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# Sigma-7 Series

## AC Servo Drives

# Quick. Fast. Reliable.

The development of the new Sigma-7 series focused on three main goals: consistently fast commissioning, high production output and maximum operational reliability. The series offers a powerful response to today‘s market requirements for both machine constructors and final customers in the production industry. Sigma-7 offers particularly great potential for packaging plants, semiconductor manufacturing, wood processing and digital printing machines.

*200 V Series*

*400 V Series*

### Quick Setup in just 3 Minutes

Presets in the amplifier software simplify commissioning. A ‚tuning-less‘ function allows immediate use of the Sigma-7 without the need for complex parametrisation or special knowledge of control equipment, while an auto-tuning function ensures quick adjustment.

### Space Savings

New book-style housing supports gap-free, side-by-side installation of amplifiers even in small spaces. This makes it possible to realize a high performance density inside a cabinet. The needed space is reduced to a minimum, allowing it and the drive electronics to be integrated in the machine.

### Eco Friendly

Sigma-7 motor efficiency reduces heat generation by up to 20 %. The possible DC Power coupling of axes allows energy sharing and energy savings of up to 30 %.

### Cost Savings

Sigma-7 reduces the overall costs by providing faster machine setup, higher throughput with more products in less time and reduced machine downtimes due to the high reliability of our products.

# Seven Reasons for Sigma-7

Sigma-7 Servo Drives provide you with the ultimate experience in seven key areas and delivers the optimal solution that only Yaskawa can offer.

## 1 Comprehensive Motor and Amplifier Power Range

### Wide Power Range

- Very compact motors from 50 W to 15 kW
- Linear motors iron core and ironless with a peak force up to 7,560 N
- Direct drives with torques from 2 Nm up to 600 Nm

## 2 Savings through Performance

### Lower Production Costs

- Speed loop bandwidth of 3.1 kHz
- Shorter settling time, reduced positioning time, higher throughput

### Higher Performance

- Overload 350 % for 3 – 5 seconds
- High peak torque, fast acceleration

### Energy Savings and higher Productivity

- High peak torque, fast acceleration, no amplifier oversizing
- Lightweight mechanics

## 3 Safety Features

**Smooth Integration of mandatory Legal Safety Standards**

- The STO function is implemented by default in all Sigma-7 series servo amplifiers
- Build safer machines - Sigma-7 safety modules satisfy the requirements of SIL3/PLe (Cat. 3)
- The functions SS1, SS2, SOS and SLS are standard in each safety module
- 3 different option modules are available with up to 14 safety functions

## 4 High Efficiency

**Very low Heat Generation**

- Optimized magnetic circuit improves motor efficiency
- Improved motor efficiency reduces heat generation by about 20 %
- Ambient temperature from -5 to 55 °C (max. 60 °C with derating)

## 5 High Accuracy

**Next level 24-Bit Absolute Encoder for maximum Accuracy**

- Resolution of 16 million pulses per revolution for extremely precise positioning

## 6 Impressive System Performance

**Very high Precision teamed up with fast, smooth Operation**

- Ripple compensation for highest demands in smoothness and dynamics
- Even for machines for which speed loop gains cannot be set high

## 7 Outstanding Reliability

**Even more Reliability for your Production**

- More than 18 million servo systems in the field
- Improved machine reliability, reduced service and maintenance costs, less downtime

# Next Generation Servo Systems

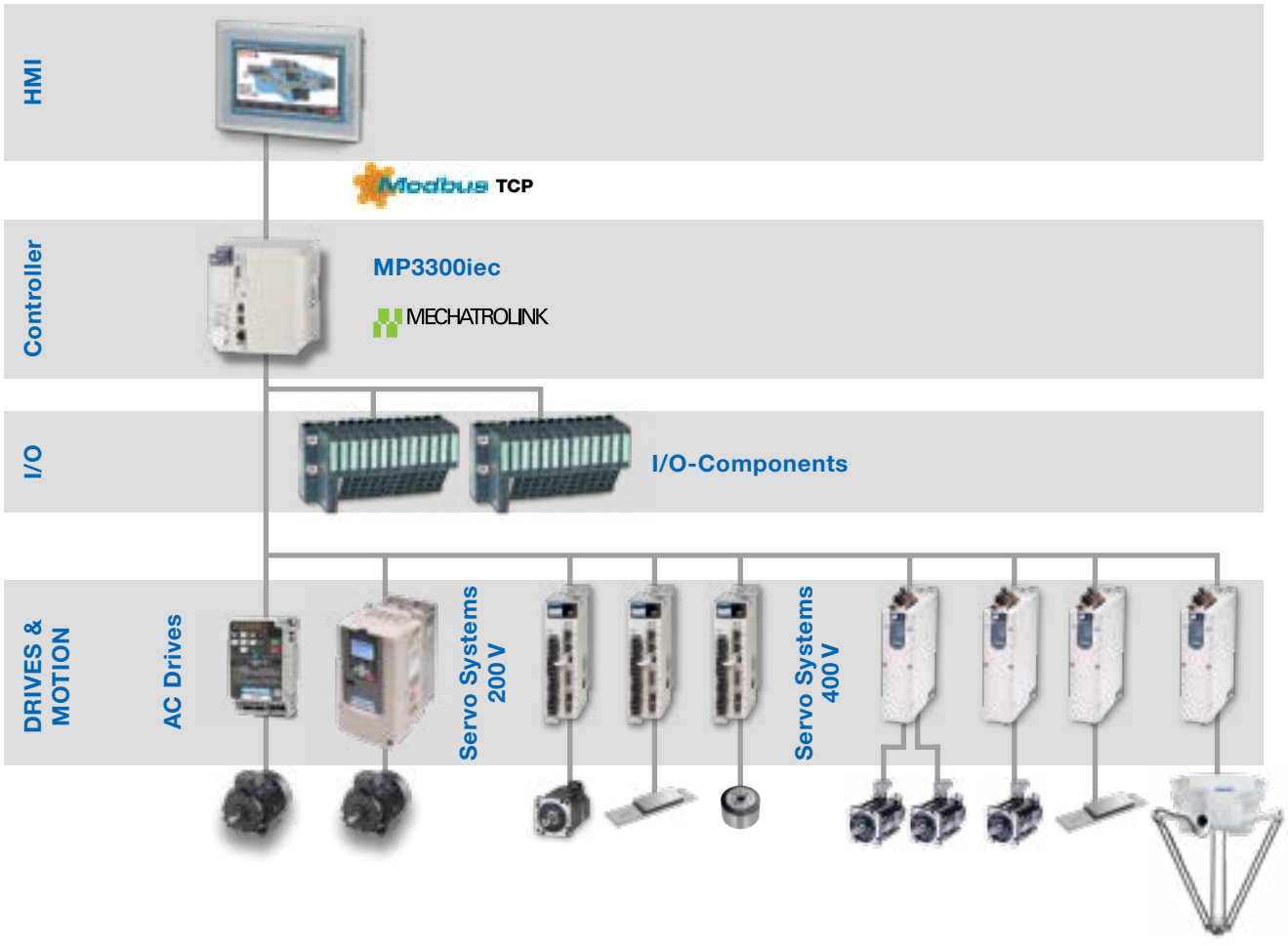
With more than 18 million servo systems in the field, we have a lot of experience and technical know-how in motion and control. The Result: Excellent performance and an extremely low fault rate. With the new Sigma-7 series, we managed to create a masterpiece in reliable precision performance. Thanks to its new features, start-up is possible in just a few minutes. Quick, application specific drive adjustments and maximised product output are guaranteed.

## SERVOPACKs

- Single & dual axis amplifier
- One amplifier for linear & rotary motors
- SIL 3 for STO, PL-e CAT 3
- Speed frequency response: 3.1 kHz
- Advanced safety functions SS1, SS2, SLS
- Feedback options
- Ripple compensation, vibration suppression, etc.

## Servomotors

- 24-bit high-resolution encoder installed
- High efficiency, low heat generation
- Three motor models available
  - » Low inertia SMG7A up to 7 kW
  - » Medium inertia SGM7J up to 1.5 kW
  - » Medium inertia SGM7G up to 15 kW



# Bundles and Individual Components

We can offer our customers bundles as well as individual components for many applications in the automation industry.

### Machine Controller MP3300iec

High performance machine controller for automation technology. Yaskawa machine controllers manage complex systems with servo and AC drives. High-speed communication provides high-performance and high-accuracy motion control, even for complex movements.

- Up to 62 axes
- Communication: Modbus TCP/IP, MECHATROLINK-III, Ethernet (100 Mbps)
- PLCopen function blocks
- Reusable code library

### MPP 3 & MPK Series Pick & Place Robots + MP3300 with IEC Robot Control

The 4-axis high-speed robot MOTOMAN MPP3 with parallel kinematic system combines the speed of the delta design with a high payload capacity and a large working range.
The MOTOMAN MPK is a high-speed, 5-axis picking robot that provides superior performance and reliability for food handling, picking, packing and other high-speed material handling applications.

