

SIEMENS

SINAMICS G220

The high-performance variable frequency drive for industry

usa.siemens.com/sinamics-g220



Efficient. Secure. Future-proof.

Meet current and future challenges in motor control

SINAMICS G220 is the new and innovative variable frequency drive to meet current and future challenges for industry. Most objectives in motor control involve energy efficiency, increasing productivity and system availability to reduce downtime—not only right now, but also years down the line. This is a drive that enables you to meet these objectives. Thanks to its advanced hardware and software, SINAMICS G220 takes digital drive technology to a new level, making your applications more efficient, secure and future-proof.



Efficient.

- ✓ Energy efficient, making your applications more sustainable
- ✓ Ease-of-use with user-friendly selection, configuration, commissioning and engineering tools
- ✓ Grid friendly low harmonic technology
- ✓ Enhanced motor control
- ✓ Integrated web server simplifies user interface
- ✓ Integration in TIA Portal



Secure.

- ✓ Safety Integrated functions for personnel and plant protection (SIL3 and PLe)
- ✓ Secure technology integrated, guaranteeing safe and reliable operation
- ✓ ATEX certified motor protection
- ✓ Reduce downtime with S2 System Redundancy
- ✓ UL Type 12/IP55 protection and Class 3C3 coating
- ✓ An innovative UL 61800-5-1 compliant design with up to 100kA SCCR



Future-proof.

- ✓ Future-proof solution, opening up new possibilities via digitalization
- ✓ Seamless integration into automation systems
- ✓ Digital twin technology to optimize machines and processes
- ✓ Cloud and Industrial Edge connectivity to monitor and enhance operations
- ✓ Hardware and software options for a perfect solution fit
- ✓ Sustainability designed into all product life cycle phases



The seamless power range at a glance

SINAMICS G220		SINAMICS G220 Clean Power				
Target verticals						
	Food and Beverage	Pharma	Oil and Gas	Chemicals	Marine	General Machinery
Protective coatings	Class 3C2 Standard, Class 3C3 optional; per IEC 60721-3-3: 2002					
EMC line filter	200 ... 240V: unfiltered 380 ... 500V: unfiltered, optional Category C2 filter			380...500V: integral Category C2 filter with removable grounding screw for operation on ungrounded or delta (IT) systems. See manual.		
Cooling	Air cooling using an integrated fan					
Ambient temperatures	UL Open Type/IP20: –20 to 45° C / to 60° C (> 45° C with derating) UL Type 12/IP55: –20 to 40° C / to 55° C (> 40° C with derating)					
Motor cable length	< 150 m shielded cable meets IEC 61800-3 EMC Category C2 < 300 m unshielded cable without dv/dt filtering with no EMC requirements					
Motor supported	Asynchronous motor (induction), synchronous reluctance motor, permanent magnet motor					
Motor control	U/f, FCC, ECO, vector control encoderless or with encoder, torque control encoderless or with encoder*					
Overload capability	Constant Torque (CT) or High Overload (HO): 200% 3 s, 150% 57 s Variable Torque (VT) or Low Overload (LO): 150% 3s, 110% 57s every 300 s					
Inputs/outputs	6 DI and 1 Fail-safe dual channel input (factory configured as STO), 3 DO (1 NO and 2 NO/NC relays) and 1 Fail-safe DO, 2 AI, 1 AO, 1 input for PTC/KTY84/Pt1000 motor temperature sensor					
Communication	Options for PROFINET (RT/IRT, MRP and S2 redundancy), Modbus TCP/IP, EtherNet/IP, Profibus and Modbus RTU					
Safety functions	Integrated: Safe Torque Off (STO), Safe Stop 1 (SS1), SIL 3, PL e, Cat. 4 via terminals or PROFIsafe SINAMICS Safety Integrated Extended license: SS1, SS1E, SS2, SS2E, SLS, SLA, SSM, SDI, SOS					

* Possible with synchronous reluctance and SINAMICS Motor Control Extended license.

Introducing Clean Power technology

The SINAMICS G220 Clean Power variable frequency drive ensures optimal power quality and compliance with the strictest grid standards. Its industry-leading, compact design allows for seamless and quick integration, making it a best-in-class solution where a grid friendly installation is required in the process, hybrid and Infrastructure industries.

