

Overview of functions



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Ordering examples
for SINUMERIK 840DE sl

The most important functions of the SINUMERIK 802D sl, SINUMERIK 840Di sl and SINUMERIK 840D sl are listed in the Overview of functions.

This allows to access individual functions quickly and easily.

The designation "E" in the name of the control indicates that it is the export version, i.e. the control can be exported with the functions specified in the table.

Overview of functions

SINUMERIK CNC controls

Export control information Standard/export versions

2

Overview

As a consequence of the prevailing export restrictions applicable to the system software of numerical controls in relation to particular control functions in accordance with the European/German Export List (export list item 2D002), SINUMERIK 840Di sl and SINUMERIK 840D sl are available in two versions.

This applies to NCK system software for the SINUMERIK 840Di sl and to NCU system software for the SINUMERIK 840D sl.

The **standard versions** SINUMERIK 840Di sl and SINUMERIK 840D sl offer the full scope of control functions, but **require official approval** according to the export list item 2D002 when exported to countries outside the EU.

The **export versions** SINUMERIK 802D sl, SINUMERIK 840DiE sl and SINUMERIK 840DE sl have restricted functionality in accordance with the export list restrictions and therefore **do not require official approval** as a result of their "Type" in accordance with EU or German law.

The approval status for the complete CNC system is correspondingly dependent on the hardware or software version used.

General note:

If any particular components require official re-export approval according to US law, this must be duly filed for. Information about official approval requirements for supplied components is given in the delivery documentation: Goods labeled here with "AL not equal to N" are subject to European or German export authorization if they are exported out of the EU. Goods labeled with "ECCN not equal to N" are subject to US re-export authorization. Even if goods are not labeled or labeled with "AL:N" or "ECCN:N", they may still be subject to export authorization depending on the final destination and end use of the goods.

If a purchase contract is concluded, it shall be discharged by Siemens with the proviso that performance of the contract shall not be hindered by national or international legal requirements and especially by export control regulations.

Important export information

Export of standard versions of components or systems can be subjected to a time-consuming official authorization process, so it is recommended that **the export version** is used where applicable.

"Information on List of Items (Auskunft zur Güterliste (AZG))" pertaining to the official export authorization process is available for each export version (e.g. BAFA, Customs). You can obtain a copy of this list from your local Siemens sales office.

When the standard variant is used, it is important to note that official authorization is also required for the export of components subject to export approval within the framework of service provision, the supply of spare parts and for delivery of software updates and upgrades. This is especially relevant in cases where the control is exported after the machine manufacturer has installed it in a machine tool. The lengthy official approval procedure can severely restrict after-sales service.

When an application for an export permit for a system is made, we therefore recommend that spare parts supplies for any components requiring approval are included in the application as a matter of course to avoid future delays.

If the control system is to be exported as an installed component in a machine tool, we recommend that machine manufacturers include any components requiring approval in the export permit application for the machine. If the machine itself does not require official export approval, but contains components which do, we recommend that an export permit for the replacement supply of such components is applied for in advance.

Spare parts supplies requiring official approval can then be exported quickly and easily by the machine manufacturer himself, or by Siemens if the manufacturer can make the original export permit available to Siemens.

Overview of functions SINUMERIK CNC controls

Export control information
Standard/export versions

2

Overview (continued)

Functional restrictions for export versions

Function	Order No.	SINUMERIK 840DiE sl	SINUMERIK 840DE sl
Generic transformation	●	–	–
Linear interpolating axes	●	⌘ ¹⁾	⌘ ¹⁾
Helical interpolation 2D+6	●	–	–
Synchronized actions	●	⌘ ²⁾	⌘ ²⁾
Tool orientation interpolation	●	–	–
SINUMERIK NCK Runtime OA	6FC5800-0AM04-0YB0	–	–
Multi-axis interpolation (> 4 interpolating axes)	6FC5800-0AM15-0YB0	–	–
Crank interpolation CRIP	6FC5800-0AN04-0YB0	–	–
Master value coupling and curve table interpolation LEAD	6FC5800-0AM20-0YB0	⌘ ³⁾	⌘ ³⁾
Axial coupling in the machine coordinate system MCS coupling	6FC5800-0AM23-0YB0	–	–
Generic coupling CP Basic	6FC5800-0AM72-0YB0	⌘ ³⁾	⌘ ³⁾
Generic coupling CP Comfort	6FC5800-0AM73-0YB0	⌘ ³⁾	⌘ ³⁾
Generic coupling CP Expert	6FC5800-0AM74-0YB0	⌘ ³⁾	⌘ ³⁾
Electronic gear EG	6FC5800-0AM22-0YB0	⌘ ³⁾	⌘ ³⁾
Machining package milling	6FC5800-0AM26-0YB0	–	–
Machining package 5 axes	6FC5800-0AM30-0YB0	–	–
Machining package 5 axes Additional function 7th axis	6FC5800-0AS01-0YB0	–	–
Transformation DOUBLETRANSMIT	6FC5800-0AM25-0YB0	–	–
Handling transformation package	6FC5800-0AM31-0YB0	–	–
PARACOP 3-axis transformation for parallel kinematics (first channel)	6FC5800-0AM44-0YB0	–	–
Transformation for pantograph kinematics 2 axes	6FC5800-0AM51-0YB0	–	–
Electronic transfer	6FC5800-0AM35-0YB0	⌘ ³⁾	⌘ ³⁾
Electronic transfer CP	6FC5800-0AM76-0YB0	⌘ ³⁾	⌘ ³⁾
Synchronized actions stage 2	6FC5800-0AM36-0YB0	⌘ ⁴⁾	⌘ ⁴⁾
Clearance control, 1D/3D in position control cycle	6FC5800-0AM40-0YB0	⌘ ⁵⁾	⌘ ⁵⁾
Sag compensation, multi-dimensional	6FC5800-0AM55-0YB0	⌘ ⁶⁾	⌘ ⁶⁾
Space error compensation (SEC3D) for kinematic transformations	6FC5800-0AM57-0YB0	–	–

● Basic version

⌘ Restricted functionality of the Export control version

– Not possible

The designation "E" in the name of the control indicates that it is the export variant, i.e. the relevant control software is classified as not requiring official approval (AL=N) with the functional restrictions specified in the table according to AL item 2D002.

For further details on restricted functionality for the export versions, see the Glossary on the CD-ROM for Catalog NC 61 or go to:

www.siemens.com/automation/mall

¹⁾ The number of simultaneously interpolating axes is restricted to four.

²⁾ Only one active synchronous function (SYNFCT) is possible at a time. The number of simultaneously traversing axes is limited to four (path and positioning axes).

³⁾ The number of simultaneously traversing axes is restricted to four.

⁴⁾ The number of simultaneously traversing axes is restricted to four (path and positioning axes).

⁵⁾ 1D clearance control only in the position control cycle, and the number of simultaneously interpolating axes is restricted to four.

⁶⁾ The correctable tolerance band is restricted to 1 mm (0.04 in).

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Control structure and configuration

Structure:

- Panel-based
- PC-based
- Drive-based

SINUMERIK 840D sl:

- NCU 710.2 with PLC 317-2DP
- NCU 720.2 with PLC 317-2DP
- NCU 720.2 PN with PLC 319-3PN/DP
- NCU 730.2 with PLC 317-2DP
- NCU 730.2 PN with PLC 319-3PN/DP
- Seal for external heat dissipation of NCUs

• Numeric Control Extension NX10

• Numeric Control Extension NX15

• Maximum configuration NX10/NX15

NCU 710.2

NCU 720.2/NCU 720.2 PN/NCU 730.2/NCU 730.2 PN

Software for SINUMERIK NCU 710.2/NCU 720.2/NCU 730.2:

- 6 axes with HMI-Embedded, export version, on CF card, with license
- 6 axes with HMI-Embedded, on CF card, with license
- 31 axes with HMI-Embedded, export version, on CF card, with license
- 31 axes with HMI-Embedded, on CF card, with license
- 6/31 axes with HMI-Embedded, export version, on DVD, without license
- 6 axes with HMI-Embedded, export version, license
- 31 axes with HMI-Embedded, export version, license
- 6/31 axes with HMI-Embedded, on DVD, without license
- 6 axes with HMI-Embedded, license
- 31 axes with HMI-Embedded, license
- 6/31 axes with HMI-Embedded, export version, software update service, without license
- 6/31 axes with HMI-Embedded, software update service, without license

6FC5371-0AA10-0AA1

6FC5372-0AA00-0AA1

6FC5372-0AA01-0AA1

6FC5373-0AA00-0AA1

6FC5373-0AA01-0AA1

6FC5348-0AA07-0AA0

6SL3040-0NC00-0AA0

6SL3040-0NB00-0AA0

6FC5840-1YG...YA0

6FC5840-1XG...YA0

6FC5840-3YG...YA0

6FC5840-3XG...YA0

6FC5840-3YC...YA8

6FC5840-1YF00-0YB0

6FC5840-3YF00-0YB0

6FC5840-3XC...YA8

6FC5840-1XF00-0YB0

6FC5840-3XF00-0YB0

6FC5840-3YP00-0YL8

6FC5840-3XP00-0YL8

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Control structure and configuration (continued)

Software for SINUMERIK NCU 710.2/NCU 720.2/NCU 730.2 (continued):

- 6 axes and ShopMill HMI, export version, on CF card, with license
- 6 axes and ShopMill HMI, on CF card, with license
- 31 axes and ShopMill HMI, export version, on CF card, with license
- 31 axes and ShopMill HMI, on CF card, with license
- 6/31 axes and ShopMill HMI, export version, on DVD, without license
- 6 axes with ShopMill HMI, export version, license
- 31 axes and ShopMill HMI, export version, license
- 6/31 axes and ShopMill HMI, on DVD, without license
- 6 axes and ShopMill HMI, license
- 31 axes and ShopMill HMI, license
- 6/31 axes and ShopMill HMI, export version, software update service, without license
- 6/31 axes and ShopMill HMI, software update service, without license
- 6 axes and ShopTurn HMI, export version, on CF card, with license
- 6 axes and ShopTurn HMI, on CF card, with license
- 31 axes and ShopTurn HMI, export version, on CF card, with license
- 31 axes and ShopTurn HMI, on CF card, with license
- 6/31 axes and ShopTurn HMI, export version, on DVD, without license
- 6 axes and ShopTurn HMI, export version, license
- 31 axes and ShopTurn HMI, export version, license
- 6/31 axes and ShopTurn HMI, on DVD, without license
- 6 axes and ShopTurn HMI, license
- 31 axes and ShopTurn HMI, license
- 6/31 axes and ShopTurn HMI, export version, software update service, without license
- 6/31 axes and ShopTurn HMI, software update service, without license

6FC5841-1YG...-YA0

6FC5841-1XG...-YA0

6FC5841-3YG...-YA0

6FC5841-3XG...-YA0

6FC5841-3YC...-YA8

6FC5841-1YF00-0YB0

6FC5841-3YF00-0YB0

6FC5841-3XC...-YA8

6FC5841-1XF00-0YB0

6FC5841-3XF00-0YB0

6FC5841-3YP00-0YL8

6FC5841-3XP00-0YL8

6FC5842-1YG...-YA0

6FC5842-1XG...-YA0

6FC5842-3YG...-YA0

6FC5842-3XG...-YA0

6FC5842-3YC...-YA8

6FC5842-1YF00-0YB0

6FC5842-3YF00-0YB0

6FC5842-3XC...-YA8

6FC5842-1XF00-0YB0

6FC5842-3XF00-0YB0

6FC5842-3YP00-0YL8

6FC5842-3XP00-0YL8

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

–	–	–	–	○	–	●	●		–	
–	–	–	–	–	○	●	●		–	
–	–	–	–	○	–	●	●		–	
–	–	–	–	–	○	●	●		–	
–	–	–	–	○	–	●	●		–	
–	–	–	–	○	–	●	●		–	
–	–	–	–	○	–	●	●		–	
–	–	–	–	–	○	●	●		–	
–	–	–	–	–	○	●	●		–	
–	–	–	–	○	–	●	●		–	
–	–	–	–	–	○	●	●		–	
–	–	–	–	○	–	●		●	–	
–	–	–	–	–	○	●		●	–	
–	–	–	–	○	–	●		●	–	
–	–	–	–	–	○	●		●	–	
–	–	–	–	○	–	●		●	–	
–	–	–	–	○	–	●		●	–	
–	–	–	–	–	○	●		●	–	
–	–	–	–	–	○	●		●	–	
–	–	–	–	○	–	●		●	–	
–	–	–	–	–	○	●		●	–	
–	–	–	–	○	–	●		●	–	
–	–	–	–	–	○	●		●	–	
–	–	–	–	–	○	●		●	–	
–	–	–	–	○	–	●		●	–	
–	–	–	–	–	○	●		●	–	