- Minimal footprint
- Fast acceleration and high speed increase productivity
- Optional vision and conveyor tracking for maximum flexibility
- Manage every system component with one software package, running on one motion controller.
- Migrate a motion axis from servos to robots and back again, without changing the application code.
- Do it all with the same IEC 61131-3 programming format that your team is already skilled and comfortable with utilizing.

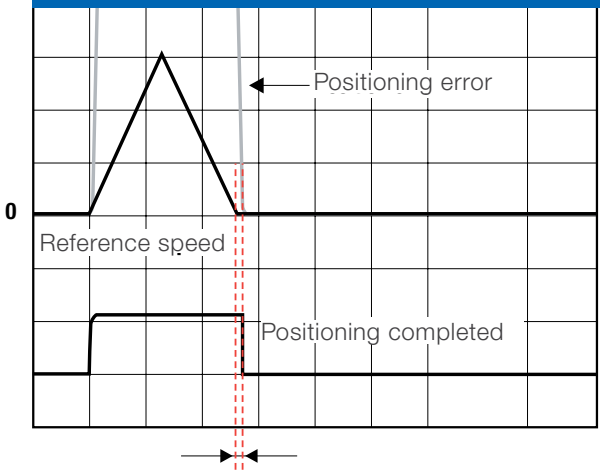
### VIPA Touch Panels

VIPA professional touch panels with display sizes from 4.3“ to 12.1“, operating system Windows Embedded CE 6.0 and Runtime Movicon 11 can be used universally. VIPA eco panels in 4 different display sizes from 4.3“ to 15“ are designed for maximum reliability and flexibility, as well as longevity and quality.

# Savings through Performance

With a best in class frequency response of 3.1 kHz, Sigma-7 SERVOPACKs can reduce settling time to less than 4 ms. Compared to a standard system with for example 40 ms settling time, a pick & place unit based on Sigma-7 components can save a significant amount of money.

**Servo adjustment example**




**Settling time 0 to 4 ms! (Sigma-7)**

**Form, fill and seal machine**

## Shorter Settling Time increases your Revenue

### Pick & place example with 40 ms settling time

| Axis length | Move | Settle | Move | Settle | Time per part | Parts per minute | Parts per hour | Price per part | Revenue per hour |
|---|---|---|---|---|---|---|---|---|---|
| X = 200 mm | 0.5 s | 0.04 s | 0.5 s | 0.04 s | | | | | |
| X = 200 mm | 0.2 s | 0.04 s | 0.2 s | 0.04 s | 1.56 s | 38.46 | 2,307 | € 0.1 | 230.77 € |
| Total | 0.7 s | 0.08 s | 0.7 s | 0.08 s | | | | | |

### Pick & place example with 4 ms settling time

| Axis length | Move | Settle | Move | Settle | Time per part | Parts per minute | Parts per hour | Price per part | Revenue per hour |
|---|---|---|---|---|---|---|---|---|---|
| X = 200 mm | 0.5 s | 0.004 s | 0.5 s | 0.004 s | | | | | |
| X = 200 mm | 0.2 s | 0.004 s | 0.2 s | 0.004 s | 1.416 s | 42.37 | 2,542 | € 0.1 | 254.24 € |
| Total | 0.7 s | 0.008 s | 0.7 s | 0.008 s | | | | | |

Additional revenue per hour: **23.47 €**

Additional revenue per 16 hours: **375.53 €**

Additional revenue per 5 days: **1,877.66 €**

Additional revenue per year: **93,657.75 €**

# Safety in Motion

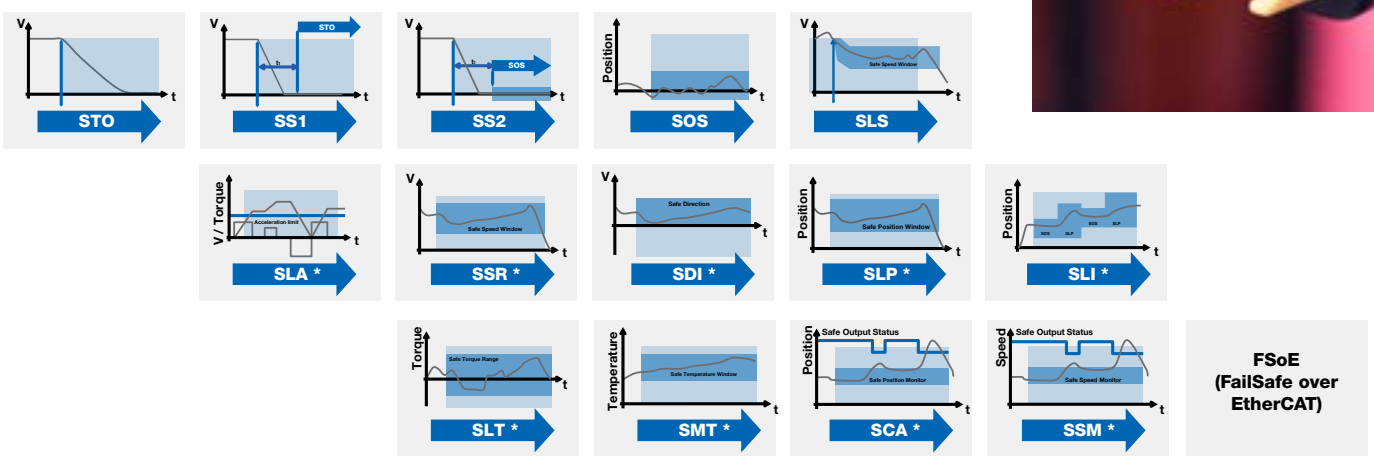
Yaskawa offers a new generation of safety modules, which are geared to your requirements. They follow with SIL3/PLe and FSoE (FailSafe over EtherCAT) the latest standards of the industry.

In order to find a suitable and economical solution for your application Yaskawa offers a scalable concept. While Safe Torque Off is integrated in every SERVOPACK, three different option modules can be selected for further requirements:

| Option Module | Safety Function | I/Os | FSoE |
|---|---|---|---|
| SGDV-OSA01A | STO/SS1/SS2/<br>SOS/SLS | 2 Safe Inputs | - |
| SGD7S-OSB02A | STO/SS1/SS2/<br>SOS/SLS/SLA/<br>SSR/SDI/SLP/<br>SLI/SLT/SMT/<br>SCA/SSM | - | ✓ |
| SGD7S-OSB01A | STO/SS1/SS2/<br>SOS/SLS/SLA/<br>SSR/SDI/SLP/<br>SLI/SLT/SMT/<br>SCA/SSM | 4 Safe I/Os<br>2 Safe Inputs<br>1 Safe Analog Input<br>1 Input 4 - 20 mA<br>1 Input PT100 /PT1000 | ✓ |

**SIL3**

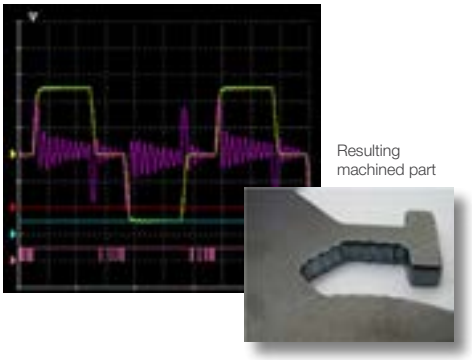
Up to 14 safety functions enable you to find a suitable solution for many applications. Fulfilling for every safety function the latest standard SIL3/ PLe (Cat. 3) Yaskawa supports you to easily reduce risks.
The new generation of Yaskawa safety modules is also providing FSoE Slave functionality. Combining Safety and the open as well as common Ethernet based fieldbus system EtherCAT helps you to realize your safety application with less effort for wiring.



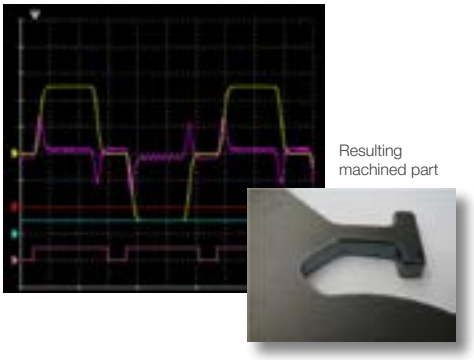
# Get Rid of Effects that Steal away Performance

Unwanted mechanical effects rob a servo system of the quick, smooth and precise movement you need. Yaskawa SERVOPACKs are equipped with suppression features that automatically eliminate harmful artifacts.

*Without vibration suppression*




*With vibration suppression*




### Vibration

Machine vibrations are eliminated by Yaskawa Vibration Suppression, which samples your equipment's natural oscillations and uses compensating frequencies to cancel them out..

### Ripples

Motor cogging effects are removed by Ripple Compensation, an especially important effect for systems that require minimum settling time and exceptionally precise positioning.

