

# General Motion Control Product Portfolio Overview

SINAMICS  
Low Voltage Converters

# Index



# Siemens Organization



# Providing technology solutions to address the greatest challenges of our time

## Healthcare system

Aging society  
 Personalized healthcare  
 Affordable healthcare

Population growth  
 Increase in chronic diseases

## Digital transformation of industry, infrastructure and mobility

Competitive industries  
 Productivity

Efficient infrastructure  
 Sustainable use of resources

Economic growth  
 Prosperity

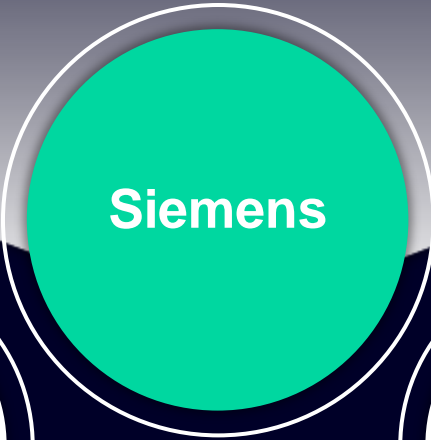
## Energy transition

Distributed energy systems / Grid edge  
 Reliable supply

Increasing demand  
 Climate change / decarbonization

Energy efficiency  
 Hydrogen / sector coupling

Energy backbone for society



# A new chapter in the history of Siemens AG

Company setup as of October 1, 2020

## Businesses

Digital Industries



Smart Infrastructure



Mobility



Siemens Advanta



Portfolio Companies



Siemens Healthineers<sup>1</sup>



## Countries

## Service & Governance

<sup>1</sup> Publicly listed subsidiary of Siemens; Siemens Healthineers with its own setup for Countries and Service & Governance



**CEO** Cedrik Neike  
**CFO** Rudolf Basson  
**HQ** Nuremberg, Germany



# Digital Industries

Factory Automation

Motion Control

Process Automation

Software

Customer Services

# Siemens Business Unit Motion Control (MC)

**CEO** Achim Peltz  
**CFO** Bernd Ulbricht  
**HQ** Erlangen, Germany

## General Motion Control (GMC)



## Low Voltage Motors (LVM)



## Machine Tool Systems (MTS)



### R&D & Factories

Erlangen, DE

Nuremberg, DE

Mohelnice, CZ

Yizheng, CN

Chemnitz, DE

Maroldsweisach, DE

Frenštát, CZ

Shanghai, CN

Bad Neustadt, DE

Tübingen, DE

Nanjing, CN

Guadalajara, MX

Renningen, DE

Congleton, GB

Tianjin, CN

# Portfolio Motion Control





# Siemens Portfolio Motion Control

Motion Control (worldwide ~ 20,000 employees)

## SINUMERIK



The perfect CNC solution for every machine tool and digitalization in machine tool manufacturing

## SINAMICS



Low-voltage converters - the integrated drive family for every application

## SIMOTICS



The right motor for every motion control task - the widest range of motors worldwide

## SIMOGEAR



The complete spectrum of geared motors with all common types of gear unit, suitable for every application

**The integrated product portfolio is the basis for highly productive machines and plants for the Digital Enterprise**

# SINAMICS

## Portfolio Overview

### SINAMICS frequency converter portfolio

#### Standard performance converters

- SINAMICS V20
- SINAMICS G120/G120C
- SINAMICS G130/G150



#### Distributed converters

- SINAMICS G115D
- SINAMICS G120D



#### Industry-specific converters

- SINAMICS G120X



#### Servo converters

- SINAMICS V90
- SINAMICS S210
- SINAMICS S120



#### High performance converters

- SINAMICS S120
- SINAMICS S150



0.05 kW – 1200 kW

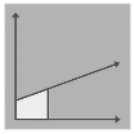
# Standard Performance Converters

SINAMICS


V20, G120C, G120, G130, G150

# Standard Performance Converters


## SINAMICS V20 – Cost-effective, reliable and easy-to-use




Continuous Motion  
Basic Performance



Moving



Processing




Pumping, Ventilating  
Compressing



- ✔ **Easy to install**
  - Flexible mounting
  - EMC integrated filter (C1) for 1AC 230V
  - Compact design
- ✔ **Easy to use**
  - Parameter loading without power-supply
  - Smart Access Webserver Module
- ✔ **Easy to save money**
  - Eco and hibernation modes
  - High and low overload modes



