SINAMICS S110

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

<table>
<thead>
<tr>
<th>Low-voltage AC</th>
<th>Direct current DC</th>
<th>Medium-voltage AC</th>
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<tbody>
<tr>
<td>Basic performance</td>
<td>General performance</td>
<td>High-performance</td>
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<tr>
<td>V-series 0.05 – 30 kW</td>
<td>G-series 0.37 – 6,600 kW</td>
<td>S-series 0.55 – 5,700 kW</td>
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<tr>
<td>The functionality of SINAMICS G-series drives makes them the perfect choice for basic and medium requirements relating to dynamic performance.</td>
<td>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.</td>
<td>In addition to the highest power ratings, SINAMICS DC drives also offer the maximum degree of availability.</td>
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<tr>
<td>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.</td>
<td></td>
<td>Our seamless and integrated range, which is unique worldwide, encompasses all dynamic response and performance levels in voltage classes 2.3 to 11 kV.</td>
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</tbody>
</table>
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 —
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.

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\(^1\) MDI: Manual Data Input
\(^2\) Epos: Easy Positioning

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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
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.

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)

![Diagram of SINAMICS S110 positioning drive connected to a higher-level control via selectable fieldbus interface](image.png)
# SINAMICS S110 — Selection and ordering guide

## Power Modules PM240-2

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### 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

<table>
<thead>
<tr>
<th>Frame size</th>
<th>FSA</th>
<th>FSB</th>
<th>FSC</th>
<th>FSD</th>
<th>FSE</th>
<th>FSF</th>
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</table>

**Drive type**
- AC/AC device, modular

**Degree of protection**
- IP20

**Line voltage $V_{\text{line}}$ / 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, 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, PROFlsafe

**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**
- $V_{\text{line}}$

**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

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\(^1\) 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.

usa.siemens.com/sinamics

Everything about our drive family can be found online.

SINAMICS — one family, one source, all applications