### Resonance

Sigma-7 amplifiers have twice as many anti-resonance filters to more effectively repress a servo system's natural medium-frequency resonances.

### Friction

Coulomb friction and viscosity-related variables are effectively addressed by Friction Model Compensation, which effectively elicits smooth start-up action in low speed or high rigidity machines. It corrects changes in machine operation caused by component wear and other friction effects over time.

### Electromagnetic interference

The number of interference filters has been increased by 225% to counteract losses caused by data dropouts, electromagnetic interferences and artifacts from long cable runs.

### Better Noise Protection

Sigma Series servos are equipped with nine discrete filters to protect against electrical noise, vibration and resonance. The result is more reliable performance, faster response and greater accuracy despite long cable runs, noisy equipment and everyday variations in a machine's mechanical condition.

# Simplify your Life

The Sigma-7 Series provides an easy and quick adjustment for your servo solution. That saves time and money.

## The Yaskawa Tuning Suite

Yaskawa equips each SERVOPACK with a suite of software commissioning and tuning tools, designed to achieve full functioning right out of the box. This superior performance continues in spite of all the vibration, resonance, friction and noise that a modern automated machine can dish out.

### Tuning-Less Function

**Get up and running quickly**

From Day One, the tuning-less function automatically compensates for mismatches in load to rotor inertia up to 30:1.

Setting time:

40 ms

range

### Advanced Autotuning

**Minimize setting time**
**Maximize smooth motion**

Advanced auto tuning automatically adjusts nearly 20 gain and filter parameters to cancel vibration, rippling, friction and resonance.

Setting time:

4 ms

range

### One Parameter Tuning

**Precise user-driven adjustment**

Improve your machine's performance even further with easy fine tuning adjustments that won't throw off your existing operating parameters.

Setting time:

0 to 4 ms

range

# Packed with Performance

### More Torque in Less Space, for an Easier Fit in Your Tightest Application

- The segmented stator core design and automated winding techniques pack nearly twice the copper into the stator gap, for much more torque output from every cubic millimeter of space
- Encapsulated windings prevent shorts between windings, improving heat dissipation
- Precise machining is used to minimize the air gap between rotor magnets and stator windings, for higher running torque and reduced cogging torque
- By reducing the space taken up by the end turns of the winding, overall motor length is significantly reduced
- Neodymium-Iron-Boron rotor magnets optimize flux density in the motor

### Eliminate Mechanical Breakdowns

Simplify your machine's design, decrease part counts and cut assembly time by replacing mechanical linkages with reliable, flexible servo control.

- Designed to accommodate up to a 30:1 inertia mismatch
- Reduce gearbox size, or eliminate gearboxes altogether
- Eliminate maintenance points in machinery and improve safety

## Software Tools

### Software Setup Wizard

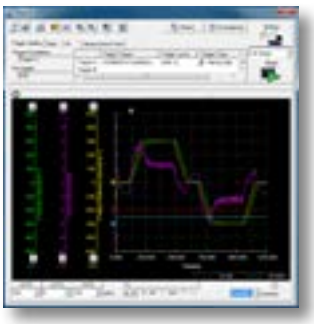
Simple parameter setup with wizard guided input.

### Wiring Check Function

The SigmaWin+ wiring check function checks your wiring in a single operation.

### Trace Function

Real-time trace of adjustment state facilitates instantaneous monitoring.



### Full of handy Functions for Startup and more effective Operation

Optimal selection for your application with consideration of moment of inertia, dynamic braking resistance, etc.

### Maintenance

Faster troubleshooting with alarm diagnostic function – presumes possible causes of alarm and immediately displays suggested corrective actions.

# The 200 V Series

## Amplifiers

- Single & three-phase input
- Embedded fieldbus
  - » Pulse train / analog input
  - » MECHATROLINK-II
  - » MECHATROLINK-III
  - » EtherCAT
  - » PROFINET
  - » Command Option Type
- Single & dual axis amplifier
- Dual axis amplifier with built-in controller
- Single axis amplifier with IEC-based built-in controller

## Motors

- Rotary, Linear and Direct Drive Motors available
- Very compact design
- Available from 50 W to 15 kW

# Product Overview 200 V

## Servomotors

### Rotary

#### SGM7J

- Medium inertia, high speed
- 50 W - 750 W

#### SGM7A

- Low inertia, high speed
- 50 W - 7 kW

#### SGM7G

- Medium inertia, large torque
- 300 W - 15 kW

#### SGMMV

- Low inertia, ultra-small capacity
- 10 W - 30 W

### Direct Drive

#### SGM7D

- Medium capacity, with core
- Rated: 1.3 Nm - 240 Nm
  Peak: 4 Nm - 400 Nm

#### SGM7E

- Coreless, inner rotor
- Rated: 2 Nm - 35 Nm
  Peak: 6 Nm - 105 Nm

#### SGM7F

- With core, inner rotor
- Rated: 2 Nm - 200 Nm
  Peak: 6 Nm - 600 Nm

#### SGMCS

- Small capacity, coreless or Medium capacity, with core
- Rated: 2 Nm - 200 Nm
  Peak: 6 Nm - 600 Nm

#### SGMCV

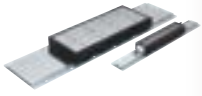
- Small capacity, with core
- Rated: 4 Nm - 35 Nm
  Peak: 12 Nm - 105 Nm

### Linear

#### SGLG

- Coreless model
- Rated: 12.5 N - 750 N
  Peak: 40 N - 3000 N

#### SGLFW2 / SGLFW



- Model with F-type iron core
- Rated: 25 N - 2520 N
  Peak: 86 N - 7560 N

#### SGLT

- Model with T-type iron core
- Rated: 130 N - 2000 N
  Peak: 380 N - 7500 N

# SERVOPACKs

## SGD7S-□□□A00A

Single-axis
Analog Voltage/
Pulse Train Reference

## SGD7S-□□□A10A

Single-axis
MECHATROLINK-II
Communication
Reference

## SGD7S-□□□A20A

Single-axis
MECHATROLINK-III
Communication
Reference

## SGD7S-□□□A30A

Single-axis
MECHATROLINK-III
Communication
Reference
with RJ45 connector

## SGD7S-□□□AA0A

Single-axis
EtherCAT
Communication
Reference

## SGD7S-□□□AC0A

Single-axis
PROFINET
Communication
Reference

## SGD7S-□□□AE0A

Single-axis
Command Option
Attachable Type

## SGD7S-□□□M0A

Single-axis
Sigma-7Siec
(with integrated
iec-Controller)

## SGD7W-□□□A20A

Dual-axis
MECHATROLINK-III
Communication
Reference

## SGD7C-□□□AMAA□□□

Dual-axis
SERVOPACK
with built-in
controller

# Option Modules

## SGDV-OF□0□A

Fully-Closed /
Feedback Option
Modules

## SGDV-OSA01A
## SGD7S-OSB0□A

Safety Modules

## SGDV-OCA03A

INDEXER Module

## SGDV-OCA0□A

DeviceNet Modules

## SGDV-OCC02A

MP2600iec Module

# Model Designations 200V

## Rotary Servomotors

### SGM7J - 01 A 7 A 2 1

| Sigma-7 Series Servomotors: SGM7J | - | 01 | A | 7 | A | 2 | 1 |
|---|---|---|---|---|---|---|---|
| | | 1st + 2nd | 3rd | 4th | 5th | 6th | 7th digit |

**1st + 2nd digit - Rated Output**

| Code | Specification |
|---|---|
| A5 | 50 W |
| 01 | 100 W |
| C2 | 150 W |
| 02 | 200 W |
| 04 | 400 W |
| 06 | 600 W |
| 08 | 750 W |

**3rd digit - Power Supply Voltage**

| Code | Specification |
|---|---|
| A | 200 VAC |

**4th digit - Serial Encoder**

| Code | Specification |
|---|---|
| 6 | 24-bit batteryless absolute |
| 7 | 24-bit absolute |
| F | 24-bit incremental |

**5th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard model |

**6th digit - Shaft End**

| Code | Specification |
|---|---|
| 2 | Straight without key |
| 6 | Straight with key and tap |
| B | With two flat seats |

**7th digit - Options**

| Code | Specification |
|---|---|
| 1 | Without options |
| C | With holding brake (24 VDC) |
| E | With oil seal and holding brake (24 VDC) |
| S | With oil seal |

### SGM7A - 01 A 7 A 2 1

| Sigma-7 Series Servomotors: SGM7A | - | 01 | A | 7 | A | 2 | 1 |
|---|---|---|---|---|---|---|---|
| | | 1st + 2nd | 3rd | 4th | 5th | 6th | 7th digit |

**1st + 2nd digit - Rated Output**

| Code | Specification |
|---|---|
| A5 | 50 W |
| 01 | 100 W |
| C2 | 150 W |
| 02 | 200 W |
| 04 | 400 W |
| 06 | 600 W |
| 08 | 750 W |
| 10 | 1.0 kW |
| 15 | 1.5 kW |
| 20 | 2.0 kW |
| 25 | 2.5 kW |
| 30 | 3.0 kW |
| 40 | 4.0 kW |
| 50 | 5.0 kW |
| 70 | 7.0 kW |

**3rd digit - Power Supply Voltage**

| Code | Specification |
|---|---|
| A | 200 VAC |

**4th digit - Serial Encoder**

| Code | Specification |
|---|---|
| 6 | 24-bit batteryless absolute |
| 7 | 24-bit absolute |
| F | 24-bit incremental |

**5th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard model |

**6th digit - Shaft End**

| Code | Specification |
|---|---|
| 2 | Straight without key |
| 6 | Straight with key and tap |
| B* | With two flat seats |

* Code B is not supported for models with a rated output of 1.5 kW or higher.

