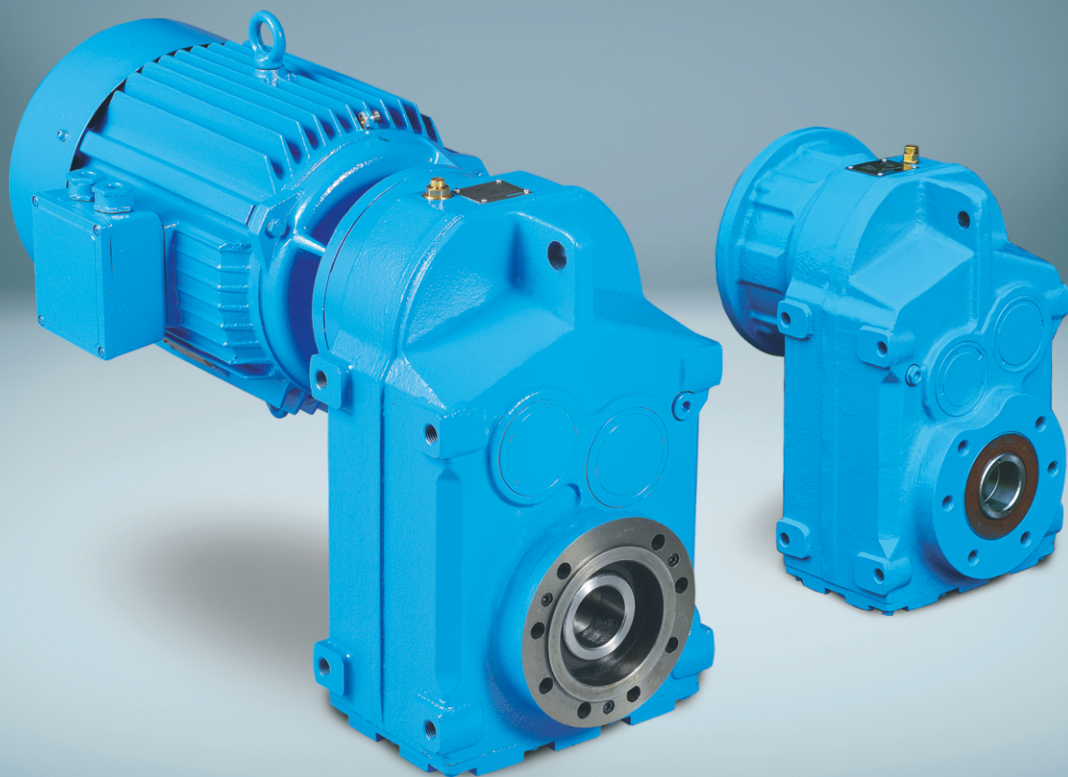
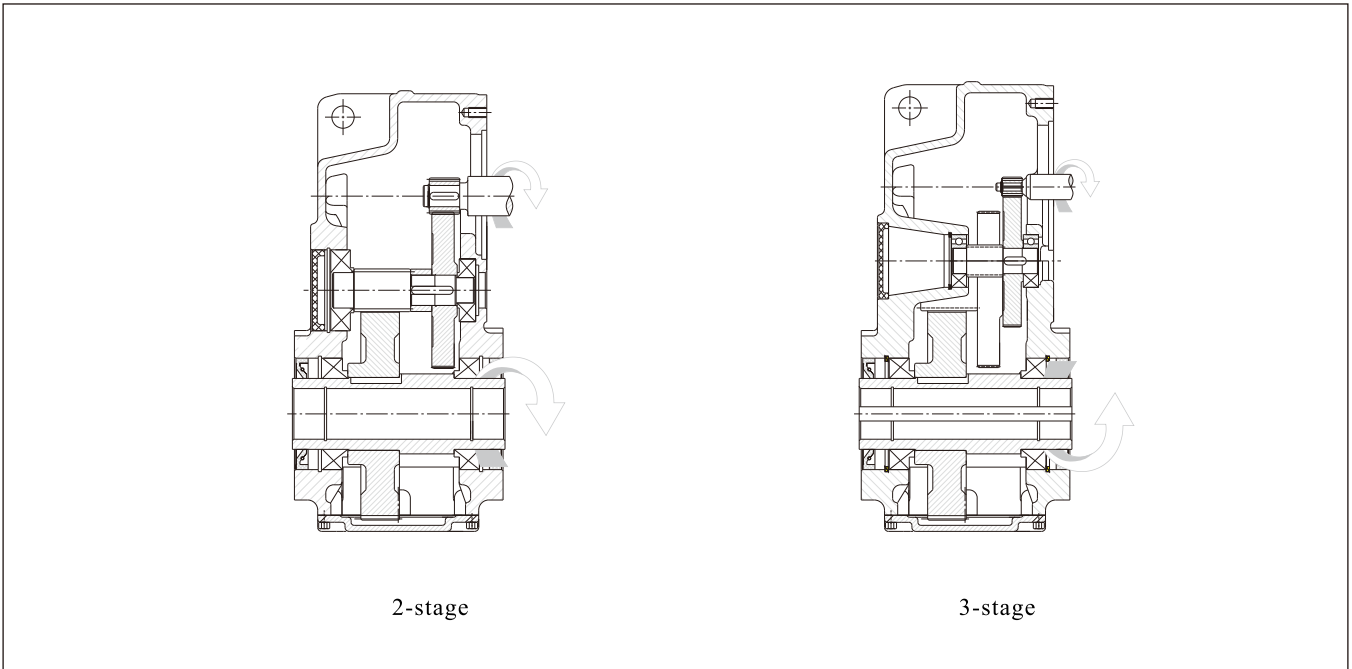


# F Series Parallel Shaft Helical Gear Units





1 Sectional Drawings:



2 Type Designation

**FF 97 A - 25.3 - Y-5.5 +T21 - B51 - 90**

**F Series**

- F* = Foot-mounted solid shaft with parallel key
- FH* = Foot-mounted hollow shaft with shrink disk
- FW* = Foot-mounted hollow shaft with parallel key
- FN* = Foot-mounted hollow shaft with involute spline
- FF* = Flange-mounted solid shaft with parallel key
- FL* = Flange-mounted hollow shaft with parallel key
- FHL* = Flange-mounted hollow shaft with shrink disk
- FNF* = Flange-mounted hollow shaft with involute spline
- FA* = Torque-arm-mounted hollow shaft with parallel key
- FHA* = Torque-arm-mounted hollow shaft with shrink disk
- FNA* = Torque-arm-mounted hollow shaft with involute spline
- FZ* = Short-flange-mounted hollow shaft with parallel key
- FHZ* = Short-flange-mounted hollow shaft with shrink disk
- FNZ* = Short-flange-mounted hollow shaft with involute spline

**Size**

**Output Shaft Direction**

- A\B* = Unidirectional output shaft
- S* = Bidirectional output shaft

**Nominal Ratio**

**Input Part**

- Y* = Motor
- AE* = Input Shaft
- AG* = Connection Flange

**Accessories and Special Requests**

**Mounting Positions**

**Positions of Motor Terminal Box**

Combi-type Designation: **F87A/CRL47-295-Y-1.1+E01-B6-90**



3 Mounting Positions, Position of Motor Terminal Box and Output Shaft Direction:

<p><b>F..FW..FH..FN..</b></p>		<p><b>B6</b></p>	<p><b>V5</b></p>	<p><b>B3</b></p>
		<p><b>B61</b></p>	<p><b>V6</b></p>	<p><b>B31</b></p>
<p><b>FF..FL..FHL..FNF..</b></p>		<p><b>B5</b></p>	<p><b>V1</b></p>	<p><b>B52</b></p>
		<p><b>B51</b></p>	<p><b>V3</b></p>	<p><b>B53</b></p>
<p><b>FZ..FHZ..FNZ..</b></p>		<p><b>H1</b></p>	<p><b>H5</b></p>	<p><b>H4</b></p>
		<p><b>H2</b></p>	<p><b>H6</b></p>	<p><b>H3</b></p>
<p><b>FA..FHA..FNA..</b></p>		<p><b>H1</b></p>	<p><b>H5</b></p>	<p><b>H4</b></p>
		<p><b>H2</b></p>	<p><b>H6</b></p>	<p><b>H3</b></p>

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4 Type Selection and Example:

Steps	Specification	Symbol	Calculate parameter			
1	Driven Machine Factor	f <sub>1</sub>	Load Characteristic	Operating hours per day (h)		
				≤2	2~10	10~24
			Uniform	1.00(1.00)	1.00(1.25)	1.25(1.50)
			Moderate	1.00(1.25)	1.25(1.50)	1.50(1.75)
			Heavy	1.25(1.50)	1.50(1.75)	1.75(2.00)
Note: Apply values in the brackets when starts per hour are 10 times or more.						
2	Input Speed	n <sub>1</sub>	≤1800r/min Consult us if higher speed required.			
3	Calculation of the Ratio	i	i=n <sub>1</sub> /n <sub>2</sub>			
4	Transmission Efficiency	η	2-stage	96%		
			3-stage	94%		
5	Calculation of the input power of the gear unit on basis of the torque and power required by the driven machine.	P <sub>1</sub>	P <sub>1</sub> =T <sub>2</sub> · n <sub>1</sub> /(9550 · i · η) or P <sub>1</sub> =P <sub>2</sub> /η			
6	Determination of gear unit type referring to the table of transmission capacity after calculation, For directly-connected motor, require to refer to directly-connected motor power table.	T <sub>2N</sub> 、P <sub>1N</sub>	T <sub>2N</sub> ≥T <sub>2</sub> · f <sub>1</sub> or P <sub>1N</sub> ≥P <sub>1</sub> · f <sub>1</sub>			
7	Check the radial and axial forces on the shafts.	F <sub>r1</sub> /F <sub>r2</sub> F <sub>a1</sub> /F <sub>a2</sub>	See P17/F.			
8	Determination of Lubrication System		Generally Splash Lubrication			
9	Determination of Cooling System		Generally Air Cooling			
10	Determination of every item included in the Type Designation		For details about Type Designation, see P 2/F.			
11	Normal ambient conditions		Ambient temperature -10 to 40℃, ample space, good ventilation, altitude not exceeding 1000m and common plant dust.			
12	Special ambient conditions		For higher or lower temperature, dusty sites, chemical reaction (acids, alkaline, etc), or open field (sunlight, ice, rain, etc), please consult us!			

