

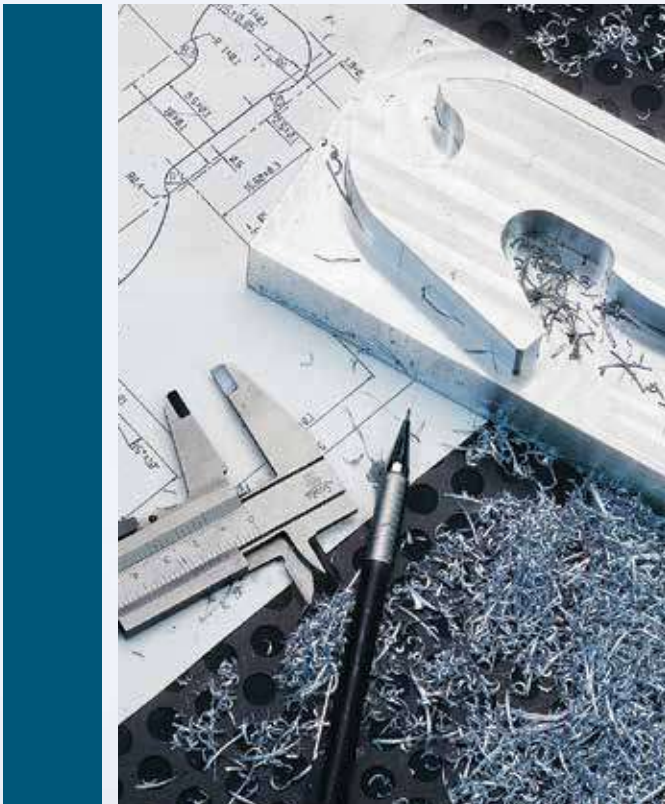
SIEMENS



SINUMERIK 828D SINUMERIK 828D BASIC

Advanced CNC made easy

usa.siemens.com/828D



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We bring your manufacturing up to speed

With their unique CNC performance, the SINUMERIK 828D and SINUMERIK 828D BASIC CNCs set benchmarks when it comes to milling and turning on mid-range machines. Our premium CNC technology opens up unique possibilities for even more productive workpiece milling and turning. With its SINUMERIK 828 controls, Siemens Machine Tool Systems offers compact CNC systems for standard milling and turning machines.

With its technology-specific system software, the range of applications extends from vertical and basic horizontal machining centers — naturally also for moldmaking applications — up to turning machines with counterspindle, driven tools and Y-axis. Rugged hardware architecture and intelligent control algorithms, along with premium drive and motor technology, ensure the highest dynamic response and precision when machining. The intuitive SINUMERIK Operate graphical user interface facilitates efficient machine operation. With their outstanding performance, SINUMERIK 828 controls master all of the demands for standard milling and turning machines, and are supplemented by a range of integrated IT solutions.

SINUMERIK 828D / SINUMERIK 828D Basic

Compact, powerful, simple — simply perfect



SINUMERIK 828D and SINUMERIK 828D BASIC set standards in the compact CNC class when it comes to ruggedness and operator friendliness.

Rugged and maintenance-free

With an operator panel front manufactured out of die-cast magnesium, a panel-based CNC design with well conceived interfaces along with the high IP65 degree of protection make the SINUMERIK 828 a reliable CNC, even in harsh environments. The SINUMERIK 828D and SINUMERIK 828D BASIC are completely maintenance-free CNC controls as they have no fan and no hard disk — and are equipped with NV-RAM memory technology without buffer battery. Two different panel layouts are available — horizontal and vertical — a feature that further enhances their versatility.

User-friendly

Equipped with a full QWERTY CNC keyboard with shortcut keys and a high resolution 8.4" / 10.4" TFT color display, SINUMERIK 828 controls can be simply operated. CNC data can be transferred quickly and easily using USB, Compact Flash (CF) card and RJ45 interfaces at the operator panel front. The fully graphical user interface and the structure of the CNC direct keys facilitate fast operation with just a few keystrokes. Turning and milling machines are operated in an identical fashion.



SINUMERIK 808D



SINUMERIK 828D / SINUMERIK 828D BASIC



SINUMERIK 840D sl

A CNC portfolio for the global machine tool market

SINUMERIK 808D

- Technologies: turning and milling
- Up to 4 axes/spindles
- 1 machining channel
- 7.5" color display
- S7-200 PLC

SINAMICS V60

SINUMERIK 808D

Entry-level class

SINUMERIK 828D SINUMERIK 828D BASIC

- Panel-based compact CNC
- Technologies: turning and milling
- Up to 8 axes/spindles
- 1 machining channel
- 8.4" / 10.4" color display
- S7-200 PLC

SINAMICS S120

SINAMICS S120 Combi

SINUMERIK
828D BASIC

SINUMERIK
828D

Compact class

SINUMERIK 840D sl

- Drive-based, modular CNC
- Multi-technology CNC
- Up to 93 axes/spindles
- Up to 30 machining channels
- Modular panel concept up to 19" color display
- SIMATIC S7-300 PLC

SINAMICS S120 Combi

SINAMICS S120

SINUMERIK
840D sl BASIC

SINUMERIK
840D sl

Premium class

Panel Processing Unit (PPU)