**7th digit - Options**

| Code | Specification |
|---|---|
| 1 | Without options |
| C | With holding brake (24 VDC) |
| E | With oil seal and holding brake (24 VDC) |
| S | With oil seal |

## SGM7G - 03 A 7 A 2 1

Sigma-7 series Servomotors: SGM7G

1st + 2nd | 3rd | 4th | 5th | 6th | 7th digit

| 1st + 2nd digit - Rated Output | |
|---|---|
| **Code** | **Specification** |
| 03 | 300 W |
| 05 | 450 W |
| 09 | 850 W |
| 13 | 1.3 kW |
| 20 | 1.8 kW |
| 30 | 2.9 kW* |
| 44 | 4.4 kW |
| 55 | 5.5 kW |
| 75 | 7.5 kW |
| 1A | 11.0 kW |
| 1E | 15.0 kW |

| 3rd digit - Power Supply Voltage | |
|---|---|
| **Code** | **Specification** |
| A | 200 VAC |

| 4th digit - Serial Encoder | |
|---|---|
| **Code** | **Specification** |
| 6 | 24-bit batteryless absolute |
| 7 | 24-bit absolute |
| F | 24-bit incremental |

| 5th digit - Design Revision Order | |
|---|---|
| **Code** | **Specification** |
| A | Standard model |

| 6th digit - Shaft End | |
|---|---|
| **Code** | **Specification** |
| 2 | Straight without key |
| 6 | Straight shaft with key and tap |

| 7th digit - Options | |
|---|---|
| **Code** | **Specification** |
| 1 | Without options |
| C | With holding brake (24 VDC) |
| E | With oil seal and holding brake (24 VDC) |
| S | With oil seal |

* The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.

## SGMMV - A1 A 2 A 2 1

Sigma-5 mini series Servomotors: SGMMV

1st + 2nd | 3rd | 4th | 5th | 6th | 7th digit

| 1st + 2nd digit - Rated Output | |
|---|---|
| **Code** | **Specification** |
| A1 | 10 W |
| A2 | 20 W |
| A3 | 30 W |

| 3rd digit - Power Supply Voltage | |
|---|---|
| **Code** | **Specification** |
| A | 200 VAC |

| 4th digit - Serial Encoder | |
|---|---|
| **Code** | **Specification** |
| 2 | 17-bit absolute |

| 5th digit - Design Revision Order | |
|---|---|
| **Code** | **Specification** |
| A | Standard model |

| 6th digit - Shaft End | |
|---|---|
| **Code** | **Specification** |
| 2 | Straight without key |
| A | Straight with flat seats (optional) |

| 7th digit - Options | |
|---|---|
| **Code** | **Specification** |
| 1 | Without options |
| C | With holding brake (24 VDC) |

# Direct Drive Servomotors

## SGM7D - 30 F 7 C 4 1

Direct Drive Servomotors — 1st + 2nd — 3rd — 4th — 5th — 6th — 7th digit

### 1st + 2nd digit - Rated Output

| Code | Specification | Code | Specification |
|---|---|---|---|
| 01 | 1.3 Nm | 30 | 30 Nm |
| 02 | 2.06 Nm | 34 | 34 Nm |
| 03 | 3 Nm | 38 | 38 Nm |
| 05 | 5 Nm | 45 | 45 Nm |
| 06 | 6 Nm | 58 | 58 Nm |
| 08 | 8 Nm | 70 | 70 Nm |
| 09 | 9 Nm | 90 | 90 Nm |
| 12 | 12 Nm | 1Z | 100 Nm |
| 18 | 18 Nm | 1A | 110 Nm |
| 20 | 20 Nm | 1C | 130 Nm |
| 24 | 24 Nm | 2B | 220 Nm |
| 28 | 28 Nm | 2D | 240 Nm |

### 3rd digit - Servomotor Outer Diameter

| Code | Specification |
|---|---|
| F | 264 mm |
| G | 160 mm |
| H | 116 mm |
| I | 264 mm |
| J | 150 mm |
| K | 107 mm |
| L | 224 mm x 224 mm |

### 4th digit - Serial Encoder

| Code | Specification |
|---|---|
| 7 | 24-bit multi-turn absolute encoder*1 |
| F | 24-bit incremental encoder*1 |

### 5th digit - Design Revision Order

| Code | Specification |
|---|---|
| C | Standard Model |

### 6th digit - Flange

| Code | Mounting | Servomotor Outer Diameter Code (3rd digit) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | F | G | H | I | J | K | L |
| 4 | Non-load side with cable on side | ✓ | ✓ | ✓ | — | — | — | ✓ |
| 5 | Non-load side with cable on bottom | ✓ | ✓*2 | — | ✓ | ✓ | ✓ | — |

### 7th digit - Options

| Code | Specification |
|---|---|
| 1 | Standard machine precision |
| 2 | High machine precision*3 |

*1. Both multiturn absolute encoder and incremental encoder can be used as a single-turn absolute encoder by setting parameters.
*2. SGM7D-01G and -05G are not available with a cable extending from the bottom.
*3. The SGM7D-01G, -05G, and -03H are available only with high mechanical precision.

## SGM7E - 02 B 7 A 1 1

Direct Drive Servomotors — 1st + 2nd — 3rd — 4th — 5th — 6th — 7th digit

### 1st + 2nd digit - Rated Output

| Code | Specification |
|---|---|
| 02 | 2 Nm |
| 04 | 4 Nm |
| 05 | 5 Nm |
| 07 | 7 Nm |
| 08 | 8 Nm |
| 10 | 10 Nm |
| 14 | 14 Nm |
| 16 | 16 Nm |
| 17 | 17 Nm |
| 25 | 25 Nm |
| 35 | 35 Nm |

### 3rd digit - Servomotor Outer Diameter

| Code | Specification |
|---|---|
| B | 135 mm |
| C | 175 mm |
| D | 230 mm |
| E | 290 mm |

### 4th digit - Serial Encoder

| Code | Specification |
|---|---|
| 7 | 24-bit multiturn absolute encoder* |
| F | 24-bit incremental encoder* |

### 5th digit - Design Revision Order

| Code | Specification |
|---|---|
| A | Standard Model |

### 6th digit - Flange

| Code | Mounting |
|---|---|
| 1 | Non-load side |
| 4 | Non-load side (with cable on side) |

### 7th digit - Options

| Code | Specification |
|---|---|
| 1 | Without options |
| 4 | High machine precision (runout at end of shaft and runout of shaft surface: 0.01 mm) |

* Both multiturn absolute encoder and incremental encoder can be used as a single-turn absolute encoder by setting parameters.
Note: 1. Direct Drive Servomotors are not available with holding brakes.
2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

## SGM7F - 02 A 7 A 1 1

Direct Drive Servomotors — 1st + 2nd — 3rd — 4th — 5th — 6th — 7th — digit

| 1st + 2nd digit - Rated Output | | | |
|---|---|---|---|
| Code | Specification | Code | Specification |
| Small-capacity Series, coreless | | Medium-capacity Series, with core | |
| 02 | 2 Nm | 45 | 45 Nm |
| 04 | 4 Nm | 80 | 80 Nm |
| 05 | 5 Nm | 1A | 110 Nm |
| 07 | 7 Nm | 1E | 150 Nm |
| 08 | 8 Nm | 2Z | 200 Nm |
| 10 | 10 Nm | | |
| 14 | 14 Nm | | |
| 16 | 16 Nm | | |
| 17 | 17 Nm | | |
| 25 | 25 Nm | | |
| 35 | 35 Nm | | |

| 3rd digit - Servomotor Outer Diameter | |
|---|---|
| Code | Specification |
| A | 100 mm |
| B | 135 mm |
| C | 175 mm |
| D | 230 mm |
| M | 280 mm |
| N | 360 mm |

| 4th digit - Serial Encoder | |
|---|---|
| Code | Specification |
| 7 | 24-bit multiturn absolute encoder* |
| F | 24-bit incremental encoder* |

| 5th digit - Design Revision Order | |
|---|---|
| Code | Specification |
| A | Standard Model |

| 6th digit - Flange | | | | | | | |
|---|---|---|---|---|---|---|---|
| Code | Mounting | Servomotor Outer Diameter Code (3rd digit) | | | | | |
| | | A | B | C | D | M | N |
| 1 | Non-load side | ✓ | ✓ | ✓ | ✓ | — | — |
| | Load side | — | — | — | — | ✓ | ✓ |
| 3 | Non-load side | — | — | — | — | ✓ | ✓ |
| 4 | Non-load side (with cable on side) | ✓ | ✓ | ✓ | ✓ | — | — |

| 7th digit - Options | |
|---|---|
| Code | Specification |
| 1 | Without options |
| 2 | High machine precision (runout at end of shaft and runout of shaft surface: 0.01 mm) |

* Both multiturn absolute encoder and incremental encoder can be used as a single-turn absolute encoder by setting parameters.

