

MANUFACTURING IN AMERICA 19

What's New in SINAMICS Drives and SIMOTICS Motors

Presented by Mark Martina










Manufacturing in America | March 20-21, 2019

SINAMICS V & G - AC Low Voltage Drives Family

Standard Performance - Component and Distributed



¹ Available on 12/2019

	Component Drives				Distributed Drives				
	V20 	G120C 	G120 	G120X 	G130 	G110D 	G110M 	G120D 	G120X ¹ 
Description	Basic, cost-effective,	Compact vector drive system	Modular vector application-specific drive system	Pump and Fan Applications	Chassis for higher-powered enclosed drives	Simple VHz	Vector SIMOGEAR- or wall-mounted	Vector	Pump and Fan Applications
Voltage Range (Power Range)	1AC 200 – 240V (.16 to 4HP) 3AC 380 – 480V (0.50 to 40HP)	3AC 380 – 480V (0.75 to 150 HP)	1/AC 200 – 240V (0.75 – 5.0 HP) 3AC 200- - 240V (0.75 to 60HP) 3AC 380 – 480V (0.75 to 400HP) 3AC 500 – 690V (15 to 75HP)	3AC200 – 230V¹ (1 – 75 HP) 3AC380 – 480V (1 – 700 HP) 3AC500 – 690V (4 – 700 HP)	3AC 380 – 480V (150 to 800HP) 3AC 500 – 600V (150 to 800HP) 3AC 660 – 690V (75 to 800kw)	3AC 380 – 480V (1 - 10 HP)	3AC 380 – 500V (0.5 to 5hp)	3AC 380 – 480V (1 - 10 HP)	3AC200 – 230V (1 – 75 HP) 3AC380 – 480V (1 – 200 HP) 3AC500 – 690V (4 – 200 HP)
Enclosure	IP20	IP20	IP20	IP20 / IP21	IP00 / IP20	IP65, UL Type 3	IP65 / IP66	IP65, UL Type 3	UL Types 1 and 2
Control Modes	V/Hz	V/Hz Sensorless	V/Hz Sensorless Closed Loop Positioning	V/Hz Sensorless	V/Hz Sensorless Closed Loop	V/Hz	V/Hz Sensorless	V/Hz Sensorless Closed Loop	V/Hz Sensorless
Communications	USS, Modbus	USS, Modbus Profibus ProfiNet, Ethernet/IP	USS, Modbus BacNet Profibus Profinet, Ethernet/IP	Modbus¹ Profibus¹ Profinet, Ethernet/IP	Profibus Profinet, Ethernet/IP Modbus TCP/IP	AS-I	USS, Modbus Profibus ProfiNet, Ethernet/IP	Profibus Profinet Ethernet/IP	Modbus Profibus Profinet, Ethernet/IP
Integrated Safety	NA	STO	STO, SS1, SBC SLS, SD1, SSM	STO SIL 3 HW	STO, SS1, SBC SLS, SD1, SSM	STO	STO	STO, SS1, SBC SLS, SD1, SSM	STO SIL 3 HW

SINAMICS G120C

Powerful compact drive

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Compact frame size and side-by-side installation

- Smaller and favorably priced control cabinet
- Increased power density in the control cabinet
- **Newly expanded to 150 HP**
- **Migration to FSAA**

+ New & Available



SINAMICS G120C FSAA – FSC

SINAMICS G120C FSD – FSF extension for power to 150 HP

SINAMICS G120 modular vector drive

Power module PM240-2

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Migration from PM240 and MicroMaster Drives

+ New & Available



+ New & Available

- Compact Design
- Integrated DC-choke and brake chopper
- Safe Torque Off (STO) built-in. Integrated and certified

SINAMICS G120C FSA – FSC

SINAMICS G120C FSD – FSF

FSG = 400HP

SINAMICS G120 Modular Vector Drive Push-thru Designs

SINAMICS G120 push-thru designs

Now up to 200 Hp

For NEMA 12 (non-ventilated) and NEMA 3R (outdoor)

Dramatic reduction in panel space

Air conditioning not required

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Frame

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SINAMICS G120X – A Solution for the Infrastructure Market

Pump and Fan Drive Loaded with Functionality

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Feature / Function

“Out-of-the-box” - Complete drive delivered together ready to switch on from **0.75kW - 630kW / 1- 700 HP**

Dedicated user interface with optimized **SAM (webserver)** and **IOP-2**

Optimized design: **3C3 coating¹** + extended operating temperatures **-20 °C to 45 ...60 °C** (with derating)³

EMC compliant (C1 + C2) and integrated **full DC-link choke**

Safe Torque Off SIL 3 hardware

Compatible with **SINAMICS connect** and **TIA Portal** via GSD file

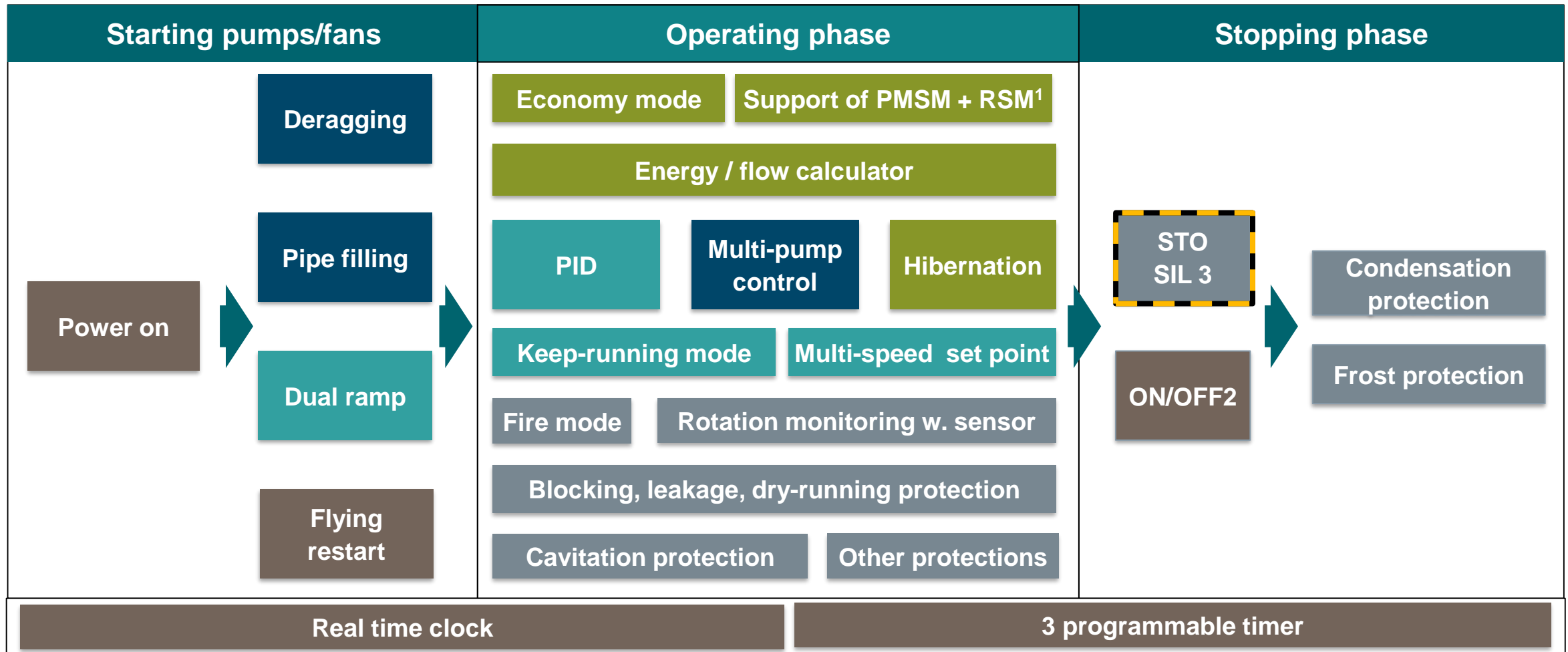
Pluggable I/O terminal hardware and optional **repair switch** (for IP55/UL12²)

Benefits

- ▶ **Reduced cost and efforts** for: ordering (1 MLFB), delivery and commissioning
- ▶ **Faster commissioning** with improved **user friendly setup**
- ▶ Ability to work in **harsh environments** (e.g. corrosive gases)
- ▶ **Grid friendly** design with reduced harmonics and **long cable length**
- ▶ Reduced electromechanical components and **standard compliant**
- ▶ **Fit for digitalization** and for cloud based analytics
- ▶ **PLC connectivity** as a standard
- ▶ **Simple** installation, service and maintenance