Overview

Everything at a glance

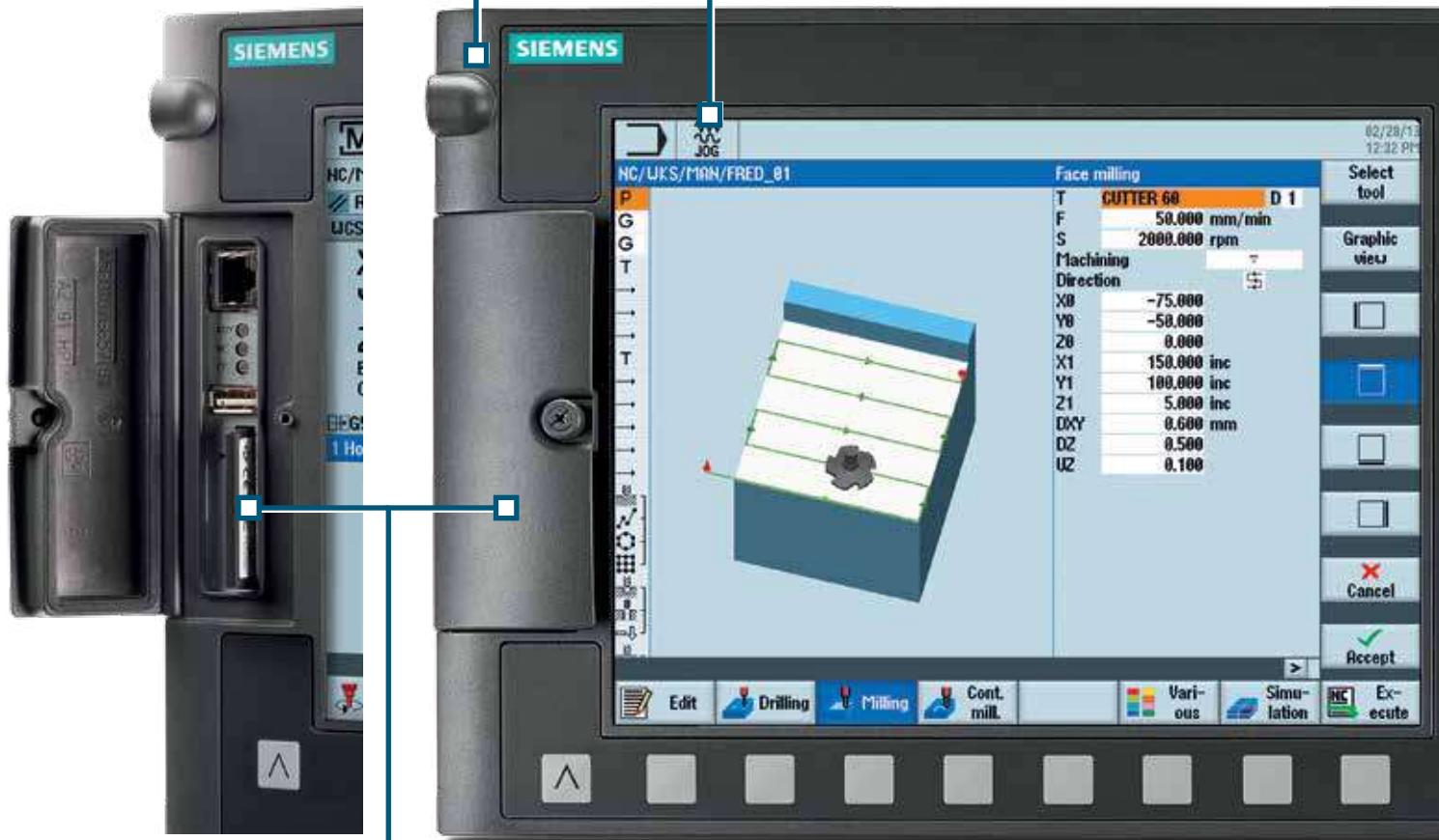
Depending on the particular model:
8.4" TFT color display or 10.4" TFT color display

Durable and rugged

Panel-based CNC with panel front manufactured out of die-cast magnesium

16 softkeys

Using the 8 horizontal and 8 virtual keys, you can quickly get into all of the operator screen forms with just a few keystrokes.



Communications

Front interfaces (IP65)

- RJ45 Ethernet
- USB 2.0
- Compact Flash (CF) card

Maintenance-free

No battery (continuous data buffering based upon NV-RAM technology)

