

SINUMERIK CNC

Functions

Control structure and configuration

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Control structure and configuration					
SINUMERIK 840D sl BASIC:					
• NCU 710.3 PN + SINAMICS S120 Combi				○	○
SINUMERIK 840D sl type 1B:					
• NCU 710.3 PN with PLC 317-3PN/DP		6FC5371-0AA30-0AA1		○	○
• NCU 720.3 PN with PLC 317-3PN/DP		6FC5372-0AA30-0AA1		○	○
• NCU 730.3 PN with PLC 317-3PN/DP		6FC5373-0AA30-0AA1		○	○
• Seal for external cooling of NCUs		6FC5348-0AA07-0AA0		○	○
• Numeric Control Extension NX10.3		6SL3040-1NC00-0AA0		○	○
• Numeric Control Extension NX15.3		6SL3040-1NB00-0AA0		○	○
• Maximum configuration NX:					
- NCU 710.3 PN + SINAMICS S120 Combi				–	–
- NCU 710.3 PN				3	3
- NCU 720.3 PN				5	5
- NCU 730.3 PN				5	5
• Maximum configuration NCU + NX + CU3x0-2:					
- NCU 710.3 PN				9	9
- NCU 720.3 PN				13	13
- NCU 730.3 PN				15	15
• Maximum configuration CU3x0-2:					
- NCU 710.3 PN	x = no. of NX			8-x	8-x
- NCU 720.3 PN	x = no. of NX			12-x	12-x
- NCU 730.3 PN	x = no. of NX			14-x	14-x
• SINUMERIK COM01.3 module	As an alternative to CBE30-2 module.	6FC5312-0FA01-1AA0		○	○
• CBE30-2 communication module with PROFINET IO	As an alternative to COM01.3 module.	6FC5312-0FA00-2AA0		○	○
Software for SINUMERIK NCU 710.3 PN/NCU 720.3 PN/NCU 730.3 PN:					
• CNC software 31-3 with SINUMERIK Operate, export version, on CF card, with license	SW version 4.5 SP3	6FC5851-1YG41-3YA0		○	–
• CNC software 31-3 with SINUMERIK Operate, on CF card, with license	SW version 4.5 SP3	6FC5851-1XG41-3YA0		–	○
• CNC software 31-3 with SINUMERIK Operate, export version, on CF card, without license	SW version 4.5 SP3	6FC5851-1YG41-3YA8		○	–
• CNC software 31-3 with SINUMERIK Operate, on CF card, without license	SW version 4.5 SP3	6FC5851-1XG41-3YA8		–	○
• CNC software 31-3 with SINUMERIK Operate, export version, on DVD, without license	SW version 4.5 SP3	6FC5851-1YC41-3YA8		○	–
• CNC software 31-3 with SINUMERIK Operate, on DVD, without license	SW version 4.5 SP3	6FC5851-1XC41-3YA8		–	○
• CNC software 31-3 with SINUMERIK Operate, export version, license		6FC5851-1YF00-0YB0		○	–
• CNC software 31-3 with SINUMERIK Operate, license		6FC5851-1XF00-0YB0		–	○

Control structure and configuration

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Control structure and configuration (continued)					
Machining channels/mode groups:				● 1	● 1
• Mode group, each additional		6FC5800-0AC00-0YB0	C01...C09	○	○
• Machining channel, each additional		6FC5800-0AC10-0YB0	C11... C19	○	○
• Maximum configuration:					
- CNC software 31-3				10	10
- NCU 710.3 PN/NCU 710.3 PN + SINAMICS S120 Combi				4	4
- NCU 720.3 PN/NCU 730.3 PN				10	10
CNC user memory, buffered for programs and OEM cycles				● 3 MB	● 3 MB
• Expansion by increments of 2 MB		6FC5800-0AD00-0YB0	D01... D06	○	○
• Maximum configuration:					
- NCU 710.3 PN				9 MB	9 MB
- NCU 720.3 PN/NCU 730.3 PN				15 MB	15 MB
HMI user memory, additional on CF card of NCU	Not in combination with PCU.	6FC5800-0AP12-0YB0	P12	○	○
Axis/spindle, each additional		6FC5800-0AA00-0YB0	A01... A28	○	○
Positioning axis/auxiliary spindle, each additional		6FC5800-0AB00-0YB0	B01... B28	○	○
Multi-axis package Expansion to 31 axes/spindles and 10 machining channels		6FC5800-0AM10-0YB0	M10	○	○
Axes/spindles or positioning axes/auxiliary spindle CNC software 31-3:				● 3	● 3
• Maximum configuration of axes:					
- NCU 710.3 PN + SINAMICS S120 Combi				6	6
- NCU 710.3 PN				8	8
- NCU 720.3 PN/NCU 730.3 PN				31	31
• Maximum configuration of spindles:					
- NCU 710.3 PN + SINAMICS S120 Combi				3	3
- NCU 710.3 PN				8	8
- NCU 720.3 PN/NCU 730.3 PN				31	31
• Configuration per channel axes incl. spindles:					
- NCU 710.3 PN + SINAMICS S120 Combi				6	6
- NCU 710.3 PN				8	8
- NCU 720.3 PN/NCU 730.3 PN				20	20
PLC-controlled axis				●	●
PLC positioning axis via PROFIBUS DP:				●	●
• Maximum configuration axes/spindles, numerically and PLC-controlled:					
- NCU 710.3 PN + SINAMICS S120 Combi				15	15
- NCU 710.3 PN				15	15
- NCU 720.3 PN				40	40
- NCU 730.3 PN				50	50

SINUMERIK CNC

Functions

Control structure and configuration Drives

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Control structure and configuration (continued)					
• Maximum configuration axes/spindles, PLC-controlled:	No CNC option axis/spindle required.				
- NCU 710.3 PN + SINAMICS S120 Combi	Max. 15 minus numerically controlled axes/spindles.			9...15	9...15
- NCU 710.3 PN	Max. 15 minus numerically controlled axes/spindles.			7...15	7...15
- NCU 720.3 PN	Max. 40 minus numerically controlled axes/spindles.			9...40	9...40
- NCU 730.3 PN	Max. 50 minus numerically controlled axes/spindles.			19...50	19...50
Drives					
SINUMERIK Analog Drive Interface for 4 axes ADI 4	No PROFIBUS certification.	6FC5211-0BA01-0AA4		○	○
SINAMICS S120 Combi Power Modules	See SINAMICS S120.	6SL3111-3VE21-6FA0 6SL3111-3VE21-6EA0 6SL3111-3VE22-0HA0 6SL3111-4VE21-6FA0 6SL3111-4VE21-6EA0 6SL3111-4VE22-0HA0		○	○
SINAMICS S120 in booksize compact format Motor Modules as expansion for SINAMICS S120 Combi	See SINAMICS S120.	6SL34...-.....-....		○	○
SINAMICS S120 booksize format, Motor Modules via DRIVE-CLiQ	See SINAMICS S120.			○	○
SINAMICS S120 CU320-2 DP Control Unit without CompactFlash card		6SL3040-1MA00-0AA0		○	○
SINAMICS S120 CU320-2 PN Control Unit without CompactFlash card	For positioning tasks via PLC.	6SL3040-1MA01-0AA0		○	○
CompactFlash card with current SINAMICS FW release:					
• License for basic performance		6SL3054-0EE00-1BA0		○	○
• License incl. FW option Performance expansion		6SL3054-0EE01-1BA0		○	○
SINAMICS S120 Control Unit:					
• CU310-2 DP		6SL3040-1LA00-0AA0		○	○
• CU310-2 PN		6SL3040-1LA01-0AA0		○	○
• CUA31 Adapter		6SL3040-0PA00-0AA1		○	○
• CUA32 Adapter		6SL3040-0PA01-0AA0		–	–
SINAMICS S120 Sensor Module Cabinet-Mounted:					
• SMC10	No SINUMERIK Safety Integrated.	6SL3055-0AA00-5AA3		○	○
• SMC20		6SL3055-0AA00-5BA3		○	○
• SMC30	No SINUMERIK Safety Integrated.	6SL3055-0AA00-5CA2		○	○
SINAMICS S120 Sensor Module External:					
• SME20		6SL3055-0AA00-5EA3		○	○
• SME25		6SL3055-0AA00-5HA3		○	○
• SME120		6SL3055-0AA00-5JA3		○	○
• SME125		6SL3055-0AA00-5KA3		○	○

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Drives (continued)					
SINAMICS S120 TB Terminal Board/TM Terminal Module:					
• TM15		6SL3055-0AA00-3FA0		○	○
• TM17	Requirement: Extrapolated switch- ing signals XOUT.	6SL3055-0AA00-3HA0		–	○
• TM41		6SL3055-0AA00-3PA1		○	○
• TM120		6SL3055-0AA00-3KA0		○	○
• TB30		6SL3055-0AA00-2TA0		–	–
• TM31		6SL3055-0AA00-3AA1		–	–
SINAMICS S120 expansion modules:					
• DMC20		6SL3055-0AA00-6AA0		○	○
• DME20		6SL3055-0AA00-6AB0		○	○
• VSM10	Integrated in SINAMICS S120 chassis format.	6SL3053-0AA00-3AA1		○	○
SINAMICS S120 booksize format Motor Modules	See SINAMICS S120.				
• 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..		○	○
• 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..		○	○
• 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..		○	○
• Liquid cooling		6SL3125-1TE32-0A..		○	○

