YASKAWA

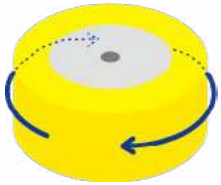
# Direct Drive Servomotors

## Sigma-7 200V Series


www.yaskawa.eu.com

# Product Overview

## SGM7D

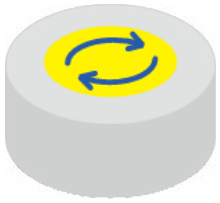


*Outer Rotor with Core*

Ideal for applications that require high torque, high precision and high rigidity.

- High inertia
- Built-in high-resolution (24-bit) encoder
- A high allowable load moment of inertia ratio enables application to large loads
- Large center aperture provides more space for wiring connections

## SGM7F

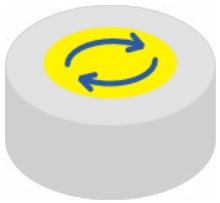


*Inner Rotor with Core*

Ideal for applications that require downsizing and a shorter takt time.

- Medium inertia
- Built-in high-resolution (24-bit) encoder
- Compact size with small rotor diameter
- Greater speed and torque stability enable high-speed, high-frequency positioning

## SGM7E



*Coreless, Inner Rotor*

Ideal for applications that require smooth movement withput speed fluctuations.

- Low inertia
- Built-in high-resolution (24-bit) encoder
- Smooth operation without speed fluctuations achieved through coreless structure with low cogging

# Range Overview

| | SGM7D | SGM7F | SGM7E |
|---|---|---|---|
| **Outer diameter of motor (mm)** | 107 – 264 | 100 – 360 | 135 – 290 |
| **Rated torque (Nm)** | 1.3 – 240 | 2 – 200 | 2 – 35 |
| **Maximum torque (Nm)** | 5 – 400 | 6 – 600 | 6 – 105 |
| **Maximum speed ($min^{-1}$)** | 48 – 360 | 250 – 600 | 250 – 500 |
| **Supply Voltage** | 200 V | | |
| **Encoder** | 24 bit (multiturn and incremental) | | |

# Open for challenging Applications

YASKAWA provides equipment for a broad range of applications and offers support in all engineering tasks. This way YASKAWA will find the perfect solution for common tasks and complex automation challenges.

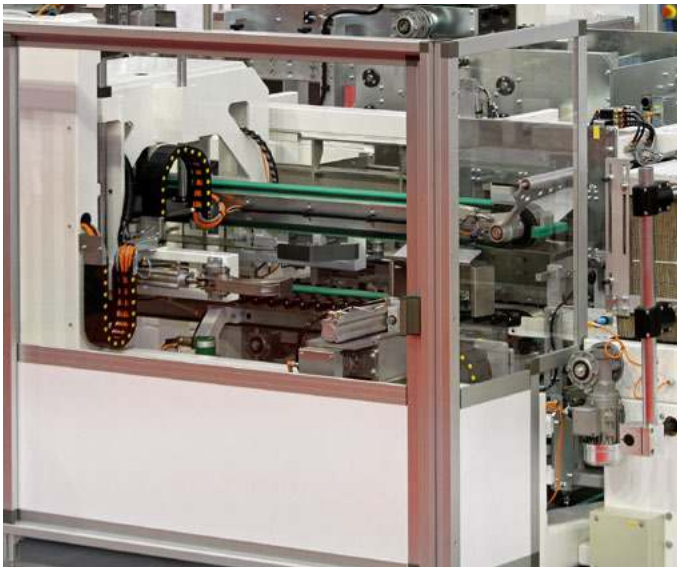
- Quick and easy set-up and no configuration effort - these are the benefits of the YASKAWA out-of-the-box solutions.
- In case you want to upgrade a solution, the whole Sigma-7 system can easily be used for any new task.

### Complete Solutions

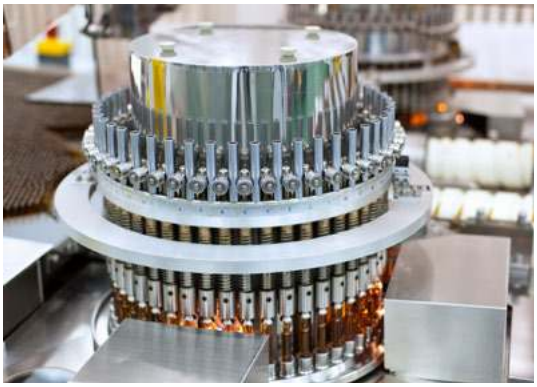
YASKAWA offers comprehensive customized automation solutions with powerful hardware, including controller, visualization, drive concept and industrial robots.

