Control structure and configuration

Overview table

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	SINUMERIK 840D sl
Control structure and configuration					
SINUMERIK 840D sl BASIC:					
• NCU 710.3 PN + SINAMICS S120 Combi				○	○
SINUMERIK 840D sl:					
• 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
• COM01.3 module	As an alternative to CBE30-2.	**6FC5312-0FA01-1AA0**		○	○
• CBE30-2 PROFINET module	As an alternative to COM01.3.	**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		**6FC5851-1YG..-.YA0**		○	–
• CNC software 31-3 with SINUMERIK Operate, on CF card, with license		**6FC5851-1XG..-.YA0**		–	○
• CNC software 31-3 with SINUMERIK Operate, export version, on CF card, without license		**6FC5851-1YG..-.YA8**		○	–
• CNC software 31-3 with SINUMERIK Operate, on CF card, without license		**6FC5851-1XG..-.YA8**		–	○
• CNC software 31-3 with SINUMERIK Operate, export version, on DVD, without license		**6FC5851-1YC..-.YA8**		○	–
• CNC software 31-3 with SINUMERIK Operate, on DVD, without license		**6FC5851-1XC..-.YA8**		–	○
• CNC software 31-3 with SINUMERIK Operate, export version, license		**6FC5851-1YF00-0YB0**		○	–
• CNC software 31-3 with SINUMERIK Operate, license		**6FC5851-1XF00-0YB0**		–	○
• CNC software 31-3 with SINUMERIK Operate, export version, software update service, without license		**6FC5851-1YP00-0YL8**		○	–
• CNC software 31-3 with SINUMERIK Operate, software update service, without license		**6FC5851-1XP00-0YL8**		–	○

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Control structure and configuration (continued)					
Channels/mode groups:				1	1
• 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
• Mode group, each additional		**6FC5800-0AC00-0YB0**	**C01...C09**	○	○
• Machining channel, each additional		**6FC5800-0AC10-0YB0**	**C11...C19**	○	○
CNC user memory (buffered) for programs and OEM cycles in MB				3	3
CNC user memory, maximum configuration:					
• NCU 710.3 PN				9	9
• NCU 720.3 PN/NCU 730.3 PN				15	15
CNC user memory, expansion by increments of 2 MB		**6FC5800-0AD00-0YB0**	**D01...D06**	○	○
HMI user memory, additional 2 GB on CF card of NCU	Not in combination with PCU.	**6FC5800-0AP12-0YB0**	**P12**	○	○
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
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 channels)		**6FC5800-0AM10-0YB0**	**M10**	○	○
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

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Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
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					
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				●	●
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 CU310-2 DP Control Unit		**6SL3040-1LA00-0AA0**		○	○
SINAMICS S120 CU310-2 PN Control Unit		**6SL3040-1LA01-0AA0**		○	○
SINAMICS S120 Control Unit Adapter CUA31		**6SL3040-0PA00-0AA1**		○	○
SINAMICS S120 CUA32 Control Unit Adapter		**6SL3040-0PA01-0AA0**		–	–
SINAMICS S120 Sensor Module Cabinet:					
• SINAMICS S120 SMC10	No SINUMERIK Safety Integrated.	**6SL3055-0AA00-5AA3**		○	○
• SINAMICS S120 SMC20		**6SL3055-0AA00-5BA3**		○	○
• SINAMICS S120 SMC30	No SINUMERIK Safety Integrated.	**6SL3055-0AA00-5CA2**		○	○
SINAMICS S120 SME Sensor Module Externally Mounted:					
• SINAMICS S120 SME20		**6SL3055-0AA00-5EA3**		○	○
• SINAMICS S120 SME25		**6SL3055-0AA00-5HA3**		○	○
• SINAMICS S120 SME120		**6SL3055-0AA00-5JA3**		○	○
• SINAMICS S120 SME125		**6SL3055-0AA00-5KA3**		○	○

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Drives (continued)					
SINAMICS S120 TB/TM terminal modules:					
• SINAMICS S120 TB30		**6SL3055-0AA00-2TA0**		–	–
• SINAMICS S120 TM31		**6SL3055-0AA00-3AA1**		–	–
• SINAMICS S120 TM41		**6SL3055-0AA00-3PA1**		○	○
• SINAMICS S120 TM15		**6SL3055-0AA00-3FA0**		○	○
• SINAMICS S120 TM17	Requirement: Option N51.	**6SL3055-0AA00-3HA0**		–	○
• SINAMICS S120 TM120		**6SL3055-0AA00-3KA0**		○	○
SINAMICS S120 expansion modules:					
• SINAMICS S120 VSM		**6SL3053-0AA00-3AA0**		–	–
• SINAMICS S120 DMC20		**6SL3055-0AA00-6AA0**		○	○
• SINAMICS S120 DME20		**6SL3055-0AA00-6AB0**		○	○
• SINAMICS S120 booksize format Motor Modules; internal air cooling	See SINAMICS S120.	**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..**		○	○
• 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 Motor Modules; liquid cooling		**6SL3125-1TE32-0A..**		○	○
• 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..**		○	○