 1AC (200V) 0.12 – 3kW  
3AC (400V) 0.37 – 30kW

 **Integrated Braking Chopper<sup>1</sup>**


 **USS  
Modbus RTU**


1) Only for frame size FSD/FSE, external braking chopper available for FSA, FSB and FSC





# Standard Performance Converters

## SINAMICS G120C – Versatile, user-friendly and compact






 Continuous Motion  
Medium Performance

 Moving


 Processing


 Pumping, Ventilating  
Compressing




-  **Compact frame size and side-by-side installation**
-  **Energy Efficient**  
Energy-saving functions as ECO-mode and PROFenergy
-  **Compact frame size and side-by-side installation**
-  **TIA - Totally Integrated Automation**
-  **Safety functions**  
Safe Torque Off (STO) integrated as a standard



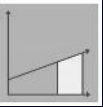
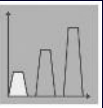




 **3AC 0.55 – 132kW  
(400V)**

 **Integrated Braking  
Chopper**

 **PROFINET / Ethernet/IP  
PROFIBUS DP  
USS / Modbus RTU**

# Standard Performance Converters

## SINAMICS G120 – Multifunctional, combinable and safe

-  Continuous Motion  
High Performance
-  Discontinuous Motion  
Basic Performance
-  Moving
-  Processing
-  Pumping, Ventilating  
Compressing
-  Positioning



**PM240-2**  
**PM250**

+



**CU230P-2**  
**CU240E-2**  
**CU250S-2**






+




**BOP-2**  
**IOP-2**


=




-  **Technology**  
Safety integrated basic and extended and **EPOS mode**.
-  **Modularity**  
Lower stock inventory and simple, fast service
-  **Interfaces**  
Full TIA integration, building systems, third-party systems
-  **Energy efficiency**  
PROFenergy, **energy recovery** and saving mode, etc.
-  **Ruggedness**  
Reliable operation and a long service life

**1/3AC 0.55 – 250kW**  
**(200V, 400V, 690V)**



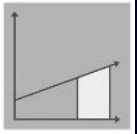
**Int. Braking Chopper**  
**(PM240-2)**  
**Energy recovery**  
**(PM250)**




**PROFINET / EtherNet/IP**  
**PROFIBUS DP**  
**USS / Modbus RTU**  
**CANopen**

# Standard Performance Converters


## SINAMICS G130/G150 – The universal converter for high power ratings




Continuous Motion  
High Performance



Moving



Processing



Pumping, Ventilating  
Compressing

**G130**  
Built-in unit



**G150**  
Cabinet unit



- ✓ **Cost saving** as a result of the high energy efficiency
- ✓ **Quiet operation and compact design**
- ✓ **Service-friendly** thanks to device modules that are easy to access
- ✓ **Integrated web server** functionality
- ✓ **Easy adaptable** to address many applications, thanks to wide range of components



3AC 110 – 2700kW  
(400V, 500V, 690V)



