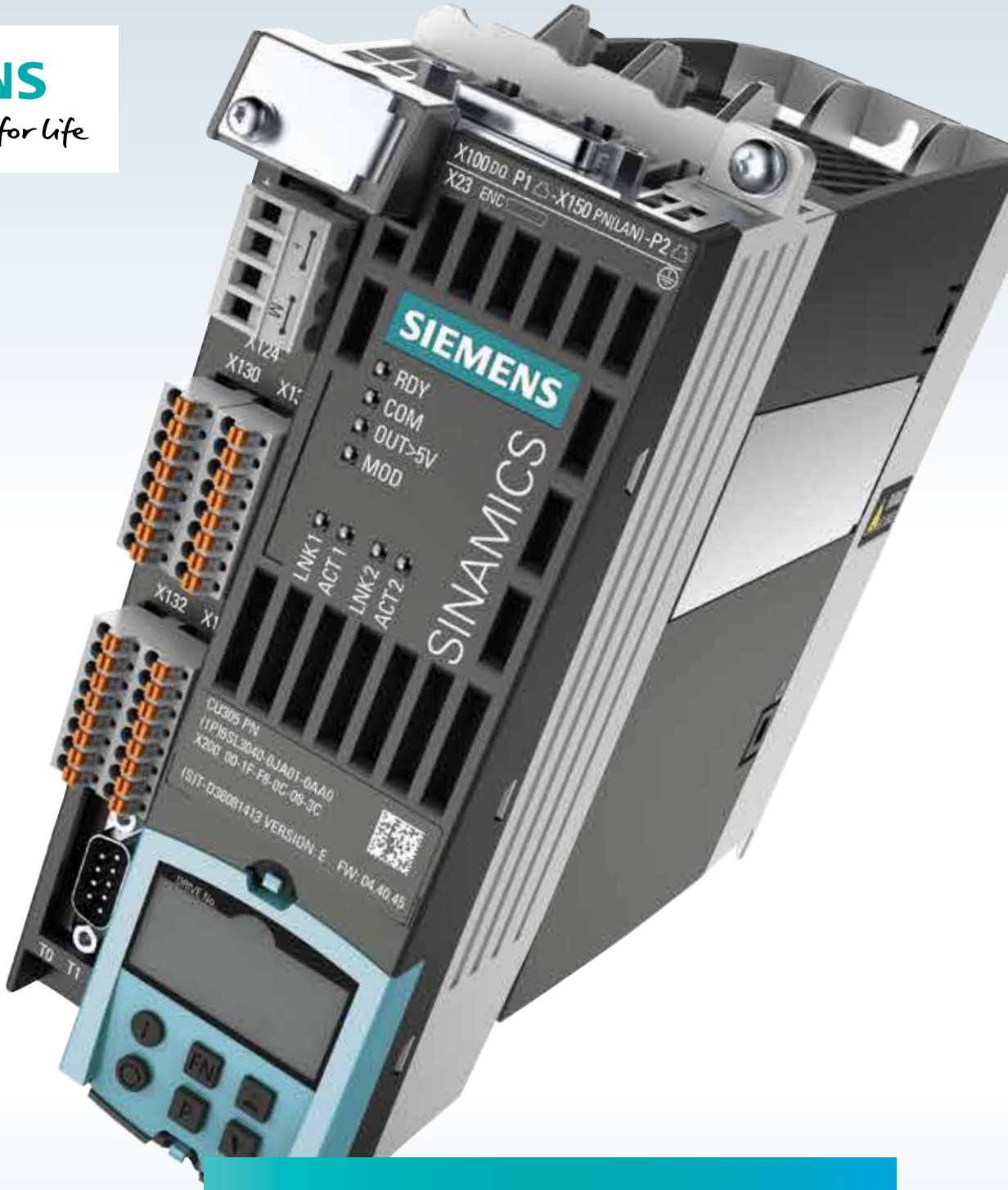
SIEMENS

Ingenuity for life



SINAMICS S110

The compact single-axis servo drive for basic positioning with integrated safety functions

