

# Synchronous motors

## Gearboxes

### Series SP+ planetary gearbox, single-stage for 1FK7 motors

#### Selection and Ordering Data

Motor Natural cooling	Planetary gearbox Single-stage			Available gear ratios $i =$				Motor speed, max. S3-60%	Output torque, max. S3-60%	Radial load on output shaft, max. <sup>1)</sup>	Axial load on output shaft, max. <sup>1)</sup>
				4	5	7	10				
Type	Type	Tor- sional back- lash  arcmin	Weight of gearbox, approx.  kg (lb)					$n_{G1}$  ( $n_1$ )  rpm	$M_{G2}$  ( $T_{2B}$ )  Nm (lb <sub>f</sub> -ft)	$F_r$  ( $F_{2Rmax}$ )  N (lb <sub>f</sub> )	$F_a$  ( $F_{2Amax}$ )  N (lb <sub>f</sub> )
1FK7022	SP 060S-MF1	≤ 4	1.9 (4.19)	✓	✓	✓	✓	6000	40 (29.5) (32 (23.6) for $i = 10$ )	2700 (607)	2400 (540)
1FK7032				✓	✓	✓	✓				
1FK7033				✓	✓	✓	✓				
1FK7034				✓	✓	✓	✓				
1FK7040	SP 075S-MF1	≤ 4	3.9 (8.60)	✓	✓	✓	✓	6000	110 (81.1) (90 (66.4) for $i = 10$ )	4000 (899)	3350 (753)
1FK7042				✓	✓	✓	✓				
1FK7043				✓	✓	✓	✓				
1FK7044				✓	✓	✓	✓				
1FK7060	SP 100S-MF1	≤ 3	7.7 (17.0)	✓	✓	✓	✓	4500	300 (221) (225 (166) for $i = 10$ )	6300 (1416)	5650 (1270)
1FK7061				✓	✓	✓	✓				
1FK7063				✓	✓	✓	✓				
1FK7064				✓	✓	✓	✓				
1FK7080	SP 140S-MF1	≤ 3	17.2 (37.9)	✓	✓	✓	✓	4000	600 (443) (480 (354) for $i = 10$ )	9450 (2124)	9870 (2219)
1FK7082				✓	✓	✓	✓				
1FK7083				✓	✓	✓	✓				
1FK7085				✓	✓	✓	✓				
1FK7086				✓	✓	✓	✓				
1FK7100	SP 180S-MF1	≤ 3	34 (75)	✓	✓	✓	✓	3500	1100 (811)	14700 (3305)	14150 (3181)
1FK7101				✓	✓	✓	✓				
1FK7103				✓	✓	✓	✓				
1FK7105				✓	✓	✓	–				
1FK7105	SP 210-MF1 <sup>2)</sup>	≤ 4	53 (117)	–	–	–	✓	2200	2720 (2006)	18000 (4047)	22500 (5058)

#### Order codes

- Gearbox shaft with fitted key
- Gearbox shaft without fitted key

J02  
J22

J03  
J23

J05  
J25

J09  
J29

Ordering data:

1FK7...-A.71-..5-Z

J ■ ■

G

H

without holding brake  
with holding brake

Order No. of the motor with identifier "-Z" and  
order code for mounting the planetary gearbox assigned to the motor  
Preconditions for mounting planetary gearboxes:  
Plain motor shaft extension and IP65 degree of protection, anthracite paint finish

✓ Possible

– Not possible

<sup>1)</sup> In reference to the output shaft center.

<sup>2)</sup> For these versions, the quantity of oil in the gearbox depends on the mounting position. In the case of a vertical mounting position, the 12th position in the Order No. should be "9" and a further order code also has to be specified: 1FK7...-A.79-..5-Z J.. + M1 ■