Integrated Braking  
Module<sup>1</sup>



PROFINET / EtherNet/IP  
PROFIBUS DP  
USS / Modbus RTU  
CANopen



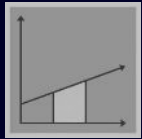
# Distributed Converters

SINAMICS  
G115D, G120D



# Distributed Converters

## SINAMICS G115D – The specialized solution for conveyor applications



Continuous Motion  
Medium Performance



Moving

IP65<sup>1</sup>



Intralogistics



Airports

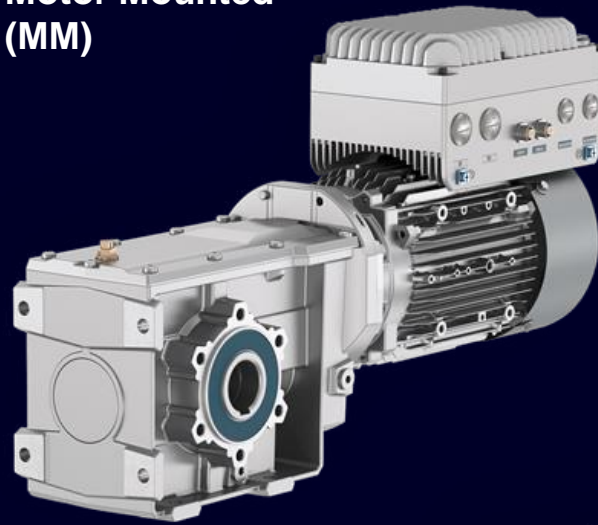


Automotive

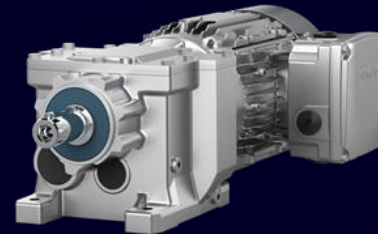
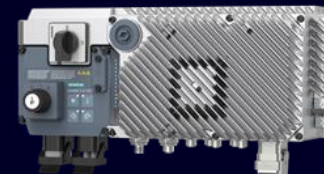


F&B

Motor Mounted  
(MM)



Wall Mounted  
(WM)



Simple setup and optimized user interface via Startdrive / SAM



Robust design enables operation at harsh environments



Consistent communication fieldbuses and fit for digitalization



Dedicated for conveyor technology applications



Safety integrated STO / PROFIsafe as standard



3AC 400V  
0.37 – 4kW (MM)  
0.37 – 7.5kW (WM)



Integrated Braking Module



PROFINET / Ethernet/IP  
AS-Interface<sup>2</sup>  
I/O Communication<sup>2</sup>

1) MM: IP55 (limited by geared motor) or optional IP65 / UL rating follows geared motor (compact system)

WM: IP65 (connector version) or IP66 (gland version) / UL type 4x

2) In 2nd Step

# Distributed Converters

SINAMICS G120D – The specialist for demanding applications – with positioning capability



Continuous Motion  
High Performance

Discontinuous Motion  
Basic Performance


**IP65<sup>1</sup>**

Moving

Positioning




- ✓ **Technology**  
Safety functions, FFBs and positioning control **EPOS**.
- ✓ **Modularity**  
Lower stock inventory and simple, fast service
- ✓ **Full TIA integration**  
Simple commissioning using prompted parameterizing software
- ✓ **Energy efficiency**  
Innovative power electronics with **energy feedback**
- ✓ **Ruggedness**  
Rugged and compact design with plug connectors and IP65

3AC 0.75 – 7.5kW  
(380 – 500V)



Energy recovery



PROFINET /  
EtherNet/IP  
PROFIBUS DP




# Industry Specific Converters


SINAMICS  
G120X

# Industry Specific Converters


SINAMICS G120X – The specialized solution for Pump & Fan applications




Continuous Motion  
Medium Performance



Pumping, Ventilating  
Compressing



**Water/WW**



**HVAC**




- ✓ **Cost efficient**  
Supports high efficiency motors<sup>2</sup>: PMSM + SRM
- ✓ **Simple setup** and optimized user interface
- ✓ **Grid friendly**  
Integrated full **DC-link choke** assures reduced harmonics
- ✓ **EMC compliant** and **long cable lengths** without output chokes
- ✓ **Robust and reliable**  
3C3 coating, and Safety functions STO SIL3 HW






	1/3AC (200V)	0.75 – 55kW
	3AC (400V)	0.75 – 560kW
	3AC (690V)	3 – 630kW



**Integrated DC-link choke<sup>1</sup>**



**PROFINET / EtherNet/IP**  
**PROFIBUS DP**  
**BACnet MS/TP / USS /**  
**Modbus RTU**

1) Only for frame sizes A – G, for FSH and J refer to the manual  
2) Refer to de manual

