

SINAMICS – The optimum drive for every application



SINAMICS drives

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The information in this brochure only provides a general description and performance figures. For specific applications, please refer to the technical specifications. The required performance features are only binding if they have been expressly agreed upon in the form of a written contract.

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Low voltage														DC	Medium voltage			
G110	G120P	G120	G110D	G120D	G130	G150	S110	S120					S150	DCM	GM150/SM1507/GL150/SL150			
Frequency converter for variable-speed drives in the lower power range	Versatile single-motor drive for pumps, fans and compressors	Modular frequency converter for variable-speed single-motor drives	Distributed drive for basic single-axis applications in the lower power range	Distributed drive for complex single-axis/multi-axis applications	Frequency converter for variable-speed single-motor drives		Single-axis positioning drive	Modular drive system for demanding single-axis/multi-axis applications							Frequency converter for demanding variable-speed single-motor drives	Scalable DC converter for basic and demanding applications	Medium-voltage converter for single and multi-motor drives	
Format	Blocksize unit	Blocksize unit	Blocksize unit	Blocksize unit	Blocksize unit	Chassis unit	Converter cabinet unit	Blocksize unit	Blocksize unit	Chassis unit	Booksize unit	Chassis unit	Cabinet module	Converter cabinet unit	DC converter unit	Converter cabinet unit		
Drive type	AC/AC unit ready to connect up	AC/AC unit modular	AC/AC unit modular	AC/AC unit ready to connect up	AC/AC unit modular	AC/AC unit modular	AC/AC unit ready to connect up	AC/AC unit modular	AC/AC unit modular		DC/AC system modular			AC/AC unit ready to connect up	AC/DC unit compact	AC/AC unit ready to connect up		
Degree of protection	IP20	• With operator unit: IP54/IUL Type 12 • With blanking cover: IP55/IUL Type 12	IP20	IP65	IP65	IP00 / IP20	IP20 (IP21 / IP23 / IP43 / IP54)	IP20	IP20	IP20	IP20	IP00 / IP20	IP20 (IP21 / IP23 / IP43 / IP54)	IP20 (IP21 / IP23 / IP43 / IP54)	IP00 / IP20	IP21 / IP22 / IP42 / IP43 / IP54		
Line voltage V_{line} / power ranges	0.12 ... 3 kW	–	–	–	–	–	–	0.12 ... 0.75 kW	0.12 ... 0.75 kW	–	–	–	–	–	–	–		
1-ph. 200 ... 240 V AC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		
3-ph. 380 ... 480 V AC	–	0.37 ... 90 kW	0.37 ... 250 kW	0.75 ... 7.5 kW	0.75 ... 7.5 kW	110 ... 560 kW	110 ... 900 kW	0.37 ... 90 kW	0.37 ... 90 kW	110 ... 250 kW	1.6 ... 107 kW	110 ... 3000 kW	1.6 ... 3000 kW	110 ... 800 kW	–	–		
3-ph. 500 ... 600 V AC	–	–	–	–	–	110 ... 560 kW	110 ... 1000 kW	–	–	–	–	–	–	–	–	–		
3-ph. 500 ... 690 V AC	–	–	–	–	–	–	–	–	–	–	–	75 ... 4500 kW	75 ... 4500 kW	75 ... 1200 kW	–	–		
3-ph. 660 ... 690 V AC	–	–	11 ... 55 kW	–	–	–	–	–	–	–	–	–	–	–	–	–		
1-ph. 85 V AC ... 3-ph. 950 V AC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6 ... 2508 kW (parallel connection up to 30 MW)	–		
3-ph. 1.5 ... 4.16 kV AC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	800 ... 120,000 kW		
Current infeed	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled		Uncontrolled	Uncontrolled			Optional, uncontrolled or controlled			Controlled	–	Uncontrolled, controlled	