- No fan
- No hard disk

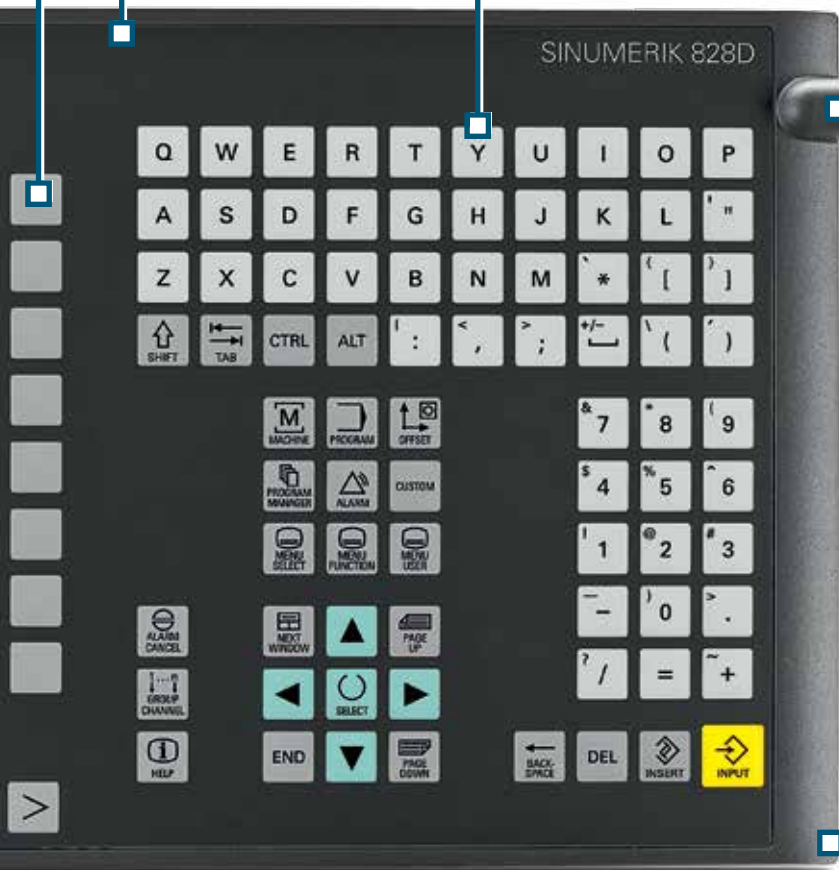
User-friendly

Full QWERTY keyboard

- Hard keys with protective foil
- IP65 degree of protection

Clever

3/8" thread for accessories



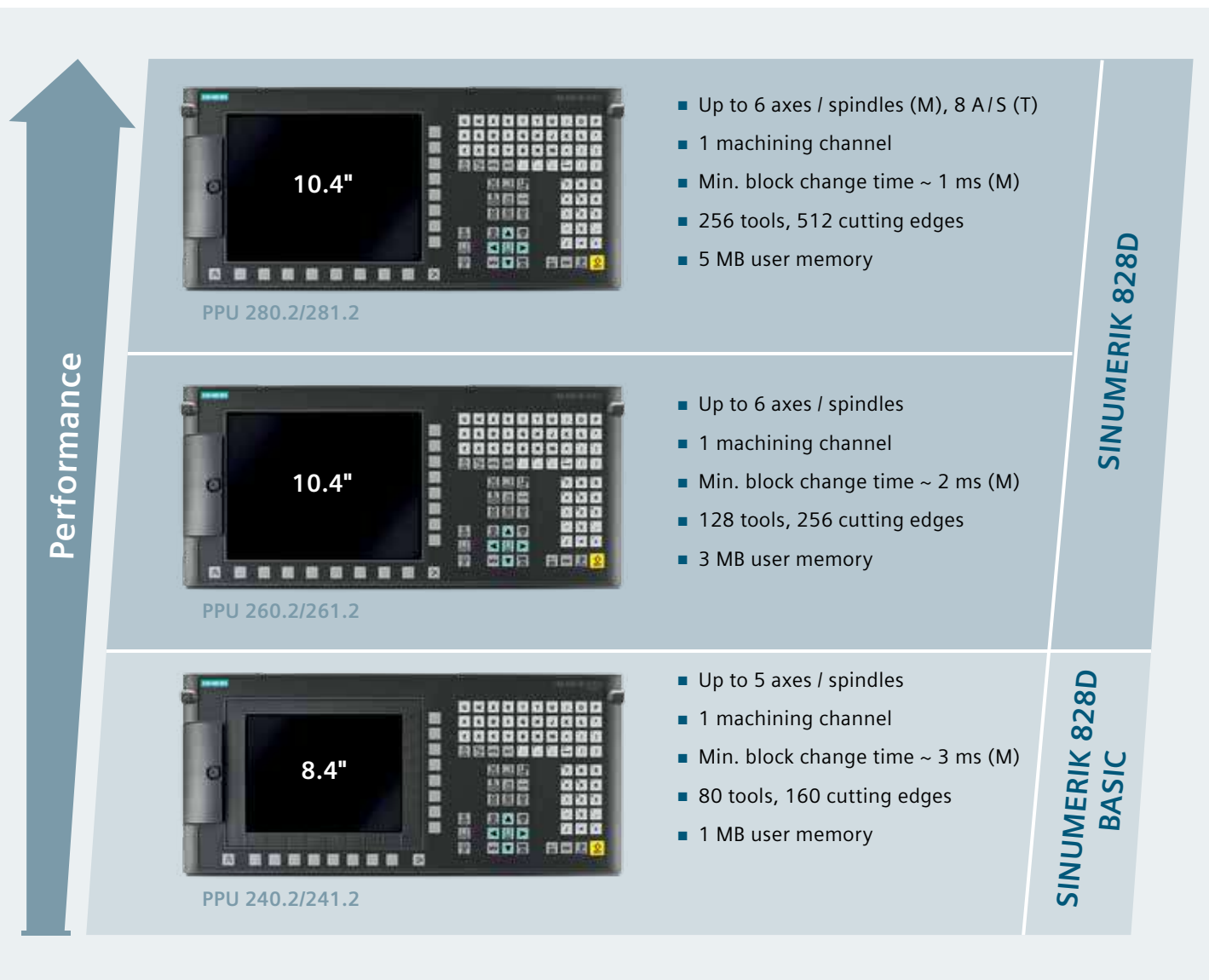
Optimum connection

Rear interfaces

- USB 2.0
- RJ45 Ethernet
- DRIVE-CLiQ
- PLC I/O interface
- RS232 C
- NC inputs/outputs

SINUMERIK 828D and SINUMERIK 828D Basic

Optimum scalability in the compact class



Scalable CNC performance

In addition to two high-performance CNC versions of the SINUMERIK 828D, the SINUMERIK 828D BASIC is the favorably-priced entry into the compact class. This means that SINUMERIK 828 CNCs are always perfectly adapted to the performance requirements of standard machine tools.

SINAMICS and SIMOTICS

The powerhouses behind the scenes



SINUMERIK 828 controls in conjunction with SINAMICS drives and SIMOTICS motors are optimally designed to address the requirements of standard turning and milling machines.

SINAMICS S120 — the highest degree of flexibility

SINAMICS S120 is synonymous with performance and flexibility when it comes to CNC machines. In addition to a wide range of motor modules up to a power rating of 300 kW, there is also an infeed unit with a controlled DC link. This ensures the shortest spindle acceleration times and facilitates perfect reactive power compensation for the complete machine ($\cos \phi = 1$). This is complemented by DSC (Dynamic Servo Control), which represents a unique position control technique to achieve the highest dynamic performance of feed and spindle motors.

SINAMICS S120 Combi — the ideal drive for compact CNC machines

SINAMICS S120 Combi combines the performance of the modular SINAMICS S120 in a compact, rugged design. Here, an infeed and up to four motor modules are integrated in one housing. By intelligently expanding the system to include two more motor modules, the SINAMICS S120 Combi is the ideal drive for compact, standard CNC machines with a spindle power of up to 15 kW and up to five feed axes.

SIMOTICS servomotors

High standstill torques, the fastest speeds and smooth-running characteristics make SIMOTICS servomotors the optimal feed drive for CNC machines. A high degree of protection, strong bearings and a vibration-free design mean that these synchronous servomotors have outstanding reliability. High-quality magnetic materials result in a very high power density — and therefore very small motor dimensions. As a result, these motors can be installed in extremely tight spaces.

usa.siemens.com/simotics-s

SIMOTICS torque motors

Based upon SIMOTICS 1FW6 torque motors, completely new technologies can be addressed, such as turning on milling machines — also known as multi-tasking.

