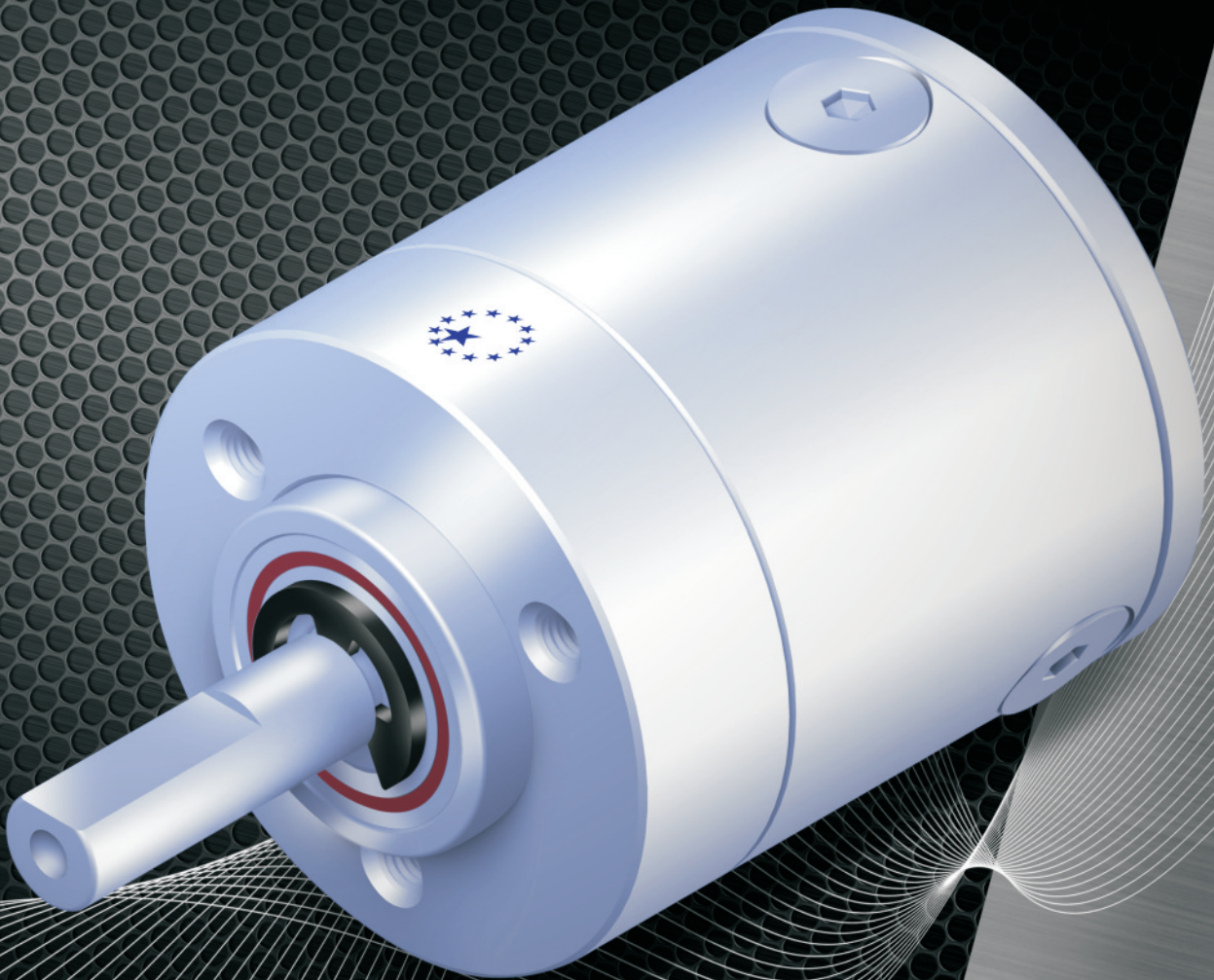




APEX DYNAMICS, INC.