Note: 1. Direct Drive Servomotors are not available with holding brakes.
2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

## SGMCS - 02 B 3 C 1 1 E

Direct Drive Servomotors — 1st + 2nd — 3rd — 4th — 5th — 6th — 7th — 8th — digit

| 1st + 2nd digit - Rated Output | | | |
|---|---|---|---|
| Code | Specification | Code | Specification |
| Small-capacity Series, coreless | | Medium-capacity Series, with core | |
| 02 | 2 Nm | 45 | 45 Nm |
| 04 | 4 Nm | 80 | 80 Nm |
| 05 | 5 Nm | 1A | 110 Nm |
| 07 | 7 Nm | 1E | 150 Nm |
| 08 | 8 Nm | 2Z | 200 Nm |
| 10 | 10 Nm | | |
| 14 | 14 Nm | | |
| 16 | 16 Nm | | |
| 17 | 17 Nm | | |
| 25 | 25 Nm | | |
| 35 | 35 Nm | | |

| 3rd digit - Servomotor Outer Diameter | |
|---|---|
| Code | Specification |
| B | 135 mm |
| C | 175 mm |
| D | 230 mm |
| E | 290 mm |
| M | 280 mm |
| N | 360 mm |

| 4th digit - Serial Encoder | |
|---|---|
| Code | Specification |
| 3 | 20-bit single-turn absolute encoder |
| D | 20-bit incremental encoder |

| 5th digit - Design Revision Order | |
|---|---|
| Code | Specification |
| A | Model with servomotor outer diameter code M or N |
| B | Model with servomotor outer diameter code E |
| C | Model with servomotor outer diameter code B, C, or D |

| 6th digit - Flange | | | | | | | |
|---|---|---|---|---|---|---|---|
| Code | Mounting | Servomotor Outer Diameter Code (3rd digit) | | | | | |
| | | B | C | D | E | M | N |
| 1 | Non-load side | ✓ | ✓ | ✓ | ✓ | — | — |
| | Load side | — | — | — | — | ✓ | ✓ |
| 3 | Non-load side | — | — | — | — | ✓ | ✓ |
| 4 | Non-load side (with cable on side) | ✓ | ✓ | ✓ | ✓ | — | — |

| 7th digit - Options | |
|---|---|
| Code | Specification |
| 1 | Without options |

| 8th digit | |
|---|---|
| Code | Specification |
| E | RoHS II Suffix |

Note:
1. Direct Drive Servomotors are not available with holding brakes.
2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

SGMCV - 04 B E A 1 1

| Direct Drive Servomotors | 1st + 2nd | 3rd | 4th | 5th | 6th | 7th | digit |
|---|---|---|---|---|---|---|---|

**1st + 2nd digit - Rated Output**

| Code | Specification |
|---|---|
| 04 | 4 Nm |
| 08 | 8 Nm |
| 10 | 10 Nm |
| 14 | 14 Nm |
| 17 | 17 Nm |
| 25 | 25 Nm |
| 35 | 35 Nm |

**3rd digit - Servomotor Outer Diameter**

| Code | Specification |
|---|---|
| B | 135 mm dia. |
| C | 175 mm dia. |
| D | 230 mm dia. |

**4th digit - Serial Encoder**

| Code | Specification |
|---|---|
| E | 22-bit single-turn absolute encoder |
| I | 22-bit multiturn absolute encoder |

**5xth digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard Model |

**6th digit - Flange**

| Code | Mounting |
|---|---|
| 1 | Non-load side |
| 4 | Non-load side (with cable on side) |

**7th digit - Options**

| Code | Specification |
|---|---|
| 1 | Without options |
| 5 | High machine precision (runout at end of shaft and runout of shaft surface: 0.01 mm) |

Note:
1. Direct Drive Servomotors are not available with holding brakes.
2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

# Linear Servomotors SGLG (Coreless Models)

## Moving Coil

SGL G W - 30 A 050 C P □ - E

| Sigma-7 Series Linear Servomotors | 1st | 2nd | 3rd + 4th | 5th | 6th - 8th | 9th | 10th | 11th | 12th | digit |
|---|---|---|---|---|---|---|---|---|---|---|

**1st digit - Servomotor Type**

| Code | Specifications |
|---|---|
| G | Coreless model |

**2nd digit - Moving Coil/ Magnetic Way**

| Code | Specification |
|---|---|
| W | Moving Coil |

**3rd + 4th digit - Magnet Height**

| Code | Specification |
|---|---|
| 30 | 30 mm |
| 40 | 40 mm |
| 60 | 60 mm |
| 90 | 86 mm |

**5th digit - Power Supply Voltage**

| Code | Specification |
|---|---|
| A | 200 VAC |

**6th ... 8th digit - Length of Moving Coil**

| Code | Specification |
|---|---|
| 050 | 50 mm |
| 080 | 80 mm |
| 140 | 140 mm |
| 200 | 199 mm |
| 253 | 252.5 mm |
| 365 | 365 mm |
| 370 | 367 mm |
| 535 | 535 mm |

**7th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A, B, ... | Revision |

**10th digit - Sensor Specification and Cooling Method**

| Code | Specifications | | Applicable Models |
|---|---|---|---|
| | Polarity Sensor | Cooling Method | |
| None | None | Self-cooled | All models |
| C | None | Air-cooled | SGLGW-40A, -60A, -90A |
| H | Yes | Air-cooled | |
| P | Yes | Self-cooled | All models |

**11th digit - Connector for Servomotor Main Circuit Cable**

| Code | Specifications | Applicable Models |
|---|---|---|
| None | Connector from Tyco Electronics Japan G.K. | All models |
| D | Connector from Interconnectron GmbH | SGLGW-30A, -40A, -60A |

**12th digit**

| Code | Specifications |
|---|---|
| E | RoHS II Suffix |

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

## Magnetic Way

SGL G M - 30 108 C □ -E

| Sigma-7 Series Linear Servomotors | 1st | 2nd | 3rd + 4th | 5th - 7th | 8th | 9th | 10th | digit |
|---|---|---|---|---|---|---|---|---|

**1st digit - Servomotor Type**

| Code | Specifications |
|---|---|
| G | Coreless model |

**2nd digit - Moving Coil/ Magnetic Way**

| Code | Specifications |
|---|---|
| M | Magnetic Way |

**3rd + 4th digit - Magnet Height**

| Code | Specifications |
|---|---|
| 30 | 30 mm |
| 40 | 40 mm |
| 60 | 60 mm |
| 90 | 86 mm |

**5rd ... 7th digit - Length of Magnetic Way**

| Code | Specifications |
|---|---|
| 090 | 90 mm |
| 108 | 108 mm |
| 216 | 216 mm |
| 225 | 225 mm |
| 252 | 252 mm |
| 360 | 360 mm |
| 405 | 405 mm |
| 432 | 432 mm |
| 450 | 450 mm |
| 504 | 504 mm |

**8th digit - Design Revision Order**

| Code | Specifications |
|---|---|
| A, B, C* | Revision |

**9th digit - Options**

| Code | Specifications | Applicable Models |
|---|---|---|
| None | Standard-force | All models |
| -M | High-force | SGLGM-40, -60 |

**10th digit**

| Code | Specifications |
|---|---|
| E | RoHS II Suffix |

*: SGLGM-40 and SGLGM-60 also have a CT Code.
C = Without mounting holes on the bottom.
CT = With mounting holes on the bottom.