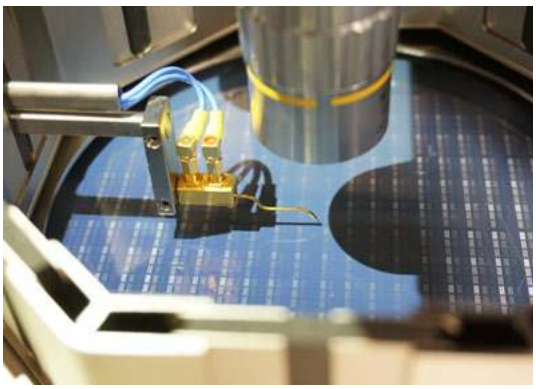
Our motion control products are developed to control all functions in machine process control including motion control, PLC functionality, I/O, sequential logic and process algorithms. Controller integration lowers system cost, increases performance, reduces required panel space and unifies programming.

Process monitoring and diagnostics are inherent features of our platform. These advancements increase product throughput and reduce machine downtime. With our systems in the field, productivity increases by more than 200 % have been achieved. Smoother running and e-stop recovery routines lessen mechanical wear and reduce down time.



# For a wide Range of Applications





- Machine tools
- Printing rolls
- Indexers
- Sorters and bonders

- Rotary tables
- Semiconductor manufacturing
- Direct torque transmission
- And many other applications

# Sigma-7 Direct Drive Motors Highlights

## High precision and performance


**Built-in high-resolution 24 bit encoder**

With 16.77 million pulses per revolution, we provide the industry-top level of positioning precision.

**Improved machine performance**

The motion mechanisms stiffness is greatly improved. YASKAWA direct drive motors allow high radial and axial forces.The motors are also available in a high mechanical precision version.

## High efficiency and energy saving

**Short acceleration and settling time**

In combination with the Sigma-7 drive and the performance of the linear motor, the after motion settling time will be shortened significantly.

**No gear losses**

There is no reduction like a gear or a belt in efficiency due to a power transmitting mechanism, which helps save energy for the machine. A high amount of poles guarantees a smooth running characteristic of the motor. No gear losses.

## High reliability and compact design

**Ease of operation and high reliability**

YASKAWA products stand for high reliability by best performance. YASKAWA Direct Drive Motors are easily handled by the use of the intergrated auto tuning functions.

**Direct coupling design and construction**

A direct drive servomotor is an actuator that directly transmits the rotational force of the motor so that couplings and other support mechanisms are not required, which saves installation space.