SINUMERIK CNC

Functions

Drives

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Drives (continued)					
SINAMICS S120 booksize format Active Line Modules	See SINAMICS S120.				
• Internal air cooling		6SL3130-7TE21-6A.. 6SL3130-7TE23-6A.. 6SL3130-7TE25-5A.. 6SL3130-7TE28-0A.. 6SL3130-7TE31-2A..		○	○
• External air cooling		6SL3131-7TE21-6A.. 6SL3131-7TE23-6A.. 6SL3131-7TE25-5A.. 6SL3131-7TE28-0A.. 6SL3131-7TE31-2A..		○	○
• Cold plate cooling		6SL3136-7TE21-6A.. 6SL3136-7TE23-6A.. 6SL3136-7TE25-5A.. 6SL3136-7TE28-0A.. 6SL3136-7TE31-2A..		○	○
• Liquid cooling		6SL3135-7TE31-2A..		○	○
SINAMICS S120 booksize format Active Interface Modules		6SL3100-0BE21-6A.. 6SL3100-0BE23-6A.. 6SL3100-0BE25-5A.. 6SL3100-0BE28-0A.. 6SL3100-0BE31-2A..		○	○
SINAMICS S120 booksize format Smart Line Modules					
• Internal air cooling		6SL3130-6AE15-0A.. 6SL3130-6AE21-0A.. 6SL3130-6TE21-6A.. 6SL3130-6TE23-6A.. 6SL3130-6TE25-5A..		○	○
• External air cooling		6SL3131-6AE15-0A.. 6SL3131-6AE21-0A.. 6SL3131-6TE21-6A.. 6SL3131-6TE23-6A.. 6SL3131-6TE25-5A..		○	○
• Cold plate cooling		6SL3136-6AE15-0A.. 6SL3136-6AE21-0A..		○	○
SINAMICS S120 booksize format Basic Line Modules					
• Internal air cooling		6SL3130-1TE22-0A.. 6SL3130-1TE24-0A.. 6SL3130-1TE31-0A..		○	○
• Cold plate cooling		6SL3136-1TE22-0A.. 6SL3136-1TE24-0A.. 6SL3136-1TE31-0A..		○	○
SINAMICS S120 chassis format Motor Modules Internal air cooling					
• Rated pulse frequency 2 kHz		6SL3320-1TE32-1AA3 6SL3320-1TE32-6AA3 6SL3320-1TE33-1AA3 6SL3320-1TE33-8AA3 6SL3320-1TE35-0AA3		○	○
• Rated pulse frequency 1.25 kHz		6SL3320-1TE36-1AA. 6SL3320-1TE37-5AA. 6SL3320-1TE38-4AA. 6SL3320-1TE41-0AA. 6SL3320-1TE41-2AA. 6SL3320-1TE41-4AA.		–	–

SINUMERIK CNC

Functions

Drives Connectable motors

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Drives (continued)					
SINAMICS S120 chassis format Active Line Modules Internal air cooling	See SINAMICS S120.				
• Up to 300 kW		6SL3330-7TE32-1AA. 6SL3330-7TE32-6AA. 6SL3330-7TE33-8AA. 6SL3330-7TE35-0AA.		○	○
• 500 kW and higher		6SL3330-7TE36-1AA. 6SL3330-7TE38-4AA. 6SL3330-7TE41-0AA. 6SL3330-7TE41-4AA.		–	–
SINAMICS S120 chassis format Active Interface Modules		6SL3300-7TE32-6A.. 6SL3300-7TE33-8A.. 6SL3300-7TE35-0A..		○	○
SINAMICS S120 blocksize format Power Modules 230 V 1 AC Internal air cooling	No SINUMERIK Safety Integrated.	6SL3210-1SB11-0... 6SL3210-1SB12-3... 6SL3210-1SB14-0...		○	○
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		○	○
	See SINAMICS S120.	6SL3210-1SE16-0... 6SL3210-1SE17-7... 6SL3210-1SE21-0... 6SL3210-1SE21-8... 6SL3210-1SE22-5... 6SL3210-1SE23-2... 6SL3210-1SE23-8... 6SL3210-1SE24-5... 6SL3210-1SE26-0... 6SL3210-1SE27-5... 6SL3210-1SE31-0... 6SL3210-1SE31-1... 6SL3210-1SE31-5... 6SL3210-1SE31-8...		○	○
SINAMICS S120 chassis format Power Modules 400 V 3 AC Internal air cooling		6SL3310-1TE32-1AA. 6SL3310-1TE32-6AA. 6SL3310-1TE33-1AA. 6SL3310-1TE33-8AA. 6SL3310-1TE35-0AA.		–	–
Connectable motors					
SIMOTICS synchronous motors	See SIMOTICS motors.				
• 1FT7/1FK7 feed motors				○	○
• 1PH8/1FE1/2SP1 main spindle motors				○	○
• 1FN3/1FN6 linear motors				○	○
• 1FW6 torque motors				○	○
SIMOTICS asynchronous motors	See SIMOTICS motors.				
• 1PH8/1PH2/2SP1 main spindle motors				○	○
External drive:					
• Hydraulic axis (distributed), can be connected as interpolating CNC axis. Distributed axes can be operated in isochronous mode with PROFIdrive V4.1 on PROFIBUS DP-V2.	No SINUMERIK Safety Integrated.			○	○

Connectable measuring systems

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Connectable measuring systems					
SINAMICS S120 DRIVE-CLiQ on SIMOTICS motor:					
• Resolver				○	○
• sin/cos 1 V _{pp}				○	○
• EnDat 2.1				○	○
Measuring systems per axis, maximum number				2	2
Absolute encoder with DRIVE-CLiQ interface	Via SINAMICS.			●	●
Absolute/incremental encoder installed in SIMOTICS S-1FT7/-1FK7 and SIMOTICS M-1PH8 motors	Integrated in motor via SINAMICS Sensor Modules.			●	●
Absolute encoder with SSI interface	Via SINAMICS SMC30 Sensor Modules. For analog axes via SINUMERIK ADI 4.			●	●
Resolver:	Via SINAMICS Sensor Modules:				
• Installed in SIMOTICS S-1FK7 motors	Integrated in motor			●	●
• As external machine encoder	SMC10			●	●
Rotary measuring systems with:	Via SINAMICS Sensor Modules:				
• RS422 (TTL)	SMC30			●	●
• sin/cos 1 V _{pp}	SMC20/SME20			●	●
• Distance-coded reference marks	SMC20/SME20			●	●
• EnDat 2.1	SMC20/SME25			●	●
Linear scale LMS with:	Via SINAMICS Sensor Modules:				
• sin/cos 1 V _{pp}	SMC20/SME20			●	●
• Distance-coded reference marks	SMC20/SME20			●	●
• EnDat 2.1	SMC20/SME25			●	●

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Drive functions					
Voltage protection for SIMOTICS 1PH8/1FE1/2SP1 motors externally via VPM Voltage Protection Module:	See SIMOTICS motors.				
• VPM 120		6SN1113-1AA00-1JA1		○	○
• VPM 200		6SN1113-1AA00-1KA1		○	○
• VPM 200 DYNAMIC		6SN1113-1AA00-1KC1		○	○
Control:				●	●
• Servo control				●	●
• Vector control				–	–
• V/f control				●	●
• Combination of servo/V/f control possible, e.g on an NCU, NX, CU or CX				–	–
• Setting the pulse frequency grid in fine steps (3.2 kHz/4 kHz/5.33 kHz/6.4 kHz/8 kHz)	Requires current control cycle of 62.5 μs or 31.25 μs in some cases.			●	●
• Sine-wave filter				–	–
• Unit switchover US/SI etc.				–	–
• Direction reversal without changing the setpoint				–	–
• Technology controller				–	–
• k_T estimator				–	–
• $k_T(i_q)$ characteristic				●	●
• Rotor/pole position identification saturation-based/motion-based				●	●
• Edge modulation				–	–
• Motor data identification stationary/rotating				●	●
• Flux reduction for asynchronous motors				●	●
Modular machine concept (sub-topologies):					
• Parking axis/encoder				●	●
Brakes:					
• Braking signal, basic/extended				●/●	●/●
• Armature short-circuit brake, internal/external				–/●	–/●
• DC brake				–	–
Motor/winding switchover				○	○
Suspended axis/electronic counterweight				●	●
Dynamic energy management (DC link voltage management)				●	●
Runtime meter				●	●
I^2t monitoring for motors				●	●
Automatic restart mechanism (servo/infeed)				–	–
Technology function: Friction characteristic				–	–
Drive Control Chart DCC				–	–
Drive Based Open Architecture				○	○
Basic positioner				○	○
2 command data sets				–	–
Parallel connection of SINAMICS S120 Motor Modules				–	–

