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# Data sheet for SINAMICS G120X

## Article No. : 6SL3220-1YH50-1CP0



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 | 500 ... 690 V +10 % -20 % | |
| Line frequency | 47 ... 63 Hz | |
| **Rated voltage** | **690V IEC** | **600V NEC** |
| Rated current (LO) | 171.00 A | 171.00 A |
| Rated current (HO) | 158.20 A | 158.20 A |
| **Output** | | |
| Number of phases | 3 AC | |
| **Rated voltage** | **690V IEC** | **600V NEC** [1] |
| Rated power (LO) | 160.00 kW | 150.00 hp |
| Rated power (HO) | 132.00 kW | 150.00 hp |
| Rated current (LO) | 171.00 A | 171.00 A |
| Rated current (HO) | 144.00 A | 144.00 A |
| Rated current (IN) | 175.00 A | |
| Max. output current | 231.00 A | |
| Pulse frequency | 2 kHz | |
| Output frequency for vector control | 0 ... 200 Hz | |
| Output frequency for V/f control | 0 ... 550 Hz | |
| **Overload capability** | | |
| Low Overload (LO) | | |
| 110% base load current IL for 60 s in a 300 s cycle time | | |
| High Overload (HO) | | |
| 150% x base load current IH for 60 s within a 600 s cycle time | | |

### General tech. specifications

| | |
|---|---|
| Power factor λ | 0.90 ... 0.95 |
| Offset factor cos φ | 0.99 |
| Efficiency η | 0.98 |
| Sound pressure level (1m) | 74 dB |
| Power loss [3] | 2.930 kW |
| Filter class (integrated) | RFI suppression filter for Category C3 |
| EMC category (with accessories) | Category C3 |
| Safety function "Safe Torque Off" | without SIRIUS device (e.g. via S7-1500F) |

### Communication

| | |
|---|---|
| Communication | PROFIBUS DP |

### Inputs / outputs

| | |
|---|---|
| **Standard digital inputs** | |
| Number | 6 |
| Switching level: 0 → 1 | 11 V |
| Switching level: 1 → 0 | 5 V |
| Max. inrush current | 15 mA |
| **Fail-safe digital inputs** | |
| Number | 1 |
| **Digital outputs** | |
| Number as relay changeover contact | 2 |
| Output (resistive load) | DC 30 V, 5.0 A |
| Number as transistor | 0 |
| **Analog / digital inputs** | |
| Number | 2 (Differential input) |
| Resolution | 10 bit |
| **Switching threshold as digital input** | |
| 0 → 1 | 4 V |
| 1 → 0 | 1.6 V |
| **Analog outputs** | |
| Number | 1 (Non-isolated output) |
| **PTC/ KTY interface** | |
| 1 motor temperature sensor input, sensors that can be connected PTC, KTY and Thermo-Click, accuracy ±5 °C | |

### 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 | No |
| Encoderless torque control | No |
| Torque control, with encoder | No |

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### Ambient conditions

| | |
|---|---|
| Standard board coating type | Class 3C2, according to IEC 60721-3-3: 2002 |
| Cooling | Air cooling using an integrated fan |
| Cooling air requirement | 0.210 m³/s (7.416 ft³/s) |
| Installation altitude | 1,000 m (3,280.84 ft) |
| **Ambient temperature** | |
| Operation | -20 ... 45 °C (-4 ... 113 °F) |
| Transport | -40 ... 70 °C (-40 ... 158 °F) |
| Storage | -25 ... 55 °C (-13 ... 131 °F) |
| **Relative humidity** | |
| Max. operation | 95 % At 40 °C (104 °F), condensation and icing not permissible |

### Connections

| | |
|---|---|
| **Signal cable** | |
| Conductor cross-section | 0.15 ... 1.50 mm² (AWG 24 ... AWG 16) |
| **Line side** | |
| Version | M10 screw |
| Conductor cross-section | 35.00 ... 2 x 185.00 mm² (AWG 1 ... MCM 2 x 350) |
| **Motor end** | |
| Version | M10 screw |
| Conductor cross-section | 35.00 ... 2 x 185.00 mm² (AWG 1 ... MCM 2 x 350) |
| **DC link (for braking resistor)** | |
| PE connection | M10 screw |
| **Max. motor cable length** | |
| Shielded | 150 m (492.13 ft) |