usa.siemens.com/sinamics-s110

SINAMICS —

the optimum drive for every task

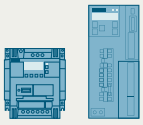
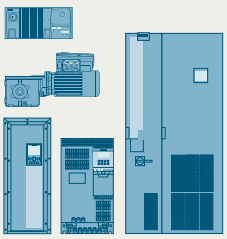
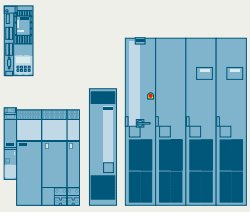
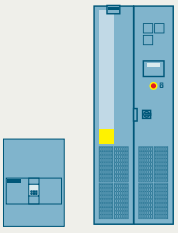
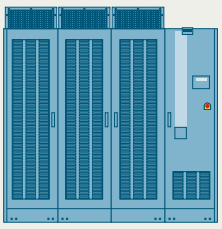
SINAMICS offers the optimum drive for each and every task — and all of these drives can be engineered, parameterized, commissioned and operated in the same standard way.

Standard and integrated in the SINAMICS family

The SINAMICS S110 positioning drive has the same look and feel as the SINAMICS S120 motion control system — both regarding the hardware as well as functionality and handling. It's possible to quickly and simply migrate to a SINAMICS S120 if a drive solution based upon SINAMICS S110 requires a higher degree of performance or functionality.

The advantages of the SINAMICS family — an overview:

- Wide range of power ratings from 0.05 kW to 85 MW
- Available in low-voltage, medium-voltage as well as DC versions
- High degree of flexibility and combinability
- Simple coupling to SIMATIC control systems and seamless integration in the automation landscape
- Higher-level, standard Safety Integrated concept
- Standard and unified functionality resulting from a common hardware and software platform
- Common engineering for all drives
- SIZER for engineering
- Startdrive for parameterizing and commissioning

Low-voltage AC			Direct current DC	Medium-voltage AC
Basic performance	General performance	High-performance	DC applications	For applications with high power ratings
				
V-series	G-series	S-series	DCM	Medium-voltage series
0.05 – 30 kW	0.37 – 6,600 kW	0.55 – 5,700 kW	6 kW – 30 MW	0.15 – 85 MW
When it comes to the hardware as well as the functionality, SINAMICS V-series drives concentrate on the essentials. This results in a high degree of ruggedness with low associated investment costs.	The functionality of SINAMICS G-series drives makes them the perfect choice for basic and medium requirements relating to dynamic performance.	SINAMICS S-series drives are pre-destined for demanding single-axis and multi-axis applications in plant and machine building — including the widest range of motion control tasks.	In addition to the highest power ratings, SINAMICS DC drives also offer the maximum degree of availability.	Our seamless and integrated range, which is unique worldwide, encompasses all dynamic response and performance levels in voltage classes 2.3 to 11 kV.

SINAMICS S110 —
The ideal drive for basic positioning tasks

Reliably positioning single axes — quickly and precisely

For many applications in machine and plant construction, axes must be positioned as simply as possible, but always quickly and precisely — and SINAMICS S110 was specifically designed for this purpose. It's the optimum choice when it involves moving a machine axis reliably and with adequate performance from one position to another.

Everything that a positioning drive requires

SINAMICS S110 integrates all of the required positioning functions and can control synchronous and induction servomotors. It supports a wide variety of encoder types most frequently used in the field. An analog +/–10 V setpoint interface, a pulse/direction interface, a USS interface as well as various fieldbus interfaces are available to connect a SINAMICS S110 drive unit to a higher-level control.

Unique in its class — integrated safety functions

SINAMICS S110 drives set themselves apart as a result of the integrated safety functions. All of the relevant safety directives can be implemented without incurring any significant additional costs.

Totally Integrated Automation with SINAMICS S110

SINAMICS S110 is the ideal positioning drive suitable for applications in conjunction with the SIMATIC automation system. All components of the automation solution can be programmed, parameterized and commissioned using a standard, integrated engineering platform. With its fieldbus interfaces, SINAMICS S110 is flexible and can be integrated into the widest range of system environments.