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Control structure and configuration (continued)

Software for SINUMERIK NCU 710.2/NCU 720.2/
NCU 720.2 PN/NCU 730.2/ NCU 730.2 PN:

- 6 axes with HMI sl, export version,
on CF card, with license
- 31 axes with HMI sl, export version,
on CF card, with license
- 6 axes with HMI sl,
on CF card, with license
- 31 axes with HMI sl,
on CF card, with license
- 6/31 axes with HMI sl, export version,
on DVD, without license
- 6 axes with HMI sl, export version,
license
- 31 axes with HMI sl, export version,
license
- 6/31 axes with HMI sl,
on DVD, without license
- 6 axes with HMI sl, license
- 31 axes with HMI sl, license
- 6/31 axes with HMI sl, export version,
software update service, without license
- 6/31 axes with HMI sl,
software update service, without license

Data carrier for NCU software:

- CompactFlash Card 1 GB

For NCU software version 1.5/2.5
or higher

SINUMERIK 840Di sl/840DiE sl hardware with system software
and licenses installed:

- Current system software, export version, on hard disk of the
SINUMERIK 840DiE sl (PCU 50.3-C 1.5 GHz/512 MB +
MC12 board, Windows XP ProEmbSys)
- Current system software on hard disk of the
SINUMERIK 840Di sl (PCU 50.3-C 1.5 GHz/512 MB +
MC12 board, Windows XP ProEmbSys)
- Current system software, export version, on hard disk of the
SINUMERIK 840DiE sl (PCU 50.3-P 2.0 GHz/1024 MB +
MC12 board, Windows XP ProEmbSys)
- Current system software on hard disk of the
SINUMERIK 840Di sl (PCU 50.3-P 2.0 GHz/1024 MB +
MC12 board, Windows XP ProEmbSys)
- 6/20 axes, export version,
software update service, without license
- 6/20 axes,
software update service, without license

¹⁾ 6 axes: L11
20 axes: L12

¹⁾ 6 axes: L11
20 axes: L12

¹⁾ 6 axes: L11
20 axes: L12

¹⁾ 6 axes: L11
20 axes: L12

6FC5850-1YG...-YA0

6FC5850-3YG...-YA0

6FC5850-1XG...-YA0

6FC5850-3XG...-YA0

6FC5850-3YC...-YA8

6FC5850-1YF00-0YB0

6FC5850-3YF00-0YB0

6FC5850-3XC...-YA8

6FC5850-1XF00-0YB0

6FC5850-3XF00-0YB0

6FC5850-3YP00-0YL8

6FC5850-3XP00-0YL8

6FC5313-5AG00-0AA0

6FC5220-0YA31-2AA0-Z
L1.¹⁾ + Q00 + R006FC5220-0XA31-2AA0-Z
L1.¹⁾ + Q00 + R006FC5220-0YA33-2AA0-Z
L1.¹⁾ + Q00 + R006FC5220-0XA33-2AA0-Z
L1.¹⁾ + Q00 + R00

6FC5820-3YP00-0YL8

6FC5820-3XP00-0YL8

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

–	–	–	–	○	–	–	–	–	●	
–	–	–	–	○	–	–	–	–	●	
–	–	–	–	–	○	–	–	–	●	
–	–	–	–	–	○	–	–	–	●	
–	–	–	–	○	–	–	–	–	●	
–	–	–	–	○	–	–	–	–	●	
–	–	–	–	○	–	–	–	–	●	
–	–	–	–	–	○	–	–	–	●	
–	–	–	–	–	○	–	–	–	●	
–	–	–	–	–	○	–	–	–	●	
○	○	–	–	○	○					
–	–	○	–	–	–					
–	–	–	○	–	–					
–	–	○	–	–	–					
–	–	–	○	–	–					
–	–	○	–	–	–					
–	–	–	○	–	–					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Control structure and configuration (continued)

SINUMERIK 840Di sl hardware with Windows OS:

- 840Di sl (PCU 50.3-C 1.5 GHz/512 MB + MCI2 board, Windows XP ProEmbSys)
- 840Di sl (PCU 50.3-P 2.0 GHz/1024 MB + MCI2 board, Windows XP ProEmbSys)

MCI board extension slot version with cable distributor

Software for SINUMERIK 840Di sl:

- 6/20 axes and ShopMill HMI, ShopTurn HMI and HMI-Advanced, export version, on DVD, without license
- 6 axes, export version, license
- 20 axes, export version, license
- 6/20 axes and ShopMill HMI, ShopTurn HMI and HMI-Advanced, on DVD, without license
- 6 axes, license
- 20 axes, license

SINUMERIK 802D sl:

- Version T/M value, export version
- Version T/M plus, export version
- Version T/M pro, export version
- Version G/N plus, export version
- Version G/N pro, export version

Channels/mode groups (MG):

- Maximum configuration
- 6-axis software
- 20/31-axis software
- NCU 710.2
- NCU 720.2/NCU 720.2 PN/NCU 730.2/NCU 730.2 PN
- Each additional mode group (MG)
- Each additional machining channel

6FC5220-0AA31-2AA0

6FC5220-0AA33-2AA0

6FC5222-0AA00-0AA1
6FX2006-1BA02For software version 1.4 SP1
or higher.

6FC5820-3YC...-YA8

6FC5820-1YP00-0YB0

6FC5820-3YP00-0YB0

For software version 1.4 SP1
or higher.

6FC5820-3XC...-YA8

6FC5820-1XP00-0YB0

6FC5820-3XP00-0YB0

6FC5370-0AA00-1AA0

6FC5370-0AA00-2AA0

6FC5370-0AA00-3AA0

6FC5370-0AA00-2BA0

6FC5370-0AA00-3BA0

6FC5800-0AC00-0YB0

C01 ... C09

6FC5800-0AC10-0YB0

C11 ... C19

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
–	–	○	○	–	–	–	◆	◆	–	○
–	–	○	○	–	–	–	◆	◆	–	○
–	–	○	○	–	–					
–	–	○	–	–	–		◆	◆	–	
–	–	○	–	–	–		◆	◆	–	
–	–	○	–	–	–		◆	◆	–	
–	–	–	○	–	–		◆	◆	–	
–	–	–	○	–	–		◆	◆	–	
–	–	–	○	–	–		◆	◆	–	
●	–	–	–	–	–					
●	–	–	–	–	–					
●	–	–	–	–	–					
–	●	–	–	–	–					
–	●	–	–	–	–					
●	●	●	●	●	●					
1	1	1	1	1	1	10	1	1	10	10
–	–	2	2	2	2					
–	–	10	10	10	10					
–	–	–	–	4	4					
–	–	–	–	10	10					
–	–	○	○	○	○	○	–	–	○	○
–	–	○	○	○	○	○	–	–	○	○

Overview of functions SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Control structure and configuration (continued)

CNC user memory (buffered)
for programs and OEM cycles in MB

- ¹⁾ With value version: 512 KB
With plus version: 1 MB

CNC user memory for programs,
OEM cycles and data, expansion
by 2 MB in each case

6FC5800-0AD00-0YB0**D01 ... D06**

CNC user memory, maximum configuration

- ¹⁾ With value version: 512 KB
With plus version: 1 MB
²⁾ For NCU 710.2 max. 9 MB

HMI user memory, additional 256 MB
on NCU's CF card

- ¹⁾ On external CF card.
²⁾ Not in combination with
HMI-Advanced.

6FC5800-0AP12-0YB0**P12**

Axes/spindles or positioning axes/auxiliary spindle:

- ¹⁾ With value version: 3/1.

6-axis software

20/31-axis software

- Maximum configuration of axes

- ¹⁾ With value version: 3/1.
²⁾ Display: 3 geometry axes +
2 additional axes + 1 spindle.
³⁾ Display: 3 geometry axes +
2 additional axes + 3 spindles.

NCU 710.2

NCU 720.2/NCU 720.2 PN/NCU 730.2/NCU 730.2 PN

- Maximum configuration of spindles

NCU 710.2

NCU 720.2/NCU 720.2 PN/NCU 730.2/NCU 730.2 PN

- Maximum configuration of axes and spindles

- ¹⁾ With value version: 3/1.

NCU 710.2

NCU 720.2/NCU 720.2 PN/NCU 730.2/NCU 730.2 PN

- Configuration per channel axes
incl. spindles

- ¹⁾ With value version: 3/1.

NCU 710.2

NCU 720.2/NCU 720.2 PN/NCU 730.2/NCU 730.2 PN

Axis/spindle, each additional

6FC5800-0AA00-0YB0**A01 ... A26**

Positioning axis/auxiliary spindle, each additional

6FC5800-0AB00-0YB0**B01 ... B26**

PLC-controlled axis

- ¹⁾ With plus and pro versions.

PLC positioning axis via PROFIBUS DP

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
● 3 ¹⁾	● 3 ¹⁾	● 5	● 5	● 3	● 3					
–	–	–	–	○	○					
3 ¹⁾	3 ¹⁾	5	5	15 ²⁾	15 ²⁾					
● 1)	● 1)	–	–	◇	◇	○	○ 2)	○ 2)	○	–
4/1 3/2 ¹⁾	4/1 3/2									
–	–	● 3	● 3	● 3	● 3					
–	–	● 5	● 5	● 5	● 5					
4/1 3/2 ¹⁾	4/1 3/2	20	20			31	12 ²⁾	12 ³⁾	31	31
–	–	–	–	6	6					
–	–	–	–	31	31					
2 ¹⁾	2	20	20			31	1	3+2C	31	31
–	–	–	–	6	6					
–	–	–	–	31	31					
4/1 3/2 ¹⁾	4/1 3/2	20	20			31	12	12	31	31
–	–	–	–	6	6					
–	–	–	–	31	31					
4/1 3/2 ¹⁾	4/1 3/2	12	12			12 12	12 1	12 3	12 12	12 12
–	–	–	–	6	6					
–	–	–	–	12	12					
–	–	○	○	○	○					
–	–	○	○	○	○					
1 ¹⁾	1 ¹⁾	●	●	●	●					
–	–	●	●	●	●					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Drives

SINAMICS S120 booksize compact format

See SINAMICS S120 drive system.

SINAMICS S120 booksize format, Motor Modules via DRIVE-CLiQ

See SINAMICS S120 drive system.

SINAMICS S120 closed-loop control CU320¹⁾¹⁾ For positioning tasks via PLC.**6SL3040-0MA00-0A..**

- CompactFlash card with current SINAMICS FW release

- License for basic performance

- License incl. FW option

Enhanced performance

6SL3054-0AA00-1AA0**6SL3054-0AA01-1AA0**

SINAMICS S120 closed-loop control CU310 DP

For positioning tasks via PLC with blocksize Power Module.

6SL3040-0LA00-0AA.

SINAMICS S120 closed-loop control CU310 PN

6SL3040-0LA01-0AA.

SINAMICS S120 Control Unit Adapter CUA31

6SL3040-0PA00-0A..

SINAMICS S120 Sensor Modules Cabinet

- SINAMICS S120 SMC10

¹⁾ No SINUMERIK Safety Integrated.**6SL3055-0AA00-5AA.**

- SINAMICS S120 SMC20

6SL3055-0AA00-5BA.

- SINAMICS S120 SMC30

¹⁾ No SINUMERIK Safety Integrated.**6SL3055-0AA00-5CA.**

SINAMICS S120 Sensor Modules External

- SINAMICS S120 SME20

6SL3055-0AA00-5EA.