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

# Linear Servomotors (Models with F-type Iron Cores)

## Moving Coil

S G L F W2 - 30 A 070 A S 1 E

| Sigma-7 Series Linear Servomotors | 1st | 2nd | 3rd + 4th | 5th | 6th - 8th | 9th | 10th | 11th | 12th | digit |
|---|---|---|---|---|---|---|---|---|---|---|

**1st digit - Servomotor Type**

| Code | Specification |
|---|---|
| F | With F-type iron core |

**2nd digit - Moving Coil/Magnetic Way**

| Code | Specification |
|---|---|
| W2 | Moving Coil |

**3rd + 4th digit - Magnet Height**

| Code | Specification |
|---|---|
| 30 | 30 mm |
| 45 | 45 mm |
| 90 | 90 mm |
| 1D | 135 mm |

**5th digit - Power Supply Voltage**

| Code | Specification |
|---|---|
| A | 200 VAC |

**6th ... 8th digit - Length of Moving Coil**

| Code | Specification |
|---|---|
| 070 | 70 mm |
| 120 | 125 mm |
| 200 | 205 mm |
| 230 | 230 mm |
| 380 | 384 mm |
| 560 | 563 mm |

**9th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard Model |

**10th digit - Sensor Specification**

| Code | Specification |
|---|---|
| S | With polarity sensor and thermal protector |
| T | Without polarity sensor, with thermal protector |

**11th digit - Options**

| Code | Cooling Method |
|---|---|
| 1 | Self-cooled |
| L | Water-cooled* |

**12th digit - Options**

| Code | Connection |
|---|---|
| E | Metal round connector (Phoenix) |

* Contact your Yaskawa representative for information on water-cooled model.
Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

## Magnetic Way

S G L F M2 - 30 270 A

| Sigma-7 Series Linear Servomotors | 1st | 2nd | 3rd + 4th | 5th - 7th | 8th | digit |
|---|---|---|---|---|---|---|

**1st digit - Servomotor Type**

| Code | Specification |
|---|---|
| F | With F-type iron core |

**2nd digit - Moving Coil/Magnetic Way**

| Code | Specification |
|---|---|
| M2 | Magnetic Way |

**3rd + 4th digit - Magnet Height**

| Code | Specification |
|---|---|
| 30 | 30 mm |
| 45 | 45 mm |
| 90 | 90 mm |
| 1D | 135 mm |

**5th ... 7th digit - Length of Magnetic Way**

| Code | Specification |
|---|---|
| 270 | 270 mm |
| 306 | 306 mm |
| 450 | 450 mm |
| 510 | 510 mm |
| 630 | 630 mm |
| 714 | 714 mm |

**8th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard Model |

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

## Moving Coil

S G L F W - 20 A 090 A P □ - E

| Sigma-7 Series Linear Servomotors | 1st | 2nd | 3rd + 4th | 5th | 6th - 8th | 9th | 10th | 11th | 12th | digit |
|---|---|---|---|---|---|---|---|---|---|---|

**1st digit - Specification**

| Code | Servomotor Type |
|---|---|
| F | With F-type iron core |

**2nd digit - Moving Coil/ Magnetic Way**

| Code | Specification |
|---|---|
| W | Moving Coil |

**3rd + 4th digit - Magnet Height**

| Code | Specification |
|---|---|
| 20 | 20 mm |
| 35 | 36 mm |
| 50 | 47.5 mm |
| 1Z | 95 mm |

**5th digit - Voltage**

| Code | Specification |
|---|---|
| A | 200 VAC |

**6th - 8th digit - Length of Moving Coil**

| Code | Specification |
|---|---|
| 090 | 91 mm |
| 120 | 127 mm |
| 200 | 215 mm |
| 230 | 235 mm |
| 380 | 395 mm |

**9th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A, B, ... | Revision |

**10th digit - Sensor Specification**

| Code | Specification |
|---|---|
| P | With polarity sensor |
| None | Without polarity sensor |

**11th digit - Connector for Servomotor Main Circuit Cable**

| Code | Specification | Applicable Models |
|---|---|---|
| None | Connector from Tyco Electronics Japan G.K. | All models |
| D | Connector from Interconnectron GmbH | SGLFW-35, -50, -1Z□200B |

**12th digit**

| Code | Specifications |
|---|---|
| E | RoHS II Suffix |

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

## Magnetic Way

S G L F M - 20 324 A □ - E

| Sigma-7 Series Linear Servomotors | 1st | 2nd | 3rd + 4th | 5th - 7th | 8th | 9th | 10th | digit |
|---|---|---|---|---|---|---|---|---|

**1st digit - Servomotor Type**

| Code | Specification |
|---|---|
| F | With F-type iron core |

**2nd digit - Moving Coil/Magnetic Way**

| Code | Specification |
|---|---|
| M | Magnetic Way |

**3rd + 4th digit - Magnet Height**

| Code | Specification |
|---|---|
| 20 | 20 mm |
| 35 | 36 mm |
| 50 | 47.5 mm |
| 1Z | 95 mm |

**5rd ... 7th digit - Length of Magnetic Way**

| Code | Specification |
|---|---|
| 324 | 324 mm |
| 405 | 405 mm |
| 540 | 540 mm |
| 675 | 675 mm |
| 756 | 756 mm |
| 945 | 945 mm |

**8th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A, B, ... | Revision |

**9th digit - Options**

| Code | Specification |
|---|---|
| None | Without options |
| C | With magnet cover |

**10th digit**

| Code | Specifications |
|---|---|
| E | RoHS II Suffix |

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

# SGLT (Models with T-type Iron Cores)

## Moving Coil

SGL T W - 20 A 170 A P □ - E

Sigma-7 Series Linear Servomotors — 1st — 2nd — 3rd + 4th — 5th — 6th ... 8th — 9th — 10th — 11th — 12th digit

**1st digit - Servomotor Type**

| Code | Specification |
|---|---|
| T | With T-type iron core |

**2nd digit - Moving Coil/Magnetic Way**

| Code | Specification |
|---|---|
| W | Moving Coil |

**3rd + 4th digit - Magnet Height**

| Code | Specification |
|---|---|
| 20 | 20 mm |
| 35 | 36 mm |
| 40 | 40 mm |
| 50 | 51 mm |
| 80 | 76.5 mm |

**5th digit - Power Supply Voltage**

| Code | Specification |
|---|---|
| A | 200 VAC |

**6th ... 8th digit - Length of Moving Coil**

| Code | Specification |
|---|---|
| 170 | 170 mm |
| 320 | 315 mm |
| 400 | 394.2 mm |
| 460 | 460 mm |
| 600 | 574.2 mm |

**9th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A, B, ... | Revision |
| H | High-efficiency model |

**10th digit - Sensor Specifications and Cooling Method**

| Code | Specifications | | Applicable Models |
|---|---|---|---|
| | Polarity Sensor | Cooling Method | |
| None | None | Self-cooled | All models |
| C* | None | Water-cooled | SGLTW-40, -80 |
| H* | Yes | Water-cooled | |
| P | Yes | Self-cooled | All models |

**11th digit - Connector for Servomotor Main Circuit Cable**

| Code | Specification | Applicable Models |
|---|---|---|
| None | Connector from Tyco Electronics Japan G.K. | SGLTW-20A□□□□□<br>-35A□□□□□ |
| | MS connector | SGLTW-40A□□□□B□<br>-80A□□□□B□ |
| | Loose lead wires with no connector | SGLTW-35A□□□H□<br>-50A□□□H□ |

**12th digit**

| Code | Specifications |
|---|---|
| E | RoHS II Suffix |

* Contact your Yaskawa representative for the characteristics, dimensions, and other details on servomotors with these specifications.

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combination of codes.

## Magnetic Way

SGL T M - 20 324 A □ - E

Sigma-7 Series Linear Servomotors — 1st — 2nd — 3rd + 4th — 5th ... 7th — 8th — 9th — 10th digit

**1st digit - Servomotor Type**

| Code | Specification |
|---|---|
| T | With T-type iron core |

**2nd digit - Moving Coil/Magnetic Way**

| Code | Specification |
|---|---|
| M | Magnetic Way |

**3rd + 4th digit - Magnet Height**

| Code | Specification |
|---|---|
| 20 | 20 mm |
| 35 | 36 mm |
| 40 | 40 mm |
| 50 | 51 mm |
| 80 | 76.5 mm |

**5th ... 7th digit - Length of Magnetic Way**

| Code | Specification |
|---|---|
| 324 | 324 mm |
| 405 | 405 mm |
| 540 | 540 mm |
| 675 | 675 mm |
| 756 | 756 mm |
| 945 | 945 mm |

**8th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A, B, ... | Revision |
| H | High-efficiency model |

**9th digit - Options**

| Code | Specification | Applicable Models |
|---|---|---|
| None | Without options | – |
| C | With magnet cover | All models |
| Y | With base and magnet cover | SGLTM-20, -35*, -40, -80 |

**10th digit**

| Code | Specifications |
|---|---|
| E | RoHS II Suffix |

* The SGLTM-35□□□H (high-efficiency models) do not support this specification.