SINAMICS S110

- Specialist for positioning tasks
- Safety functions onboard
- Ideal for use with SIMATIC PLC systems
- Can be used with every control

The perfect solution for different applications

- Handling equipment
- Feed and withdrawal equipment
- Stacking units
- Automatic assembly machines
- Laboratory automation
- Tool changers
- Adjuster axes
- Tracking equipment, e.g. for solar panels
- Healthcare, e.g. patient beds

SINAMICS S110 — Positioning functions for general applications

Powerful, efficient and reliable

The SINAMICS S110 single-axis drive can control linear axes just the same as rotary axes. Axes can be positioned to absolute target points — or moved through relative distances. A following error monitoring function that can be optionally activated immediately issues an alarm if irregularities occur while traversing. The zero speed monitoring at the end positions also has an alarm function. When required, jerk limiting can ensure that the axis starts and stops smoothly. As a result, even sensitive products or containers filled with liquid can be moved efficiently.

"MDI" mode

The "MDI" mode[1] is the simplest way of positioning using SINAMICS S110. Positioning parameters (velocity, target position/travel distance — optionally also acceleration rates) can be entered from a higher-level control, and are activated by the start command. If required, individual parameters for positioning travel can be modified as the axis moves.

"Traversing blocks" mode

Simple traversing profiles can be implemented in the "traversing blocks" mode. Up to 16 position or traversing distances can be saved in the drive together with the corresponding velocity and acceleration parameters. These traversing blocks can be executed either sequentially or according to additional criteria.

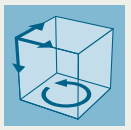
"Jog" mode

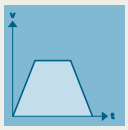
Goods randomly arriving on a conveyor belt can be brought into a precise position using the "jog" mode. Epos[2] functionality can also be simply used to clamp workpieces using the travel to endstop function.

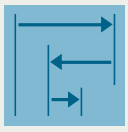
[1] MDI: Manual Data Input
[2] Epos: Easy Positioning

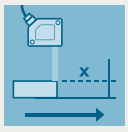
Epos positioning functions

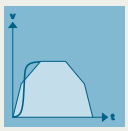
- Linear/rotary axes
- Point-to-point positioning (absolute/relative)
- Traversing profiles
- Flying positioning
- Travel to fixed end-stop
- Jerk limiting
- Motion and standstill monitoring
- Monitoring travel range limits