SINAMICS G120X

Best Pump and Fan Control for Energy-savings and Protection

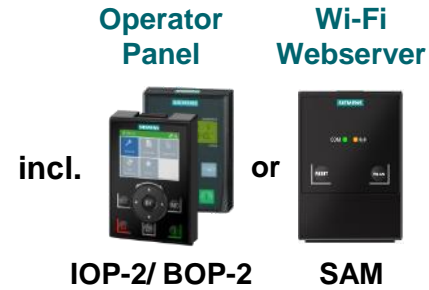
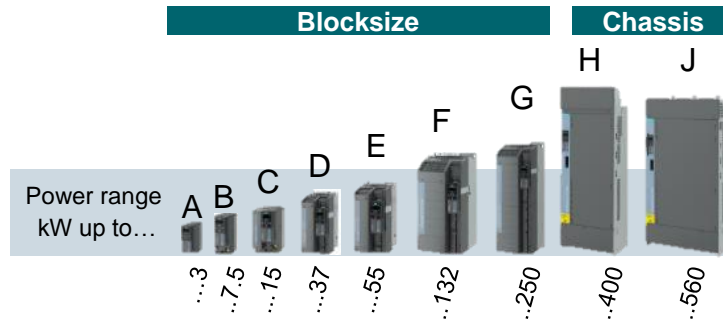


SINAMICS G120X

IP20 Available Now



Voltage / Power Range	IP20 /IP21 kit^{2,3/} IP20 Push Through kit³ UL open type Power: 0.75 – 560 kW 1 – 700 HP
	3AC380 – 480V (0.75 – 560 kW / 1 – 700 HP)
	3AC500 – 690V (3 – 630 kW / 4 – 700 HP)



Options

- SD card
- IP21 roof top kit
- IP20 / UL open push through kit
- I/O ext. module¹
- Filter B
- Passive harmonic filter
- Choke
- Sinus filter du/dt filter

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³ IP21 kit/ IP20 PT-kit FS A-G as an orderable option
 SAM: Smart Access Module
 IOP: Intelligent Operator Panel

² Wall mounted w/o cabinet in lockable electrical room

SINAMICS G120X

Phase 2 – Degrees of Protection and 230V

Voltage / Power Range 3AC200 – 230V ¹ (0.75 – 55 kW / 1 – 75 HP) 3AC380 – 480V (0.75 – 560 kW / 1 – 700 HP) 3AC500 – 690V (3 – 630 kW / 4 – 700 HP)	IP20 / IP21 kit^{2,3/} IP20 Push Through kit³ UL open type Power: 0.75 – 560 kW 1 – 700 HP	Blocksize Power range kW up to... Chassis H J 	Operator Panel Wi-Fi Webserver incl. or IOP-2/ BOP-2 SAM	Options SD card IP21 roof top kit IP20 / UL open push through kit I/O ext. module ¹ Filter B Passive harmonic filter Choke Sinus filter du/dt filter
	(IP21 UL-type 1)¹ Power: 0.75 – 132 kW 1 – 200 HP	Wall mounted Power range kW up to... 	incl. or	
	(IP55 UL-type 12)¹ Power: 0.75 – 132 kW 1 – 200 HP	Wall mounted Power range kW up to... 	incl. or	

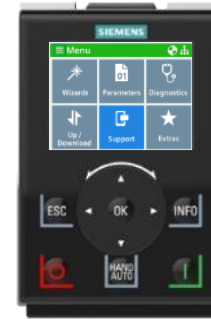
¹ Available on 12/2019

³ IP21 kit/ IP20 PT-kit FS A-G as an orderable option

² Wall mounted w/o cabinet in lockable electrical room

Product overview

Operator Panels for G120 Series (G120X, G120C, G120 Modular)

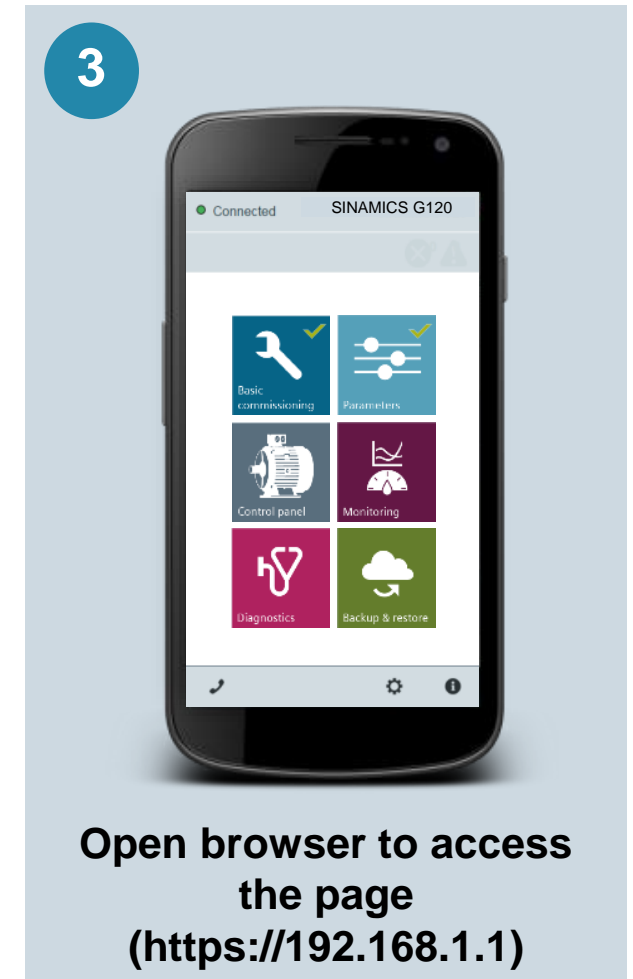
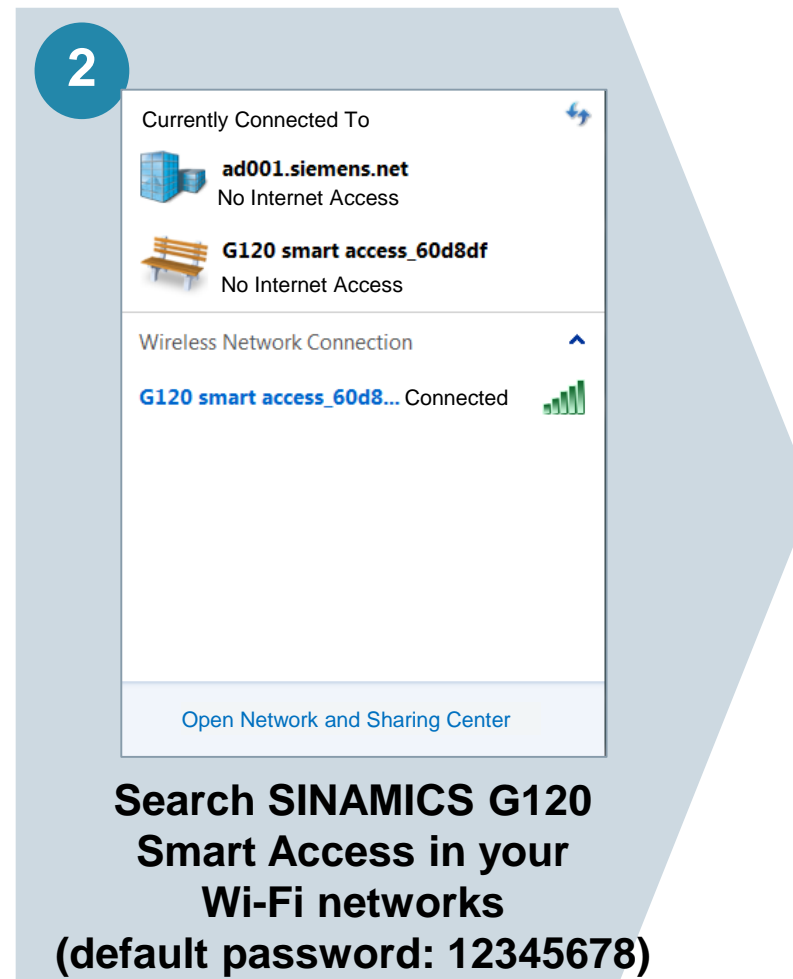


	SINAMICS G120 Smart Access Module	SINAMICS Intelligent Operator Panel IOP-2	SINAMICS Basic Operator Panel BOP-2
Product description	Web server-based control panel with wireless client connection	Intelligent control panel for direct connection to the converter	Basic control panel for direct connection to the converter
Main functions	Mobile Commissioning Diagnostics Service	Local Operation Monitoring Commissioning Diagnostics Service	Local Operation Monitoring Commissioning Diagnostics

SINAMICS G120 Smart Access Module

Connect your mobile/end device in less than one minute

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4*

A step 4 for password changing is mandatory for the 1st access

SINAMICS G120 Smart Access Module

Provides all the necessary functions in one device

Basic commissioning

Quick commissioning wizard that covers the areas of motor data, connection and application settings as well as common used parameters.

