



Gearheads Size 12
pg. 11-3



Gearheads Size 12
pg. 11-4



Gearheads Size 16
pgs. 11-5 & 11-6



Gearheads Size 20
pg. 11-7



Speed Reducers Size 20
pg. 11-8



Gearheads Size 22
pg. 11-9



Gearheads Size 27
pg. 11-10



Speed Reducers Size 27
pg. 11-11



Gearheads Size 37
pg. 11-12



Gearheads Size 42
pg. 11-13



Speed Reducers & Gearheads Size 42
pg. 11-14



Gearheads Size 43
pg. 11-15



Gearheads Size 48
pgs. 11-16



Gearheads Size 60
pg. 11-17



Speed Reducers & Gearheads Size 60
pg. 11-18



PRX Planetary Gearheads Size 60
pg. 11-22



RTX Planetary Gearheads Size 60
pg. 11-23



PRX Planetary Gearheads Size 90
pg. 11-24



RTX Planetary Gearheads Size 90
pg. 11-25



T-Series Planetary Gearheads Size 60
pg. 11-28

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T-Series Right Angle Planetary Gearheads Size 60 pg. 11-30



T-Series Planetary Gearheads Size 90 pg. 11-32



T-Series Right Angle Planetary Gearheads Size 90 pg. 11-34



T-Series Planetary Gearheads Size 115 pg. 11-36



T-Series Right Angle Planetary Gearheads Size 115 pg. 11-38

Technical Data:

- Planetary Gearhead Types-pg. 11-19
- Planetary Gear Systems-pg. 11-20
- PRX and RTX Planetary Gearheads-pg. 11-21
- T-Series Gearhead Mounting Instruction-pg. 11-26
- Gearhead to Motor Mounting Information-pg. 11-27

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12 mm DIAMETER

PHONE: 516.328.3300 • FAX: 516.326.8827 • WWW.SDP-SI.COM

> MATERIAL:

Gearhead - Housing - Stainless Steel
Mating Motor Pinion - Brass

> OPERATING TEMPERATURE:

-10°C to +60°C

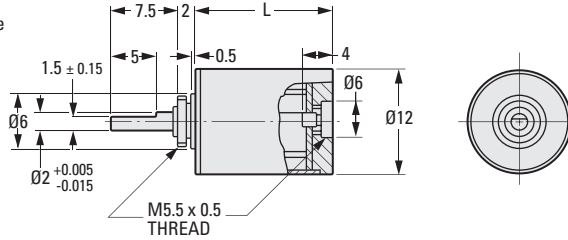
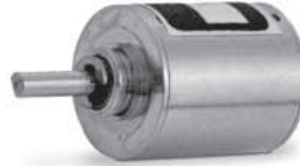
> FEATURES:

Small size, lightweight and compact design.
 The input and output shafts have the same center line.
 Decreased noise and smooth rotation due to the use of high-precision gears.

> SPECIFICATIONS:

Radial Play of Shaft: ≤ 0.07 mm
Thrust Play of Shaft: ≤ 0.2 mm
Shaft Rotation - Same direction relative to input

These gearheads can be used as replacements for **D33S12M...** and **D33S57M28F...** Series gearmotors.



The projections shown are per ISO convention.

METRIC COMPONENT

Catalog Number *	Ratio to 1	Input Pinion Code	L Length	Efficiency %	Maximum Torque N • mm (oz. in.)	
					Continuous	Momentary
Gearheads						
A 2G12M0032	32	1	14.2	66	9.8 (1.4)	29.4 (4.2)
A 2G12M0052	52	1	14.2	66	14.7 (2.1)	34.3 (4.9)
A 2G12M0070	70	1	14.2	66	14.7 (2.1)	34.3 (4.9)
A 2G12M0103	103	2	15.6	60	19.6 (2.8)	39.2 (5.5)
A 2G12M0144	144	2	15.6	60	19.6 (2.8)	39.2 (5.5)

* To be discontinued when present stock is depleted. Similar gearheads are offered as **A 2G12MRB...**

Catalog Number	Pinion Code	Number of Teeth	Module	P.D.	O.D.	Bore +0.012 +0.004	Face Width
Mating Motor Pinion for Gearheads							
A 1B 8MYSH1012	1	12	0.15	1.905	2.205	1	2.5
A 1B 8MYSH1013	2	13	0.15	2.055	2.355	1	2.5

12 mm DIAMETER

PHONE: 516.328.3300 • FAX: 516.326.8827 • WWW.SDP-SI.COM

> MATERIAL:

Gearhead - Housing - Zinc Die Cast
Mating Motor Pinion - Brass

> OPERATING TEMPERATURE:

-10°C to +60°C

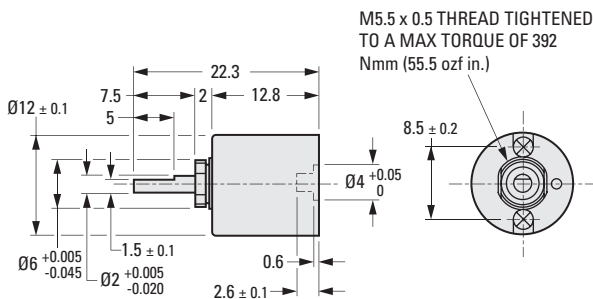
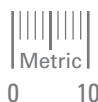
> FEATURES:

Small size, lightweight and compact design.
The input and output shafts have the same centerline.
Decreased noise and smooth rotation due to the use of high-precision gears.

> SPECIFICATIONS:

Radial Play of Shaft: ≤ 0.07 mm
Thrust Play of Shaft: ≤ 0.25 mm

These gearheads can be used as replacements for **D33S12M13...** and **D33S12M18...** Series gearmotors.



The projections shown are per ISO convention.

METRIC COMPONENT

Catalog Number *	Ratio to 1	Shaft Rotation	Efficiency %	Maximum Torque Nmm (ozf in.)
Gearheads				
A 2G12MRB0007	7.49	CW	81	4.9 (.69)
A 2G12MRB0016	15.56	CCW	73	11.8 (1.67)
A 2G12MRB0031	31.12	CW	66	24.5 (3.47)
A 2G12MRB0052	52.25	CW	66	24.5 (3.47)
A 2G12MRB0072	71.99	CW	66	24.5 (3.47)
A 2G12MRB0100	100.22	CCW	59	24.5 (3.47)
A 2G12MRB0144	143.99	CCW	59	24.5 (3.47)
A 2G12MRB0209	208.79	CCW	59	24.5 (3.47)

* To be discontinued when present stock is depleted.

NOTE: CW - same as that of a motor; CCW - opposite of that of a motor

Catalog Number	Number of Teeth	Module	P.D.	O.D.	Bore +0.012 +0.004	Face Width
Mating Motor Pinion for Gearheads						
A 1B 8MYSH1012	12	0.15	1.905	2.205	1	2.5

16 mm DIAMETER

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> MATERIAL:

Gearhead - Housing - Stainless Steel
Mating Motor Pinion - Brass

> OPERATING TEMPERATURE:

-10°C to +60°C

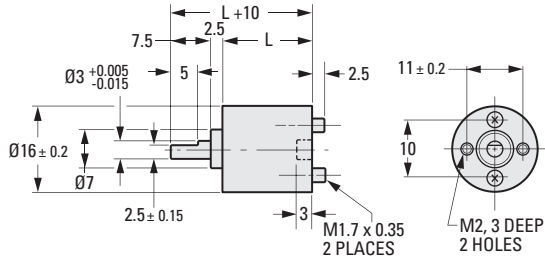
> FEATURES:

Small size, lightweight and compact design.
 The input and output shafts have the same center line.
 Decreased noise and smooth rotation due to the use of high-precision gears.
 Stable quality.

> SPECIFICATIONS:

Radial Play of Shaft: ≤ 0.07 mm
Thrust Play of Shaft: ≤ 0.25 mm
Shaft Rotation - Same direction relative to input

These gearheads can be used as replacements for **D33S16M...**, **D33S57M25H...** and **D33S57M35H...** Series gearmotors.



The projections shown are per ISO convention.

METRIC COMPONENT

Catalog Number *	Ratio to 1	L Length	Efficiency %	Maximum Torque N • mm (oz. in.)	
				Continuous	Momentary
Gearheads					
A 2G16M0010	10.24	14.75	66	9.8 (1.4)	29 (4.1)
A 2G16M0019	19.36	14.75	66	9.8 (1.4)	29 (4.1)
A 2G16M0030	29.9	14.75	66	20 (2.8)	59 (8.4)
A 2G16M0042	41.53	14.75	66	20 (2.8)	59 (8.4)
A 2G16M0050	50.32	14.75	66	29 (4.1)	88 (12.5)
A 2G16M0063	62.66	14.75	66	29 (4.1)	88 (12.5)
A 2G16M0103	102.59	17.05	53	49 (6.9)	147 (20.8)
A 2G16M0157	156.52	17.05	53	49 (6.9)	147 (20.8)
A 2G16M0208	208.03	17.05	53	49 (6.9)	147 (20.8)
A 2G16M0258	257.57	17.05	53	49 (6.9)	147 (20.8)
A 2G16M0366	365.94	17.05	53	49 (6.9)	147 (20.8)
A 2G16M0540	539.82	17.05	53	49 (6.9)	147 (20.8)

* To be discontinued when present stock is depleted. Similar gearheads are offered as **A 2G16MA...** See Index.