QMT *SERIES*



Micro-Planetary Gearboxes

Stainless

AM Series

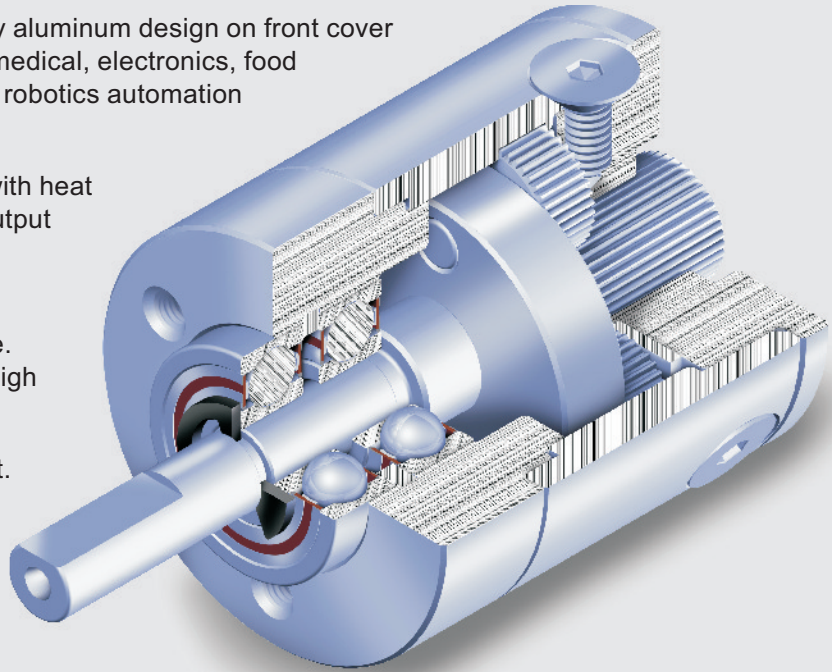
Characteristic Highlights

Stainless steel housing with alloy aluminum design on front cover and motor adapter. Suitable for medical, electronics, food industry, packaging industry and robotics automation applications.

Gearing set is using alloy steel with heat treatment. It can transmit high output torque and longer service life.

All parts are made out by high precision machine tools in-house. Smooth rotation, low backlash, high efficiency and low noise level.

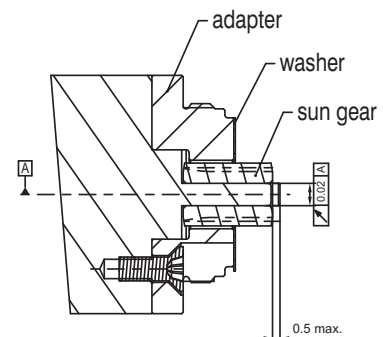
Compact design with light weight. Wide variation of ratios selection, ideal for adapting with DC motor, step motor and servomotor. Excellent design for easy installation. No need to use special tooling.



Micro Planetary Gearbox Installation Manual

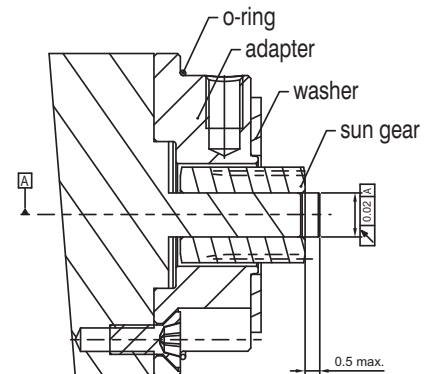
» AM013 Assemble Procedures:

1. Check motor shaft runout. $\sqrt{0.02A}$
2. Clean the grease or oil on motor shaft. Apply Loctite 638 on motor shaft (please see apply glue procedures).
3. Slide and rotate the sun gear on motor shaft.
4. Bolts the adapter on motor.
5. Put washer on adapter surface.
6. Screw the gearbox on adapter all the way and verify is seal tight.



» AM016 / 022 / 026 / 032 Assemble Procedures:

1. Check motor shaft runout. $\sqrt{0.02A}$
2. Clean the grease or oil on motor shaft. Apply Loctite 638 on motor shaft (please see apply glue procedures).
3. Slide and rotate the sun gear on motor shaft.
4. Bolts the adapter on motor.
5. Put washer on adapter surface, check o-ring position.
6. Bolts the gearbox and motor together. Verify is seal tight.



