

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 geared servomotors with SP+ planetary gearbox

Selection and ordering data

Motor	Planetary gearbox single-stage			Available gear ratio $i =$				Motor speed, max. S3-60 %	Output torque, max. S3-60 %	Radial output shaft loading, max. ¹⁾	Axial output shaft loading, max. ¹⁾
	Type	Torsional backlash	Gearbox weight, approx.	4	5	7	10	n_{G1} (n_1) rpm	M_{G2} (T_{2B}) Nm (lb _r -ft)	F_r (F_{2Rmax}) N (lb _f)	F_a (F_{2Amax}) N (lb _f)
1FK7022	SP 060S-MF1	≤ 4	1.9 (4.19)	✓	✓	✓	✓	6000	40 (295) (32 for $i = 10$)	2700 (607)	2400 (540)
1FK7032				✓	✓	✓	✓				
1FK7033				✓	✓	✓	✓				
1FK7034				✓	✓	✓	✓				
1FK7040	SP 075S-MF1	≤ 4	3.9 (8.6)	✓	✓	✓	✓	6000	110 (81.1) (90 for $i = 10$)	4000 (899)	3350 (753)
1FK7042				✓	✓	✓	✓				
1FK7043				✓	✓	✓	✓				
1FK7044				✓	✓	✓	✓				
1FK7060	SP 100S-MF1	≤ 3	7.7 (17.0)	✓	✓	✓	✓	4500	300 (221) (225 for $i = 10$)	6300 (1416)	5650 (1270)
1FK7061				✓	✓	✓	✓				
1FK7062				✓	✓	✓	✓				
1FK7063				✓	✓	✓	✓				
1FK7064				✓	✓	✓	✓				
1FK7080	SP 140S-MF1	≤ 3	17.2 (37.9)	✓	✓	✓	✓	4000	600 (442) (480 for $i = 10$)	9450 (2124)	9870 (2219)
1FK7081				✓	✓	✓	✓				
1FK7083				✓	✓	✓	✓				
1FK7084				✓	✓	✓	✓				
1FK7085				✓	✓	✓	✓				
1FK7086				✓	✓	✓	✓				
1FK7100	SP 180S-MF1	≤ 3	34 (75.0)	✓	✓	✓	✓	3500	1100 (810) (880 for $i = 10$)	14700 (3305)	14150 (3181)
1FK7101				✓	✓	✓	✓				
1FK7103				✓	✓	✓	✓				
1FK7105				✓	✓	✓	–				
1FK7105	SP 210S-MF1	≤ 3	56 (123)	–	–	–	✓	2500	2500 (1844) (2400 for $i = 7$ 1900 for $i = 10$)	21000 (4721)	30000 (6744)
Gear shaft				Order code							
With feather key				J02	J03	J05	J09				
Without feather key				J22	J23	J25	J29				

Preconditions:

SP+ planetary gearboxes can be mounted with the following motor versions:

- Plain motor shaft extension, shaft and flange accuracy tolerance N, without/with holding brake
- IP65 degree of protection and anthracite paint finish

SP+ planetary gearboxes can therefore only be ordered with these motors:

1FK7 . . . -2 A ■ 1 Compact
1FK7 . . . -3 B ■ 1 High Inertia
1FK7 . . . -4 C ■ 1 High Dynamic
G without brake
H with brake

or

1FK7 0 2 . -5 A ■ G 5
1FK7 0 2 . -5 A ■ H 5

✓ Possible

– Not possible

¹⁾ In reference to the output shaft center.

When ordering a motor with gearbox, **-Z** should be added to the order number.

Example:

1FK7042 motor without holding brake with single-stage SP+ planetary gearbox with $i = 7$ and gear shaft without feather key.

1FK7042-2AF71-1AG1-**Z**

J25

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 geared servomotors with SP+ planetary gearbox