Catalog Number	Number of Teeth	Module	P.D.	O.D.	Bore +0.012 +0.004	Face Width
Mating Motor Pinion for Gearheads						
A 1B 8MYSH1015	15	0.15	2.31	2.61	1.5	3.2

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16 mm DIAMETER

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➤ **MATERIAL:**

Gearhead - Housing - Stainless Steel
Mating Motor Pinion - Brass

➤ **OPERATING TEMPERATURE:**

-10°C to +60°C

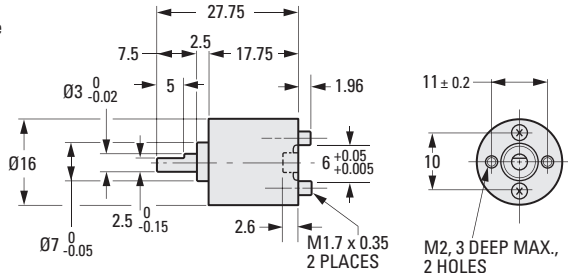
➤ **FEATURES:**

Small size, lightweight and compact design.
The input and output shafts have the same center line.
Decreased noise and smooth rotation due to the use of high-precision gears.
Stable quality.

➤ **SPECIFICATIONS:**

Radial Play of Shaft: ≤ 0.07 mm
Thrust Play of Shaft: ≤ 0.25 mm

These gearheads can be used as replacements for **D33S57M25G...**, **D33S16M255...** and **D33S16M259...** Series gearmotors.



The projections shown are per ISO convention.

METRIC COMPONENT

Catalog Number	Ratio to 1	Efficiency %	Max. Continuous Torque N • mm (oz. in.)
Gearheads			
A 2G16MA0011	10.91	73	12.8 (1.81)
A 2G16MA0019	19.22	73	12.8 (1.81)
A 2G16MA0031	31.06	66	29.4 (4.16)
A 2G16MA0040	40.14	66	34.3 (4.86)
A 2G16MA0055	54.58	66	34.3 (4.86)
A 2G16MA0062	62.37	66	34.3 (4.86)
A 2G16MA0097	97.37	59	49.1 (6.96)
A 2G16MA0150	150.11	59	58.9 (8.34)
A 2G16MA0206	206.45	53	58.9 (8.34)
A 2G16MA0259	258.78	53	58.9 (8.34)
A 2G16MA0375	375.49	53	58.9 (8.34)
A 2G16MA0535	534.96	53	58.9 (8.34)
A 2G16MA0782	781.62	48	58.9 (8.34)
A 2G16MA0992	992.36	48	58.9 (8.34)
A 2G16MA1237	1237.09	48	58.9 (8.34)
A 2G16MA1414	1413.82	48	58.9 (8.34)

Catalog Number	No. of Teeth	Module	P.D.	O.D.	Bore -0.02 -0.04	Face Width	For Ratio to 1
Mating Motor Pinion for Gearheads							
A 1B 8MYS01515	15	0.15	2.295	2.595	1.5	1.7	19.22, 62.37, 97.37, 15.011, 375.49, 534.96, 781.62, 992.36, 1413.82
A 1B 8MYS02012	15	0.2	2.452	2.852	1.5	1.7	10.91, 31.06, 40.14, 54.58, 206.45, 258.78, 1237.09

20 mm DIAMETER

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> MATERIAL:

Gearhead - Housing - Zinc Die Cast
Shaft & Gears - Steel
Bearings - Bronze
Mating Motor Pinion - Brass



> OPERATING TEMPERATURE:

-10°C to +60°C

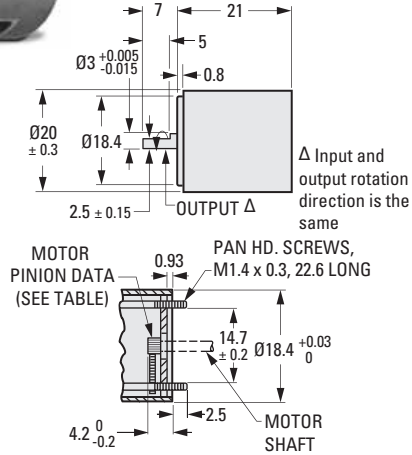
> SPECIFICATIONS:

Radial Play of Shaft: ≤ 0.1 mm
Thrust Play of Shaft: ≤ 0.18 mm
Backlash: 2° at output shaft

> WEIGHT:

17 g

Gearhead (Mounting Screws supplied)
 These gearheads can be used as replacements for **D33S20ME20...D** and **D33S57M20K...** Series gearmotors.