SINUMERIK CNC

Functions

Drive functions Axis functions

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Drive functions (continued)					
Maximum configuration valid for standard PROFIBUS DP cycle with:					
• Current/speed controller cycle 125 µs:					
- Axes/spindles				31	31
- Axes/spindles per NCU/NX				6	6
- Motor measuring systems and direct measuring systems per NCU/NX				12	12
• Current/speed controller cycle 62.5 µs:					
- Axes/spindles				11	11
- Axes/spindles per NCU/NX				3	3
• Current/speed controller cycle 31.25 µs:					
- Axes/spindles				1	1
• SINAMICS S120 chassis format Motor Modules per NCU/NX				2	2
Current/speed controller cycle:					
• SINAMICS S120 booksize format, minimum				31.25 µs	31.25 µs
• SINAMICS S120 chassis format, minimum				125 µs	125 µs
• Maximum				250 µs	250 µs
PROFIBUS DP cycle (corresponds to IPO cycle), minimum				0.5 ms	0.5 ms
Drive data sets, maximum number				32	32
Motor data sets, maximum number				8	8
Encoder data sets, maximum number				8	8
Axis functions					
Traversing range				± 9 decades	± 9 decades
Rotary axis, turning endlessly				●	●
Velocity, maximum				300 m/s	300 m/s
Acceleration with jerk limitation				●	●
Programmable acceleration				●	●
Follow-up mode				●	●
Measuring systems 1 and 2, selectable				●	●
Feedrate interpolation				●	●
Separate feedrate for roundings and chamfers				●	●
Travel to fixed stop				●	●
Travel to fixed stop with Force Control		6FC5800-0AM01-0YB0	M01	○	○
Setpoint exchange		6FC5800-0AM05-0YB0	M05	○	○
Tangential control		6FC5800-0AM06-0YB0	M06	○	○
Position switching signals/cam controller:		6FC5800-0AM07-0YB0	M07	○	○
• Pairs, maximum number				16	16
Advanced Position Control APC		6FC5800-0AM13-0YB0	M13	○	○
Axis container				●	●
Link axes (axis container distributed among several NCUs):	Requirement: CBE30-2 communication module.			●	●
• NCUs, maximum number				3	3

Spindle functions

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Spindle functions					
Digital spindle speed				●	●
Spindle speed, max. programmable value range Display ± 999 999 999.9999				10 ⁶ ... 10 ⁻⁴	10 ⁶ ... 10 ⁻⁴
Gear stages				5	5
Gear stage selection, automatic				●	●
Oriented spindle stop				●	●
Spindle speed limitation, min./max.				●	●
Constant cutting rate				●	●
Spindle control via PLC Positioning, oscillation				●	●
Changeover to axis mode				●	●
Axis synchronization on-the-fly				●	●
Thread run-in and run-out, programmable				●	●
Thread cutting with constant or variable pitch				●	●
Tapping with compensating chuck/rigid tapping				●	●

SINUMERIK CNC

Functions

Interpolations

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Interpolations					
Floating point accuracy (80-bit floating point accuracy)				●	●
Linear interpolating axes:				4	4
• Maximum number				4	20
Circle via center point and end point				●	●
Circle via interpolation point				●	●
Helical interpolation				2D+2	2D+6
Universal interpolator NURBS (non-uniform rational B splines)				●	●
Continuous-path mode with programmable rounding clearance				●	●
Multi-axis interpolation > 4 interpolating axes		6FC5800-0AM15-0YB0	M15	–	○
Advanced Surface motion control		6FC5800-0AS07-0YB0	S07	○	○
Computational motion control EMC (engineered motion control) Contains the option: Nodding compensation NOCO	Requirements: Loadable compile cycle and NCU 720.3 PN/ NCU 730.3 PN.	6FC5800-0AN47-0YB0 On request.	N47	–	○
Variable-based axis movement AMOV	Requirement: Loadable compile cycle.	6FC5800-0AN62-0YB0	N62	–	○
Compressor for 3-axis machining				●	●
Compressor for 5-axis machining				●	●
Spline interpolation (A, B and C splines)		6FC5800-0AS16-0YB0	S16	○	○
Polynomial interpolation		6FC5800-0AM18-0YB0	M18	○	○
Involute interpolation		6FC5800-0AM21-0YB0	M21	○	○
Continue machining at the contour (retrace support)	Requirements: Loadable compile cycle and option "cross-mode actions".	6FC5800-0AM24-0YB0	M24	○	○
Crankshaft interpolation CRIP	Requirement: Loadable compile cycle.	6FC5800-0AN04-0YB0	N04	–	○

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Couplings					
Pair of synchronous axes (gantry axes): • Maximum number		6FC5800-0AM02-0YB0	M02	○ 8	○ 8
Master/slave for drives		6FC5800-0AM03-0YB0	M03	○	○
Generic coupling Standard, CP-Standard: • 4 axis pairs in simultaneous coupled motion				●	●
Generic coupling Static, CP-Static: • 1 × simple synchronous spindle, coupling ratio 1 :1, no multi-edge machining		6FC5800-0AM75-0YB0	M75	○	○
Generic coupling Basic, CP-Basic: • 4 axis pairs in simultaneous coupled motion and • 1 × synchronous spindle/multi-edge turning and/or master value coupling/curve table interpolation and/or axial coupling in the machine coordinate system	¹⁾ Restricted functionality for export versions. The number of simultaneously traversing axes is restricted to 4.	6FC5800-0AM72-0YB0	M72	○ 1)	○
Generic coupling Comfort, CP-Comfort: • 4 axis pairs in simultaneous coupled motion and • 4 × synchronous spindle/multi-edge turning and/or master value coupling/curve table interpolation and/or axial coupling in the machine coordinate system and • 1 × electronic gear for 3 leading axes without curve table, without cascading	¹⁾ Restricted functionality for export versions. The number of simultaneously traversing axes is restricted to 4.	6FC5800-0AM73-0YB0	M73	○ 1)	○
Generic coupling Expert, CP-Expert: • 8 axis pairs in simultaneous coupled motion and • 8 × synchronous spindle/multi-edge turning and/or master value coupling/curve table interpolation and/or axial coupling in the machine coordinate system and • 8 × electronic gear for 3 leading axes with curve tables, with cascading • 5 × electronic gear for 5 leading axes with curve tables, with cascading	Requirement: NCU 720.3 PN/ NCU 730.3 PN. ¹⁾ Restricted functionality for export versions. The number of simultaneously traversing axes is restricted to 4.	6FC5800-0AM74-0YB0	M74	○ 1)	○
Compensation of a forced mechanical coupling AXCO	Requirement: Loadable compile cycle.	6FC5800-0AM81-0YB0	M81	–	○
Transformation: Redundant axes at workpiece RDCC	Requirement: Loadable compile cycle.	6FC5800-0AN26-0YB0	N26	–	○

SINUMERIK CNC

Functions

Transformations Measuring functions/measuring cycles

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Transformations					
Cartesian Point-to-Point travel PTP				●	●
Concatenated transformations (inclined axis TRAANG after TRAORI/ cardanic milling head/TRANSMIT/TRACYL)				●	●
Generic transformation	Requirement: 5-axis machining package or Milling technology package SINUMERIK MDynamics 5 axes.			–	●
TRANSMIT/cylinder surface transformation		6FC5800-0AM27-0YB0	M27	○	○
Inclined axis		6FC5800-0AM28-0YB0	M28	○	○
Transformation: DOUBLETRANSMIT 2TRA	Requirement: Loadable compile cycle.	6FC5800-0AM25-0YB0	M25	–	○
Transformation: Handling RCTRA	Requirement: Loadable compile cycle.	6FC5800-0AM31-0YB0	M31	–	○
PARACOP 3-axis transformation for parallel kinematics, 1st channel	Requirement: Loadable compile cycle.	6FC5800-0AM44-0YB0	–	–	○
Transformation Pantograph kinematics 2 axes SCIS	Requirement: Loadable compile cycle.	6FC5800-0AM51-0YB0	M51	–	○
Double generic transformation DGEN	Requirement: Loadable compile cycle.	6FC5800-0AN34-0YB0	N34	–	○
Transformation TRIPOD HYBRID basis 5 axes THYK	Requirement: Loadable compile cycle.	6FC5800-0AN36-0YB0	N36	–	○
Transformation robotics extended ROBX	Requirement: Loadable compile cycle.	6FC5800-0AN54-0YB0	N54	–	○
Transformation: Machining with virtual Y axis MAVY	Requirement: Loadable compile cycle.	6FC5800-0AN56-0YB0	N56	–	○
Measuring functions/measuring cycles					
Measuring stage 1 Two probes (switching) with/without deletion of distance-to-go				●	●
Measuring stage 2 Axial measuring, measuring from synchronized actions, cyclic measurement		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 axes		6FC5800-0AP18-0YB0	P18	○	○
Measuring inputs expanded for axial measurements PROX	Requirement: SINAMICS TM17 Terminal Module.	6FC5800-0AN57-0YB0	N57	–	○
		On request.			16

