SINAMICS G120X
Master the elements in infrastructure applications

siemens.com/sinamics-g120x
Harness the forces of the elements – for the benefit of all

SINAMICS G120X series belongs to the well-proven family of SINAMICS converters. It has been optimized for applications where water and air are moved – for example, for infrastructure projects with a focus on the water/wastewater sectors as well as HVAC applications in building automation. SINAMICS G120X is impressive as a result of its maximum degree of simplicity, reliability, and efficiency. It plays its role in harnessing the force of the elements for the benefit for all.

**Highlights – water/wastewater**

- Seamless and compact drive system up to 630 kW/700 hp
- Integrated in SIMATIC PCS 7
- Rugged design with coated printed circuit boards for reliable operation
- EMC-optimized for long motor feeder cables without requiring an additional output reactor
- Integrated STO safety function certified according to SIL 3

**Highlights – heating, ventilation, and air conditioning (HVAC)**

- Simple setup and optimized user interface
- Reliable operation with favorable costs
- Conforms with EMC and harmonic standards without requiring additional options
- Lower energy consumption using integrated software functions
- Supports building-specific communication
SINAMICS G120X is optimized for applications in infrastructure projects. With a power range extending from 0.75 up to 630 kW, these converters can master each and every challenge.
Water and wastewater applications always under control

SINAMICS G120X converters were developed for the optimum operation of pumps and fans in the water industry. The converters are rugged, reliable, and simple to operate. For utility companies, this means that these devices represent the perfect solution to control their water and wastewater systems.

Water
Drinking water treatment, water transport (pipelines), drinking water networks, drinking water supply, irrigation/sprinkling systems, desalination

Wastewater
Wastewater pumping stations, wastewater treatment

Air
Blowers in wastewater systems and industrial processes

IP20 degree of protection
IP21 degree of protection with protective cover
Admirably suited to address a wide range of sectors

Application examples – water/wastewater:
- Water treatment plants
- Irrigation
- Pumping stations
- Filter and cleaning processes
- Water towers
- Swimming pools
Optimally operating water/wastewater applications

Convincingly simple

- Seamless drive system from 0.75 kW / 1 hp to 630 kW / 700 hp
- Simple to integrate into your existing application
- Simple to maintain by backing up parameters to an SD card and fast fan change
- Simple to set up using the Smart Access Module (Wi-Fi) or the graphic color IOP-2 operator panel
- Simple wizards for water and wastewater applications with pre-installed firmware functions

Convincingly rugged

- The integrated DC link reactor means that the converter operates with high stability under all line supply conditions
- Complies with EMC requirements and supports long cable length
- Complies with line harmonic standards according to EN 61000-3-12
- Is rugged, compact, and corresponds to IP20 and IP21 in an open UL version (optional)
- Can operate under harsh environmental conditions as it is resistant to corrosive pollutants according to Class 3C3

Convincingly efficient

- Highest energy efficiency in conjunction with SIMOTICS synchronous-reluctance motors
- For low dynamic loads, the ECO mode ensures the best possible performance and lowest losses
- Together with PROFINET, supports PROFIenergy to control and reduce energy usage
Specific water/wastewater sector functions

- High degree of connectivity based on communication via PROFINET, EtherNet/IP, PROFIBUS DP, and Modbus RTU
- Integration into SIMATIC PCS 7 via SIMATIC PDM and FDI package as PC tool
- The deragging function allows deposits that have accumulated on the pump impeller to be removed

- The pipe filling mode gently fills empty pipes before the drive system transitions into controlled operation in order to avoid the water hammer effect
- Cavitation detection protects pumps against cavitation and reduces maintenance costs
- The multipump/staging mode allows several pumps to be controlled from just one converter
First choice for a great climate

Simple, reliable, and efficient: SINAMICS G120X is the first choice when it comes to controlling pumps and fans in HVAC applications in the building automation domain. The converter was developed to comply with the highest requirements. Our health and quality of life are simply too valuable to compromise.

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**Air**
Air intake and air discharge fans, fresh air fans, fans for cooling systems, smoke extraction fans, fans for pressurizing systems

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**Water**
Circulating pumps for heating systems, cold water pumps, pumps to increase pressure, pumps for remote heating systems
Power wherever you need it

HVAC application examples:
- Climate-control systems
- Ventilation systems for tunnels and subways
- Refrigeration machine compressors
- Cooling towers
- Heating and cooling systems
- Smoke extraction systems
Optimally operating building automation applications

Convincingly simple

- Simple selection and ordering: The Siemens Drive Technology Configurator generates just one single order number that precisely specifies the converter
- Simple setup using the Smart Access Module or the color IOP-2 operator panel
- Simple wizards for pump and fan applications with pre-installed firmware functions