- SINAMICS S120 SME25

6SL3055-0AA00-5HA.

- SINAMICS S120 SME120

6SL3055-0AA00-5JA.

- SINAMICS S120 SME125

6SL3055-0AA00-5KA.

SINAMICS S120 TB/TM Terminal Module

- SINAMICS S120 TB30

6SL3055-0AA00-2T..

- SINAMICS S120 TM31

6SL3055-0AA00-3A..

- SINAMICS S120 TM15

6SL3055-0AA00-3FA.

- SINAMICS S120 TM17

6SL3055-0AA00-3HA.

SINAMICS S120 expansion modules

- SINAMICS S120 VSM

6SL3053-0AA00-3A..

- SINAMICS S120 DMC20

6SL3055-0AA00-6AA.

SINAMICS S120 booksize format Motor Modules, internal air cooling

6SL3120-1TE13-0A..
6SL3120-1TE15-0A..
6SL3120-1TE21-0A..
6SL3120-1TE21-8A..
6SL3120-1TE23-0A..
6SL3120-1TE24-5A..
6SL3120-1TE26-0A..
6SL3120-1TE28-5A..
6SL3120-1TE31-3A..
6SL3120-1TE32-0A..
6SL3120-2TE13-0A..
6SL3120-2TE15-0A..
6SL3120-2TE21-0A..
6SL3120-2TE21-8A..

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
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				1)	1)					
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○	○	○	○	○	○					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Drives (continued)

SINAMICS S120 booksize format Motor Modules,
external air cooling

6SL3121-1TE13-0A..
6SL3121-1TE15-0A..
6SL3121-1TE21-0A..
6SL3121-1TE21-8A..
6SL3121-1TE23-0A..
6SL3121-1TE24-5A..
6SL3121-1TE26-0A..
6SL3121-1TE28-5A..
6SL3121-1TE31-3A..
6SL3121-1TE32-0A..
6SL3121-2TE13-0A..
6SL3121-2TE15-0A..
6SL3121-2TE21-0A..
6SL3121-2TE21-8A..

SINAMICS S120 booksize format Motor Modules,
cold plate cooling

6SL3126-1TE13-0A..
6SL3126-1TE15-0A..
6SL3126-1TE21-0A..
6SL3126-1TE21-8A..
6SL3126-1TE23-0A..
6SL3126-1TE24-5A..
6SL3126-1TE26-0A..
6SL3126-1TE28-5A..
6SL3126-1TE31-3A..
6SL3126-1TE32-0A..
6SL3126-2TE13-0A..
6SL3126-2TE15-0A..
6SL3126-2TE21-0A..
6SL3126-2TE21-8A..

SINAMICS S120 booksize format Active Line Modules,
internal air cooling

6SL3130-7TE21-6A..
6SL3130-7TE23-6A..
6SL3130-7TE25-5A..
6SL3130-7TE28-0A..
6SL3130-7TE31-2A..

SINAMICS S120 booksize format Active Line Modules,
external air cooling

6SL3131-7TE21-6A..
6SL3131-7TE23-6A..
6SL3131-7TE25-5A..
6SL3131-7TE28-0A..
6SL3131-7TE31-2A..

SINAMICS S120 booksize format Active Line Modules,
cold plate cooling

6SL3136-7TE21-6A..
6SL3136-7TE23-6A..
6SL3136-7TE25-5A..
6SL3136-7TE28-0A..
6SL3136-7TE31-2A..

SINAMICS S120 booksize format Smart Line Modules,
internal air cooling

6SL3130-6AE15-0A..
6SL3130-6AE21-0A..
6SL3130-6TE21-6A..
6SL3130-6TE23-6A..

SINAMICS S120 booksize format Smart Line Modules,
external air cooling

6SL3131-6AE15-0A..
6SL3131-6AE21-0A..

SINAMICS S120 booksize format Smart Line Modules,
cold plate cooling

6SL3136-6AE15-0A..
6SL3136-6AE21-0A..

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

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—	—	○	○	○	○					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Drives (continued)

SINAMICS S120 chassis format Motor Modules, internal air cooling (rated pulse frequency 2 kHz)	No SINUMERIK Safety Integrated.	6SL3320-1TE32-1AA. 6SL3320-1TE32-6AA. 6SL3320-1TE33-1AA. 6SL3320-1TE33-8AA. 6SL3320-1TE35-0AA.	
SINAMICS S120 chassis format Motor Modules, internal air cooling (rated pulse frequency 1.25 kHz)		6SL3320-1TE36-1AA. 6SL3320-1TE37-5AA. 6SL3320-1TE38-4AA. 6SL3320-1TE41-0AA. 6SL3320-1TE41-2AA. 6SL3320-1TE41-4AA.	
SINAMICS S120 chassis format Active Line Modules, internal air cooling (up to 300 kW)	No SINUMERIK Safety Integrated.	6SL3330-7TE32-1AA. 6SL3330-7TE32-6AA. 6SL3330-7TE33-8AA. 6SL3330-7TE35-0AA.	
SINAMICS S120 chassis format Active Line Modules, internal air cooling (up to 500 kW)		6SL3330-7TE36-1AA. 6SL3330-7TE38-4AA. 6SL3330-7TE41-0AA. 6SL3330-7TE41-4AA.	
SINAMICS S120 blocksize format Power Modules 230 V 1 AC, internal air cooling	No SINUMERIK Safety Integrated.	6SL3210-1SB10-9UA0 6SL3210-1SB12-3UA0 6SL3210-1SB13-9UA0 6SL3210-1SB10-9AA0 6SL3210-1SB12-3AA0 6SL3210-1SB13-9AA0	
SINAMICS S120 blocksize format Power Modules 400 V 3 AC, internal air cooling	No SINUMERIK Safety Integrated.	6SL3210-1SE11-3UA0 6SL3210-1SE11-7UA0 6SL3210-1SE12-2UA0 6SL3210-1SE13-1UA0 6SL3210-1SE14-1UA0 6SL3210-1SE16-0UA0 6SL3210-1SE17-7UA0 6SL3210-1SE21-0UA0 6SL3210-1SE21-8UA0 6SL3210-1SE22-5UA0 6SL3210-1SE23-2UA0 6SL3210-1SE23-8UA0 6SL3210-1SE24-5UA0 6SL3210-1SE26-0UA0 6SL3210-1SE27-5UA0 6SL3210-1SE31-0UA0 6SL3210-1SE31-1UA0 6SL3210-1SE31-5UA0 6SL3210-1SE31-8UA0 6SL3210-1SE11-3AA0 6SL3210-1SE11-7AA0 6SL3210-1SE12-2AA0 6SL3210-1SE13-1AA0 6SL3210-1SE14-1AA0 6SL3210-1SE16-0AA0 6SL3210-1SE17-7AA0 6SL3210-1SE21-0AA0 6SL3210-1SE21-8AA0 6SL3210-1SE22-5AA0 6SL3210-1SE23-2AA0 6SL3210-1SE23-8AA0 6SL3210-1SE24-5AA0 6SL3210-1SE26-0AA0 6SL3210-1SE27-5AA0 6SL3210-1SE31-0AA0 6SL3210-1SE31-1AA0 6SL3210-1SE31-5AA0 6SL3210-1SE31-8AA0	

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
–	–	○	○	○	○					
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–	–	○	○	○	○					
–	–	○	○	○	○					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Drives (continued)

SINAMICS S120 chassis format Power Modules,
400 V 3 AC, internal air cooling

6SL3310-1TE32-1AA0
6SL3310-1TE32-6AA0
6SL3310-1TE33-1AA0
6SL3310-1TE33-8AA0
6SL3310-1TE35-0AA0

Hydraulic axis (distributed)
for connection as interpolating CNC axis

Coupled via PROFIBUS DP V2 with
PROFIdrive V3.1, isochronous
for electrical drives
(e.g. IAC-R).
No SINUMERIK
Safety Integrated.

ADI 4 (Analog Drive Interface for 4 axes)

No PROFIBUS
certification.

6FC5211-0BA01-0AA3

SIMODRIVE 611 universal HRS

No combined operation with
SINAMICS.

For further information,
see the NC 60 Catalog.

SIMODRIVE 611 universal E HRS
via PROFIBUS

No combined operation with
SINAMICS.

For further information,
see the NC 60 Catalog.

Connectable measuring systems

• Max. number

Two measuring systems per axis.

• Absolute/incremental encoder installed
in 1FT6/1FT7/1FK7/1PH7

Integrated in motor via SINAMICS S120
Sensor Modules

• Resolver installed in 1FT6/1FK7/1PH7

Integrated in motor via SINAMICS S120
Sensor Modules

• Incremental rotary measuring systems with RS 422 (TTL)

Via SINAMICS S120 Sensor Modules
SMC30.
1) For analog spindle,
setpoint via MCPA.
2) For analog axes via ADI 4.

• Linear scale LMS with sin/cos 1 V_{pp}

Via SINAMICS S120 Sensor Modules
SMC20/SME20.

• Rotary measuring systems with sin/cos 1 V_{pp}

Via SINAMICS S120 Sensor Modules
SMC20/SME20.

• Linear scale LMS with distance-coded
reference marks

Via SINAMICS S120 Sensor Modules
SMC20/SME20.

• Rotary measuring systems with distance-coded
reference marks

Via SINAMICS S120 Sensor Modules
SMC20/SME20.

• Linear scale LMS with EnDat 2.1

Via SINAMICS S120 Sensor Modules
SMC20/SME25.

• Rotary measuring systems with EnDat 2.1

Via SINAMICS S120 Sensor Modules
SMC20/SME25.

• Absolute encoder with SSI interface

For analog axes via ADI 4.

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
–	–	–	–	–	–					
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● 1)2)	● 1)2)	● 2)	● 2)	●	●					
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Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Axis functions

Feedrate override 0 ... 200 %			
Feedrate override, axis-specific 0 ... 200 %			
Traversing range ± 9 decades			
Rotary axis, turning endlessly	¹⁾ With plus and pro versions.		
Velocity, max. 300 m/s (984 ft/s)			
Acceleration with jerk limitation			
Programmable acceleration			
Follow-up mode			
Measuring system 1 and 2, selectable			
Feedrate interpolation			
Separate path feed for corners and chamfers			
Travel to fixed stop	¹⁾ With plus and pro versions.		
Travel to fixed stop with Force Control		6FC5800-0AM01-0YB0	M01
Analog axis	With ADI 4.		
Setpoint exchange		6FC5800-0AM05-0YB0	M05
Tangential control		6FC5800-0AM06-0YB0	M06
Path switch signals/cam controller:	¹⁾ Path switch signals only.	6FC5800-0AM07-0YB0	M07
• Max. number of pairs			
Advanced Position Control APC		6FC5800-0AM13-0YB0	M13

Spindle functions

Analog spindle speed	¹⁾ With MCPA. ²⁾ With ADI 4.		
Digital spindle speed			
Spindle speed, max. programmable value range: 10 ⁶ ... 0.0001 (display: $\pm 999\,999\,999.9999$)			
Spindle override 0 ... 200 %			
5 gear stages			
Automatic gear stage selection			
Oriented spindle stop			
Spindle speed limitation (min./max.)			
Constant cutting rate			
Spindle control via PLC (positioning, oscillation)	¹⁾ With plus and pro versions.		
Changeover to axis mode	¹⁾ With plus and pro versions.		

1)	1)	2)	2)	—	—					
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Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Spindle functions (continued)

Axis synchronization on-the-fly

Thread run-in and run-out
programmableThread cutting with constant or
variable pitch

Tapping with compensating chuck/rigid tapping

Interpolations

Linear interpolation axes

¹⁾ With value version: 3.

• Maximum

¹⁾ With value version: 3.

Circle via center point and end point

Circle via interpolation point

Helical interpolation

¹⁾ With value version: 2D+1.Universal interpolator NURBS
(non-uniform rational B-splines)Continuous-path mode with programmable
rounding clearanceMulti-axis interpolation
(> 4 interpolating axes)

6FC5800-0AM15-0YB0

M15

Spline interpolation (A, B and C splines/compressor)
for 3-axis machining

6FC5800-0AM16-0YB0

M16

Spline interpolation (A, B and C splines/compressor)
for 5-axis machining

6FC5800-0AM17-0YB0

M17

Polynomial interpolation

6FC5800-0AM18-0YB0

M18

Involute interpolation

6FC5800-0AM21-0YB0

M21

Continue machining at the contour
(retrace support)Precondition:
Loadable compile cycle and
cross-mode actions M43.