# SERVOPACKs

SGD7S - R70 A 00 A 001 000

| Sigma-7 Series Sigma-7S Models | 1st ... 3rd | 4th | 5th + 6th | 7th | 8th ... 10th | 11th ... 13th | digit |
|---|---|---|---|---|---|---|---|

**1st ... 3rd digit - Maximum Applicable Motor Capacity**

| Code | Specification |
|---|---|
| Three-phase, 200 V | |
| R70*1 | 50 W |
| R90*1 | 100 W |
| 1R6*1 | 200 W |
| 2R8*1 | 400 W |
| 3R8 | 500 W |
| 5R5*1 | 750 W |
| 7R6 | 1.0 kW |
| 120*2 | 1.5 kW |
| 180 | 2.0 kW |
| 200*3 | 3.0 kW |
| 330 | 5.0 kW |
| 470 | 6.0 kW |
| 550 | 7.5 kW |
| 590 | 11 kW |
| 780 | 15 kW |

**4th digit - Voltage**

| Code | Specification |
|---|---|
| A | 200 VAC |

**5th + 6th digit - Interface*4**

| Code | Specification |
|---|---|
| 00 | Analog Voltage/ Pulse train reference |
| 10 | MECHATROLINK-II communication reference |
| 20 | MECHATROLINK-III communication reference |
| 30 | MECHATROLINK-III communication reference with RJ45 connector |
| A0 | EtherCAT communication reference |
| C0 | PROFINET*5 communication reference |
| E0 | Command Option Attachable Type*6 |
| M0 | Sigma-7Siec (with integrated iec-Controller) |

**7th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard Model |

**8th ... 10th digit - Hardware Options Specifications**

| Code | Specifications | Applicable Models |
|---|---|---|
| None | Without Options | All models |
| 001 | Rack-mounted | SGD7S-R70A to -330A |
| | Duct-ventilated | SGD7S-470A to -780A |
| 002 | Varnished | All models |
| 008 | Single-phase, 200 V power input | SGD7S-120A |
| 020*7 | No dynamic brake | SGD7S-R70A to -2R8A |
| | External dynamic brake resistor | SGD7S-3R8A to -780A |
| 00A | Varnished and single-phase power input | All models |

**11th ... 13th digit - FT/EX Specifications**

| Code | Specifications |
|---|---|
| None | None |
| 000 | |
| F50*9 | Application function for integrated MPiec |
| F82*8 | Application function option for special motors, SGM7D motor drive |
| F83*8 | Application function option for special motors, SGM7D motor drive, indexing |

Notes:
*1. You can use these models with either a single-phase or three-phase power supply input.
*2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (SGD7S-120A□0A008).
*3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
*4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
*5. Available for a rated output of up to 1.5 kW.
*6. A command option module must be attached to the Command Option Attachable-type SERVOPACK for use.
*7. Refer to the following manual for details.
Sigma-7-Series AC Servo Drive Sigma-7S/Sigma-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
*8. Refer to the following manual for details.
Sigma-7-Series AC Servo Drive □-7S SERVOPACK with FT/EX Specification for SGM7D Motor Product Manual (Manual No.: SIEP S800001 91)
*9. Applicable for Sigma-7Siec models.

## SGD7W - 1R6 A 20 A 700 000

| Sigma-7 Series Sigma-7W Models | 1st ... 3rd | 4th | 5th + 6th | 7th | 8th ... 10th | 11th ... 13th | digit |
|---|---|---|---|---|---|---|---|

**1st ... 3rd digit - Maximum Applicable Motor Capacity per Axis**

| Code | Specification |
|---|---|
| Three-phase, 200 V | |
| 1R6*1 | 200 W |
| 2R8*1 | 400 W |
| 5R5*2 | 750 W |
| 7R6 | 1.0 kW |

**4th digit - Voltage**

| Code | Specification |
|---|---|
| A | 200 VAC |

**5th + 6th digit - Interface*3**

| Code | Specification |
|---|---|
| 20 | MECHATROLINK-III communication Reference |

**7th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard Model |

**8th ... 10th digit - Hardware Options Specifications**

| Code | Specification | Applicable Models |
|---|---|---|
| None | Without Options | All models |
| 700*4 | HWBB Option | All models |

**11th ... 13th digit - FT/EX Specifications**

| Code | Specifications |
|---|---|
| None | None |
| 000 | |

Note:
*1. You can use these models with either a single-phase or three-phase power supply input. For more information, please contact your Yaskawa representative.
*2. If you use the SGD7W-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.
*3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
*4. Refer to the following manual for details.
Sigma-7 Series AC Servo Drive Sigma-7W/Sigma-7C SERVOPACK with Hardware Option Specifications HWBB Function Product Manual (Manual No.: SIEP S800001 72)

## SGD7C - 1R6 A MA A 700

| Sigma-7 Series Sigma-7C Models | 1st ... 3rd | 4th | 5th + 6th | 7th | 8th ... 10th | digit |
|---|---|---|---|---|---|---|

**1st ... 3rd digit - Maximum Applicable Motor Capacity per Axis**

| Code | Specification |
|---|---|
| Three-phase, 200 V | |
| 1R6*1 | 200 W |
| 2R8*1 | 400 W |
| 5R5*2 | 750 W |
| 7R6 | 1.0 kW |

**4th digit - Voltage**

| Code | Specification |
|---|---|
| A | 200 VAC |

**5th + 6th digit - Interface*3**

| Code | Specification |
|---|---|
| 20 | MECHATROLINK-III communication Reference |
| MA | Bus connection with references |

**7th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard Model |

**8th ... 10th digit - Hardware Options Specifications**

| Code | Specification | Applicable Models |
|---|---|---|
| None | Without Options | All models |
| 700*4 | HWBB Option | All models |

Note:
*1. You can use these models with either a single-phase or three-phase power supply input.
*2. If you use the SGD7W-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.
*3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
*4. Refer to the following manual for details.
Sigma-7 Series AC Servo Drive Sigma-7W/Sigma-7C SERVOPACK with Hardware Option Specifications HWBB Function Product Manual (Manual No.: SIEP S800001 72)

# The 400 V Series

## Amplifier

- Space saving bookstyle for side-by-side mounting
- Embedded fieldbus
  - » EtherCAT
  - » MECHATROLINK-III
  - » PROFINET
  - » iec-Controller
- Single & dual axis amplifier
- European connectors
- Daisy-chain-connection

## Motors

- Plug-and-turn connectors according to european standards (M12, M17, M23 and M40)
- Available from 200 W - 15 kW

- Connectors for power supply, EtherCAT, I/O, encoder, USB, etc.

- Option units for advanced safety, encoder

- Connector for digital operator

- Power connectors for motor, brake, braking resistor
- Metal sheet for motor cable shielding

# Product Overview 400 V

## Servomotors

### Rotary

#### SGM7J

- Medium inertia, high speed
- 200 W - 1.5 kW

#### SGM7A

- Low inertia, high speed
- 200 W - 7.0 kW

#### SGM7G

- Medium inertia, high torque, low speed or high speed models
- 450 W - 15 kW

### Linear

#### SGLFW2

- Model with F-type iron core
- Rated: 45 N - 2,520 N
  Peak: 135 N - 7,560 N

## SERVOPACKs

### Single Axis

#### SGD7S-□□□DA0B

EtherCAT Communication Reference

#### SGD7S-□□□D30B

MECHATROLINK-III Communication Reference

#### SGD7S-□□□DC0B

PROFINET Communication Reference

#### SGD7S-□□□DM0B

Siec (with integrated iec-Controller)

### Dual Axis

#### SGD7W-□□□DA0B

EtherCAT Communication Reference

#### SGD7W-□□□D30B

MECHATROLINK-III Communication Reference

## Option Modules

#### SGDV-OSA01A000FT900

Safety Module

#### SGDV-OF□□□A

Feedback Option/ Fully Closed Loop Module

# Model Designations 400V

## Rotary Servomotors

### SGM7J - 02 D F F 6 1

| Sigma-7 Series Servomotors: SGM7J | - | 02 | D | F | F | 6 | 1 | |
|---|---|---|---|---|---|---|---|---|
| | | 1st + 2nd | 3rd | 4th | 5th | 6th | 7th | digit |

**1st + 2nd digit - Rated Output**

| Code | Specification |
|---|---|
| 02 | 200 W |
| 04 | 400 W |
| 08 | 750 W |
| 15 | 1.5 kW |

**3rd digit - Power Supply Voltage**

| Code | Specification |
|---|---|
| D | 400 VAC |

**4th digit - Serial Encoder**

| Code | Specification |
|---|---|
| 7 | 24-bit absolute |
| F | 24-bit incremental |

**5th digit - Design Revision Order**

| Code | Specification |
|---|---|
| F | Standard model |

**6th digit - Shaft End**

| Code | Specification |
|---|---|
| 2 | Straight without key |
| 6 | Straight with key and tap |

**7th digit - Options**

| Code | Specification |
|---|---|
| 1 | Without options |
| C | With holding brake (24 VDC) |

### SGM7A - 02 D F F 6 1

| Sigma-7 Series Servomotors: SGM7A | - | 02 | D | F | F | 6 | 1 | |
|---|---|---|---|---|---|---|---|---|
| | | 1st + 2nd | 3rd | 4th | 5th | 6th | 7th | digit |

**1st + 2nd digit - Rated Output**

| Code | Specification |
|---|---|
| 02 | 200 W |
| 04 | 400 W |
| 08 | 750 W |
| 10 | 1.0 kW |
| 15 | 1.5 kW |
| 20 | 2.0 kW |
| 25 | 2.5 kW |
| 30 | 3.0 kW |
| 40 | 4.0 kW |
| 50 | 5.0 kW |
| 70 | 7.0 kW |

**3rd digit - Power Supply Voltage**

| Code | Specification |
|---|---|
| D | 400 VAC |

**4th digit - Serial Encoder**

| Code | Specification |
|---|---|
| 7 | 24-bit absolute |
| F | 24-bit incremental |

**5th digit - Design Revision Order**

| Code | Specification |
|---|---|
| F | Standard model |

**6th digit - Shaft End**

| Code | Specifications |
|---|---|
| 2 | Straight without key |
| 6 | Straight with key and tap |

**7th digit - Options**

| Code | Specifications |
|---|---|
| 1 | Without options |
| C*2 | With holding brake (24 VDC) |
| F*1, *2 | With dust seal |
| H*1, *2 | With dust seal and holding brake (24 VDC) |

*1 This option is supported only for SGM7A-10 to -50 Servomotors.
*2 These options are not supported by SGM7A-70 Servomotors.