Drives

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	SINUMERIK 840D sl
Drives (continued)					
SINAMICS S120 expansion modules (continued):					
• 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 Active Line Modules; liquid cooling		**6SL3135-7TE31-2A..**		○	○
• SINAMICS S120 booksize format Active Interface Modules	See SINAMICS S120.	**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..**		○	○
• SINAMICS S120 booksize format Smart Line Modules; external air cooling		**6SL3131-6AE15-0A.. 6SL3131-6AE21-0A.. 6SL3131-6TE21-6A.. 6SL3131-6TE23-6A.. 6SL3131-6TE25-5A..**		○	○
• SINAMICS S120 booksize format Smart Line Modules; 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..**		○	○
• SINAMICS S120 booksize format Basic Line Modules; 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**		○	○
• 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)		**6SL3330-7TE32-1AA. 6SL3330-7TE32-6AA. 6SL3330-7TE33-8AA. 6SL3330-7TE35-0AA.**		○	○
• SINAMICS S120 chassis format Active Line Modules; internal air cooling (from 500 kW)		**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...**		○	○

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Drives (continued)					
SINAMICS S120 expansion modules (continued):					
• 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**		○	○
		6SL3210-1SE16-0... **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	See SINAMICS S120.	**6SL3310-1TE32-1AA.** **6SL3310-1TE32-6AA.** **6SL3310-1TE33-1AA.** **6SL3310-1TE33-8AA.** **6SL3310-1TE35-0AA.**		–	–
SINUMERIK Analog Drive Interface:					
• Analog Drive Interface for 4 axes ADI 4	No PROFIBUS certification.	**6FC5211-0BA01-0AA4**		○	○
External drive:					
• Hydraulic axis (distributed) can be connected as interpolating NC axis. Distributed axes can be operated in isochronous mode with PROFIdrive V4.1 on PROFIBUS DP-V2.	No SINUMERIK Safety Integrated.			○	○
Synchronous motors 1FT7/1FK7/1FE1/2SP1/1FW6/1FN3/1FN6	See Motors.			○	○
Induction motors 1PH8/1PH7/1PH2	See Motors.			○	○
SINAMICS S120 DRIVE-CLiQ on motor:					
• Resolver				○	○
• sin/cos 1 V_{pp} and EnDat 2.1				○	○
Connectable measuring systems:					
• Max. number	Two measuring systems per axis.			●	●
• Absolute/incremental encoder installed in 1FT7/1FK7/1PH7/1PH8	Integrated in motor via SINAMICS Sensor Modules.			●	●
• Resolver installed in 1FK7	Integrated in motor via SINAMICS Sensor Modules.			●	●
• Incremental rotary measuring systems with RS422 (TTL)	Via SINAMICS SMC30 Sensor Modules.			●	●
• Linear scale LMS with sin/cos 1 V_{pp}	Via SINAMICS SMC20/SME20 Sensor Modules.			●	●
• Rotary measuring systems with sin/cos 1 V_{pp}				●	●
• Linear scale LMS with distance-coded reference marks	Via SINAMICS SMC20/SME20 Sensor Modules.			●	●

Drives
Drive functions

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	SINUMERIK 840D sl
Drives (continued)					
Connectable measuring systems (continued):					
• Rotary measuring systems with distance-coded reference marks	Via SINAMICS SMC20/SME20 Sensor Modules.			●	●
• Linear scale LMS with EnDat 2.1	Via SINAMICS SMC20/SME25 Sensor Modules.			●	●
• Rotary measuring systems with EnDat 2.1	Via SINAMICS SMC20/SME25 Sensor Modules.			●	●
• Absolute encoder connection with SSI interface	Via SINAMICS SMC30 Sensor Modules/for analog axes via ADI 4.			●	●
• Resolver as external machine encoder	Via SINAMICS SMC10 Sensor Modules.			●	●
• Absolute encoder connection with DRIVE-CLiQ interface	Via SINAMICS.			●	●
Drive functions					
Control:				●	●
• Servo control				●	●
• Vector control				–	–
• *V/f* control				●	●
• Combination of servo/*V/f* control possible on a CU				–	–
• 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				–	–
• kT estimator				–	–
• kT(iq) characteristic				●	●
• Rotor/pole position identification saturation-based/motion-based				●	●
• Edge modulation				–	–
• Motor data identification stationary/rotating				●	●
• Flux reduction for induction motors				●	●
Modular machine concept (sub-topologies):				–	–
• Parking axis/encoder				●	●
Brakes:					
• Braking signal, basic/extended				●	●
• Armature short-circuit brake, internal/external				–/●	–/●
• DC brake				–	–

