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Data sheet for SINAMICS G220

Article No. : 6SL4113-0JP11-2AF0

Figure similar

Client order no. :
Order no. :
Offer no. :
Remarks :

Item no. :
Consignment no. :
Project :

Rated data

Input

Number of phases	3 AC	
Line voltage	380...415V / 440...500V (--20+10 %)	
Line frequency	50/60 Hz (47 ... 63 Hz)	
Voltage range (voltage class)	**380 ... 415 V (400V IEC)**	**440 ... 500 V (480V NEC)**
Rated current	5.6 A	4.9 A

Output

Number of phases	3 AC	
Voltage range (voltage class)	**380 ... 415 V (400V IEC)**	**440 ... 500 V (480V NEC)**
Rated power (LO)	2.20 kW	3.00 hp
Rated power (HO)	1.50 kW	2.00 hp
Rated current (LO)	6.5 A	4.8 A
Rated current (HO)	4.7 A	3.4 A
Rated current (IN)	6.7 A	5.0 A
Rated Current (SRM)	6.5 A	
Max. output current	9.8 A	
Pulse frequency (factory setting)	4 kHz	
Output frequency for vector control	0 ... 480 Hz	
Output frequency for V/f control	0 ... 550 Hz	

Overload capability

Low Overload (LO)

150% rated current (LO) for 3 s, followed by 110% rated current (LO) for 57 s in a 300 s cycle time

High Overload (HO)

200% rated current (HO) for 3 s, followed by 150% rated current (HO) for 57 s in a 300 s cycle time

Electronic power supply

Voltage	24 V (20.4 ... 28.8 V)
Current demand, max.	2.00 A

General tech. specifications

Power factor λ (typical)	0.90
Displacement factor cos φ (typical)	0.98
Efficiency η	0.97
Sound pressure level (1m)	63 dB
Filter class (integrated)	RFI suppression filter for Category C2

Communication

Communication	PROFINET, Modbus TCP, EtherNet/IP

SINAMICS SDI Standard Operator Panel

User interface

Operator element version	Integrated SDI standard for monitoring and diagnostics
Interface design	RJ45 with 100 MBit/s Ethernet
Display design	1.4" graphic display
Screen resolution	128 x 160 Pixel

Inputs / outputs

Standard digital inputs

Number	6 (additionally 2 AI configurable as 2 DI)
Switching level: 0 → 1	11 V
Switching level: 1 → 0	5 V
Max. inrush current	4 mA
Number as rapid input	1 (DI5)

Fail-safe digital inputs

Number	1 (additionally 4 DI configurable as 2 FDI)

Digital outputs

Number as relay changeover contact	2
Output (resistive load)	DC 30 V, max. 0.5 A
Number as transistor	1
Output (resistive load)	DC 30 V, max. 0.4 A

Analog inputs

Number	2 (Differential input)
Resolution	16 bit
Operating mode	
Voltage bipolar	-10 ... 10 V
Voltage unipolar	0 ... 10 V
Current	0 ... 20 mA
Current monitored	4 ... 20 mA

Switching threshold as digital input

0 → 1	11 V
1 → 0	5 V

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Analog outputs	
Number	1 (Non-isolated output)
Operating mode	
Voltage unipolar	0 ... 10 V
Current	0 ... 20 mA
Current monitored	4 ... 20 mA
Motor temperature interface	
1 input for motor temperature, connectable PTC, KTY 84, PT1000, and bimetal temperature switch	
PTC interface	
Short-circuit monitoring < 20Ohm, overtemperature>1650Ohm	
KTY84 interface	
Short-circuit monitoring < 50Ohm; wire breakage>2120Ohm; measurement current 2mA	
PTC1000 interface	
Short-circuit monitoring < 603Ohm; wire breakage>2120Ohm; measurement current 2mA	

Closed-loop control techniques

V/f linear / square-law / parameterizable	Yes
V/f with flux current control (FCC)	Yes
V/f ECO linear / square-law	Yes
Sensorless vector control	Yes
Vector control, with sensor	Yes
Encoderless torque control	Yes
Torque control, with encoder	Yes

Ambient conditions

Cooling	Air cooling using an integrated fan
Cooling air requirement	0.050 m³/s (1.766 ft³/s)
Installation altitude (without derating)	1,000 m (3,281 ft)
Max. ambient temperature with derating	50 °C
Ambient temperature with high overload (without derating)	45 °C
Ambient temperature with low overload (without derating)	40 °C
Relative humidity during	
Max. operation	95 %

Environmental conditions

Chemically active substances	
Operation	Class 3C2, according to IEC 60721-3-3: 2002
Transport	Class 2C2 according to IEC 60721-3-2:1997 in marine- and weather-resistant transport packaging
Storage	Class 1C2 according to IEC 60721-3-1: 2002 in the transport packaging
Biologically active substances	
Operation	Class 3B1 according to IEC 60721-3-3: 2002
Transport	Class 2B1 according to IEC 60721-3-2:1997 in the transport packaging
Storage	Class 1B1 according to IEC 60721-3-1:1997 in the transport packaging
Mechanically active substances	
Operation	Class 3S2 according to IEC 60721-3-3: Ed. 2.2 2002 (Conductive dusts are not permitted.)
Climatic environmental conditions	
Operation	Class 3K3 according to IEC 60721-3-3 Ed. 2.2: 2002
Transport	Class 2K4 according to IEC 60721-3-2:1997 in the transport packaging; temperature -40 ... +70 °C; relative atmospheric humidity 5..95% (without condensation)
Storage	Class 1K4 according to IEC 60721-3-1:1997 in the transport packaging; temperature -25 ... +55 °C; relative atmospheric humidity 5..95% (without condensation), storage altitude <=4000m; condensation, spray water, ice formation, salt mist not permissible
Mechanical environmental conditions	
Operation	Class 3M1 according to IEC 60721-3-3 Ed. 2.2: 2002
Transport	Class 2M3 according to IEC 60721-3-2:1997 in the transport packaging
Storage	Class 1M2 according to IEC 60721-3-1:1997 in the transport packaging

Integrated Safety functions

Safety function "Safe Torque Off"	Yes
Safe Stop 1 (SS1)	Yes
Safe Motor Temperature (SMT)	No
Extended software functions can be enabled with a license using an SD card.	

