

Article No. : 6SL4113-2CA21-2AF0

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

Item no. :  
Consignment no. :  
Project :

Figure similar



### 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                       | 39.9 A                             | 34.2 A                   |
| Output                              |                                    |                          |
| Number of phases                    | 3 AC                               |                          |
| Voltage range (voltage class)       | 380 ... 415 V (400V IEC)           | 440 ... 500 V (480V NEC) |
| Rated power (LO)                    | 22.00 kW                           | 30.00 hp                 |
| Rated power (HO)                    | 18.50 kW                           | 25.00 hp                 |
| Rated current (LO)                  | 46.0 A                             | 40.0 A                   |
| Rated current (HO)                  | 40.0 A                             | 34.0 A                   |
| Rated current (IN)                  | 47.2 A                             | 41.1 A                   |
| Rated Current (SRM)                 | 50.0 A                             |                          |
| Max. output current                 | 80.0 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 (HO) for 3 s, followed by 110% rated current (HO) 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)            | 1.00                                   |
| Displacement factor cos φ (typical) | 0.98                                   |
| Efficiency η                        | 0.97                                   |
| Sound pressure level (1m)           | 70 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 < 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                                   | 0.039 m³/s (1.377 ft³/s)            |
| Installation altitude (without derating)                  | 1,000 m (3,281.00 ft)               |
| Max. ambient temperature with derating                    | 60 °C                               |
| Ambient temperature with high overload (without derating) | 50 °C                               |
| Ambient temperature with low overload (without derating)  | 45 °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 3S1 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  | 6.00 ... 35.00 mm² (10 ... 2 AWG) |
| for multi-core cables   | 6.00 ... 35.00 mm² (10 ... 2 AWG) |
| Motor end               |                                   |
| Type                    | screw terminal                    |
| Conductor cross-section | 6.00 ... 35.00 mm² (10 ... 2 AWG) |
| DC link                 |                                   |
| Type                    | screw terminal                    |
| Conductor cross-section | 6.00 ... 35.00 mm² (10 ... 2 AWG) |
| PE connection           |                                   |
| Type                    | M5, screw terminal                |
| Conductor cross-section | 6.00 ... 35.00 mm² (10 ... 2 AWG) |
| Max. motor cable length |                                   |
| Shielded                | 200 m (656.17 ft)                 |
| Unshielded              | 300 m (984.25 ft)                 |
| with EMC category C2    |                                   |
| Shielded                | 150 m (492.13 ft)                 |

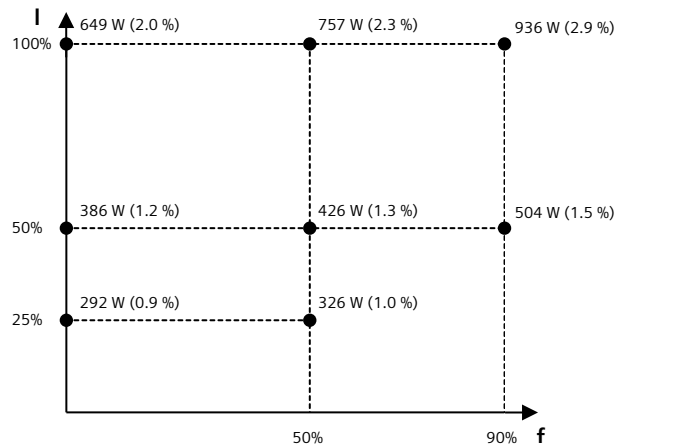
| Mechanical data      |                     |
|----------------------|---------------------|
| Degree of protection | IP20 / UL open type |
| Frame size           | FSD1                |
| Net weight           | 16.9 kg (37.26 lb)  |
| Dimensions           |                     |
| Width                | 150 mm (5.91 in)    |
| Height               | 400 mm (15.75 in)   |
| Depth                | 245 mm (9.65 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 (Not in the scope of the ecodesign guideline) |
| Reason of exception               | sinusoidal input current                         |

|                              |                                                      |
|------------------------------|------------------------------------------------------|
| 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         | 32.7 kVA                                             |
| Power loss in standby        | 32.2 W (0.1%)                                        |



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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,<br>4 kHz Space-vector modulation |
| Rated apparent power  | 34.2 kVA                                                |
| Power loss in standby | 32.2 W (0.1%)                                           |

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

