

Article No. : 6SL4112-0JP12-0BF0

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

| Rated data                          |                          |                          |
|-------------------------------------|--------------------------|--------------------------|
| Input                               |                          |                          |
| Number of phases                    | 3 AC                     |                          |
| Line voltage                        | 200...240V (–20+10 %)    |                          |
| Line frequency                      | 50/60 Hz (47 ... 63 Hz)  |                          |
| Voltage range (voltage class)       | 200 ... 240 V (230V IEC) | 200 ... 240 V (240V NEC) |
| Rated current                       | 13.0 A                   | 12.0 A                   |
| Output                              |                          |                          |
| Number of phases                    | 3 AC                     |                          |
| Voltage range (voltage class)       | 200 ... 240 V (230V IEC) | 200 ... 240 V (240V NEC) |
| Rated power (LO)                    | 3.00 kW                  | 4.00 hp                  |
| Rated power (HO)                    | 2.20 kW                  | 3.00 hp                  |
| Rated current (LO)                  | 14.5 A                   | 12.4 A                   |
| Rated current (HO)                  | 11.0 A                   | 9.6 A                    |
| Rated current (IN)                  | 14.9 A                   | 12.8 A                   |
| Max. output current                 | 22.0 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.    | 3.00 A                 |

| General tech. specifications        |            |
|-------------------------------------|------------|
| Power factor λ (typical)            |            |
| Displacement factor cos φ (typical) | 0.98       |
| Efficiency η                        | 0.96       |
| Sound pressure level (1m)           | 63 dB      |
| Filter class (integrated)           | Unfiltered |

| Communication |                                   |
|---------------|-----------------------------------|
| Communication | PROFINET, Modbus TCP, EtherNet/IP |



Figure similar

| 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 < 200Ohm, overtemperature>1650Ohm |
|------------------------------------------------------------|

### KTY84 interface

|                                                                                   |
|-----------------------------------------------------------------------------------|
| Short-circuit monitoring < 500Ohm; 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. |                                                                                                                                                                                                                                                              |

## Data sheet for SINAMICS G220

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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  | 2.00 ... 6.00 mm² (16 ... 10 AWG) |
| for multi-core cables   | 2.00 ... 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 | 2.00 ... 6.00 mm² (14 ... 10 AWG) |
| PE connection           |                                   |
| Type                    | M5, screw terminal                |
| Conductor cross-section | 2.00 ... 6.00 mm² (14 ... 10 AWG) |
| Type                    | screw terminal, M4                |
| Conductor cross-section | 2.00 ... 6.00 mm² (14 ... 10 AWG) |
| Max. motor cable length |                                   |
| Shielded                | 200 m (656 ft)                    |
| Unshielded              | 300 m (984 ft)                    |

| Mechanical data      |                    |
|----------------------|--------------------|
| Degree of protection | IP55 / UL type 12  |
| Frame size           | FSB                |
| Net weight           | 17.4 kg (38.36 lb) |
| Dimensions           |                    |
| Width                | 220 mm (8.66 in)   |
| Height               | 415 mm (16.34 in)  |
| Depth                | 225 mm (8.86 in)   |

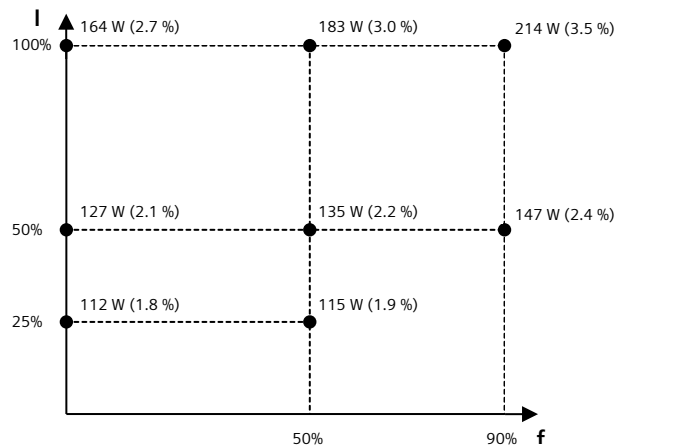
| Memory card        |                          |
|--------------------|--------------------------|
| 1 slot for SD card | SINAMICS SD card, 8GByte |

| Certificates                                                                                                                        |                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Certificate of suitability                                                                                                          | CE, 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 230 V, 50 Hz                                       |
| Output                | 3 AC 0 - 230 V, 50 Hz,<br>4 kHz Space-vector modulation |
| Rated apparent power  | 5.9 kVA                                                 |
| Power loss in standby | 25.2 W (0.4%)                                           |



## Data sheet for SINAMICS G220

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NEC power loss data based on

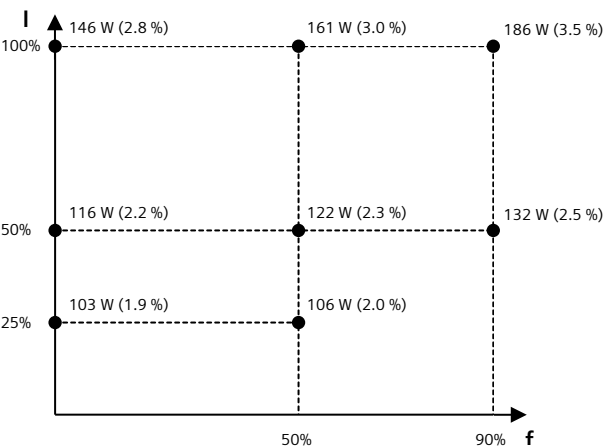
|                       |                                                         |
|-----------------------|---------------------------------------------------------|
| Input                 | 3 AC 240 V, 60 Hz                                       |
| Output                | 3 AC 0 - 240 V, 60 Hz,<br>4 kHz Space-vector modulation |
| Rated apparent power  | 5.3 kVA                                                 |
| Power loss in standby | 25.2 W (0.5%)                                           |

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



## Data sheet for SINAMICS G220

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| Data sheet for Option Module OM-DQ (Drive CLiQ) |                                                                                                                                   |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Electrical data                                 | Ambient conditions                                                                                                                |
| Operating voltage (DC)                          | 24.0 V (20.4 ... 28.8 V)                                                                                                          |
|                                                 | External 24 V power supply required if 24 V supply via DRIVE-CLiQ                                                                 |
| Current demand, max.                            | 0.70 A                                                                                                                            |
| Power loss                                      | 2.4 W                                                                                                                             |
| Inputs / outputs                                | Ambient temperature during                                                                                                        |
| DRIVE-CLiQ interface                            | Operation                                                                                                                         |
| Number                                          | 2                                                                                                                                 |
|                                                 | RJ45, 100Mbit/s                                                                                                                   |
| Mechanical data                                 | Transport                                                                                                                         |
| Degree of protection                            | IP20 / UL open type                                                                                                               |
| Net weight                                      | 71.8 g (2.53 oz)                                                                                                                  |
| Dimensions                                      | Storage                                                                                                                           |
| Width                                           | 65.2 mm (2.57 in)                                                                                                                 |
| Height                                          | 44.8 mm (1.76 in)                                                                                                                 |
| Depth                                           | 38.3 mm (1.51 in)                                                                                                                 |
| Certificates                                    |                                                                                                                                   |
| Certificate of suitability                      | CU, cULus (UL 61800-5-1, CSA 22.2 No. 274), EAC, RoHS II, REACH, safety according to EC 61800-5-2 and ISO 13849-1, Green Passport |
| Environmental compatibility                     | RoHS II, REACH, Green Passport                                                                                                    |