» Apply Glue Procedures:

1. Check motor shaft and sun gear hole tolerance within 0.02mm. (sun gear hole tolerance is H7).
2. Clean the grease or oil in sun gear hole and motor shaft.
3. Sun gear can rotate or slide on motor shaft.
4. Minimum dry time for Loctite 638 is 4 hours. Keep the assembly in horizontal position.
5. After dried, under no-load test run for 15 minutes.

AM016 Series

Specifications

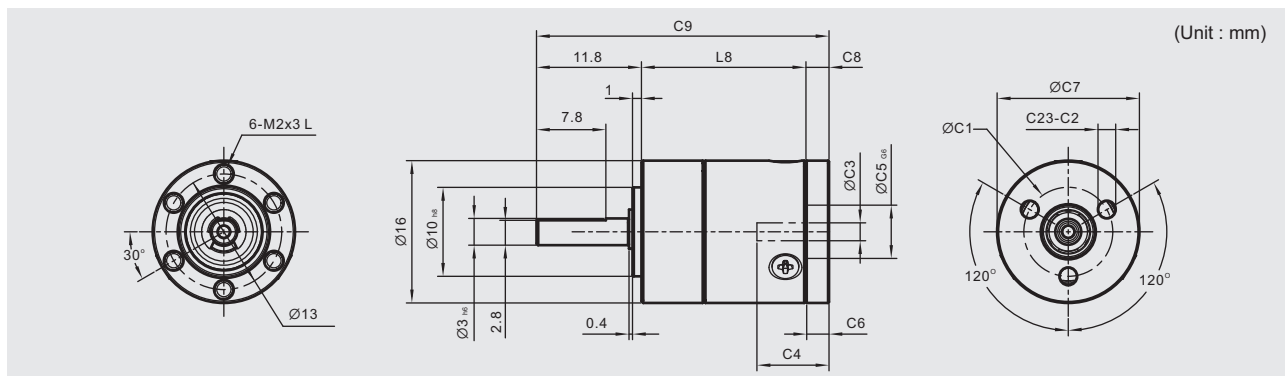
Gearbox Performance

Model No.	1-Stage		2-Stage		3-Stage		4-Stage		5-Stage	
	Ratio ¹	Torque	Ratio ¹	Torque	Ratio ¹	Torque	Ratio ¹	Torque	Ratio ¹	Torque
Nominal Output Torque T _{2N}	Absolute Ratios		Absolute Ratios		Absolute Ratios		Absolute Ratios		Absolute Ratios	
	4.4	0.1	19	0.15	84	0.2	370	0.25	1621	0.3
	57/13		3249/169		185193/2197		10556001/28561		601692057/371293	
	5.4	0.1	24	0.15	104	0.2	455	0.25	1996	0.3
	27/5		1539/65		87723/845		5000211/10985		285012027/142805	
			29	0.15	128	0.2	561	0.25	2458	0.3
			729/25		41553/325		2368521/4225		135005697/54925	
					157	0.2	690	0.25	3027	0.3
					19683/125		1121931/1625	0.25	63950067/21125	0.3
							850		3728	0.3
						531441/625		30292137/8125	0.3	
								4592	0.3	
								14348907/3125	0.3	
Max. Acceleration Torque T _{2B}	Nm 1.5 times of Nominal Output Torque									
Nominal Input Speed n _{1N}	rpm 8,000									
Max. Acceleration Input Speed n _{1B}	rpm 12,000									
Backlash (No-Load)	Deg ≤ 1.4, ≤ 1.6, ≤ 2, ≤ 2.4, ≤ 3									
Max. Radial Load F _{2R} ²	N 25									
Max. Axial Load F _{2AB} ²	N 12.5									
Mass Moment of Inertia J ₁	4.4	0.01	19	0.01	84	0.01	370	0.01	1621	0.01
	5.4	0.005	24	0.01	104	0.01	455	0.01	1996	0.01
			29	0.005	128	0.01	561	0.01	2458	0.01
					157	0.005	690	0.005	3027	0.005
							850	0.005	3728	0.005
Service Life	hr 10,000*									
Efficiency η (MAX)	% 90, 81, 73, 65, 59									
Weight	g 22, 30, 35, 42, 49									
Operating Temperature	°C -30°C~+100°C									
Degree of Gearbox Protection	IP44									
Mounting Position	all directions									