Convincingly reliable

- Complies with EMC standard EN 61800-3 and standards relating to line harmonics
- Can operate under the widest range of conditions as a result of the wide operating temperature range
- Is rugged, compact, and corresponds to IP20 and IP21 in an open UL version (optional)
- As standard, the electronics and PC board components are protected against corrosive pollutants in the air up to Class 3C2

Convincingly efficient

- Efficiency up to 98%: SINAMICS G120X displays the energy consumption and has additional, integrated energy saving functions
- Operation together with high efficiency motors additionally increases the energy saving potential
- For low dynamic loads, the ECO mode ensures the best possible performance and lowest losses
- In the no-load state, the motor automatically switches off and on to save energy and reduce wear

Smartphones, tablets and PCs
Specific HVAC sector functions

- High degree of building connectivity based on communication via Modbus RTU and BACnet MS/TP
- The flying restart function shortens starting times after brief power failures
- Automatic restart function after power failures
- For smoke extraction systems and emergency ventilation systems, the essential service mode maintains fan operation
- Critical motor speeds are skipped to avoid resonance effects, vibration and wear
- A realtime clock for autonomous time-controlled operation around the clock
- The multipump/staging mode allows several pumps to be controlled from just one converter
MindSphere

SINAMICS G120X

SINAMICS Connect 300 IoT Gateway
The MindSphere application such as Analyze MyDrives facilitates:
- Transparency along the drive train
- Analysis of converter data
- Preventive maintenance

SINAMICS G120X – ready for digitalization

Connected to the cloud via the SINAMICS CONNECT 300 IoT Gateway means that the SINAMICS G120X is ready for digitalization: The states of the converter, motor, and driven load can be visualized and analyzed. The MindSphere Analyze MyDrives application provides you with valuable data to optimize your processes and maintenance strategy. The setup is especially simple using the Smart Access Module via Wi-Fi or the IOP-2 Intelligent Operator Panel, both of which have been optimized for pump and fan applications.
Ordering – it couldn’t be simpler

You can simply configure and order the complete drive using just one 16-digit order number. The following structure shows you how to configure a SINAMICS G120X to specifically address your requirements. Your converter is supplied pre-assembled and can be immediately commissioned.

Selecting the power range

<table>
<thead>
<tr>
<th>Key</th>
<th>18</th>
<th>20</th>
<th>22</th>
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<td>4</td>
<td>5.5</td>
<td>7.5</td>
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<td>400</td>
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<td>5</td>
<td>7.5</td>
<td>10</td>
<td>15</td>
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<td>450</td>
<td>500</td>
<td>–</td>
<td>600</td>
<td>700</td>
<td>–</td>
</tr>
</tbody>
</table>

2 HP (400 V)
3 In progress
## Technical data

| Voltage / power range / frequency | · 3AC 200 V–240 V, -20% / +10%, 0.75–55 kW / 1–55 hp  
|                                  | · 3AC 380 V–480 V, -20% / +10%, 0.75–560 kW / 1–700 hp  
|                                  | · 3AC 500 V–690 V, -20% / +10%, 3–630 kW / 4–700 hp  
|                                  | · 47 / 63 Hz +/-5% |
| Overload capability              | 110%/60 sec or 135%/3 sec \(^{1}\); HO\(^{2}\): 150%/60 sec |
| Degree of protection             | IP20, UL open type, IP21 (with protective cover set) |
| Ambient temperature              | -20 to +45 °C (60 °C with power derating \(^{3}\)) |
| Cooling                          | Fan, IP20 throughput (option) |
| EMC conformance                  | EN 61800-3 Category C2 / C3 (with integrated EMC filter); C1\(^{5}\) |
| Harmonics                        | Integrated DC link reactor, FSA-G, IEC 61000-3-12 |
| Motor cable lengths              | EMC C2 (FSA-G): 150 m, C3 (FSH-J) 100 m, unfiltered converter: up to 300 / 450 m |
| Signal inputs / outputs          | 6DI, 2DO (relay), 2AI [0–10 V; 0 / 4–20 mA], 1AO [0–10 V, 0 / 4–20 mA], 1 input for PTC / KTY / Pt100 / Pt1000 motor temperature sensor |
| I/O expansion modules            | 2DI, 2AO, 4DO (relay), 1 x Pt1000, 1 x Ni1000 |
| Closed-loop control modes        | U/f (linear, square law, FCC, ECO), sensorless vector control (SLVC) |
| Energy functions                 | ECO mode, hibernation mode, bypass, energy flow computer |
| Functions                        | Fixed speed setpoint, PID controller, special pump and fan functions (removing deposits from the pump impeller, pipe filling, essential service mode for extracting smoke ...) |
| P & F protective functions       | Cavitation detection, protection against condensation and frost, blocked pump protection, pipe leakage and dry running protection, no-load, torque and speed monitoring |
| Safety functions                 | STO SIL 3 HW via terminals |
| Brakes                           | A DC brake unit can be connected |
| Communication                    | PROFINET, PROFIBUS, EtherNet/IP, Modbus RTU, USS, BACnet MS/TP, Wi-Fi via SINAMICS G120 Smart Access Module, SD card for parameter cloning |
| Standards                        | CE, UL, cUL, EAC, KC, C-Tick |