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Technologies					
Multiple feedrates in one block, e.g. for clamp meters				●	●
Handwheel override				●	●
Contour handwheel		6FC5800-0AM08-0YB0	M08	○	○
Punching/nibbling		6FC5800-0AM33-0YB0	M33	○	○
Oscillation functions block-related, modal and asynchronous		6FC5800-0AM34-0YB0	M34	○	○
Electronic transfer CP Contains the options: • Position switching signals/cam controller • Polynomial interpolation • Generic coupling Comfort CP Comfort • Cross-mode actions • I/O interfacing via PROFIBUS DP • Synchronized actions stage 2 • Pairs of synchronous axes (gantry axes)	¹⁾ Restricted functionality for export versions. The number of simultaneously traversing axes is restricted to 4.	6FC5800-0AM76-0YB0	M76	○ ¹⁾	○
Milling technology package SINUMERIK MDynamics 3 axes Contains the options: • ShopTurn/ShopMill ¹⁾ • Residual material detection and machining for contour pockets and cutting • 3D simulation 1 (finished part) • Simultaneous recording • Advanced Surface motion control • Spline interpolation (A, B and C splines) • TRANSMIT/cylinder surface transformation • Measuring cycles for drilling/milling and turning • HMI user memory, additional on CF card of NCU	¹⁾ Function is dependent on operating software.	6FC5800-0AS32-0YB0	S32	○	○
5-axis machining package Contains the option: Multi-axis interpolation > 4 interpolating axes		6FC5800-0AM30-0YB0	M30	–	○
5-axis machining package Additional function 7th axis		6FC5800-0AS01-0YB0	S01	–	○
Milling technology package SINUMERIK MDynamics 5 axes Contains the options: • 5-axis machining package • Multi-axis interpolation (> 4 interpolating axes) • ShopTurn/ShopMill ¹⁾ • Residual material detection and machining for contour pockets and cutting • 3D simulation 1 (finished part) • Simultaneous recording • Advanced Surface motion control • Spline interpolation (A, B and C splines) • TRANSMIT/cylinder surface transformation • Measuring cycles for drilling/milling and turning • HMI user memory, additional on CF card of NCU • 3D tool radius compensation • Measure kinematics	¹⁾ Function is dependent on operating software.	6FC5800-0AS33-0YB0	S33	–	○
Block cycle times (block processing times) with:	Requirement: With use of the compressor.				
• NCU 710.3 PN, typically				1.5 ms	1.5 ms
• NCU 720.3 PN, typically	¹⁾ Under development.			0.6 ms ¹⁾	0.6 ms ¹⁾
• NCU 730.3 PN, typically				0.4 ms	0.4 ms
Handling package Contains the options: • 3 additional axes • 3 additional channels • Handling transformation • Synchronized actions stage 2 No tool offsets or spindles possible.	Requirement: Loadable compile cycle.	6FC5800-0AS31-0YB0	S31	–	○

SINUMERIK CNC

Functions

Technologies

Motion-synchronous actions

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Technologies (continued)					
External position display EXPO	Requirement: Loadable compile cycle.	6FC5800-0AN64-0YB0	N64	–	○
SINUMERIK plastics package IME Contains the function: • Travel to fixed stop Contains the options: • 3 additional axes • Pair of synchronous axes (gantry axes) • Master/slave for drives • Position switching signals/cam controller • Polynomial interpolation • Handling transformation • Synchronized actions stage 2 No tool offsets or spindles possible.		6FC5800-0AS40-0YB0	S40	–	○
Velocity adaptation VADA	Requirement: Loadable compile cycle.	6FC5800-0AN05-0YB0	N05	–	○
Extrapolated switching signals XOUT	Requirement: Loadable compile cycle.	6FC5800-0AN51-0YB0	N51	–	○ 64
Path-related pulse output PRIG	Requirement: Loadable compile cycle.	6FC5800-0AN76-0YB0	N76	–	○
Scalable analog setpoint SANS	Requirement: Loadable compile cycle.	6FC5800-0AN48-0YB0 On request.	N48	–	○
CCG compiler as DLL for SINUMERIK PCU 50.5 (Cam Contour Grinding)		6FC5800-0AP10-0YB0	P10	○	○
Motion-synchronous actions					
CNC inputs/outputs, high-speed:					
• Digital inputs on-board				4	4
• Digital inputs or outputs on-board, total				4	4
• Expansion via SIMATIC S7 I/O				○	○
- Digital inputs/outputs				32/32	32/32
- Analog inputs/outputs				4/4	4/4
Synchronized actions (max. 24) and high-speed auxiliary function output incl. 3 synchronous functions (max. 159 elements for synchronized actions)	¹⁾ Restricted functionality for export versions. The number of simultaneously traversing axes is limited to 4. The number of simultaneously active synchronous functions SYNFACT is limited to 1.			● 1)	●
Synchronized actions stage 2	¹⁾ Restricted functionality for export versions. The number of simultaneously traversing path and positioning axes is limited to 4.	6FC5800-0AM36-0YB0	M36	○ 1)	○

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Motion-synchronous actions (continued)					
Positioning axes and spindles via synchronized actions (command axes)				●	●
Analog value control in the interpolation cycle	Requirement: Analog input			●	●
Analog output, path velocity-dependent (laser power control)		6FC5800-0AM37-0YB0	M37	○	○
Laser switching signal HSLC, high-speed	Requirement: Loadable compile cycle.	6FC5800-0AM38-0YB0	M38	○	○
Clearance control:					
• 1D in interpolation cycle via synchronized actions				●	●
• Clearance control 1D/3D in position control cycle CLC, incl. in the IPO cycle	Requirement: Loadable compile cycle. 1) Restricted functionality for export versions. The number of simultaneously traversing axes is restricted to 4. Only clearance control 1D in position control cycle.	6FC5800-0AM40-0YB0	M40	○ 1)	○
• Clearance control 1D/3D in position control cycle, free direction	Requirement: Loadable compile cycle and clearance control 1D/3D in position control cycle CLC.	6FC5800-0AM65-0YB0	M65	○	○
Evaluation of internal drive variables	Requirement for Adaptive Control.	6FC5800-0AM41-0YB0	M41	○	○
Continuous dressing, parallel dressing online modification of the tool offset				●	●
Asynchronous subprograms ASUB	High-speed CNC inputs/outputs.			●	●
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	○	○
Open Architecture (see SINUMERIK Integrate)					
Program screens, operating areas and user interfaces SINUMERIK Integrate Create MyHMI:	OEM contract required.				
• Create MyHMI /3GL (programming package) Software for PC on DVD-ROM	Single license for current SW version	6FC5861-1YC00-0YA0		○	○
	Single license for SW version 2.7 SP1	6FC5861-1YC23-0YA0		○	○
	Single license without data carrier	6FC5861-1YP00-0YB0		○	○
	Software update service	6FC5861-1YP00-0YL8		○	○
• Run MyHMI /3GL		6FC5800-0AP60-0YB0	P60	○	○
• Run MyHMI /3GL (.NET)		6FC5800-0AP66-0YB0	P66	○	○
Use SIMATIC OP 177B/TP 177B/OP 277/TP 277/MP 277/MP 377/OP 170B/TP 170B/OP 270/TP 270 with 6"/10" display and MP 170/MP 270B/MP 370 with keys/touch SINUMERIK Integrate Create MyHMI:					
• Run MyHMI /SIMATIC OP for SIMATIC Comfort and Mobile Panels		6FC5800-0AP03-0YB0	P03	○	○

SINUMERIK CNC

Functions

Open Architecture CNC programming language

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Open Architecture (continued)					
Integrate screens with variable layout in SINUMERIK Operate with SINUMERIK Integrate Create MyHMI /PRO	Single license for current SW version	6FC5867-3YC00-0YA8		○	○
	Single license for SW version 2.7 SP1	6FC5867-3YC27-0YA8		○	○
• Run MyHMI /PRO for SINUMERIK PCU 50.5/NCU 710.3 PN/ NCU 720.3 PN/NCU 730.3 PN for machine operation		6FC5800-0AP47-0YB0	P47	○	○
Integrate screens in SINUMERIK Operate with SINUMERIK Integrate Run MyScreens					
• Free screens				5	5
• > 5 screens, extended functions		6FC5800-0AP64-0YB0	P64	○	○
Integrate OEM-specific solutions in the NC kernel with SINUMERIK Integrate Create MyCC:					
• Create MyCC for openness in the NC kernel	OEM contract required.	On request.		–	○
• Create MyCCI for openness in the NC kernel based on customized interface	COA contract required.	6FC5863-1YP00-0YB8		○	○
• Create MyCCI /Interpreter for openness in the NC kernel based on Interpreter interface	COA contract required.	6FC5863-0YP00-0YB8		○	○
• Run MyCC	Requirement: Create MyCC.	6FC5800-0AM04-0YB0	M04	–	○
• Run MyCCI /IMD	Requirement: Create MyCC or Create MyCCI or Create MyCCI /Interpreter.	6FC5800-0AN13-0YB0	N13	○	○
• Run MyCCI /VCI	Requirement: Create MyCC or Create MyCCI or Create MyCCI /Interpreter.	6FC5800-0AN74-0YB0	N74	○	○
		On request.			
• Run MyCCI /COOC	Requirement: Create MyCC or Create MyCCI or Create MyCCI /Interpreter.	6FC5800-0AM67-0YB0	M67	○	○
CNC programming language					
Programming language DIN 66025 and high-level language expansion				●	●
Main program call from main program and subprogram				●	●
Subprogram levels/interrupt routines, max.				16/2	16/2
Number of subprogram passes				≤ 9999	≤ 9999
Number of levels for skip blocks				0 ... 8	0 ... 8
Polar coordinates				●	●
1/2/3-point contours				●	●
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	● INT 2 ³¹ -1
• H word, max. programmable value range REAL ± 3.4028 ex 38 Display ± 999 999 999.9999				● INT -2 ³¹ ... 2 ³¹ -1	● INT -2 ³¹ ... 2 ³¹ -1

