

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS SINAMICS

6SL3544-0FB21-1PA0

CU250D-2 PN-F CONTROL UNIT

Used with the applicable SINAMICS G120D configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens official product documentation

SINAMICS G120D distributed inverters

0.75 kW to 7.5 kW (1 hp to 10 hp)



8/2	Introduction	8/33	Recommended line-side power components
8/2	Application		
8/2	More information		
8/3	SINAMICS G120D distributed inverters	8/34	Supplementary system components
8/3	Overview	8/35	Intelligent Operator Panel IOP Handheld
8/5	Benefits	8/36	Memory cards
8/6	Design	8/36	PC inverter connection kit 2 (mini USB interface cable for communication with a PC)
8/7	Configuration	8/36	STARTER commissioning tool
8/8	Technical specifications	8/37	<u>Connecting cables for the Control Unit</u>
		8/37	PROFINET connecting cables
8/9	CU240D-2 and CU250D-2 Control Units	8/37	PROFIBUS connecting cables
8/9	Overview	8/37	Connecting cables/plug-in connectors for supplying 24 V DC to the Control Unit
8/10	Selection and ordering data	8/38	Connecting cables and connectors for digital inputs and outputs
8/11	Design	8/38	Connecting cables and connectors for encoders and analog inputs
8/13	Function	8/38	<u>Connecting cables for Power Module</u>
8/15	Integration	8/38	Connecting cables pre-assembled at one end and connector sets to connect to the line supply
8/23	Technical specifications	8/39	Motor cables pre-assembled at one end and connector sets to connect the Power Module to the motor
		8/39	Power bus distribution 400 V in IP65 degree of protection
8/26	PM250D Power Modules	8/39	Additional information
8/26	Overview		
8/26	Selection and ordering data		
8/27	Integration		
8/28	Technical specifications		
8/31	Characteristic curves		
8/32	Dimensional drawings		
		8/40	Spare parts
		8/40	Spare Parts Kit
		8/40	Replacement fans

SINAMICS G120D distributed inverters

0.75 kW to 7.5 kW (1 hp to 10 hp)

CU240D-2 and CU250D-2 Control Units

Overview



CU250D-2 PN-F PP and CU250D-2 PN-F FO Control Units

Safety Integrated functions

The safety function "Safe Torque Off" (STO) (certified according to IEC 61508 SIL 2, EN ISO 13849-1 PL d and Category 3) is already integrated into the standard versions of the CU240D-2 series (CU240D-2 DP and CU240D-2 PN). It can be activated either over PROFIsafe or over the safety input.

With the fail-safe variants of the CU240D-2 series (CU240D-2 DP-F xx and CU240D-2 PN-F xx) and with the entire CU250D-2 series, the fail-safe SINAMICS G120D inverter provides five safety functions which are certified according to IEC 61508 SIL 2, EN ISO 13849-1 PL d and Category 3:

- Safe Torque Off (STO)
to protect against active movement of the drive
- Safe Stop 1 (SS1)
for continuous monitoring of a safe braking ramp
- Safely Limited Speed (SLS)
for protection against dangerous movements on exceeding a speed limit
- Safe direction (SDI)
This function ensures that the drive can only rotate in the selected direction.
- Safe speed monitoring (SSM)
This function signals if a drive is operating below a specific speed/feed velocity.

These functions can be activated by means of PROFIsafe or via the safety inputs. A safety output is provided in addition.

All safety functions can be implemented without having to use a motor encoder; the implementation costs are minimal. Existing systems in particular can be simply updated with safety technology without the need to change the motor or mechanical system.

The Safe Torque Off (STO) function can be used without restriction for all applications. The SS1, SLS, SSM and SDI functions are only permissible for applications where the load can never accelerate when the inverter is switched off. They are therefore not permitted for applications involving pull-through loads such as hoisting gear and unwinders.

Additional information is provided in chapter Highlights, section Safety Integrated.

8

Selection and ordering data

Communication	Digital inputs (number which can be parameterized as fail-safe given below)	Analog inputs	Digital outputs (number which can be parameterized as fail-safe given below)	Encoder inter- faces HTL/SSI	Safety Integrated functions	Designation	Control Unit Article No.
CU240D-2 series – standard							
PROFIBUS DP	6 (1)	2	2	1/–	STO	CU240D-2 DP	6SL3544-0FB20-1PA0
PROFINET, EtherNet/IP	6 (1)	2	2	1/–	STO	CU240D-2 PN	6SL3544-0FB20-1FA0
CU240D-2 series – fail-safe for Safety Integrated							
PROFIBUS DP	6 (3)	2	2 (1)	1/–	STO, SLS, SS1, SSM, SDI	CU240D-2 DP-F	6SL3544-0FB21-1PA0
PROFINET, EtherNet/IP	6 (3)	2	2 (1)	1/–	STO, SLS, SS1, SSM, SDI	CU240D-2 PN-F	6SL3544-0FB21-1FA0
						CU240D-2 PN-F PP	6SL3544-0FB21-1FB0
						CU240D-2 PN-F FO	NEW 6SL3544-0FB21-1FC0
CU250D-2 series – basic positioner (EPos) and fail-safe for Safety Integrated							
PROFIBUS DP	6 (3)	–	2 (1)	1/1	STO, SLS, SS1, SSM, SDI	CU250D-2 DP-F	6SL3546-0FB21-1PA0
PROFINET, EtherNet/IP	6 (3)	–	2 (1)	1/1	STO, SLS, SS1, SSM, SDI	CU250D-2 PN-F	6SL3546-0FB21-1FA0
						CU250D-2 PN-F PP	6SL3546-0FB21-1FB0
						CU250D-2 PN-F FO	NEW 6SL3546-0FB21-1FC0