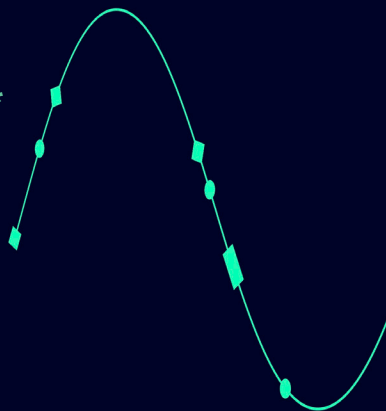


Grid compliance

Protect your power network by meeting the most stringent harmonic standards with SINAMICS G220 Clean Power drive. The integrated Active Infeed Unit keeps harmonics to a minimum (THDi < 5% in compliance with IEEE 519). This also reduces energy losses in the system and provides near unity power factor.

Total harmonic
distortion

< 2%*



Lower your carbon emissions

By reducing harmonics and providing near unity power factor, SINAMICS G220 Clean Power drives lower your carbon footprint and operational costs for a greener, more sustainable future while increasing the availability of the overall system.

* With a relative short-circuit power of 33 in undistorted networks under nominal load conditions up to 90 kW.



The ultimate low-harmonics drive for a sustainable future



Optimal power quality



Robust and seamless space-saving design



space savings up to

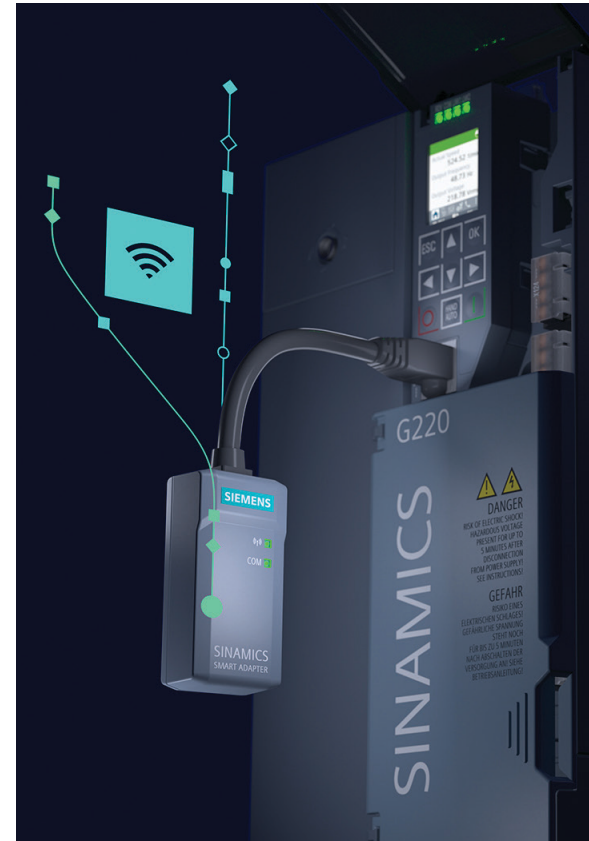
80%



Optimize space and maximize efficiency

SINAMICS G220 Clean Power drives boast an ultra-compact design capable of side-by-side mounting—reducing cabinet footprint by up to 80% compared to traditional setups. No external power components are required, which minimizes space requirements and maximizes efficiency.