# Combination of Direct Drive Servomotors and SERVOPACKs

| Direct Drive Servomotor Model | | Rated torque [Nm] | Instantaneous Max. Torque [Nm] | SERVOPACK Model | |
|---|---|---|---|---|---|
| | | | | SGD7S-□□□□ | SGD7W-□□□□<br>SGD7C-□□□□ |
| SGM7D<br>(With core, outer rotor) | SGM7D-30F | 30 | 50 | 120A*1 | – |
| | SGM7D-58F | 58 | 100 | | |
| | SGM7D-90F | 90 | 150 | | |
| | SGM7D-1AF | 110 | 200 | | |
| | SGM7D-01G | 1.3 | 4 | 2R8A*1, 2R8F*1 | |
| | SGM7D-05G | 5 | 6 | | |
| | SGM7D-08G | 8 | 15 | 120A*1 | |
| | SGM7D-18G | 18 | 30 | | |
| | SGM7D-24G | 24 | 45 | | |
| | SGM7D-34G | 34 | 60 | | |
| | SGM7D-45G | 45 | 75 | | |
| | SGM7D-03H | 3 | 4 | 2R8A*1, 2R8F*1 | |
| | SGM7D-28I | 28 | 50 | 120A*1 | |
| | SGM7D-70I | 70 | 100 | | |
| | SGM7D-1ZI | 100 | 150 | | |
| | SGM7D-1CI | 130 | 200 | | |
| | SGM7D-2BI | 220 | 300 | | |
| | SGM7D-2DI | 240 | 400 | | |
| | SGM7D-06J | 6 | 8 | | |
| | SGM7D-09J | 9 | 15 | | |
| | SGM7D-18J | 18 | 30 | | |
| | SGM7D-20J | 20 | 45 | | |
| | SGM7D-38J | 38 | 60 | | |
| | SGM7D-02K | 2.06 | 5 | 2R8A*1, 2R8F*1 | |
| | SGM7D-06K | 6 | 10 | | |
| | SGM7D-08K | 8 | 15 | | |
| | SGM7D-06L | 6 | 10 | | |
| | SGM7D-12L | 12 | 20 | | |
| | SGM7D-30L | 30 | 40 | 120A*1 | |
| SGM7E<br>(Coreless, inner rotor) | SGM7E-02B | 2 | 6 | 2R8A, 2R1F | 2R8A |
| | SGM7E-05B | 5 | 15 | | |
| | SGM7E-07B | 7 | 21 | | |
| | SGM7E-04C | 4 | 12 | 2R8A, 2R8F | |
| | SGM7E-10C | 10 | 30 | | |
| | SGM7E-14C | 14 | 42 | | |
| | SGM7E-08D | 8 | 24 | | |
| | SGM7E-17D | 17 | 51 | | |
| | SGM7E-25D | 25 | 75 | | |
| | SGM7E-16E | 16 | 48 | 5R5A | |
| | SGM7E-35E | 35 | 105 | | |
| SGM7F<br>(With core, inner rotor) | SGM7F-02A | 2 | 6 | 2R8A, 2R1F | 2R8A |
| | SGM7F-05A | 5 | 15 | | |
| | SGM7F-07A | 7 | 21 | 2R8A, 2R8F | |
| | SGM7F-04B | 4 | 12 | | |
| | SGM7F-10B | 10 | 30 | | |
| | SGM7F-14B | 14 | 42 | 5R5A | |
| | SGM7F-08C | 8 | 24 | 2R8A, 2R8F | 2R8A |
| | SGM7F-17C | 17 | 51 | 5R5A | |
| | SGM7F-25C | 25 | 75 | 7R6A | |
| | SGM7F-16D | 16 | 48 | 5R5A | |
| | SGM7F-35D | 35 | 105 | 7R6A*2, 120A | 7R6A*2 |
| | SGM7F-45M | 45 | 135 | 7R6A | |
| | SGM7F-80M | 80 | 240 | 120A | – |
| | SGM7F-1AM | 110 | 330 | 180A | |
| | SGM7F-80N | 80 | 240 | 120A | |
| | SGM7F-1EN | 150 | 450 | 200A | |
| | SGM7F-2ZN | 200 | 600 | | |

*1: An SGM7D Servomotor is used together with an FT-specification SERVOPACK. The following SERVOPACK models can be used.
- SGD7S-□□□□□□A□□□F82□
- SGD7S-□□□□00A□□□F83□
- SGD7S-□□□□20A□□□F84□

*2: Use the derated values given in the table below for the rated output and rated motor speed of this combination.

# SGM7D (Outer Rotor, with Core)

## Model designations

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** |
| 01 | 1.30 Nm |
| 02 | 2.06 Nm |
| 03 | 3.00 Nm |
| 05 | 5.00 Nm |
| 06 | 6.00 Nm |
| 08 | 8.00 Nm |
| 09 | 9.00 Nm |
| 12 | 12.0 Nm |
| 18 | 18.0 Nm |
| 20 | 20.0 Nm |
| 24 | 24.0 Nm |
| 28 | 28.0 Nm |
| 30 | 30.0 Nm |
| 34 | 34.0 Nm |
| 38 | 38.0 Nm |
| 45 | 45.0 Nm |
| 58 | 58.0 Nm |
| 70 | 70.0 Nm |
| 90 | 90.0 Nm |
| 1Z | 100 Nm |
| 1A | 110 Nm |
| 1C | 130 Nm |
| 2B | 220 Nm |
| 2D | 240 Nm |

| 3rd digit - Servomotor Outer Diameter | |
|---|---|
| **Code** | **Specification** |
| F | 264 mm dia. |
| G | 160 mm dia. |
| H | 116 mm dia. |
| I | 264 mm dia. |
| J | 150 mm dia. |
| K | 107 mm dia. |
| L | 224 mm x 224 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.
3. The SGM7D-01G, -05G, and -03H are available only with high mechanical precision.