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
CNC programming language (continued)					
CNC high-level 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				●	●
• Comparison operations and logic combinations				●	●
• Macro techniques				●	●
• Control structures IF-ELSE-ENDIF				●	●
• Control structures WHILE, FOR, REPEAT, LOOP				●	●
• Commands to HMI				●	●
• STRING functions				●	●
Program functions:					
• Preprocessing memory, dynamic FIFO				●	●
• Look Ahead				●	●
• Frame concept				●	●
• Inclined-surface machining with frames				●	●
• Axis/spindle interchange				●	●
• Geometry axes, switchable online in the CNC program				●	●
• Program preprocessing				●	●
Online ISO dialect interpreter				●	●
Program/workpiece management:					
• Part programs on NCU, max. number	In total maximum 512 files per directory.			1000	1000
• Workpieces on NCU, maximum number	In total maximum 256 directories.			250	250
• Workpieces on SSD of PCU, maximum number	In total maximum 10 ⁵ user files.			10 ⁵	10 ⁵
• In additional HMI user memory on CF card of the NCU	In total maximum 10 ⁵ user files and directories.			○	○
• On additional plug-in CF card in SINUMERIK PCU 50.5				○	○
• On integrated hard disk in SINUMERIK PCU 50.5				○	○
• On USB storage medium, e.g. floppy disk drive, memory stick				○	○
• On network drive				●	●
• Templates for workpieces and programs				●	●
• Job lists				●	●

SINUMERIK CNC

Functions

CNC programming language Programming support

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
CNC programming language (continued)					
Basic frames, maximum number				16	16
Settable offsets, maximum number				100	100
Work offsets, programmable (frames)				●	●
Scratching, determining work offset				●	●
Work offsets, external via PLC				●	●
Global and local user data				●	●
Global program user data				●	●
Display system variables (also via online configurable display) and log them	1) Function is dependent on operating software.			1)	1)
Programming support					
Program editor:					
• Text editor: Selecting, copying, deleting				●	●
• Dual editor				●	●
• Multi-editor, maximum	Requirement: SINUMERIK OP 019.			4	4
• Write protection for lines				●	●
• Suppression of lines in the display				●	●
ShopTurn/ShopMill:					
• Machining step programming and multiple clamping of identical workpieces	Function is dependent on operating software.	6FC5800-0AP17-0YB0	P17	○	○
• Multiple clamping of various workpieces	Function is dependent on operating software. Requirement: Option P17.	6FC5800-0AP14-0YB0	P14	○	○
programSYNC machining step programming	Function is dependent on operating software.	6FC5800-0AP05-0YB0	P05	○	○
Programming support for geometry entries:					
• programGUIDE Programming support for cycles, dynamic programming graphics, animated elements				●	●
Technology cycles:					
• Drilling				●	●
• Milling				●	●
• Turning				●	●
Pocket milling with free contour definition and islands				●	●
Residual material detection and machining for contour pockets and stock removal		6FC5800-0AP13-0YB0	P13	○	○
Programming support for cycles:					
• Dynamic programming graphic during programming				●	●
• Programming support is expandable, e.g. customer cycles	See SINUMERIK Integrate Run MyScreens.			●	●

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Programming support (continued)					
Access protection for cycles SINUMERIK Integrate Lock MyCycles ● Lock MyCycles (cycle protection OEM)	See SINUMERIK Integrate.	6FC5800-0AP54-0YB0	P54	○	○
CAD Reader for PC	Single license without data carrier	6FC5260-0AY00-0AG1		○	○
	Single license for current SW version	6FC5260-0AY00-0AG0		○	○
	Single license for SW version 6.2	6FC5260-6AY00-2AG0		○	○
	Software update service	6FC5260-0AY00-0AG2		○	○
	Service pack for SW version 6.2	6FC5260-6AY00-2AG8		○	○
Simulations					
Machining channels capable of simulation, maximum	Requirement: programSYNC			4	4
Simulation of program X, while program Y is being executed	Requirement: NCU 720.3 PN/ NCU 730.3 PN.			●	●
Quickview for mold-making programs				●	●
Turning/drilling/milling:					
● Simultaneous recording (real-time simulation of current machining)		6FC5800-0AP22-0YB0	P22	○	○
● 3D simulation 1 (finished part)		6FC5800-0AP25-0YB0	P25	○	○
● Turning				●	●
● Counterspindle				●	●
● Turn-milling				●	●
● Mill-turning with supported kinematics	Application-specific by machine manufacturer.			●	●
● Milling up to 5-axis machining with TRAORI				●	●
● 2D simulation (finished part)				●	●

SINUMERIK CNC

Functions

Operating modes Tools

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Operating modes					
JOG:				●	●
• Handwheel selection				●	●
• Inch/metric changeover				●	●
• Manual measurement of work offset				●	●
• Manual measurement of tool offset				●	●
• Automatic tool/workpiece measurement				●	●
• Reference point approach automatic/via CNC program				●	●
MDI:				●	●
• Input in text editor				●	●
• Save MDI program				●	●
Teach-in:				●	●
• Teach positions in MDI buffer				●	●
• Teach-in function Handling				●	●
AUTO :				●	●
• Execution from HMI memory on CF card of NCU	Requirement: Additional HMI user memory on CF card of NCU.	6FC5800-0AP12-0YB0	P12	○	○
• Execution from storage medium on rear USB interface of TCU/PCU, e.g. card reader, memory stick				●	●
• Execution from network drive				●	●
• Execution from hard disk	On SINUMERIK PCU 50.5.			●	●
• Program control				●	●
• Program editing				●	●
• Overstore					
• DRF offset				●	●
• Block search with/without calculation				●	●
Repos (repositioning on the contour) via:				●	●
• Operator command/semi-automatically				●	●
• Program				●	●
Tools					
Tool types:					
• Turning				●	●
• Drilling/milling				●	●
• Grinding				●	●
• Nibbling	Not in SINUMERIK Operate.			–	–
• Groove sawing				●	●
Tool radius compensations in plane with:					
• Approach and retract strategies				●	●
• Transition circle/transition ellipse at outside corners				●	●
Configurable intermediate blocks with tool radius compensation active				●	●
3D tool radius compensation		6FC5800-0AM48-0YB0	M48	○	○

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Tools (continued)					
Tool change via T number				●	●
Tool carrier with orientation capability				●	●
Look-ahead detection of contour violations				●	●
Grinding wheel peripheral speed, programmable				●	●
Tool orientation interpolation	Requirement: SINUMERIK MDynamics 5 axes or 5-axis machining package.			–	●
Tool length compensation, online				●	●
Operation <u>without</u> magazine 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				●	●
• Tools/cutting edges in tool list				600/1500	600/1500
Operation <u>with</u> tool management, up to 3 magazines (corresponding to one real magazine):				●	●
• Operation <u>with</u> tool management with more than 3 magazines		6FC5800-0AM88-0YB0	M88	○	○
• Monitoring for maximum tool speed/acceleration		6FC5800-0AS08-0YB0	S08	○	○
• System displays in standard software				●	●
• User-friendly commissioning via system displays				●	●
• Tool list				●	●
• Configurable tool lists				1	1
• Number of tools/cutting edges in tool list				600/1500	600/1500
• Tool offset selection via T and D numbers				●	●
• Editing of tool data				●	●
• Editing of OA data				●	●
• Magazine list				●	●
• Configurable magazine list				●	●
• Magazines, maximum				32	32
• Magazine data				●	●
• Empty location search and place positioning				●	●
• Easy empty location search using softkeys				●	●
• Loading and unloading of tools				●	●
• More than one loading and unloading point per magazine				●	●
• Tool life monitoring and workpiece count				●	●

SINUMERIK CNC

Functions

Tools

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Tools (continued)					
Tool management functions for individual machines and networked machines SINUMERIK Integrate Manage MyTools (MCIS TDI):					
• Manage MyTools Software for PC/Server	Single license for current SW version	6FC6000-2XC00-0AA8		○	○
	Single license for SW version 2.4	6FC6000-2XC02-4AA8		○	○
• Manage MyTools License for NCU 710.3 PN/NCU 720.3 PN/NCU 730.3 PN	Single license without data carrier	6FC5800-0AP37-0YB0	P37	○	○
• Manage MyTools (Node) License per system node	Single license without data carrier	6FC6000-2NF00-0YB0		○	○
Tool identification for loading/unloading tools with code carrier	See SIMATIC Ident Catalog ID 10 or Siemens Industry Mall.				
• Tool Ident Connection		6FC5800-0AP52-0YB0	P52	○	○

