

**SIEMENS**

*Ingenuity for life*



# SINAMICS G120X

Master the elements in  
infrastructure applications

[siemens.com/sinamics-g120x](https://www.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.



IP20 degree of protection

IP21 degree of protection with protective cover

## 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





## 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

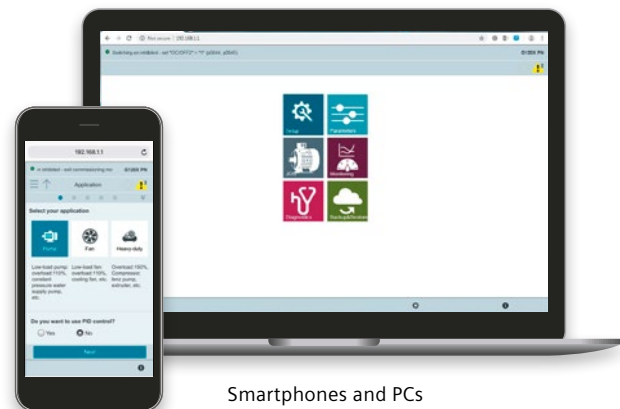


- The integrated DC link reactor means that the converter operates with high stability under all line supply conditions
- Complies with EMC requirements and supports long cable length
- Complies with line harmonic standards according to EN 61000-3-12
- Is rugged, compact, and corresponds to IP20 and 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 PROFinergy to control and reduce energy usage



Smartphones and PCs

# 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

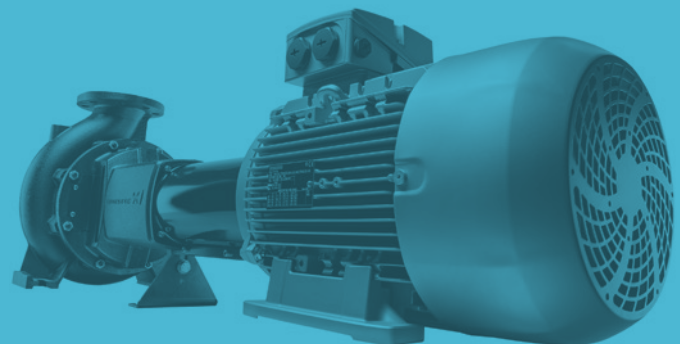


The multipump/staging mode allows several pumps to be controlled from just one converter



SINAMICS G120X with SAM

SINAMICS G120X with IOP-2



# 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.



IP20 degree of protection

IP21 degree of protection with protective cover

## Air

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

## 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



IOP-2



SAM



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



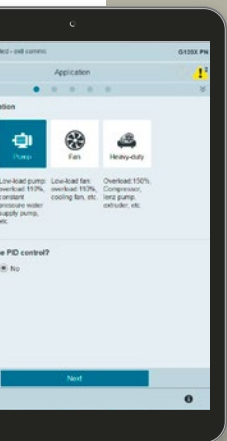
Critical motor speeds are skipped to avoid resonance effects, vibration and wear



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



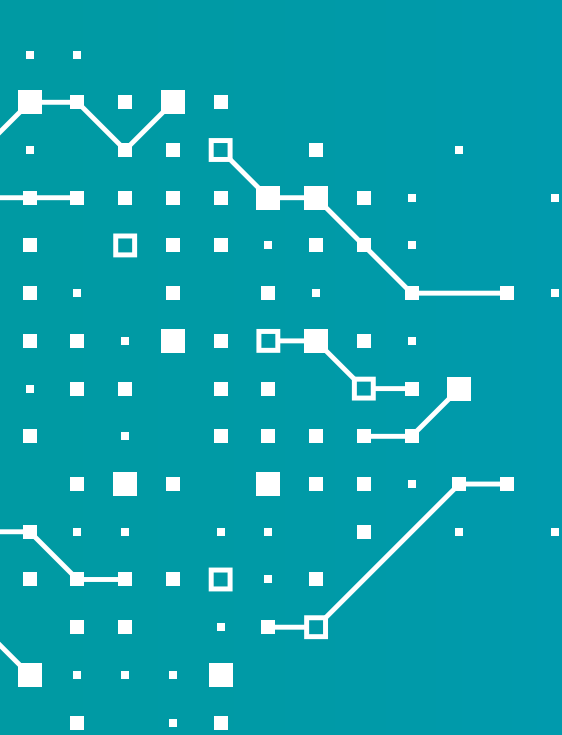
# MindSphere



SINAMICS G120X



SINAMICS Connect 300 IoT Gateway



The MindSphere application such as **Analyze MyDrives** facilitates:

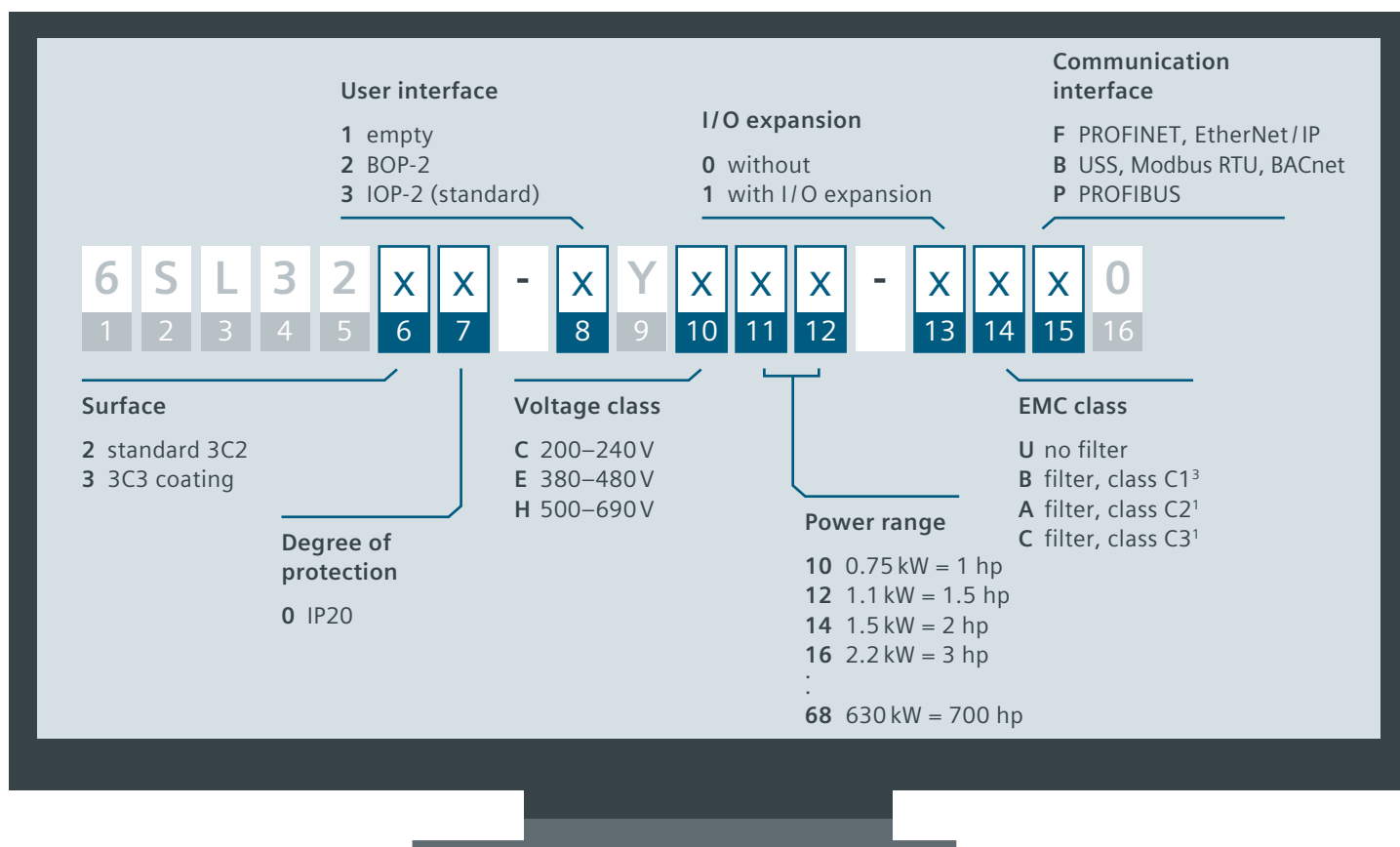
- Transparency along the drive train
- Analysis of converter data
- Preventive maintenance

# 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

Key	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68
kW	3	4	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	250	315	355	400	450	500	560	630
hp <sup>2</sup>	4	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	200	250	300	400	–	450	500	–	600	700	–

<sup>1</sup> C2: Frame sizes A–G, C3: Frame sizes F–J

<sup>2</sup> HP (400V)

<sup>3</sup> In progress

## Technical data

Voltage / power range / frequency	<ul style="list-style-type: none"> <li>· 3AC 200V–240V, -20%/+10%, 0.75–55 kW / 1–55 hp</li> <li>· 3AC 380V–480V, -20%/+10%, 0.75–560 kW / 1–700 hp</li> <li>· 3AC 500V–690V, -20%/+10%, 3–630 kW / 4–700 hp</li> <li>· 47 / 63 Hz +/-5%</li> </ul>
Overload capability	110%/60 sec or 135%/3 sec <sup>1</sup> ; HO <sup>2</sup> : 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 <sup>3</sup> )
Cooling	Fan, IP20 throughput (option)
EMC conformance	EN 61800-3 Category C2/C3 (with integrated EMC filter); C1 <sup>5</sup>
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	<b>6DI, 2DO</b> (relay), <b>2AI</b> [0–10V; 0/4–20 mA], <b>1AO</b> [0–10V, 0/4–20 mA], <b>1</b> 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 <sup>4</sup> , C-Tick