Control panel

Control panel with basic functions. Supporting JOG mode and static set point mode.

Diagnostics

Get a quick overview over all current faults and alarms, receive tips how to solve the issues and acknowledge the errors. Furthermore the status of all signal in-/outputs.



Parameters

Check and set parameter values. Save the preferred parameters in a customizable list or reset the drive to the factory settings.

Monitoring

Overview over the most important online values.

Backup & restore





Quick way to save or restore the parameterization of the drive.

SINAMICS S - AC Low Voltage Drives Family

High Performance - Component and Distributed



¹ Available CY10
1.5/2.0kW (Q2);
3.5/5.0/7.0kW (Q3)

	Component Drives			Distributed Drive
	S210 	S120 Single-axis (AC/AC) 	S120 Multi-axis (DC/AC) 	S120M Distributed (DC / AC) 
Description	Mid range single-axis servo drive system	High dynamic performance servo drive for single axis applications	High dynamic servo drive for multi-axis common dc bus applications	High dynamic servo drive for distributed (on machine) applications
Voltage Range (Power Range)	1AC 200-230V (0.1 to 0.75kW) 3AC 200 – 480V (0.4 to 1.0kW) (1.5 to 7kW)¹	1/AC 200 – 240V (0.75 – 5.0 HP) 3AC 200- - 240V (0.75 to 60HP) 3AC 380 – 480V (0.75 to 400HP) 3AC 500 – 690V (15 to 75HP)	3AC 380 – 480V (1 to 1150 HP) 3AC 500 – 690V (100 to 1400 HP) Note – Parallel Configuration allowed up to 4 units for chassis 3 Infeed Options: 6-Pulse, Regen, and AFE (Regen, Low Harmonics, PF Control)	3AC 380 – 480V 3AC 500 – 690V (0.3 – 2 HP)
Enclosure	IP20	IP20	IP20	IP65 / 67
Control Modes	Servo	V/Hz Sensorless Vector Closed Loop Vector Servo	V/Hz Sensorless Vector Closed Loop Vector Servo	Closed Loop Vector Servo
Communications	ProfiNet	Profibus ProfiNet Ethernet/IP, Modbus TCP/IP	Profibus ProfiNet Ethernet/IP, Modbus TCP/IP, EtherCAT	Profibus ProfiNet Ethernet/IP, Modbus TCP/IP, EtherCAT
Integrated Safety	STO, SS1, SBC SOS, SS2, SLS, SD1, SSM, SBT, SLP, SP	STO, SS1, SBC SOS, SS2, SLS, SD1, SSM, SBT, SLP, SP	STO, SS1, SBC SOS, SS2, SLS, SD1, SSM, SBT, SLP, SP	Consult Factory for Options

SINAMICS S210 Servo Drive Package

Positioning within SINAMICS Servo Portfolio

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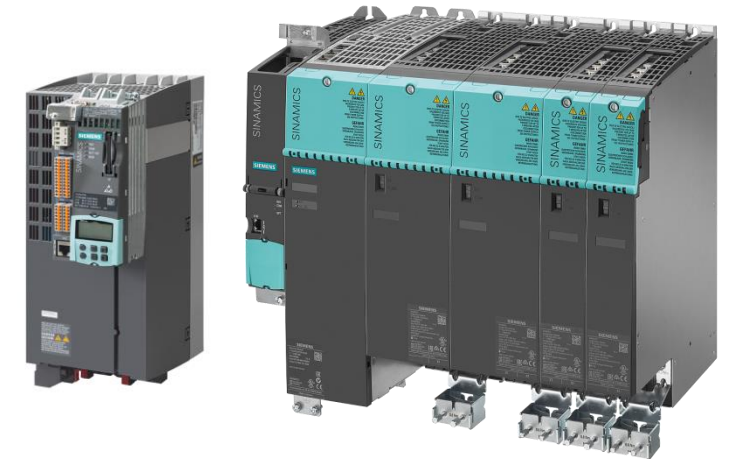
Basic: SINAMICS V90 Servo Package

Single axis AC/AC drive with basic performance and functionality



Midrange: SINAMICS S210 Servo Package

Single axis AC/AC drive with high dynamic performance for motion applications in the mid range segment.

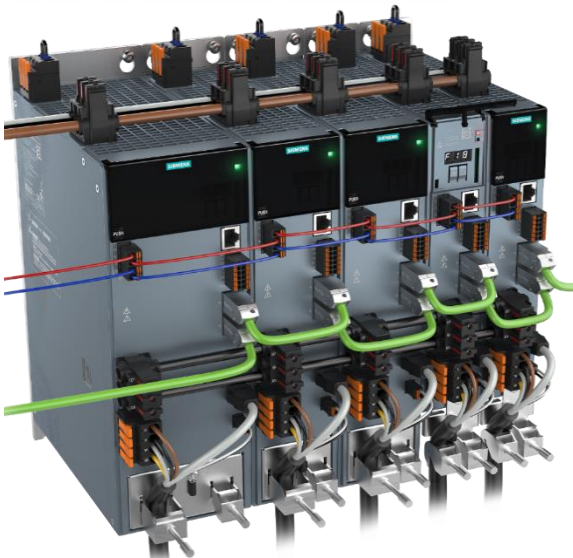


High-End: SINAMICS S120 Servo Drive System

Modular single & multi axis system with most advanced drive based technology and connectivity to high end numeric and motion controllers

SINAMICS S210 Servo Drive System

The top highlights of the System



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Feature / Function

- Dedicated S-1FK2 motor(HD/CT)
- Fast Current Controller (62,5 μs)
- Fast PROFINET IRT (250 μs) **NEW!**
- **DC-Coupling (for 3-AC units)**
- Basic & **Extended** Safety integrated functions via PROFIsafe **NEW!**
- Integrated Webserver
- “One Button Tuning” **NEW!**
- **TIA Portal (V15.1) integrated****
- **TIA Selection Tool integrated**
- One-Cable-Connection (OCC)
- Integrated EMC Filter
- Integrated Braking Resistor
- 1AC 230V (200-240V) 0.05 – 0.75kW
- **3AC 480V (200-480V) 0.4 – 7kW*** **NEW!**
- UL Certification

*) FSB 1.5/2.0kW (April); FSC 3.5/5.0/7.0kW (June)

Benefits

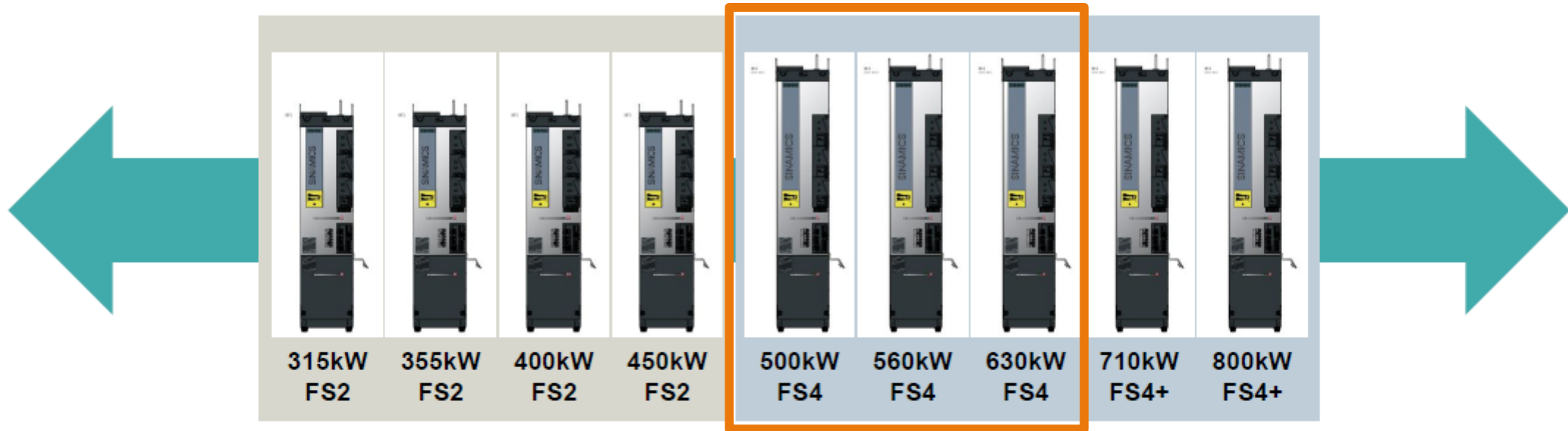
- ▶  • Increase performance
 - ▶  • Fulfill high demands for safety
 - ▶  • Easy engineering
 - ▶  • Saves time on installation
 - ▶  • Ready for world wide markets
- Community. Collaboration. Innovation.