Energy recovery	No	No	optional	No	Yes	No		No	No			Yes, depending on the infeed			Yes	Yes, with the appropriate version	For SM150, GL150 and SL150	
Line frequency	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz		47 ... 63 Hz	47 ... 63 Hz					47 ... 63 Hz	45 ... 65 Hz	47 ... 63 Hz		
Output voltage ⁴	0 ... V_{line}	0 ... V_{line}	0 ... V_{line}	0 ... V_{line}	0 ... V_{line}	0 ... V_{line}		0 ... V_{line}	0 ... V_{line}			0 ... V_{line}			0 ... V_{line}	0 ... 1000 V	0 ... V_{line}	
Output frequency	0 ... 650 Hz	0 ... 650 Hz	0 ... 650 Hz (V/f)	0 ... 200 Hz (V/f)	0 ... 650 Hz	0 ... 300 Hz		0 ... 300 Hz ¹	V/f control: 0 ... 400 ² Vector control: 0 ... 300 ² Servo control: 0 ... 650 ²	200 Hz ³ 160 Hz ³ 300 Hz ³	0 ... 400 Hz ² 0 ... 300 Hz ² 0 ... 650 Hz ^{2,5}	0 ... 160 Hz ² 0 ... 300 Hz ²	0 ... 300 Hz	–	–	0 ... 250 Hz		
Closed-loop control technique																		
V/f control	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes			Yes			Yes	–	Yes	
Vector control with / without encoder	–	Yes	Yes	–	Yes	Yes		–	Yes			Yes			Yes	–	Yes	
Servo control with / without encoder	–	–	–	–	–	–		Yes	Yes			Yes			Yes	–	–	
Closed-loop speed / torque control	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes			Yes			Yes	Yes	Yes	
Motors																		
Induction motors	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes			Yes			Yes	–	Yes	
Synchronous motors	–	–	–	–	–	Yes, sensorless		Yes	Yes			Yes			Yes	–	Yes	
Torque motors	–	–	–	–	–	Yes, sensorless		–	Yes			Yes			–	–	–	
Linear motors	–	–	–	–	–	–		–	Yes			–			–	–	–	
DC motors	–	–	–	–	–	–		–	–			–			Yes	–	–	
Control dynamic performance																		
Vector control for SINAMICS DCM V/f-control*	Rise time, speed control	–	–	35 ... 40 ms	–	35 ... 40 ms	11 ... 15 ms	11 ... 15 ms	–	8 ... 10 ms ²	11 ... 15 ms ³	8 ... 10 ms ²	11 ... 15 ms ³	11 ... 15 ms ³	11 ... 15 ms	40 ms*	–	
	Rise time, torque control	–	–	approx. 3 ms	–	approx. 3 ms	2 ... 3 ms	2 ... 3 ms	–	1 ... 2 ms ²	2 ... 3 ms ³	1 ... 2 ms ²	2 ... 3 ms ³	2 ... 3 ms ³	2 ... 3 ms	6 ... 9 ms*	–	
Servo control	Rise time, speed control	–	–	–	–	–	–	5 ... 7 ms ³	2 ... 3 ms ²	5 ... 7 ms ³	2 ... 3 ms ²	5 ... 7 ms ³	5 ... 7 ms ³	5 ... 7 ms ³	5 ... 7 ms ³	–	–	
	Rise time, torque control	–	–	–	–	–	–	1 ... 2 ms ³	0.5 ... 1 ms ²	1 ... 2 ms ³	0.5 ... 1 ms ²	1 ... 2 ms ³	1 ... 2 ms ³	1 ... 2 ms ³	1 ... 2 ms ³	–	–	
Technological functions	Flying restart, automatic restart, compound braking (ZIG-wire control), DC braking	Automatic restart, energy-saving mode (ECO mode), hibernation mode, flying restart compound braking, motor staging, 4 PID technology controllers, logical and arithmetic functions, extended essential service mode, bypass	–	Flying restart, automatic restart, kinetic buffering, BICO technology, technology controller, free function blocks, compound braking, DC braking, dynamic braking	–	–	Flying restart, automatic restart, kinetic buffering, BICO technology, technology controller, Drive Control Chart	–	Basic positioner, BICO technology, technology controller	Flying restart, automatic restart, kinetic buffering, basic positioner, BICO technology, technology controller, Drive Control Chart, motion control (in conjunction with SIMOTION), numerical control with SINUMERIK solution line					Flying restart, automatic restart, kinetic buffering, technology controller, Drive Control Chart, BICO technology	BICO technology, technology controller, free function blocks, automatic restart, Drive Control Chart	–	Flying restart, automatic restart, kinetic buffering, technology controller, Drive Control Chart, BICO technology
