

# AFH series

## Overview



- High torque gearbox
- Special design for continuous (S1) or cyclic (S5) duty operation
- Steel housing/aluminum, aluminum black anodized motor adapter flange
- Steel output shaft with or without key, with spline (DIN5480) or hollow shaft
- Helical gear design
- Nominal torques:
  - $T_{2N}$  : 24 Nm – 3.805 Nm
- Ratios
  - 1-stage : 3 / 4 / 5 / 7 / 10
  - 2-stage : 16 / 20 / 25 / 28 / 35 / 40 / 50 / 70 / 100
- Low backlash
  - 1-stage :  $\leq 1$  arcmin /  $\leq 2$  arcmin
  - 2-stage :  $\leq 2$  arcmin /  $\leq 3$  arcmin
- High efficiency
  - 1-stage :  $\geq 97\%$
  - 2-stage :  $\geq 94\%$
- Easy mount
- Low noise
- Compact structure
- Sizes available: AFH060 / AFH075 / AFH100 / AFH140 / AFH180 / AFH210 / AFH240

# Specifications

Model No.	Stage	Ratio <sup>1</sup>	AFH060	AFH075	AFH100	AFH140	AFH180	AFH210	AFH240	
Nominal Output Torque $T_{2N}$	1	3	85	150	415	630	1,485	2,255	4,090	
		4	95	195	350	600	1,290	1,960	3,715	
		5	80	165	305	525	1,145	1,745	3,285	
		7	60	130	250	435	980	1,495	2,525	
		10	24	55	160	305	700	1,070	1,810	
	Nm	2	16	95	195	360	615	1,320	2,000	3,785
			20	95	200	360	615	1,320	2,000	3,800
			25	80	165	310	535	1,165	1,770	3,330
			28	60	200	360	615	1,325	2,000	3,800
			35	70	170	310	535	1,165	1,775	3,335
			40	40	96	220	615	1,215	2,000	3,805
			50	50	120	275	535	1,170	1,775	3,340
			70	60	130	250	440	990	1,510	2,550
			100	24	55	160	295	660	1,005	1,700
Emergency Stop Torque $T_{2Not}$	Nm	1,2	3~100			3 times $T_{2N}$				
Max. Acceleration Torque $T_{2b}$	Nm	1,2	3~100			1.5 times $T_{2N}$				
No Load Running Torque <sup>(2)</sup>	NM	1	3~10	0.3	0.6	1.4	2.5	5	7	11
		2	16~100	0.2	0.3	0.5	1.2	1.7	3	4
Backlash <sup>(3)</sup>	arcmin	1	3~10	≤2	≤1	≤1	≤1	≤1	≤1	≤1
		2	16~100	≤3	≤2	≤2	≤2	≤2	≤2	≤2
Torsional Rigidity	Nm/arcmin	1,2	3~100	4.6	10	30	55	175	400	550
Nominal Input Speed $n_{1N}$	rpm	1	3~10	5,000	3,600	3,600	3,000	2,700	2,400	2,100
		2	16~100	5,000	4,600	4,600	4,000	3,700	3,400	3,100
Max. Input Speed	rpm	1	3~10	7,000	6,000	6,000	5,000	4,500	4,000	3,500
		2	16~100	7,000	7,000	7,000	6,000	5,500	5,000	4,500
Max. Radial Load $F_{2r}$ <sup>(4)</sup>	N	1,2	3~100	3,000	4,500	6,700	10,000	15,000	22,000	30,000
Max. Axial Load $F_{2a}$ <sup>(4)</sup>	N	1,2	3~100	1,500	2,250	3,350	5,000	7,500	11,000	15,000
Max. Tilting Moment $M_{2k}$ <sup>(4)</sup>	Nm	1,2	3~100	160	270	550	1,050	1,740	3,350	5,420
Service Life <sup>(5)</sup>	hr	1,2	3~100			20,000				
Operating Temp.	°C	1,2	3~100			-10° C ~ 90° C				
Degree of Gearbox Protection		1,2	3~100			IP65				
Lubrication		1,2	3~100			Synthetic lubrication grease				
Mounting Position		1,2	3~100			All directions				

Running Noise <sup>(6)</sup>	dB(A)	1	3~10	≤58	≤59	≤64	≤65	≤66	≤66	≤66
		2	16~100	≤58	≤59	≤60	≤63	≤66	≤66	≤66
Efficiency	%	1	3~10	≥97%						
		2	16~100	≥94%						

(1) Ratio ( i = N in / N out)