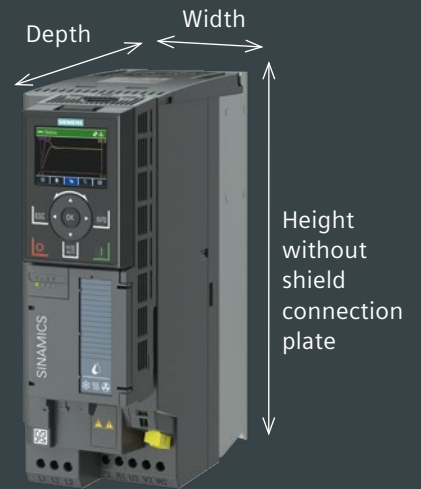
<sup>1</sup> FSH, J and cycle times, refer to the manual

<sup>2</sup> HO: high overload for cyclic operation

<sup>3</sup> The maximum temperature is 55 °C for drives in the PN version

<sup>4</sup> Only available in the 400 V version

<sup>5</sup> In progress



## Dimensions

Frame size	Power range kW (hp) 380–480 V	Width – mm (inch)	Height – mm (inch)		Depth incl. CU – mm (inch)	Additional depths – mm (inch)		
			without shield connection plate	with shield connection plate		with operator panel	with G120 Smart Access	with I/O expansion module
FSA	0.75–3 (1–4)	73 (2.8)	232 (9.1)	330 (13)	209 (8.2)	9 (0.4)	7 (0.3)	27 (1.1) <sup>1</sup>
FSB	4–7.5 (5–10)	100 (3.9)	275 (10.8)	383 (15.1)	209 (8.2)	9 (0.4)	7 (0.3)	27 (1.1) <sup>1</sup>
FSC	11–15 (15–20)	140 (5.5)	295 (11.6)	423 (16.7)	209 (8.2)	9 (0.4)	7 (0.3)	27 (1.1) <sup>1</sup>
FSD	18.5–37 (25–50)	200 (7.9)	472 (18.5)	625 (24.6)	239 (9.4)	9 (0.4)	7 (0.3)	27 (1.1) <sup>1</sup>
FSE	45–55 (60–75)	275 (10.8)	551 (21.7)	729 (28.7)	239 (9.4)	9 (0.4)	7 (0.3)	27 (1.1) <sup>1</sup>
FSF	75–132 (100–200)	305 (12)	709 (27.9)	969 (38.1)	360 (14.2)	9 (0.4)	7 (0.3)	27 (1.1) <sup>1</sup>
FSG	160–250 (250–400)	305 (12)	999 (39.3)	1255 (49.4)	360 (14.2)	9 (0.4)	7 (0.3)	27 (1.1) <sup>1</sup>
FSH	315–400 (500)	548 (21.6)	1696 (66.7)	–	393 (15.5)	–	–	–
FSJ	450–560 (700)	801 (31.5)	1621 (63.8)	–	393 (15.5)	–	–	–

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

<sup>1</sup> 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



## 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](https://www.siemens.com/sinamics-selector)

## Siemens Drive Technology Configurator selection tool

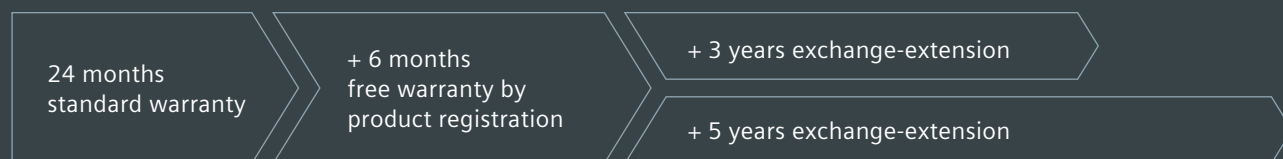
You can also order SINAMICS G120X converters in the Internet using the Siemens Drive Technology Configurator. This configurator supports you when selecting the optimum product version for your specific application.

**Configurator address:**



[siemens.com/dt-configurator](https://www.siemens.com/dt-configurator)

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



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](https://www.siemens.com/drive-registration)

**Published by  
Siemens AG**

Digital Industries  
Customer Services  
P.O. Box 31 80  
91050 Erlangen, Germany

Article No. DIMC-B10022-00-7600  
Dispo 21500  
HL 19074676 WS 09190.5  
© Siemens 2019

Subject to changes and errors. The information given in this document only contains general descriptions and / or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.