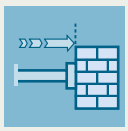

Linear and rotary axes

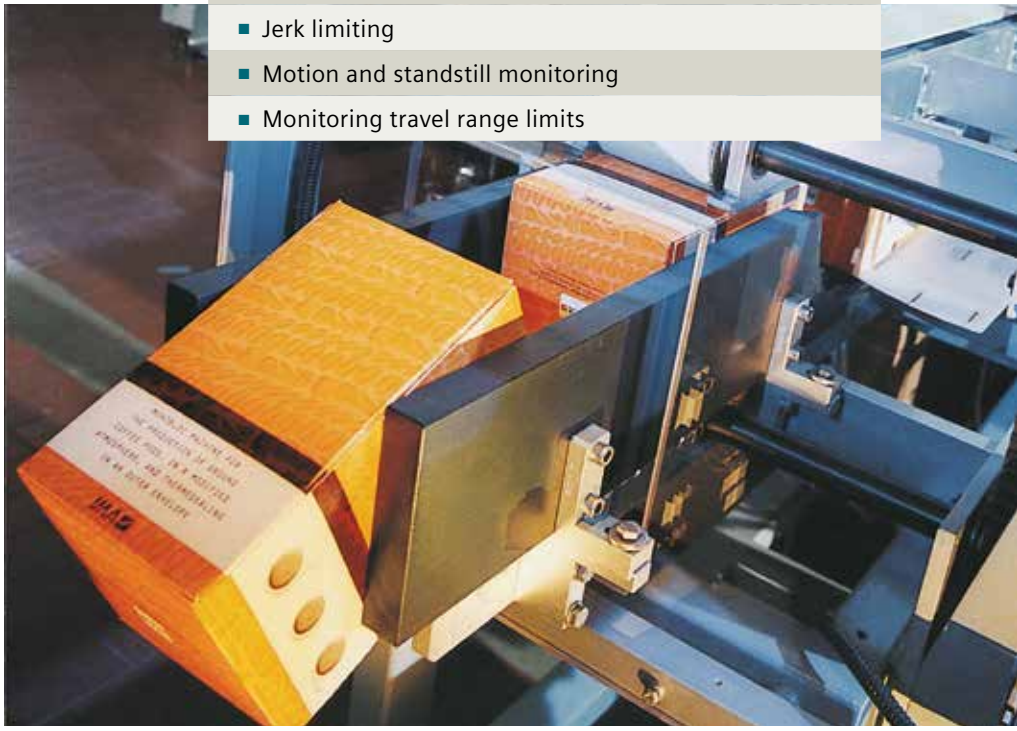

Positioning


Automatic positioning


Positioning on-the-fly


Jerk limiting


Travel to end-stop



SINAMICS S110 — One of the most universal and safest positioning drives

Versatile single-axis servo drive

As the ideal drive for standard positioning tasks, SINAMICS S110 operates quickly and efficiently. This can involve machining axes with a higher dynamic performance, which define the primary process of a machine or plant, as well as actuator axes that are less critical from a time perspective. SINAMICS S110 positions synchronous and induction motors with power ratings of up to 132 kW.

Open and connection-friendly

SINAMICS S110 is open regarding the source of the motors used. A complete solution based upon Siemens motors ensures that the drive and motor are optimally harmonized to one another. Both SIMOTICS S-1FK7/1FT7 synchronous servomotors. as well as the smooth-running SIMOTICS M-1PH8 main motors, have electronic rating plates and a digital DRIVE-CLiQ interface, which allows the drive system to be commissioned quickly.

Universal connection to higher-level controls

The SINAMICS S110 positioning drive is available with a PROFIBUS or PROFINET interface, and supports standard protocols, such as PROFIdrive and PROFIsafe for connection to a higher-level control system. SINAMICS S110 can be easily integrated into the SIMATIC automation system via PROFIBUS and PROFINET. In addition, SINAMICS S110 can also be connected to a higher-level control using the USS protocol, analog or pulse/direction interface.

SIMOTICS GP
low-voltage motor

SIMOTICS S-1FK7
servomotor

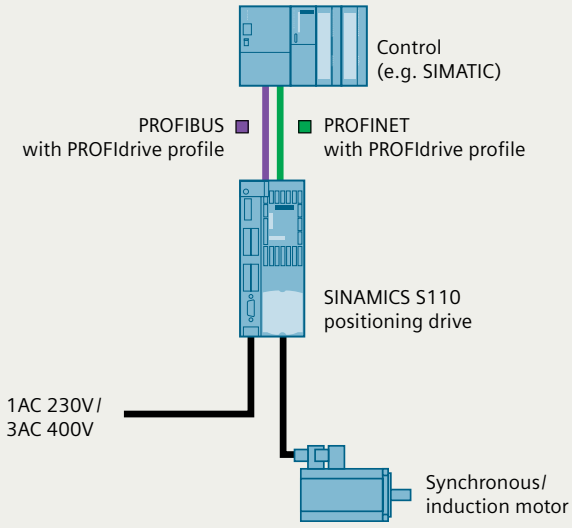
SIMOTICS M-1PH8
main motor

Safety-based motion control

The positioning functions of SINAMICS S110 are complemented by an extensive set of integrated safety functions. These safety functions support the straightforward implementation of innovative safety concepts in compliance with the appropriate standards. As the safety functions are integrated, they respond very quickly in critical situations—avoiding injury to persons and damage to the machine. The safety functions are controlled using integrated safety-relevant input terminals or via PROFIBUS/PROFINET using the PROFIsafe profile.