Technical specifications

SIMOTICS S-1FK7 motor with SP+ planetary gearbox

Single-stage Type	Gear ratio i	Motor speed	Output torque	Moments of inertia of gearboxes (referred to the drive)					
		Continuous duty S1 ¹⁾ n_{N1} rpm	$M_{N2} (T_{2N})$ Nm (lb _f -ft)	1FK702. J_1 kgcm ² (lb _f -in ²)	1FK703. J_1 kgcm ² (lb _f -in ²)	1FK704. J_1 kgcm ² (lb _f -in ²)	1FK706. J_1 kgcm ² (lb _f -in ²)	1FK708. J_1 kgcm ² (lb _f -in ²)	1FK710. J_1 kgcm ² (lb _f -in ²)
SP 060S-MF1	4	3300	26 (19.2)	0.15 (0.05)	0.22 (0.08)	–	–	–	–
	5	3300	26 (19.2)	0.12 (0.04)	0.20 (0.07)	–	–	–	–
	7	4000	26 (19.2)	0.10 (0.034)	0.18 (0.062)	–	–	–	–
	10	4000	17 (12.5)	0.09 (0.031)	0.17 (0.058)	–	–	–	–
SP 075S-MF1	4	2900	75 (55.3)	–	–	0.78 (0.27)	–	–	–
	5	2900	75 (55.3)	–	–	0.68 (0.23)	–	–	–
	7	3100	75 (55.3)	–	–	0.59 (0.20)	–	–	–
	10	3100	52 (38.4)	–	–	0.54 (0.19)	–	–	–
SP 100S-MF1	4	2500	180 (133)	–	–	–	3.04 (1.04)	–	–
	5	2500	175 (129)	–	–	–	2.61 (0.89)	–	–
	7	2800	170 (125)	–	–	–	2.29 (0.78)	–	–
	10	2800	120 (88.5)	–	–	–	2.07 (0.71)	–	–
SP 140S-MF1	4	2100	360 (266)	–	–	–	–	11.0 (3.76)	–
	5	2100	360 (266)	–	–	–	–	9.95 (3.40)	–
	7	2600	360 (266)	–	–	–	–	9.01 (3.08)	–
	10	2600	220 (162)	–	–	–	–	8.44 (2.88)	–
SP 180S-MF1	4	1500	750 (553)	–	–	–	–	–	33.9 (11.6)
	5	1500	750 (553)	–	–	–	–	–	27.9 (9.53)
	7	2300	750 (553)	–	–	–	–	–	22.2 (7.59)
	10	2300	750 (553)	–	–	–	–	–	19.2 (6.56)
SP 210S-MF1	10	2000	1000 (738)	–	–	–	–	–	53.1 (18.1)

¹⁾ The limit values in the table apply for S1 continuous duty (ON time > 60 % or > 20 min) for a maximum gearbox temperature of 90 °C (194 °F).

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 geared servomotors with SP+ planetary gearbox

Selection and ordering data

Motor	Planetary gearbox two-stage			Available gear ratio $i =$					Motor speed, max. S3-60 %	Output torque, max. S3-60 %	Radial output shaft loading, max. ¹⁾	Axial output shaft loading, max. ¹⁾
Type	Type	Torsional backlash arcmin	Gearbox weight, approx. kg (lb)	16	20	28	40	50	n_{G1} (n_1) rpm	M_{G2} (T_{2B}) Nm (lb _f -ft)	F_r (F_{2Rmax}) N (lb _f)	F_a (F_{2Amax}) N (lb _f)
1FK7022	SP 060S-MF2	≤ 6	2 (4.41)	✓	✓	✓	–	–	6000	40 (29.5)	2700 (607)	2400 (540)
1FK7032				✓	✓	–	–	–				
1FK7033				✓	✓	–	–	–				
1FK7022	SP 075S-MF2	≤ 6	3.6 (7.9)	–	–	–	✓	✓	6000	110 (81.1)	4000 (899)	3350 (753)
1FK7032				–	–	✓	✓	✓				
1FK7033				–	–	✓	✓	✓				
1FK7034				✓	✓	✓	–	–				
1FK7040				✓	✓	✓	–	–				
1FK7042				✓	✓	–	–	–				
1FK7043				✓	–	–	–	–				
1FK7034				–	–	–	✓	✓				
1FK7040	SP 100S-MF2	≤ 5	7.9 (17.4)	–	–	–	✓	✓	4500	300 (221)	6300 (1416)	2400 (540)
1FK7042				–	–	✓	✓	✓				
1FK7043				–	✓	✓	✓	✓				
1FK7044				✓	✓	✓	✓	–				
1FK7060				✓	✓	✓	–	–				
1FK7061				✓	✓	–	–	–				
1FK7062				✓	✓	–	–	–				
1FK7044				–	–	–	–	✓				
1FK7060	SP 140S-MF2	≤ 5	17 (37.5)	–	–	–	✓	✓	4000	600 (442)	9450 (2124)	9870 (2219)
1FK7061				–	–	✓	✓	✓				
1FK7062				–	–	✓	✓	–				
1FK7063				✓	✓	✓	–	–				
1FK7064				✓	✓	✓	–	–				
1FK7080				✓	✓	✓	✓	–				
1FK7081				✓	✓	✓	–	–				
1FK7083				✓	✓	–	–	–				
1FK7084				✓	–	–	–	–				
Gear shaft				Order code								
With feather key				J12	J13	J15	J16	J17				
Without feather key				J32	J33	J35	J36	J37				