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**Example****1) Geared motor****Known Criteria:**

1. The power required by the driven machine  $P_2=2.2\text{kW}$ , speed  $n_2=51\text{r/min}$
2. Common motor: 4-pole, speed  $n_1=1450\text{r/min}$
3. Load characteristics: moderate, working 16 hours/d and starting 6 times/h
4. Mounting mode: flange-mounted, mounting position B52, A direction solid output shaft with parallel key, terminal box position 90

**Selection Steps:**

1. By referring to the table of Load Characteristic, we get the driven machine factor  $f_1=1.75$ .
2. Calculation of the Ratio:  
As  $i=n_1/n_2=1450/51=28.4$ , nominal ratio  $i_N=28.2$  is appropriate.
3. Calculation of the input power and determination of the motor power (transmission efficiency  $\eta=94\%$ ):  
 $P_1=P_2/\eta=2.2/0.94=2.3\text{kW}$ , so 3kW motor is selected.  
Refer to the directly-connected motor power table, it can be directly-connected.
4. Determination of the nominal power of the geared motor  $P_{1N}$ :  
 $P_{1N} \geq P_2 \cdot f_1/\eta=2.2 \times 1.75/0.94=4.1\text{kW}$
5. The type selected:  
**FF67A-28.2-Y-3-B52-90**

**2) Gear Unit****Known Criteria:**

1. The torque required by the driven machine  $T_2=1000\text{N} \cdot \text{m}$  and speed  $n_2=70\text{r/min}$
2. The motor supplied by the users: 4-pole, speed  $n_1=1450\text{r/min}$
3. Load characteristic: moderate, operating 8h/d continuously
4. Mounting mode: shaft input, foot-mounted, Hollow output shaft with parallel key mounting position B51.

**Selection steps:**

1. By referring to the table of Load Characteristic, we get the driven machine factor  $f_1=1.25$ .
2. Calculation of the ratio  $i_N$ :  
As  $i=n_1/n_2=1450/70=20.7$ , nominal ratio  $i_N=21.1$  is appropriate
3. Determination of the nominal torque  $T_{2N}$  and nominal power  $P_{1N}$  of the gear unit (transmission efficiency  $\eta=96\%$ ):  
 $T_{2N} \geq T_2 \cdot f_1=1000 \times 1.25=1250\text{N} \cdot \text{m}$ ;  
 $P_{1N} \geq P_1 \cdot f_1=T_2 \cdot f_1 \cdot n_1/(9550 \cdot i_N \cdot \eta)$   
 $=1000 \times 1.25 \times 1450/(9550 \times 21.1 \times 0.96)$   
 $=9.37\text{kW}$   
In the table of Transmission Capacity, F77 meets the requirements ( $T_{2N}=1500\text{N} \cdot \text{m}$ ,  $P_{1N}=10.6\text{kW}$ )
4. Determination of the input mode:  
As  $P_{1N} \geq P_1=T_2 \cdot n_1/(9550 \cdot i_N \cdot \eta)$   
 $=1000 \times 1450/(9550 \times 21.1 \times 0.96)=7.5\text{kW}$   
and power of the user-supplied motor is specified as 7.5kW, in the table of Dimensions of the AE Input Shaft, AE4 is selected.
5. The type selected:  
**FL77-21.1-AE4-B51**

**F**



5 Transmission Capacity:

F.. (n1=1450r/min)

		F..37				F..47			F..67			F..77			
n <sub>1</sub> (r/min)	n <sub>2N</sub> (r/min)	i <sub>N</sub>	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	
1450	337	4.3	110	4.28	3.902	173	4.34	6.05	305	4.38	10.6	470	4.18	17.1	
	280	5.2	120	5.09	3.58	191	5.21	5.57	330	5.22	9.6	555	5.17	16.3	
	252	5.8	125	5.58	3.401	191	5.92	4.9	355	5.93	9.09	605	5.76	15.9	
	219	6.6	140	6.45	3.296	200	6.57	4.62	385	6.58	8.88	670	6.65	15.3	
	195	7.4	145	7.5	2.935	225	7.36	4.22	410	7.37	8.45	720	7.4	14.8	
	174	8.3	170	8.34	3.095	230	8.25	3.88	440	8.3	8.05	765	8.28	14	
	160	9.1	175	8.89	2.989	250	9	5.34	450	9.04	7.56	765	8.84	13.1	
	134	10.8	185	10.58	2.655	380	10.8	5.62	800	10.8	9.42	1180	10.9	16.4	
	117	12.4	200	12.15	2.499	400	12.3	4.95	800	12.3	9.92	1280	12.2	16	
	105	13.8	200	13.39	2.268	400	13.6	4.46	820	13.6	8.91	1420	14.1	15.3	
	94	15.5	200	15.58	1.949	400	15.2	3.99	820	15.2	8.17	1500	15.6	14.6	
	83	17.4	200	17.33	1.752	400	17.1	3.55	820	17.1	7.27	1500	17.5	13	
	74	19.5	200	19.46	1.56	400	19.4	3.13	820	19.4	6.41	1500	19.7	11.5	
	69	21.1	200	20.64	1.471	400	21.3	2.86	820	21.3	5.85	1500	21.4	10.6	
57	25.3	-	-	-	300	25.3	1.8	620	25.3	3.72	1500	25.5	8.93		
1450	51	28.2	200	27.79	1.093	400	28.1	2.16	820	28.4	4.39	1500	28.5	7.99	
	43	34.0	200	34.25	0.887	400	33.5	1.81	820	33.9	3.68	1500	34	6.7	
	38	38.3	200	38.23	0.794	400	38.5	1.58	820	38.4	3.24	1500	38.6	5.9	
	33	43.6	200	42.87	0.708	400	42.4	1.43	820	42.8	2.91	1500	42.9	5.32	
	29.8	48.7	200	48.35	0.628	400	49.3	1.23	820	47.8	2.61	1500	48	4.75	
	26.6	54.5	200	54.93	0.553	400	54.9	1.11	820	53.7	2.32	1500	53.9	4.22	
	24.0	60.5	200	60.08	0.505	400	59.7	1.02	820	59.7	2.08	1500	60.4	3.77	
	21.4	67.8	200	67.05	0.453	400	68.6	0.89	820	67.8	1.84	1500	68.6	3.32	
	18.8	77.0	200	75.19	0.404	400	75.6	0.8	820	75.4	1.65	1500	76.2	2.99	
	16.8	86.1	200	84.81	0.358	400	88	0.69	820	84.2	1.48	1500	85.3	2.67	
	15.0	96.4	200	96.35	0.315	400	97.8	0.62	820	94.7	1.31	1500	96	2.37	
	13.6	107	200	103	0.295	400	110	0.55	820	107	1.16	1500	109	2.1	
	12.3	118	200	118.8	0.256	400	117	0.52	820	118	1.06	1500	119	1.91	
	10.3	141	200	138.7	0.219	400	141	0.43	820	140	0.89	1500	142	1.61	
	9.0	161				400	163	0.37	820	159	0.78	1500	165	1.38	
	8.4	173				400	176	0.35	820	170	0.73	1500	175	1.3	
7.3	198							820	197	0.63	1500	198	1.15		
6.4	227										1500	226	1.01		
6.0	241										1150	244	0.72		
5.3	273														

F



	F..87			F..97			F..107			F..127			F..157		
	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)
	1260	4.41	43.4	1690	4.2	61	2290	4.2	82.8	4150	4.29	147			
	1510	5.25	43.7	2150	5.2	62.8	2290	5.2	66.9	4900	5.17	144			
	1530	5.85	39.7	2250	5.79	59	2290	5.79	60.1	4900	5.76	129			
	1530	6.75	34.4	2360	6.68	53.6	2290	6.68	52.1	6030	6.65	138			
	1530	7.51	30.9	2360	7.43	48.2	2730	7.43	55.8	6000	7.4	123			
	1530	8.4	27.7	2360	8.32	43.1	3090	8.32	56.4	7000	8.28	128			
	2880	9.32	46.9	2360	8.9	40.3	3090	8.9	52.7	9040	9.13	150	15000	9.1	250.3
	3000	11	41.4	4100	11	56.5	4000	11	55.2	9040	11	125	16000	10.94	222.1
	3000	12.3	37.1	4300	12.3	53.2	4540	12.3	56.2	10000	12.3	124	16000	12.66	191.9
	3000	14.2	32.2	4300	14.2	46.1	5410	14.2	58.1	11000	14.2	118	17000	14.01	184.2
	3000	15.8	28.9	4300	15.8	41.5	6120	15.8	59	11000	15.8	106	18000	15.59	175.3
	3000	17.6	25.9	4300	17.6	37	6120	17.6	52.7	11000	17.6	94.7	18000	17.36	157.4
	3000	19.9	22.9	4300	19.9	32.9	7090	19.9	54.2	10800	19.9	82.6	17000	19.2	134.4
	3000	21.6	21.1	4300	21.6	30.3	7840	21.6	55.2	12000	21.6	84.5	18000	21.36	127.9
	3000	25.7	17.7	4300	25.7	25.4	7500	25.7	44.3	8500	25.7	50.3	15000	25.41	89.63
	3000	27.9	16.3	4300	28.8	22.7	7840	28.8	41.3	12000	28.9	63.1	18000	28.01	97.57
	3000	34.5	13.2	4300	34.4	19	7400	34.4	32.7	12000	34.4	52.9	18000	33.76	80.95
	3000	38.5	11.8	4300	38.4	17	7680	38.4	30.4	12000	38.9	46.8	18000	37.71	72.47
	3000	44.3	10.3	4300	44.3	14.8	7680	44.3	26.4	12000	44.8	40.6	18000	43.44	62.91
	3000	49.3	9.24	4300	49.2	13.3	7680	49.2	23.7	12000	49.7	36.7	18000	48.32	56.56
	3000	55.1	8.26	4300	55	11.9	7680	55	21.2	12000	55.3	33	18000	54.04	50.57
	3000	60.8	7.49	4300	60.8	10.7	7680	60.8	19.2	12000	60.3	30.2	18000	59.9	45.63
	3000	67.9	6.71	4300	67.9	9.61	7680	67.9	17.2	12000	68.2	26.7	18000	66.9	40.85
	3000	78.3	5.82	4300	78.3	8.34	7680	78.3	14.9	12000	78.5	23.2	18000	77.07	35.46
	3000	87	5.23	4300	87	7.5	7680	87	13.4	12000	86.9	21	18000	85.72	31.88
	3000	97.3	4.68	4300	97.3	6.71	7680	97.3	12	12000	96.8	18.8	18000	95.88	28.5
	3000	110	4.15	4300	110	5.96	7680	110	10.6	12000	108	16.8	18000	108	25.31
	3000	119	3.82	4300	119	5.47	7680	119	9.77	12000	119	15.3	18000	117.5	23.26
	3000	142	3.21	4300	142	4.6	7680	142	8.22	12000	141	12.9	18000	139.8	19.55
	3000	160	2.85	4300	160	4.08	7680	160	7.29	12000	159	11.4	18000	157.6	17.34
	3000	175	2.6	4300	175	3.72	7680	175	6.65	12000	175	10.4	18000	172.7	15.83
	3000	193	2.36	4300	204	3.21	7680	204	5.73	12000	203	8.99	18000	190.4	14.35
	2800	227	1.87	4300	227	2.88	7680	227	5.14	12000	226	8.06			
	1900	241	1.19	4300	241	2.71	7680	241	4.85	12000	240	7.61			
	1900	273	1.06				7680	275	4.25	12000	271	6.71			