PMSM: Permanent Magnet Synchronous Motor  
SRM: Synchronous Reluctance Motor





# Servo Converters

SINAMICS  
V90, S210

# Servo Converters

SINAMICS V90 – The performance-optimized and simple servo drive system



Discontinuous Motion  
Basic Performance



Moving



Processing



Positioning



- ✓ **Performance-optimized**  
Advanced one-button tuning and real-time auto tuning
- ✓ **Easy-to-use**  
Plug & play design and graphic user interface V-Assistant tool
- ✓ **Cost effective**  
**EPos**, integrated into STEP-7 Professional (PROFINET version)
- ✓ **Reliable operation**  
High degree of motor protection and Safety Integrated **STO** HW function



1/3AC 0.05 – 0.75kW  
3AC 0.4 – 7kW  
(200V, 400V)



Integrated Braking  
Resistor



PROFINET  
PTI - Pulse Train Input

# Servo Converters

SINAMICS S210 – The performance-optimized and simple servo drive system



Discontinuous Motion  
Medium Performance



Moving



Processing



Positioning

1AC 200V  
version



3AC 400V  
version



✓ **Compact design - High Performance**  
Dedicated Motor and DC Coupling<sup>1</sup> for optimal performance

✓ **Optimal together with SIMATIC controller**  
Easy setup of entire Systems

✓ **Integrated Safety Functionality**  
Basic and extended Safety Functionalities via PROFIsafe

✓ **Simple installation with One Cable Connection**  
1FK2 Motors matched to the System UL Certification



1/3AC 0.05 – 0.75kW  
3AC 0.4 – 7kW  
(200V, 400V)



**Integrated Braking Resistor and EMC filter**



**PROFINET**

# High Performance Converters


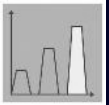





SINAMICS

S120, S120M, S150



# High Performance Converters

## SINAMICS S120 single-axis drive AC/AC

-  Continuous Motion  
High Performance
-  Discontinuous Motion  
High Performance
-  Moving
-  Processing
-  Positioning
-  Pumping, Ventilating  
Compressing
-  Machining



**PM240-2**  
Blocksize format

**Power Module**  
Chassis format









**CU310-2**

**CUA31; CUA32**  
(expansion for multi-axis applications)



**BOP20**



-  **High degree of flexibility**  
With highly scalable power and performance
-  **Integrated technological functions**, Epos, DCC, PID technology controller...
-  **Energy efficiency**  
Energy-saving functions  
Adaptation to the process
-  **Robustness**  
Reliable operation and a long service life
-  **Extensive range of options**  
Matched 1FK2 and 1FT7 Motors
-  **Safety Integrated functions**  
Basic, extended and advanced



**PM240-2 (200V, 400V, 690V)**  
1/3AC 0.55 – 250kW  
Chassis (400V, 690V)  
3AC 110 – 250kW



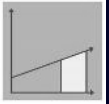
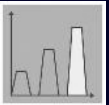





**Integrated Braking  
Chopper**

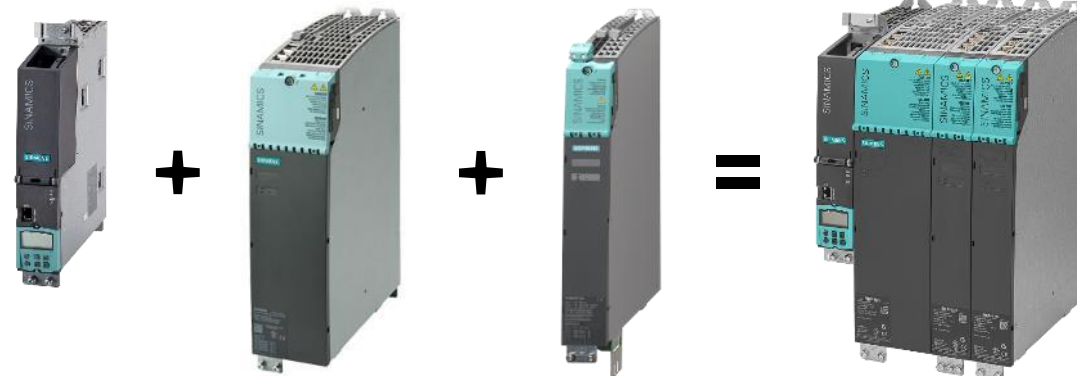


**PROFINET /  
EtherNet/IP  
PROFIBUS DP**

# High Performance Converters







## SINAMICS S120 multi-axis drive DC/AC


-  Continuous Motion  
High Performance
-  Discontinuous Motion  
High Performance
-  Moving
-  Processing
-  Positioning
-  Pumping, Ventilating  
Compressing
-  Machining