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Drive functions (continued)					
Voltage protection for 1PH8, 1FE1, 2SP1 motors:					
• Externally via VPM module				○	○
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				–	–
DCC (Drive Control Chart)				–	–
Drive Based Open Architecture				○	○
Basic positioner				○	○
2 command data sets				–	–
Parallel connection of Motor Modules				–	–
200 V 3 AC possible for booksize/blocksize modules				○	○
Maximum configuration valid for standard PROFIBUS DP cycle:					
• Axes/spindles for current/speed controller cycle of 125 µs/62.5 µs				31/11	31/11
• Axes/spindles per NCU/NX for current/ speed controller cycle of 125 µs/62.5 µs/31.25 µs				6/3/1	6/3/1
• Motor measuring systems and direct measuring systems per NCU/NX for current/speed controller cycle of 125 µs				12	12
• SINAMICS S120 chassis format Motor Modules per NCU/NX				2	2
Current/speed controller cycle:					
• Minimum for SINAMICS S120 in booksize format				31.25 µs	31.25 µs
• Minimum for SINAMICS S120 in chassis format				125 µs	125 µs
• Maximum				250 µs	250 µs
PROFIBUS DP cycle (corresponds to FIPO cycle):					
• Minimum				0.5 ms	0.5 ms
Maximum number:					
• Drive data sets				32	32
• Motor data sets				8	8
• Encoder data sets				8	8

Axis functions
Spindle functions

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	SINUMERIK 840D sl
Axis functions					
Traversing range ± 9 decades				●	●
Rotary axis turning endlessly				●	●
Velocity, max. 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**	○	○
• Max. number of pairs				16	16
Advanced Position Control, APC		**6FC5800-0AM13-0YB0**	**M13**	○	○
Axis container	Within 31 axes.			●	●
Link axes (axis container distributed among several NCUs):	Requirement: CBE 30-2 PROFINET module.			●	●
• Max. number of NCUs				3	3
Spindle functions					
Digital spindle speed				●	●
Spindle speed, max. programmable value range: 10^6 ... 0.0001 (display: ± 999 999 999.9999)				●	●
5 gear stages				●	●
Automatic gear stage selection				●	●
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				●	●

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Interpolations					
Floating point accuracy (80-bit floating point accuracy)				●	●
Linear interpolating axes:				4	4
• Maximum				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**	–	○
Motion control: Advanced Surface		**6FC5800-0AS07-0YB0**	**S07**	○	○
3-axis compressor				●	●
5-axis compressor				●	●
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)	Requirement: Loadable compile cycle and cross-mode actions M43.	**6FC5800-0AM24-0YB0**	**M24**	○	○
Crankshaft interpolation CRIP	Requirement: Loadable compile cycle.	**6FC5800-0AN04-0YB0**	**N04**	–	○

Couplings

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Couplings					
Pair of synchronous axes (gantry axes): • Max. 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) With restricted functionality, see export control version.	**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 • 1 × electronic gear for 3 leading axes (without curve table, without cascading)	1) With restricted functionality, see export control version.	**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 • 8 × electronic gear for 3 leading axes (with curve tables, with cascading) • 5 × electronic gear for 5 leading axes (with curve tables, with cascading)	1) With restricted functionality, see export control version. 2) Requirement: NCU 720.3 PN/ NCU 730.3 PN.	**6FC5800-0AM74-0YB0**	**M74**	○ 1) 2)	○ 2)
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**	–	○

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Transformations					
Cartesian Point-to-Point (PTP) travel				●	●
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**	–	○
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**	○	○