1. Ratio (i=N_{in}/N_{out})

2. Apply to the output shaft center @ 100 rpm

* S1 service life 5000 hrs



Dimension	1-Stage		2-Stage		3-Stage		4-Stage		5-Stage	
Length	L8		24		29.5		35		40.5	
Mounting hole PCD	C1 ³				10					
Mounting hole O.D.	C2 ³				1.8					
Number of mounting hole	C23 ³				3					
Motor shaft O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.
	4.4	≤ 2	19	≤ 2	84	≤ 2	370	≤ 2	1621	≤ 2
	5.4	≤ 1.5	24	≤ 2	104	≤ 2	455	≤ 2	1996	≤ 2
			29	≤ 1.5	128	≤ 2	561	≤ 2	2458	≤ 2
					157	≤ 1.5	690	≤ 1.5	3027	≤ 1.5
Motor Shaft Length	C4 ³				8.1					
Motor Pilot O.D.	C5 ³ _{GB}				6					
Motor Pilot Depth	C6 ³				2.5					
Motor adapter O.D.	C7 ³				16					
Motor adapter Thickness	C8 ³				2.6					
Total Length	C9 ³		32.9		38.4		43.9		49.4	
									51.9	

3. C1 – C9 are motor specific dimensions (metric std shown). Refer to apexdyna.com and AM Design Tool to view your specific motor mounting system.

AM022 Series

Specifications

Gearbox Performance

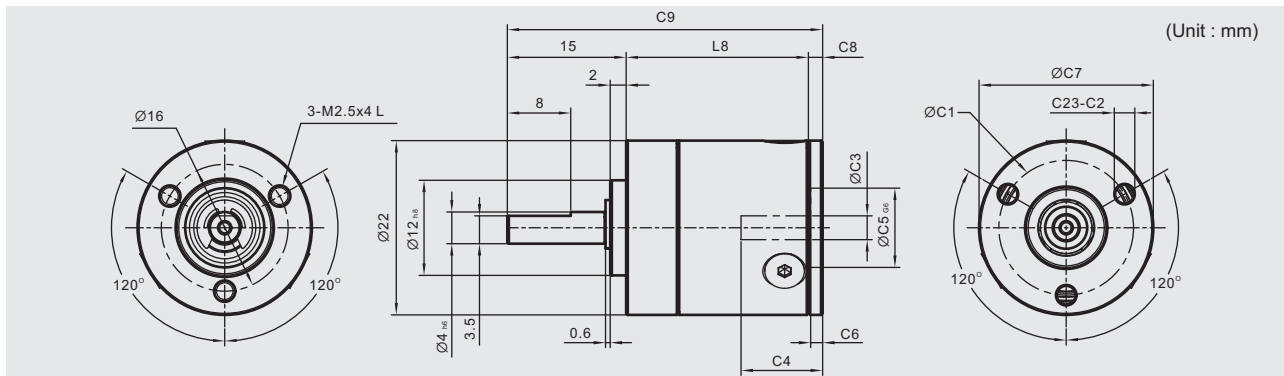
Model No.		1-Stage		2-Stage				3-Stage			
Nominal Output Torque T_{2N}	Nm	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue
		4	0.2	16	1	49	1	64	1.5	196	1.5
		5	0.2	20	1			80	1.5	245	1.5
		7	0.2	28	1			112	1.5	343	1.5
		9	0.2	35	1			140	1.5		
Max. Acceleration Torque T_{2B}	Nm	1.5 times of Nominal Output Torque									
Nominal Input Speed n_{1N}	rpm	6,000		6,000				6,000			
Max. Acceleration Input Speed n_{1B}	rpm	10,000		10,000				10,000			
Backlash*	acrmin	≤ 20		≤ 35				≤ 50			
Max. Radial Load F_{2RB} ²	N	40									
Max. Axial Load F_{2aB} ²	N	20									
Mass Moment of Inertia J_1	g.cm ²	4	0.067	16	0.067	49	0.006	64	0.067	196	0.067
		5	0.024	20	0.024			80	0.067	245	0.024
		7	0.006	28	0.006			112	0.067	343	0.006
		9	0.003	35	0.006			140	0.067		
Service Life	hr	10,000*									
Efficiency η (MAX)	%	96		90				85			
Weight	g	47.38		67.34				84.3			
Operating Temperature	°C	-30°C~+100°C									
Degree of Gearbox Protection		IP44									
Mounting Position		all directions									

