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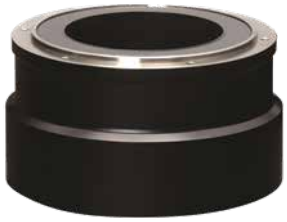
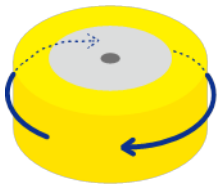
Direct Drive Servomotors

Sigma-7 200 V Series

Product Overview

SGM7D



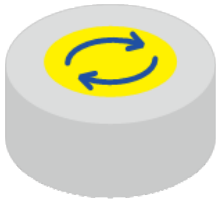


Outer Rotor with Core

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

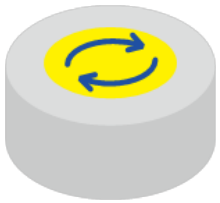


Inner Rotor with Core

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.

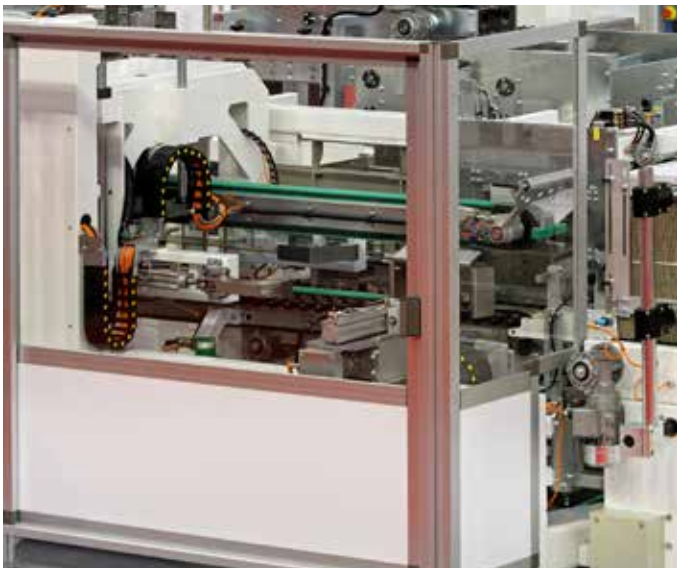
- Quick and easy set-up and no configuration effort - these are the benefits of the YASKAWA out-of-the-box solutions.
- In case you want to upgrade a solution, the whole Sigma-7 system can easily be used for any new task.

Complete Solutions

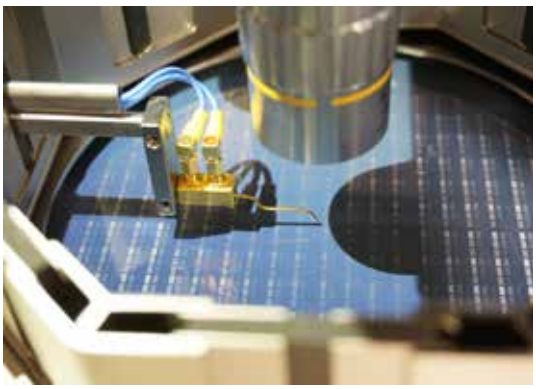
YASKAWA offers comprehensive customized automation solutions with powerful hardware, including controller, visualization, drive concept and industrial robots.

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-□□□□ SGD7C-□□□□
SGM7D (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 (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 (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.

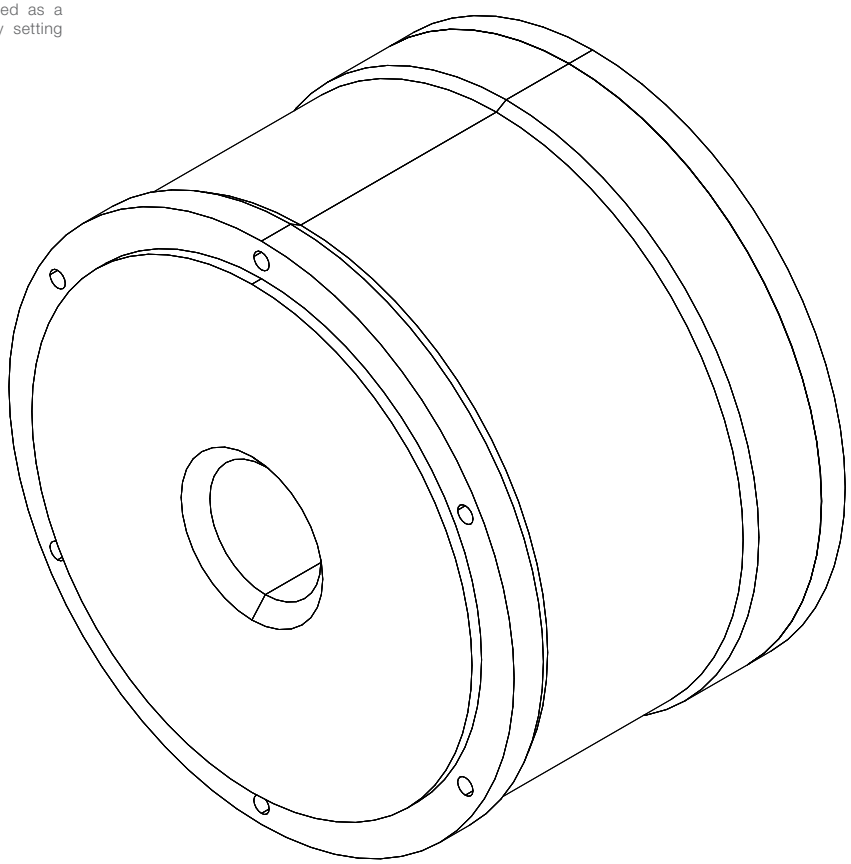
5th digit - Design Revision Order	
Code	**Specification**
C	Standard Version