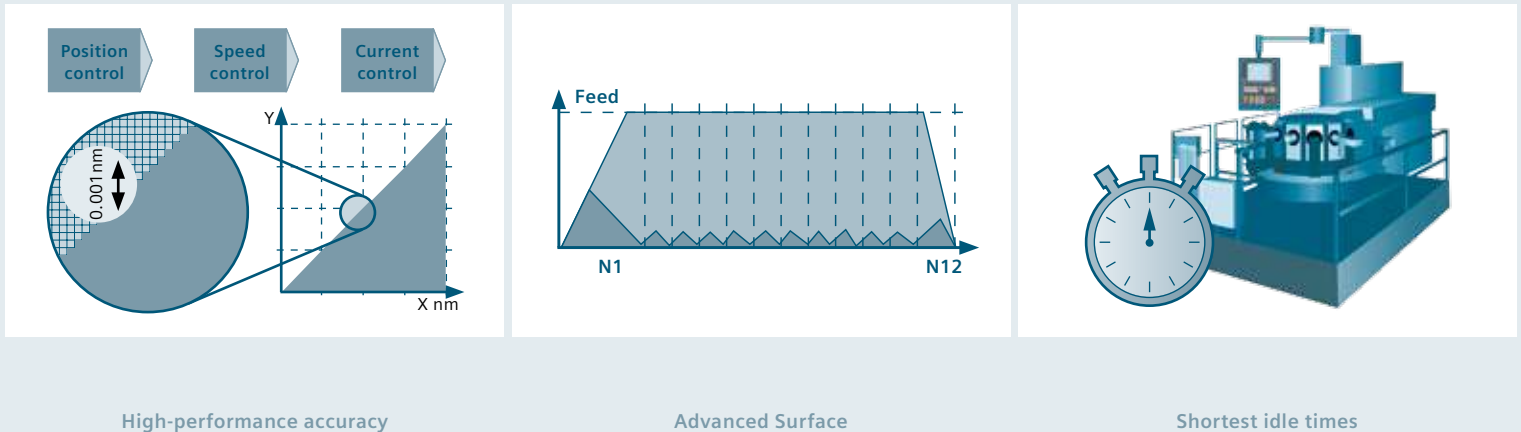
usa.siemens.com/simotics-t

Spindle solutions from Siemens

Siemens has supplemented its long tradition in building electric motors to include a high level of expertise in spindle manufacturing with Weiss Spindle Technology. This allows us to offer you a wide range of spindle solutions from a single source. The result is a portfolio that ideally supports each spindle solution type.

SINUMERIK CNC performance

The machining standard



SINUMERIK controls set standards relating to every aspect of machining performance. Whether precision and speed, reducing cycle times or energy efficiency and safety — SINUMERIK CNCs set the pace.

The highest precision

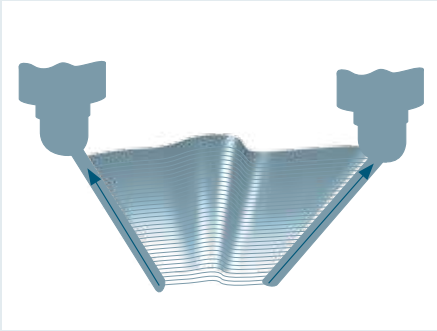
SINUMERIK CNCs and SINAMICS drives compute with high-performance 80 bit NANO^{FP} accuracy. This eliminates rounding errors and results in an extremely high internal computational accuracy in the complete controller circuit. Feed forward control ensures that errors are almost completely compensated — and jerk limitation reduces stress on the mechanical system when axes accelerate. Thanks to Dynamic Servo Control, SINAMICS drives offer additional position control — and as an additional feature, disturbance resistance for the machine control.

Maximum speed

When machining many CNC blocks in the shortest time, for example, free-form surfaces, the machining process itself no longer defines the speed, but the performance of the CNC system. With the Advanced Surface feature, SINUMERIK CNC offers you the ideal solution. Advanced Surface stands for state-of-the-art control algorithms, such as Look Ahead or the dynamic compression of linear and circular blocks in fifth degree polynomials (NURBS). This means that machines equipped with SINUMERIK controls can be operated at their physical limit.

The shortest idle times

Especially in large serial production, idle times, where the machine is no longer productive, represent a critical productivity-inhibiting factor. Here, with its synchronous architecture and intelligent functions, such as synchronized actions or asynchronous sub-programs, SINUMERIK provides the optimal solution. For example, the loading of equipment can be implemented without having to make time-consuming interventions in the PLC.



Kinematic transformations



SINUMERIK Ctrl-Energy



SINUMERIK Safety Integrated

Kinematic transformations

SINUMERIK CNC is in its element when it comes to the handling of complex machine kinematics — from the classic face / peripheral surface transformation for turning machines through multi-side machining in swiveled planes, up to dynamic 5-axis transformation in tool- and moldmaking, as well as in the aerospace industry. The SINUMERIK 840D sl supports every type of special transformations up to milling with robot kinematics — therefore paving the way for advanced machine tool applications.

Energy efficiency with SINUMERIK Ctrl-Energy

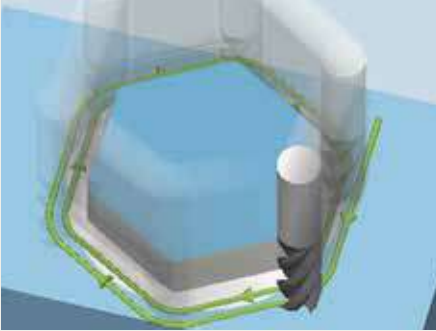
Siemens Machine Tool Systems sets the standard when it comes to energy efficiency — SINUMERIK Ctrl-Energy encompasses a wide range of high-efficiency drive / motor components, CNC / drive functions, software solutions and services. SINUMERIK Ctrl-Energy offers energy-efficient solutions over the machine's entire lifecycle — from the design to the operation of the machine. Users have intelligent functions at their fingertips, such as the ability to analyze the energy costs associated with the workpiece. SINUMERIK CNC helps you to save energy by simply pressing the Ctrl + E shortcut key.

Protection for people and machine with SINUMERIK Safety Integrated

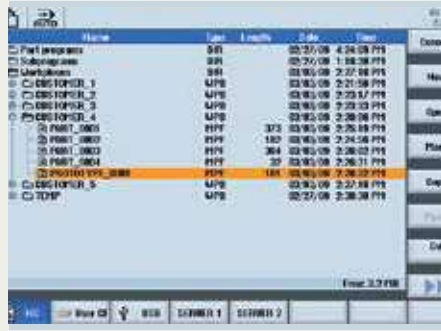
Siemens Machine Tool Systems is the leader when it comes to the protection of people and the machine. SINUMERIK Safety Integrated has set the standard for machine tool safety technology. Here, intelligent system functions permit user-friendly operation of the machine. For example, machine setup with the protective doors open — this provides the highest degree of safety for machine operators and the machine itself.

SINUMERIK Operate

The state-of-the-art operating system for the 21st century



Animated Elements



Program manager



SinuTrain

SINUMERIK Operate offers you such an easy-to-use graphical user interface that's setting the standard for efficient machine tool operation.

usa.siemens.com/sinumerik-operate

Interactive input with Animated Elements

With Animated Elements, SINUMERIK Operate makes it very easy to enter parameters. Animated Elements completely redefine what graphical programming and operation truly mean — using a unique display with moving (animated) image sequences.

Program manager for a better overview

SINUMERIK's program manager makes data handling just as easy-to-use as a PC, where data from various storage media are displayed. A CNC program can be transferred from the data server to the CNC's memory by simply copying and pasting. And it's even easier — large moldmaking workpieces can be executed right in the program manager, directly via the company's network or a Compact Flash (CF) card.