Technologies

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	SINUMERIK 840D sl
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 option: CP Comfort	1) With restricted functionality, see export control version.	**6FC5800-0AM76-0YB0**	**M76**	○ 1)	○
Milling technology package: SINUMERIK MDynamics 3 axes Contains the options: ShopTurn/ShopMill, residual material detection and machining for contour pockets and cutting, 3D simulation 1 (finished part), simultaneous recording, Advanced Surface, Spline interpolation, Transmit and peripheral surface transformation, measuring cycles, additional HMI user memory on CF card		**6FC5800-0AS32-0YB0**	**S32**	○	○
5-axis machining package • Contains the option Multi-axis interpolation (> 4 interpolating axes) • 5-axis functionality (TRAORI, RTCP)		**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, ShopTurn/ShopMill, residual material detection and machining for contour pockets and cutting, 3D simulation 1 (finished part), simultaneous recording, Advanced Surface, Spline interpolation, Transmit and peripheral surface transformation, measuring cycles, additional HMI user memory on CF card, 3D tool radius compensation, measure kinematics		**6FC5800-0AS33-0YB0**	**S33**	–	○
Typical block cycle times (block processing times) in ms • NCU 710.3 PN • NCU 720.3 PN • NCU 730.3 PN	Requirement: With use of the compressor. 1) Under development.			1.5 0.6 1) 0.4	1.5 0.6 1) 0.4
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 plastics package IME Contains the options: • Three additional axes • Travel to fixed stop • Pair of synchronous axes (gantry axes) • Master/slave for drives • Position switching signals/cam controller • Polynomial interpolation • Handling transformation • Synchronized actions stage 2 and no tool offsets or spindles possible		**6FC5800-0AS40-0YB0**	**S40**	–	○
Velocity adaptation VADA	Requirement: Loadable compile cycle.	**6FC5800-0AN05-0YB0**	**N05**	–	○

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Technologies (continued)					
Extrapolated switching signals (64) XOUT	Requirement: Loadable compile cycle.	**6FC5800-0AN51-0YB0**	**N51**	–	○
Path-related pulse output PRIG	Requirement: Loadable compile cycle.	**6FC5800-0AN76-0YB0**	**N76**	–	○
CCG compiler as DLL for SINUMERIK PCU 50.5 (CCG = 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				4	4
• 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 control version.			● 1)	●
Synchronized actions stage 2	1) With restricted functionality, see export control version.	**6FC5800-0AM36-0YB0**	**M36**	○ 1)	○
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, high-speed HSLC	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 including in the IPO cycle	Requirement: Loadable compile cycle. 1) With restricted functionality, see export control version.	**6FC5800-0AM40-0YB0**	**M40**	○ 1)	○
• Clearance control 1D/3D in position control cycle, free direction	Requirement: 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 subprograms ASUP	High-speed CNC inputs/outputs.			●	●
Interrupt routines with fast retraction from the contour		**6FC5800-0AM42-0YB0**	**M42**	○	○
Cross-mode actions (ASUPs and synchronized actions in all operating modes)		**6FC5800-0AM43-0YB0**	**M43**	○	○

Open Architecture

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	SINUMERIK 840D sl
Open Architecture					
Program screens, operating areas and user interfaces SINUMERIK Integrate Create MyHMI:	See SINUMERIK Integrate.				
Create MyHMI /3GL (programming package) Software for PC	OEM contract required.	**6FC5861-1YC00-0YA0** **6FC5861-1YC..-.YA0** **6FC5861-1YP00-0YB0** **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:	See SINUMERIK Integrate.				
Run MyHMI /SIMATIC OP for SIMATIC Basic /Comfort Panels		**6FC5800-0AP03-0YB0**	**P03**	○	○
Integrate screens with variable layout in SINUMERIK Operate with SINUMERIK Integrate Create MyHMI /PRO	See SINUMERIK Integrate.	**6FC5867-3YC00-0YA8** **6FC5867-3YC2.-.YA8**		○	○
SINUMERIK Integrate 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	See SINUMERIK Integrate.	**6FC5800-0AP64-0YB0**	**P64**	○	○
• Free screens				5	5
Integrate OEM specific solutions in the NC kernel with SINUMERIK Integrate Create MyCC:	See SINUMERIK Integrate.				
• 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**	○	○
• Run MyCCI /COOC	Requirement: Create MyCC or Create MyCCI or Create MyCCI /Interpreter.	**6FC5800-0AM67-0YB0**	**M67**	○	○

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
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				●	●
Number of levels for skip blocks (/0 to /...)				8	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				●	●
• Via H word, max. programmable value range: REAL ± 3.4028 ex 38 (display: ± 999 999 999.9999) INT -2^{31} to 2^{31} -1				●	●
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 buffer, dynamic (FIFO)				●	●
• Look Ahead				●	●
• Frame concept				●	●
• Inclined-surface machining with frames				●	●
• Axis/spindle interchange				●	●
• Geometry axes, switchable online in the CNC program				●	●
• Program preprocessing				●	●