Communication and data management

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Communication and data management					
HMI user memory, additional on CF card of NCU 6 GB of HMI user memory with 8 GB CF card	See CNC. Not in combination with PCU 50.5.	6FC5800-0AP12-0YB0	P12	○	○
Data on storage medium on rear USB interface of TCU/PCU, e.g. card reader, memory stick	2 plant HMIs can be accessed per plant network.			●	●
Data on storage medium on front USB interface of operator panel, e.g. memory stick	2 plant HMIs can be accessed per plant network.			●	●
Manage additional drives via:					
• Ethernet				4	4
• USB				●	●
• CF card of the PCU				●	●
COM (RS232C) serial interface	Requirement: COM01.3 module for NCU or PCU 50.5.			●	●
I/O interfacing via PROFIBUS DP				●	●
Axis data output via PROFIBUS ADAS	Requirement: Loadable compile cycle.	6FC5800-0AN07-0YB0	N07	○	○
Reading of actual positions correlated with output signal COPA	Requirement: Loadable compile cycle.	6FC5800-0AN61-0YB0	N61	○	○
Data backup for NCU CF card (backup/restore) on memory stick or via network				●	●
Data backup on hard disk of SINUMERIK PCU 50.5				●	●
Data backup with Ghost (backup/restore) on hard disk of SINUMERIK PCU 50.5/network				●	●
CNC program transfer SINUMERIK Integrate Manage MyPrograms (MCIS DNC):					
• Manage MyPrograms Software for PC/Server	Single license for current SW version	6FC6000-0XC00-0AA8		○	○
	Single license for SW version 2.4	6FC6000-0XC02-4AA8		○	○
• Manage MyPrograms License for NCU 710.3 PN/NCU 720.3 PN/NCU 730.3 PN	Single license without data carrier	6FC5800-0AP40-0YB0	P40	○	○
• Manage MyPrograms License per connection node	Single license without data carrier	6FC6000-0NF00-0YB0		○	○
Host computer interface SINUMERIK Integrate Create MyInterface:	See SINUMERIK Integrate.				
• Create MyInterface Software for PC/Server on CD-ROM without license	Current SW version	6FC6000-0XC02-0AA8		○	○
	SW version 2.6 SP1	6FC6000-7AC02-0AA8		○	○
• Create MyInterface License for NCU 710.3 PN/NCU 720.3 PN/NCU 730.3 PN	Single license without data carrier	6FC5800-0AP50-0YB0	P50	○	○
• Create MyInterface License per connection node	Single license without data carrier	6FC6000-7NF00-0YB0		○	○
Host computer interface Server for OPC unified architecture SINUMERIK Integrate Access MyMachine:	See SINUMERIK Integrate.				
• Access MyMachine /OPC UA License for NCU 710.3 PN/NCU 720.3 PN/NCU 730.3 PN		6FC5800-0AP67-0YB0	P67	○	○

SINUMERIK CNC

Functions

Operation

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Operation					
Operator panel fronts:					
• SINUMERIK OP 010, 10.4", color		6FC5203-0AF00-0AA1		○	○
• SINUMERIK OP 010C, 10.4", color		6FC5203-0AF01-0AA0		○	○
• SINUMERIK OP 010S, 10.4", color		6FC5203-0AF04-0AA0		○	○
• SINUMERIK OP 012, 12.1", color		6FC5203-0AF02-0AA1		○	○
• SINUMERIK OP 015, 15", color		6FC5203-0AF03-0AA0		○	○
• SINUMERIK OP 015A, 15", color		6FC5203-0AF05-0AB0		○	○
• SINUMERIK TP 015A, 15", color, touch		6FC5203-0AF08-0AB2		○	○
• SINUMERIK OP 019, 19", color	Requirement: PCU 50.5.	6FC5303-0AF13-0AA0		○	○
Operator panel fronts with integrated SINUMERIK TCU:					
• SINUMERIK OP 08T, 8", color		6FC5203-0AF04-1BA0		○	○
• SINUMERIK OP 015AT, 15", color		6FC5203-0AF05-1AB1		○	○
• SINUMERIK TP 015AT, 15", color, touch		6FC5203-0AF08-1AB3		○	○
SINUMERIK TCU 20.2 for operator panel fronts	Not in combination with SINUMERIK OP 019.	6FC5312-0DA00-0AA2		○	○
• Additional components for SINUMERIK TCU 20.2:	See Catalog IK PI or Siemens Industry Mail.				
- Switch SCALANCE XB005 unmanaged		6GK5005-0BA00-1AB2		○	○
- Switch SCALANCE X005 unmanaged		6GK5005-0BA00-1AA3		○	○
- Switch SCALANCE X108 unmanaged		6GK5108-0BA00-2AA3		○	○
- Switch SCALANCE X208 managed		6GK5208-0BA10-2AA3		○	○
- Switch SCALANCE X208 PRO managed		6GK5208-0HA00-2AA6		○	○
Accessories for operator panels:					
• USB interface for mounting in control cabinet, with connection between cabinet mounting component and the USB connector, length 1 m (3.28 ft)		6FC5347-0AF01-1AA0		○	○
Industrial PC for operator panel fronts:					
• SINUMERIK PCU 50.5-C P4505, Windows XP Pro EmbSys		6FC5210-0DF52-2AA0		○ 1.86 GHz 1024 MB	○ 1.86 GHz 1024 MB
• SINUMERIK PCU 50.5-P i5-520E, Windows XP Pro EmbSys		6FC5210-0DF53-2AA0		○ 2.4 GHz 2048 MB	○ 2.4 GHz 2048 MB
• Memory expansion for SINUMERIK PCU 50.5					
- 1024 MB		6ES7648-2AJ40-1KA0		○	○
- 2048 MB		6ES7648-2AJ50-1KA0		○	○
Integration of KUKA robots into SINUMERIK for operation, programming and diagnostics:					
SINUMERIK Integrate Run MyRobot Contains the options: • 1 additional machining channel • Run MyCC /EXPD • Run MyHMI /3GL • Run MyScreens	Requirement: Loadable compile cycle.	6FC5800-0AP74-0YB0	P74	–	○

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Operation (continued)					
Operating software for machine operation:					
• SINUMERIK Operate /NCU		6FC5800-0AS00-0YB0	S00	○	○
• SINUMERIK Operate for SINUMERIK PCU 50.5	Single license without data carrier	6FC5860-1YF00-0YB0		○	○
	Single license for current SW version	6FC5860-1YC00-0YA0		○	○
	Single license for SW version 2.7 SP2	6FC5860-1YC23-1YA0		○	○
	Without license for SW version 2.7 SP2	6FC5860-1YC23-1YA8		○	○
	Software update service	6FC5860-1YP00-0YL8		○	○
• SINUMERIK Operate for PC	Single license without data carrier	6FC5860-2YF00-0YB0		○	○
	Single license for current SW version	6FC5860-2YC00-0YA0		○	○
	Single license for SW version 2.7 SP2	6FC5860-2YC23-1YA0		○	○
	Without license for SW version 2.7 SP2	6FC5860-2YC23-1YA8		○	○
	Software update service	6FC5860-2YP00-0YL8		○	○
Assembly materials for SINUMERIK PCU/TCU:					
• Mounting bracket for PCU or TCU behind operator panel front		6FC5248-0AF20-2AA0		○	○
• Upright mounting bracket for PCU 50.5 in control cabinet		6FC5248-0AF20-1AA1		○	○
• Flat mounting bracket for PCU in control cabinet		6FC5248-0AF20-0AA0		○	○
Connection for:					
• SIMATIC Thin Client Touch 10" and 15" operator panels via Industrial Ethernet				●	●
• Standard monitor DVI VGA via external adapter for PCU 50.5				●	●
• SIMATIC OP 177B/TP 177B, OP 277/TP 277 and MP 277/MP377	Requirement: WinCC flexible and Run MyHMI /SIMATIC OP.			●	●
• SIMATIC OP 170B/TP 170B and OP 270/TP 270 with 6"/10" display and MP 170/MP 270B/MP 370 with keys/touch	Requirement: WinCC flexible and Run MyHMI /SIMATIC OP.			●	●
Software for:					
• SIMATIC OP 177B/TP 177B/MP 277 operator panel for machine operation with HMI Lite CE	Single license for current SW version	6FC5263-0PY11-0AG0		○	○
	Single license for SW version 5.1	6FC5263-5PY11-1AG0		○	○
	Single license without data carrier	6FC5263-0PY11-0AG1		○	○

SINUMERIK CNC

Functions

Operation

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Operation (continued)					
Control unit management:					
• Identical display on all OPs with TCU:				●	●
- Simultaneous operation interlock				●	●
- Activate/deactivate MCP/MPP				●	●
- Different resolutions, e.g. SINUMERIK OP 010/OP 012				●	●
- Up to 2 operator panel fronts, each with one TCU on an NCU 710.3 PN				●	●
- Up to 4 operator panel fronts, each with one TCU on an NCU 720.3 PN/NCU 730.3 PN				●	●
- Up to 4 operator panel fronts, each with one TCU on a PCU plus 1 additional operator panel front directly on the PCU				●	●
- From 2/4 operator panel fronts, as many operator panel fronts as required due to intelligent suppression				●	●
• One or several TCUs which can be switched over via several NCUs and PCUs				●	●
• One HMI switchable via several NCUs				●	●
• One integrated HMI and one SINUMERIK Operate simultaneously on one NCU	For loading/unload- ing tools only.			●	●
Operation via a VNC viewer				●	●
Handheld units:					
• SINUMERIK HT 8 handheld terminal		6FC5403-0AA20-0AA0		○	○
• SINUMERIK HT 8 H handheld terminal (with handwheel):		6FC5403-0AA20-1AA0		○	○
- Touch pen with holding loop for HT 8/HT 8 H		6FC5348-0AA08-4AA0		○	○
- Wall holder for HT 8/HT 8 H		6AV6574-1AF04-4AA0		○	○
• SINUMERIK HT 2 handheld terminal:		6FC5303-0AA00-2AA0		○	○
- Magnetic clamp for HT 2		6FC5348-0AA08-0AA0		○	○
- Holder for HT 2		6FC5348-0AA08-1AA0		○	○
- Slide-in labels, inscribable (3 A4 sheets)		6FC5348-0AA08-2AA0		○	○
• Connection module Basic PN without emergency stop override, with switch, control cabinet mounting, for SINUMERIK HT 8 and SINUMERIK HT 2		6FC5303-0AA01-1AA0		○	○
• PN Basic connection box without emergency stop override, for SINUMERIK HT 8 and SINUMERIK HT 2		6AV6671-5AE01-0AX0		○	○
• PN Plus connection box with emergency stop override, for SINUMERIK HT 8 and SINUMERIK HT 2		6AV6671-5AE11-0AX0		○	○
• Mini handheld unit with coiled connecting cable		6FX2007-1AD03		○	○
• Mini handheld unit with straight cable		6FX2007-1AD13		○	○
• Connection kit for mini handheld unit		6FX2006-1BG03		○	○
• Handwheel connection module for PROFIBUS	Not required for handwheel connec- tion via machine con- trol panel.	6FC5303-0AA02-0AA0		○	○