Increased safety and productivity with integrated safety functions

- Safe Torque Off (STO)
- Safe Operating Stop (SOS)
- Safe Stop 1 (SS1)
- Safe Stop 2 (SS2)
- Safe Direction (SDI)
- Safely Limited Speed (SLS)
- Safe Speed Monitor (SSM)
- Safe Brake Control (SBC)



Single-axis SINAMICS S110 positioning drive connected to a higher-level control via selectable fieldbus interface

SINAMICS S110 — Selection and ordering guide

Control Units	
	Article No.
CU305 DP	6SL3040-0JA00-0AA0
CU305 PN	6SL3040-0JA01-0AA0
Control Unit accessories (optional)	
SINAMICS S110 SD card to save the safety license or backup project data	6SL3054-4TC00-2AA0
Basic Operator Panel BOP20	6SL3055-0AA00-4BA0
Safety license (Extended Functions)	6SL3074-0AA10-0AA0

Power Module PM240-2 Control Unit CU305 SINAMICS S110

A PM240-2 Power Module with mounted CU305 Control Unit forms a SINAMICS S110 positioning drive.

Power Modules PM240-2

			Standard mounting		Push-through mounting	
Type rating	Output current	Frame size	Without line filter	With integrated line filter	Without line filter	With integrated line filter
kW	A		Article No.	Article No.	Article No.	Article No.
Line voltage 1AC 200 – 240V						
0.55	3.0	FSA	6SL3210-1PB13-0UL0	6SL3210-1PB13-0AL0	–	–
0.75	3.9	FSA	6SL3210-1PB13-8UL0	6SL3210-1PB13-8AL0	6SL3211-1PB13-8UL0	6SL3211-1PB13-8AL0
1.1	5.5	FSB	6SL3210-1PB15-5UL0	6SL3210-1PB15-5AL0	–	–
1.5	7.4	FSB	6SL3210-1PB17-4UL0	6SL3210-1PB17-4AL0	–	–
2.2	10.4	FSB	6SL3210-1PB21-0UL0	6SL3210-1PB21-0AL0	6SL3211-1PB21-0UL0	6SL3211-1PB21-0AL0
3.0	13.6	FSC	6SL3210-1PB21-4UL0	6SL3210-1PB21-4AL0	–	–
4.0	17.5	FSC	6SL3210-1PB21-8UL0	6SL3210-1PB21-8AL0	6SL3211-1PB21-8UL0	6SL3211-1PB21-8AL0
Line voltage 3AC 380 – 480 V						
0.55	1.7	FSA	6SL3210-1PE11-8UL1	6SL3210-1PE11-8AL1	–	–
0.75	2.2	FSA	6SL3210-1PE12-3UL1	6SL3210-1PE12-3AL1	–	–
1.1	3.1	FSA	6SL3210-1PE13-2UL1	6SL3210-1PE13-2AL1	–	–
1.5	4.1	FSA	6SL3210-1PE14-3UL1	6SL3210-1PE14-3AL1	–	–
2.2	5.9	FSA	6SL3210-1PE16-1UL1	6SL3210-1PE16-1AL1	–	–
3.0	7.7	FSA	6SL3210-1PE18-0UL1	6SL3210-1PE18-0AL1	6SL3211-1PE18-0UL1	6SL3211-1PE18-0AL1
4.0	10.2	FSB	6SL3210-1PE21-1UL0	6SL3210-1PE21-1AL0	–	–
5.5	13.2	FSB	6SL3210-1PE21-4UL0	6SL3210-1PE21-4AL0	–	–
7.5	18	FSB	6SL3210-1PE21-8UL0	6SL3210-1PE21-8AL0	6SL3211-1PE21-8UL0	6SL3211-1PE21-8AL0
11	26	FSC	6SL3210-1PE22-7UL0	6SL3210-1PE22-7AL0	–	–
15	32	FSC	6SL3210-1PE23-3UL0	6SL3210-1PE23-3AL0	6SL3211-1PE23-3UL0	6SL3211-1PE23-3AL0
18.5	38	FSD	6SL3210-1PE23-8UL0	6SL3210-1PE23-8AL0	–	–
22	45	FSD	6SL3210-1PE24-5UL0	6SL3210-1PE24-5AL0	–	–
30	60	FSD	6SL3210-1PE26-0UL0	6SL3210-1PE26-0AL0	–	–
37	75	FSD	6SL3210-1PE27-5UL0	6SL3210-1PE27-5AL0	–	–
45	90	FSE	6SL3210-1PE28-8UL0	6SL3210-1PE28-8AL0	–	–
55	110	FSE	6SL3210-1PE31-1UL0	6SL3210-1PE31-1AL0	–	–
75	145	FSF	6SL3210-1PE31-5UL0	6SL3210-1PE31-5AL0	–	–
90	178	FSF	6SL3210-1PE31-8UL0	6SL3210-1PE31-8AL0	–	–
110	205	FSF	6SL3210-1PE32-1UL0	6SL3210-1PE32-1AL0	–	–
132	250	FSF	6SL3210-1PE32-5UL0	6SL3210-1PE32-5AL0	–	–