CNC programming language

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
CNC programming language (continued)					
Online ISO dialect interpreter				●	●
Program/workpiece management:					
• Part programs on NCU, max. number	In total max. 512 files per directory.			1000	1000
• Workpieces on NCU, max. number	In total max. 256 directories.			250	250
• Workpieces on SSD of PCU, max. number	In total max. 100000 user files.			10^5	10^5
• In additional HMI user memory on CF card of the NCU	In total max. 100000 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. diskette drive, memory stick				○	○
• On network drive				●	●
• Templates for workpieces and programs				●	●
• Job lists				●	●
Number of basic frames, max.				16	16
Number of settable offsets, max.				100	100
Work offsets, programmable (frames)				●	●
Scratching, determining zero work offset				●	●
Zero work offsets, external (PLC)				●	●
Global and local user data				●	●
Global program user data				●	●
Display system variables (also via online configurable display) and log them				◇	◇

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Programming support					
Program editor:					
• Text editor with editing functions: Selecting, copying, deleting				●	●
• Dual editor				●	●
• Multi-editor, maximum 4	Requirement: SINUMERIK OP 019.			●	●
• Write protection for lines				●	●
• Suppression of lines in the display				●	●
ShopTurn/ShopMill:					
• Machining step programming and multiple clamping of identical workpieces		**6FC5800-0AP17-0YB0**	**P17**	◇	◇
Multiple clamping of various workpieces	Requirement: Option P17.	**6FC5800-0AP14-0YB0**	**P14**	◇	◇
programSYNC (machining step programming)		**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)	SINUMERIK Integrate Run MyScreens.			●	●
Access protection for cycles SINUMERIK Integrate Lock MyCycles:	See SINUMERIK Integrate.				
• Lock MyCycles (cycle protection (OEM))		**6FC5800-0AP54-0YB0**	**P54**	○	○
CAD Reader for PC		**6FC5260-0AY00-0AG0** **6FC5260-6AY00-2AG0** **6FC5260-0AY00-0AG2**		○	○

Simulation

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Simulation					
Up to n channels can be simulated	Requirement: programSYNC			4	4
Simulation of program X, while program Y is being executed	With NCU 720.3/ NCU 730.3			●	●
Quickview for mold-making programs				●	●
Turning/drilling/milling:					
• Turning				●	●
• Counterspindle				●	●
• Turn-milling				●	●
• Mill-turning with supported kinematics	Application-specific by machine manufacturer.			●	●
• Milling up to 5-axis machining with TRAORI				●	●
• Simultaneous recording (real-time simulation of current machining)		**6FC5800-0AP22-0YB0**	**P22**	○	○
• 2D simulation (finished part)				●	●
• 3D simulation 1 (finished part)		**6FC5800-0AP25-0YB0**	**P25**	○	○

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Operating modes					
JOG:				●	●
• Handwheel selection				●	●
• Inch/metric changeover				●	●
• Manual measurement of zero 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				●	●
Automatic:				●	●
• Execution from storage medium at rear USB interface of TCU/PCU e.g. card reader, memory stick				●	●
• Execution from HMI memory on CF card of NCU	Requirement: Additional HMI user memory on CF card of the NCU.	**6FC5800-0AP12-0YB0**	**P12**	○	○
• Execution from network drive				●	●
• Execution from hard disk	On PCU 50.5.			●	●
• Program control				●	●
• Program editing				●	●
• Overstore					
• DRF offset				●	●
• Block search with/without calculation				●	●
Repos (repositioning on the contour):				●	●
• With operator command/semi-automatically				●	●
• Program-controlled				●	●

Tools

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	**Instructions** (footnotes are applicable line by line)	**Order No.** Type (for complete Order No., see notes)	**Order code**	**SINUMERIK**	
				840DE sl	**840D sl**
Tools					
Tool types:					
• Turning				●	●
• Drilling/milling				●	●
• Grinding				●	●
• Nibbling	Not in SINUMERIK Operate.			–	–
• Groove sawing				●	●
Tool radius compensations in plane:					
• With approach and retract strategies				●	●
• With transition circle/transition ellipse at outside corners				●	●
Configurable intermediate blocks with tool radius compensation active				●	●
3D tool radius compensation		**6FC5800-0AM48-0YB0**	**M48**	○	○
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.			–	●
Online tool length compensation				●	●
Operation without 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				●	●
• Number of tools/cutting edges in tool list				600/ 1500	600/ 1500