***) Version V15.1 update in 04/2019

SINAMICS S120 Chassis 2

3 Frame Sizes and Only Two Footprints

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Only three different Frame sizes to minimize the variance and to improve the flexibility

Available



The mechanical design and the function are Standardized to minimize the required effort for Integration, Installation etc.

SINAMICS S120 Chassis 2

Improved Performance, Smaller Footprint, Easier Installation

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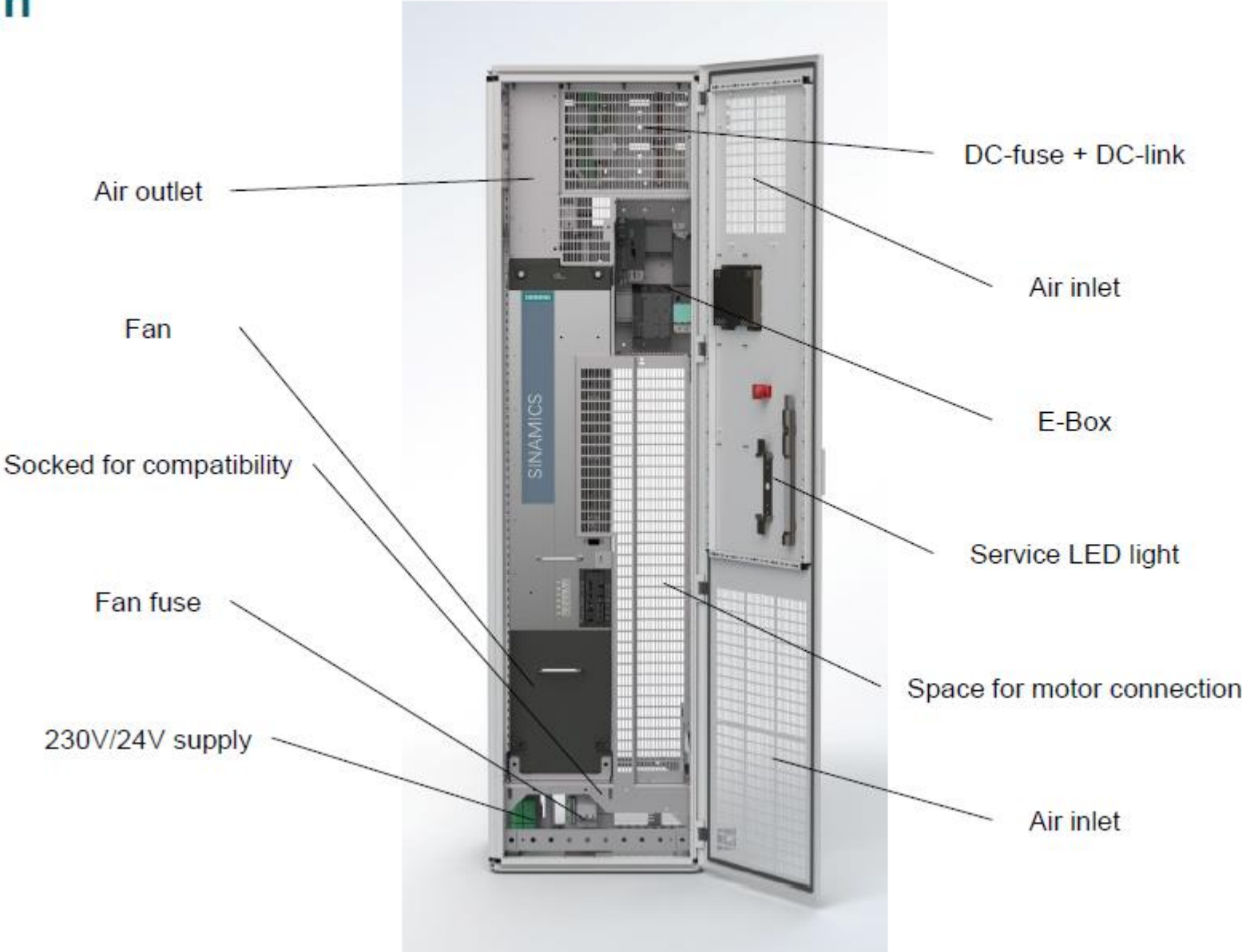
Feature / Function

- **Independent design**
New Chassis can stand on its own
- **Standardized footprint**
From 315kw to 800kW all chassis have the same footprint
- **Improved cooling system**
Closed cooling duct and closed housing
- **Standardized terminals**
All control and power terminals are at the same position
- **Smaller footprint**
State of the art footprint

Benefit

- ✓ Easier Cabinet Integration
- ✓ Possibility to address new applications
- ✓ Reduction of engineering efforts
- ✓ Reduction of required parts for cabinet integration
- ✓ Less effort required for cooling
- ✓ Reduced chance for unwanted damage
- ✓ Higher reliability
- ✓ Reduced engineering effort
- ✓ Faster diagnostic
- ✓ Reduction of installation effort
- ✓ Less space required
- ✓ Retrofit of SINAMICS and MASTERDRIVES possible

SINAMICS S120 Cabinet Modules-2 New Design



IEC Cabinets Available Now
NEMA Cabinets in Design
Integration Kits Available

LV Drives Business Unit

SINAMICS S120-2 Chassis – New 480V Motor Modules



Rated Power

(rated output power of a typical 6-pole standard induction motor based on I_L or I_H for 400 V 3 AC 50 Hz)

	500kW	560kW	630kW
Rated Current I _N	975A	1075A	1200A
Low overload current I _L	1000A	1100A	1260A
High overload current I _H	1200A	1335A	1500A
Loadcycle S6	1365A	1505A	1710A
Base load current low overload I _L	910A	1000A	1145A
Base load current high overload I _H	800A	890A	1000A
Base load current S6	683A	753A	840A
Conformances/ certificates of suitability, according to	CE (EMC directive 2014/30/EU, Low-voltage directive 2014/35/EU and Machinery directive 2006/42/EG for functional safety) ROHS II, REACH, WEEE		
Migration Strategy	No Product replacement until complete portfolio is available in the innovation design. After discontinuing approximately 10 years spare part process.		

SINAMICS web server strategy

The most significant milestones on the way to portfolio 2025

Characteristics

Necessary additional hardware:

Web design:

Status:

Core features:

Web server module for SINAMICS V20



- In delivery
- Supports Wifi connections only
- Optimized for use on mobile devices

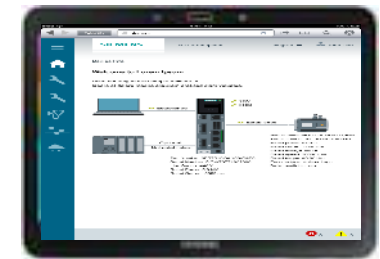
Web server module for SINAMICS G120



- In delivery
- Supports Wifi connections only
- Optimized for use on mobile devices

Integrated web server in SINAMICS S120 and S210

NO additional HW integrated in CUs



- S120*) in delivery / S210 ready for sales release
- Supports platform web server concept
- S210 already supports full responsive design for all client systems (PC→Smartphone)