\(^{1}\) FSH, J and cycle times, refer to the manual  
\(^{2}\) HO: high overload for cyclic operation  
\(^{3}\) The maximum temperature is 55°C for drives in the PN version  
\(^{4}\) Only available in the 400V version  
\(^{5}\) In progress
## Dimensions

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Power range kW (hp)</th>
<th>Width – mm (inch)</th>
<th>Height – mm (inch)</th>
<th>Depth incl. CU – mm (inch)</th>
<th>Additional depths – mm (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>380–480 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSA</td>
<td>0.75–3 (1–4)</td>
<td>73 (2.8)</td>
<td>232 (9.1)</td>
<td>330 (13)</td>
<td>209 (8.2)</td>
</tr>
<tr>
<td>FSB</td>
<td>4–7.5 (5–10)</td>
<td>100 (3.9)</td>
<td>275 (10.8)</td>
<td>383 (15.1)</td>
<td>209 (8.2)</td>
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<tr>
<td>FSC</td>
<td>11–15 (15–20)</td>
<td>140 (5.5)</td>
<td>295 (11.6)</td>
<td>423 (16.7)</td>
<td>209 (8.2)</td>
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<tr>
<td>FSD</td>
<td>18.5–37 (25–50)</td>
<td>200 (7.9)</td>
<td>472 (18.5)</td>
<td>625 (24.6)</td>
<td>239 (9.4)</td>
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<td>FSE</td>
<td>45–55 (60–75)</td>
<td>275 (10.8)</td>
<td>551 (21.7)</td>
<td>729 (28.7)</td>
<td>239 (9.4)</td>
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<tr>
<td>FSF</td>
<td>75–132 (100–200)</td>
<td>305 (12)</td>
<td>709 (27.9)</td>
<td>969 (38.1)</td>
<td>360 (14.2)</td>
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<td>FSG</td>
<td>160–250 (250–400)</td>
<td>305 (12)</td>
<td>999 (39.3)</td>
<td>1255 (49.4)</td>
<td>360 (14.2)</td>
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<tr>
<td>FSH</td>
<td>315–400 (500)</td>
<td>548 (21.6)</td>
<td>1696 (66.7)</td>
<td>–</td>
<td>393 (15.5)</td>
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<tr>
<td>FSJ</td>
<td>450–560 (700)</td>
<td>801 (31.5)</td>
<td>1621 (63.8)</td>
<td>–</td>
<td>393 (15.5)</td>
</tr>
</tbody>
</table>

### Notes:
- **FS A–G**
  Side-by-side mounting possible without any intermediate space
- **FS H, J**
  A clearance of 30 mm (1.18") should be maintained between the converters

1 Additional depth of 11.8 mm / 9.8 mm is required if an operator panel / G120 Smart Access is mounted on the I/O expansion module.
Do you place emphasis on maximum availability and cost efficiency along with optimum asset management? We can provide you with a unique offer based on the SINAMICS G120X:

In the case of service, within a period of up to 7 ½ years, you can have your converter repaired or replaced.

Your advantages:

· Security of service for up to 7 ½ years – half a year is free, six years will be charged for at a fair lump-sum price
· Maximum protection of your investment
· Our experts support you over the complete converter lifecycle

Register your SINAMICS G120X online and obtain our service package free-of-charge for the first six months: siemens.com/drive-registration

Our service package – replacement guarantee for up to 7 ½ years

- 24 months standard warranty
- + 6 months free warranty by product registration
- + 3 years exchange-extension
- + 5 years exchange-extension

Siemens Drive Technology Configurator selection tool

You can also order SINAMICS G120X converters in the Internet using the Siemens Drive Technology Configurator. This configurator supports you when selecting the optimum product version for your specific application.

Configurator address:

siemens.com/dt-configuration

SINAMICS SELECTOR App

Configure your desired converters in the power range from 0.12 kW to 630 kW intuitively and quickly. With just a few clicks, you get to the correct part numbers – from anywhere. Our app contains the products SINAMICS V20, G120, G120C, G120X, and G120P.

Download the SINAMICS SELECTOR app today from the App Store or Google Play.

siemens.com/sinamics-selector
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