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Tools (continued)					
Operation with tool management up to 3 magazines (corresponding to one real magazine):				●	●
• Operation with tool management with more than three magazines		**6FC5800-0AM88-0YB0**	**M88**	○	○
• System displays in standard software				●	●
• User-friendly commissioning via system displays				●	●
• Tool list				●	●
• Configurable tool lists	One configured list is possible.			●	●
• 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				●	●
• Max. number of magazines				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 points per magazine				●	●
• Tool life monitoring and workpiece count				●	●
• Monitoring for max. tool speed/acceleration		**6FC5800-0AS08-0YB0**	**S08**	○	○
Tool management functions for individual machines and networked machines SINUMERIK Integrate Manage MyTools (TDI):	See SINUMERIK Integrate.				
• Manage MyTools Software for PC/Server		**6FC6000-2XC02-4AA8** **6FC6000-2XC0.-.AA8**			
• Manage MyTools License for NCU 710.3 PN/NCU 720.3 PN/NCU 730.3 PN		**6FC5800-0AP37-0YB0**	**P37**	○	○
• Manage MyTools (Node) Node license for other ports		**6FC6000-2NF00-0YB0**			
Tool identification for loading/unloading tools by means of code carrier SINUMERIK Integrate Access MyTool ID:	See SINUMERIK Integrate.				
• Access MyTool ID (TDI Ident Connection)		**6FC5800-0AP52-0YB0**	**P52**	○	○

Communication/data management

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	SINUMERIK 840D sl
Communication/data management					
HMI user memory, additional on CF card of NCU	See CNC. 1) Not in combination with PCU 50.5.	**6FC5800-0AP12-0YB0**	**P12**	○ 1)	○ 1)
Data on storage medium on rear USB interface of TCU/PCU, e.g. card reader, memory stick	1) Two plant HMIs can be accessed per plant network.			● 1)	● 1)
Data on storage medium on front USB interface of operator panel, e.g. memory stick	1) Two plant HMIs can be accessed per plant network.			● 1)	● 1)
Manage additional drives:					
• Via Ethernet, max. 4				●	●
• Via USB				●	●
• Via CF card of the PCU				●	●
COM (RS232C/V.24) serial interface	Requirement: COM01 RS232C (V.24) 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):	See SINUMERIK Integrate.				
• Manage MyPrograms Software for PC/Server		**6FC6000-0XC02-4AA8** **6FC6000-0XC0.-.AA8**			
• Manage MyPrograms License for NCU 710.3 PN/NCU 720.3 PN/NCU 730.3 PN		**6FC5800-0AP41-0YB0**	**P41**	○	○
• Manage MyPrograms Node license for other ports		**6FC6000-0NF00-0YB0**			

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
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**		○	○
Thin Client Unit for operator panel fronts:					
• SINUMERIK TCU	Not in combination with SINUMERIK OP 019.	**6FC5312-0DA00-0AA1**		○	○
Operator panel fronts with integrated TCU:					
• SINUMERIK OP 08T, 8", color		**6FC5203-0AF04-1BA0**		○	○
• SINUMERIK OP 015AT, 15", color		**6FC5203-0AF05-1AB0**		○	○
• SINUMERIK TP 015AT, 15", color, touch		**6FC5203-0AF08-1AB2**		○	○
Additional components for Thin Client:					
• 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 (39.37 in))		**6FC5347-0AF01-1AA0**		○	○
Industrial PC for operator panel fronts:					
• SINUMERIK PCU 50.5-C P4505; 1.86 GHZ/1024 MB, Windows XP ProEmbSys		**6FC5210-0DF52-2AA0**		○	○
• SINUMERIK PCU 50.5-P i5-520E; 2.4 GHZ/2048 MB, Windows XP ProEmbSys		**6FC5210-0DF53-2AA0**		○	○
• Memory expansion 1024 MB for SINUMERIK PCU 50.5		**6ES7648-2AJ40-1KA0**		○	○
• Memory expansion 2048 MB for SINUMERIK PCU 50.5		**6ES7648-2AJ50-1KA0**		○	○

Operation

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Operation (continued)					
Software for:	See SINUMERIK Operate.				
• SINUMERIK PCU 50.5 for machine operation with SINUMERIK Operate		**6FC5860-1YF00-0YA0** **6FC5860-1YF2.-.YA0** **6FC5860-1YC00-0YA0** **6FC5860-1YC2.-.YA0** **6FC5860-1YC2.-.YA8** **6FC5860-1YF00-0YB0** **6FC5860-1YP00-0YL8**		○	○
• PC for machine operation with SINUMERIK Operate		**6FC5860-2YC00-0YA0** **6FC5860-2YC20-.YA0** **6FC5860-2YC20-.YA8** **6FC5860-2YF00-0YB0** **6FC5860-2YP00-0YL8**		○	○
Assembly materials for PCU and 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 50.3				●	●
• 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		**6FC5263-0PY11-0AG0** **6FC5263-.PY11-.AG0** **6FC5263-0PY11-0AG1**		○	○
Control unit management:					
• Identical display on all OPs with TCU				●	●
- Simultaneous operation interlock				●	●
- Activate/deactivate MCP/MPP				●	●
- Different resolutions (e.g. SINUMERIK OP 010/SINUMERIK 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				●	●