1. Ratio ($i=N_{in}/N_{out}$)

* S1 service life 5000 hrs

2. Apply to the output shaft center @ 100 rpm

* Backlash is test under 2% of T_{2N}



Dimension		1-Stage		2-Stage				3-Stage			
Length	L8	23		31.5				40			
Mounting hole PCD	C1 ³	17									
Mounting hole O.D.	C2 ³	2.2									
Number of mounting hole	C23 ³	3									
Motor shaft O.D.	C3 ³ ₁₇	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.
		4	≤ 4	16	≤ 4	49	≤ 1.5	64	≤ 4	196	≤ 4
		5	≤ 3	20	≤ 3			80	≤ 4	245	≤ 3
		7	≤ 1.5	28	≤ 1.5			112	≤ 4	343	≤ 1.5
		9	≤ 1	35	≤ 1.5			140	≤ 4		
Motor Shaft Length	C4 ³	10.3									
Motor Pilot O.D.	C5 ³ ₀₆	10									
Motor Pilot Depth	C6 ³	1.5									
Motor adapter O.D.	C7 ³	22									
Motor adapter Thickness	C8 ³	1.8									
Total Length	C9 ³	39.8		48.3				56.8			

3. C1 ~ C9 are motor specific dimensions (metric std shown). Refer to apexdyna.com and AM Design Tool to view your specific motor mounting system.

AM026 Series

Specifications

Gearbox Performance

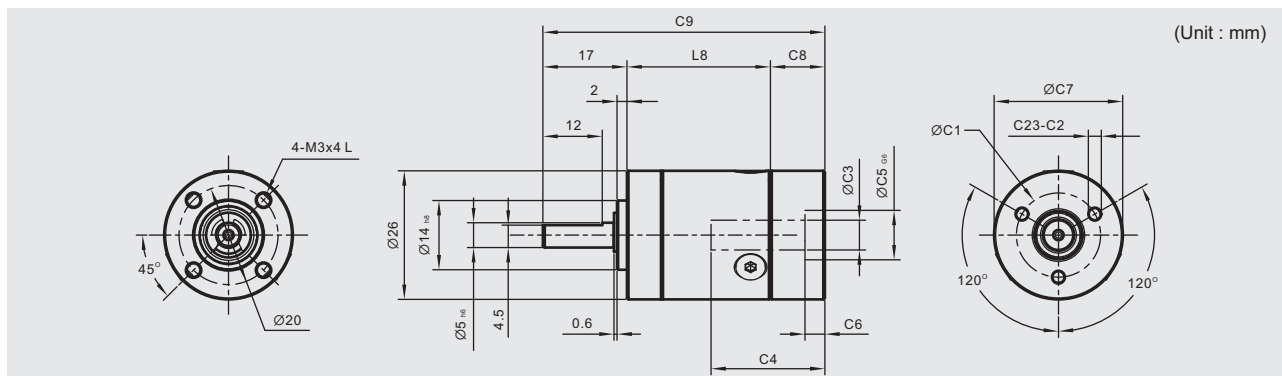
Model No.		1-Stage		2-Stage			3-Stage				
Nominal Output Torque T_{2N}	Nm	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue
		3.5	0.6	12.25	2	46	2	81.37	3	216	3
		4.33	0.6	18.78	2			112.67	3	276	3
		6	0.6	26	2			143.96	3	352.67	3
		7.67	0.6	33.22	2			199.33	3		
Max. Acceleration Torque T_{2B}	Nm	1.5 times of Nominal Output Torque									
Nominal Input Speed n_{1N}	rpm	6,000		6,000			6,000				
Max. Acceleration Input Speed n_{1B}	rpm	10,000		10,000			10,000				
Backlash*	acrmin	≤ 20		≤ 35			≤ 50				
Max. Radial Load F_{2rB} ²	N	55									
Max. Axial Load F_{2aB} ²	N	27.5									
Mass Moment of Inertia J_1	g.cm ²	3.5	0.273	12.25	0.273	46	0.024	81.37	0.117	216	0.024
		4.33	0.117	18.78	0.117			112.67	0.117	276	0.024
		6	0.024	26	0.117			143.96	0.117	352.67	0.024
		7.67	0.011	33.22	0.117			199.33	0.117		
Service Life	hr	10,000*									
Efficiency η (MAX)	%	96		90			85				
Weight	g	98.66		137.83			170.62				
Operating Temperature	°C	-30°C~+100°C									
Degree of Gearbox Protection		IP44									
Mounting Position		all directions									

