Specifications / AFR Series

Gearbox Performance

Model No.		Stage	Ratio (1)	AFR042	AFR060	AFR060 A	AFR075	AFR075A	AFR100	AFR100A	AFR140	AFR140A	AFR180	AFR220
Nominal Output Torque T_{2N}	Nm	1	3	9	36	–	90	–	195	–	342	–	588	1,140
			4	12	48	–	120	–	260	–	520	–	1,040	1,680
			5	15	60	–	150	–	325	–	650	–	1,200	2,000
			6	18	55	–	150	–	310	–	600	–	1,100	1,900
			7	19	50	–	140	–	300	–	550	–	1,100	1,800
			8	17	45	–	120	–	260	–	500	–	1,000	1,600
			9	14	40	–	100	–	230	–	450	–	900	1,500
			10	14	60	–	150	–	325	–	650	–	1,200	2,000
			12	–	55	–	150	–	310	–	600	–	1,100	1,900
			14	–	42	–	140	–	300	–	550	–	1,100	1,800
			16	–	45	–	120	–	260	–	500	–	1,000	1,600
			20	–	40	–	100	–	230	–	450	–	900	1,500
		2	12	12	–	–	–	–	–	–	–	–	–	–
			15	14	–	–	–	–	–	–	–	–	–	–
			16	15	–	–	–	–	–	–	–	–	–	–
			20	14	–	–	–	–	–	–	–	–	–	–
			25	15	60	60	150	150	325	325	650	650	1,200	2,000
			28	19	50	50	140	140	300	300	550	550	1,100	1,800
			30	20	55	55	150	150	310	310	600	600	1,100	1,900
			32	17	45	45	120	120	260	260	500	500	1,000	1,600
			35	19	50	50	140	140	300	300	550	550	1,100	1,800
			40	17	45	45	120	120	260	260	500	500	1,000	1,600
			45	14	40	40	100	100	230	230	450	450	900	1,500
			48	–	–	55	150	150	310	310	600	600	1,100	1,900
			50	14	60	60	150	150	325	325	650	650	1,200	2,000
			60	20	55	55	150	150	310	310	600	600	1,100	1,900
			64	–	–	45	120	120	260	260	500	500	1,000	1,600
			70	19	50	50	140	140	300	300	550	550	1,100	1,800
			80	17	45	45	120	120	260	260	500	500	1,000	1,600
			90	14	40	40	100	100	230	230	450	450	900	1,500
			100	14	40	60	150	150	325	325	650	650	1,200	2,000
			120	–	–	55	150	150	310	310	600	600	1,100	1,900
			140	–	–	50	140	140	300	300	550	550	1,100	1,800
			160	–	–	45	120	120	260	260	550	550	1,000	1,600
			180	–	–	40	100	100	230	230	450	450	900	1,500
			200	–	–	40	100	100	230	230	450	450	900	1,500
Emergency Stop Torque T_{2NOT} (2)	Nm	1,2	3~200	3 times of Nominal Output Torque										
Nominal Input Speed n_{1N}	rpm	1,2	3~200	5,000	5,000	5,000	4,000	4,000	4,000	4,000	3,000	3,000	3,000	2,000
Max. Input Speed n_{1B}	rpm	1,2	3~200	10,000	10,000	10,000	8,000	8,000	8,000	8,000	6,000	6,000	6,000	4,000
Micro Backlash P0	arcmin	1	3~20	–	–	–	≤2	–	≤2	–	≤2	–	≤2	≤2
		2	12~200	–	–	–	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4
Reduced Backlash P1	arcmin	1	3~20	≤4	≤4	–	≤4	–	≤4	–	≤4	–	≤4	≤4
		2	12~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Standard Backlash P2	arcmin	1	3~20	≤6	≤6	–	≤6	–	≤6	–	≤6	–	≤6	≤6
		2	12~200	≤9	≤9	≤9	≤9	≤9	≤9	≤9	≤9	≤9	≤9	≤9
Torsional Rigidity	Nm/arcmin	1,2	3~200	3	7	7	14	14	25	25	50	50	145	225
Max. Radial Load F_{2rB} (3)	N	1,2	3~200	610	1,400	1,400	4,100	4,100	9,200	9,200	14,000	14,000	18,000	33,000
Max. Axial Load F_{2aB} (3)	N	1,2	3~200	320	1,100	1,100	3,700	3,700	5,800	5,800	11,400	11,400	19,500	16,300
Max. Tilting Moment M_{2K}	N m		3~200	20	85	85	380	380	970	970	1,840	1,840	2,740	5,030
Efficiency η	%	1	3~20	≥95%										
		2	12~200	≥92%										
Weight	kg	1	3~20	0.9	2.1	–	6.4	–	11.3	–	22.5	–	44	77
		2	12~200	1.2	1.9	2.8	4.8	8	10.6	15.1	21	29.2	41	75
Operating Temp	°C	1,2	3~200	-10℃~+90℃										
Lubrication		1,2	3~200	Synthetic lubrication oils										
Degree of Gearbox Protection		1,2	3~200	IP65										
Mounting Position		1,2	3~200	all directions										
Noise(4)	dB(A)	1,2	3~200	≤61	≤63	≤65	≤65	≤68	≤68	≤70	≤70	≤72	≤72	≤74

(1) Ratio ($i=N_{in} / N_{out}$)
(2) Max. acceleration torque T_{2B} = 60% of T_{2NOT}
(3) Applied to the output shaft center at 100 rpm
(4) The dB values are measured by gearbox with ratio 10 (1-stage) or ratio 100 (2-stage), no loading at 3,000 RPM or at the respective Nominal Input Speed by bigger model size.
By lower ratio and/or higher RPM, the noise level could be 3 to 5 dB higher.

Gearbox Inertia

Model No.		Stage	Ratio	AFR042	AFR060	AFR060 A	AFR075	AFR075A	AFR100	AFR100A	AFR140	AFR140A	AFR180	AFR220
Mass Moments of Inertia J_1	kg・cm^2	1	3~10	0.09	0.35	–	2.25	–	6.84	–	23.4	–	68.9	135.4
			12~20	–	0.31	–	1.87	–	6.25	–	21.8	–	65.6	119.8
		2	12~20	0.09	–	–	–	–	–	–	–	–	–	–
			25~90	0.09	0.09	0.35	0.35	2.25	2.25	6.84	6.84	23.4	23.4	68.9
			48, 64	–	–	0.31	0.31	1.87	1.87	6.25	6.25	21.8	21.8	65.6
			100~200	–	–	0.31	0.31	1.87	1.87	6.25	6.25	21.8	21.8	65.6