SinuTrain for SINUMERIK Operate

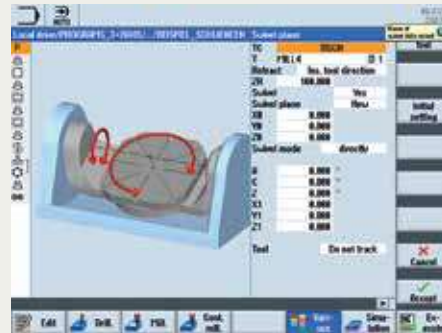
SinuTrain training software makes SINUMERIK Operate even closer to reality on the PC, including the animated machine operator panel. The expertise you gain in the training course can be easily transferred into real life applications. This powerful tool facilitates offline programming at the PC — NC programs can be transferred directly to the CNC.

Thanks to SINUMERIK Operate and the original SINUMERIK NC kernel, there are no restrictions in the operation, programming or execution of NC programs.

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Intelligent JOG mode



Tool and workpiece measuring



Transparent tool management

Intuitive handling, shorter setup times — based upon an intelligent JOG mode and intuitive tool management, SINUMERIK Operate graphically and interactively supports all of the typical setup functions. This keeps unproductive times to an absolute minimum.

Intelligent JOG mode

In SINUMERIK Operate, the intelligent JOG mode provides graphical, interactive support for every typical setup function for turning and milling machines. This means that a tool can be simply loaded with just three clicks. On lathes, face turning of a blank or boring soft clamping jaws are directly realized in the intelligent JOG mode — without having to generate a part program. This means that non-productive times are reduced to an absolute minimum.

Tool and workpiece measuring

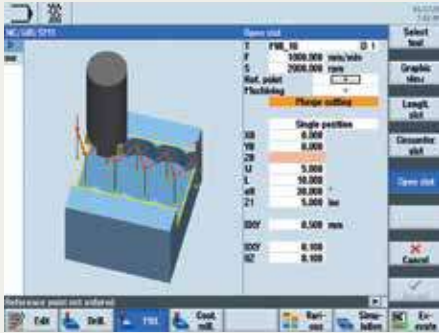
Tool and workpiece measurement is optimally supported in the intelligent JOG mode. It is sufficient to probe an edge, corner or holes in order to determine the clamping position, including the basic rotation of the tool — also in swiveled workpiece planes. Measuring tools is a simple procedure for the SINUMERIK CNC. Regardless of whether the tool geometry is simply “scratched” or determined using a tool measuring system, by pressing just one key, the geometry is transferred into the CNC’s tool offset memory.

Transparent tool management

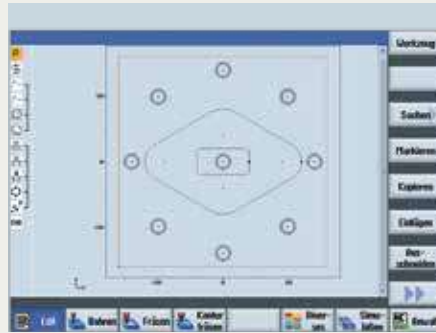
SINUMERIK offers the perfect command when it comes to tool management. Tool data and magazine location are clearly displayed on the screen. A suitable magazine location is automatically selected by simply selecting a tool and pressing a key — the SINUMERIK CNC does the rest. It goes without saying that each tool’s lifetime is monitored, and when required, the appropriate replacement tool is loaded.

SINUMERIK Operate

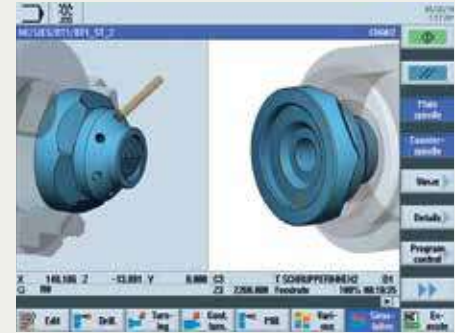
Perfect for every programming task



Large serial production



Small serial production



SINUMERIK CNC simulation

With various programming languages, SINUMERIK supports every CNC programming method that is used around the world — from machining individual parts, up to large serial production.

For large series ...

Achieve the shortest machining times for large serial production and with the highest flexibility for special applications — SINUMERIK controls make this possible with advanced CNC programming based upon high-level language elements. Using programGUIDE, SINUMERIK CNC programs can be easily combined with high-performance technology and measuring cycles. Even classic ISO codes can be programmed. As a result, SINUMERIK is especially attractive for machine operators who prefer this classical programming method.

... and small serial production

For small serial production and individual parts, programming time is a decisive factor — and both ShopMill and ShopTurn machining step programming are unbeatable. Machining operations such as drilling, centering, plunging or pocket milling are shown in the form of machining steps. Even for complicated machining operations, CNC programs are extremely compact and easy to read. Using dynamic broken-line graphics, which are absolutely unique in the market, all of the geometrical elements can be displayed to-scale in the CNC program.

CNC simulation for reliable and safe processes

SINUMERIK CNC simulation guarantees maximum process reliability and safety as the real geometries of the tools are always used. It goes without saying that the simulation shows the precise image of the required machining operation — not just bright, colorful graphics.

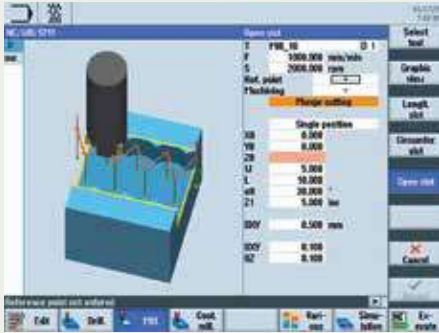
Whether face or peripheral surfaces, swiveled workpiece planes or even machining in several channels, SINUMERIK CNC simulation simulates every machining type. With the moldmaking quick view, even very large part programs can be displayed on the screen within seconds.

Quick View for moldmaking

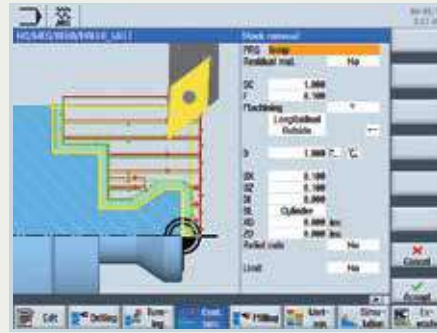
Quick View facilitates the visualization of geometries in tool- and moldmaking in the shortest amount of time. Critical areas can be quickly identified as the actual CAM files are displayed.

