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Overview



Example of CU240D DP-F Control Unit



Example of CU240D PN-F Control Unit

The Control Unit performs closed-loop control functions for the inverter. In addition to the closed-loop control, it has additional functions that can be adapted to the particular application through parameterization. Control Units are available in different versions:

- CU240D DP
- CU240D DP-F
- CU240D PN
- CU240D PN-F

Safety Integrated functions

The SINAMICS G120D fail-safe inverter provides three safety functions, certified in accordance with EN 954-1, Category 3 and IEC 61508 SIL 2:

- 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 when a speed limit is exceeded

The functions “Safe Stop 1” and “Safely Limited Speed” can both be implemented without a motor encoder or encoder; the implementation cost is minimal. Existing systems in particular can be simply updated with safety technology without the need to change the motor or mechanical system.

The safety functions “Safely Limited Speed” and “Safe Stop 1” are not permitted for pull-through loads such as e.g. hoisting gear and unwinders.

Safety functions have been extended with firmware V3.2.

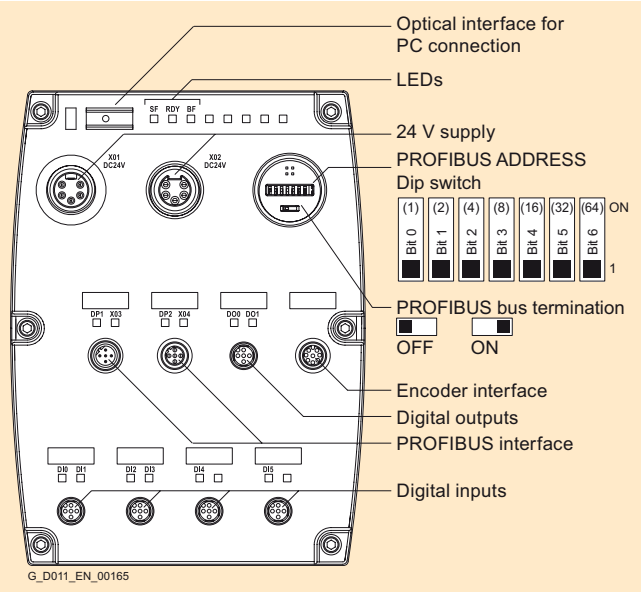
Additional information is provided in the part Highlights, section Safety Integrated.

Selection and ordering data

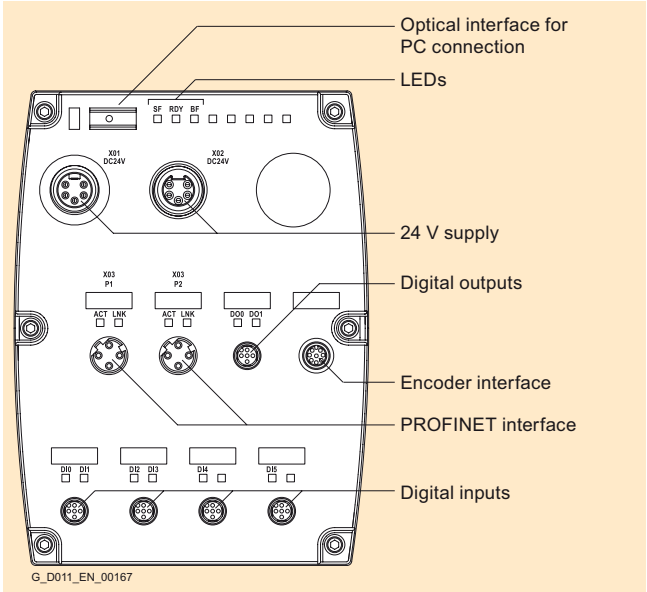
Communication	Digital inputs	Digital outputs	Encoder interfaces	Designation	**Control Unit** Order No.
Standard					
PROFIBUS DP	6	2	1	CU240D DP	**6SL3544-0FA20-1PA0**
PROFINET	6	2	1	CU240D PN	**6SL3544-0FA20-1FA0**
Fail-safe for Safety Integrated					
PROFIBUS DP	6	2	1	CU240D DP-F	**6SL3544-0FA21-1PA0**
PROFINET	6	2	1	CU240D PN-F	**6SL3544-0FA21-1FA0**