F



F.. (n1=1740r/min)

n <sub>1</sub> (r/min)	n <sub>2N</sub> (r/min)	i <sub>N</sub>	F..37			F..47			F..67			F..77		
			T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)
1740	405	4.3	110	4.28	4.68	173	4.34	7.26	305	4.38	12.72	470	4.18	20.52
	335	5.2	120	5.09	4.30	191	5.21	6.68	330	5.22	11.52	555	5.17	19.56
	300	5.8	125	5.58	4.08	191	5.92	5.88	355	5.93	10.91	605	5.76	19.08
	264	6.6	140	6.45	3.96	200	6.57	5.54	385	6.58	10.66	670	6.65	18.36
	235	7.4	145	7.5	3.52	225	7.36	5.06	410	7.37	10.14	720	7.4	17.76
	210	8.3	170	8.34	3.71	230	8.25	4.66	440	8.3	9.66	765	8.28	16.80
	191	9.1	175	8.89	3.59	250	9	6.41	450	9.04	9.07	765	8.84	15.72
	161	10.8	185	10.58	3.19	380	10.8	6.74	800	10.8	11.30	1180	10.9	19.68
	140	12.4	200	12.15	3.00	400	12.3	5.94	800	12.3	11.90	1280	12.2	19.20
	126	13.8	200	13.39	2.72	400	13.6	5.35	820	13.6	10.69	1420	14.1	18.36
	112	15.5	200	15.58	2.34	400	15.2	4.79	820	15.2	9.80	1500	15.6	17.52
	100	17.4	200	17.33	2.10	400	17.1	4.26	820	17.1	8.72	1500	17.5	15.60
	89.2	19.5	200	19.46	1.87	400	19.4	3.76	820	19.4	7.69	1500	19.7	13.80
	82.5	21.1	200	20.64	1.77	400	21.3	3.43	820	21.3	7.02	1500	21.4	12.72
68.8	25.3	-	-	-	300	25.3	2.16	620	25.3	4.46	1500	25.5	10.72	
1740	61.7	28.2	200	27.79	1.31	400	28.1	2.59	820	28.4	5.27	1500	28.5	9.59
	51.2	34.0	200	34.25	1.06	400	33.5	2.17	820	33.9	4.42	1500	34	8.04
	45.4	38.3	200	38.23	0.95	400	38.5	1.90	820	38.4	3.89	1500	38.6	7.08
	39.9	43.6	200	42.87	0.85	400	42.4	1.72	820	42.8	3.49	1500	42.9	6.38
	35.7	48.7	200	48.35	0.75	400	49.3	1.48	820	47.8	3.13	1500	48	5.70
	31.9	54.5	200	54.93	0.66	400	54.9	1.33	820	53.7	2.78	1500	53.9	5.06
	28.8	60.5	200	60.08	0.61	400	59.7	1.22	820	59.7	2.50	1500	60.4	4.52
	25.7	67.8	200	67.05	0.54	400	68.6	1.07	820	67.8	2.21	1500	68.6	3.98
	22.6	77.0	200	75.19	0.48	400	75.6	0.96	820	75.4	1.98	1500	76.2	3.59
	20.2	86.1	200	84.81	0.43	400	88	0.83	820	84.2	1.78	1500	85.3	3.20
	18.0	96.4	200	96.35	0.38	400	97.8	0.74	820	94.7	1.57	1500	96	2.84
	16.3	107	200	103	0.35	400	110	0.66	820	107	1.39	1500	109	2.52
	14.7	118	200	118.8	0.31	400	117	0.62	820	118	1.27	1500	119	2.29
	12.3	141	200	138.7	0.26	400	141	0.52	820	140	1.07	1500	142	1.93
	10.8	161				400	163	0.44	820	159	0.94	1500	165	1.66
	10.1	173				400	176	0.42	820	170	0.88	1500	175	1.56
8.8	198							820	197	0.76	1500	198	1.38	
7.7	227										1500	226	1.21	
7.2	241										1150	244	0.86	
6.4	273													

F





	F..87			F..97			F..107			F..127			F..157		
	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)
	1260	4.41	52.08	1690	4.2	73.2	2290	4.2	99.4	4150	4.29	176.4			
	1510	5.25	52.44	2150	5.2	75.4	2290	5.2	80.3	4900	5.17	172.8			
	1530	5.85	47.64	2250	5.79	70.8	2290	5.79	72.1	4900	5.76	154.8			
	1530	6.75	41.28	2360	6.68	64.3	2290	6.68	62.5	6030	6.65	165.6			
	1530	7.51	37.08	2360	7.43	57.8	2730	7.43	67.0	6000	7.4	147.6			
	1530	8.4	33.24	2360	8.32	51.7	3090	8.32	67.7	7000	8.28	153.6			
	2880	9.32	56.28	2360	8.9	48.4	3090	8.9	63.2	9040	9.13	180.0	15000	9.1	300.4
	3000	11	49.68	4100	11	67.8	4000	11	66.2	9040	11	150.0	16000	10.94	266.5
	3000	12.3	44.52	4300	12.3	63.8	4540	12.3	67.4	10000	12.3	148.8	16000	12.66	230.3
	3000	14.2	38.64	4300	14.2	55.3	5410	14.2	69.7	11000	14.2	141.6	17000	14.01	221.0
	3000	15.8	34.68	4300	15.8	49.8	6120	15.8	70.8	11000	15.8	127.2	18000	15.59	210.4
	3000	17.6	31.08	4300	17.6	44.4	6120	17.6	63.2	11000	17.6	113.6	18000	17.36	188.9
	3000	19.9	27.48	4300	19.9	39.5	7090	19.9	65.0	10800	19.9	99.1	17000	19.2	161.3
	3000	21.6	25.32	4300	21.6	36.4	7840	21.6	66.2	12000	21.6	101.4	18000	21.36	153.5
	3000	25.7	21.24	4300	25.7	30.5	7500	25.7	53.2	8500	25.7	60.4	15000	25.41	107.6
	3000	27.9	19.56	4300	28.8	27.2	7840	28.8	49.6	12000	28.9	75.7	18000	28.01	117.1
	3000	34.5	15.84	4300	34.4	22.8	7400	34.4	39.2	12000	34.4	63.5	18000	33.76	97.1
	3000	38.5	14.16	4300	38.4	20.4	7680	38.4	36.5	12000	38.9	56.2	18000	37.71	87.0
	3000	44.3	12.36	4300	44.3	17.8	7680	44.3	31.7	12000	44.8	48.7	18000	43.44	75.5
	3000	49.3	11.09	4300	49.2	16.0	7680	49.2	28.4	12000	49.7	44.0	18000	48.32	67.9
	3000	55.1	9.91	4300	55	14.3	7680	55	25.4	12000	55.3	39.6	18000	54.04	60.7
	3000	60.8	8.99	4300	60.8	12.8	7680	60.8	23.0	12000	60.3	36.2	18000	59.9	54.8
	3000	67.9	8.05	4300	67.9	11.5	7680	67.9	20.6	12000	68.2	32.0	18000	66.9	49.0
	3000	78.3	6.98	4300	78.3	10.0	7680	78.3	17.9	12000	78.5	27.8	18000	77.07	42.6
	3000	87	6.28	4300	87	9.0	7680	87	16.1	12000	86.9	25.2	18000	85.72	38.3
	3000	97.3	5.62	4300	97.3	8.1	7680	97.3	14.4	12000	96.8	22.6	18000	95.88	34.2
	3000	110	4.98	4300	110	7.2	7680	110	12.7	12000	108	20.2	18000	108	30.4
	3000	119	4.58	4300	119	6.6	7680	119	11.7	12000	119	18.4	18000	117.5	27.9
	3000	142	3.85	4300	142	5.5	7680	142	9.9	12000	141	15.5	18000	139.8	23.5
	3000	160	3.42	4300	160	4.9	7680	160	8.7	12000	159	13.7	18000	157.6	20.8
	3000	175	3.12	4300	175	4.5	7680	175	8.0	12000	175	12.5	18000	172.7	19.0
	3000	193	2.83	4300	204	3.9	7680	204	6.9	12000	203	10.8	18000	190.4	17.2
	2800	227	2.24	4300	227	3.5	7680	227	6.2	12000	226	9.7			
	1900	241	1.43	4300	241	3.3	7680	241	5.8	12000	240	9.1			
	1900	273	1.27				7680	275	5.1	12000	271	8.1			

F



F../CRL..(n1=1450r/min)