6FC5800-0AM24-0YB0

M24

Crank interpolation CRIP

Precondition:
Loadable compile cycle.

6FC5800-0AN04-0YB0

N04

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
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4 ¹)	4	4	12	4	12					
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2D+2 ¹)	2D+2	2D+2	2D+6	2D+2	2D+6					
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Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Couplings

Trailing axes TRAIL			
Synchronous spindle/multi-edge turning COUP		6FC5800-0AM14-0YB0	M14
Axial coupling in the machine coordinate system MCS coupling	Precondition: Loadable compile cycle.	6FC5800-0AM23-0YB0	M23
Master value coupling and curve table interpolation LEAD	¹⁾ With restricted functionality, see export versions.	6FC5800-0AM20-0YB0	M20
Electronic gear EG	¹⁾ With restricted functionality, see export versions.	6FC5800-0AM22-0YB0	M22
Pair of synchronized axes (gantry axes) Max. number		6FC5800-0AM02-0YB0	M02
Master/slave for drives		6FC5800-0AM03-0YB0	M03
Generic couplings CP			
Generic coupling Standard, CP Standard			
• 4 axis pairs in simultaneous coupled motion			
Generic coupling Static, CP Static		6FC5800-0AM75-0YB0	M75
• 1x simple synchronous spindle coupling factor 1:1			
Generic coupling Basic, CP Basic		6FC5800-0AM72-0YB0	M72
• 4 axis pairs in simultaneous coupled motion and • 1x synchronous spindle/multi-edge turning or master value coupling/curve table interpolation or axial coupling in the machine coordinate system	¹⁾ With restricted functionality, see export versions.		
Generic coupling Comfort, CP Comfort		6FC5800-0AM73-0YB0	M73
• 4 axis pairs in simultaneous coupled motion and • 4x synchronous spindle/multi-edge turning and/or master value coupling/curve table interpolation and/or axial coupling in the machine coordinate system and • 1x electronic gear for 3 master axes (without curve table, without cascading)	¹⁾ With restricted functionality, see export versions.		
Generic coupling Expert, CP Expert		6FC5800-0AM74-0YB0	M74
• 8 axis pairs in simultaneous coupled motion and • 8x synchronous spindle/multi-edge turning and/or master value coupling/curve table interpolation and/or axial coupling in the machine coordinate system and • 8x electronic gear for 3 master axes (with curve tables, with cascading) • 5x electronic gear for 5 master axes (with curve tables, with cascading)	¹⁾ With restricted functionality, see export versions. ²⁾ Precondition: NCU 720.2/NCU 720.2 PN/ NCU 730.2/NCU 730.2 PN.		

Transformations

Cartesian point-to-point (PTP) travel			
TRANSMIT and peripheral surface transformation	¹⁾ With plus and pro versions.	6FC5800-0AM27-0YB0	M27
Inclined axis		6FC5800-0AM28-0YB0	M28
Concatenated transformations (inclined axis TRAANG after TRAORI/ cardan millhead/TRANSMIT/TRACYL)			

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
–	–	●	●	●	●					
–	–	○	○	○	○					
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Overview of functions SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Transformations (continued)

Handling Transformation Package	Precondition: Loadable compile cycle.	6FC5800-0AM31-0YB0	M31
Generic transformation	Precondition: Machining package 5 axes or Machining package milling		
Transformation DOUBLETRANSMIT	Precondition: Loadable compile cycle.	6FC5800-0AM25-0YB0	M25
Transformation for pantograph kinematics, 2 axes	Precondition: Loadable compile cycle.	6FC5800-0AM51-0YB0	M51
PARACOP 3-axis transformation for parallel kinematics (first channel)	Precondition: Loadable compile cycle.	6FC5800-0AM44-0YB0	

Measuring functions/measuring cycles

Measuring stage 1 2 probes (switching) with/without deletion of distance-to-go	See HMI software. 1) 1 probe. 2) With plus and pro versions only. 3) Precondition: MCI board extension.		
Measuring stage 2 Axial measuring, measuring from synchronized actions, cyclic measuring	1) Precondition: MCI board extension.	6FC5800-0AM32-0YB0	M32
Measuring cycles for drilling/milling and turning Calibrate workpiece probe, workpiece measurement, tool measurement		6FC5800-0AP28-0YB0	P28
Measure kinematics (determine transformation data of rotary axis)		6FC5800-0AP18-0YB0	P18

Technologies

Punching/nibbling		6FC5800-0AM33-0YB0	M33
Oscillation functions block-related, modal and asynchronous		6FC5800-0AM34-0YB0	M34
More than one feed in block, e. g. for calipers			
Handwheel override			
Contour handwheel		6FC5800-0AM08-0YB0	M08
Electronic transfer Contains the option: Master value coupling LEAD	1) With restricted functionality, see export versions.	6FC5800-0AM35-0YB0	M35
Electronic transfer CP Contains the option: CP Comfort	1) With restricted functionality, see export versions.	6FC5800-0AM76-0YB0	M76
Machining package 5 axes Contains the option: Multi-axis interpolation		6FC5800-0AM30-0YB0	M30
Machining package milling Contains the options: Machining package 5 axes incl. multi-axis interpolation, spline interpolation (A, B and C splines/compressor for 5-axis machining and 3D tool radius compensation)		6FC5800-0AM26-0YB0	M26
Machining package 5 axes Additional function 7th axis		6FC5800-0AS01-0YB0	S01

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
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Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Motion-synchronous actions

High-speed CNC inputs/outputs			
• Digital inputs on-board	1) Precondition: MCPA. 2) Precondition: MCI board extension.		
• Digital inputs or outputs on-board	1) Precondition: MCPA. 2) Precondition: MCI board extension.		
• Expansion via SIMATIC S7 I/O 32 digital inputs/32 digital outputs 4 analog inputs/4 analog outputs			
Synchronized actions (max. 24) and high-speed auxiliary function output incl. 3 synchronous functions	Max. 159 elements for synchronized actions. 1) With restricted functionality, see export versions.		
Synchronized actions stage 2	1) With restricted functionality, see export versions.	6FC5800-0AM36-0YB0	M36
Positioning axes and spindles via synchronized actions (command axes)			
Analog value control in interpolation cycle (precondition: analog output)	1) Precondition: SIMATIC DP ET 200 analog module.		
Path-velocity-dependent analog output Laser power control	1) Precondition: SIMATIC DP ET 200 analog module.	6FC5800-0AM37-0YB0	M37
Laser switching signal, high-speed	Precondition: Loadable compile cycle.	6FC5800-0AM38-0YB0	M38
Clearance control:			
• 1D in interpolation cycle via synchronized action			
• Clearance control 1D/3D in position control cycle including in the IPO cycle	Precondition: Loadable compile cycle. 1) With restricted functionality, see export versions.	6FC5800-0AM40-0YB0	M40
• 1D/3D clearance control in position control cycle, free direction	Precondition: Loadable compile cycle and M40.	6FC5800-0AM65-0YB0	M65
Evaluation of internal drive variables (precondition for Adaptive Control)		6FC5800-0AM41-0YB0	M41
Continuous dressing (parallel dressing, online modification of the tool offset)			
Asynchronous subroutines ASUB:	High-speed CNC inputs/outputs required.		
• Interrupt routines with fast retraction from the contour		6FC5800-0AM42-0YB0	M42
Cross-mode actions (ASUBs and synchronized actions in all operating modes)		6FC5800-0AM43-0YB0	M43

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

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Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Open Architecture

User interface expansion
• Free displays

SINUMERIK HMI programming package
(OEM contract required)

¹⁾ Precondition:
PCU 50.3.

6FC5253-0BX20-0AG0
6FC5253-. BX20-. AG0
6FC5253-0BX20-0AG1
6FC5253-0BX20-0AG2
6FC5253-. BX20-. AG3

SINUMERIK HMI configuring package WinCC flexible 2005
(OEM contract required)

¹⁾ Precondition:
PCU 50.3.

6FC5253-0CX25-0AG0
6FC5253-. CX25-. AG0
6FC5253-0CX25-0AG1
6FC5253-0CX25-0AG2
6FC5253-. CX25-. AG3

SINUMERIK HMI programming package sl
(OEM contract required)

6FC5861-1YC00-0YA0
6FC5861-1YC...YA0
6FC5861-1YP00-0YB0
6FC5861-1YP00-0YL8
6FC5861-1YC...YA8

SINUMERIK HMI copy license OA
and Expand User Interface from the 21st screen

6FC5800-0AP02-0YB0

P02

SINUMERIK HMI copy license CE

6FC5800-0AP03-0YB0

P03

SINUMERIK HMI sl runtime license OA
Programming

6FC5800-0AP60-0YB0

P60

OA package NCK (OEM contract required)

See Basic components.

SINUMERIK NCK Runtime OA

See Basic components.
¹⁾ On request.

6FC5800-0AM04-0YB0

M04

CNC programming language

Programming language
(DIN 66025 and high-level language expansion)

Main program call from main program and
subroutine

Subroutine levels/interrupt routines,
max.

Number of subroutine passes ≤ 9 999

Number of levels for skip blocks (/O to /...)

Polar coordinates

1/2/3-point contours

¹⁾ With value version.

Dimensions metric/inch,
changeover manually or via program

Inverse time feedrate

Auxiliary function output

• Via M word, max. programmable value range:
INT $2^{31} - 1$

• Via H word, max. programmable value range:
REAL $\pm 3.4028 \times 10^{38}$ (display: $\pm 999\,999\,999.9999$)
INT $-2^{31} \dots 2^{31} - 1$

¹⁾ With plus and pro versions.

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl								
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	Blank field: Function is not dependent on operating software				
						HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

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Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

CNC programming language (continued)

High-level CNC language with:

- User variables, configurable
- Predefined user variables (arithmetic parameters)
- Predefined user variables (arithmetic parameters), configurable
- Read/write system variables
- Indirect programming
- Program jumps and branches
- Program coordination with WAIT, START, INIT
- Arithmetic and trigonometric functions
- Compare operations and logic operations
- Macro technique
- Control structures IF-ELSE-ENDIF
- Control structures WHILE, FOR, REPEAT, LOOP
- Commands to HMI
- STRING functions

Program functions:

- Dynamic preprocessing memory (FIFO)
- Look ahead
- Frame concept
- Inclined-surface machining with frames
- Axis/spindle replacement
- Geometry axes, switchable online in the CNC program
- Program preprocessing

Online ISO dialect interpreter

Program/workpiece management:

- Parts programs on NCU, max. number
- Workpieces on NCU, max. number
- Workpieces on hard disk, max. number
- Additional 256 MB HMI user memory on NCU's CF card
- On additional plug-in CF card
- On integral hard disk in PCU 50.3

¹⁾ Restricted scope.¹⁾ In basic scope with software version 1.5/2.5 or higher.**6FC5800-0AM00-0YB0****M00**In total max.
512 files
per directory.In total max.
256 directories.In total max.
100 000 user files.In total max.
100 000 user files
and directories.¹⁾ On the front.
²⁾ With PCU 50.3.

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
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Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

CNC programming language (continued)

Program/workpiece management (continued):

- On USB storage medium
(e. g. disk drive, memory stick)
- On network drive

- 1) With pro version.
2) Precondition:
Managing of network drives.

- Templates for workpieces, programs
and INI files
- Job lists

Number of basic frames, max.

Number of settable offsets, max.

Zero offsets, programmable
(frames)

Scratching, determining zero offset

Zero offsets, external (PLC)

Global and local user data

Global program user data

Display system variables (also via online configurable display)
and log them

- 1) With PCU 50.3.

Programming support

Program editor:

- Text editor with editing functions:
Marking, copying, deleting
- Dual editor
- Write protection for lines
- Suppression of lines in the display
- Machining step programming

Multiple clamping of various
workpieces

- 1) Precondition: P04

6FC5800-0AP04-0YB0

P04

6FC5800-0AP14-0YB0

P14

Programming support for input of geometry specifications:

- Program guide
(programming support for cycles, dynamic programming
graphics)

- 1) NCU software version 2.5
or higher.