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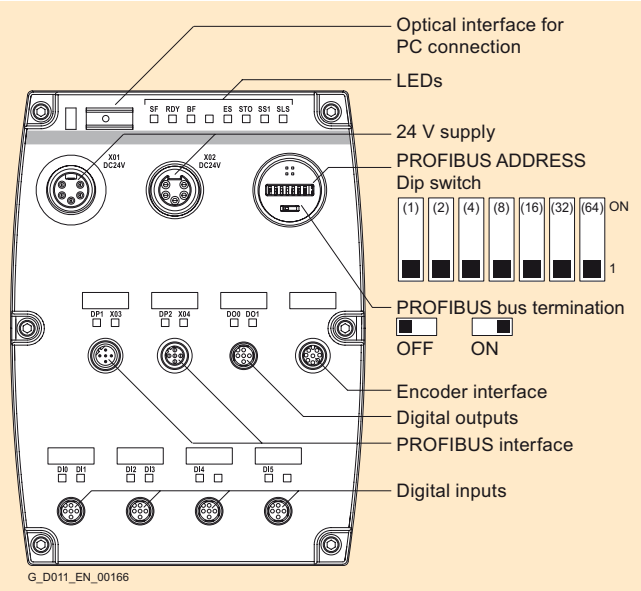
Design