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

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

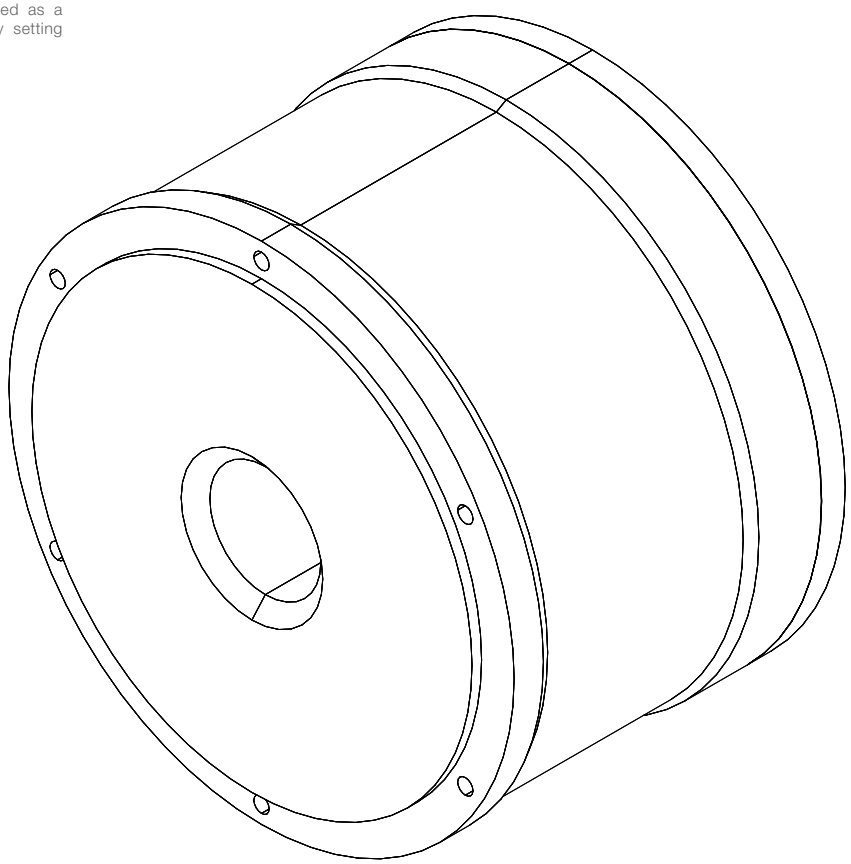
| 5th digit - Design Revision Order | |
|---|---|
| **Code** | **Specification** |
| C | Standard Version |

| 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 | ✓ | ✓* | — | ✓ | ✓ | ✓ | — |

✓ : Applicable models
* SGM7D-01G and -05G are not available with a cable extending from the bottom.

| 7th digit - Options | |
|---|---|
| **Code** | **Specification** |
| 1 | Standard mechanical precision |
| 2 | High mechanical precision*3 |

* The SGM7D-01G, -05G, and -03H are available only with high mechanical precision.



More detailed information, technical specifications and accessories (e.g. cables) can be found in our main Sigma-7 200 V catalog. Please contact your YASKAWA representative or find the documents on our website.

# SGM7E (Inner Rotor, Coreless)

## Model designations

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 dia. |
| C | 175 mm dia. |
| D | 230 mm dia. |
| E | 290 mm dia. |

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

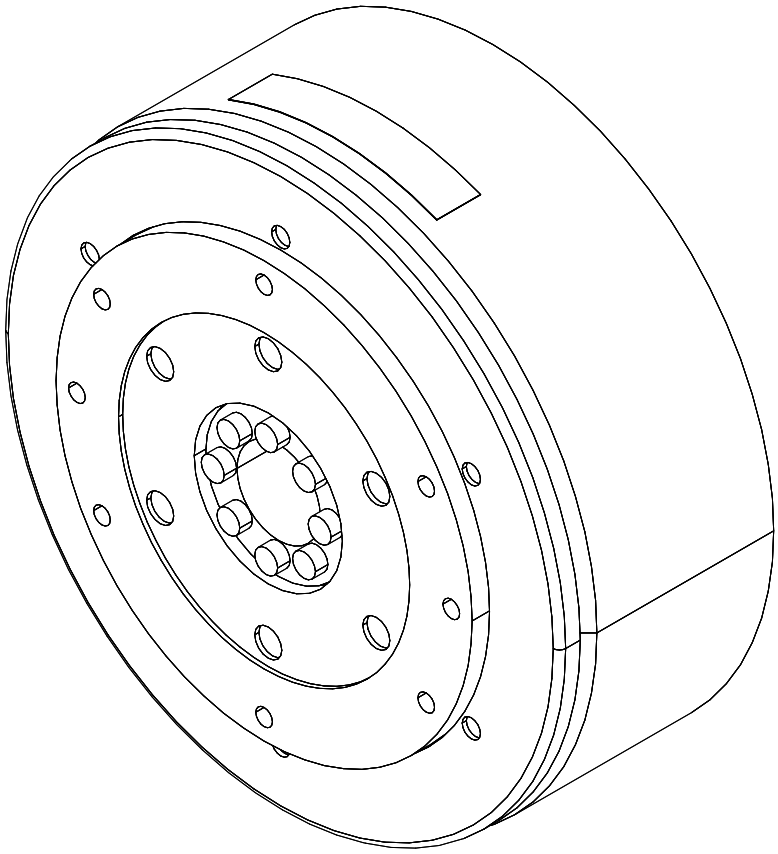
* Both multiturn absolute encoder and incremental encoder can be used as a single-turn absolute encoder by setting parameters.