Please contact your local Siemens sales person or order the drive unit directly through: www.siemens.com/automation/mall

SINAMICS S110 —
Everything at a glance

SINAMICS S110 — for basic positioning tasks						
Frame size	**FSA**	**FSB**	**FSC**	**FSD**	**FSE**	**FSF**
						
Drive type	AC/AC device, modular					
Degree of protection	IP20					
Line voltage V_{line} / power ranges						
1AC 200 ... 240V	0.55 – 0.75 kW	1.1 – 2.2 kW	3.0 – 4.0 kW	–	–	–
3AC 380 ... 480V	0.55 – 3.0 kW	4.0 – 7.5 kW	11 – 15 kW	18.5 – 37 kW	45 – 55 kW	75 – 132 kW
Positioning functions	Point-to-point positioning, absolute/relative; linear/rotary axis; flying positioning; traversing blocks (max. 16)					
Monitoring functions	Traversing range limits, following error, standstill, motor temperature					
Additional technology functions	BICO technology, technology controller					
Safety functions acc. to EN 954 1, Cat 3, EN 61508, SIL 2 or EN ISO 13849 1, PL d	STO: Safe Torque Off, SOS: Safe Operating Stop, SS1, SS2: Safe Stop 1[3], Safe Stop 2, SBC: Safe Brake Control, SDI (Safe Direction)[3], SLS: Safely Limited Speed[3], SSM: Safe Speed Monitor[3]					
Communication interfaces	PROFINET, PROFIBUS DP, RS232/USS protocol, pulse/direction interface +/–10 V analog interface					
Communication profiles	PROFIdrive, PROFIsafe					
Encoders that can be connected	HTL-/TTL; SSI; DRIVE-CLiQ, additional encoders via SMC interface module					
Onboard inputs/outputs[1]	4 DI, 24 V, floating; 4 DI/DO, 24 V; 1 AI (12 bit); 1 PTC/KTY temperature sensor connection					
Safety-related onboard inputs/outputs[2]	3 F-DI, 24 V; 1 F-DO, 24 V					
Line frequency	43 – 63 Hz					
Output voltage	V_{line}					
Output frequency	0 – 300 Hz					
Motors	Synchronous motors, induction motors					
Closed-loop control modes	Servo control, speed control, position control					
Closed-loop control performance	Positioning: 4 ms					
Tools	Engineering: SIZER, Commissioning: STARTER					
Typical applications	Pick and place applications, storage and retrieval machines, basic handling tasks, positioning indexing tables, positioning adjuster and actuator axes in all machine building industries					

[1] DI: Digital Input, DO: Digital Output; AI: Analog Input
[2] F DI/F DO: fail-safe digital input/output; each F-DI, if not used for safety, can be used as two standard DIs
[3] also available without encoder

There’s more to it.

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Everything about our drive family can be found online.

SINAMICS — one family, one source,all applications

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