Safety functions	–	–	STO, SBC, SS1, SLS	–	STO, SS1, SLS	–	STO, SS1	STO, SOS, SBC, SS1, SS2, SLS, SSM	STO, SOS, SBC, SS1, SS2, SLS, SSM	STO, SOS, SS1, SS2, SLS, SSM	STO, SOS, SBC, SS1, SS2, SLS, SSM	STO, SOS, SS1, SS2, SLS, SSM	STO, SS1, SS2, SLS, SSM, SOS	STO, SS1, SS2, SLS, SSM, SOS	–	STO		
Interfaces	Digital, analog, serial (RS 485)	digital, analog, serial (RS 232), Ni1000 interface USS, Modbus RTU, BacNet MS/TP, PROFIBUS DP, CANopen	Digital, analog, serial (RS 232 / RS 485), PROFIBUS DP (PROFIdrive profile 4 with NAMUR, PROFIsafe), PROFINET	Digital, analog, serial (RS 232), AS-Interface	PROFIBUS and PROFIdrive profile 4 with PROFIsafe	–	Digital, analog, serial (RS 232 / RS 485), PROFIBUS DP, CANopen, PROFINET, PROFIsafe (PROFIdrive profile 4 with NAMUR)	Digital, serial (USS protocol), analog, PROFIBUS DP, PROFINET ¹ , CANopen, pulse/direction interface	Digital, analog, serial (RS 232 / RS 485), PROFIBUS DP, PROFINET, PROFIsafe, CANopen (in conjunction with CU320)					Digital, analog, serial (RS 232 / RS 485), PROFIBUS DP, PROFINET	Digital, analog, serial (RS 232 / RS 485), PROFIBUS DP, PROFINET			
Tools	SIZER for engineering, STARTER for commissioning																	
Typical application technologies	Standard V/f applications, such as e.g. pumps, fans, blowers, conveyor belts, moving billboards, fitness machines	Single-motor drive for pumps, fans, compressors in e.g. building technology, water industry and the process industry	Single-motor drives, e.g. pumps, fans, blowers, compressors, conveyor belts, extruders, mixers, crushers	Standard V/f applications for conveyor technology, distribution logistics, airport. Basic performance applications in automotive, food and beverage industry, packaging	Single-motor drives, e.g. suspended monorail, conveyor belts, hoisting gear, pumps, fans, compressors	Single-motor drives, e.g. pumps, fans, blowers, compressors, conveyor belts, extruders, mixers, crushers	–	Servo-controlled positioning of single-motor drives with synchronous/induction motors	High performance single-motor drives			High-performance multi-motor drives			High-performance single-motor drives for test stands, cross-cutters, centrifuges, conveyor belts, presses	Rolling mill drives, wire-drawing machines, extruders and kneaders, cable railways and lifts, test stand drives	Pumps, fans, compressors, mixers, extruders, crushers, rolling mills, mine hoist drives, excavators, test stands	
Catalog	D11.1	D11.1	D11.1	D11.1	D11.1	D11	PM22	PM21			PM21, D21.3			D21.3	D21.3	D23.1	D12 (GM150ISM150)	

1) being prepared 2) for 4 kHz pulse frequency 3) for 2 kHz pulse frequency 4) max. output voltage in the individual case depends on the motor type, motor power and dynamic performance 5) in conjunction with SINUMERIK up to 1300 Hz
 STO: Safe Torque Off SOS: Safe Operating Stop SBC: Safe Brake Control SS1: Safe Stop 1 (safe stopping process, Cat. 1) SS2: Safe Stop (safe stopping process, Cat. 2) SLS: Safely Limited Speed SSM: Safe Speed Monitor