			F..37/CRL37			F..47/CRL37			F..67/CRL37			F..77/CRL37				
n <sub>1</sub> (r/min)	n <sub>2N</sub> (r/min)	i <sub>N</sub>	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)		
1450	8.58	169	200	164.3	0.20	400	165.8	0.40	820	165.6	0.82	1500	164.7	1.5		
	7.75	187	200	185.3	0.18	400	187	0.35	820	186.8	0.72	1500	155.7	1.59		
	6.87	211	200	210.6	0.16	400	212.5	0.31	820	212.3	0.64	1500	211	1.17		
	6.20	234	200	235.5	0.14	400	237	0.28	820	236.7	0.57	1500	237.8	1.04		
	5.58	260	200	263	0.13	400	264.7	0.25	820	264.4	0.51	1500	265.6	0.93		
	4.92	295	200	294.8		400	296.7	0.22	820	296.3	0.46	1500	297.6	0.83		
	4.35	333	200	335.3		400	337.5	0.20	820	337	0.4	1500	338.5	0.73		
	3.54	410	200	412.9		400	415.6	0.16	820	415	0.33	1500	416.9	0.59		
	3.13	463	200	461.1		400	464.1	0.14	820	463.5	0.29	1500	465.5	0.53		
	2.78	521	200	516.9		400	520.2	0.13	820	519.6	0.26	1500	521.9	0.47		
	2.51	578	200	583		400	586.8		820	586.1	0.23	1500	588.7	0.42		
	2.23	651	200	662.5		400	666.9		820	666	0.2	1500	668.9	0.37		
	2.00	724	200	708.4		400	713		820	712.1	0.19	1500	715.3	0.35		
	1.82	797	200	816.2		400	821.5		820	820.5	0.16	1500	824.1	0.3		
	1.53	950	200	953.1		400	959.3		820	958.1	0.14	1500	962.3	0.26		
	1.39	1042	200	1039		400	1046		820	1044	0.13	1500	1049	0.24		
	1.14	1268	200	1280		400	1289		820	1287		1500	1293	0.19		
	1.02	1425	200	1429		400	1438		820	1437		1500	1443	0.17		
	0.90	1616	200	1602		400	1613		820	1611		1500	1618	0.15		
	0.80	1823	200	1822		400	1832		820	1832		1500	1840	0.13		
	0.63	2287	200	2246		400	2257		820	2257		1500	2267			
	0.57	2551	200	2506		400	2519		820	2519		1500	2531			
	0.51	2861	200	2810		400	2840		820	2840		1500	2876			
	0.45	3227	200	3196		400	3229		820	3229		1500	3271			
	0.36	4048	200	3939		400	3980		820	3980		1500	4031			
	0.32	4515	200	4396		400	4442		820	4442		1500	4499			
	0.29	5065	200	4930		400	4982		820	4982		1500	5046			
0.25	5729	200	5560		400	5619		820	5619		1500	5691				
0.23	6400	200	6316		400	6383		820	6383		1500	6465				
0.21	7051	200	6755		400	6826		820	6826		1500	6914				
0.18	8146	200	7989		400	7854		820	7854		1500	7962				
0.16	9100	200	9076		400	8923		820	8923		1500	9045				
0.14	10026	200	9706		400	9542		820	9542		1500	9673				
0.13	11086	200	11187		400	10998		820	10998		1500	11149				
0.11	13207	200	13065		400	12844		820	12844		1500	13020				
0.10	15135															
0.09	16388															
0.08	18509															

F



	F..87/CRL47			F..97/CRL67			F..107/CRL77			F..127/CRL87			F..157/CRL97		
	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)
	3000	162	3.05	4300	162.6	4.36	7680	164.8	7.68	12000	167.4	11.8	18000	173.7	17.1
	3000	188.5	2.62	4300	181.7	3.9	7680	184.6	6.85	12000	186.3	10.6	18000	193.3	15.3
	3000	209.9	2.35	4300	204.3	3.47	7680	207.7	6.09	12000	208.6	9.48	18000	216.5	13.7
										F..127/CRL77					
	3000	230.1	2.15	4300	234.2	3.02	7680	225.8	5.6	12000	231.9	8.53	18000	228.5	13
	3000	264.3	1.87	4300	265.7	2.67	7680	256.5	4.93	12000	263.4	7.51	18000	255.3	11.6
	3000	290.8	1.7	4300	295.3	2.4	7680	284.9	4.44	12000	292.6	6.76	18000	294.1	10.1
	3000	336.6	1.47	4300	337.5	2.1	7680	318.7	3.97	12000	327.2	6.04	18000	326.9	9.07
	3000	401.2	1.23	4300	403.2	1.76	7680	400.1	3.16	12000	410.9	4.81	18000	402.7	7.36
	3000	460.5	1.07	4300	457.3	1.55	7680	454.3	2.79	12000	466.5	4.24	18000	448.7	6.61
	3000	507	0.97	4300	508.8	1.39	7680	504.3	2.51	12000	517.9	3.82	18000	517.4	5.73
	3000	590.1	0.84	4300	568.7	1.25	7680	564.9	2.24	12000	580.1	3.41	18000	575.8	5.15
	3000	657.1	0.75	4300	639.4	1.11	7680	635.8	1.99	12000	652.9	3.03	18000	644.8	4.6
	3000	735.9	0.67	4300	724.2	0.98	7680	719.2	1.76	12000	738.5	2.68	18000	726.3	4.08
	3000	781.3	0.63	4300	794.1	0.89	7680	787.7	1.61	12000	808.9	2.44	18000	788.9	3.76
	3000	947.1	0.52	4300	944.6	0.75	7680	937.8	1.35	12000	963	2.05	18000	939	3.16
	3000	1065	0.46	4300	1049	0.68	7680	1046	1.21	12000	1074	1.84	18000	1019	2.91
	3000	1270	0.39	4300	1251	0.57	7680	1255	1.01	12000	1289	1.53	18000	1261	2.35
	3000	1458	0.34	4300	1437	0.49	7680	1425	0.89	12000	1463	1.35	18000	1404	2.11
	3000	1605	0.31	4300	1582	0.45	7680	1582	0.8	12000	1624	1.22	18000	1620	1.83
	3000	1868	0.26	4300	1841	0.38	7680	1771	0.71	12000	1819	1.09	18000	1803	1.64
	3000	2334	0.21	4300	2296	0.31	7680	2255	0.56	12000	2316	0.85	18000	2273	1.3
	3000	2601	0.19	4300	2562	0.28	7680	2512	0.5	12000	2580	0.77	18000	2479	1.2
	3000	2834	0.17	4300	2798	0.25	7680	2854	0.44	12000	2848	0.69	18000	2874	1.03
	3000	3299	0.15	4300	3256	0.22	7680	3196	0.4	12000	3189	0.62	18000	3198	0.93
	3000	4121	0.12	4300	4062	0.17	7680	4068	0.31	12000	4060	0.49	18000	4033	0.74
	3000	4591		4300	4532	0.16	7680	4532	0.28	12000	4523	0.44	18000	4398	0.67
	3000	5055		4300	4989	0.14	7680	5031	0.25	12000	5021	0.39	18000	5074	0.58
	3000	5883		4300	5806	0.12	7680	5634	0.22	12000	5623	0.35	18000	5646	0.53
	3000	6550		4300	6465		7680	6320	0.2	12000	6307	0.31	18000	6321	0.47
	3000	7335		4300	7240		7680	7171	0.18	12000	7156	0.28	18000	7118	0.42
	3000	8431		4300	8322		7680	8076	0.16	12000	7975	0.25	18000	8092	0.37
	3000	9386		4300	9265		7680	9058	0.14	12000	8945	0.22	18000	9060	0.33
	3000	10513		4300	10376		7680	10278	0.12	12000	10150	0.19	18000	10202	0.29
	3000	11165		4300	11018		7680	11268		12000	11127	0.18	18000	11084	0.27
	3000	13530		4300	13355		7680	13413		12000	13246	0.15	18000	13193	0.22
	3000	15604		4300	15389		7680	15226		12000	15037	0.13	18000	14861	0.2
	3000	16850		4300	16626		7680	16304		12000	16101	0.12	18000	16300	0.18
							7680	18861		12000	18626		18000	17978	0.16

F



F../CRL..(n1=1740r/min)

			F..37/CRL37			F..47/CRL37			F..67/CRL37			F..77/CRL37				
n <sub>1</sub> (r/min)	n <sub>2N</sub> (r/min)	i <sub>N</sub>	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)		
1740	10.30	169	200	164.3	0.24	400	165.8	0.48	820	165.6	0.98	1500	164.7	1.80		
	9.30	187	200	185.3	0.22	400	187	0.42	820	186.8	0.86	1500	155.7	1.91		
	8.24	211	200	210.6	0.19	400	212.5	0.37	820	212.3	0.77	1500	211	1.40		
	7.44	234	200	235.5	0.17	400	237	0.34	820	236.7	0.68	1500	237.8	1.25		
	6.70	260	200	263	0.16	400	264.7	0.30	820	264.4	0.61	1500	265.6	1.12		
	5.90	295	200	294.8	0.13	400	296.7	0.26	820	296.3	0.55	1500	297.6	1.00		
	5.22	333	200	335.3		400	337.5	0.24	820	337	0.48	1500	338.5	0.88		
	4.25	410	200	412.9		400	415.6	0.19	820	415	0.40	1500	416.9	0.71		
	3.76	463	200	461.1		400	464.1	0.17	820	463.5	0.35	1500	465.5	0.64		
	3.34	521	200	516.9		400	520.2	0.16	820	519.6	0.31	1500	521.9	0.56		
	3.01	578	200	583		400	586.8	0.13	820	586.1	0.28	1500	588.7	0.50		
	2.68	651	200	662.5		400	666.9		820	666	0.24	1500	668.9	0.44		
	2.40	724	200	708.4		400	713		820	712.1	0.23	1500	715.3	0.42		
	2.18	797	200	816.2		400	821.5		820	820.5	0.19	1500	824.1	0.36		
	1.84	950	200	953.1		400	959.3		820	958.1	0.17	1500	962.3	0.31		
	1.67	1042	200	1039		400	1046		820	1044	0.16	1500	1049	0.29		
	1.37	1268	200	1280		400	1289		820	1287	0.12	1500	1293	0.23		
	1.22	1425	200	1429		400	1438		820	1437		1500	1443	0.20		
	1.08	1616	200	1602		400	1613		820	1611		1500	1618	0.18		
	0.96	1823	200	1822		400	1832		820	1832		1500	1840	0.16		
	0.76	2287	200	2246		400	2257		820	2257		1500	2267	0.13		
	0.68	2551	200	2506		400	2519		820	2519		1500	2531			
	0.61	2861	200	2810		400	2840		820	2840		1500	2876			
	0.54	3227	200	3196		400	3229		820	3229		1500	3271			
	0.43	4048	200	3939		400	3980		820	3980		1500	4031			
	0.38	4515	200	4396		400	4442		820	4442		1500	4499			
	0.35	5065	200	4930		400	4982		820	4982		1500	5046			
	0.30	5729	200	5560		400	5619		820	5619		1500	5691			
	0.28	6400	200	6316		400	6383		820	6383		1500	6465			
0.25	7051	200	6755		400	6826		820	6826		1500	6914				
0.22	8146	200	7989		400	7854		820	7854		1500	7962				
0.19	9100	200	9076		400	8923		820	8923		1500	9045				
0.17	10026	200	9706		400	9542		820	9542		1500	9673				
0.16	11086	200	11187		400	10998		820	10998		1500	11149				
0.13	13207	200	13065		400	12844		820	12844		1500	13020				
0.12	15135															
0.11	16388															
0.10	18509															