Preconditions:

SP+ planetary gearboxes can be mounted with the following motor versions:

- Plain motor shaft extension, shaft and flange accuracy tolerance N, without/with holding brake
- IP65 degree of protection and anthracite paint finish

SP+ planetary gearboxes can therefore only be ordered with these motors:

1FK7 . . . -2 A ■ 1 Compact
1FK7 . . . -3 B ■ 1 High Inertia
1FK7 . . . -4 C ■ 1 High Dynamic
G without brake
H with brake

or

1FK7 0 2 . -5 A **G 5**
1FK7 0 2 . -5 A **H 5**

✓ Possible

– Not possible

¹⁾ In relation to the center of the output shaft at 100 rpm.

When ordering a motor with gearbox, **-Z** should be added to the order number.

Example:

1FK7042 motor without holding brake
 with two-stage SP+ planetary gearbox
 with $i = 28$ and gear shaft without feather key
1FK7042-2AF71-1AG1-Z
J35

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 geared servomotors with SP+ planetary gearbox

Selection and ordering data

Motor	Planetary gearbox two-stage			Available gear ratio $i =$					Motor speed, max. S3-60 %	Output torque, max. S3-60 %	Radial output shaft loading, max. ¹⁾	Axial output shaft loading, max. ¹⁾
Type	Type	Torsional backlash arcmin	Gearbox weight, approx. kg (lb)	16	20	28	40	50	n_{G1} (n_1) rpm	M_{G2} (T_{2B}) Nm (lb _f -ft)	F_r (F_{2Rmax}) N (lb _f)	F_a (F_{2Amax}) N (lb _f)
1FK7062	SP 180S-MF2	≤ 5	36.4 (80.3)	–	–	–	–	✓	4000	1100 (811)	14700 (3305)	14150 (3181)
1FK7063				–	–	–	✓	✓				
1FK7064				–	–	–	✓	✓				
1FK7080				–	–	–	–	✓				
1FK7081				–	–	–	✓	✓				
1FK7083				–	–	✓	–	–				
1FK7084				–	✓	✓	–	–				
1FK7085				✓	✓	–	–	–				
1FK7086				✓	✓	–	–	–				
1FK7100				✓	✓	✓	–	–				
1FK7101	✓	✓	–	–	–							
1FK7103	✓	–	–	–	–							
1FK7083	SP 210S-MF2	≤ 6	55 (121)	–	–	–	✓	✓	3500	2400 (1770) (2500 for $i = 20$)	21000 (4721)	30000 (6744)
1FK7084				–	–	–	✓	✓				
1FK7085				–	–	✓	✓	–				
1FK7086				–	–	✓	–	–				
1FK7100				–	–	–	✓	✓				
1FK7101				–	–	✓	–	–				
1FK7103				–	✓	–	–	–				
1FK7105				✓	✓	–	–	–				
1FK7101	SP 240S-MF2	≤ 6	80.6 (178)	–	–	–	✓	✓	3500	4500 (3319) (4000 for $i = 40$ 4300 for $i = 50$)	30000 (6744)	33000 (7419)
1FK7103				–	–	✓	✓	–				
1FK7105				–	–	✓	–	–				
Gear shaft				Order code								
With feather key				J12	J13	J15	J16	J17				
Without feather key				J32	J33	J35	J36	J37				

Preconditions:

SP+ planetary gearboxes can be mounted with the following motor versions:

- Plain motor shaft extension, shaft and flange accuracy tolerance N, without/with holding brake
- IP65 degree of protection and anthracite paint finish

SP+ planetary gearboxes can therefore only be ordered with these motors:

1FK7 . . . -2 A ■ 1 Compact
1FK7 . . . -3 B ■ 1 High Inertia
1FK7 . . . -4 C ■ 1 High Dynamic
G without brake
H with brake

or

1FK7 0 2 . -5 A ■ G5
1FK7 0 2 . -5 A ■ H5

When ordering a motor with gearbox, **-Z** should be added to the order number.