Note:

An external 24 V DC power supply is required in order to operate the Control Unit. For information about suitable connecting cables, refer to section "Supplementary system components", connecting cables/plug-in connectors for supplying 24 V DC to the Control Unit.

SINAMICS G120D distributed inverters

0.75 kW to 7.5 kW (1 hp to 10 hp)

CU240D-2 and CU250D-2 Control Units

Technical specifications

Control Unit	CU240D-2 DP 6SL3544-0FB20-1PA0	CU240D-2 PN 6SL3544-0FB20-1FA0	CU240D-2 DP-F 6SL3544-0FB21-1PA0	CU240D-2 PN-F 6SL3544-0FB21-1FA0 CU240D-2 PN-F PP 6SL3544-0FB21-1FB0 CU240D-2 PN-F FO 6SL3544-0FB21-1FC0	CU250D-2 DP-F 6SL3546-0FB21-1PA0	CU250D-2 PN-F 6SL3546-0FB21-1FA0 CU250D-2 PN-F PP 6SL3546-0FB21-1FB0 CU250D-2 PN-F FO 6SL3546-0FB21-1FC0
Electrical specifications						
Operating voltage	External 24 V DC necessary	External 24 V DC necessary	External 24 V DC necessary	External 24 V DC necessary	External 24 V DC necessary	External 24 V DC necessary
Current consumption ¹⁾ (from the 24 V DC supply)						
• With Power Module frame sizes FSA and FSB	300 mA	400 mA	300 mA	400 mA (FO variant: 520 mA)	300 mA	400 mA (FO variant: 520 mA)
• With Power Module frame size FSC	450 mA	550 mA	450 mA	550 mA (FO variant: 670 mA)	450 mA	550 mA (FO variant: 670 mA)
Interfaces						
Digital inputs (non-isolated)	6	6	6	6	6	6
• Optionally parameterizable as safe inputs	1	1	3	3	3	3
Analog inputs (0 ... 10 V)	2	2	2	2	—	—
Digital outputs (0.5 A, fed through switched 24 V DC, isolated)	2	2	2	2	2	2
• Optionally parameterizable as safe digital output	—	—	1	1	1	1
Bus interface						
• Fieldbus protocols	PROFIBUS DP	PROFINET EtherNet/IP	PROFIBUS DP	PROFINET EtherNet/IP	PROFIBUS DP	PROFINET EtherNet/IP
• Profile	PROFIdrive PROFIsafe	PROFIdrive PROFIsafe PROFInergy	PROFIdrive PROFIsafe	PROFIdrive PROFIsafe PROFInergy	PROFIdrive PROFIsafe	PROFIdrive PROFIsafe PROFInergy
HTL encoder interface (incremental interface, bipolar up to 2048 pulses, max. 150 mA)	1	1	1	1	1	1
SSI encoder interface (absolute encoder, singleturn and multiturn 4096 pulses, 24 V, max. 250 mA)	—	—	—	—	1	1
PTC/KTY interface (connection via Power Module)	✓	✓	✓	✓	✓	✓
• Motor temperature sensor	1 input, sensors that can be connected: PTC, KTY or bimetal	1 input, sensors that can be connected: PTC, KTY or bimetal	1 input, sensors that can be connected: PTC, KTY or bimetal	1 input, sensors that can be connected: PTC, KTY or bimetal	1 input, sensors that can be connected: PTC, KTY or bimetal	1 input, sensors that can be connected: PTC, KTY or bimetal
Control of a mechanical motor brake (connection via Power Module)	✓	✓	✓	✓	✓	✓
Slot for SINAMICS memory card (SD card)	✓	✓	✓	✓	✓	✓
Commissioning interface (mini USB)	✓	✓	✓	✓ Not with PP and FO variants	✓	✓ Not with PP and FO variants

¹⁾ The current consumption of connected encoders (HTL ≤ 100 mA or SSI ≤ 250 mA), sensors (total, max. 300 mA) as well as the current drawn from the digital outputs (total, max. 500 mA) must be added, where applicable.