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Operation (continued)					
Machine control panels:					
• SINUMERIK MCP 310C PN		6FC5303-0AF23-0AA1		○	○
• SINUMERIK MCP 310		6FC5203-0AF23-1AA0		○	○
• SINUMERIK MCP 310 PN:		6FC5303-0AF23-1AA1		○	○
- Actuating element, 22 mm (0.87 in), latching mushroom pushbutton, red		3SB3000-1HA20		○	○
- Contact block		3SB3400-0A		○	○
- Cable set for additional control devices		6FC5247-0AA35-0AA0		○	○
- Spindle/rapid traverse override rotary switch, 1×16G, T=24, cap, button, pointer, rapid traverse and spindle dials		6FC5247-0AF12-1AA0		○	○
• SINUMERIK MCP 483C PN:		6FC5303-0AF22-0AA1		○	○
- Cable set for additional control devices		6FC5247-0AA35-0AA0		○	○
• SINUMERIK MCP 483:		6FC5203-0AF22-1AA2		○	○
- Cable set for additional control devices		6FC5247-0AA35-0AA0		○	○
• SINUMERIK MCP 483 PN		6FC5303-0AF22-1AA1		○	○
MPP Machine Push Button Panel with machine control panel functions:					
• SINUMERIK MPP 310 IEH with connection for SINUMERIK HT 8		6FC5303-1AF20-8AA1		○	○
• SINUMERIK MPP 483 IE		6FC5303-1AF10-0AA0		○	○
• SINUMERIK MPP 483 IEH with connection for SINUMERIK HT 8		6FC5303-1AF10-8AA0		○	○
• SINUMERIK MPP 483		6FC5303-1AF00-0AA1		○	○
• SINUMERIK MPP 483H for handheld unit		6FC5303-1AF00-1AA1		○	○
• SINUMERIK MPP 483A without override		6FC5303-1AF01-0AA1		○	○
• SINUMERIK MPP 483 HTC with connection for SINUMERIK HT 8		6FC5303-1AF00-8AA1		○	○
Electronic Key System EKS	Software option	6FC5800-0AP53-0YB0	P53	○	○
Direct key module:		6FC5247-0AF11-0AA0		○	○
• Direct key module mounting kit		6FC5247-0AF30-0AA0		○	○
Electronic handwheels:	Third handwheel can be operated as a contour handwheel.			2 (3)	2 (3)
• With 120 mm × 120 mm (4.72 in × 4.72 in) front panel, 5 V DC		6FC9320-5DB01		○	○
• With 76.2 mm × 76.2 mm (3 in × 3 in) front panel, 5 V DC		6FC9320-5DC01		○	○
• With 76.2 mm × 76.2 mm (3 in × 3 in) front panel, 24 V DC, HTL		6FC9320-5DH01		○	○
• Without front panel, without setting wheel, 5 V DC		6FC9320-5DF01		○	○
• Without front panel, with setting wheel, 5 V DC		6FC9320-5DM00		○	○
• Portable in housing, 2.5 m (8.2 ft) coiled cable, 5 V DC		6FC9320-5DE02		○	○
- Flange socket for portable handwheel		6FC9341-1AQ		○	○
• Handwheel connection module for PROFIBUS	Not required for handwheel connection via machine control panel.	6FC5303-0AA02-0AA0		○	○

SINUMERIK CNC

Functions

Operation

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Operation (continued)					
Keyboards:					
• SINUMERIK KB 483C		6FC5203-0AF20-0AA1		○	○
• SINUMERIK KB 310C		6FC5203-0AF21-0AA1		○	○
• KBPC CG US standard PC keyboard		6FC5203-0AC01-3AA0		○	○
- Keyboard tray for standard PC keyboard		6FC5247-0AA40-0AA0		○	○
• Full CNC keyboard, vertical format		6FC5303-0DT12-1AA0		–	–
• Full CNC keyboard, horizontal format		6FC5303-0DM13-1AA0		–	–
Memory and storage devices:				○	○
• Card reader for CF/SD memory media with USB connection:		6FC5335-0AA00-0AA0		○	○
- 1 GB CompactFlash card	Requirement: Card reader.	6FC5313-5AG00-0AA1		○	○
- 8 GB CompactFlash card	Requirement: Card reader.	6FC5313-6AG00-0AA0		○	○
• Industrial USB hub 4	With SINUMERIK PCU 50.5.	6AV6671-3AH00-0AX0		○	○
• SIMATIC USB FlashDrive 8 GB		6ES7648-0DC50-0AA0		○	○
Plain text display of user variables				●	●
Multi-channel display, number of machining channels:				3	3
• Number of machining channels with SINUMERIK OP 019				4	4
Workpiece-related actual value system				●	●
Menu selection via the PLC	1) Function is dependent on operating software.			1)	1)
CNC program messages				●	●
Access protection				7 levels	7 levels
Operating software languages:					
• Additional languages	SW versions available on request.	6FC5800-0AN00-0YB0	N00	○	○
• Language switchover online				●	●
• Chinese Simplified, English, French, German, Italian, Spanish				●	●
• Installed languages, maximum	SINUMERIK PCU 50.5 unlimited.			8	8
Additional languages for operating software SINUMERIK Operate on DVD, without license:	SW version 2.7	6FC5860-0YC40-0YA8		○	○
• Chinese Traditional, Czech, Danish, Dutch, Finnish, Hungarian, Japanese, Korean, Polish, Portuguese/Brazilian, Romanian, Russian, Slovak, Slovene, Swedish, Turkish	SW versions available on request.				
• Other languages	On request.			○	○

Monitoring functions

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Monitoring functions					
Working area limitation				●	●
Limit switch monitoring Software and hardware limit switches				●	●
Position monitoring				●	●
Standstill monitoring				●	●
Clamping monitoring				●	●
2D/3D protection areas				●	●
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				●	●
Axis collision protection PROT	Requirement: Loadable compile cycle.	6FC5800-0AN06-0YB0	N06	–	○
Extended stop and retract ESR, numerically controlled and drive-autonomous		6FC5800-0AM61-0YB0	M61	○	○
PROFIBUS tool and process monitoring	Requirement: Loadable compile cycle.	6FC5800-0AM62-0YB0	M62	○	○
Integrated tool monitoring and diagnostics:					
• IMD light	Requirement: Loadable compile cycle.	6FC5800-0AN12-0YB0	N12	○	○
• IMD base	Requirement: Loadable compile cycle.	6FC5800-0AN13-0YB0	N13	○	○

SINUMERIK CNC

Functions

Compensation

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Compensation					
Backlash compensation				●	●
Leadscrew error compensation				●	●
Measuring system error compensation				●	●
Feedforward control:					
• Velocity-dependent				●	●
• Acceleration-dependent				●	●
Weight counterbalance, electronic	Function of SINAMICS S120.			●	●
Temperature compensation				●	●
Quadrant error compensation				●	●
Circularity test				●	●
Leadscrew error compensation, bidirectional	¹⁾ Restricted functionality for export versions. The correctable tolerance band is restricted to 1 mm (0.04 in).	6FC5800-0AM54-0YB0	M54	○ 1)	○
Sag compensation, multi-dimensional	¹⁾ Restricted functionality for export versions. The correctable tolerance band is restricted to 1 mm (0.04 in).	6FC5800-0AM55-0YB0	M55	○ 1)	○
Nodding compensation NOCO	Requirement: Loadable compile cycle.	6FC5800-0AN63-0YB0	N63	–	○
Volumetric space error compensation:					
• Spatial compensation VCS A3	Requirement: Loadable compile cycle.	6FC5800-0AN15-0YB0	N15	–	○
• Spatial compensation VCS A5	Requirement: Loadable compile cycle.	6FC5800-0AN16-0YB0	N16	–	○
• Spatial compensation VCS A5 plus	Requirement: Loadable compile cycle.	6FC5800-0AN17-0YB0	N17	–	○
• Spatial compensation VCS Rotary	Requirement: Loadable compile cycle.	6FC5800-0AN31-0YB0	N31	–	○
• Spatial compensation for kinematic transformations SEC	Requirement: Loadable compile cycle.	6FC5800-0AM57-0YB0	M57	–	○
Vibration extinction VIBX	Requirement: Loadable compile cycle.	6FC5800-0AN11-0YB0	N11	–	○
Magnetic cogging torque compensation COCO	Requirement: Loadable compile cycle.	6FC5800-0AN46-0YB0	N46	–	○