SINAMICS S120 drives Connectivity just keeps expanding



PROFINET

- CU310-2 PN, CU320-2 PN and CBE20



EtherNet/IP

- CU310-2 PN, CU320-2 PN and CBE20



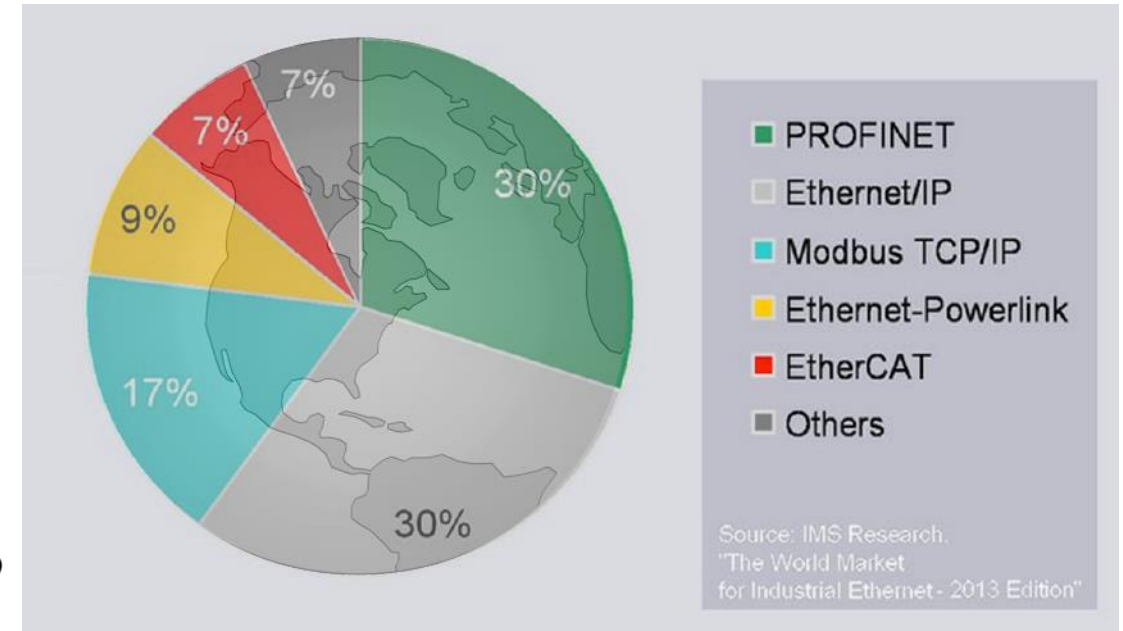
Modbus TCP/IP

- CU310-2 PN, CU320-2 PN and CBE20



EtherCAT

- Option board for CU320-2



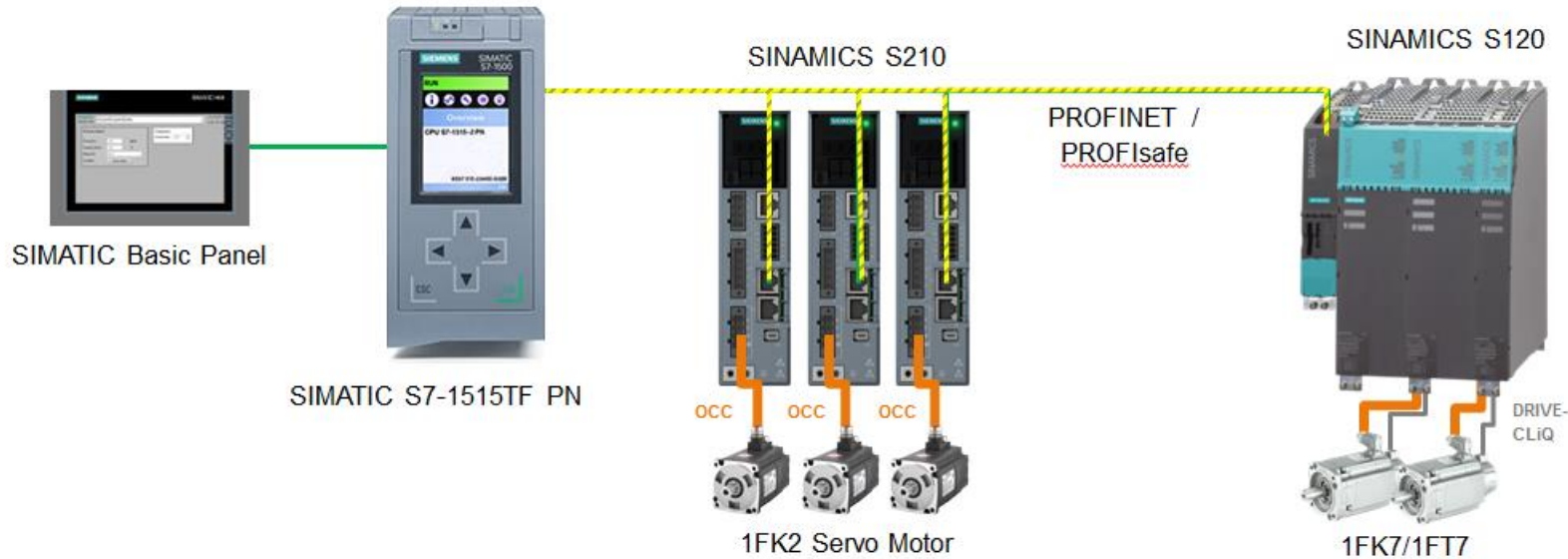
A New Way of Motion

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Available
Now



Motion Control
in S7-1500 or 1500T PLC



Easy Engineering

Select Drive and Motor
per load requirements

Seamless spectrum of motion control systems

Perfect teamwork by all automation components



TIA Portal V15.1

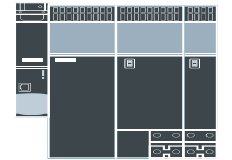


**SIMOTION
&
SIMATIC**

S7-1200
S7-1500
S7-1500T



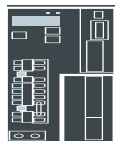
**SINAMICS
S120**



**SINAMICS
S210**



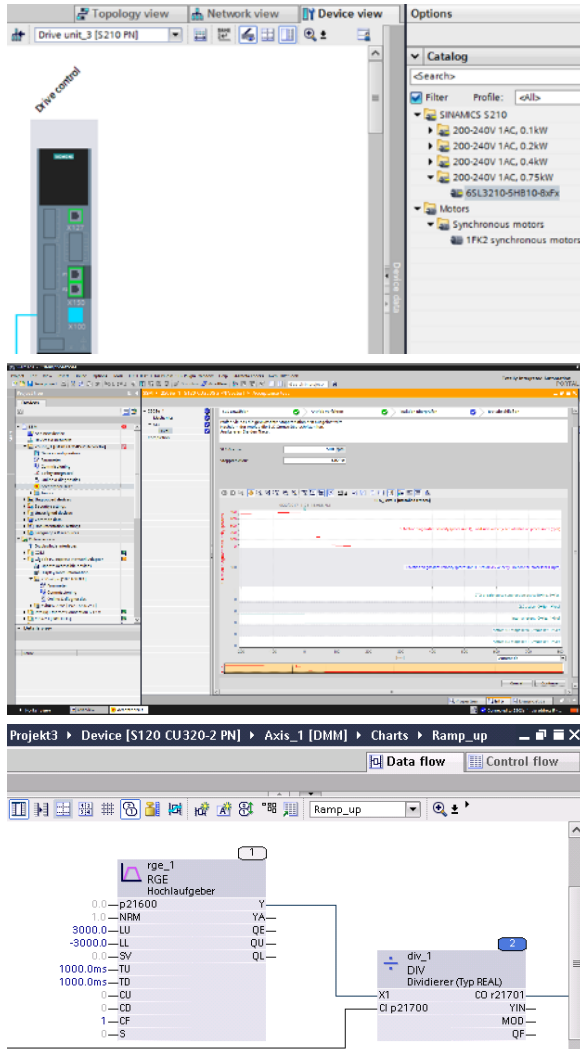
**SINAMICS
V90 with PROFINET**



**SINAMICS
G120 drives family**



SINAMICS Startdrive V15.1 Highlights



Feature / function

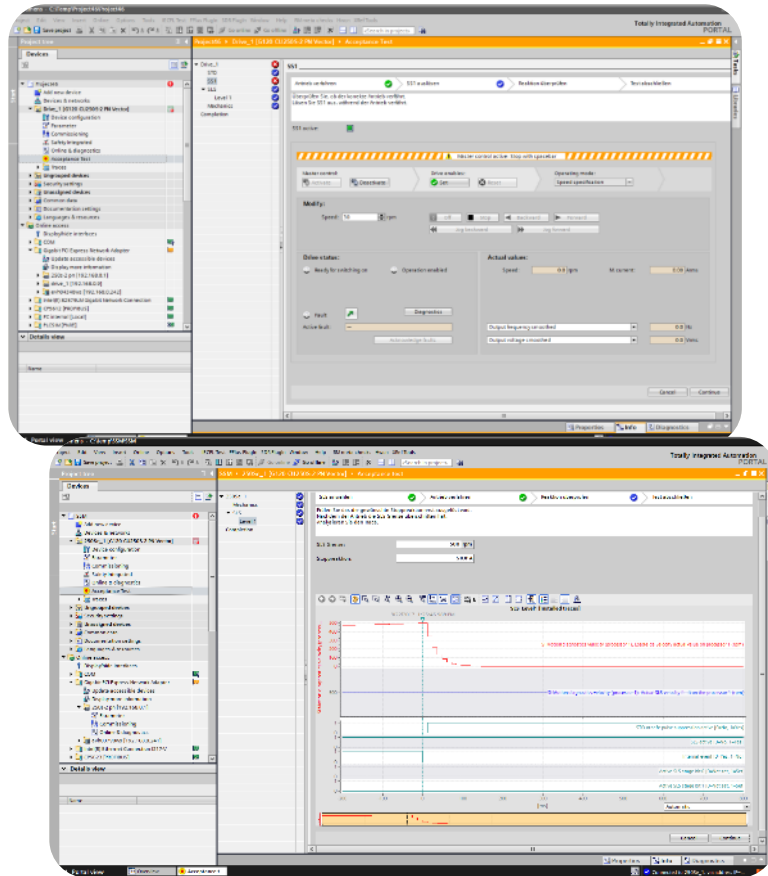
- Integration of **SINAMICS S210** and **SIMOTICS 1FK2**
- Startdrive Advanced: **Safety Acceptance Test** for G120, S210 and CU320-2 based drives (e.g. S120)
- **Extension of the Startdrive Openness** interface incl. Startdrive App
 - EPLAN import/export
 - Access to further drive parameters
- Integration of **SINAMICS Drive Control Charts**:
 - Graphical configuration of technological functions in the drive