F



	F..87/CRL47			F..97/CRL67			F..107/CRL77			F..127/CRL87			F..157/CRL97		
	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)	T <sub>2N</sub> (N·m)	i <sub>ex</sub>	P <sub>1N</sub> (kW)
	3000	162	3.66	4300	162.6	5.23	7680	164.8	9.22	12000	167.4	14.2	18000	173.7	20.5
	3000	188.5	3.14	4300	181.7	4.68	7680	184.6	8.22	12000	186.3	12.7	18000	193.3	18.4
	3000	209.9	2.82	4300	204.3	4.16	7680	207.7	7.31	12000	208.6	11.4	18000	216.5	16.4
										F..127/CRL77					
	3000	230.1	2.58	4300	234.2	3.62	7680	225.8	6.72	12000	231.9	10.2	18000	228.5	15.6
	3000	264.3	2.24	4300	265.7	3.20	7680	256.5	5.92	12000	263.4	9.01	18000	255.3	13.9
	3000	290.8	2.04	4300	295.3	2.88	7680	284.9	5.33	12000	292.6	8.11	18000	294.1	12.1
	3000	336.6	1.76	4300	337.5	2.52	7680	318.7	4.76	12000	327.2	7.25	18000	326.9	10.9
	3000	401.2	1.48	4300	403.2	2.11	7680	400.1	3.79	12000	410.9	5.77	18000	402.7	8.83
	3000	460.5	1.28	4300	457.3	1.86	7680	454.3	3.35	12000	466.5	5.09	18000	448.7	7.93
	3000	507	1.16	4300	508.8	1.67	7680	504.3	3.01	12000	517.9	4.58	18000	517.4	6.88
	3000	590.1	1.01	4300	568.7	1.50	7680	564.9	2.69	12000	580.1	4.09	18000	575.8	6.18
	3000	657.1	0.90	4300	639.4	1.33	7680	635.8	2.39	12000	652.9	3.64	18000	644.8	5.52
	3000	735.9	0.80	4300	724.2	1.18	7680	719.2	2.11	12000	738.5	3.22	18000	726.3	4.90
	3000	781.3	0.76	4300	794.1	1.07	7680	787.7	1.93	12000	808.9	2.93	18000	788.9	4.51
	3000	947.1	0.62	4300	944.6	0.90	7680	937.8	1.62	12000	963	2.46	18000	939	3.79
	3000	1065	0.55	4300	1049	0.82	7680	1046	1.45	12000	1074	2.21	18000	1019	3.49
	3000	1270	0.47	4300	1251	0.68	7680	1255	1.21	12000	1289	1.84	18000	1261	2.82
	3000	1458	0.41	4300	1437	0.59	7680	1425	1.07	12000	1463	1.62	18000	1404	2.53
	3000	1605	0.37	4300	1582	0.54	7680	1582	0.96	12000	1624	1.46	18000	1620	2.20
	3000	1868	0.31	4300	1841	0.46	7680	1771	0.85	12000	1819	1.31	18000	1803	1.97
	3000	2334	0.25	4300	2296	0.37	7680	2255	0.67	12000	2316	1.02	18000	2273	1.56
	3000	2601	0.23	4300	2562	0.34	7680	2512	0.60	12000	2580	0.92	18000	2479	1.44
	3000	2834	0.20	4300	2798	0.30	7680	2854	0.53	12000	2848	0.83	18000	2874	1.24
	3000	3299	0.18	4300	3256	0.26	7680	3196	0.48	12000	3189	0.74	18000	3198	1.12
	3000	4121	0.14	4300	4062	0.20	7680	4068	0.37	12000	4060	0.59	18000	4033	0.89
	3000	4591	0.13	4300	4532	0.19	7680	4532	0.34	12000	4523	0.53	18000	4398	0.80
	3000	5055		4300	4989	0.17	7680	5031	0.30	12000	5021	0.47	18000	5074	0.70
	3000	5883		4300	5806	0.14	7680	5634	0.26	12000	5623	0.42	18000	5646	0.64
	3000	6550		4300	6465	0.13	7680	6320	0.24	12000	6307	0.37	18000	6321	0.56
	3000	7335		4300	7240		7680	7171	0.22	12000	7156	0.34	18000	7118	0.50
	3000	8431		4300	8322		7680	8076	0.19	12000	7975	0.30	18000	8092	0.44
	3000	9386		4300	9265		7680	9058	0.17	12000	8945	0.26	18000	9060	0.40
	3000	10513		4300	10376		7680	10278	0.14	12000	10150	0.23	18000	10202	0.35
	3000	11165		4300	11018		7680	11268	0.13	12000	11127	0.22	18000	11084	0.32
	3000	13530		4300	13355		7680	13413		12000	13246	0.18	18000	13193	0.26
	3000	15604		4300	15389		7680	15226		12000	15037	0.16	18000	14861	0.24
	3000	16850		4300	16626		7680	16304		12000	16101	0.14	18000	16300	0.22
							7680	18861		12000	18626	0.12	18000	17978	0.19

F



6 Directly connected motor power table:

iN	P <sub>m</sub> (kW)	F37										F47									
		0.12	0.18	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3	0.12	0.18	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3
4.3																					
5.2																					
5.8																					
6.6																					
7.4																					
8.3																					
9.1																					
10.8																					
12.4																					
13.8																					
15.5																					
17.4																					
19.5																					
21.1																					
25.3																					
28.2																					
34																					
38.3																					
43.6																					
48.7																					
54.5																					
60.5																					
67.8																					
77																					
86.1																					
96.4																					
107																					
118																					
141																					
161																					
173																					
198																					
227																					
241																					
273																					

F

iN	P <sub>m</sub> (kW)	F67												F77													
		0.12	0.18	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3	4	5.5	0.12	0.18	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3	4	5.5	7.5	11
4.3																											
5.2																											
5.8																											
6.6																											
7.4																											
8.3																											
9.1																											
10.8																											
12.4																											
13.8																											
15.5																											
17.4																											
19.5																											
21.1																											
25.3																											
28.2																											
34																											
38.3																											
43.6																											
48.7																											
54.5																											
60.5																											
67.8																											
77																											
86.1																											
96.4																											
107																											
118																											
141																											
161																											
173																											
198																											
227																											
241																											
273																											

- Note: 1.  Means permissible directly-connected motor.  
 2.  Means permissible directly-connected motor(The motor's power is more than nominal input power of gear unit, P<sub>1</sub> > P<sub>IN</sub>).  
 3.  Means unallowed directly-connected motor.  
 4. The selection of motor shall be suitable for driver machine factor and regulations of type selection.  
 5. The motor is 4-pole motor.



iN	P <sub>m</sub> (kW)	F87											F97														
		0.55	0.75	1.1	1.5	2.2	3	4	5.5	7.5	11	15	18.5	22	0.75	1.1	1.5	2.2	3	4	5.5	7.5	11	15	18.5	22	30
4.3																											
5.2																											
5.8																											
6.6																											
7.4																											
8.3																											
9.1																											
10.8																											
12.4																											
13.8																											
15.5																											
17.4																											
19.5																											
21.1																											
25.3																											
28.2																											
34																											
38.3																											
43.6																											
48.7																											
54.5																											
60.5																											
67.8																											
77																											
86.1																											
96.4																											
107																											
118																											
141																											
161																											
173																											
198																											
227																											
241																											
273																											

iN	P <sub>m</sub> (kW)	F107													F127													
		1.5	2.2	3	4	5.5	7.5	11	15	18.5	22	30	37	45	2.2	3	4	5.5	7.5	11	15	18.5	22	30	37	45	55	75
4.3																												
5.2																												
5.8																												
6.6																												
7.4																												
8.3																												
9.1																												
10.8																												
12.4																												
13.8																												
15.5																												
17.4																												
19.5																												
21.1																												
25.3																												
28.2																												
34																												
38.3																												
43.6																												
48.7																												
54.5																												
60.5																												
67.8																												
77																												
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96.4																												
107																												
118																												
141																												
161																												
173																												
198																												
227																												
241																												
273																												

Note: 1.  Means permissible directly-connected motor.  
 2.  Means permissible directly-connected motor(The motor's power is more than nominal input power of gear unit, P1 > P1N).  
 3.  Means unallowed directly-connected motor.  
 4. The selection of motor shall be suitable for driver machine factor and regulations of type selection.  
 5. The motor is 4-pole motor.