G  
H

H Mounting position IM V1  
G Mounting position IM V3

# Synchronous motors

## Gearboxes

### Series SP+ planetary gearbox, single-stage for 1FK7 motors

#### Technical specifications

Planetary gearbox with 1FK7 motor, natural cooling									
Single-stage Type	Gear ratio	Motor speed	Output torque	Moments of inertia of gearbox (referred to the drive)					
		Continuous duty S1 <sup>1)</sup>		1FK702.	1FK703.	1FK704.	1FK706.	1FK708.	1FK710.
		$n_{rated1}$	$M_{rated2}$ ( $T_{2 rated}$ )	$J_1$	$J_1$	$J_1$	$J_1$	$J_1$	$J_1$
		rpm	Nm (lb <sub>f</sub> -in)	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )
SP 060S-MF1	4	3300	26 (230)	0.16 (0.05)	0.24 (0.08)	–	–	–	–
	5	3300	26 (230)	0.13 (0.04)	0.22 (0.08)	–	–	–	–
	7	4000	26 (230)	0.11 (0.04)	0.19 (0.06)	–	–	–	–
	10	4000	17 (151)	0.10 (0.03)	0.18 (0.06)	–	–	–	–
SP 075S-MF1	4	2900	75 (664)	–	–	0.94 (0.32)	–	–	–
	5	2900	75 (664)	–	–	0.83 (0.28)	–	–	–
	7	3100	75 (664)	–	–	0.73 (0.25)	–	–	–
	10	3100	52 (460)	–	–	0.67 (0.23)	–	–	–
SP 100S-MF1	4	2500	180 (1593)	–	–	–	3.65 (1.25)	–	–
	5	2500	175 (1549)	–	–	–	2.99 (1.02)	–	–
	7	2800	170 (1505)	–	–	–	2.81 (0.96)	–	–
	10	2800	120 (1062)	–	–	–	2.58 (0.88)	–	–
SP 140S-MF1	4	2100	360 (3186)	–	–	–	–	14.3 (4.89)	–
	5	2100	360 (3186)	–	–	–	–	13.1 (4.48)	–
	7	2600	360 (3186)	–	–	–	–	12 (4.1)	–
	10	2600	220 (1947)	–	–	–	–	11.4 (3.90)	–
SP 180S-MF1	4	1500	750 (6638)	–	–	–	–	–	45.1 (15.4)
	5	1500	750 (6638)	–	–	–	–	–	36.4 (12.4)
	7	2300	750 (6638)	–	–	–	–	–	28.6 (9.77)
	10	2300	750 (6638)	–	–	–	–	–	24.4 (8.34)
SP 210-MF1	4	1200	1000 (8851)	–	–	–	–	–	75.8 (25.9)
	5	1200	1000 (8851)	–	–	–	–	–	63.5 (21.7)
	7	1700	1000 (8851)	–	–	–	–	–	52.9 (18.1)
	10	1700	1000 (8851)	–	–	–	–	–	47.1 (16.1)

<sup>1)</sup> 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).

# Synchronous motors

## Gearboxes

### Series SP+ planetary gearbox, two-stage for 1FK7 motors

#### Selection and Ordering Data

Motor Natural cooling	Planetary gearbox Two-stage			Available gear ratios $i =$					Motor speed, max. S3-60%	Output torque, max. S3-60%	Radial load on output shaft, max. <sup>1)</sup>	Axial load on output shaft, max. <sup>1)</sup>
Type	Type	Tor- sional back- lash arcmin	Weight of gearbox, approx. kg (lb)	16	20	28	40	50	$n_{G1}$  ( $n_1$ )  rpm	$M_{G2}$  ( $T_{2B}$ )  Nm (lb <sub>f</sub> -ft)	$F_r$  ( $F_{2Rmax}$ )  N (lb <sub>f</sub> )	$F_a$  ( $F_{2Amax}$ )  N (lb <sub>f</sub> )
1FK7022	SP 060S-MF2	≤ 6	2 (4.4)	✓	✓	✓	–	–	6000	40 (29)	2700 (607)	2400 (540)
1FK7032				✓	✓	–	–	–				
1FK7033				✓	✓	–	–	–				
1FK7022	SP 075S-MF2	≤ 6	3.6 (7.9)	–	–	–	✓	✓	6000	110 (81)	4000 (899)	3350 (753)
1FK7032				–	–	✓	✓	✓				
1FK7033				–	–	✓	✓	✓				
1FK7034				✓	✓	✓	–	–				
1FK7040				✓	✓	✓	–	–				
1FK7042				✓	✓	–	–	–				
1FK7043				✓	–	–	–	–				
1FK7034	SP 100S-MF2	≤ 5	7.9 (17.4)	–	–	–	✓	✓	4500	300 (221)	6300 (1416)	5650 (1270)
1FK7040				–	–	–	✓	✓				
1FK7042				–	–	✓	✓	✓				
1FK7043				–	✓	✓	✓	✓				
1FK7044				✓	✓	✓	✓	–				
1FK7060				✓	✓	✓	–	–				
1FK7061				✓	✓	–	–	–				
1FK7044	SP 140S-MF2	≤ 5	17 (17.4)	–	–	–	–	✓	4000	600 (442)	9450 (2124)	9870 (2219)
1FK7060				–	–	–	✓	✓				
1FK7061				–	–	✓	✓	✓				
1FK7063				✓	✓	✓	–	–				
1FK7064				✓	✓	✓	–	–				
1FK7080				✓	✓	✓	✓	–				
1FK7082				✓	✓	–	–	–				
1FK7083				✓	✓	–	–	–				
Order codes												
• Gearbox shaft <u>with</u> fitted key				J12	J13	J15	J16	J17				
• Gearbox shaft <u>without</u> fitted key				J32	J33	J35	J36	J37				