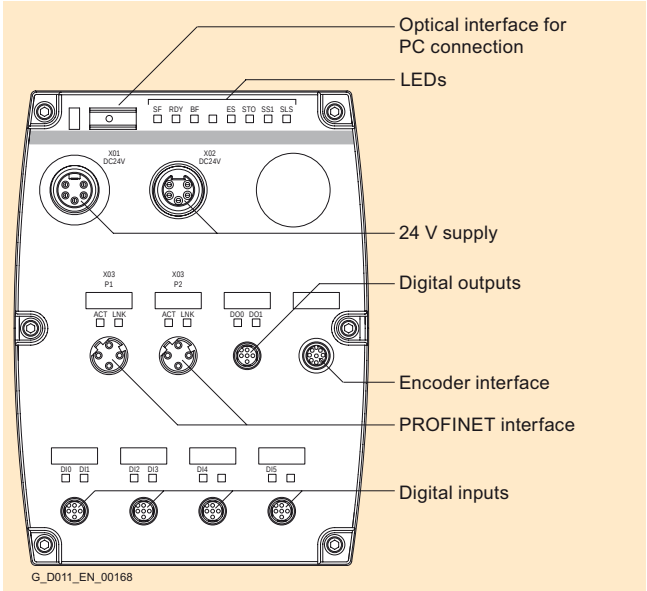
CU240D DP Control Unit



CU240D PN Control Unit



CU240D DP-F Control Unit



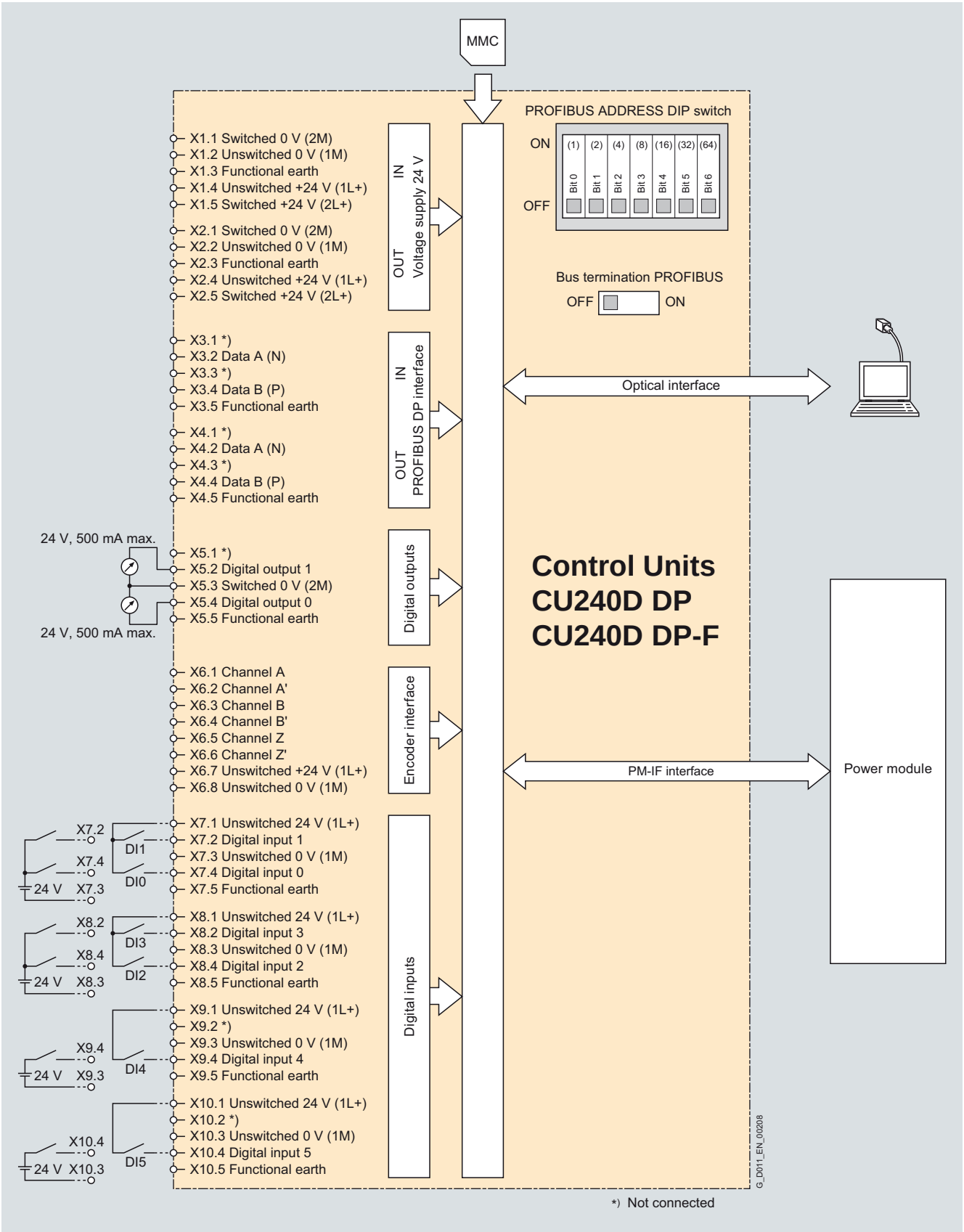
CU240D PN-F Control Unit



Control Unit, view from the rear, MMC slot at the top and PM-IF interface at bottom center