Benefits

- TIA Portal system benefits for the new servo drive system usable
- Efficient engineering
- Efficient execution and documentation of the safety acceptance test
- Support in compliance with the machinery directive
- High time saving
- Flexible Startdrive extensions to meet customer-specific requirements
- Integration into customer-specific and automated workflows
- Efficient mass data operation
- Individual adaptability for specific drive tasks
- Create own functions for customer-specific requirements

Startdrive V15.1

Safety Integrated acceptance test



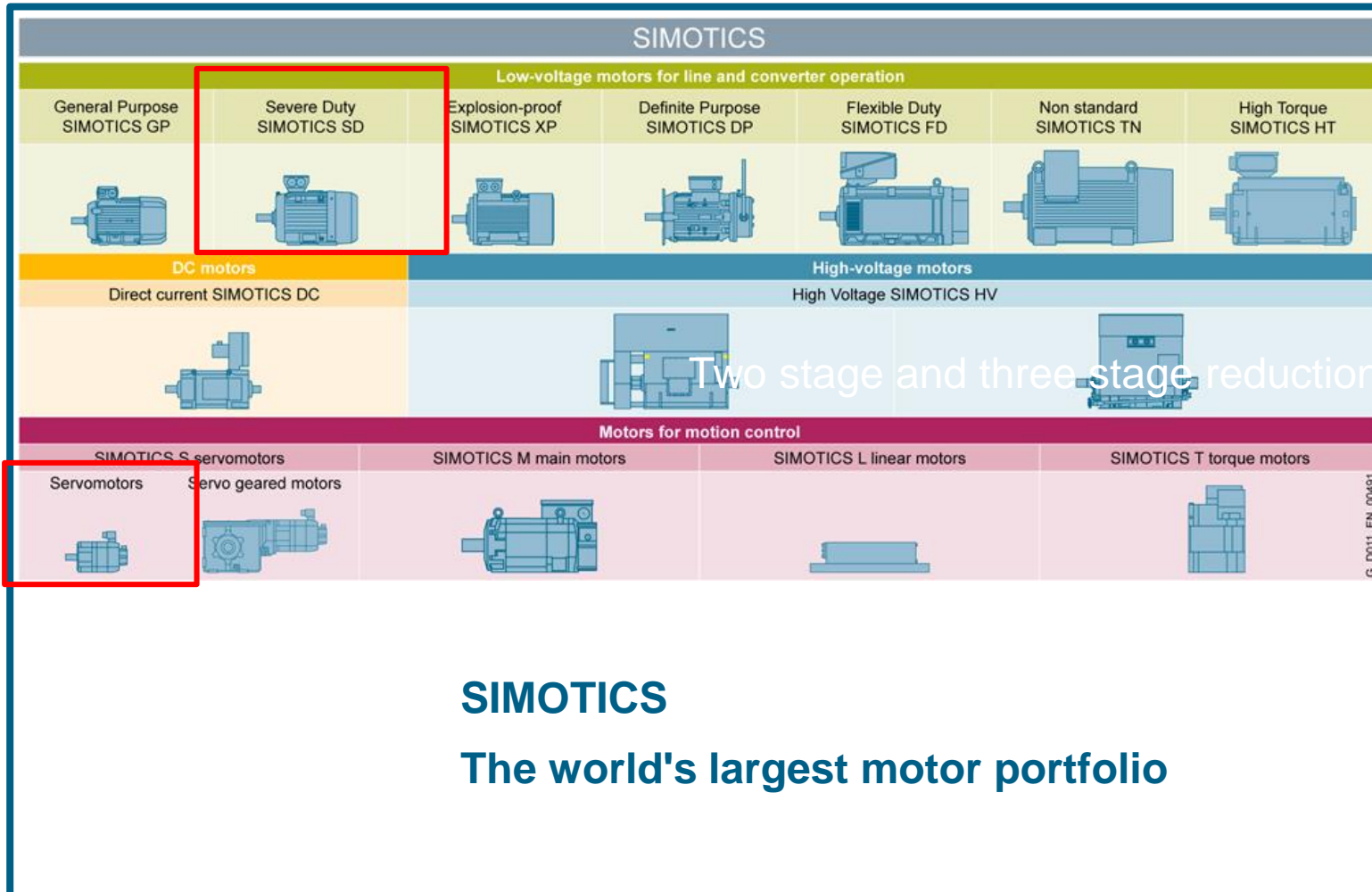
Feature / function

- Managed acceptance test assistant for all drive-based, safety-integrated functions (basic and extended safety)
- Automatic and safety-function-specific creation of traces
- Generation of an acceptance protocol as an Excel file
- Available for G110M, G120, G120C, G120D, G120P, S210 & CU320-2 based drives (e.g. S120, S150, G130, G150)

Benefits

- Efficient execution and documentation of the safety acceptance test
- Support in compliance with the machinery directive
- High time saving

SIMOTICS Motors for Motion Control Applications Portfolio Positioning



SIMOGEAR
SIMOGEAR geared motors
<small>G_D011_EN_00514</small>
<h3>Covering the Applications</h3> <ul style="list-style-type: none"> ❖ Two stage and three stage reduction ❖ Helical, parallel shaft, bevel, and helical worm geared motors ❖ Ideal for machine builders in Material Handling Verticals (i.e. Automotive, Warehouse Distribution, Airport/Parcel Post)

SIMOTICS SD200 – One motor for any challenge

Range Expanded (350 to 800hp, 460V, 575V)

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Flexibility simplifies configuration and reduces costs