Geometry processor with programming graphics/
Free contour input (contour calculator)

- 1) With plus and pro versions.

Screens for 1/2/3-point contours
(contour definition programming)

Programming support for cycles:

- Screens and stationary auxiliary displays
- Dynamic programming graphics
during programming
- Programming support is expandable
(e. g. customer cycles)

- 1) On request.

- 1) On request.
2) With Expand User Interface, see
HMI/MMC Commissioning Manual.

Process-oriented cycles for drilling/milling
and turning

- 1) Software version 2.5
or higher.

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl								
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	Blank field: Function is not dependent on operating software				
						HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

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Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Programming support (continued)

Grinding and nibbling for traverse path simulation without model (broken-line graphics)

Pocket milling with free contour definition and islands

Residual material detection and machining for contour pockets and cutting

¹⁾ Precondition:
Machining step programming.

6FC5800-0AP13-0YB0**P13**

Access protection for cycles

Programming and operator support for machines:

- ShopTurn HMI

- Manual machine (ShopTurn manual)

- ShopMill HMI

- ShopTurn HMI/ShopMill HMI for SINUMERIK 840Di sl incl. HMI-Advanced

¹⁾ Software version 1.4 or lower.

6FC5800-0AP15-0YB0

CAD Reader for PC

6FC5260-0AY00-0AG1
6FC5260-0AY00-0AG0
6FC5260- .AY00- .AG0
6FC5260-0AY00-0AG2
6FC5260- .AY00- .AG8

Simulation

Up to n channels can be simulated sequentially

Several channels and programs can machine the same blank part in succession

Simulation of program X, while program Y is being executed

Quick view for mold-making programs

¹⁾ With PCU 50.3.

Drilling/milling (tool carrier vertical to the workpiece):

- Single-sided 2D view, dynamic

- Simulation of milling multiple sides 2D dynamic, 3D static

- ShopMill simultaneous recording
Real-time simulation of current machining operation

6FC5800-0AP21-0YB0**P21****6FC5800-0AP23-0YB0****P23**

Turning (tool carrier vertical to the workpiece):

- Traverse path simulation without model, broken-line graphics

- Contour of blank part can be specified

- Simulation in working plane G18

- Simulation in working planes G17/G19

- Full cut/partial cut with circumferential edges, front face and peripheral surfaces, milling and drilling operations

- Counterspindle

- 3D simulation of the finished part

6FC5800-0AP20-0YB0**P20**

- ShopTurn simultaneous recording
Real-time simulation of current machining operation

6FC5800-0AP24-0YB0**P24**

Grinding and nibbling

- Traverse path simulation without model (broken-line graphics)

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl								
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	Blank field: Function is not dependent on operating software				
						HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

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Overview of functions SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Operating modes

JOG:

- Handwheel selection
- Switchover: inch/metric
- Manual measurement of zero offset
- Manual measurement of tool offset
- Automatic tool/workpiece measurement

1) Tool measuring only.

- Dressing grinding wheels
- Reference point approach
automatic/via CNC program

MDA:

- Input in text editor
- Save MDA program
- Input screen forms for technology and positioning,
cycle support

Teach-in:

- Teach positions in MDA buffer
- Teach-in function handling

Automatic:

- Execution of HMI memory
on NCU's CF card

1) External CF card.
2) Precondition:
Additional 256 MB
HMI user memory
on NCU's CF card.

6FC5800-0AP12-0YB0**P12**

- Execution from network drive

1) With pro version.
2) Precondition:
Network drive management.

6FC5800-0AP01-0YB0**P01**

- Execution from hard disk

1) On PCU 50.3.

- Program control
- Program editing
- Overstoring
- DRF offset
- Block search with/without calculation

Repos (repositioning on the contour)

- With operator command/semi-automatically
- Program-controlled

Preset

Set actual value

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
●	●	●	●	●	●	●			●	●
●	●	◆	◆	●	●	●	—	—	●	●
●	●	◆	◆	●	●	●	●	●	●	●
●	—	◆	◆	◇	◇	●	●	●	—	●
●	—	◇	◇	◇	◇	—	●	●	—	—
● 1)	—	◆	◆	◆	◆	—	●	● 1)	—	○
—	●	—	—	—	—	—	—	—	—	—
●	●	●	●	●	●	●	●	●	●	●
●	●	◆	◆	●	●	●			●	●
●	●	◆	◆	●	●	●	●	●	●	●
●	●	◆	◆	●	●	●	—	—	●	●
—	—	◆	◆	●	●	—	●	●	—	—
●	—	◆	◆	●	●	●	—	—	●	●
●	—	◆	◆	●	●	●	—	—	●	●
—	—	—	—	●	●	●	—	—	●	●
●	●	●	●	●	●	●	●	●	●	●
● 1)	● 1)	●	●	○ 2)	○ 2)					
● 1)2)	● 1)2)	◆	◆	○ 2)	○ 2)	○ 2)	○	○	—	○ 2)
—	—	◆	◆	◇	◇	—	● 1)	● 1)	—	●
●	●	◆	◆	●	●	●	●	●	●	●
●	●	◆	◆	●	●	●	●	●	●	●
—	—	◆	◆	●	●	●	●	●	—	●
—	—	◆	◆	●	●	●	●	●	●	●
●	●	◆	◆	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●
—	—	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●
●	●	◆	◆	●	●	●	●	●	—	●
—	—	◆	◆	●	●	●	●	●	—	●

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Tools

Tool types:

- Turning
- Drilling/milling
- Grinding
- Nibbling
- Groove sawing

Tool radius compensations in plane:

- With approach and retract strategies
- With transition circle/ellipse on outer edges

Configurable intermediate blocks with
tool radius compensation active

3D tool radius compensation

Tool change via T number

Tool carrier with orientation capability

Look-ahead detection of contour
violationsGrinding-specific tool offset with
grinding wheel surface speed

Tool orientation interpolation

Precondition:
Machining package 5 axes.

Online tool length compensation

Operation without tool management:

- Tool offset selection via D number without
T assignment (flat D number)
- Editing of tool data
- Tool offset selection via T and
D numbers
- Number of tools/cutting edges
in tool list

1) With value version: 32.
With plus version: 64.Operation with tool management with up to 3 magazines
(corresponds to one real magazine):1) Software version 2.5 or higher.
2) NCU software version 1.5/2.5
or higher.Operation with tool management with more than 3 magazines1) Software version 2.5 or higher.
2) NCU software version 1.5/2.5
or higher.

- System displays in standard software

- Comfortable startup via system
displays

1) Precondition: PCU 50.3.

- Tool list

- Configurable tool lists

1) One configured list is possible.

- Number of tools/cutting edges
in tool list

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
•	–	◆	◆	•	•	•	–	•	–	•
•	–	◆	◆	•	•	•	•	•	•	•
–	•	◆	◆	•	•	•	–	–	–	•
–	•	◆	◆	•	•	•	–	–	–	•
–	–	◆	◆	•	•	•	–	–	–	•
–	–									
–	–	•	•	•	•					
•	•	•	•	•	•					
–	–	•	•	•	•					
–	–	○	○	○	○	○	○	–	○	○
•	•	•	•	•	•	•	•	•	•	•
–	–	•	•	•	•	•	•	–	•	•
•	•	•	•	•	•					
–	•	•	•	•	•	•	–	–	•	•
–	–	–	•	–	•					
–	–	–	–	•	•					
•	•	◆	◆	•	•	•	–	–	•	•
–	–	◆	◆	•	•	•	–	–	–	•
•	•	◆	◆	•	•	•	–	–	•	•
•	•	•	•	•	•	•	–	–	•	•
128 ¹⁾	128 ¹⁾	◆ 600/ 1 500	◆ 600/ 1 500	600/ 1 500	600/ 1 500		–	–		
–	–	◆ ¹⁾	◆ ¹⁾	• ²⁾	• ²⁾					
–	–	○ ¹⁾	○ ¹⁾	○ ²⁾	○ ²⁾					
–	–	–	–	•	•	•	•	•	•	•
–	–	–	–	◆	◆	–	• ¹⁾	• ¹⁾	•	•
–	–	–	–	•	•	•	•	•	•	•
–	–	–	–	•	•	–	• ¹⁾	• ¹⁾	• ¹⁾	•
–	–	◆ 600/ 1 500	◆ 600/ 1 500	600/ 1 500	600/ 1 500					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Tools (continued)

Operation with tool management with more than 3 magazines (continued)

- Unambiguous D number structure
- Tool offset selection via T and D numbers
- Editing of tool data
- Editing of OA data

¹⁾ In configured list.

- Magazine list
- Configurable magazine list
- Number of magazines, max.
- Magazine data
- Vacant position search and positioning
- Easy vacant position search using softkeys
- Loading and unloading of tools
- More than one loading and unloading point per magazine
- Tool cabinet and tool catalog
- Loading and unloading via code carrier system
- Adapter data
- Local compensations
- Monitoring of tool life and workpiece count

Operation with tool management:

- ¹⁾ Software version 1.4 or lower.
²⁾ Software version 1.4/2.4 or lower.

6FC5800-0AM50-0YB0**M50**

- System displays in standard software
- Comfortable startup via system displays
- Tool list
- Configurable tool lists

¹⁾ Precondition: PCU 50.3.

¹⁾ One configured list is possible.

- Number of tools/cutting edges in tool list

- Unambiguous D number structure
- Tool offset selection via T and D numbers
- Editing of tool data

- Editing of OA data

¹⁾ In configured list.

- Magazine list
- Configurable magazine list
- More than one magazine is possible
- Magazine data

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl								
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	Blank field: Function is not dependent on operating software				
						HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

–	–	◆	◆	◆	◆	–	–	–	●	●
–	–	●	●	●	●					
–	–	◆	◆	●	●					
–	–	◆	◆	●	●	●	1)	1)	●	●
–	–	◆	◆	●	●	●	●	●	●	●
–	–	◆	◆	●	●	–	–	–	●	●
–	–	32	32	32	32					
–	–	◆	◆	●	●	○	●	●	●	●
–	–	◆	◆	●	●	○	●	●	●	●
–	–	◆	◆	●	●	–	–	–		●
–	–	◆	◆	●	●	○	●	●	●	●
–	–	◆	◆	●	●	–	–	–	●	●
–	–	◆	◆	●	●	–	–	–		●
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–	–	◆	◆	●	●	–	–	–		●
–	–	◆	◆	●	●	–	–	–		●
●	●	◆	◆	●	●	●	●	●		
–	–	◆ 1)	◆ 1)	○ 2)	○ 2)	○	●	●	○	○
–	–	◆	◆	○	○	○	●	●	○	○
–	–	◆	◆	○	○	–	1)	1)	–	○
–	–	○	○	○	○	○	●	●	○	○
–	–	○	○	○	○	–	1)	1)	○ 1)	○
–	–	◆ 600/ 1 500	◆ 600/ 1 500	600/ 1 500	600/ 1 500					
–	–	◆	◆	○	○	–	–	–	–	○
–	–	●	●	●	●	○	●	●	○	○
–	–	◆	◆	○	○	○	●	●	○	○
–	–	◆	◆	○	○	○	1)	1)	○	○
–	–	◆	◆	○	○	○	●	●	○	○
–	–	◆	◆	○	○	–	–	–	○	○
–	–	32	32	32	32	32	32	32	32	32
–	–	◆	◆	○	○	○	●	●	○	○

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Tools (continued)

Operation with tool management: (continued)

- Vacant position search and positioning
- Easy vacant position search using softkeys
- Loading and unloading of tools
- More than one loading and unloading point per magazine
- Tool cabinet and tool catalog
- Loading and unloading via code carrier system
- Adapter data
- Local compensations

Monitoring of tool life and workpiece count

TDI – Tool management functions for individual machines and networked machines:

- TDI IFC
Tool management, version with network capability
- TDI Overview
Overview of actual tool data, local version
- TDI Toolhandling
Tool handling, local version
- TDI Planning
Tool planning, local version
- TDI Statistic
Tool statistics, local version
- TDI Cell
- TDI Machine
Tool management, local version
- TDI Toolplan Generation
Tool plan generation, local version
- TDI Ident Connection
Interfacing of tool identification systems

See MCIS software.
1) On PCU 50.3.On request.
1) On PCU 50.3.