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Connections

Signal cable	
Type	Push-in connection
Conductor cross-section	0.20 ... 2.50 mm² (24 ... 12 AWG)
Line side	
Type	screw terminal
Conductor cross-section	
for single-core cables	1.50 ... 6.00 mm² (16 ... 10 AWG)
for multi-core cables	1.50 ... 6.00 mm² (16 ... 10 AWG)
Motor end	
Type	screw terminal
Conductor cross-section	2.50 ... 6.00 mm² (14 ... 10 AWG)
DC link	
Type	screw terminal
Conductor cross-section	2.50 ... 6.00 mm² (14 ... 10 AWG)
PE connection	
Type	M5, screw terminal
Conductor cross-section	2.50 ... 6.00 mm² (14 ... 10 AWG)
Type	screw terminal, M4
Conductor cross-section	2.50 ... 6.00 mm² (14 ... 10 AWG)
Max. motor cable length	
Shielded	200 m (656 ft)
Unshielded	300 m (984 ft)
with EMC category C2	
Shielded	150 m (492 ft)

Mechanical data

Degree of protection	IP55 / UL type 12
Frame size	FSB
Net weight	17.2 kg (37.92 lb)
Dimensions	
Width	225 mm (8.86 in)
Height	415 mm (16.34 in)
Depth	225 mm (8.86 in)

Memory card

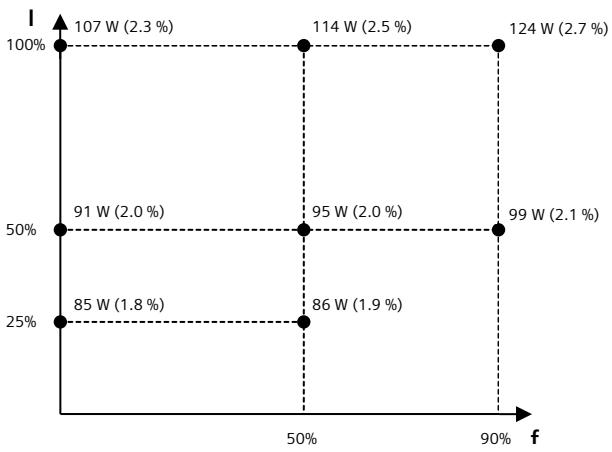
1 slot for SD card	SINAMICS SD card, 8GByte

Certificates

Certificate of suitability	CE, KC, cULus (UL 61800-5-1, CSA 22.2 No. 274) , EAC, UKCA
CE marking	
EMC directive 2014/30/EU; Low Voltage Directive 2014/35/EU; RoHS Directive 2011/65/EU; energy efficiency and eco design 2009/125/EU	
Verification of suitability for fail-safety	SIL 3 according to IEC 61508 and IEC 61800-5-2, PL e according to ISO 13849-1, Category 4 according to ISO 13849-1
Environmental compatibility	RoHS II, REACH, Green Passport
Explosion protection	-
shipbuilding approval	No

Converter losses to IEC61800-9-2*

Efficiency class	IE2
In scope of Ecodesign Directive	No (in the valid range)
Reason of exception	no exception
IEC power loss data based on	
Input	3 AC 400 V, 50 Hz
Output	3 AC 0 - 400 V, 50 Hz, 4 kHz Space-vector modulation
Rated apparent power	4.6 kVA
Power loss in standby	23.1 W (0.5%)



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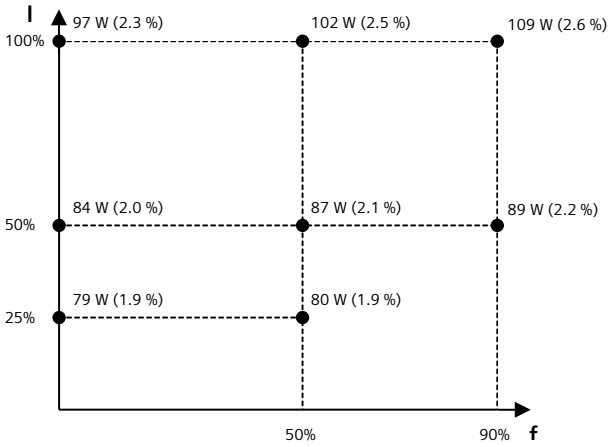
NEC power loss data based on

Input	3 AC 480 V, 60 Hz
Output	3 AC 0 - 480 V, 60 Hz, 4 kHz Space-vector modulation
Rated apparent power	4.2 kVA
Power loss in standby	23.1 W (0.6%)



the absolute power losses for motor voltages according to NEC (AC 230 V, AC 460 V, AC 575 V) are approximately 2 % lower

The percentage values show the losses in relation to the rated apparent power of the converter.

The diagram shows the losses for the points (as per standard IEC61800-9-2) of the relative torque generating current (I) over the relative motor stator frequency (f). The values are valid for the basic version of the converter without options/components.

*calculated values