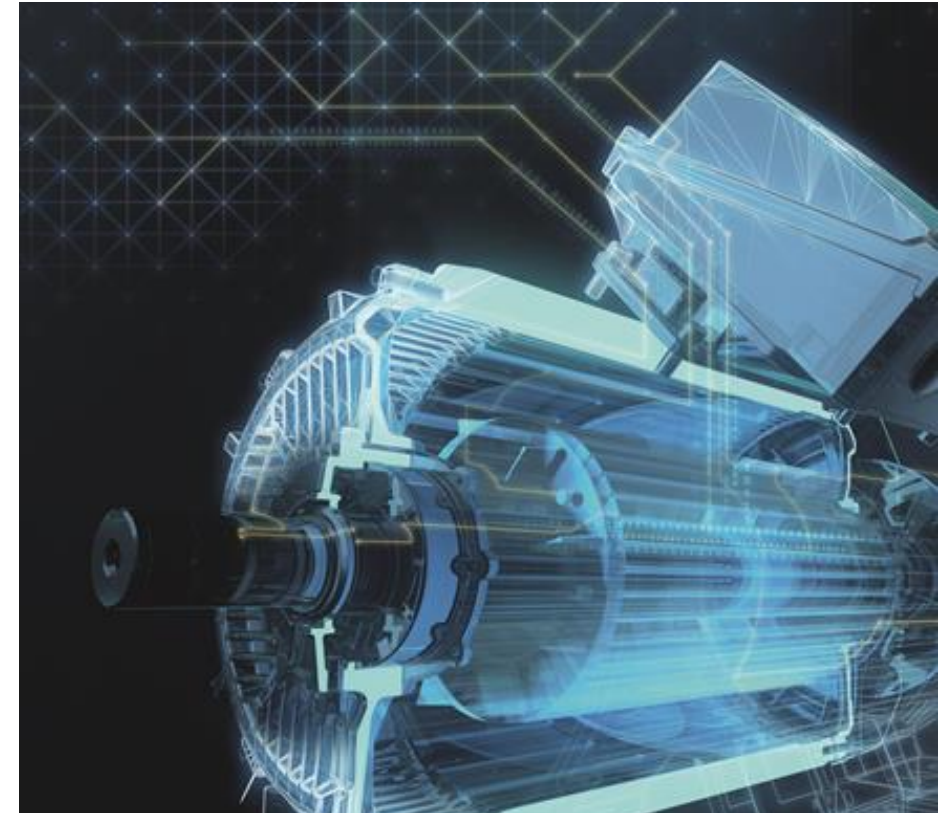


Best-in-class design for long life in harsh environments

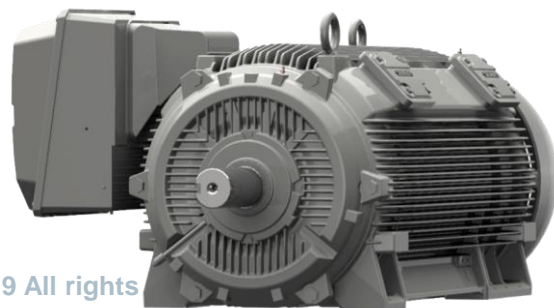


NEMA Premium efficiency for maximized energy savings

Hazardous Classification



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usa.siemens.com/simotics-sd-nextgeneration



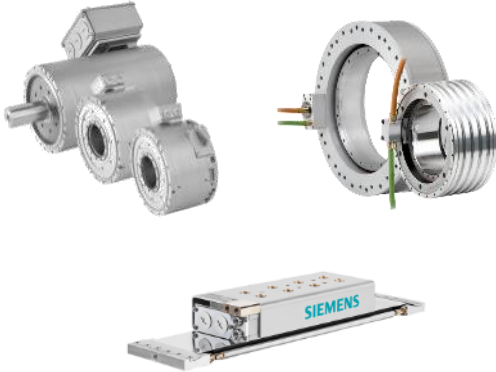

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SIMOTICS Motors for Motion Control Applications

Wide range of suitable system components


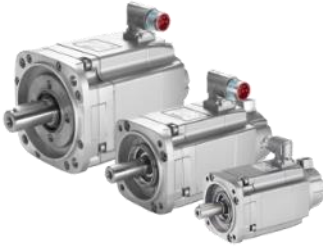
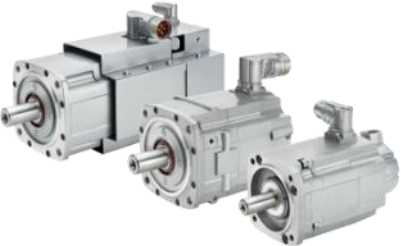


SIMOTICS S Servomotors	SIMOTICS M Main motors	SIMOTICS L / T Direct Drives	Components
<p>Motors for servo drive applications, synchronous motor technology</p> 	<p>Motors for main drive applications, synchronous and asynchronous motor technology</p> 	<p>Motors for direct drive applications, synchronous motor technology</p> 	<p>Connection between drive and motor Built-on encoders DRIVE-CLiQ - the open interface for encoders</p> 

SIMOTICS Servomotors

Wide range for different performance requirements

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	Basic	Performance		High Performance		
	SIMOTICS S-1FL6	SIMOTICS S-1FK7		SIMOTICS S-1FT7		
	Natural cooling	Natural cooling	Forced Ventilation	Natural cooling	Forced ventilation	Water cooling
						
Rated power P_N [kW]	0.05 – 7.00	0.05 – 8.2	7.5	0.88 – 17	3.8 – 45.5	3.1 – 34.2
Rated speed n_N [rpm]	2 000 / 3 000	2 000 – 6 000	3 000	1 500 – 6 000	1 500 – 4 500	1 500 – 6 000
Rated torque M_N [Nm]	0.16 – 33.4	0.08 – 37	24	1.4 – 108	11 – 250	9.2 – 125
Drive system	SINAMICS V70/V90	SINAMICS S120	SINAMICS S120	SINAMICS S120	SINAMICS S120	SINAMICS S120

SIMOTICS S servo motors

1FK7 – Generation II

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1FK7 Preferred Servomotors
(Bills of Material Simplification and
Inventory Reduction)

New



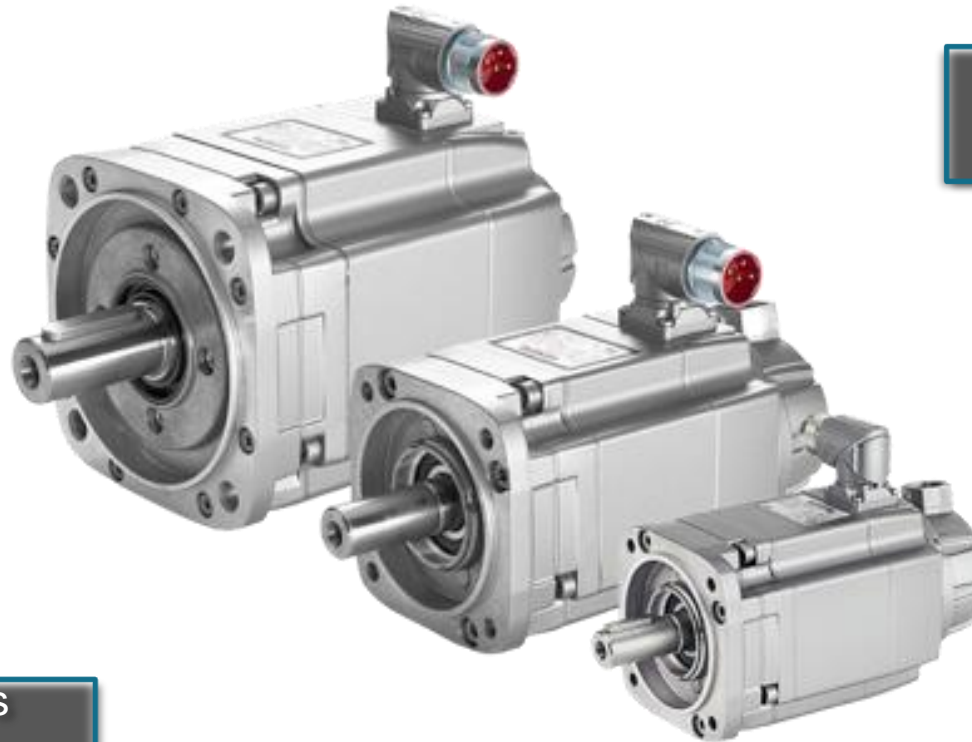
Higher dynamics



Smoother performance



Field exchangeable encoders
(thermally and mechanically
insulated -> longer lifetime)



Gen I – mature product
Migration to Generation II



SIZER for SINAMICS drives Developments

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New

Inclusion of SINAMICS G120X

Controller selection in tabular menu format

Graphic utilization display

Quick dimensioning with PROFIdrive drives

Inclusion of SIMATIC S7-1500/S7-1500T Controller

Interface between TIA Selection Tool
and SIZER

- i.e. single project bill of material file possible

SQL server no longer required



+ SIZER is the engineering tool for SINAMICS drives as well as SINUMERIK, SIMOTION controller, and SIMATIC Technology

Totally Integrated Automation (TIA) Selection Tool Developments

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New

Inclusion of SINAMICS S210 and V90
servo drive systems in Offline : TIA
Selection Tool

One selection tool for automation and drive products
Load, motor, and drive selection permitted in any
order