Ordering data: **1FK7...-A.71-..5-Z****J** ■ ■**G**  
**H**without holding brake  
with holding brakeOrder No. of the motor with identifier "**-Z**" and order code for mounting the planetary gearbox assigned to the motor  
Preconditions for mounting planetary gearboxes: Plain motor shaft extension and IP65 degree of protection, anthracite paint finish

✓ Possible

– Not possible

<sup>1)</sup> In reference to the output shaft center.

# Synchronous motors

## Gearboxes

### Series SP+ planetary gearbox, two-stage for 1FK7 motors

#### Selection and Ordering Data

Motor Natural cooling	Planetary gearbox Two-stage			Available gear ratios $i =$					Motor speed, max. S3-60%	Output torque, max. S3-60%	Radial load on output shaft, max. <sup>1)</sup>	Axial load on output shaft, max. <sup>1)</sup>
Type	Type	Tor- sional back- lash arcmin	Weight of gearbox, approx. kg (lb)	16	20	28	40	50	$n_{G1}$  ( $n_1$ ) rpm	$M_{G2}$  ( $T_{2B}$ ) Nm (lb <sub>f</sub> -ft)	$F_r$  ( $F_{2Rmax}$ ) N (lb <sub>f</sub> )	$F_a$  ( $F_{2Amax}$ ) N (lb <sub>f</sub> )
1FK7063	SP 180S-MF2	≤ 5	36.4 (80.3)	—	—	—	✓	✓	4000	1100 (811)	14700 (3305)	14150 (3181)
1FK7064				—	—	—	✓	✓				
1FK7080				—	—	—	—	✓				
1FK7083				—	—	✓	—	—				
1FK7085				✓	✓	—	—	—				
1FK7086				✓	✓	—	—	—				
1FK7100				✓	✓	✓	—	—				
1FK7101				✓	✓	—	—	—				
1FK7103				✓	—	—	—	—				
1FK7083	SP 210-MF2 <sup>2)</sup>	≤ 6	50 (110)	—	—	—	✓	✓	3500	1900 (1401)	18000 (4047)	22500 (5058)
1FK7085				—	—	✓	✓	—				
1FK7086				—	—	✓	—	—				
1FK7100				—	—	—	✓	✓				
1FK7101				—	—	✓	—	—				
1FK7103				—	✓	—	—	—				
1FK7105				✓	✓	—	—	—				
1FK7101	SP 240-MF2 <sup>2)</sup>	≤ 6	70 (154)	—	—	—	✓	✓	3500	3400 (2508)	27000 (6070)	27800 (6250)
1FK7103				—	—	✓	✓	—				
1FK7105				—	—	✓	—	—				
Order codes												
• Gearbox shaft with fitted key				J12	J13	J15	J16	J17				
• Gearbox shaft without fitted key				J32	J33	J35	J36	J37				

Ordering data:

**1FK7...-A.71-..5-Z****J ■ ■****G**  
**H**without holding brake  
with holding brake

Order No. of the motor with identifier "-Z" and order code for mounting the planetary gearbox assigned to the motor

Preconditions for mounting planetary gearboxes: Plain motor shaft extension and IP65 degree of protection, anthracite paint finish

<sup>1)</sup> In reference to the output shaft center.