Enjoy a **new level of efficiency**



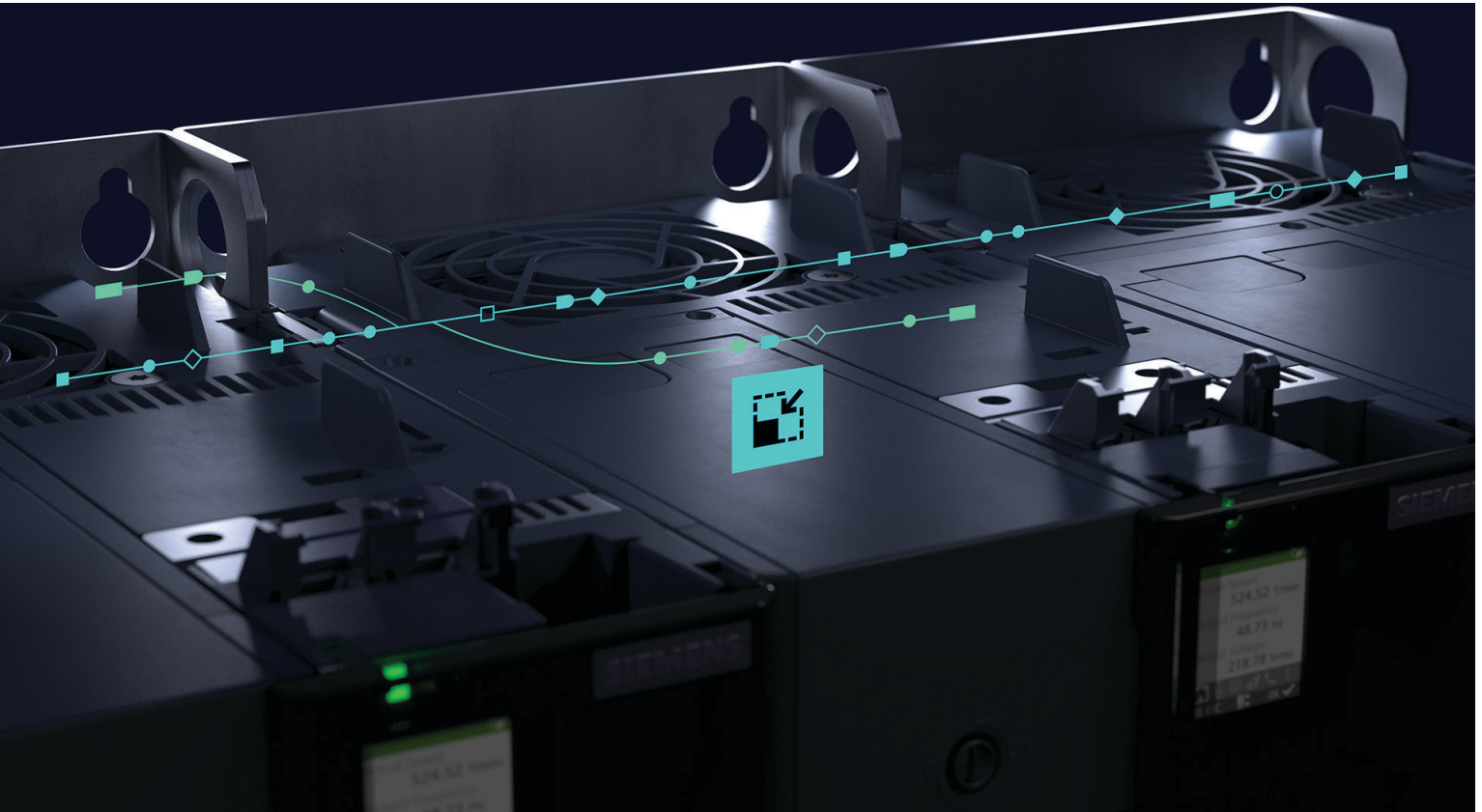
In addition to streamlining the selection and commissioning process, SINAMICS G220 increases productivity and energy efficiency during operation. This reduces both operating costs and CO₂ emissions, making your applications more sustainable.

Intuitive access with integrated web-server

The integrated web-server, accessible wirelessly via the Smart Adaptor or a cable connection with laptop or Smart Drive Interface Pro (SDI Pro), allows for intuitive commissioning, operation, monitoring, diagnostics, maintenance and service.

Achieve optimal dynamics with SINAMICS Motor Control Extended

The drive system offers best-in-class motor control, which allows you to achieve optimal dynamics and be more energy efficient. Synchronous reluctance motors (SRM) can be optimally controlled, even if they are near standstill or have a high load torque.



Integration in TIA Portal and Industrial Edge

- Increase your productivity thanks to seamless interaction with SIMATIC PLCs and HMI.
- Save time and resources in the design phase by using the digital twin and SINAMICS DriveSim Advanced — the ultimate solution for drive system optimization. It is integrated with TIA Portal (SINAMICS Startdrive) and provides advanced customization and detailed functions to quickly simulate different operating conditions and scenarios.
- Optimize your processes based upon more transparent drive train and application data.

Individual features for more productivity and increased sustainability

- Support for high-efficiency motors including IE5 (International Efficiency Class 5)
- Fast PROFINET RT/IRT connection and MRP/MRPD/S2 redundancy via the plug-in communication module
- Designed for long cable lengths, with an integrated DC-link choke in all power ratings*, optional coatings to improve robustness against aggressive environmental condition, EMC line filter and energy-saving functions

* for non-Clean Power variants

Rely on **safe and secure technology**

To keep your machines running smoothly, SINAMICS G220 includes comprehensive functions for machine safety and cybersecurity. All Safety Integrated functions can be directly controlled via PROFI-safe and the terminals, while Security Integrated can be easily managed via the Security wizard and User Management and Access Control (UMAC).