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 200V 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

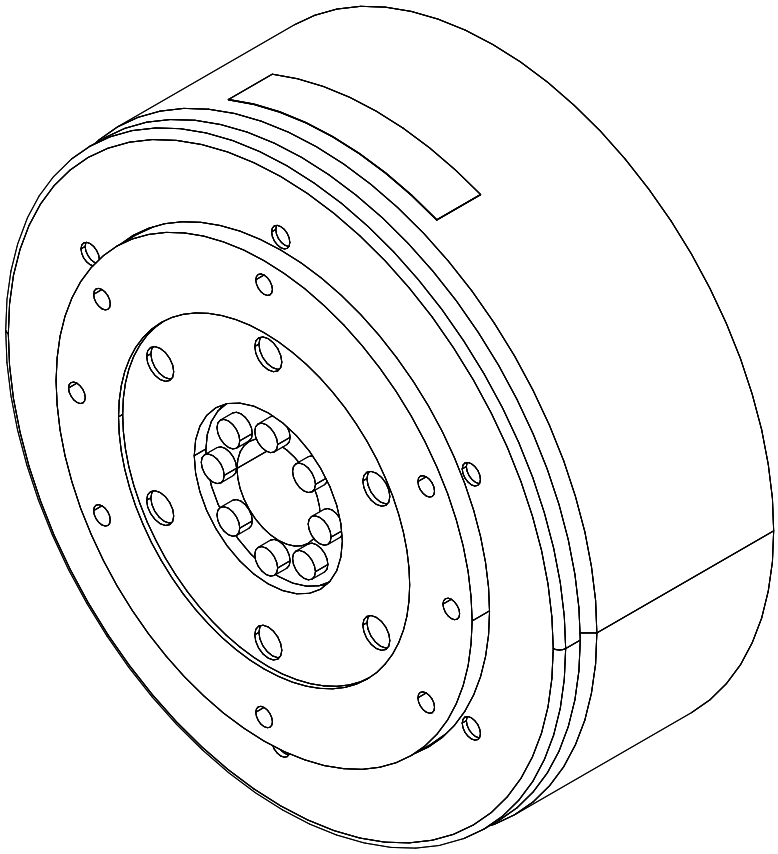
* Both multiturn absolute encoder and incremental encoder can be used as a single-turn absolute encoder by setting parameters.

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.



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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.

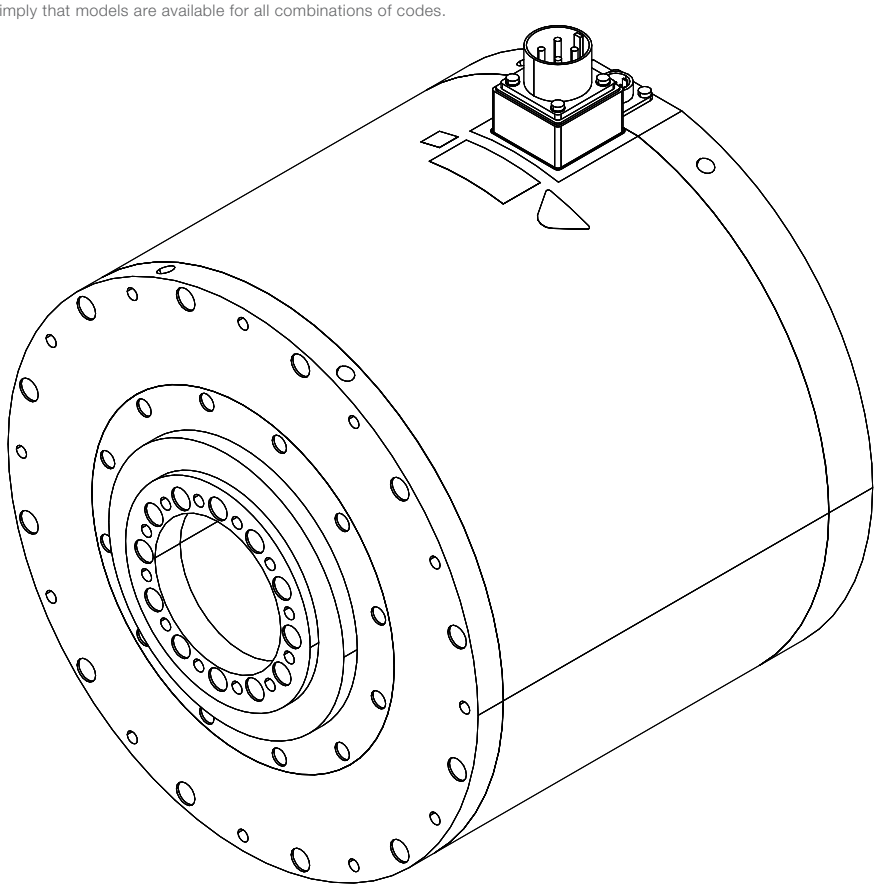
5th digit - Design Revision Order	
Code	**Specification**
A	Standard Version

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.



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