<sup>2)</sup> For these versions, the quantity of oil in the gearbox depends on the mounting position. In the case of a vertical mounting position, the 12th position in the Order No. should be "9" and a further order code also has to be specified: **1FK7...-A.79-..5-Z J.. + M1 ■**

**G**  
**H****H** Mounting position IM V1  
**G** Mounting position IM V3

# Synchronous motors

## Gearboxes

### Series SP+ planetary gearbox, two-stage for 1FK7 motors

#### Technical specifications

Planetary gearbox with 1FK7 motor									
Two-stage Type	Gear ratio	Motor speed	Output torque	Moments of inertia of gearbox (referred to the drive)					
		Continuous duty S1 <sup>1)</sup>		1FK702.	1FK703.	1FK704.	1FK706.	1FK708.	1FK710.
		$n_{rated\ 1}$	$M_{rated\ 2}$ ( $T_{2\ rated}$ )	$J_1$	$J_1$	$J_1$	$J_1$	$J_1$	$J_1$
		rpm	Nm (lb <sub>f</sub> -in)	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>f</sub> -in <sup>2</sup> )
SP 060S-MF2	16	4400	26 (230)	0.08 (0.03)	0.18 (0.06)	–	–	–	–
	20	4400	26 (230)	0.07 (0.03)	0.17 (0.06)	–	–	–	–
	28	4400	26 (230)	0.06 (0.02)	0.16 (0.05)	–	–	–	–
	40	4400	26 (230)	0.06 (0.02)	0.16 (0.05)	–	–	–	–
	50	4800	26 (230)	0.06 (0.02)	0.16 (0.05)	–	–	–	–
SP 075S-MF2	16	3500	75 (664)	0.17 (0.06)	0.25 (0.08)	0.68 (0.23)	–	–	–
	20	3500	75 (664)	0.14 (0.05)	0.22 (0.08)	0.65 (0.22)	–	–	–
	28	3500	75 (664)	0.11 (0.04)	0.19 (0.06)	0.62 (0.21)	–	–	–
	40	3500	75 (664)	0.10 (0.03)	0.18 (0.06)	0.61 (0.21)	–	–	–
	50	3800	75 (664)	0.10 (0.03)	0.18 (0.06)	0.61 (0.21)	–	–	–
SP 100S-MF2	16	3100	180 (1593)	–	–	0.96 (0.33)	2.60 (0.89)	–	–
	20	3100	180 (1593)	–	–	0.84 (0.29)	2.48 (0.85)	–	–
	28	3100	180 (1593)	–	–	0.73 (0.25)	2.36 (0.81)	–	–
	40	3100	180 (1593)	–	–	0.67 (0.23)	2.31 (0.79)	–	–
	50	3500	175 (1549)	–	–	0.66 (0.23)	2.30 (0.79)	–	–
SP 140S-MF2	16	2900	360 (3186)	–	–	2.79 (0.96)	3.61 (1.23)	9.60 (3.28)	–
	20	2900	360 (3186)	–	–	2.26 (0.77)	3.08 (1.05)	9.07 (3.1)	–
	28	2900	360 (3186)	–	–	1.84 (0.63)	2.66 (0.91)	8.65 (2.96)	–
	40	2900	360 (3186)	–	–	1.58 (0.54)	2.39 (0.82)	8.39 (2.87)	–
	50	3200	360 (3186)	–	–	1.57 (0.54)	2.38 (0.81)	8.37 (2.86)	–
SP 180S-MF2	16	2700	750 (6638)	–	–	–	10.2 (3.48)	15.8 (5.41)	14.4 (4.91)
	20	2700	750 (6638)	–	–	–	8.48 (2.9)	14.1 (4.82)	12.1 (4.12)
	28	2700	750 (6638)	–	–	–	6.90 (2.36)	12.5 (4.27)	11 (3.76)
	40	2700	750 (6638)	–	–	–	6.06 (0.91)	11.6 (3.96)	10.2 (3.48)
	50	2900	750 (6638)	–	–	–	5.98 (2.04)	11.6 (3.96)	10.1 (3.45)
SP 210-MF2	16	2100	1000 (8851)	–	–	–	–	36.3 (12.4)	37.4 (12.8)
	20	2100	1000 (8851)	–	–	–	–	34.5 (11.8)	35.6 (12.2)
	28	2100	1000 (8851)	–	–	–	–	32.3 (11.0)	33.4 (11.4)
	40	2300	1000 (8851)	–	–	–	–	23.1 (7.89)	24.3 (8.3)
	50	2300	1000 (8851)	–	–	–	–	21.9 (7.48)	23 (7.86)
SP 240-MF2	16	1900	1700 (15046)	–	–	–	–	–	48.4 (16.5)
	20	1900	1700 (15046)	–	–	–	–	–	44.2 (15.1)
	28	1900	1700 (15046)	–	–	–	–	–	38.6 (13.2)
	40	2100	1700 (15046)	–	–	–	–	–	33.6 (11.5)
	50	2100	1700 (15046)	–	–	–	–	–	30.6 (10.5)

<sup>1)</sup> 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).