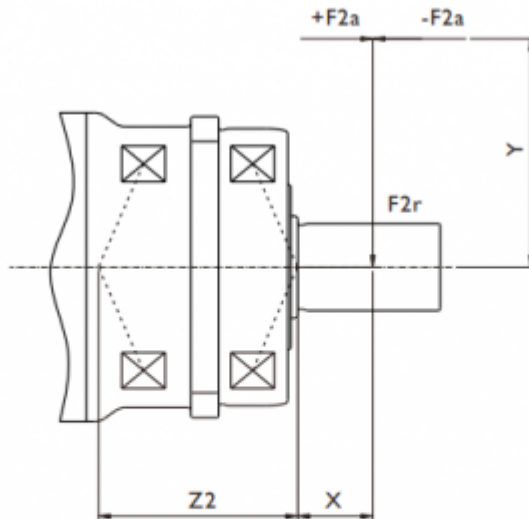
(2) These values are measured by gearbox with ratio 10 (1-stage) or ratio 100 (2-stage) at 3,000 rpm no loading.

(3) Backlash is measured at 2% of Nominal Output Torque T<sub>2N</sub>

(4) Applied to the output shaft center at 100 rpm.

(5) Continuous operation is not recommended.

(6) These values are measured by gearbox with ratio 10 (1-stage) or ratio 100 (2-stage) at 3,000 rpm no loading. By lower ratio and/or higher RPM, the noise level could be 3 to 5 dB higher.



$$\text{Max. Tilting Moment } M_{\text{sk}} = \frac{F2a \cdot Y + F2r \cdot (X + Z2)}{1000}$$

$M_{\text{sk}}$  : [Nm]  
 $F2a, F2r$  : [N]  
 $X, Y, Z2$  : [mm]

AFH / AFHK	060	075	100	140	180	210	240
Z2 [mm]	41,3	50,1	58,9	72,7	93,7	98,5	112,2

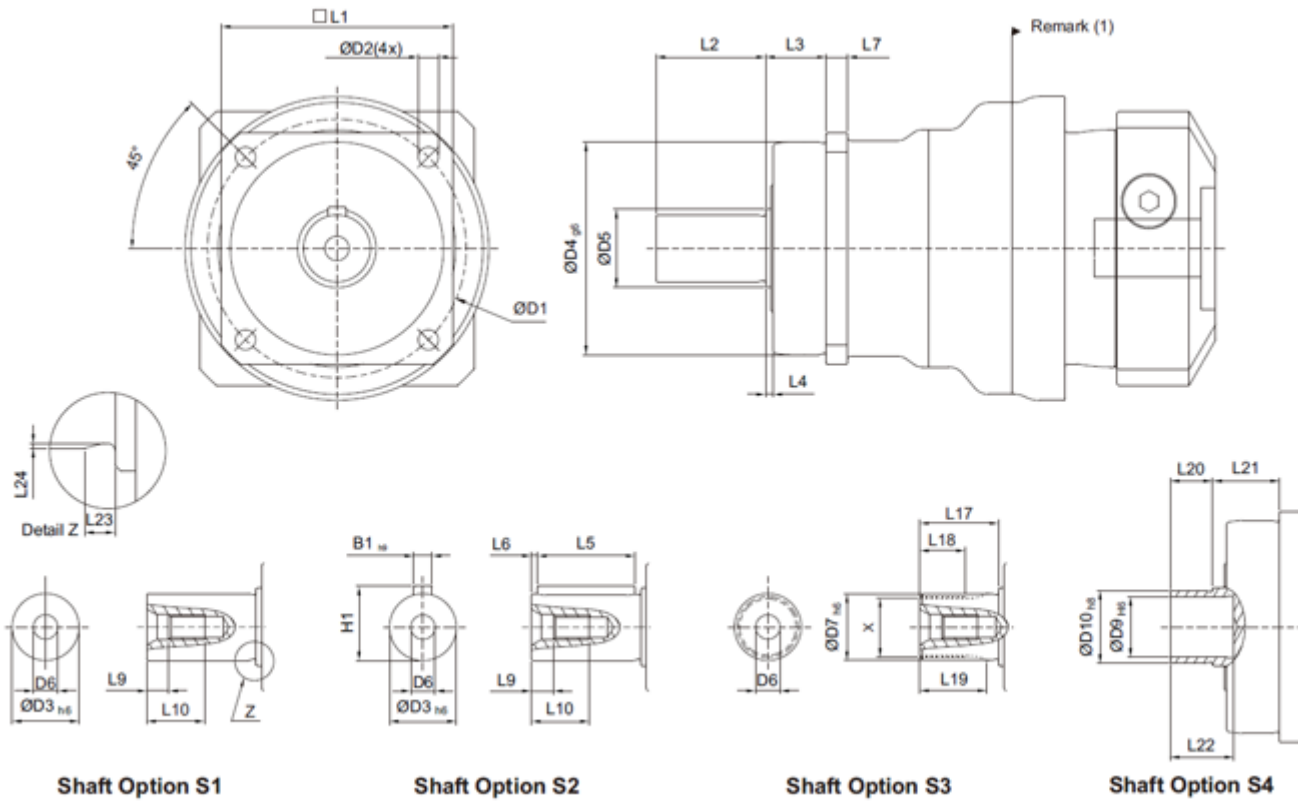
Applied to the output shaft center at 100 rpm.