F

$i_N$ \ $P_m$ (kW)	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160
9.1														
10.8														
12.4														
13.8														
15.5														
17.4														
19.5														
21.1														
25.3														
28.2														
34														
38.3														
43.6														
48.7														
54.5														
60.5														
67.8														
77														
86.1														
96.4														
107														
118														
141														
161														
173														
198														

F157

- Note: 1.  Means permissible directly-connected motor.  
 2.  Means permissible directly-connected motor(The motor's power is more than nominal input power of gear unit,  $P1 > P1N$ ).  
 3.  Means unallowed directly-connected motor.  
 4. The selection of motor shall be suitable for driver machine factor and regulations of type selection.  
 5. The motor is 4-pole motor.





7 Permissible Radial Force and Axial Force on Shaft:

7.1 Radial Force on Input Shaft (Fr1)(N):

	Fr1(N)								
	F..37	F..47	F..67	F..77	F..87	F..97	F..107	F..127	F..157
AE2	803	803	803	803	803	/	/	/	/
AE3	/	/	1504	1504	1504	1504	1504	/	/
AE4	/	/	/	2188	2188	2188	2188	2188	/
AE5	/	/	/	/	4207	4207	4207	4207	4207
AE6	/	/	/	/	/	5664	5664	5664	5664
AE7	/	/	/	/	/	/	/	9957	9957
AE8	/	/	/	/	/	/	/	12546	12546

F

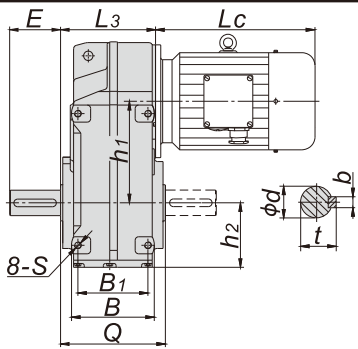
7.2 Radial Force on Output Shaft (Fr2)(N):

n <sub>2N</sub> (r/min)	Fr2(N)								
	F..37	F..47	F..67	F..77	F..87	F..97	F..107	F..127	F..157
315 ~ 425	1827	2079	7641	9180	5382	9090	11000	26550	\
280 ~ 315	1908	2115	7965	9630	5787	9540	14000	28530	\
224 ~ 280	1971	2151	8280	10170	6318	10080	15300	28800	\
200 ~ 224	2043	2223	8694	10800	7011	10080	18990	28980	\
180 ~ 200	2115	2277	9090	11250	7452	10530	20880	33300	\
160 ~ 180	2115	2646	9810	11790	8001	11520	21600	32760	\
140 ~ 160	2214	2925	10260	12420	4545	12240	22500	31500	31450
125 ~ 140	2322	3096	9270	12780	4770	12240	20610	30600	33150
112 ~ 125	2475	3366	9270	13410	5310	9450	21870	32760	37350
100 ~ 112	2547	3555	9270	14130	5733	9900	22050	32760	38250
90 ~ 100	2763	3888	9270	14130	6651	10710	22700	33840	40410
80 ~ 90	2862	4005	9270	14130	7236	11880	24300	36000	42300
71 ~ 80	3051	4293	9270	14130	7956	13140	25290	37800	45810
63 ~ 71	3150	4527	9270	14130	8577	13500	27000	37800	45900
56 ~ 63	3519	4923	9270	14130	9990	15120	28980	48600	55350
45 ~ 56	3654	5247	9270	14130	12510	16110	30330	42750	54720
40 ~ 45	3861	5328	9270	14130	13140	18270	34470	47340	71370
35.5 ~ 40	3861	5328	9270	14130	13860	23400	35550	49320	74070
31.5 ~ 35.5	3861	5328	9270	14130	14220	21240	37800	52110	79020
28 ~ 31.5	3861	5328	9270	14130	14850	23220	39150	55620	83520
25 ~ 28	3861	5328	9270	14130	15930	23220	41850	58770	88470
22.4 ~ 25	3861	5328	9270	14130	15120	26100	43020	60660	74250
≤22.4	3861	5328	9270	14130	17640	26910	44820	63450	78300

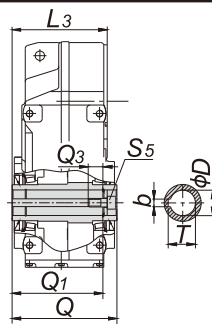
Note: For lower output speed, apply the largest Fr2 value in each type.



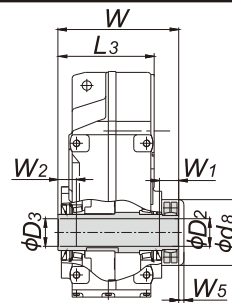
8 Mounting and Output Modes and Dimensions:



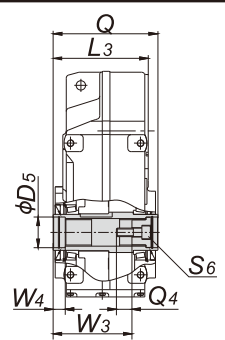
Solid shaft with parallel key  
**F37~F157**



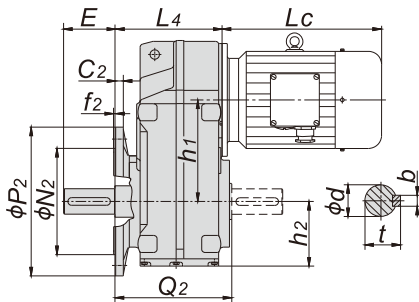
Hollow shaft with parallel key  
**FW37~FW157**



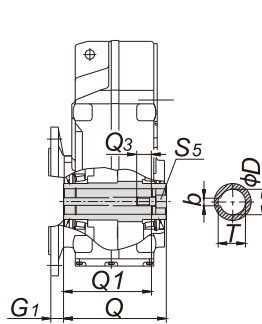
Hollow shaft with shrink disk  
**FH37~FH157**



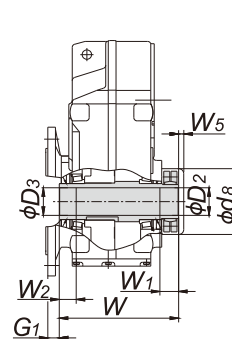
Hollow shaft with involute spline  
**FN37~FN107**



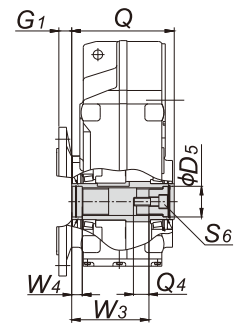
Solid shaft with parallel key  
**FF37~FF157**



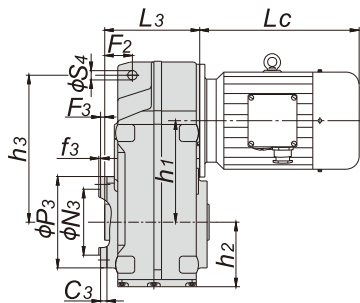
Hollow shaft with parallel key  
**FL37~FL157**



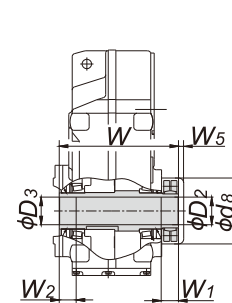
Hollow shaft with shrink disk  
**FHL37~FHL157**



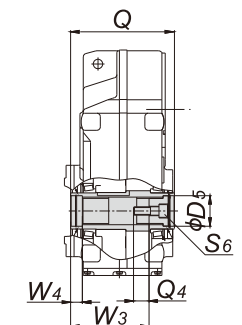
Hollow shaft with involute spline  
**FNF37~FNF107**



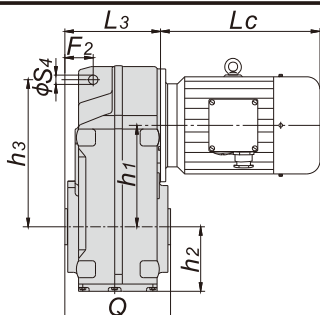
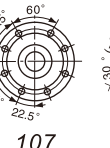
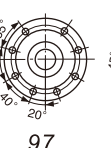
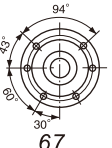
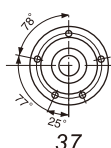
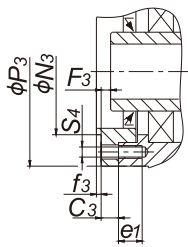
Hollow shaft with parallel key  
**FZ37~FZ157**



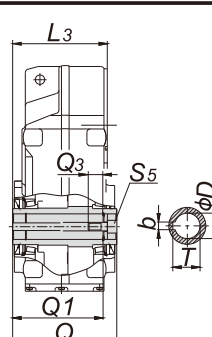
Hollow shaft with shrink disk  
**FHZ37~FHZ157**



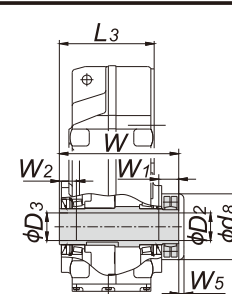
Hollow shaft with involute spline  
**FNZ37~FNZ107**



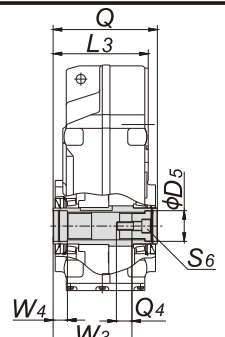
Hollow shaft with parallel key  
**FA37~FA157**



Hollow shaft with shrink disk  
**FHA37~FHA157**



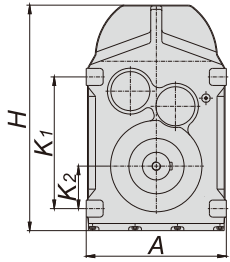
Hollow shaft with involute spline  
**FNA37~FNA107**



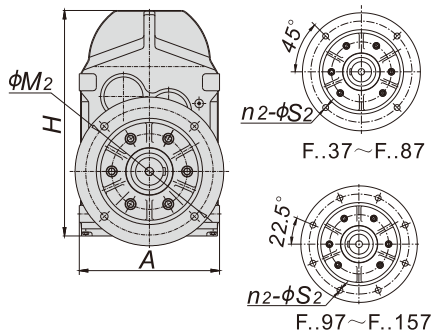
\* For FHL, FHZ, shrink disk should be installed on the opposite side of flange.