**CU320-2**    **Line Modules AC/DC**    **Motor Modules DC/AC**    **Option Modules**  
**BOP20**    **BLM**    **Booksize**    **Reactors and filters**  
               **SLM**    **Chassis**  
               **ALM+AIM**




-  **High degree of flexibility**  
With highly scalable power and performance
-  **Integrated technological functions**, Epos, DCC, PID technology controller...
-  **Energy efficiency**  
Energy-saving functions  
Adaptation to the process
-  **Robustness**  
Reliable operation and a long service life
-  **Extensive range of options**  
Matched 1FK2 and 1FT7 Motors
-  **Safety Integrated functions**  
Basic, extended and advanced



**Booksize (400V)**  
 3AC    1.6 – 107kW  
**Chassis (400V, 690V)**  
 3AC    110 – 6840kW



**Energy recovery<sup>1</sup>**



**PROFINET / EtherNet/IP**  
**PROFIBUS DP**  
**USS / Modbus TCP**  
**CANopen**



1) Depending on the infeed

BLM: Basic Line Module  
 SLM: Smart Line Module

ALM: Active Line Module  
 AIM: Active Interface Module

# High Performance Converters

## SINAMICS S120M distributed multi-axis system DC/AC

Continuous Motion  
High Performance

Discontinuous Motion  
High Performance

Moving

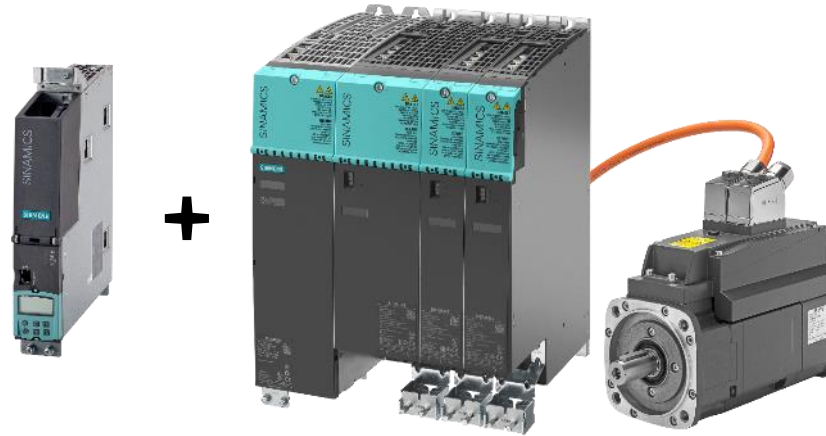
Processing

Positioning

Pumping, Ventilating  
Compressing

Machining

**IP65<sup>2</sup>**



CU320-2      Line Modules AC/DC      Adapter Module      S120M

BOP20      BLM      AM600

                 SLM     

                 ALM+AIM



- ✓ **High degree of flexibility**  
Up to 12 distributed drive units
- ✓ **Integrated technological functions**, Epos, DCC, PID technology controller...
- ✓ **Energy efficiency**  
Energy-saving functions  
Adaptation to the process
- ✓ **Robustness**  
Reliable operation and a long service life
- ✓ **Reduced** control cabinet volume and **longer** power cables
- ✓ **Safety Integrated functions**  
Basic, extended and advanced



**0.25 – 1.5kW**  
**(510 – 700V DC)**

**Energy recovery<sup>1</sup>**

**PROFINET / EtherNet/IP**  
**PROFIBUS DP**  
**USS / Modbus TCP**  
**CANopen**

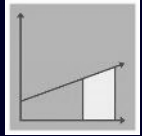
1) Depending on the infeed  
2) Only for S120M