Protect personnel and plants with Safety Integrated

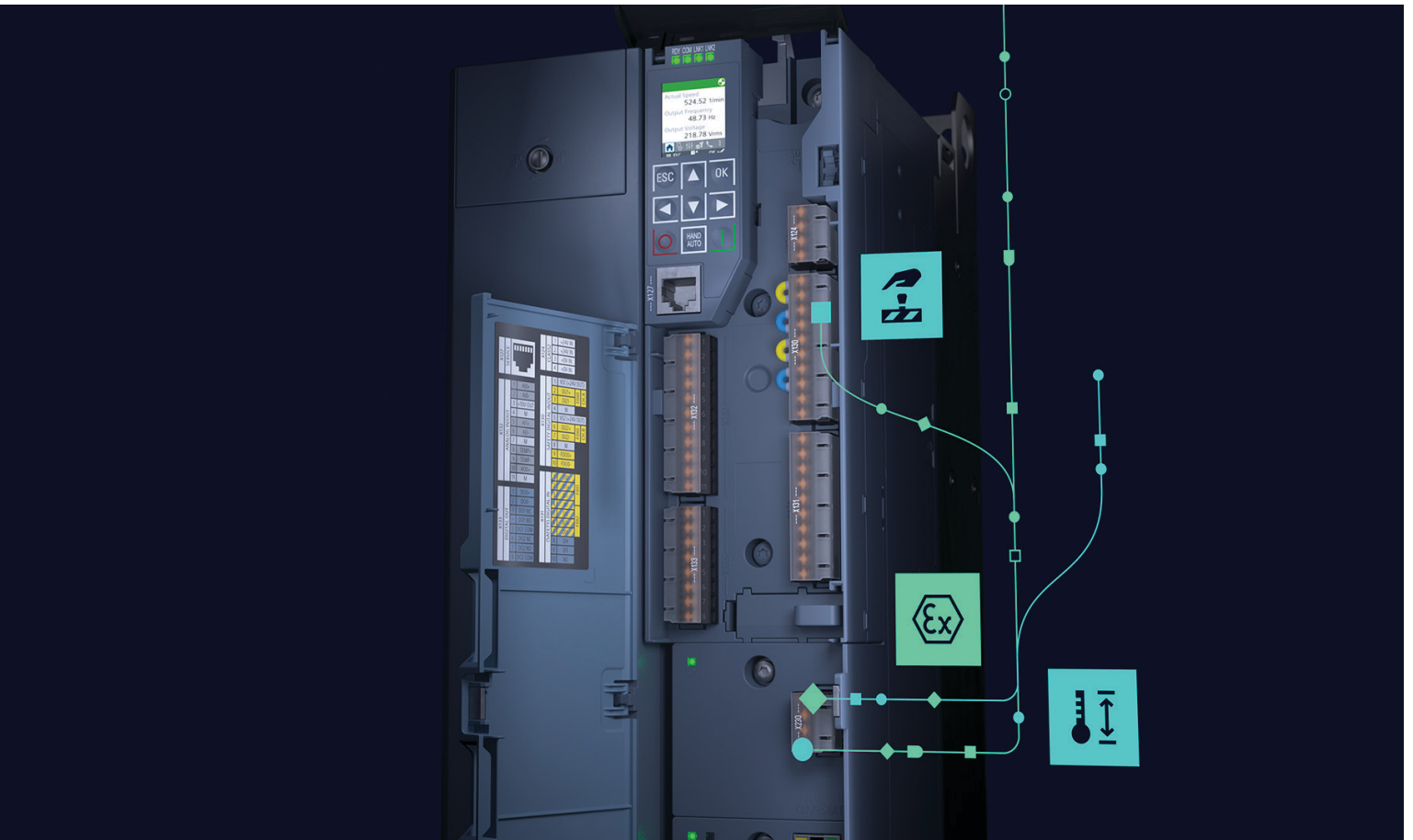
- SINAMICS G220 includes safety functions up to safety integrity level (SIL) 3/performance level (PL) e/Category 4. Commissioning and testing these functions is now much easier due to significantly improved usability concept. Additionally, there is no need to perform manual forced test stop functions to comply with SIL 3/PL e/Cat. 4 anymore. In SINAMICS G220, the forced test stops are now performed automatically.
- For additional safety, Safe Torque Off (STO) is pre-commissioned and immediately ready for use.
- With the Safe Motor Temperature (SMT) option module, the drive is suitable for controlling motors in ATEX environments. The input for PTC sensors is ATEX-certified, ensuring thermal motor protection.
- Extended safety functions can be added easily through software options: Safely-Limited Speed (SLS), Safe Direction (SDI), Safe Speed Monitor (SSM), Safe Stop 1 (SS1), Safe Stop 2 (SS2), Safe Operating Stop (SOS), Safely-Limited Acceleration (SLA)
- A state-of-the-art and innovative UL 61800-5-1 design with up to 100kA SCCR ensures improved personnel safety and robustness.