# Inertia

Model No.		AFH060		AFH075		AFH100		AFH140		AFH180		AFH210		AFH240	
Ø <sup>(A)</sup>	Stage	1	2	1	2	1	2	1	2	1	2	1	2	1	2
8		-	0.10	-	-	-	-	-	-	-	-	-	-	-	-
11		0.21	0.16	-	0.17	-	-	-	-	-	-	-	-	-	-
14		0.24	0.20	0.54	0.21	-	0.42	-	-	-	-	-	-	-	-
19		0.64	-	0.79	0.60	2.51	0.66	-	1.83	-	-	-	-	-	-
24		-	-	4.06	-	4.78	3.94	6.85	4.11	-	4.61	-	-	-	-
28		-	-	-	-	6.15	-	8.38	5.48	-	6.14	-	-	-	-
32	kg.cm <sup>2</sup>	-	-	-	-	8.03	-	10.41	7.36	19.50	8.17	-	10.55	-	-
35		-	-	-	-	14.72	-	15.56	14.04	26.71	15.54	39.60	17.75	86.48	20.80
38		-	-	-	-	17.38	-	20.43	16.71	29.11	18.19	42.43	20.17	86.48	23.66
42		-	-	-	-	-	-	25.44	-	34.35	23.20	47.65	25.4	92.61	28.88
48		-	-	-	-	-	-	54.66	-	64.13	52.42	77.41	55.18	122.26	58.64
55		-	-	-	-	-	-	-	-	-	-	111.26	-	156.7	92.48
60		-	-	-	-	-	-	-	-	-	-	-	-	180.17	-

(A) Ø = Input shaft diameter.

# Sizes



	AFH060	AFH075	AFH100	AFH140	AFH180	AFH210	AFH240
D1	68	85	120	165	215	250	290
D2	5.5	7	9	11	13.5	17	17
D3 h6	16	22	32	40	55	75	85
D4 g6	60	70	90	130	160	180	200
D5	18.5	25.8	36.8	55.2	69.2	82.2	92.2
D6	M5 x 0.8P	M8 x 1.25P	M12 x 1.75P	M16 x 2P	M20 x 2.5P	M20 x 2.5P	M20 x 2.5P
D7 h6	16	22	32	40	55	75	85
D9 H6	15	20	30	40	55	-	-
D10 h8	18	24	36	50	68	-	-
L1	62	76	101	141	182	215	245
L2	28	36	58	82	82	105	130
L3	20	20	30	30	30	38	40
L4	2	2.5	3	3	3	3	3
L5	25	32	50	63	70	90	125
L6	2	2	4	5	6	7	3
L7	6	7	10	12	15	17	22
L9	4.8	7.2	10	12	15	15	15
L10	12.5	19	28	36	42	42	42
L17	26	26	26	40	41.5	52	60
L18	15	15	15	20	21.5	28	36
L19	21	22.5	23	33.5	33.5	45	53
L20	12	14	18	22	23	-	-
L21	22	22	32	33	32	-	-
L22	19	21	25	30	30	-	-
L23	2	2.5	2.5	2.5	2.5	2.5	4
L24	0.3	0.4	0.4	0.4	0.4	0.4	0.5
B1 h9	5	6	10	12	16	20	22
H1	18	24.5	35	43	59	79.5	90
X DIN5480	W16x0.8x30x18x6m	W22x1.25x30x16x6m	W32x1.25x30x24x6	W40x2x30x18x6m	W55x2x30x26x6m	W70x2x30x34x6m	W80x2x30x38x6m

(1) Dimensions are related to motor interface. Please contact APEX for details.