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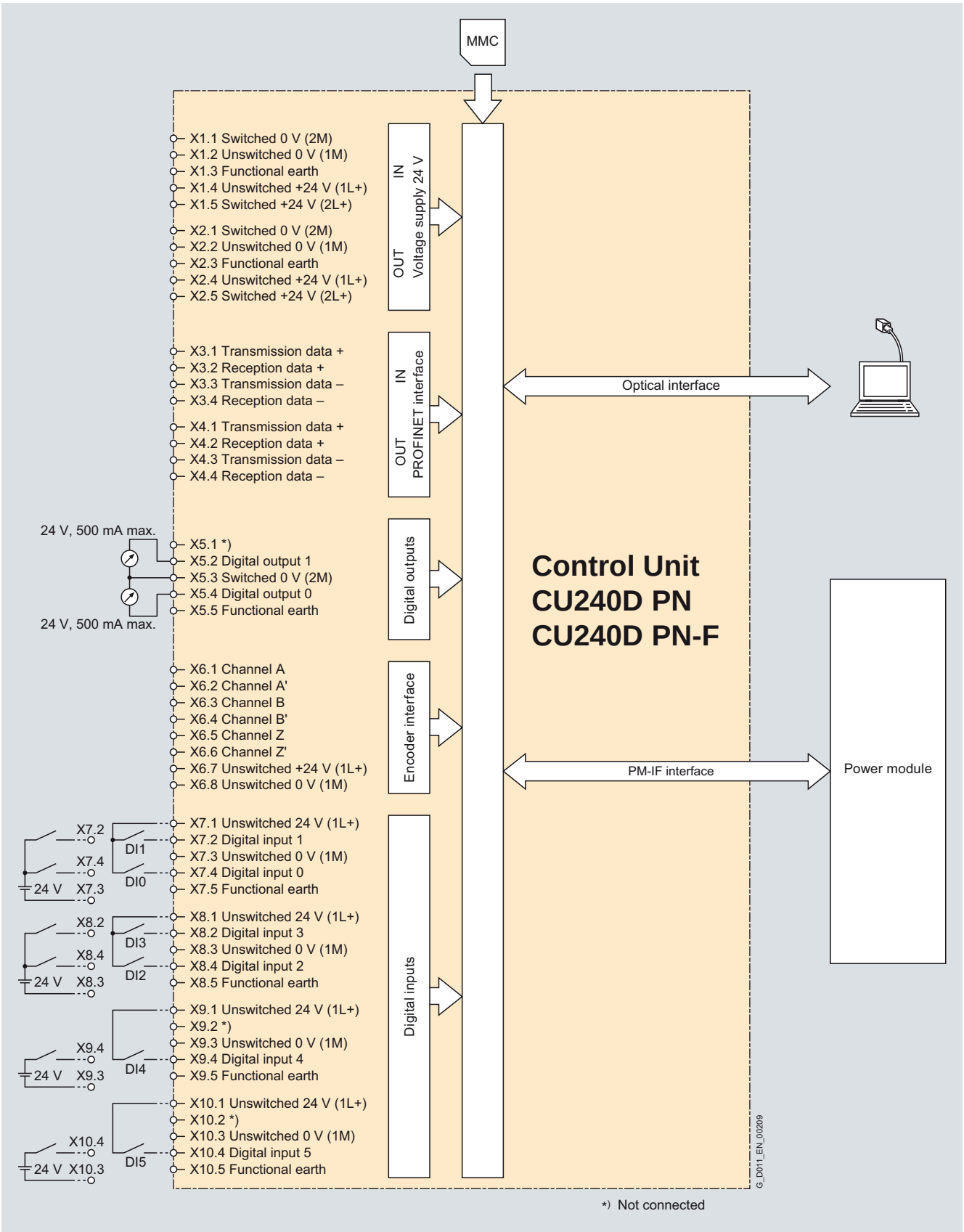
Integration



