

Article No. : 6SL3220-3YH32-1AF0

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                                                   | 500 ... 690 V +10 % -20 %                 |                        |
| Line frequency                                                 | 47 ... 63 Hz                              |                        |
| Rated voltage                                                  | 690V IEC                                  | 600V NEC               |
| Rated current (LO)                                             | 25.00 A                                   | 25.00 A                |
| Rated current (HO)                                             | 23.40 A                                   | 23.40 A                |
| Output                                                         |                                           |                        |
| Number of phases                                               | 3 AC                                      |                        |
| Rated voltage                                                  | 690V IEC                                  | 600V NEC <sup>1)</sup> |
| Rated power (LO)                                               | 22.00 kW                                  | 25.00 hp               |
| Rated power (HO)                                               | 18.50 kW                                  | 20.00 hp               |
| Rated current (LO)                                             | 27.00 A                                   | 27.00 A                |
| Rated current (HO)                                             | 23.00 A                                   | 23.00 A                |
| Rated current (IN)                                             | 28.00 A                                   |                        |
| Max. output current                                            | 37.00 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)                                      | 70 dB                                     |                        |
| Power loss <sup>3)</sup>                                       | 0.617 kW                                  |                        |
| Filter class (integrated)                                      | RFI suppression filter for Category C2    |                        |
| EMC category (with accessories)                                | Category C2                               |                        |
| Safety function "Safe Torque Off"                              | without SIRIUS device (e.g. via S7-1500F) |                        |
| Communication                                                  |                                           |                        |
| Communication                                                  | PROFINET, EtherNet/IP                     |                        |

| 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  |

## Data sheet for SINAMICS G120X

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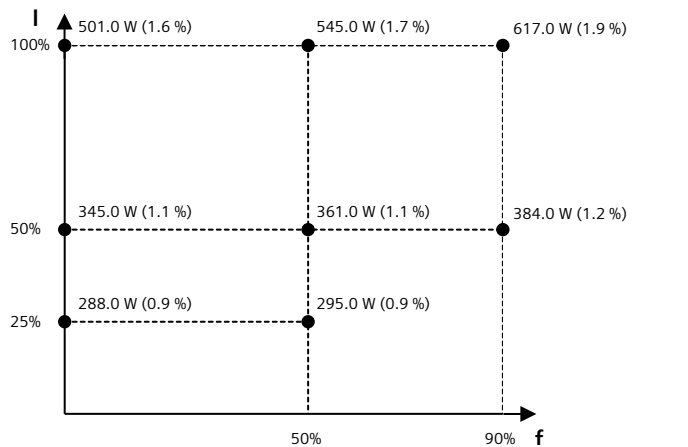
| Ambient conditions          |                                                                |
|-----------------------------|----------------------------------------------------------------|
| Standard board coating type | Class 3C2, according to IEC 60721-3-3: 2002                    |
| Cooling                     | Air cooling using an integrated fan                            |
| Cooling air requirement     | 0.055 m³/s (1.942 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                        | screw-type terminal                   |
| Conductor cross-section        | 10.00 ... 35.00 mm² (AWG 8 ... AWG 2) |
| Motor end                      |                                       |
| Version                        | Screw-type terminals                  |
| Conductor cross-section        | 10.00 ... 35.00 mm² (AWG 8 ... AWG 2) |
| DC link (for braking resistor) |                                       |
| PE connection                  | Screw-type terminals                  |
| Max. motor cable length        |                                       |
| Shielded                       | 100 m (328.08 ft)                     |

| Mechanical data      |                     |
|----------------------|---------------------|
| Degree of protection | IP20 / UL open type |
| Frame size           | FSD                 |
| Net weight           | 18.3 kg (40.34 lb)  |
| Dimensions           |                     |
| Width                | 200 mm (7.87 in)    |
| Height               | 472 mm (18.58 in)   |
| Depth                | 248 mm (9.76 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%) | 39.3 % |



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 550V-600V  
<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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|                                                    |                                                                      |
|----------------------------------------------------|----------------------------------------------------------------------|
| Operator panel: Intelligent Operator Panel (IOP-2) |                                                                      |
| Screen                                             |                                                                      |
| Display design                                     | LCD color                                                            |
| Screen resolution                                  | 320 x 240 Pixel                                                      |
| Mechanical data                                    |                                                                      |
| Degree of protection                               | IP55 / UL type 12                                                    |
| Net weight                                         | 0.134 kg (0.30 lb)                                                   |
| Dimensions                                         |                                                                      |
| Width                                              | 70.00 mm (2.76 in)                                                   |
| Height                                             | 106.85 mm (4.21 in)                                                  |
| Depth                                              | 19.65 mm (0.77 in)                                                   |
| Ambient conditions                                 |                                                                      |
| Ambient temperature                                |                                                                      |
| Operation                                          | 0 ... 50 °C (32 ... 122 °F)<br>55 °C only with door installation kit |
| Storage                                            | -40 ... 70 °C (-40 ... 158 °F)                                       |
| Transport                                          | -40 ... 70 °C (-40 ... 158 °F)                                       |
| Relative humidity at 25°C during                   |                                                                      |
| Max. operation                                     | 95 %                                                                 |
| Approvals                                          |                                                                      |
| Certificate of suitability                         | CE, cULus, EAC, KCC, RCM                                             |

## Data sheet for SINAMICS G120X

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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