Keep systems and data safe with Security Integrated

- Combining plant security, network security and system integrity, Security Integrated is a defense-in-depth concept that shields your applications from cybersecurity threats.
- By default, only necessary functions are enabled in the factory settings and they are pre-configured with secure settings.
- Security Integrated ensures safe communication between the drive and TIA Portal or web clients.
- Integrity and authenticity checks prevent the installation of manipulated firmware.

Ensure availability in harsh environments with a high protection class

- SINAMICS G220 is available with IP55/Type 12 enclosure protection, which protects the drive from dust and dripping water.
- Optional Class 3C3 coating on electronic components makes them extremely robust, ensuring longer lifetimes in corrosive environments.
- PROFINET S2 system redundancy guarantees the availability of your systems even in case of a controller failure.



Future-proof your applications

SINAMICS G220 offers digital tools and services to stream-line processes in each phase, making them more time and cost-efficient. Thanks to additional hardware modules and expandable software options, SINAMICS G220 meets the specific requirements to future-proof your business.

Accelerate time-to-market with the digital twin

- SINAMICS G220 allows for easy and fast design and commissioning thanks to the digital twin. This way, you can test the drive's behavior, identify any issues and make adjustments in the design phase—without requiring any hardware.
- The digital twin is available through SINAMICS Startdrive in TIA Portal with SINAMICS DriveSim Advanced, which is the ultimate solution for optimizing your drive system.

Optimize your drive and plants with the IIoT Option Module (OM-IIoT)

- SINAMICS G220 can be easily connected to the Industrial Edge eco-system via the IIoT option module. This module exchanges high frequency data between the drive and Industrial Edge, increasing transparency and providing valuable insights.
- This data can be used for extensive monitoring and diagnostics, which provide the basis for improving the system and boosting its reliability.
- In addition, the insights that are gathered from this data and analyzed via Drivetrain Analyzer Edge can be used for predictive maintenance and prevent downtime.



Enjoy maximum flexibility with hardware and software options

- To fulfill specific requirements, SINAMICS G220 is customizable with communication modules and option modules. They can be easily plugged into the drive and swapped out if any of your requirements change.
- While the majority of SINAMICS Drive Software functions are already included in the firmware, additional software options are available for specific needs. SINAMICS Safety Integrated Extended offers additional safety functions while SINAMICS Motor Control Extended enhances motor performance. Additional software options are available for OPC UA, Positioning functions and Drive Control Chart programming blocks.
- All offerings are included in a seamless portfolio that complies with global standards. As a result, SINAMICS G220 can be implemented in any plant worldwide.

Sustainability designed into all product life cycle phases

- The SINAMICS G220 Environmental Product Declaration (EPD) provides transparency on the environmental impact of the product throughout the life cycle according to ISO 14021 including Life Cycle Impact Assessment.

Digitalization is the key
to making processes
more efficient, increasing
machine availability and
streamlining workflows.



The perfect fit for industry

Thanks to its comprehensive features and innovative design, SINAMICS G220 is suitable for various industries, including processing, manufacturing and marine. It can be implemented in moving, processing, pumping, ventilating, compressing and positioning applications—meeting even the most stringent requirements.



Food and Beverage

With SINAMICS G220, we provide the food and beverage industry with a drive solution that allows them to meet individual customer requirements quickly, flexibly and in the highest quality. In addition, the drive ensures that all processes are energy-efficient and reliable.



Pharma

The pharmaceutical industry is characterized by fast changes and requires a drive system that can match this pace. Thanks to its flexible design, SINAMICS G220 can be easily adapted to changing requirements. Its communication redundancy and security enable reliable production for users while energy efficiency gives users a competitive edge.





Chemicals

Applications in the chemical industry need to be robust, reliable and safe—and the same applies to the drive systems. SINAMICS G220 offers optional Class 3C3 coating and IP55/Type 12 protection, making it fit for use in harsh environments. To further increase availability and reliability, SINAMICS G220 supports S2 redundancy.



Oil and Gas

High levels of efficiency and safety are crucial in the oil and gas industry—SINAMICS G220 can fulfill both requirements. Security Integrated ensures system availability and Safety Integrated functions keep people and machines safe, even in ATEX environments.