Connection diagram for CU240D DP and CU240D DP-F Control Units

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Integration



Connection diagram for CU240D PN and CU240D PN-F Control Units

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Technical specifications

Control Unit	CU240D DP 6SL3544-0FA20-1PA0	CU240D PN 6SL3544-0FA20-1FA0	CU240D DP-F 6SL3544-0FA21-1PA0	CU240D PN-F 6SL3544-0FA21-1FA0
Electrical specifications				
Operating voltage	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 supply)				
• with Power Module frame sizes FSA and FSB	200 mA	350 mA	200 mA	350 mA
• with Power Module frame size FSC	350 mA	500 mA	350 mA	500 mA
Interfaces				
Digital inputs	6	6	6	6
Digital outputs (0.5 A, fed through switched 24 V DC)	2	2	2	2
Bus interface	PROFIBUS DP	PROFINET	PROFIBUS DP, PROFIsafe	PROFINET, PROFIsafe
Encoder interfaces (HTL incremental interface, bipolar up to 2048 pulses, max. 100 mA)	1	1	1	1
PTC/KTY interface (connection via Power Module)	✓	✓	✓	✓
• Motor temperature sensor	1 input, sensors that can be connected: PTC, KTY or Thermo-Click	1 input, sensors that can be connected: PTC, KTY or Thermo-Click	1 input, sensors that can be connected: PTC, KTY or Thermo-Click	1 input, sensors that can be connected: PTC, KTY or Thermo-Click
Control of a mechanical motor brake (connection via Power Module)	✓	✓	✓	✓
MMC memory card slot	✓	✓	✓	✓
RS232 interface (connected with RS232 interface cable or USB interface cable via the optical interface of the Control Unit)	✓	✓	✓	✓
Safety functions				
Integrated safety functions Acc. to Category 3 of EN 954-1 and acc. to SIL 2 of IEC 61508	–		• Safe Stop 1 (SS1) • Safely Limited Speed (SLS) • Safe Torque Off (STO) • The safety functions “Safely Limited Speed” and “Safe Stop 1” are not certified for pull-through loads such as e.g. hoisting gear and unwinders.	• Safe Stop 1 (SS1) • Safely Limited Speed (SLS) • Safe Torque Off (STO) • The safety functions “Safely Limited Speed” and “Safe Stop 1” are not certified for pull-through loads such as e.g. hoisting gear and unwinders.
Open-loop/closed-loop control techniques				
***V/f* linear/square/parameterizable**	✓	✓	✓	✓
***V/f* with flux current control (FCC)**	✓	✓	✓	✓
Vector control, without encoder	✓	✓	✓	✓
Vector control, with encoder	✓	✓	✓	✓
Torque control, without encoder	✓	✓	✓	✓
Torque control, with encoder	✓	✓	✓	✓

[1] The current consumption of connected encoders and sensors (total, max. 300 mA) as well as the current drawn from the digital outputs must be added.

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CU240D Control Units

Technical specifications

Control Unit	CU240D DP 6SL3544-0FA20-1PA0	CU240D PN 6SL3544-0FA20-1FA0	CU240D DP-F 6SL3544-0FA21-1PA0	CU240D PN-F 6SL3544-0FA21-1FA0
Software functions				
Fixed frequencies	16, parameterizable	16, parameterizable	16, parameterizable	16, parameterizable
Signal interconnection with BICO technology	✓	✓	✓	✓
Automatic restart after line supply failure or operational fault	✓	✓	✓	✓
Positioning down ramp	✓	✓	✓	✓
Slip compensation	✓	✓	✓	✓
Free function blocks (FFB) for logic and arithmetic operations	✓	✓	✓	✓
Ramp smoothing	✓	✓	✓	✓
3 selectable drive data sets	✓	✓	✓	✓
3 selectable command data sets (CDS) (manual/auto)	✓	✓	✓	✓
Flying restart	✓	✓	✓	✓
JOG	✓	✓	✓	✓
Technology controller (PID)	✓	✓	✓	✓
Thermal motor protection	✓	✓	✓	✓
Thermal inverter protection	✓	✓	✓	✓
Setpoint input	✓	✓	✓	✓
Motor identification	✓	✓	✓	✓
Motor holding brake	✓	✓	✓	✓
Mechanical specifications and ambient conditions				
Degree of protection	IP65	IP65	IP65	IP65
Operating temperature	–10 … +55 °C (14 … 131 °F)	–10 … +50 °C (14 … 122 °F)	0 … 55 °C (32 … 131 °F)	0 … 50 °C (32 … 122 °F)
Storage temperature	–40 … +70 °C (–40 … +158 °F)	–40 … +70 °C (–40 … +158 °F)	–40 … +70 °C (–40 … +158 °F)	–40 … +70 °C (–40 … +158 °F)
Relative humidity	< 95 % RH, condensation not permissible	< 95 % RH, condensation not permissible	< 95 % RH, condensation not permissible	< 95 % RH, condensation not permissible
Dimensions				
• Width	150 mm	150 mm	150 mm	150 mm
• Height	210 mm	210 mm	210 mm	210 mm
• Depth	40 mm	40 mm	40 mm	40 mm
Weight, approx.	0.7 kg	0.7 kg	0.7 kg	0.7 kg