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Operation (continued)					
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/unloading tools only.			●	●
Operator control without SINUMERIK operator panel		**6FC5800-0AP00-0YB0**	**P00**	○	○
Operation via a VNC viewer:				●	●
• 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 connection via machine control panel.	**6FC5303-0AA02-0AA0**		○	○
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 x 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**		○	○

Operation

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Operation (continued)					
Machine Push Button Panel with machine control panel functions				○	○
• MPP 310 IEH with connection for SINUMERIK HT 8		**6FC5303-1AF20-8AA1**		○	○
• MPP 483		**6FC5303-1AF00-0AA1**		○	○
• MPP 483H for handheld unit		**6FC5303-1AF00-1AA1**		○	○
• MPP 483A without override		**6FC5303-1AF01-0AA1**		○	○
• MPP 483 HTC with connection for SINUMERIK HT 8		**6FC5303-1AF00-8AA1**		○	○
• MPP 483 IE		**6FC5303-1AF10-0AA0**		○	○
• MPP 483 IEH with connection for SINUMERIK HT 8		**6FC5303-1AF10-8AA0**		○	○
Software option for Electronic Key System EKS		**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 × 4.72 in) front panel, 5 V DC		**6FC9320-5DB01**		○	○
• With 76.2 mm × 76.2 mm (3 × 3 in) front panel, 5 V DC		**6FC9320-5DC01**		○	○
• With 76.2 mm × 76.2 mm (3 × 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 (98.43 in) 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**		○	○
Keyboards:					
• Full CNC keyboard vertical format		**6FC5303-0DT12-1AA0**		–	–
• Full CNC keyboard horizontal format		**6FC5303-0DM13-1AA0**		–	–
• KB 483C		**6FC5203-0AF20-0AA1**		○	○
• KB 310C		**6FC5203-0AF21-0AA1**		○	○
• KBPC CG US standard PC keyboard		**6FC5203-0AC01-3AA0**		○	○
- Keyboard tray for standard PC keyboards		**6FC5247-0AA40-0AA0**		○	○

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Operation (continued)					
Memory/storage devices:				○	○
• Card reader for CF/SD memory media, with USB connection		**6FC5335-0AA00-0AA0**		○	○
• Industrial USB hub 4	With SINUMERIK PCU 50.5.	**6AV6671-3AH00-0AX0**		○	○
• 1 GB CompactFlash card	Requirement: Card reader.	**6FC5313-5AG00-0AA1**		○	○
• 8 GB CompactFlash card	Requirement: Card reader.	**6FC5313-6AG00-0AA0**		○	○
• SIMATIC USB FlashDrive 8 GB		**6ES7648-0DC50-0AA0**		○	○
Plain text display of user variables				●	●
Multi-channel display	With OP 019 up to 4 channels.			●	●
Workpiece-related actual value system				●	●
Menu selection via the PLC					
CNC program messages				●	●
Access protection, 7 levels				●	●
Operating software languages:					
• Language switchover online				●	●
• Chinese Simplified, English, French, German, Italian, Spanish				●	●
• Additional languages	SW versions available on request.	**6FC5800-0AN00-0YB0**	**N00**	○	○
• Maximum configuration for installed languages	SINUMERIK PCU 50.5 unlimited.			8	8
Additional languages for operating software SINUMERIK Operate on DVD, without license Chinese Traditional, Czech, Danish, Dutch, Finnish, Hungarian, Japanese, Korean, Polish, Portuguese/Brazilian, Romanian, Russian, Slovak, Slovene, Swedish, Turkish		**6FC5860-0YC..-.YA8**		○	○
• Other languages	On request.			○	○

Monitoring functions

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
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				●	●
Collision check:					
• 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**	○	○

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Compensation					
Backlash compensation				●	●
Lead screw error compensation				●	●
Measuring system error compensation				●	●
Feedforward control, velocity-dependent				●	●
Feedforward control, acceleration-dependent				●	●
Electronic weight counterbalance	Function of SINAMICS S120.			●	●
Temperature compensation				●	●
Quadrant error compensation				●	●
Circularity test				●	●
Bidirectional lead screw error compensation	1) With restricted functionality, see export control version.	**6FC5800-0AM54-0YB0**	**M54**	○ 1)	○
Sag compensation, multi-dimensional	1) With restricted functionality, see export control version.	**6FC5800-0AM55-0YB0**	**M55**	○ 1)	○
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 (Space Error Compensation 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**	–	○

Programmable logic controller (PLC)