The finest technology cycle packages

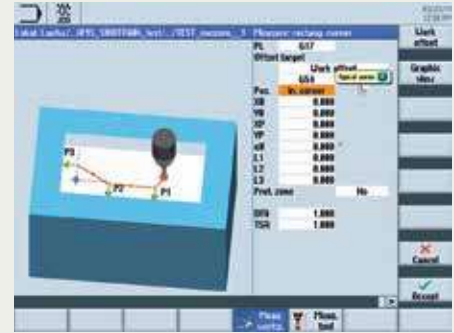
Turning, milling and more



Milling cycle



Contour machining



Measuring cycle

With a powerful technology cycle package for turning and milling, Siemens Machine Tool Systems proves its technological leadership in CNC technology once again.

Technology cycles for every machining operation

SINUMERIK controls offer a range of drilling, milling and turning cycles that are absolutely unique in the marketplace — from basic machining operations such as centering, deep-hole drilling, milling circular pockets and turning grooves, up to more complex machining operations such as engraving, deep-hole milling and the trochoidal milling of hard metals. Based upon intelligent kinematic transformations, technology cycles are available at all machining planes. For example, at the face or peripheral surfaces of turned workpieces, or in swiveled planes of milling workpieces.

Multiple clamping for ShopMill machining step programming

Milling machines become even faster and even more flexible — ShopMill machining step programs can be automatically compiled for multiple clamping with reduced tool change operations. CNC programs are automatically generated — and multiple clamping is supported for both identical and different workpieces.

High-end solid contour machining and stock removal

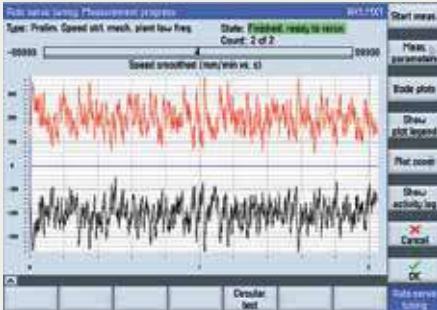
In addition to standard geometries, when you use SINUMERIK CNC, even complicated geometries can be machined without a CAD/CAM system — thanks to the integrated geometry computer and intelligent stock removal cycles. The range extends from the contour milling of pockets with a maximum of 12 islands, up to contour plunging on turning machines — and all of this with automatic residual material detection. This means that the ideal tools can be used for every machining segment. The result — ideal machining quality with significant time-savings.

Measuring cycles for the highest precision

Integrated measuring cycles ensure workpiece precision during the machining process. Tool geometries and work offsets are automatically corrected, so that the required production tolerances are maintained even for high-batch quantities. The integrated recording function ensures that the workpiece quality is optimally documented. For 5-axis machines, a special measuring cycle determines the exact machine geometry, which helps to compensate machine tolerances while workpieces are being machined.

SINUMERIK Operate

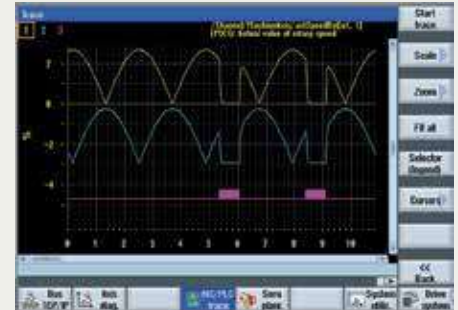
Everything on board for optimization and diagnostics



Auto-Servo Tuning



Information at a glance



Machine diagnostics

SINUMERIK Operate offers the ideal onboard resources to optimize axes, carry out fault diagnostics and perform maintenance work and service tasks. External PC-based software tools are not required.

One-click optimization

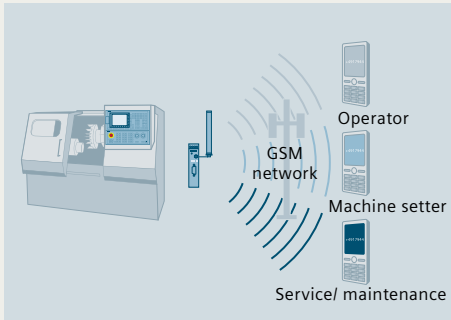
With its Auto-Servo Tuning (AST) functionality, SINUMERIK Operate offers automatic optimization of control parameters to achieve maximum dynamic performance and accuracy of the machine axes — and with just one click. This simplifies machine commissioning — and the machine can be post-optimized regularly during operation. This ensures maximum precision over the entire life of the machine.

All information onboard

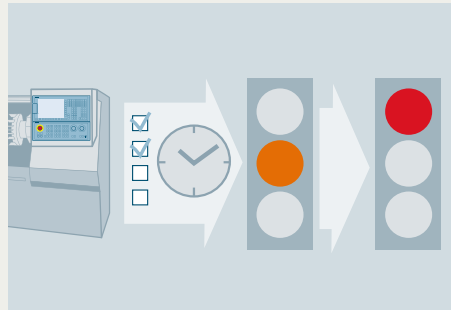
Using context-sensitive graphical onboard help, SINUMERIK technical documentation can be called up on the CNC screen. As a result, all of the information on the input fields, CNC language commands, as well as system messages and system parameters, are directly available at the machine — manuals no longer have to be printed out, which means that operation and programming have been simplified; commissioning, diagnostics and maintenance have been made far more efficient and user-friendly.

Diagnostics

Especially during large serial production, machine failures can result in huge production losses. SINUMERIK Operate provides intelligent onboard diagnostics, so in case of a problem, the machine is up and running again as quickly as possible. In addition to bus diagnostic tools for drive, peripheral and network components, there is also a powerful trace function. This is used to trace and troubleshoot NC, PLC and drive signals.



SMS / text messaging



Maintenance planner



Available in 20 languages

Consistent control with Easy Message

The process status of the machine is always available at a glance — and Easy Message makes it possible. All of the important status information is sent to your mobile phone by text message (SMS) — for example, tool life, the availability of blanks and even upcoming machine maintenance schedules. This means that you are always up to date, even if you are not standing at the machine. This feature increases machine efficiency, your overall productivity and the production process — while facilitating preventive maintenance.