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

| 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 |
| 2 | 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.



More detailed information, technical specifications and accessories (e.g. cables) can be found in our main Sigma-7 200V catalog. Please contact your YASKAWA representative or find the documents on our website.

# SGM7F (Inner Rotor, with Core)

## Model designations

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** |
| **Small Capacity** | |
| 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 |
| **Medium Capacity** | |
| 45 | 45 Nm |
| 80 | 80 Nm |
| 1A | 110 Nm |
| 1E | 150 Nm |
| 2Z | 200 Nm |

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

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

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

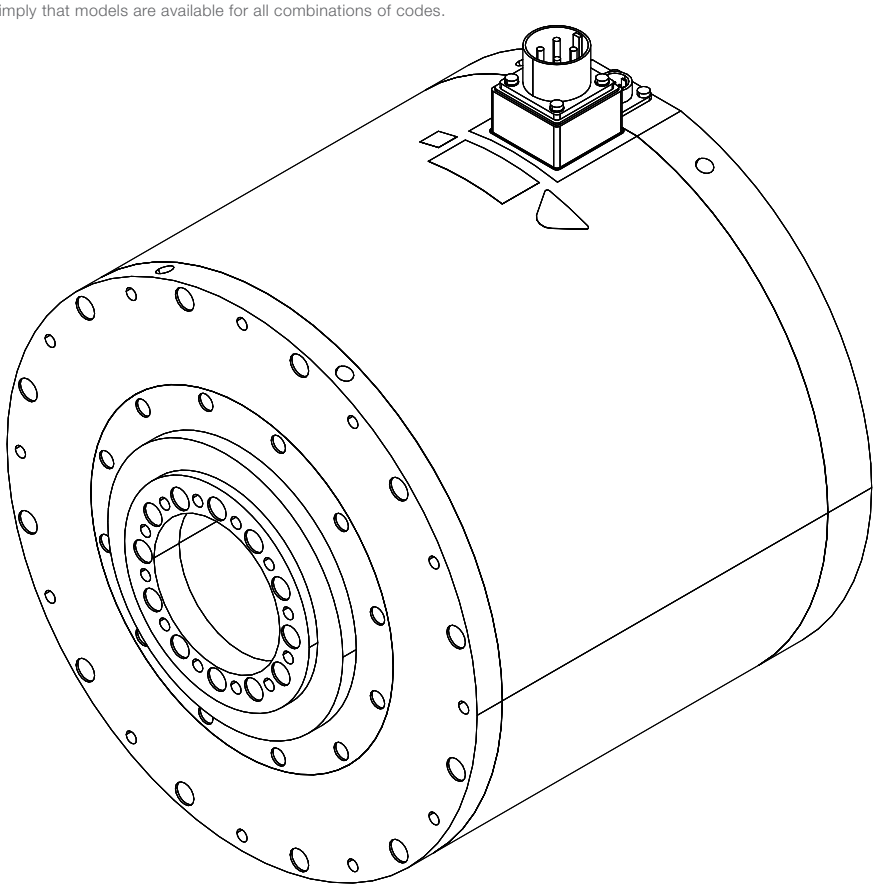
| 5th digit - Design Revision Order | |
|---|---|
| **Code** | **Specification** |
| A | Standard Version |

| 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) | ✓ | ✓ | ✓ | ✓ | — | — |

✓ : Applicable models

| 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) |

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.



More detailed information, technical specifications and accessories (e.g. cables) can be found in our main Sigma-7 200V catalog. Please contact your YASKAWA representative or find the documents on our website.

# Notes

**YASKAWA Europe GmbH**

Drives Motion Controls Division
Hauptstr. 185
65760 Eschborn
Germany

+49 6196 569-500
support@yaskawa.eu.com
www.yaskawa.eu.com

10/2018
YEU_MuC_Direct_Drives_EN_ v1



YASKAWA