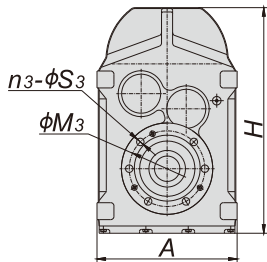
F



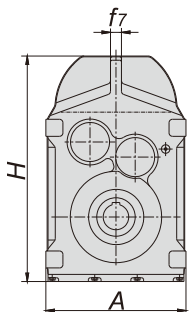
Foot-mounted



Flange-mounted



Short-flange mounted



Shaft-mounted (Applicable for torque arm mounted)

Outline Dimensions

Dimensions of output shaft

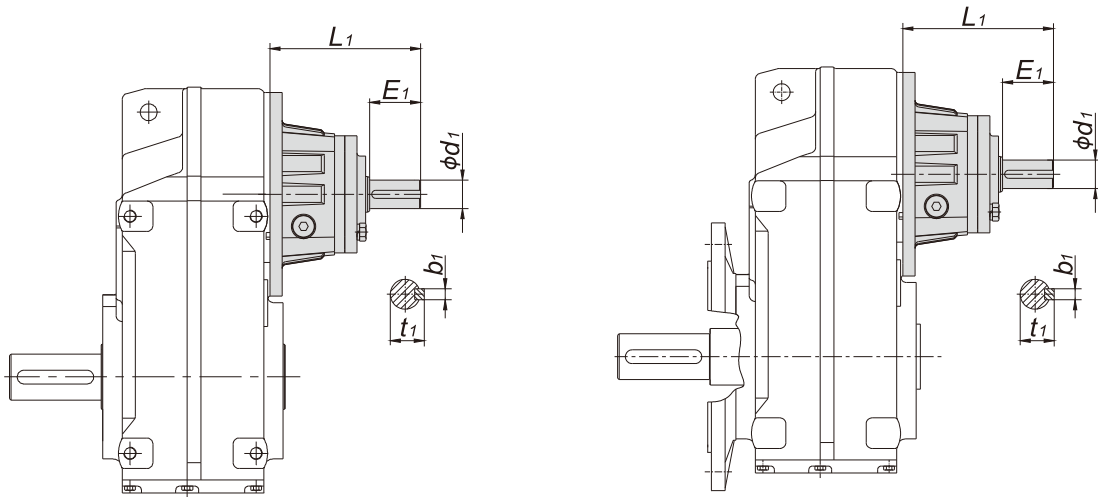
Size	37	47	67	77	87	97	107	127	157
A	165	180	212	270	330	400	450	530	660
B	95	109	135	169	195	240	260	320	364
B1	77	93	112	140	165	205	220	270	310
C2	10	12	15	16	18	22	22	25	28
C3	11	11	12	14	15	18	22	28	58
f2	3.5	3.5	4	4	5	5	5	5	6
f3	3	3	3.5	3.5	4	4	4	5	5
f7	12	14	16	20	26	30	36	40	45
F2	31.5	32	41	50	62	70	88	112.5	150
F3	9.5	9.5	10	12	13	16	19.5	25.5	25
h1	112	128.1	159.5	200	246.7	285	332.4	382.6	447
h2	68	77	97	116	152	178	193	235	286
h3	158	170	218	278	346	395	485	550	660
P3	110	120	155	170	215	260	304	350	400
N3	80h7	80h7	105h7	125h7	155h7	180h7	210h7	250h7	290h7
H	244	269	343	420	531	623	715	853	1024
e1	14	14	20	20	26	26	32	32	36
K1	115	145	190	240	310	350	400	450	540
K2	31	43	60	70	100	120	125	142	170
L3	110.5	139	160	192	220.5	274	312	367.5	443
L4	134.5	164	183	229	250.5	315.5	352.5	431	505
M2	130	165	215	265	300	400	400	500	600
M3	94	102	125	142	178	220	260	300	340
n2	4	4	4	4	4	8	8	8	8
n3	5	8	6	8	6	8	8	11	10
N2	110h7	130h7	180h7	230h7	250h7	350h7	350h7	450h7	550h7
P2	160	200	250	300	350	450	450	550	660
S4	14	14	14	22	22	26	26	33	33
S	M8	M10	M12	M16	M16	M20	M24	M30	M36
S2	9	11	13.5	13.5	17.5	17.5	17.5	17.5	22
S3	9	9	13.5	13.5	17.5	17.5	22	22	26
S4	M8	M8	M12	M12	M16	M16	M16	M16	M18
b	8	10	12	14	18	20	25	28	32
d	25k6	35k6	40k6	50k6	60m6	70m6	90m6	100m6	120m6
D	30H7	35H7	40H7	50H7	60H7	70H7	90H7	100H7	120H7
D2	30H7	35H7	40H7	50H7	65H7	75H7	85H7	105H7	115H7
D3	30H7	35H7	40H7	50H7	65H7	75H7	90H7	105H7	125H7
D5	37	37	42	55	72	72	90	/	/
d8	86	86	96	122	150	160	207	252	302
E	50	60	80	100	120	140	170	210	210
G1	24	25	23	37	30	41.5	40.5	51	62
Q	120	150	180	210	240	300	350	410	500
Q1	105	132	156	183	210	270	313	373	460
Q2	144	175	204	247	270	341.5	391	461	563
Q3	17	22	29	35	44	43	40	40	40
Q4	16	18	18	31	36.5	36.5	36.5	/	/
S6	M10	M10	M16	M16	M20	M20	M20	/	/
S5	M10	M12	M16	M16	M20	M20	M24	M24	M24
t	28	38	43	53.5	64	74.5	95	106	127
T	33.3	38.5	43.3	53.8	64.4	74.9	95.4	106.4	127.4
W	146	177	208	241	281	345	405	485	580
W1	31	32	38	36	41	55	65	85	90
W2	20	20	20	30	40	50	60	70	80
W3	91	118	144	162	182	242	292	/	/
W4	18	18	25	23	25	25	26	/	/
W5	12	12	12	9	9	11	38	22	33
m*	1.25	2	2	2	2	2	3	/	/
Z*	22	16	16	24	31	34	27	/	/
α*	30	30	30	30	30	30	30	/	/
D6*	30	35	35	50	65	70	85	/	/
Weight (kg)	12.6	16	30	50	92	160	240	400	680

Note: 1) \* Involute spline acc. to DIN 5480 Module M × number of teeth Z × Pressure angle × Major diameter D6 × 9H.  
 2) \*\* The weight of motor and lubricant is not included.



9 Input Part:

9.1 Dimensions of AE Input Shaft:



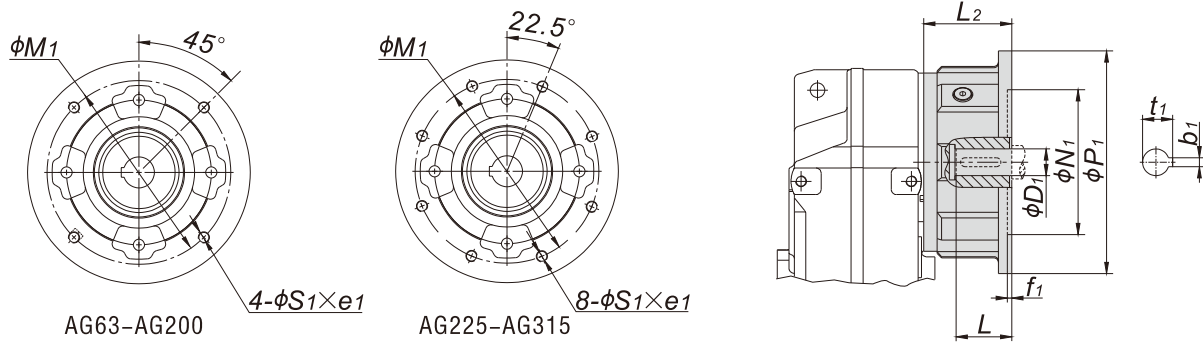
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Size	Input Shaft	Range of Power	d1	E1	L1	b1	t1	Weight (kg)
37、47	AE2	0.12-1.1kW	19k6	40	117	6	21.5	3.2
67	AE2	0.12-1.1kW	19k6	40	119	6	21.5	3.9
	AE3	1.5-5.5kW	28k6	60	175	8	31	7.5
77	AE2	0.12-1.1kW	19k6	40	111	6	21.5	4.7
	AE3	1.5-5.5kW	28k6	60	165	8	31	8.5
	AE4	7.5-11kW	38k6	80	216	10	41	12.8
87	AE2	0.12-1.1kW	19k6	40	108	6	21.5	5.9
	AE3	1.5-5.5kW	28k6	60	158	8	31	9.9
	AE4	7.5-11kW	38k6	80	209	10	41	14.5
	AE5	15-22kW	42k6	110	271	12	45	25.4
97	AE3	1.5-5.5kW	28k6	60	156	8	31	11.9
	AE4	7.5-11kW	38k6	80	203	10	41	17
	AE5	15-22kW	42k6	110	265	12	45	26.6
	AE6	30-45kW	48k6	110	327	14	51.5	51.6
107	AE3	1.5-5.5kW	28k6	60	146	8	31	13.9
	AE4	7.5-11kW	38k6	80	190	10	41	19.3
	AE5	15-22kW	42k6	110	252	12	45	29.1
	AE6	30-45kW	48k6	110	314	14	51.5	50.8
127	AE4	7.5-11kW	38k6	80	176	10	41	23.7
	AE5	15-22kW	42k6	110	238	12	45	37.3
	AE6	30-45kW	48k6	110	298	14	51.5	57.2
	AE7	55-90kW	55m6	110	297	16	59	64
	AE8	110-132kW	70m6	140	377	20	74.5	84.4
157	AE5	15-22kW	42k6	110	228	12	45	48.8
	AE6	30-45kW	48k6	110	280	14	51.5	66
	AE7	55-90kW	55m6	110	279	16	59	73.8
	AE8	110-160kW	70m6	140	361	20	74.5	96

\* Range of Power is based on 4-pole motor.