1) On PCU 50.3.

6FC5800-0AP34-0YB0
6FC6000-2EC00-0AA8
6FC6000-2EC0. - . AA8

P34

1) On PCU 50.3.

6FC5800-0AP35-0YB0
6FC6000-2FC00-0AA8
6FC6000-2FC0. - . AA8

P35

1) On PCU 50.3.

6FC5800-0AP36-0YB0
6FC6000-2GC00-0AA8
6FC6000-2GC0. - . AA8

P36

1) On PCU 50.3.

6FC6000-2KC00-0AB0
6FC6000-2KC00-0AA0
6FC6000-2KC0. - . AA0

1) On PCU 50.3.

6FC6000-2BF00-0AB0
6FC6000-2BC00-0AA0
6FC6000-2BC0. - . AA0

1) On PCU 50.3.

6FC5800-0AP37-0YB0
6FC6000-2AC00-0AA8
6FC6000-2AC0. - . AA8

P37

1) On PCU 50.3.

6FC5800-0AP38-0YB0
6FC6000-2JC00-0AA8
6FC6000-2JC0. - . AA8

P38

1) On PCU 50.3.

6FC6000-2HF00-0AB0
6FC6000-2HC00-0AA0
6FC6000-2HC0. - . AA0

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl								
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	Blank field: Function is not dependent on operating software				
						HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

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–	–	◆	◆	○	○	○	●	●	○	○
–	–	◆	◆	○	○	–	–	–	○	○
–	–	◆	◆	○	○	–	–	–	–	○
–	–	◆	◆	○	○	–	–	–	–	○
–	–	◆	◆	○	○	–	–	–	–	○
–	–	◆	◆	○	○	–	–	–	–	○
●	●	◆	◆	○	○	○	●	●	○	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○

Overview of functions SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Communication/data management

HMI user memory, additional 256 MB
on NCU's CF card

See Basic components.
1) On external CF card.
2) Not in combination with
HMI-Advanced.

6FC5800-0AP12-0YB0**P12**

Data storage to memory medium on
rear USB interface of TCU/PCU
(e. g. card reader, memory stick)

1) Two plant HMIs can be
accessed per plant network.

Data storage to memory medium on
front USB interface of OP
(e. g. memory stick)

1) One is possible per OP.

Additional network drive management:

- Via Ethernet, max. 4

1) With pro version.

6FC5800-0AP01-0YB0**P01**

- Via USB

- Via CF card of the PCU

Serial interface RS 232 C

1) On PCU 50.3.

I/O interfacing via PROFIBUS DP

Data backup on hard disk

1) On PCU 50.3.

Data backup with Ghost (Backup/Restore)
on hard disk/network

1) On PCU 50.3.

Data backup for NCU CF card (Backup/Restore)
on memory stick or via network

1) With pro version.

DNC – Direct Numeric Control:

See MCIS software.

- DNC Machine
CNC program transfer

1) On PCU 50.3.

6FC5800-0AP40-0YB0
6FC6000-0AC00-0AA8
6FC6000-0AC0. - . AA8
6FC6000-0AC0. - . AE0
6FC6000-0AC00-0AT7
6FC6000-0AC0. - . AT7

P40

- DNC Cell
CNC program management

6FC6000-0BF00-0AB0
6FC6000-0BC00-0AA0
6FC6000-0BC0. - . AA0
6FC6000-0BC0. - . AE0

- DNC Plant
CNC program management

6FC6000-0CF00-0AB0
6FC6000-0CC00-0AA0
6FC6000-0CC0. - . AA0

- DNC HMI
Additional PC user interface

6FC6000-0DF00-0AB0

- DNC IFC SINUMERIK
CNC program transfer
via network on the control

1) On PCU 50.3.

6FC5800-0AP41-0YB0**P41**

- DNC IFC Serial
Connection for serial CNC

1) On PCU 50.3.

6FC6000-0FF00-0AB0

- DNC IFC Dialog
Option for serial CNC

1) On PCU 50.3.

6FC6000-0GF00-0AB0

- DNC IFC Filesystem
Connection for network-capable CNC machines

1) On PCU 50.3.

6FC6000-0KF00-0AB0

- DNC Compare
CNC program comparison

1) On PCU 50.3.

6FC6000-0HF00-0AB0

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
● 1)	● 1)	—	—	◇	◇	○ 2)	○ 2)	○ 2)	○ 2)	—
—	—	◆	◆	●	●	● 1)	● 1)	● 1)	● 1)	● 1)
—	—	◆	◆	●	●	● 1)	● 1)	● 1)	● 1)	● 1)
● 1)	● 1)	◆	◆	◇	◇	○	○	○	○	○
—	—	◆	◆	◇	◇	●	●	●	●	●
—	—	◆	◆	◇	◇	●	●	●	●	●
●	●	●	●	—	—	—	● 1)	● 1)	—	●
●	●	●	●	●	●	—	—	—	—	—
—	—	◆	◆	◇	◇	—	● 1)	● 1)	—	●
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● 1)	● 1)	—	—	●	●	—	—	—	—	—
—	—	◆	◆	◇	◇	—	○ 1)	○ 1)	—	○
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—	—	◆	◆	◇	◇	—	○ 1)	○ 1)	—	○
—	—	◆	◆	◇	◇	—	○ 1)	○ 1)	—	○
—	—	◆	◆	◇	◇	—	○ 1)	○ 1)	—	○
—	—	◆	◆	◇	◇	—	○ 1)	○ 1)	—	○
—	—	◆	◆	◇	◇	—	○ 1)	○ 1)	—	○

Overview of functions SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Communication/data management (continued)

RPC SINUMERIK:

- RPC SINUMERIK
Data exchange between
CNC and host computer (computer link)

See MCIS software.

¹⁾ On PCU 50.3.

6FC5800-0AP50-0YB0
6FC6000-7AC00-0AA8
6FC6000-7AC0. - . AA8
6FC6000-7AC0. - . AE0

P50

ADDM – Automation Data Management:

- ADDM – Data Management
Data management system

See MCIS software.

Precondition: SIMATIC STEP 7

6BQ3030-1AA00-3AC0
6BQ3030-1AA10-0AC0
6BQ3030-1AA20-1AC0
6BQ3030-1AA30-3AC0
6BQ3030-1AA70-3AC0

- ADDM Agent
Client for data backup

¹⁾ On PCU 50.3.**6FC5800-0AP48-0YB0****P48**

Production data evaluation

MDA – Machine Data Acquisition
(machine and production data acquisition):

- MDA Cell
Machine and production data management
- MDA IFC (interface client)
Production data acquisition for network-capable controls
- MDA Machine
Production data acquisition, local version

See MCIS software.

6FC6000-3BF00-0AB0
6FC6000-3BC00-0AA0
6FC6000-3BC0. - . AA0
6FC6000-3BC0. - . AE0

¹⁾ On PCU 50.3.**6FC5800-0AP43-0YB0****P43**¹⁾ On PCU 50.3.

6FC5800-0AP42-0YB0
6FC6000-3AC00-0AA8
6FC6000-3AC0. - . AA8
6FC6000-3AC0. - . AE0
6FC6000-3AC00-0AT7
6FC6000-3AC0. - . AT7

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Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl								
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	Blank field: Function is not dependent on operating software				
						HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
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–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○

–	–	○	○	○	○					
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○
–	–	◆	◆	◇	◇	–	○ 1)	○ 1)	–	○

Overview of functions SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Operation

Operator panels:

- SINUMERIK 802D sl, 10.4" color

Operator panel fronts:

- OP 015, 15" color
- OP 015A, 15" color
- TP 015A, 15" color, touch
- OP 012, 12.1" color
- OP 010, 10.4" color
- OP 010C, 10.4" color
- OP 010S, 10.4" color

Thin Client Unit for operator panel fronts:

- TCU

Operator panel fronts with integrated TCU:

- OP 08T, 8" color
- OP 015AT, 15" color
- TP 015AT, 15" color, touch

Additional components for Thin Client:

- Switch SCALANCE X108 unmanaged
- Switch SCALANCE X208 managed
- Switch SCALANCE X208 PRO managed

Industrial PC for operator panel fronts:

- PCU 50.3-C
1.5 GHz/512 MB, Windows XP ProEmbSys
- PCU 50.3-P
2.0 GHz/1024 MB, Windows XP ProEmbSys
- Memory expansion 512 MB for PCU 50.3
- Memory expansion 1 GB for PCU 50.3

Software for:

- SINUMERIK PCU 50.3 for machine operation with HMI Startup
- SINUMERIK PCU 50.3 for machine operation with HMI-Advanced

- PC for machine operation with HMI-Advanced

See HMI software.

HMI software for PC/PG can be ordered separately.
¹⁾ For SINUMERIK 840Di sl only.

6FC5253-7BX10-. AF0
 6FC5253-0BX10-0AF0
 6FC5253-7BX10-. AG0
 6FC5253-0BX10-0AG1
 6FC5253-0BX10-0AG2
 6FC5253-7BX10-. AG3

L00¹⁾

6FC5253-7BX40-. AG0
 6FC5253-0BX40-0AG1
 6FC5253-0BX40-0AG2
 6FC5253-7BX40-. AG3

Overview of functions SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Operation (continued)

Software for: (continued)

- SINUMERIK PCU 50.3 for machine operation with ShopMill HMI

Only data carrier without license required.
Precondition: NCU software with ShopMill HMI.

6FC5841-3YC .. - . YA8
6FC5841-3XC .. - . YA8

- SINUMERIK PCU 50.3 for machine operation with ShopTurn HMI

Only data carrier without license required.
Precondition: NCU software with ShopTurn HMI.

6FC5842-3YC .. - . YA8
6FC5842-3XC .. - . YA8

- SINUMERIK PCU 50.3 for machine operation with ShopMill HMI or ShopTurn HMI

Only data carrier without license required.

6FC5820-3YC .. - . YA8
6FC5820-3XC .. - . YA8

- SINUMERIK 840Di sl for machine operation with ShopMill HMI or ShopTurn HMI incl. HMI-Advanced

Copied to hard disk with license.

L40

Mounting hardware for PCU/TCU:

- Mounting bracket for PCU/TCU behind operator panel front
- Upright mounting bracket for PCU in control cabinet
- Flat mounting bracket for PCU in control cabinet

6FC5248-0AF20-2AA0**6FC5248-0AF20-1AA0****6FC5248-0AF20-0AA0**

Connection for:

- Standard monitor (DVI), VGA via ext. adapter for PCU 50.3
- SIMATIC OP 177B/TP 177B, OP 277/TP 277 and MP 277/MP 377
- SIMATIC OP 170B/TP 170B and OP 270/TP 270 with 6"/10" display and MP 170/MP 270B/MP 370 with Keys/Touch

WinCC flexible is required for OA applications.

WinCC flexible is required for OA applications.