Marine

Harmonics need to be strictly limited in the marine industry, which is why SINAMICS G220 Clean Power is the ideal drive solution for auxiliary applications, such as deck machinery or winches. It reduces harmonics in compliance with IEEE 519 and thereby also lowers system losses, increasing the energy efficiency of applications and improving their environmental footprint.



Technical data

SINAMICS G220 drive system

SINAMICS G220



SINAMICS G220 Clean Power



	IP20	IP55/Type 12	IP20	IP55/Type 12
Supply voltage	Rated power kW/hp			
3AC 200 ... 240V	0.55–55 kW / 0.75–75 hp	1.1–55 kW / 1.5–75 hp	—	—
3AC 380 ... 500V	1.1–160 kW / 1.5–200 hp	1.1–110 kW / 1.5–150 hp	7.5–160 kW / 10–200 hp	7.5–110 kW / 10–150hp

Efficient usability is achieved through the integrated **SINAMICS Smart Drive Interface (SDI Standard)**



Hardware options



Operator panel

SINAMICS SDI Pro 5.5"

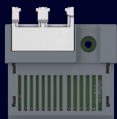
Color touch display (5.5"), multilingual operator interface, multi-drive access and available enclosure door mounting kit



Wi-Fi access

SINAMICS Smart Adapter

Wi-Fi connection to access the drive via mobile devices (smartphone, tablet, laptop)



Communication modules

CM-PN, PROFINET, Modbus TCP/IP, EtherNet/IP™



CM-DP, PROFIBUS

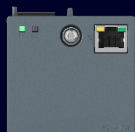


CM-RS485, Modbus RTU



Optional modules

OM-DQ (DRIVE-CLiQ) Fast connection and setup via two DRIVE-CLiQ ports



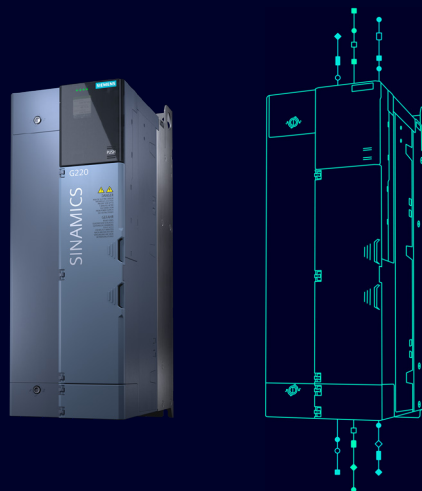
OM-IIoT (Industrial Internet of Things)

High-frequency data transfer to Industrial Edge



OM-SMT (Safe Motor Temperature)

ATEX-certified input for PTC sensors of motors in Ex-environment



Software options



SINAMICS Safety Extended

SS1, SS1E, SS2, SS2E, SOS, SLS, SLA, SSM, SDI



SINAMICS Motor Control Extended

High-performance encoder-less closed-loop motor control from standstill



SINAMICS OPC UA Single Extended

Seamless connectivity for next generation applications



SINAMICS Positioning Extended

Powerful integrated positioning



SINAMICS DCC Extended

Flexible software tool with graphical programming up to 100 blocks



SINAMICS DCC Advanced

Flexible software tool with graphical programming up to 500 blocks

Technical Data

SINAMICS G220

IP20



Frame size	Supply voltage 3AC 200...240V	Supply voltage 3AC 380...500V	Height mm / (in)	Width mm / (in)	Depth mm / (in)
FSA	0.55 ... 2.2kW (0.75 ... 3 hp)	1.1 ... 4.0kW (1.5 ... 5 hp)	288 / (11.34)	73 / (2.87)	208 / (8.19)
FSB	3.0 ... 4.0kW (4 ... 5 hp)	5.5 ... 7.5kW (7.5 ... 10 hp)	395 / (15.55)	85 / (3.35)	208 / (8.19)
FSC	5.5 ... 7.5kW (7.5 ... 10 hp)	11 ... 15kW (15 ... 20 hp)	395 / (15.55)	125 / (4.92)	209 / (8.22)
FSD1	—	18.5 ... 22kW (25 ... 30 hp)	443 / (17.44)	150 / (5.90)	245 / (9.64)
FSD2	11 ... 18.5kW (15 ... 25 hp)	30 ... 37kW (40 ... 50 hp)	492 / (19.37)	200 / (7.87)	245 / (9.64)
FSE	22 ... 30kW (30 ... 40 hp)	45 ... 55kW (60 ... 75 hp)	566 / (22.28)	250 / (9.84)	245 / (9.64)
FSF1	37 ... 55kW (50 ... 75 hp)	75 ... 110kW (100 ... 150 hp)	708 / (27.87)	300 / (11.81)	290 / (11.41)
FSF2	—	132 ... 160kW (175 ... 200 hp)	784 / (30.87)	300 / (11.81)	358 / (14.09)

Note: 690V AC and higher power ranges are planned.