### SGM7G - 05 D F F 6 F

| Sigma-7 Series Servomotors: SGM7G | - | 05 | D | F | F | 6 | F | |
|---|---|---|---|---|---|---|---|---|
| | | 1st + 2nd | 3rd | 4th | 5th | 6th | 7th | digit |

**1st + 2nd digit - Rated Output**

| Code | Specification |
|---|---|
| 05 | 450 W |
| 09 | 850 W |
| 13 | 1.3 kW |
| 20 | 1.8 kW |
| 30 | 2.9 kW |
| 44 | 4.4 kW |
| 55 | 5.5 kW |
| 75 | 7.5 kW |
| 1A | 11.0 kW |
| 1E | 15.0 kW |

**3rd digit - Power Supply Voltage**

| Code | Specification |
|---|---|
| D | 400 VAC |

**4th digit - Serial Encoder**

| Code | Specification |
|---|---|
| 7 | 24-bit absolute |
| F | 24-bit incremental |

**5th digit - Design Revision Order**

| Code | Specification |
|---|---|
| F | Standard model |
| R*2 | High-speed model |

**6th digit - Shaft End**

| Code | Specification |
|---|---|
| 2 | Straight without key (450 W, 1.8 kW, 2.9 kW) |
| 6 | Straight with key and tap (450 W, 1.8 kW, 2.9 kW) |
| S*1 | Straight without key (850 W, 1.3 kW) |
| K*1 | Straight with key and tap (850 W, 1.3 kW) |

**7th digit - Options**

| Code | Specification |
|---|---|
| 1 | Without options |
| C | With holding brake (24 VDC) |
| F | With dust seal |
| H | With dust seal and holding brake (24 VDC) |

*1 The shaft end codes are different for 850 kW and 1.3 kW Servomotors.
The shaft diameter for 850 W Servomotors is 19 mm.
The shaft diameter for 1.3 kW Servomotors is 22 mm.
*2 Available up to 4.4 kW.

# Linear Servomotors with F-Type Iron Cores

## Moving Coil

S G L F W2 - 30 D 070 A S 1 E

| Sigma-7 Series Linear Servomotors: | 1st | 2nd | 3rd + 4th | 5th | 6th - 8th | 9th | 10th | 11th | 12th | digit |
|---|---|---|---|---|---|---|---|---|---|---|

**1st digit - Servomotor Type**

| Code | Specification |
|---|---|
| F | With F-type iron core |

**2nd digit - Moving Coil/Magnetic Way**

| Code | Specification |
|---|---|
| W2 | Moving Coil |

**3rd + 4th digit - Magnet Height**

| Code | Specification |
|---|---|
| 30 | 30 mm |
| 45 | 45 mm |
| 90 | 90 mm |
| 1D | 135 mm |

**5th digit - Power Supply Voltage**

| Code | Specification |
|---|---|
| D | 400 VAC |

**6th ... 8th digit - Length of Moving Coil**

| Code | Specification |
|---|---|
| 070 | 70 mm |
| 120 | 125 mm |
| 200 | 205 mm |
| 230 | 230 mm |
| 380 | 384 mm |

**9th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard model |

**10th digit - Sensor Specification**

| Code | Specification |
|---|---|
| T | Without polarity sensor, with thermal protector |
| S | With polarity sensor and thermal protector |

**11th digit - Options**

| Code | Cooling Method |
|---|---|
| 1 | Self-cooled |
| L | Water-cooled* |

**12th digit - Options**

| Code | Connection |
|---|---|
| E | Metal round connector (Phoenix) |

* Contact your Yaskawa representative for information on water-cooled model.

## Magnetic Way

S G L F M2 - 30 270 A

| Sigma-7 Series Linear Servomotors: | 1st | 2nd | 3rd + 4th | 5th - 7th | 8th | digit |
|---|---|---|---|---|---|---|

**1st digit - Servomotor Type**

| Code | Specification |
|---|---|
| F | With F-type iron core |

**2nd digit - Moving Coil/Magnetic Way**

| Code | Specification |
|---|---|
| M2 | Magnetic Way |

**3rd + 4th digit - Magnet Height**

| Code | Specification |
|---|---|
| 30 | 30 mm |
| 45 | 45 mm |
| 90 | 90 mm |
| 1D | 135 mm |

**5th ... 7th digit - Length of Magnetic Way**

| Code | Specification |
|---|---|
| 270 | 270 mm |
| 306 | 306 mm |
| 450 | 450 mm |
| 510 | 510 mm |
| 630 | 630 mm |
| 714 | 714 mm |

**8th digit - Design Revision Order**

| Code | Specification |
|---|---|
| A | Standard model |

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

# SERVOPACKs

## Single Axis Amplifier

SGD7S - 1R9 D A0 B 000 F64

| Sigma-7 Series Sigma-7S Models | 1st ... 3rd | 4th | 5th + 6th | 7th | 8th ... 10th | 11th ... 13th | digit |
|---|---|---|---|---|---|---|---|

**1st ... 3rd digit - Maximum Applicable Motor Capacity**

| Code | Specification |
|---|---|
| Three-phase, 400 V | |
| 1R9 | 500 W |
| 3R5 | 1.0 kW |
| 5R4 | 1.5 kW |
| 8R4 | 2.0 kW |
| 120 | 3.0 kW |
| 170 | 5.0 kW |
| 210 | 6.0 kW |
| 260 | 7.5 kW |
| 280 | 11.0 kW |
| 370 | 15.0 kW |

**4th digit - Voltage**

| Code | Specification |
|---|---|
| D | 400 V AC |

**5th + 6th digit - Interface*2**

| Code | Specification |
|---|---|
| A0 | EtherCAT communication reference |
| C0 | PROFINET*4 communication reference |
| 30 | MECHATROLINK-III, RJ45 communication reference |
| M0 | Sigma-7Siec (with built-in single-axis control) |

**7th digit - Design Revision Order**

| Code | Specification |
|---|---|
| B | Standard model |

**8th ... 10th digit - Hardware Options Specifications**

| Code | Specification | Applicable Models |
|---|---|---|
| 000 | Without Options | All models |
| 026*3 | With relay for holding brake | All models |

**11th ... 13th digit - FT/EX Specification**

| Code | Specification |
|---|---|
| F64*1 | Zone table |
| F50 | Application function for Sigma-7Siec |

*1. Only available for EtherCAT (CoE) and MECHATROLINK-III communication references.
*2. The same SERVOPACKs are used for both rotary and linear servomotors.
*3. For specification of the internal brake relay, please refer to the hardware manual of the amplifier.
*4. Available for a rated output of up to 1.5 kW.

## Dual Axis Amplifier

SGD7W - 2R6 D A0 B -

| Sigma-7 Series Sigma-7W Models | 1st ... 3rd | 4th | 5th + 6th | 7th | 8th ... 10th | digit |
|---|---|---|---|---|---|---|

**1st ... 3rd digit - Maximum Applicable Motor Capacity per Axis**

| Code | Specification |
|---|---|
| Three-phase, 400 V | |
| 2R6 | 750 W |
| 5R4 | 1.5 kW |

**4th digit - Voltage**

| Code | Specification |
|---|---|
| D | 400 V AC |

**5th + 6th digit - Interface**

| Code | Specification |
|---|---|
| A0 | EtherCAT communication reference |
| 30 | MECHATROLINK-III, RJ45 communication reference |

**7th digit - Design Revision Order**

| Code | Specification |
|---|---|
| B | Standard model |

**8th ... 10th digit - Hardware Options Specifications**

| Code | Specification | Applicable Models |
|---|---|---|
| - | Without Options | All models |
| 026* | With relay for holding brake | All models |

* For specification of the internal brake relay, please refer to the hardware manual of the amplifier.

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