

## Data sheet for SINAMICS G120X

Article No. : 6SL3220-1YC40-1UP0



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         | 200 ... 240 V +10 % -20 % |                 |
| Line frequency       | 47 ... 63 Hz              |                 |
| <b>Rated voltage</b> | <b>200V IEC</b>           | <b>240V NEC</b> |
| Rated current (LO)   | 172.00 A                  | 172.00 A        |
| Rated current (HO)   | 149.00 A                  | 149.00 A        |

#### Output

|                      |                 |                               |
|----------------------|-----------------|-------------------------------|
| Number of phases     | 3 AC            |                               |
| <b>Rated voltage</b> | <b>200V IEC</b> | <b>240V NEC <sup>1)</sup></b> |
| Rated power (LO)     | 55.00 kW        | 75.00 hp                      |
| Rated power (HO)     | 45.00 kW        | 60.00 hp                      |
| Rated current (LO)   | 192.00 A        | 192.00 A                      |
| Rated current (HO)   | 154.00 A        | 154.00 A                      |
| Rated current (IN)   | 197.00 A        |                               |
| Max. output current  | 260.00 A        |                               |

|                                     |              |
|-------------------------------------|--------------|
| Pulse frequency                     | 4 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 $\lambda$            | 0.90 ... 0.95 |
| Offset factor $\cos \phi$         | 0.99          |
| Efficiency $\eta$                 | 0.96          |
| Sound pressure level (1m)         | 72 dB         |
| Power loss <sup>3)</sup>          | 2.430 kW      |
| Filter class (integrated)         | Unfiltered    |
| EMC category (with accessories)   | without       |
| Safety function "Safe Torque Off" | without       |

### 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  $\pm 5$  °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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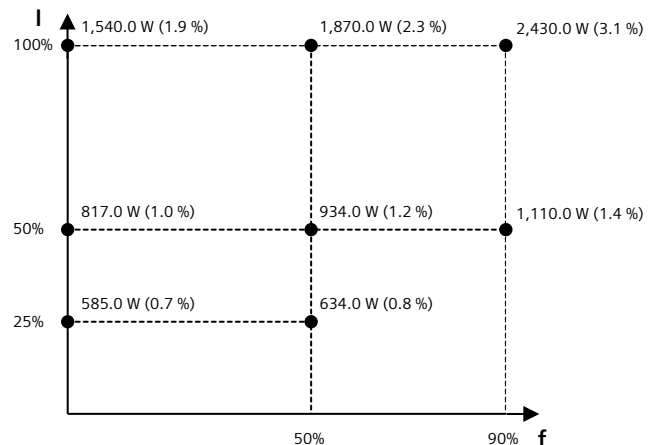
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| Ambient conditions          |  |
|-----------------------------|--|
| Standard board coating type | Class 3C2, according to IEC 60721-3-3: 2002                    |
| Cooling                     | Air cooling using an integrated fan                            |
| Cooling air requirement     | 0.153 m <sup>3</sup> /s (5.403 ft <sup>3</sup> /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 mm <sup>2</sup><br>(AWG 24 ... AWG 16)            |
| Line side                      |   |
| Version                        | M10 screw   |
| Conductor cross-section        | 35.00 ... 2 x 120.00 mm <sup>2</sup><br>(AWG 1 ... AWG 2 x 4/0) |
| Motor end                      |   |
| Version                        | M10 screw   |
| Conductor cross-section        | 35.00 ... 2 x 120.00 mm <sup>2</sup><br>(AWG 1 ... AWG 2 x 4/0) |
| DC link (for braking resistor) |   |
| PE connection                  | M10 screw   |
| Max. motor cable length        |   |
| Shielded                       | 300 m (984.25 ft)   |
| Unshielded                     | 450 m (1,476.38 ft)   |

| Mechanical data           |   |
|---------------------------|---|
| Degree of protection      | IP20 / UL open type   |
| Frame size                | FSF   |
| Net weight                | 26.7 kg (58.86 lb)  |
| Dimensions                |   |
| Width                     | 305 mm (12.01 in)   |
| Height                    | 709 mm (27.91 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%) | 65.0 % |



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.

\*converted values

<sup>1)</sup>The output current and HP ratings are valid for the voltage range 220V-240V

<sup>3)</sup>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 <sup>1)</sup> | 2  |
| Conductor cross-section                | 0.5 ... 1.5 mm <sup>2</sup> (AWG 21 ... AWG 16)<br>Alternatively 2 x 0.5 mm <sup>2</sup> |
| 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 mm <sup>2</sup> (AWG 16) |
| Output current <sup>2)</sup> | 2 A                          |

##### Analog inputs

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

##### Analog outputs

|                                      |  |
|--------------------------------------|--|
| Number of analog outputs             | 2  |
| Type of analog outputs <sup>4)</sup> | Non-isolated output  |
| Conductor cross-section              | 0.5 ... 1.5 mm <sup>2</sup> (AWG 21 ... AWG 16)<br>Alternatively 2 x 0.5 mm <sup>2</sup> |
| 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)  |

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

<sup>2)</sup>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.

<sup>3)</sup>2 analog inputs for the connection of Pt1000/Ni1000 temperature sensors. One of which can be optionally used as analog input.

<sup>4)</sup>Switchable between voltage (0 ... 10 V) and current (0 ... 20 mA) using a parameter