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Programmable logic controller (PLC)					
SIMATIC S7-300 PLC 317F-3PN/DP (integrated)				●	●
Processing time in µs, for bit operations, min.				0.025	0.025
Processing time in µs, for word operations, min.				0.03	0.03
PLC user memory, maximum configuration in KB				1536	1536
Expansion of the PLC user memory by 128 KB in each case		**6FC5800-0AD10-0YB0**	**D11...D18**	○	○
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 rates up to 12 Mbit/s				●	●
• Distributed DP slaves, max. 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 rates up to 100 Mbit/s				●	●
• Distributed PN slaves, max. number				128	128
PROFINET CBA				●	●
PROFINET IO controller				●	●
PROFINET IO device				●	●
Digital inputs, number in bytes (can be adjusted between 0 and 4049 bytes)	Number = process image inputs.			1024	1024
Digital outputs, number in bytes (can be adjusted between 0 and 4049 bytes)	Number = process image outputs.			1024	1024
I/O inputs, number in bytes:	Logical address range inputs.			8192	8192
• Maximum usable				5700	5700
I/O outputs, number in bytes:	Logical address range inputs.			8192	8192
• Maximum usable				5700	5700

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Programmable logic controller (PLC) (continued)					
Bit memories, number in bytes				4096	4096
Timers, number				512	512
Counters, number				512	512
FB, FC:				2048	2048
• Highest number per FB, FC				7999	7999
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**		○	○
• PP 72/48 I/O module, max. 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.	**6FC5211-0BA01-0AA3**		○	○
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 reduced 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.			○	○

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Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Safety functions (continued)					
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 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.			○	○
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				●	●

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	 840D sl
Commissioning (continued)					
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 the NCU.			●	●
Toolbox on DVD of the CNC software				○	○
SinuCom commissioning/service tools for SINUMERIK 840D sl:					
• Software for PC/PG		**6FC5250-0AY00-0AG0** **6FC5250-7AY00-.AG0** **6FC5250-0AY00-0AG1** **6FC5250-0AY00-0AG2** **6FC5250-7AY00-.AG3**		○	○
• Commissioning software for SINAMICS S120 (and SIMODRIVE 611 digital)	For commissioning.				
• 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					
SINUMERIK Integrate Create MyConfig for series production and software upgrades		**6FC5862-2YC41-0YA0**		○	○
STARTER drive/commissioning software for SINAMICS and MICROMASTER	For topology and diagnostics.	**6SL3072-0AA00-0AG0**		–	–

Diagnostic functions and maintenance

Description ● Basic version ○ Option ◇ Function is dependent on operating software – Not possible	Instructions (footnotes are applicable line by line)	Order No. Type (for complete Order No., see notes)	Order code	SINUMERIK 840DE sl	SINUMERIK 840D sl
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.	**6FC5252-0AY00-0AG0** **6FC5252-0AY00-0AG1** **6FC5252-.AY01-.AG0**		○	○
Remote diagnostics and file transfer SINUMERIK Integrate Access MyMachine:	See SINUMERIK Integrate.				
• Access MyMachine /P2P (RCS Commander for PC/PG). Principally permits file transfer between PC/PG and CNCs	Requirement: Access MyMachine /P2P for image transmission by modem.	**6FC5860-7YC00-0YA0** **6FC5860-7YC..-.YA0**		○	○
• Access MyMachine /P2P (RCS Host remote diagnostics software)	License for NCU 710.3 PN/ NCU 720.3 PN/ NCU 730.3 PN.	**6FC5800-0AP30-0YB0**	**P30**	○	○
SINUMERIK Integrate Access MyMachine /Ethernet (ePS Remote Access) for diagnostic functions in case of machine failures, Workflow Services, remote control and remote monitoring of machine control systems:	Requirement: Access MyMachine /Ethernet company account, setup fee.	**6FC6001-0EE00-0DS0** **6FC6001-0EE00-0DS1**		○	○
• ASP Account (ePS Company Account)		**6FC6001-0EE00-0CA1**		○	○
• ASP Machine Setup Fee (ePS Connect Machine)		**6FC6001-0EE00-0CE0** **6FC6001-0EE00-0CE1**		○	○
• Analyze MyCondition (ePS Condition Monitoring Basic) for state-oriented maintenance	Requirement: Access MyMachine /Ethernet company account, setup fee.	**6FC6001-0EE00-0MB0** **6FC6001-0EE00-0MB1**		○	○
• ASP Account (ePS Company Account)		**6FC6001-0EE00-0CA1**		○	○
• ASP Machine Setup Fee (ePS Connect Machine)		**6FC6001-0EE00-0CE0** **6FC6001-0EE00-0CE1**		○	○