SINUMERIK 828D maintenance planner — all maintenance work is displayed on the screen

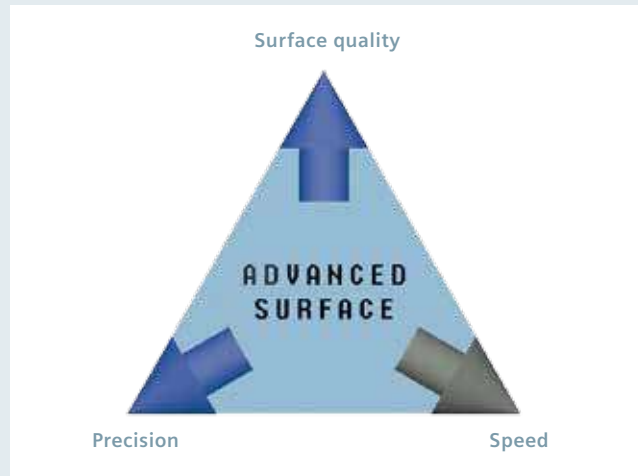
Using the onboard maintenance planner, it is even easier to plan and implement maintenance schedules. Advance warning messages support machine operators when preparing the work — and pre-defined actions play a role in protecting both the operator and the machine. The onboard maintenance planner almost completely replaces printed maintenance manuals.

SINUMERIK Operate — it speaks your language

SINUMERIK Operate is available in over 20 languages. With this comprehensive package of languages for the graphical user interface, SINUMERIK CNC systems support the global marketing of machine tools.

SINUMERIK MDynamics

Synonymous for perfect workpiece surfaces



When you combine cutting-edge machine tool operation with unique technology cycles, you have the ultimate in shopfloor programming and high-quality CNC simulation — together with premium motion control.

Advanced Surface gets the most out of your machine

Advanced Surface is synonymous with milling to the physical limits of the machine. State-of-the-art look ahead algorithms and intelligent block compression ensure maximum machining speed with the highest surface quality and precision.

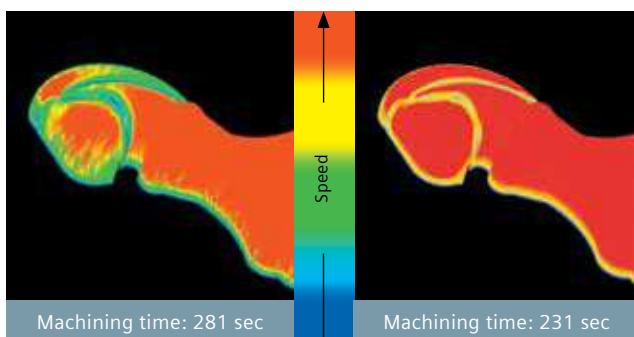
High-Speed Settings

The High-Speed Setting cycle is user-friendly and simplifies the parameterization of moldmaking applications — using just a few parameters, SINUMERIK is set to the required machining tolerance and to the particular machining task such as roughing, finishing or semi-finishing.

The combination makes the difference

Advanced Surface, High-Speed Settings, kinematic transformations and SINUMERIK Operate for machine tool operation and programming — as well as comprehensive technology and measuring cycles — create a unique combination of exciting features for sophisticated milling machines.

usa.siemens.com/sinumerik-mdynamics



IT integration with Siemens

Intelligent networking in production



In addition to CNC technology, Siemens offers an extensive portfolio for IT integration — from standard data transfer using SINUMERIK Operate, up to PLM data management with TEAMCENTER.

SINUMERIK controls master all of the usual data transfer techniques such as USB, Compact Flash (CF) card and TCP/IP Ethernet — without the need for emulation or file conversion programs.

SINUMERIK Integrate

SINUMERIK Integrate perfectly integrates SINUMERIK controls into the IT environment of today's plants. This is achieved by using a powerful software suite.

SINUMERIK and NX CAM

Using NX CAM, the well-known solution for CNC programming, companies can maximize the production yield of their modern CNC machines. In addition to a wide range of flexible technologies for CNC programming, NX CAM also includes a part manufacturing solution. This encompasses a library of clamping resources, as well as options for data management, process planning and options to directly connect to the shopfloor. Being closely tied to the SINUMERIK CNC results in an integrated and seamless CAD/CAM/CNC process chain — which ensures maximum productivity when it comes to high-quality workpiece manufacturing.

TEAMCENTER

This product from Siemens PLM Software is the central information source for product and process expertise in companies. Thanks to a comprehensive Product Lifecycle Management (PLM) solution portfolio, TEAMCENTER links every station of the product lifecycle to this central source. The portfolio encompasses requirements and engineering process management, simulation process management, as well as production process management. The latter is a single, scalable, reliable and secure source for production information, which supports lifecycle processes from development, all the way through to production.

Machine Tool Systems

Siemens — your partner for machine tools



Siemens Machine Tool Systems

A strong partner for the machine tool environment

SINUMERIK CNCs have been setting standards in the machine tool market for more than 50 years. With the power and innovation of a unique and experienced development team in the industry, Siemens is there to ensure that highly productive machine tools can also be implemented in the future based upon SINUMERIK control systems. In addition to innovation, quality is first and foremost, and based upon continuous improvements in development, production and test processes, we ensure maximum availability of software and hardware products.

Global organization

With a closely meshed network of sales, service and training locations, as well as international production facilities, Siemens Machine Tool Systems is optimally organized to globally market machine tools.

The optimum solution for each and every sector

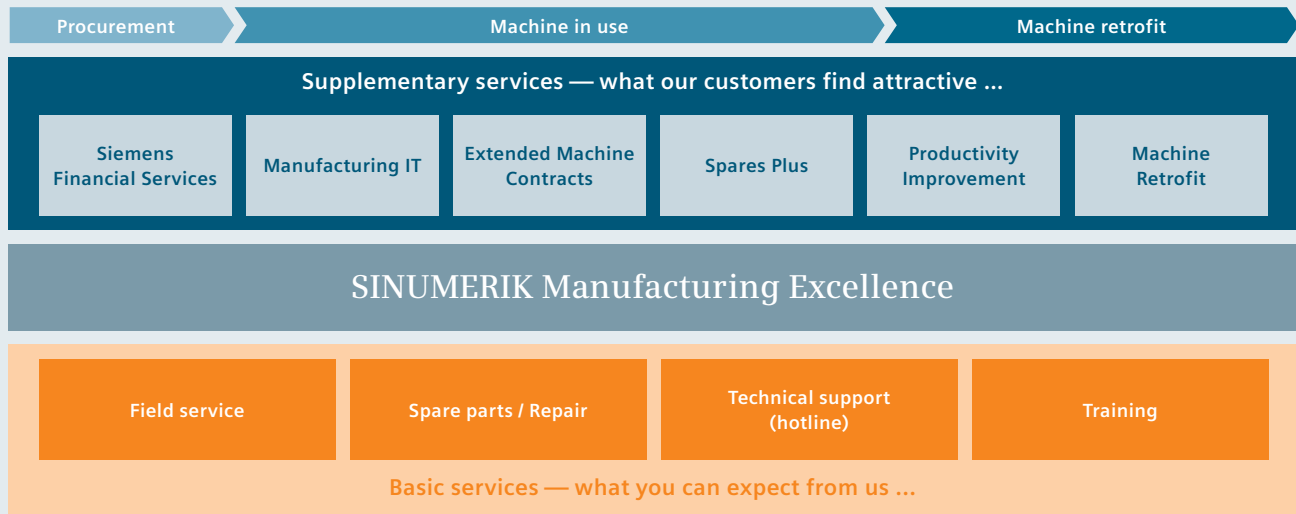
Global trends, such as the continuous population growth and the rising demand for communication resources, are placing new requirements on sectors such as automotive, aerospace, power generation and medical. Siemens Machine Tool Systems is in direct contact with these machine tool markets. This guarantees the optimum product fit for SINUMERIK systems.