Selection without load data supported



Cloud version and more
drive products
In Preparation












Smart selection wizards

SINAMICS V & G - AC Low Voltage Drives Family

Standard Performance - Component and Distributed



¹ Available on 12/2019





	Component Drives				Distributed Drives				
	V20 	G120C 	G120 	G120X 	G130 	G110D 	G110M 	G120D 	G120X ¹ 
Description	Basic, cost-effective,	Compact vector drive system	Modular vector application-specific drive system	Pump and Fan Applications	Chassis for higher-powered enclosed drives	Simple VHz	Vector SIMOGEAR- or wall-mounted	Vector	Pump and Fan Applications
Voltage Range (Power Range)	1AC 200 – 240V (.16 to 4HP) 3AC 380 – 480V (0.50 to 40HP)	3AC 380 – 480V (0.75 to 150 HP)	1/AC 200 – 240V (0.75 – 5.0 HP) 3AC 200- - 240V (0.75 to 60HP) 3AC 380 – 480V (0.75 to 400HP) 3AC 500 – 690V (15 to 75HP)	3AC200 – 230V¹ (1 – 75 HP) 3AC380 – 480V (1 – 700 HP) 3AC500 – 690V (4 – 700 HP)	3AC 380 – 480V (150 to 800HP) 3AC 500 – 600V (150 to 800HP) 3AC 660 – 690V (75 to 800kw)	3AC 380 – 480V (1 - 10 HP)	3AC 380 – 500V (0.5 to 5hp)	3AC 380 – 480V (1 - 10 HP)	3AC200 – 230V (1 – 75 HP) 3AC380 – 480V (1 – 200 HP) 3AC500 – 690V (4 – 200 HP)
Enclosure	IP20	IP20	IP20	IP20 / IP21	IP00 / IP20	IP65, UL Type 3	IP65 / IP66	IP65, UL Type 3	UL Types 1 and 2
Control Modes	V/Hz	V/Hz Sensorless	V/Hz Sensorless Closed Loop Positioning	V/Hz Sensorless	V/Hz Sensorless Closed Loop	V/Hz	V/Hz Sensorless	V/Hz Sensorless Closed Loop	V/Hz Sensorless
Communications	USS, Modbus	USS, Modbus Profibus ProfiNet, Ethernet/IP	USS, Modbus BacNet Profibus Profinet, Ethernet/IP	Modbus¹ Profibus¹ Profinet, Ethernet/IP	Profibus Profinet, Ethernet/IP Modbus TCP/IP	AS-I	USS, Modbus Profibus ProfiNet, Ethernet/IP	Profibus Profinet Ethernet/IP	Modbus Profibus Profinet, Ethernet/IP
Integrated Safety	NA	STO	STO, SS1, SBC SLS, SD1, SSM	STO SIL 3 HW	STO, SS1, SBC SLS, SD1, SSM	STO	STO	STO, SS1, SBC SLS, SD1, SSM	STO SIL 3 HW

SINAMICS S - AC Low Voltage Drives Family

High Performance - Component and Distributed








¹ Available CY10
1.5/2.0kW (Q2);
3.5/5.0/7.0kW (Q3)




	Component Drives			Distributed Drive
	S210 	S120 Single-axis (AC/AC) 	S120 Multi-axis (DC/AC) 	S120M Distributed (DC / AC) 
Description	Mid range single-axis servo drive system	High dynamic performance servo drive for single axis applications	High dynamic servo drive for multi-axis common dc bus applications	High dynamic servo drive for distributed (on machine) applications
Voltage Range (Power Range)	1AC 200-230V (0.1 to 0.75kW) 3AC 200 – 480V (0.4 to 1.0kW) (1.5 to 7kW)¹	1/AC 200 – 240V (0.75 – 5.0 HP) 3AC 200- - 240V (0.75 to 60HP) 3AC 380 – 480V (0.75 to 400HP) 3AC 500 – 690V (15 to 75HP)	3AC 380 – 480V (1 to 1150 HP) 3AC 500 – 690V (100 to 1400 HP) Note – Parallel Configuration allowed up to 4 units for chassis 3 Infeed Options: 6-Pulse, Regen, and AFE (Regen, Low Harmonics, PF Control)	3AC 380 – 480V 3AC 500 – 690V (0.3 – 2 HP)
Enclosure	IP20	IP20	IP20	IP65 / 67
Control Modes	Servo	V/Hz Sensorless Vector Closed Loop Vector Servo	V/Hz Sensorless Vector Closed Loop Vector Servo	Closed Loop Vector Servo
Communications	ProfiNet	Profibus ProfiNet	Profibus ProfiNet, Ethernet/IP, Modbus TCP/IP	Profibus ProfiNet, Ethernet/IP
Integrated Safety	STO, SS1, SBC SOS, SS2, SLS, SD1, SSM, SBT, SLP, SP	STO, SS1, SBC SOS, SS2, SLS, SD1, SSM, SBT, SLP, SP	STO, SS1, SBC SOS, SS2, SLS, SD1, SSM, SBT, SLP, SP	Consult Factory for Options

SIEMENS LV AC Enclosed Drives Family

SIEMENS

	Standard Performance			High Performance	
Drive	SINAMICS G120E 	SINAMICS G150 	W Series (Robicon or SINAMICS) 	S150 	S120 CM 
Description	General performance 6-pulse, 18-pulse	Higher-power variable speed drive	For Pump and Fan Applications 6-pulse, 18-pulse	High-performance, Active Front End, Regenerative drive	Complex multi-motor common DC bus drive line-ups. Standard, Regenerative, and Active Front End
Voltage Range (Power Range)	3AC 380 – 480V 3AC 460 – 480V (1 – 200 HP 6-Pulse) (50 – 200 HP 18-Pulse)	3AC 380 – 480V (150 – 800 HP) 3AC 500 – 600V (150 to 800HP) 3AC 660 – 690V (75 to 800kW)	3AC 460 – 480 V W120 (1-200hp) W120CP (50-200hp) W150CP (250 -800hp)	3AC 380 – 480V (150 – 1,150 HP) 3AC 500 – 600V (75 to 1,250P) 3AC 500 – 690V (75 to 1200kW)	3AC 380 – 480V (1 to 4,500HP) 3AC 500 – 600V (1 – 5,000 HP) 3AC 500 – 690V (75 to 5,550kW)
Standards	NEMA / UL	NEMA / UL / IEC	NEMA / UL	NEMA / UL / IEC	NEMA / UL / IEC
Enclosure	NEMA 1 and 12	NEMA 1 and 12 IP20, 21, 23, 43, 54	NEMA 1 and 12	NEMA 1 and 12 IP20, 21, 23, 43, 54	NEMA 1 and 12 IP20, 21, 23, 43, 54
Control Modes	V/Hz Sensorless Vector Closed Loop Vector Positioning	V/Hz Sensorless Vector Closed Loop Vector	V/Hz Sensorless Vector Closed Loop Vector	V/Hz Sensorless Vector Closed Loop Vector	V/Hz Sensorless Vector Closed Loop Vector Servo
Communications	USS, Modbus RTU BacNet Profibus ProfiNet, Ethernet/IP	Profibus ProfiNet, Ethernet/IP Modbus TCP/IP	Profibus ProfiNet, Ethernet/IP Modbus TCP/IP (W150CP)	Profibus ProfiNet, Ethernet/IP Modbus TCP/IP	Profibus ProfiNet, Ethernet/IP Modbus TCP/IP
Integrated Safety	STO, SS1, SBC SLS, SD1, SSM	STO, SS1, SBC SLS, SD1, SSM	Custom Options	STO, SS1, SBC SOS, SS2, SLS, SD1, SSM, SBT, SLP, SP	STO, SS1, SBC SOS, SS2, SLS, SD1, SSM, SBT, SLP, SP

SINAMICS DC LV High Performance Drives Family

	SINAMICS DCM (DC Drives)		
	DCM - Converter 	DCM – Base Drive 	DCP 
Description	SINAMICS DC Master builds upon the strength of Siemens installed based of SIMOREG DC drives bringing in the strength and commonality of the SINAMICS Family	SINAMICS DCM Base Drive is a pre-wired and tested solution with components mounted on a back panel. The DCM Base Drive is a drop in replacement for 6RA24 and 6RA70 Base Drives.	Alternative Energy Supply for DC to DC conversions such as battery storage solutions and Coupling DC buses with different voltage levels
Voltage Range (Power Range)	<p>Two-quadrant, Non-Regen 400VAC to 950VAC (485VDC to 1140VDC) 60A to 3,000A</p> <p>Four Quadrant, Regen 400VAC to 950VAC (485VDC to 1000VDC) 15A to 3,000A</p> <p>Up to 6 Units can be paralled</p>	<p>Two-quadrant, Non-Regen 240AC (240VDC), 3 - 250hp 480VAC (500V DC), 3 - 500hp</p> <p>Four Quadrant, Regen 240AC (240VDC), 3 - 250hp 480VAC (500V DC), 3 - 500hp</p> <p>Designs Above 500hp</p> <p>Base Drive Component Packages</p>	<p>Voltage Range 30-800VDC</p> <p>Current and Power Range P=30kW: I_{max} = 50A @ V_{in} = V_{out} = 600 VDC, P = 30 kW</p> <p>P=120kW</p> <p>Scalability: 4 x parallel</p>
Enclosure	IP20	IP20	IP20
Control Modes	Closed Loop Speed Control Closed Loop Torque Control	Closed Loop Speed Control Closed Loop Torque Control	
Communications	Profibus ProfiNet, Ethernet/IP	Profibus ProfiNet, Ethernet/IP	Profibus ProfiNet

Questions?

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