BLM: Basic Line Module  
SLM: Smart Line Module

ALM: Active Line Module  
AIM: Active Interface Module

# High Performance Converters

SINAMICS S150 – Multifunctional, precise and capable of energy recovery



Continuous Motion  
High Performance



Discontinuous Motion  
Medium Performance



Moving



Processing



Pumping, Ventilating  
Compressing



## Multifunctional

Versatile for a wide range of applications. Ready to connect drive cabinet system



## High dynamic

Superior performance even for high demanding applications  
High dynamical braking function



## Energy recovery

Significant energy savings. Almost negligible grid distortion (<<1%) due to Clean Power Filter



## Ready for Digitalization

Simplified engineering process with due to various data offering (3D, EPLAN)



3AC 110 – 800kW  
3AC 75 – 1200kW  
(480V, 690V)



Optional highly  
dynamic braking  
systems



PROFINET / EtherNet/IP  
PROFIBUS DP  
USS / Modbus TCP  
CANopen

# Selection & Configuration Tools



## Tools to enable easy selection and configuration of the drive system



TIA Selection  
Tool (SIZER)



DT-Configurator



SINAMICS SELECTOR



SinaSave



Startdrive

# Value-add Topics



# Value-add Topics



## Digitalization in Drive Technology



### MindSphere IoT Value Plan

Create an account on our cloud platform MindSphere to collect and analyze data from your machines.



### SINAMICS Analyze MyDrives

The tool that allows you to monitor multiple drive systems from a single point. ([Link](#))



## TIA Portal drive integration with SINAMICS Startdrive

The same operating concept, elimination of interfaces and the high level of user friendliness make it possible to quickly integrate SINAMICS converters into the automation environment and commission them using the TIA Portal.



## SINAMICS Safety Integrated

The drives are simply linked to SIMATIC, SINUMERIK and SIMOTION controls, and through communication via **PROFIsafe**, are perfectly harmonized with these.

- Shorter commissioning times
- Higher cost effectiveness
- Lower wiring costs.

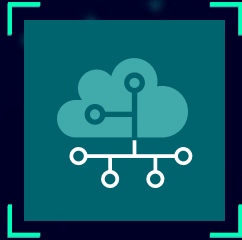


# Digital Enterprise Services

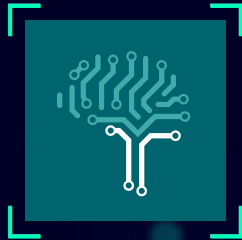
# Digital Enterprise Services



**Consulting Services**



**Engineering and Integration Services**



**Analytics and Artificial Intelligence Services**



**Industrial Security Services**



**Training Services**



**Support Services**



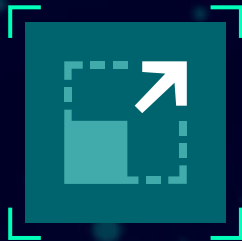
**Field and Maintenance Services**



**Spare Parts Services**



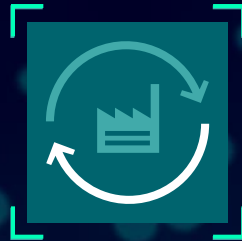
**Repair Services**



**Retrofit and Modernization Services**



**Service Contracts**



**Service Programs and Platforms**



# SINAMICS Drive Service 'Extended Exchange'

Available for:

SINAMICS V20, V90, G110, G110D, G120, G120C, G120D, G120P, G120X, S110, S120, MICROMASTER



<https://myregistration.siemens.com/>

## Scope of service

- Service includes exchange of product, or repair at a Siemens Repair Centre or a Siemens approved partner, and excludes labor on-site
- Option “+3 years” and “+5 years” are available to purchase via Service Product Codes (MLFBs)
- Option “+3 years” and “+5 years” requires product registration. The Customer will also benefit from the 6 months FOC extension
- Customer received Drive Service Extended Exchange Certificate as proof of service
- Can be purchased through standard Siemens sales channels at point of product sale or up to 12 months following product manufacture

# | Contact

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