Premium IT integration and services

We also supply leading-edge IT integration and simulation solutions to optimally network production and the IT environment. This is supplemented by a sector-specific portfolio of support and services to ensure maximum productivity in production, service and maintenance. As a result, SINUMERIK sector solutions are being employed around the world.

SINUMERIK Manufacturing Excellence

Service and support at the highest level



Basic services — what you can expect from Siemens

Field service

As a global company, Siemens Machine Tool Systems also has a global service team to provide fast and expert service, repair and maintenance around the world in more than 60 regions.

Technical support (hotline)

In more than 25 regions around the world, our technical hotline experts answer every question related to SINUMERIK CNC — and of course, in your local time zone and in even your own language.

usa.siemens.com/cnc-support

Spare parts and repair

A tight-knit, flexible and responsive spare parts and repair network in more than 70 regions around the world ensures that replacement parts are quickly available — and at reasonable prices.

SINUMERIK training

SITRAIN offers professional training for the operation, programming, commissioning and maintenance of SINUMERIK controls in more than 30 countries around the world.

Additional services — what our customers find attractive

With a wide range of additional services, SINUMERIK Manufacturing Excellence increases your machine tool productivity — from the initial design, through use, up to machine retrofit and even modernization.

■ Siemens Financial Services

Financial solutions that perfectly fit your needs

■ Manufacturing IT

Process optimization through the implementation of the SINUMERIK Integrate product suite

■ Extended Machine Contracts

Tailored machinetool service contracts that fit your budget

■ Spares Plus

Preventive spare parts management

■ Productivity Improvement

Reduce the cycle times of your existing machines

■ Machine Retrofit

General overhaul of CNC machine tools that gives new life to old iron

usa.siemens.com/cncretrofit

Technical information

	SINUMERIK 828D BASIC	SINUMERIK 828D	
	PPU24x	PPU26x	PPU28x
Configuration			
Mechanical design	Panel-based		
Operation with SINAMICS S120 Combi drives			
Operation with SINAMICS S120 Booksize drives			
Maximum number of axes/spindles (M: milling/T: turning)	5/5	6/6	6/8
CNC user memory, up to	1 MB	3 MB	5 MB
Additional CNC user memory on CF card/USB stick			
Minimum block change time	~3 ms	~2 ms	~1 ms
Current/speed controller cycle	125 µs		
Current/speed controller cycle, e.g. for high-speed spindles	62.5 µs		
Display size (TFT color displays)	8.4"	10.4"	10.4"
PLC adaptation control	S7-200-based		
PLC I/O interface based on PROFINET			
Axis functions			
Travel to fixed stop with Force Control			
Acceleration with jerk limitation			
Dynamic precontrol			
Advanced Position Control (APC)	–	–	–
Dynamic Servo Control in the drive			
Interpolation			
Interpolating axes, up to	4	4	4
Straight line, circle, helix			
Splines, polynomials, involutes			
Advanced Surface	Milling		
Look Ahead, number of blocks	50	100	150
Compressor	Milling		
Couplings			
Synchronous axis pair (gantry axes)			
Synchronous spindle/multi-edge turning			
Master value coupling/cam table interpolation	–	–	–
Electronic gear			
Transformations			
Face/peripheral surface transformation TRANSMIT			
Multi-side machining (3+2 axis machining)			
SINUMERIK synchronous architecture			
Motion-synchronized actions			
Asynchronous subprograms ASUB			
Compensations			
Compensation of measuring system and spindle pitch (bidirectional)			
Temperature compensation			
Sag compensation			
Additional compensations (cogging torques, etc.)			
Tools/tool management			
Number of tools/cutting edges in the tool list, up to	80/160	128/256	256/512
Unit quantity/tool life monitoring with replacement tool management			

	SINUMERIK 828D BASIC	SINUMERIK 828D	
	PPU24x	PPU26x	PPU28x
CNC operation			
SINUMERIK Operate			
Animated Elements			
SinuTrain training and offline programming tool			
CNC programming			
SINUMERIK CNC programming language with high level language elements			
Online ISO dialect interpreter			
programGUIDE (technology cycle support)			
Technology cycles for drilling, milling and turning			
Cycles for in-process measurements (with cycle support) (tool probe calibration, workpiece measurement, tool measurement)			
ShopMill/ShopTurn machining step programming			
programSYNC (multi-channel operation and programming)	–	–	–
3D CNC simulation for turning/milling			
Simulation parallel to the main machining time (simulation of program X, while program Y is being executed)	–	–	–
Additional functions to increase machine performance (residual material detection, multiple clamping, contour processor, etc.)			
Onboard optimization and diagnostics			
Context-sensitive onboard help system			
Onboard servo and drive optimization (AST)			
Onboard signal, bus and network diagnostics			
IT integration			
Standard data transfer	RS232C/CF card/USB/Ethernet		
SINUMERIK Integrate (Access MyMachine)			
Safety functions			
SINUMERIK Safety Integrated (drive-based)			
Open Architecture			
Openness in the user interface			
SINUMERIK Integrate Run MyScreens (OA EasyScreen)			
Openness in the CNC kernel and in the drive	–	–	–
SINUMERIK Ctrl-Energy			
Ctrl-E analysis (determining the energy usage of the machine)			
Ctrl-E Profile (energy management of the machine in non-productive times)			
Automatic reactive current compensation (with Active Line Module)			
Automatic flux reduction for induction spindle motors			

– not available

available (certain functions are available as CNC option, please ask your machine tool manufacturer)

Everything about SINUMERIK CNC can be found on the web

usa.siemens.com/cnc

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machine tool solutions

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