SINAMICS G220**IP55/Type 12**

Frame size	Supply voltage 3AC 200...240V	Supply voltage 3AC 380...500V	Height mm / (in)	Width mm / (in)	Depth mm / (in)
FSB	1.1 ... 4.0kW (1.5 ... 5 hp)	1.1 ... 7.5kW (1.5 ... 10 hp)	455 / (17.91)	225 / (8.85)	225 / (8.85)
FSC	5.5 ... 7.5kW (7.5 ... 10 hp)	11 ... 15kW (15 ... 20 hp)	500 / (19.69)	245 / (9.64)	250 / (9.84)
FSD1	—	18.5 ... 22kW (25 ... 30 hp)	610 / (24.01)	209 / (8.22)	284 / (11.18)
FSD2	11 ... 18.5kW (15 ... 25 hp)	30 ... 37kW (40 ... 50 hp)	695 / (27.36)	270 / (10.63)	284 / (11.18)
FSE	22 ... 30kW (30 ... 40 hp)	45 ... 55kW (60 ... 75 hp)	820 / (32.28)	327 / (12.87)	315 / (12.40)
FSF1	37 ... 55kW (50 ... 75 hp)	75 ... 110kW (100 ... 150 hp)	1000 / (39.37)	380 / (14.96)	440 / (17.32)

Reduce selection and **commissioning** times

SINAMICS G220 is compatible with our proven engineering tools. All of them are easy-to-use, which shortens selection and commissioning times. If you require additional functionalities, you can easily upgrade the hardware or add software options. For fast and convenient support service, all product information is available digitally—simply scan the QR code visible on the face of the product. The QR code quickly provides the part number and version information and links to technical data.

Selection tools

- Our **SINAMICS Selector** app guides you to the right drive.
- **Siemens Product Configurator (SPC)** guides you through part number selection and provides links to data sheets and CAD models.
- **TIA Selection Tool (TST)** helps you configure your drive and mechanical system.

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SINAMICS Selector

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Siemens Product Configurator (SPC)

● ■ ◆ ○ ◆
TIA Selection Tool (TST)



Motion Control Services

Scan this code or click this link to learn more:
usa.siemens.com/motion-control-services



SINAMICS G220

Scan this code or click this link to learn more:
usa.siemens.com/sinamics-g220



Commissioning tools

- The **integrated web-server** enables efficient setup, fast diagnostics and maintenance via a wide range of clients. The SINAMICS Smart Adapter enables Wi-Fi access from your smart devices.
- **SINAMICS Startdrive** in TIA Portal provides you with step-by-step instructions for commissioning and integrating the system in an automated environment.
- Integration into a **PCS7/neo environment via SIMATIC PDM** ensures that your application runs smoothly.

Integrated web-server

SINAMICS Startdrive (TIA Portal)

SIMATIC PCS 7 / neo via SIMATIC PDM

Service offerings

To ensure you are benefiting as much as possible from your SINAMICS G220, we offer a variety of services—from technical support and repairs to extended coverage options. The most comprehensive offering is Service Protect, which includes 8 years of total warranty.



Scan to download the
Siemens Industry Online Support app



Scan for
Product Registration



Support and consulting services

- Technical support via phone, e-mail and chat
- [Siemens Industry Online Support App](#)



Warranty

- 24 months standard
- Plus 12 months free-of-charge (FOC) with product registration:
myregistration.siemens.com



Spares and repairs, field services

- Spare part list available with part number or serial number at:
[Siemens Spares on Web](#)
- Spare part exchange as standard
- In-house repair with express repair offering
- Field service worldwide