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
PLC area					
Expansion of the PLC user memory by 128 KB in each case		6FC5800-0AD10-0YB0	D11... D18	○	○
PLC user memory, maximum				1536 KB	1536 KB
SIMATIC S7-300 PLC 317F-3PN/DP integrated				●	●
Processing time for bit operations, minimum				0.025 μs	0.025 μs
Processing time for word operations, minimum				0.03 μs	0.03 μs
SIMATIC STEP 7 programming language:					
• Ladder diagram LAD				○	○
• Function block diagram FBD				○	○
• Statement list STL				○	○
• Structured Control Language SCL (add-on package for STEP 7)				○	○
• Continuous Function Chart CFC (add-on package for STEP 7)				○	○
• GRAPH (add-on package for STEP 7)				○	○
PLC programming with HiGraph (add-on package for STEP 7)				○	○
Distributed I/O via PROFIBUS DP:	See Catalog ST 70 or Siemens Industry Mall.				
• Via integrated interface, data transfer rate up to				12 Mbit/s	12 Mbit/s
• Distributed PROFIBUS DP slaves, maximum number	In total on DP1 and DP2.			124	124
Distributed I/O via PROFINET:	See Catalog ST 70 or Siemens Industry Mall.				
• Via integrated interface, data transfer rate up to				100 Mbit/s	100 Mbit/s
• Distributed PN slaves, maximum number				128	128
PROFINET CBA				●	●
PROFINET IO controller				●	●
PROFINET IO device				●	●
Digital inputs, number (can be adjusted between 0 and 4049 bytes)	Number = process image inputs.			1024 bytes	1024 bytes
Digital outputs, number (can be adjusted between 0 and 4049 bytes)	Number = process image outputs.			1024 bytes	1024 bytes
I/O inputs, number:	Logical address range inputs.			8192 bytes	8192 bytes
• Usable, maximum				5700 bytes	5700 bytes
I/O outputs, number:	Logical address range inputs.			8192 bytes	8192 bytes
• Usable, maximum				5700 bytes	5700 bytes
Bit memories, number				4096 bytes	4096 bytes
Timers, number				512	512
Counters, number				512	512
FB/FC:				2048	2048
• Highest number per FB/FC				7999	7999

SINUMERIK CNC

Functions

PLC area Safety functions

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
PLC area (continued)					
DB:				2048	2048
• Highest number				16000	16000
Cyclic function block				●	●
Time-controlled function blocks				●	●
SINUMERIK PP 72/48 I/O module:	No PROFIBUS certification.	6FC5611-0CA01-0AA0		○	○
• Maximum number				125	125
SINUMERIK PP 72/48D PN I/O module	Quantity limited by I/O quantity structure of PLC.	6FC5311-0AA00-0AA0		○	○
Analog Drive Interface for 4 axes ADI 4	No PROFIBUS certification.	6FC5211-0BA01-0AA4		○	○
Safety functions					
SINUMERIK Safety Integrated Safety functions for personnel and machine protection:					
Safety functions integrated in the system:	Requirement: Safety Integrated with safe programmable logic SPL.				
• Safe shutdown (stops)				○	○
• SBR (safe braking ramp)				○	○
• SH (safe standstill)				○	○
• SBH (safe operating stop)				○	○
• SLS (safely limited speed)				○	○
• SE (safe software limit switches)				○	○
• SN (safe software cams/cam track)				○	○
• SGE/SGA (safety-related input/output signals)				○	○
• SPL (safe programmable logic)				○	○
• SBM (safe brake management)				○	○
• Safety-related output $n < n_x$				○	○
• Safety-related communication via standard bus (PROFIsafe with SIMATIC ET 200S, SIMATIC ET 200pro, SIMATIC ET 200eco)	See Catalog ST 70 or Siemens Industry Mall.			○	○
• Safe integration of sensors via DP ASi F-Link	See Catalog IK PI or Siemens Industry Mall.			○	○
Safety Integrated with safe programmable logic SPL:					
• 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-High Feature incl. 1 axis/spindle, 192 inputs/outputs for safe programmable logic	Requirement: NCU 720.x/ NCU 730.x	6FC5800-0AS68-0YB0	S68	○	○
• 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 acceptance test executed automatically with SinuCom NC SI	Requirement: SinuCom NC.			○	○

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Safety functions (continued)					
Drive-autonomous safety functions for personnel and machine protection:					
• SBC (Safe Brake Control)				●	●
• STO (Safe Torque Off)				●	●
• SS1 (Safe Stop 1)				●	●
Commissioning					
Commissioning functions for drive system are integrated					
Auto Servo Tuning AST Fully automatic speed and position controller optimization:				●	●
• Optimization of single axis incl. gantry axes				●	●
• Speed controller optimization incl. setting of current setpoint filters				●	●
• Position controller optimization incl. setting of speed setpoint filters				●	●
• Setting of feedforward control				●	●
• Overview of optimization results				●	●
• Closed circuit can be manually tuned according to Bode plot				●	●
• Optimization of path interpolation				●	●
• Assignment of torque feedforward control				●	●
• Complete (freely parameterizable) user strategy				●	●
• Forward and backward navigation through optimization menus: Re-optimization of speed controller				●	●
• Report generation: Single axis and path interpolation				●	●
• Optimization project can be loaded and optimized offline on the PC				●	●
Trace				●	●
Circularity test				●	●
SINAMICS S120	See SinuCom.			–	–
Commissioning trace (drive optimization)	See SinuCom.			–	–
Series start-up via USB interface with storage medium, e.g. memory stick				●	●
Series start-up of network drive				●	●
Series start-up via CF card programming offline or online	Requirement: Additional HMI user memory on CF card of NCU.			●	●
Toolbox on DVD containing CNC software				○	○
SINUMERIK Integrate Create MyConfig for series production and software upgrades		6FC5862-2YC41-0YA0		○	○
STARTER commissioning tool for SINAMICS and MICROMASTER	For topology and diagnostics.			–	–

SINUMERIK CNC

Functions

Commissioning

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Commissioning (continued)					
SinuCom commissioning/service tools for SINUMERIK 840D sl	For commissioning.				
Software for PC/PG:	Single license without data carrier	6FC5250-0AY00-0AG1		○	○
	Single license for current SW version	6FC5250-0AY00-0AG0		○	○
	Single license for SW version 7.7	6FC5250-7AY00-7AG0		○	○
	Software update service	6FC5250-0AY00-0AG2		○	○
	Update on order SW version 7.7	6FC5250-7AY00-7AG3		○	○
• Commissioning software for SINAMICS S120 and SIMODRIVE 611 digital • 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, deletion, insertion and editing of series startup files					

Diagnostic functions and maintenance

2

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Diagnostic functions and maintenance					
Alarms and messages				●	●
Action log can be activated for diagnostic purposes	Logbook for alarms/keys.			●	●
Trace incl. drive data				●	●
Circularity test				●	●
PLC status	Generally possible via SIMATIC STEP 7 on PG/PC.			●	●
SIMATIC STEP 7 for SINUMERIK hardware for service functions	With SINUMERIK PCU 50.5.				
	Single license without data carrier	6FC5252-0AY00-0AG1		○	○
	Single license for current SW version	6FC5252-0AY00-0AG0		○	○
	Single license for SW version 5.5 SP3	6FC5252-5AY01-5AG0		○	○
SINUMERIK Integrate Access MyMachine Remote diagnostics and data transfer:					
• Access MyMachine /P2P License for NCU 710.3 PN/ NCU 720.3 PN/ NCU 730.3 PN.		6FC5800-0AP30-0YB0	P30	○	○
• Access MyMachine /P2P for PC/PG Principally permits file transfer between PC/PG and CNCs.	Requirement: Access MyMachine /P2P for image transmission by modem.				
	Single license for current SW version	6FC5860-7YC00-0YA0		○	○
	Single license for SW version 2.7 SP1	6FC5860-7YC10-2YA0		○	○
SINUMERIK Integrate Access MyMachine for diagnostic functions in case of machine failures, Workflow Services, remote control and remote monitoring of machine control systems:					
• Access MyMachine /Ethernet – Single Access	Single license per machine	6FC5864-4AP00-0YB0		○	○
	Upgrade license per machine	6FC5864-4AP00-0YF0		○	○
	Software update service/year	6FC5864-4AP00-0YM0		○	○
• Access MyMachine /Ethernet – Conferencing	Single license per machine	6FC5864-4BP00-0YB0		○	○
	Upgrade license per machine	6FC5864-4BP00-0YF0		○	○
	Software update service/year	6FC5864-4BP00-0YM0		○	○
• Access MyMachine /Ethernet – Remote STEP 7	Single license per machine	6FC5864-4CP00-0YB0		○	○
	Upgrade license per machine	6FC5864-4CP00-0YF0		○	○
	Software update service/year	6FC5864-4CP00-0YM0		○	○

SINUMERIK CNC

Functions

Diagnostic functions and maintenance

Description ● Basic version ○ Option / – Not possible	Instructions (footnotes are applicable line by line)	Article No.	Order code	SINUMERIK	
		Type		840DE sl Type 1B	840D sl Type 1B
Diagnostic functions and maintenance (continued)					
SINUMERIK Integrate Analyze MyCondition for condition-oriented maintenance (Condition Monitoring Basic):	Requirement: SINUMERIK Integrate Access MyMachine /Ethernet				
	1 st year	6FC6001-0EE00-0MB0		○	○
	Extension 12 months	6FC6001-0EE00-0MB1		○	○
SINUMERIK Integrate Access MyMachine /Ethernet					
• Account (Company Account)		6FC6001-0EE00-0CA1		○	○
• Setup Fee (Connect Machine)	Without EUNA	6FC6001-0EE00-0CE0		○	○
	With EUNA	6FC6001-0EE00-0CE1		○	○