1. Ratio ($i=N_{in}/N_{out}$)

* S1 service life 5000 hrs

2. Apply to the output shaft center @ 100 rpm

* Backlash is test under 2% of T_{2N}



Dimension		1-Stage		2-Stage			3-Stage				
Length	L8	29		40.5			52				
Mounting hole PCD	C1 ³	17									
Mounting hole O.D.	C2 ²	2.2									
Number of mounting hole	C23 ³	3									
Motor shaft O.D.	C3 ^{3 HT}	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.
		3.5	≤ 6	12.25	≤ 6	46	≤ 2.5	81.37	≤ 4	216	≤ 2.5
		4.33	≤ 4	18.78	≤ 4			112.67	≤ 4	276	≤ 2.5
		6	≤ 2.5	26	≤ 4			143.96	≤ 4	352.67	≤ 2.5
		7.67	≤ 1.5	33.22	≤ 4			199.33	≤ 4		
Motor Shaft Length	C4 ³	23									
Motor Pilot O.D.	C5 ^{3 GB}	10									
Motor Pilot Depth	C6 ³	4									
Motor adapter O.D.	C7 ³	26									
Motor adapter Thickness	C8 ³	11									
Total Length	C9 ³	57		68.5			80				

3. C1 – C9 are motor specific dimensions (metric std shown). Refer to apexdyna.com and AM Design Tool to view your specific motor mounting system.

AM032 Series

Specifications

Gearbox Performance

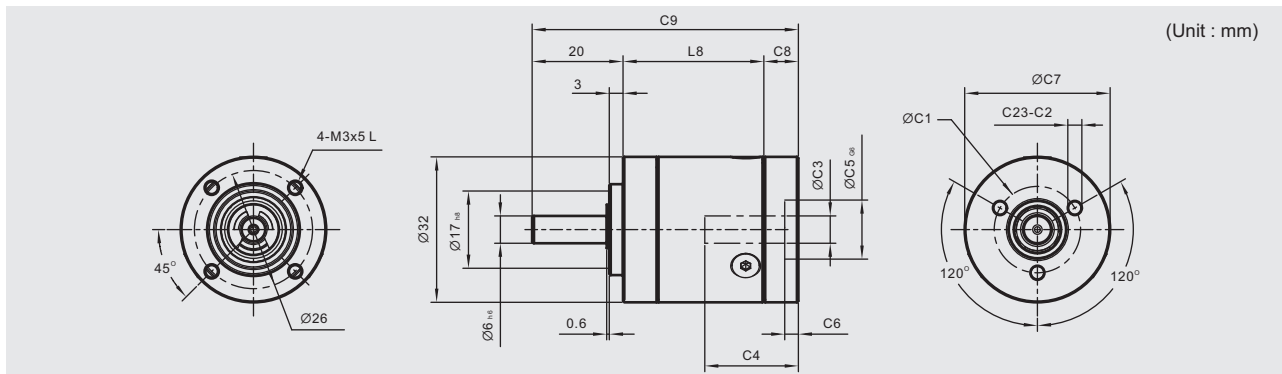
Model No.		1-Stage		2-Stage				3-Stage					
Nominal Output Torque T_{2N}	Nm	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue	Ratio ¹	Torgue
		4	0.8	16	4	36	4	64	6	144	6	288	6
		4.5	0.8	18	4	41.6	4	72	6	175.78	6	332.8	6
		5.2	0.8	20.8	4	50	4	81	6	200	6	400	6
		6.25	0.8	25	4	64	4	100	6	225	6	512	6
8	0.8	32	4			130	6	256					
Max. Acceleration Torque T_{2B}	Nm	1.5 times of Nominal Output Torque											
Nominal Input Speed n_{1N}	rpm	5,000		5,000				5,000					
Max. Acceleration Input Speed n_{1B}	rpm	8,000		8,000				8,000					
Backlash*	acrmin	≤20		≤35				≤50					
Max. Radial Load F_{2RB} ²	N	90											
Max. Axial Load F_{2aB} ²	N	45											
Mass Moment of Inertia J_1	g.cm ²	4	0.378	16	0.378	36	0.248	64	0.378	144	0.378	288	0.248
		4.5	0.248	18	0.378	41.6	0.116	72	0.378	175.78	0.248	332.8	0.116
		5.2	0.116	20.8	0.378	50	0.056	81	0.248	200	0.378	100	0.056
		6.25	0.056	25	0.378	64	0.024	100	0.378	225	0.248	512	0.024
		8	0.024	32	0.378			130	0.378	256	0.378		
Service Life	hr	10,000*											
Efficiency η (MAX)	%	96		90				85					
Weight	g	156.3		218.32				265.83					
Operating Temperature	°C	-30°C~+100°C											
Degree of Gearbox Protection		IP44											
Mounting Position		all directions											