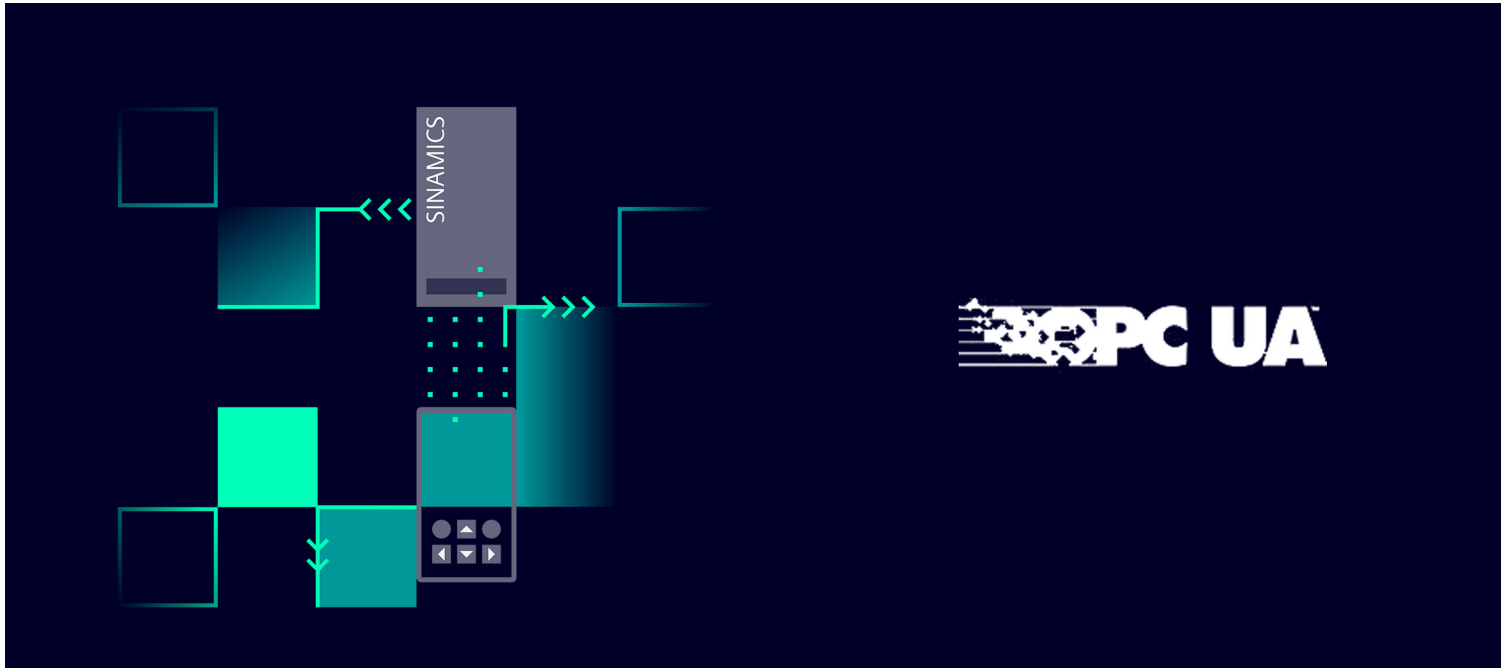


Added-value services

- Digital services
- Training services
- Service agreements
- Extended manufacturer cover—Service Protect (+3 years or +5 years)
- Retrofit and modernization service

SINAMICS Drive Software

Get the most out of your drive



SINAMICS OPC UA, the new chapter for connectivity

With compatibility in mind, SINAMICS G220 follows the universal OPC UA communication standard to allow clear communication with hardware from different manufacturers by using a standardized data exchange.

SINAMICS G220 with the integrated OPC UA server

- Is compatible with all major market-leading technologies
- Has a future-proof communication protocol
- Allows for easy collection of real-time data such as production throughput, condition monitoring and quality parameters

SINAMICS G220 is a future-proof drive that is compatible with any manufacturer's communication thanks to OPC UA. It allows a seamless data exchange and offers secure vertical communication to Industrial Edge HMI or SCADA.

Main benefits SINAMICS G220 connectivity

- Vendor-independent vertical communication
- Unrestricted parallel operation of OPC UA and PROFINET within the same Ethernet network
- Integrated security with session encryption and authentication for protected vertical communication to partners outside the protected zone
- Powertrain Information Model 40400-1 for inventory management of hardware and firmware
- SINAMICS Functional Model for acquisition of process data



SINAMICS Drive Control Chart (DCC) for SINAMICS G220

Create custom programs in DCC using intuitive drag-and-drop blocks, then download them directly to the SINAMICS drive. This allows the drive to take on more tasks which reduces the load on the PLC. DCC is fully integrated into TIA Portal and available via SINAMICS Startdrive for seamless engineering.

Easy

Enjoy effortless setup and configuration with a drag-and-drop interface in TIA Portal.

Scalable

Get 20 free blocks with SINAMICS G220, expandable up to 500 for greater flexibility.

Customizable

Access a rich library of arithmetic, logic and close-looped control blocks to meet your machine-specific needs.



Discover more about SINAMICS DCC in SINAMICS Startdrive

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