D PRINTING ADVANCED SEMINAR

2-DAY SEMINAR

Here you will acquire the basic knowledge of our CNC programme including 3D printing. In this way, they are later able to provide their clients with basic advice.

We then advise your potential client fully for you after their basic consultation.



INHALT

OVERVIEW

Our 3-D printing workshop prepares you optimally for your own practical application by taking you through the process chain of additive manufacturing and creating industry-relevant components.

CONTENT

- Extended settings in CURA
- 5-axis printing. How the system works
- Avoiding printing errors
- Handling of various materials and accessories
- Time optimisation of components

REQUIREMENT

- 3-D printing basic training

OBJECTIVES

- In this course you will learn about common sources of error in 3D printing and we will give you practical tips on how to avoid errors.
- After a short theoretical introduction to the equipment used, you will learn how to select a suitable print head (3x and 5x print head) based on given component data and material properties.
- In the second step, you will create your part and become familiar with the operation of the selected 3-D printing device.
- At the end of the workshop, the group will analyse the parts for errors and make optimisations using CAD tools to identify design difficulties.

TARGET GROUP

- Engineers
- Technicians
- Industrial designers
- Professional 3-D printing users

Date

Subject to agreement

Course number

3D GS2

Trainers:

Martin Trepesch, Thomas Laschimke

RETAILER TRAINING

2-DAY SEMINAR

In the dealer training, you will acquire sound specialist knowledge in order to be able to advise your customers competently and professionally on OPTIMUM CNC machines. In this way, you create the basis for a firm integration of CNC-controlled machine concepts into your trade and, with the knowledge you have acquired, you can optimise existing structures so that your customers use the technology optimally and successfully.



INHALT OVERVIEW

CONTENT

- Recognising the versatile application possibilities of CNC machine tools
- Tools for understanding further production methods
- Knowledge of current developments, design and manufacturing processes with CNC technologies
- Selection, application and sale of the appropriate CNC machine
- Initial experience in the planning, design and manufacture of components using CNC milling and turning machines

REQUIREMENT

- Basic knowledge of automation technology

OBJECTIVES

- Getting to know new developments in the field of CNC technology
- Optimal preparation for the customer visit
- Acquire practical and technical product knowledge to be able to advise your customers even more expertly on site.
- Conduct sales talks with the existing sales documents
- Optimal needs assessment for the customer
- Getting to know the potential of CNC machines in production and logistics and selecting the appropriate technology.
- Consulting and concept development in a wide range of production areas.
- Understand differences to competitor products

Extended in-depth training available on customer request

TARGET GROUP

- Resellers

Date	Course number
Subject to agreement	3D GS3

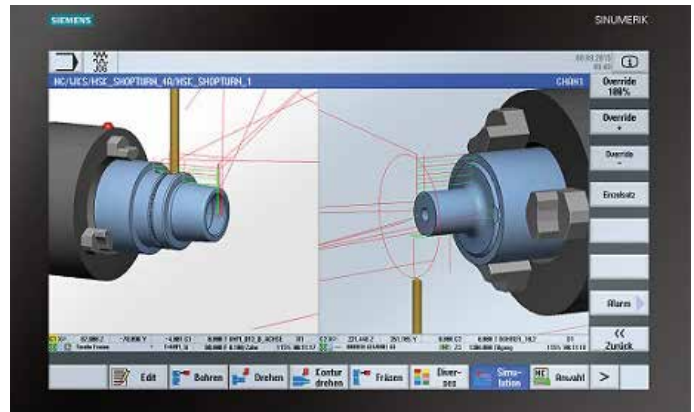
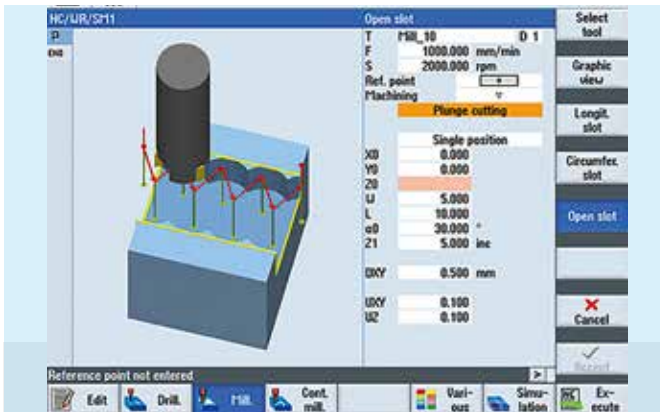
Trainers:

Martin Trepesch, Thomas Laschimke

SINUMERIK OPERATE TRAINING

UP TO MAX 5 DAYS (TURNING OR MILLING)

SINUMERIK CNC controls offer the right solution for every machine concept - from simple CNC standard machines to standardized machine concepts and modular premium machine concepts



INHALT

OVERVIEW

This course familiarises you with the operation of SINUMERIK Operate, the machine guidance and the basics of programming part programs.

CONTENT

- SINUMERIK system overview
- Machine operating and control panel
- Operating modes, operating areas, control elements
- File system, editor
- Cycle description with application examples
- Basics of programming
- Tool correction data and tool management
- Conversion and parametrisation of standard cycles
- Backing up program data
- Practical operating exercises based on existing NC programs on training equipment

REQUIREMENT

- Basic knowledge of automation technology

OBJECTIVES

- This course familiarises you with the operation of SINUMERIK Operate, the machine guidance and the basics of programming part programs.
- Practical operating exercises on our training devices using predefined part programs are an important part of the training.
- To make the exercises even more practice-oriented, we use the graphic simulation and the simultaneous recording function of SINUMERIK Operate. This allows knowledge to be conveyed even more clearly and learning success can be improved.
- After completing the course, you will be able to operate the SINUMERIK Operate with the standard user interface and make changes to sub-programs. This helps you gain confidence in handling machine tools while minimising the risk of operator error.

TARGET GROUP

- Machine operators
- Operators
- CNC programmers

Date

Course number

Subject to agreement

CNC GS1

Trainers:

Martin Trepesch, Thomas Laschimke

WELT DER MASCHINEN

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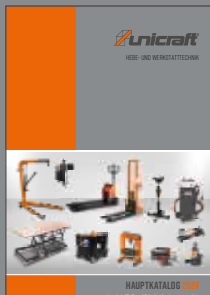
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- This offer is aimed exclusively at entrepreneurs, dealers or traders who are acting in the exercise of their commercial or self-employed activity when concluding this purchase.
- This constitutes an express **CONDITION TO THE CONTRACT**. Excluded from the sale are consumers as defined by § 13 BGB (German Civil Code)
- Subject to technical modifications and visual changes
- No liability is accepted for printing errors, mistakes or incorrect presentation.
- Illustration partly with optional accessories
- Delivery shall be made exclusively in accordance with our terms of delivery and payment
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- Our retention of title shall remain valid in case of sale to a third-party
- Reproduction and reprinting in any way, even in part, always require our written permission.
- For products with a stated guarantee: Information on scope, duration, content and guarantor at www.optimum-maschinen.de or to be requested via Optimum Maschinen Germany GmbH.
- The entire catalogue is protected by copyright. In addition, we register trade mark, patent and design rights to protect our products, insofar as this is possible in individual cases. We take strong action against any violation of our intellectual property.

GENERAL NOTES ON OPERATING OUR MACHINES

- Our machines must be supervised at all times during operation. Leaving the machine during operations constitutes gross negligence.
- The details on machine precision are found in the technical data of the catalogue pages. If you do not find any values here, please contact info@optimum-maschinen.de for more detailed information.
- The stated precisions are achieved under standardised conditions (correct installation of the machine and ambient temperature of 20 °C). The machines are not designed for continuous operation.
- Please note that operators are required to make conversions in the event of installing third-party chucks or flanged chucks to reach the stated, technically possible rotating diameter.