### Mechanical data

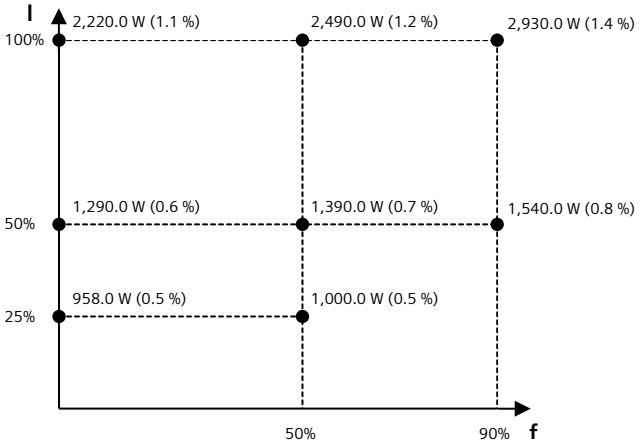
| | |
|---|---|
| Degree of protection | IP20 / UL open type |
| Frame size | FSG |
| Net weight | 105 kg (231.49 lb) |
| **Dimensions** | |
| Width | 305 mm (12.01 in) |
| Height | 999 mm (39.33 in) |
| Depth | 369 mm (14.53 in) |

### Standards

| | |
|---|---|
| Compliance with standards | UL, cUL, CE, C-Tick (RCM), EAC, KCC, SEMI F47, REACH |
| CE marking | EMC Directive 2004/108/EC, Low-Voltage Directive 2006/95/EC |

### Converter losses to IEC61800-9-2*

| | |
|---|---|
| Efficiency class | IE2 |
| Comparison with the reference converter (90% / 100%) | 35.2 % |




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

[1] The output current and HP ratings are valid for the voltage range 550V-600V

[3] Typical value. More information can be found in the element group "Converter losses to IEC 61800-9-2" in this datasheet.

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### I/O Extension Module

#### Inputs / outputs

**Digital inputs**

| | |
|---|---|
| Number of digital inputs [1] | 2 |
| Conductor cross-section | 0.5 ... 1.5 mm² (AWG 21 ... AWG 16)<br>Alternatively 2 x 0.5 mm² |
| Input voltage (0→1) | 11 V |
| Input voltage (1→0) | 5 V |
| Input voltage, max. | 30 V |

**Digital outputs**

| | |
|---|---|
| Number of digital outputs | 4 |
| Conductor cross-section | 1.5 mm² (AWG 16) |
| Output current [2] | 2 A |

**Analog inputs**

| | |
|---|---|
| Number of analog inputs [3] | 2 |
| Conductor cross-section | 0.5 ... 1.5 mm² (AWG 21 ... AWG 16)<br>alternatively 2*0.5 mm² |
| Current | 0 ... 20 mA |

**Analog outputs**

| | |
|---|---|
| Number of analog outputs | 2 |
| Type of analog outputs [4] | Non-isolated output |
| Conductor cross-section | 0.5 ... 1.5 mm² (AWG 21 ... AWG 16)<br>Alternatively 2 x 0.5 mm² |
| Output voltage | 0 ... 10 V |
| Output current | 0 ... 20 mA |

#### Mechanical data

**Dimensions**

| | |
|---|---|
| Width | 71 mm (2.80 in) |
| Height | 117 mm (4.61 in) |
| Depth | 27 mm (1.06 in) |

[1] DI 6: digital input; DI 7: P or M switch; DI COM: Input for Control Unit interface (24 V out, max. 250 mA)

[2] The max. current depends on the temperature and the size of the connected converted. It varies between 2 A and 3 A at 30 V DC.

[3] 2 analog inputs for the connection of Pt1000/Ni1000 temperature sensors. One of which can be optionally used as analog input.

[4] Switchable between voltage (0 ... 10 V) and current (0 ... 20 mA) using a parameter