Example:

1FK7042 motor without holding brake
 with two-stage SP+ planetary gearbox
 with $i = 16$ and gear shaft without feather key
 1FK7103-2AC71-1AG1-**Z**
J32

✓ Possible

– Not possible

¹⁾ In reference to the output shaft center.

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

**SIMOTICS S-1FK7 geared servomotors
with SP+ planetary gearbox**

Technical specifications

SIMOTICS S-1FK7 motor with SP+ planetary gearbox

Two-stage Type	Gear ratio	Motor speed	Output torque	Moments of inertia of gearboxes (referred to the drive)					
		Continuous duty S1 ¹⁾		1FK702.	1FK703.	1FK704.	1FK706.	1FK708.	1FK710.
	<i>i</i>	n_{N1}	$M_{N2} (T_{2N})$	J_1	J_1	J_1	J_1	J_1	J_1
		rpm	Nm (lb _f -ft)	kgcm ² (lb _f -in ²)	kgcm ² (lb _f -in ²)	kgcm ² (lb _f -in ²)	kgcm ² (lb _f -in ²)	kgcm ² (lb _f -in ²)	kgcm ² (lb _f -in ²)
SP 060S-MF2	16	4400	26 (19.2)	0.08 (0.03)	0.17 (0.06)	–	–	–	–
	20	4400	26 (19.2)	0.07 (0.024)	0.16 (0.05)	–	–	–	–
	28	4400	26 (19.2)	0.06 (0.021)	–	–	–	–	–
SP 075S-MF2	16	3500	75 (55.3)	–	0.23 (0.08)	0.55 (0.19)	–	–	–
	20	3500	75 (55.3)	–	0.20 (0.07)	0.53 (0.18)	–	–	–
	28	3500	75 (55.3)	–	0.18 (0.062)	0.50 (0.17)	–	–	–
	40	3500	75 (55.3)	0.10 (0.03)	0.17 (0.058)	–	–	–	–
	50	3800	75 (55.3)	0.10 (0.03)	0.16 (0.055)	–	–	–	–
SP 100S-MF2	16	3100	180 (133)	–	–	0.81 (0.28)	2.18 (0.75)	–	–
	20	3100	180 (133)	–	–	0.70 (0.24)	2.07 (0.71)	–	–
	28	3100	180 (133)	–	–	0.60 (0.21)	1.97 (0.67)	–	–
	40	3100	180 (133)	–	0.38 (0.13)	0.55 (0.188)	–	–	–
	50	3500	175 (129)	–	0.38 (0.13)	0.54 (0.185)	–	–	–
SP 140S-MF2	16	2900	360 (265)	–	–	–	3.19 (1.09)	10.3 (3.52)	–
	20	2900	360 (265)	–	–	–	2.71 (0.93)	9.77 (3.34)	–
	28	2900	360 (265)	–	–	–	2.34 (0.80)	9.41 (3.21)	–
	40	2900	360 (265)	–	–	–	2.10 (0.72)	9.16 (3.13)	–
	50	3200	360 (265)	–	–	1.39 (0.48)	2.08 (0.71)	–	–
SP 180S-MF2	16	2700	750 (553)	–	–	–	–	12.4 (4.24)	13.5 (4.61)
	20	2700	750 (553)	–	–	–	–	10.9 (3.73)	12.0 (4.10)
	28	2700	750 (553)	–	–	–	–	9.48 (3.24)	10.6 (3.62)
	40	2700	750 (553)	–	–	–	5.51 (1.88)	8.67 (2.96)	–
	50	2900	750 (553)	–	–	–	5.45 (1.86)	8.61 (2.94)	–
SP 210S-MF2	16	2500	1500 (1106)	–	–	–	–	–	34.5 (11.8)
	20	2500	1500 (1106)	–	–	–	–	–	31.5 (10.8)
	28	2500	1500 (1106)	–	–	–	–	30.0 (10.3)	30.0 (10.3)
	40	2500	1500 (1106)	–	–	–	–	28.5 (9.74)	28.5 (9.74)
	50	2500	1500 (1106)	–	–	–	–	28.3 (9.67)	28.3 (9.67)
SP 240S-MF2	28	2500	2500 (1844)	–	–	–	–	–	30.5 (10.4)
	40	2500	2500 (1844)	–	–	–	–	–	28.2 (9.64)
	50	2500	2500 (1844)	–	–	–	–	–	27.9 (9.53)

¹⁾ The limit values in the table apply for S1 continuous duty (ON time > 60 % or > 20 min) for a maximum gearbox temperature of 90 °C (194 °F).