9.2 Dimensions of AG Connection Flange:

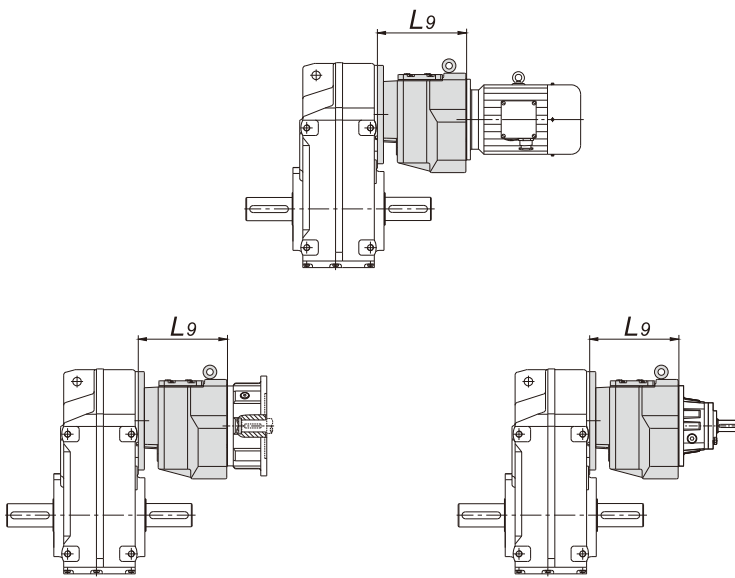


Size	Flange	e1	D1	N1	M1	P1	f1	b1	t1	L	S1	L2	Weight (kg)
37 47	AG 63	14	11H7	95H7	115	140	4	4	12.8	23	M8	59	4.5
	AG 71	14	14H7	110H7	130	160	4	5	16.3	30	M8	59	4.5
	AG 80	18	19H7	130H7	165	200	4	6	21.8	40	M10	74	7.3
67	AG 63	14	11H7	95H7	115	140	4	4	12.8	23	M8	61	4.6
	AG 71	14	14H7	110H7	130	160	4	5	16.3	30	M8	61	4.6
	AG 80	18	19H7	130H7	165	200	4	6	21.8	40	M10	76	8
	AG 90	18	24H7	130H7	165	200	4	8	27.3	50	M10	81	9.1
	AG 100\112	21	28H7	180H7	215	250	5	8	31.3	60	M12	96	13.1
77	AG 71	14	14H7	110H7	130	160	4	5	12.8	30	M8	53	5.5
	AG 80	18	19H7	130H7	165	200	4	6	21.8	40	M10	68	9.7
	AG 90	18	24H7	130H7	165	200	4	8	27.3	50	M10	73	10.6
	AG 100\112	21	28H7	180H7	215	250	5	8	31.3	60	M12	86	13.9
	AG 132	21	38H7	230H7	265	300	5	10	41.3	80	M12	103	19.7
87	AG 80	18	19H7	130H7	165	200	4	6	21.8	40	M10	65	10.2
	AG 90	18	24H7	130H7	165	200	4	8	27.3	50	M10	70	11.1
	AG 100\112	21	28H7	180H7	215	250	5	8	31.3	60	M12	83	15.8
	AG 132	21	38H7	230H7	265	300	5	10	41.3	80	M12	96	22.6
	AG 160	28	42H7	250H7	300	350	6	12	45.3	110	M16	143	37.2
97	AG 180	28	48H7	250H7	300	350	6	14	51.8	110	M16	143	37.2
	AG 90	18	24H7	130H7	165	200	4	8	27.3	50	M10	64	14.1
	AG 100\112	21	28H7	180H7	215	250	5	8	31.3	60	M12	78	17
	AG 132	21	38H7	230H7	265	300	5	10	41.3	80	M12	94	24.5
	AG 160	28	42H7	250H7	300	350	6	12	45.3	110	M16	137	40.4
	AG 180	28	48H7	250H7	300	350	6	14	51.8	110	M16	137	40.4
107	AG 200	28	55H7	300H7	350	400	6	16	59.3	110	M20	167	51.9
	AG 100\112	21	28H7	180H7	215	250	5	8	31.3	60	M12	69	19.6
	AG 132	21	38H7	230H7	265	300	5	10	41.3	80	M12	83	25.4
	AG 160	28	42H7	250H7	300	350	6	12	45.3	110	M16	124	43.4
	AG 180	28	48H7	250H7	300	350	6	14	51.8	110	M16	124	43.4
	AG 200	28	55H7	300H7	350	400	6	16	59.3	110	M20	154	52.4
127	AG 225	28	60H7	350H7	400	450	6	18	64.4	140	M16	182	89
	AG 132	21	38H7	230H7	265	300	5	10	41.3	80	M12	71	33.1
	AG 160	28	42H7	250H7	300	350	6	12	45.3	110	M16	110	50
	AG 180	28	48H7	250H7	300	350	6	14	51.8	110	M16	110	50
	AG 200	28	55H7	300H7	350	400	6	16	59.3	110	M20	138	60.3
	AG 225	28	60H7	350H7	400	450	6	18	64.4	140	M16	166	98.6
	AG 250	28	65H7	450H7	500	550	7	18	69.4	140	M16	171	122.6
157	AG 280	28	75H7	450H7	500	550	7	20	79.9	140	M16	171	122.6
	AG 160	28	42H7	250H7	300	350	6	12	45.3	110	M16	100	59.7
	AG 180	28	48H7	250H7	300	350	6	14	51.8	110	M16	100	59.7
	AG 200	28	55H7	300H7	350	400	6	16	59.3	110	M20	120	70.72
	AG 225	28	60H7	350H7	400	450	7	18	64.4	140	M16	148	100.9
	AG 250	28	65H7	450H7	500	550	7	18	69.4	140	M16	153	133.8
	AG 280	28	75H7	450H7	500	550	7	20	79.9	140	M16	153	133.8
AG 315	35	80H7	550H7	600	660	7	22	85.4	170	M20	200	221.7	

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10 Combi-type Dimensions :



Type	L9
F..37/CRL37	181
F..47/CRL37 F..67/CRL37	183
F..77/CRL37	173
F..87/CRL47	180
F..97/CRL67	225
F..107/CRL77	238.5
F..127/CRL77	227
F..127/CRL87	281
F..157/CRL97	322

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11 Accessories:

11.1 Torque-arm(Accessory code T21):

	Size	37	47	67	77	87	97	107	127	157
	d6	40	40	40	60	60	80	80	100	120
	f5	5	5	5	10	10	12	12	15	15
	f6	20	20	20	30	30	40	40	60	60
	m	M12	M12	M12	M20	M20	M24	M24	M30	M30

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11.2 Oil:

Oil level (L)						
Size \ Mounting position	B5、B6、H1	V3、V6、H6	B51、B61、H2	V1、V5、H5	B3、B52、H4	B53、B31、H3
37	1	1.2	0.7	1.3	1	1.1
47	1.6	1.9	1.1	1.9	1.5	1.7
67	2.7	3.8	1.9	3.8	2.9	3.2
77	5.1	7.3	4.3	8.1	6	6.3
87	10.3	13.2	7.8	14.1	11	11.2
97	19	22.5	12.6	25.5	18.9	20.5
107	25.5	32	19.5	38.5	27.5	28
127	41.5	56	34	63	46.5	49
157	72	105	64	106	87	79

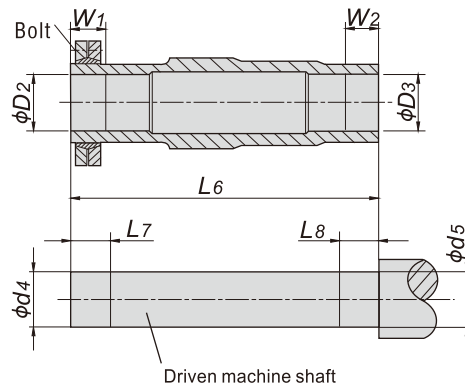
Note: When ambient temperature is -10℃ ~ +40℃, for F series products, lubricant brand is VG220(ISO viscosity class), accessory code is V22.

11.3 Please refer to page 5/Y motor section for motor accessories.



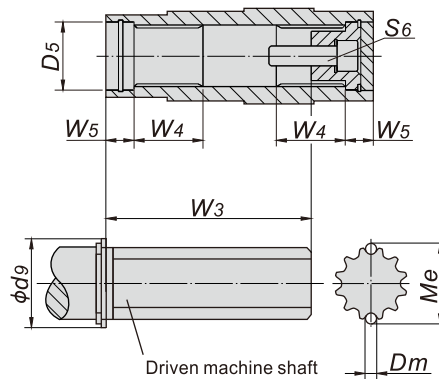
12 Recommended dimensions for the driven machine:

12.1 Shrink Disk:



Size	D2	D3	d4	d5	L6	L7	L8	W1	W2	Model	Bolt	Weight (kg)
37	30H7	30H7	30h6	30h6	146	36	25	31	20	SP2-44X80	M6	0.6
47	35H7	35H7	35h6	35h6	177	37	25	32	20	SP2-44X80	M6	0.6
67	40H7	40H7	40h6	40h6	208	43	25	38	20	SP2-50X90	M6	0.8
77	50H7	50H7	50h6	50h6	241	41	35	36	30	SP2-62X110	M6	1.3
87	65H7	65H7	65h6	65h6	281	46	45	41	40	SP2-80X145	M8	1.9
97	75H7	75H7	75h6	75h6	345	60	55	55	50	SP2-90X155	M8	3.3
107	85H7	90H7	85h6	90h6	405	75	70	65	60	SP2-110X185	M10	5.9
127	105H7	105H7	105h6	105h6	485	95	80	85	70	SP2-140X230	M12	10
157	115H7	125H7	125h6	125h6	580	100	90	90	80	SP2-155X263	M12	15

12.2 Involute Spline:



Size	D5	Dm	d9	Me	W3	W4	W5	S6
37	37	2.75	42	33.03	85	25	18	M10X30
47	37	4	42	38.92	115	32	18	M10X30
67	42	4	47	38.92	130	42	25	M10X30
77	55	4	62	54.13	160	52	23	M16X50
87	72	4	82	68.96	180	62	25	M20X60
97	72	4	90	74.15	240	72	25	M20X60
107	90	6	105	90.99	290	89	26	M20X60