Industrial PC for Thin Client operator panel fronts on SIMATIC S7-300

- SINUMERIK PCU 321

6FC5310-0DF00-2AA0

Software for:

- SINUMERIK PCU 321 for machine operation with HMI sl

6FC5860-3YG00-0YA0
6FC5860-3YG2. - . YA0
6FC5860-3YC2. - . YA8
6FC5860-3YP00-0YL8

- SINUMERIK NCU 710.2/720.2/720.2 PN/730.2/730.2 PN and SINUMERIK PCU 321 for machine operation with HMI PRO sl RT

6FC5800-0AP47-0YB0
6FC5867-3YC00-0YA8
6FC5867-3YC2. - . YA8

P47

- SIMATIC OP 177B/TP 177B/MP 277 Operator Panel for machine operation with HMI Lite CE

6FC5263-0PY11-0AG0
6FC5263-. PY11-. AG0
6FC5263-0PY11-0AG1

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
–	–	–	–	◆	◆					
–	–	–	–	◆	◆					
–	–	◆	◆	–	–					
–	–	○	○	–	–					
–	–	○	○	○	○					
–	–	○	○	○	○					
–	–	○	○	○	○					
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–	–	–	–	○	○	–	–	–	○	–
–	–	–	–	○	○					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Operation (continued)

Control unit management:

- Identical display on all OPs with TCU
 - Simultaneous operation interlock
 - Activate/deactivate MCP
 - Different resolutions (e. g. OP 010/OP 012)
- Up to 2 operator panel fronts, each with one TCU on an NCU 710.2
- Up to 4 operator panel fronts, each with one TCU on an NCU 720.2/NCU 720.2 PN/NCU 730.2/NCU 730.2 PN
- Up to 4 operator panel fronts with one TCU each on a PCU 50.3 plus 1 additional operator panel front directly on the PCU 50.3
- One or several TCUs which can be switched over via several NCUs and PCUs
- One HMI-Advanced switchable via several NCUs
- One integrated HMI and one external HMI-Advanced simultaneously on one NCU

Slightly reduced quality in the display contrast on the smaller OP.

¹⁾ A number of proven configurations (see documentation for SINUMERIK 840Di sl).

Handheld units:

- SINUMERIK HT 8 handheld terminal
- SINUMERIK HT 8 handheld terminal (with handwheel)
 - Wall holder for SINUMERIK HT 8 handheld terminal
- SINUMERIK HT 2 handheld terminal
 - Magnetic clamp for SINUMERIK HT 2
 - Holder for SINUMERIK HT 2
 - Slide-in labels for inscribing (3 A4 sheets) for SINUMERIK HT 2
- PN Basic conn. module without emergency stop override, with switch, control cabinet mounting for SINUMERIK HT 8/HT 2
- PN Basic connection box without emergency stop override, for SINUMERIK HT 8/HT 2
- PN Plus connection box with emergency stop override, for SINUMERIK HT 8/HT 2
- Handheld unit type B-MPI with coiled connecting cable
- Handheld unit type B-MPI with straight cable
 - Distributor
 - Handwheel connection module for PROFIBUS

Not required for handwheel connection via machine control panel.

2/57

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Operation (continued)

Handheld units (continued):

- Mini handheld unit
with coiled connecting cable
- Mini handheld unit
with straight connecting cable
- Connection kit for mini handheld unit
- Handwheel connection module for PROFIBUS

6FX2007-1AD02

6FX2007-1AD12

6FX2006-1BG02

Not required for handwheel
connection via
machine control panel.

6FC5303-0AA02-0AA0

Machine control panels:

- MCP
- MCP 802D sl
 - MCPA module
for MCP 802D sl connection and with ± 10 V interface
- MCP 310C IE
- MCP 310
- MCP 310 IE
 - Actuating element, 22 mm, latching mushroom
pushbutton, red
 - Contact block
 - Cable set for additional control devices
 - Spindle/rapid traverse override rotary switch
1x16G, T=24, cap, button, pointer,
rapid-traverse and spindle dials

6FC5603-0AD00-0AA2

6FC5303-0AF30-1AA0

6FC5312-0DA01-0AA0

6FC5303-0AF23-0AA0

6FC5203-0AF23-1AA0

6FC5303-0AF23-1AA0

3SB3000-1HA20

3SB3400-0A

6FC5247-0AA35-0AA0

6FC5247-0AF12-1AA0

6FC5303-0AF22-0AA0
6FC5247-0AA35-0AA06FC5203-0AF22-1AA2
6FC5247-0AA35-0AA0

6FC5303-0AF22-1AA0

Push Button Panel
with machine control panel functions:

- MPP 310 IEH with connection for SINUMERIK HT 8
- MPP 483
- MPP 483 H for handheld unit
- MPP 483 A without override
- MPP 483 HTC with connection for SINUMERIK HT 8
- MPP 483 IE
- MPP 483 IEH with connection for SINUMERIK HT 8

6FC5303-1AF20-8AA1

6FC5303-1AF00-0AA1

6FC5303-1AF00-1AA1

6FC5303-1AF01-0AA1

6FC5303-1AF00-8AA1

6FC5303-1AF10-0AA0

6FC5303-1AF10-8AA0

Direct key module
● Direct key module mounting kit6FC5247-0AF11-0AA0
6FC5247-0AF30-0AA0

2

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Operation (continued)

Connection for:

- Electronic handwheels

- 1) Precondition:
MCI board extension.
2) Third handwheel can be operated as
a contour handwheel.

Handwheels:

- With front panel 120 mm x 120 mm (4.72 x 4.72 in), 5 V DC
- With front panel 76.2 mm x 76.2 mm (3.00 x 3.00 in), 5 V DC
- With front 76.2 mm x 76.2 mm (3.00 x 3.00 in), 24 V DC, HTL
- Without front panel, without setting wheel, 5 V DC
- Without front panel, with setting wheel, 5 V DC
- Portable in housing, 2.5 m (8.2 ft) coiled cable, 5 V DC
 - Flange socket for portable handwheel
 - Handwheel connection module for PROFIBUS

6FC9320-5DB01

6FC9320-5DC01

6FC9320-5DH01

6FC9320-5DF01

6FC9320-5DM00

6FC9320-5DE02

6FC9341-1AQ

Not required for handwheel
connection via
machine control panel.

6FC5303-0AA02-0AA0

- Cable distributor

Not required for handwheel
connection via
machine control panel.

6FX2006-1BA02

Keyboards:

- Full CNC keyboard, vertical format
- Full CNC keyboard, horizontal format
- KB 483C
- KB 310C
- KBPC CG US standard PC keyboard
 - Keyboard tray for standard PC keyboards

6FC5303-ODT12-1AA0

6FC5303-ODM13-1AA0

6FC5203-0AF20-0AA1

6FC5203-0AF21-0AA1

6FC5203-0AC01-3AA0

6FC5247-0AA40-0AA0

Memory/storage devices:

- Floppy disk drive 3.5"/1.44 MB
with USB connection
- Card reader for CF/SD memory media,
with USB connection
- Industrial USB Hub 4
- CompactFlash Card 1 GB
- SIMATIC USB FlashDrive 2 GB

6FC5235-0AA05-1AA2

6FC5335-0AA00-0AA0

With PCU 50.3.

6AV6671-3AH00-0AX0

1) Precondition:
Card reader.

6FC5313-5AG00-0AA0

1) With pro version.

6ES7648-0DC40-0AA0

Plain text display of user variables

Multi-channel display

2D representation of 3D protection areas/
work areas

Actual-value system for workpiece

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Operation (continued)

Menu selection via the PLC

Not for two simultaneously active HMIs.

CNC program messages

Online help for programming, alarms and machine data (expandable)

¹⁾ With PCU 50.3.

Screen blanking

Access protection, 8 levels

Operating software languages:

- Chinese Simplified, English, French, German, Italian, Spanish

¹⁾ Other languages on request.

- Languages switchable online

- Maximum configuration for installed languages

¹⁾ All available languages are supplied on-board.
²⁾ Unrestricted with PCU 50.3.

Languages of 802D sl operating software

Chinese Traditional, Czech, Dutch, Finnish, Hungarian, Korean, Polish, Portuguese/Brazilian, Romanian, Russian, Swedish, Turkish

Component of SINUMERIK 802D sl Toolbox.

Additional languages for operating software HMI-Advanced, HMI-Embedded, ShopMill HMI, ShopTurn HMI

on DVD, without license

(Chinese Traditional, Czech, Danish, Dutch, Finnish, Hungarian, Japanese, Korean, Polish, Portuguese/Brazilian, Romanian¹⁾, Russian, Slovak¹⁾, Swedish, Turkish)¹⁾ For HMI-Advanced only.**6FC5253-7BX10-.XG8**

Additional languages for operating software HMI sl

on DVD, without license

Chinese Traditional, Czech, Danish, Dutch, Finnish, Hungarian, Japanese, Korean, Polish, Portuguese/Brazilian, Russian, Swedish, Turkish

6FC5860-0YC...-YA8

Additional languages

Software option for use of additional languages

¹⁾ Incl. on DVD of add. languages for HMI please enquire about available software versions.**6FC5800-0AN00-0YB0****N00**

Other languages

¹⁾ On request.

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
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●	●	◆	◆	●	●	●	●	●	●	●
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● 1)	● 1)	◆	◆	◇	◇	●	●	●	●	●
18	18	2	2	2	2	2	2	2	2	2
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1)	1)	◆	◆	◇	◇	1)	1)	1)	1)	1)

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Monitoring functions

Clamp protection for nibbling			
Working area limitation			
Limit switch monitoring			
Software and hardware limit switches			
Position monitoring			
Standstill (zero-speed) monitoring			
Clamping monitoring			
2D/3D protection zones			
Contour monitoring			
Contour monitoring with tunnel function		6FC5800-0AM52-0YB0	M52
Path length evaluation		6FC5800-0AM53-0YB0	M53
Axis limitation from the PLC			
Spindle speed limitation			
PROFIBUS tool and process monitoring	Precondition: Loadable compile cycle.	6FC5800-0AM62-0YB0	M62
Integrated tool monitoring and diagnostics			
• IMD light	Sales through Solution Partner.	6FC5800-0AN12-0YB0	
• IMD base	Sales through Solution Partner.	6FC5800-0AN13-0YB0	

Compensations

Backlash compensation			
Lead screw error compensation			
Measuring system error compensation			
Electronic weight compensation	SINAMICS S120 function		
Sag compensation, multi-dimensional	¹⁾ With restricted functionality, see export versions.	6FC5800-0AM55-0YB0	M55
Quadrant error compensation per operation			
Graphical monitoring of quadrant error compensation using the circularity test	¹⁾ Precondition: HMI-Advanced on PCU 50.3.		
Temperature compensation			
Space error compensation (SEC3D) for kinematic transformations	Precondition: Loadable compile cycle.	6FC5800-0AM57-0YB0	M57
Feedforward control, velocity-dependent			

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

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–	–	◆	◆	•	•					
–	–	◇	◇	◇	◇	○ ₁₎	○ ₁₎	○ ₁₎	–	•
–	–	•	•	•	•					
–	–	–	–	–	○					
•	•	•	•	•	•					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

PLC

SIMATIC S7-200 (integrated)

SIMATIC S7-300 CPU 317-2 DP (integrated)

• NCU 710.2/NCU 720.2/NCU 730.2

SIMATIC S7-300 PLC 319-3PN/DP (integrated)

• NCU 720.2 PN/NCU 730.2 PN

Machining time, typically in ms/KI for bit operations

1 KI = 1024 instructions,
corresponds to approx. 3 KB.

• NCU 710.2/NCU 720.2/NCU 730.2

• NCU 720.2 PN/NCU 730.2 PN

Machining time, typically in ms/KI for word operations

1 KI = 1024 instructions,
corresponds to approx. 3 KB.

• NCU 710.2/NCU 720.2/NCU 730.2

• NCU 720.2 PN/NCU 730.2 PN

Ladder steps memory configuration

1) With value version: 4000.

PLC user memory in KB,
incl. basic PLC program

1) SW version 1.4 and higher.