1. Ratio ($i=N_n/N_{out}$)

* S1 service life 5000 hrs

2. Apply to the output shaft center @ 100 rpm

* Backlash is test under 2% of T_{2N}



Dimension		1-Stage		2-Stage				3-Stage					
Length	L8	31		43				55					
Mounting hole PCD	C1 ³	19											
Mounting hole O.D.	C2 ³	2.7											
Number of mounting hole	C23 ³	3											
Motor shaft O.D.	C3 ³ ₁₇	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.	Ratio ¹	O.D.
		4	≤6	16	≤6	36	≤5	64	≤6	144	≤6	288	≤5
		4.5	≤5	18	≤6	41.6	≤4	72	≤6	175.78	≤5	332.8	≤4
		5.2	≤4	20.8	≤6	50	≤3	81	≤5	200	≤6	400	≤3
		6.25	≤3	25	≤6	64	≤2	100	≤5	225	≤6	512	≤2
8	≤2	32	≤6			130	≤6	256	≤6				
Motor Shaft Length	C4 ³	20.6											
Motor Pilot O.D.	C5 ³ _{G6}	13											
Motor Pilot Depth	C6 ³	3											
Motor adapter O.D.	C7 ³	32											
Motor adapter Thickness	C8 ³	7.6											
Total Length	C9 ³	58.6		70.6				82.6					

3. C1 ~ C9 are motor specific dimensions (metric std shown). Refer to apexdyna.com and AM Design Tool to view your specific motor mounting system.

Ordering Code



AM013	4.1					MOTOR
Ratios	1-Stage	2-Stage	3-Stage	4-Stage	5-Stage	Motor Designation
AM013	4.1, 5.1	17, 26	67, 131	275, 664	1119, 3373	Manufacturer Type and Model
AM016	4.4, 5.4	19, 24, 29	84, 104, 128, 157	370, 455, 561, 690, 850	1621, 1996, 2458, 3027, 3728, 4592	
AM022	4, 5, 7, 9	16, 20, 28, 35, 49	64, 80, 112, 140, 196, 245, 343			
AM026	3.5, 4.33, 6, 7.67	12.25, 18.78, 26, 33.22, 46	81.37, 112.67, 143.96, 199.33, 216, 276, 352.67			
AM032	4, 4.5, 5.2, 6.25, 8	16, 18, 20.8, 25, 32, 36, 41.6, 50, 64	64, 72, 81, 100, 130, 144, 175.78, 200, 225, 256, 288, 332.8, 400, 512			

Ordering Example : AM032 - 16 / MAXON 283872

AM SERIES
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