PLC user memory,
maximum configuration in KB

• NCU 710.2/NCU 720.2/NCU 730.2

• NCU 720.2 PN/NCU 730.2 PN

Expansion of the PLC user memory
by 128 KB in each caseD11 to D12 only with SW version 1.4
and higher.**6FC5800-0AD10-0YB0****D11 ... D12**

• NCU 710.2/NCU 720.2/NCU 730.2

D11 to D12 only with SW version 1.4
and higher.**D11 ... D12**

• NCU 720.2 PN/NCU 730.2 PN

D11 ... D18

SIMATIC STEP 7 programming language:

• LAD ladder diagram

• FBD function block diagram

• STL statement list

PLC programming with HiGraph
(add-on package for STEP 7)PLC programming tool, PLC program examples,
standard machine data and alarm text editor
on Toolbox

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
•	•	–	–	–	–					
–	–	•	•							
				•	•					
–	–	–	–							
				•	•					
0.1	0.1	0.03	0.03							
				0.03	0.03					
				0.01	0.01					
0.2	0.2	0.1	0.1							
				0.1	0.1					
				0.03	0.03					
6 000 ¹⁾	6 000	–	–	–	–					
–	–	• 128	• 128	• 512 ¹⁾	• 512 ¹⁾					
–	–	768	768							
				768	768					
				1 536	1 536					
–	–	○	○							
				○	○					
				○	○					
•	•	○	○	○	○					
–	–	○	○	○	○					
–	–	○	○	○	○					
–	–	○	○	○	○					
•	•	–	–	–	–					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

PLC (continued)

PP 72/48 I/O module	¹⁾ No PROFIBUS certification.	6FC5611-0CA01-0AA0	
• PP 72/48 I/O module, max. number			
ADI 4 (Analog Drive Interface for 4 axes)	No PROFIBUS certification.	6FC5211-0BA01-0AA3	
MCI board extension slot version		6FC5222-0AA00-0AA1	
• Cable distributor		6FX2006-1BA02	
Distributed I/O via PROFIBUS DP	See Catalog ST 70 for add. information.		
• Via integrated interface, data transfer rates up to 12 Mbit/s			
• Distributed DP slaves, max. number			
Distributed I/O via PROFINET	See Catalog ST 70 for add. information.		
• Component-based Automation			
- NCU 710.2/NCU 720.2/NCU 730.2			
- NCU 720.2 PN/NCU 730.2 PN			
• Distributed PN slaves, max. number			
- NCU 720.2 PN/NCU 730.2 PN			
Digital inputs, number in bytes	¹⁾ Number = Process image inputs.		
Digital outputs, number in bytes	¹⁾ Number = Process image outputs.		
I/O inputs, number in bytes	¹⁾ Logical address area inputs.		
I/O outputs, number in bytes	¹⁾ Logical address area outputs.		
Bit memories, number in bytes	¹⁾ With value version: 128.		
- NCU 710.2/NCU 720.2/NCU 730.2			
- NCU 720.2 PN/NCU 730.2 PN			
Timers, number	¹⁾ With value and plus versions: 40.		
- NCU 710.2/NCU 720.2/NCU 730.2			
- NCU 720.2 PN/NCU 730.2 PN			
Counters, number	¹⁾ With value and plus versions: 32.		
- NCU 710.2/NCU 720.2/NCU 730.2			
- NCU 720.2 PN/NCU 730.2 PN			
Subroutines			
FB, FC (largest number per type)			
DB, largest number			
- NCU 710.2/NCU 720.2/NCU 730.2			
- NCU 720.2 PN/NCU 730.2 PN			
Cyclic function block			
Time-controlled function blocks			
Equipment for PLC programming and program test with PG/PC			
User machine data for configuring the PLC user program			

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
○	○	○ ₁₎	○ ₁₎	○ ₁₎	○ ₁₎					
3	3	125	125	125	125					
○	○	○	○	○	○					
–	–	○	○	–	–					
●	●	●	●	●	●					
–	–	125	125	125	125					
–	–	○	○							
				–	–					
				●	●					
–	–	–	–							
				256	256					
216	216	256 ₁₎	256 ₁₎	256 ₁₎	256 ₁₎					
144	144	256 ₁₎	256 ₁₎	256 ₁₎	256 ₁₎					
–	–	8 192 ¹⁾	8 192 ¹⁾	4 096	4 096					
–	–	8 192 ¹⁾	8 192 ¹⁾	4 096	4 096					
384 ¹⁾	384	4 096	4 096							
				4 096	4 096					
				8 192	8 192					
64 ¹⁾	64 ¹⁾	512	512							
				512	512					
				2 048	2 048					
64 ¹⁾	64 ¹⁾	512	512							
				512	512					
				2 048	2 048					
64	64	–	–	–	–					
–	–	2 048	2 048	2 048	2 048					
–	–	2 047	2 047							
				2 047	2 047					
				4 095	4 095					
●	●	●	●	●	●					
–	–	●	●	●	●					
○	○	○	○	○	○					
●	●	–	–	–	–					

Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order code

Safety functions

SINUMERIK Safety Integrated
Safety functions for
personnel and machine protection

Preconditions:
See Basic components.

Safety Integrated SI-Basic
incl. 1 axis/spindle, 4 inputs/outputs
for safe programmable logic

6FC5800-0AM63-0YB0

M63

Safety Integrated SI-Comfort
incl. 1 axis/spindle, 64 inputs/outputs
for safe programmable logic

6FC5800-0AM64-0YB0

M64

Safety Integrated SI axis/spindle
extra for each additional axis/spindle

6FC5800-0AC70-0YB0

C71 ... C78

Safety Integrated SI axis/spindle package
additional 15 axes/spindles

6FC5800-0AC60-0YB0

C61, C62

Safety Integrated automated acceptance test
with SinuCom NC SI

See SinuCom.

Startup

Startup software for drive system is
integrated:

- SINAMICS S120
- SINAMICS S120 with CU320

With STARTER drive/startup
software (included in
scope of supply).

Startup trace
(drive optimization without an additional
oscilloscope)

¹⁾ With PCU 50.3.

Series startup via serial
interface

Series startup via
USB interface with memory medium
(e. g. memory stick)

Series startup from
network drive

¹⁾ Precondition:
Network drive management.

Series startup via
CF card programming
offline or online

¹⁾ Precondition:
Additional 256 MB
HMI user memory
on NCU's CF card.

STARTER drive/startup software on PC/PG
for SINAMICS S120

On Toolbox.

Startup software on PC/PG
for SINAMICS S120
(and SIMODRIVE 611 digital)

See SinuCom.

SINUMERIK 840Di/840Di sl Startup
(SimoCom U and SinuCom NC)

SINUMERIK 840Di sl Toolbox
on hard disk of PCU

SINUMERIK 840Di sl/840D sl Toolbox
on system software DVD

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced
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Overview of functions

SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Startup (continued)

PLC example library (PLC templates)

SinuCom
Startup/service tools
for SINUMERIK 840Di sl/840D sl

6FC5250-0AY00-0AG1
6FC5250-0AY00-0AG0
6FC5250-7AY00- . AG0
6FC5250-0AY00-0AG2
6FC5250-7AY00- . AG3

- SinuCom NC
Dialog-based parameterization of machine data,
management of series startup files,
integrated online help for functions,
machine data and alarms
- SinuCom NC Trace
Dynamic recording of variables
and signals - optimization without
additional oscilloscope
- SinuCom CFS
Creation of an image for the CF card
in Ext3 format
- SinuCom ARC
Reading, deleting, inserting and changing
series startup files

See SinuCom.

See SinuCom NC.

See SinuCom.

See SinuCom.

SinuCom Update Agent
for series production and software upgrades

6FC5862-2YC00-0YA0
6FC5862-2YC..- .YA0

SinuCom UPEXpert

See SinuCom Update Agent.

SinuCom UPSHield

See SinuCom Update Agent.

SinuCom UPDIff

See SinuCom Update Agent.

SinuCom UPTopo

See SinuCom Update Agent.

STARTER drive/startup software
for SINAMICS and MICROMASTER

- ¹⁾ On Toolbox.
- ²⁾ For topology and diagnostics.

6SL3072-0AA00-0AG0

Diagnostic functions

Alarms and messages

Action log for diagnostic purposes,
can be activated

¹⁾ Logbook for alarms/keys.

PLC status

¹⁾ Generally possible via STEP 7
on PG/PC.

LAD display

¹⁾ Generally possible via STEP 7
on PG/PC.

SIMATIC STEP 7 for SINUMERIK hardware
for service functions

¹⁾ With PCU 50.3.

6FC5252-0AY00-0AG0
6FC5252-0AY00-0AG1
6FC5252- .AY01- . AG0

RCS 802 (Remote Control System) remote diagnostics,
snap shot, license for PC

With pro version.

6FC6000-6DA51-0AA0

- PLC remote diagnostics via modem

Programming tool and modem
required.
¹⁾ With plus and pro versions.

- Remote diagnostics via Ethernet on the control

RCS 802 and modem required.
With pro version.

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl								
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	Blank field: Function is not dependent on operating software				
						HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

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Overview of functions SINUMERIK CNC controls

2

- Basic version
- Option
- ◇ Function is dependent on operating software
- ◆ Precondition: HMI-Advanced operating software
- Not possible

Notes

Order No.

Order
code

Diagnostic functions (continued)

RCS (Remote Control System) remote diagnostics:

See MCIS software.

- RCS Host
Remote diagnostics software
- RCS Viewer for PC/PG

¹⁾ With PCU 50.3.**6FC5800-0AP30-0YB0****P30**

- RCS Viewer Embedded for PC/PG

6FC6000-6DF00-0BB0
6FC6000-6DC00-0BA0
6FC6000-6DC0 . - . BA0
6FC6000-6DF88-8BB0
6FC6000-6DC80-0BA0
6FC6000-6DC8 . - . BA0

Service and maintenance

ePS Network Services:
- Company Account and
- Value Account
are required for using the services

¹⁾ With PCU 50.3.
6FC6001-0EE00-0AM8
6FC6001-0EE00-0AF8

- ePS Diagnostics Services for diagnostic functions
for machine faults and Workflow Services

¹⁾ With PCU 50.3.
²⁾ HMI-Advanced required in addition
for remote access functionality.

- ePS Condition Monitoring for
condition-oriented maintenance

¹⁾ With PCU 50.3.

TPM – Total Productive Maintenance
Servicing and maintenance support:

See MCIS software.

- TPM Machine for SINUMERIK
Maintenance management

¹⁾ With PCU 50.3.
6FC5800-0AP32-0YB0
6FC6000-1AC00-0AA8
6FC6000-1AC0 . - . AA8
6FC6000-1AC0 . - . AF0
P32

- TPM Cell
Maintenance management on PC

6FC6000-1BF00-0AB0
6FC6000-1BC00-0AA0
6FC6000-1BC0 . - . AA0

- TPM IFC for SINUMERIK
Preventive maintenance for network-capable
controls

¹⁾ With PCU 50.3.**6FC5800-0AP46-0YB0****P46**

- TPM HMI
Additional user interface for Windows-based PC

6FC6000-1DF00-0AB0

- TPM demo version

6FC6000-1AC00-0AT7

Overview of functions SINUMERIK CNC controls

2

SINUMERIK 802D sl		SINUMERIK 840Di sl/840D sl				Blank field: Function is not dependent on operating software				
802D sl T/M	802D sl G/N	840DiE sl	840Di sl	840DE sl	840D sl	HMI- Embedded	ShopMill HMI	ShopTurn HMI	HMI sl	HMI- Advanced

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Overview of functions

SINUMERIK CNC controls

Ordering examples for SINUMERIK 840DE sl

2

Additional information

Ordering as a bundle

Order using Order No. with order codes
License key included in delivery

Order item	Remarks
Item 1: 1 x 6FC5840-3YG10-4YA0-Z M01+A03+C11	NCU system software up to 31 axes with HMI-Embedded 6 languages (Chinese Simplified, English, French, German, Italian, Spanish) on the CF card Single license Export 840DE sl specific software version 1.4 with travel to fixed stop with Force Control, 3 x additional axis/spindle, 1 x additional machining channel

Explanation

1 x 6FC5840-3YG10-4YA0	NCU system software up to 31 axes with HMI-Embedded 6 languages (Chinese Simplified, English, French, German, Italian, Spanish) on CF card Single license Export 840DE sl specific software version 1.4
-Z	Followed by order codes
M01	Travel to fixed stop with Force Control
A03	3 x additional axis/spindle
C11	1 x additional machining channel

Ordering individually

Order using the complete Order No.
License key obtained over Internet

Order item	Remarks
Item 1: 1 x 6FC5840-3YG10-4YA0	NCU system software up to 31 axes with HMI-Embedded 6 languages (Chinese Simplified, English, French, German, Italian, Spanish) on CF card Single license Export 840DE sl specific software version 1.4
Item 2: 1 x 6FC5800-0AM01-0YB0	Travel to fixed stop with Force Control
Item 3: 3 x 6FC5800-0AA00-0YB0	3 x additional axis/spindle
Item 4: 1 x 6FC5800-0AC10-0YB0	1 x additional machining channel