METRIC COMPONENT

Catalog Number *	Gear Ratio to 1	Input Pinion Code	Efficiency %	Maximum Torque N • mm (oz. in.)	
				Continuous	Momentary
Gearheads with flat					
A 2G10M0005F	5	2	81	9.8 (1.4)	49 (6.9)
A 2G10M0020F	20	2	66	9.8 (1.4)	49 (6.9)
A 2G10M0025F	25	2	68	15 (2.1)	74 (10.5)
A 2G10M0040F	40	3	68	15 (2.1)	74 (10.5)
A 2G10M0045F	45	3	68	15 (2.1)	74 (10.5)
A 2G10M0050F	50	2	66	20 (2.8)	98 (13.9)
A 2G10M0060F	60	2	66	20 (2.8)	98 (13.9)
A 2G10M0075F	75	1	66	20 (2.8)	98 (13.9)
A 2G10M0100F	100	2	53	29 (4.1)	147 (20.8)
A 2G10M0120F	120	3	53	29 (4.1)	147 (20.8)
A 2G10M0180F	180	3	53	29 (4.1)	147 (20.8)
A 2G10M0200F	200	2	53	29 (4.1)	147 (20.8)
A 2G10M0250F	250	2	53	29 (4.1)	147 (20.8)
A 2G10M0300F	300	2	53	49 (6.9)	245 (34.7)
A 2G10M0360F	360	2	53	49 (6.9)	245 (34.7)
A 2G10M0450F	450	1	53	49 (6.9)	245 (34.7)
A 2G10M0500F	500	1	53	49 (6.9)	245 (34.7)
A 2G10M0750F	750	1	53	49 (6.9)	245 (34.7)
A 2G10M1000F	1000	1	53	49 (6.9)	245 (34.7)
A 2G10M1500F	1500	2	48	49 (6.9)	245 (34.7)
A 2G10M1800F	1800	3	48	49 (6.9)	245 (34.7)
A 2G10M3000F	3000	2	48	49 (6.9)	245 (34.7)
A 2G10M4000F	4000	2	48	49 (6.9)	245 (34.7)
A 2G10M6000F	6000	3	48	49 (6.9)	245 (34.7)

* To be discontinued when present stock is depleted.

Catalog Number	Pinion Code	Number of Teeth	Module	P.D.	O.D.	Bore -0.01 -0.03	Face Width
Mating Motor Pinion for Gearheads							
A 1B 8MYS02014	1	14	0.2	2.9	3.3	2	2.8
A 1B 8MYS02015	2	15	0.25	3.75	4.25	2	2.8
A 1B 8MYS02020	3	20	0.2	4.1	4.5	2	2.8

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20 mm DIAMETER

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> MATERIAL:

- Housing - Zinc Die Cast
- Flange - Machined Aluminum
- Shafts & Gears - Steel
- Bearings - Bronze

> OPERATING TEMPERATURE:

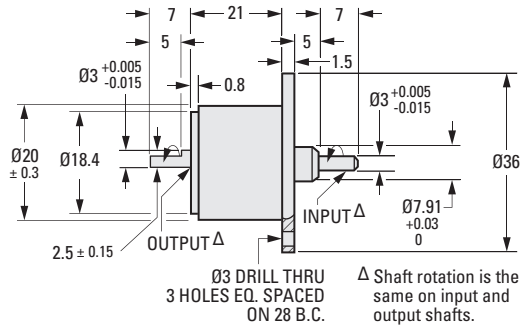
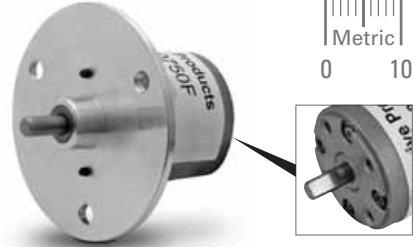
-10°C to +60°C

> SPECIFICATIONS:

- Radial Play of Shaft: ≤ 0.1 mm
- Thrust Play of Shaft: ≤ 0.18 mm
- Backlash: 2° at output shaft

> WEIGHT:

20 g



METRIC COMPONENT

Catalog Number **	Ratio to 1	Input Pinion Code*	Efficiency %	Maximum Torque N • mm (oz. in.)	
				Continuous	Momentary
Speed Reducers with Flat					
A 2210M0005F	5	2	81	9.8 (1.4)	49 (6.9)
A 2210M0010F	10	1	81	9.8 (1.4)	49 (6.9)
A 2210M0015F	15	3	66	9.8 (1.4)	49 (6.9)
A 2210M0020F	20	2	66	9.8 (1.4)	49 (6.9)
A 2210M0025F	25	2	68	15 (2.1)	74 (10.5)
A 2210M0030F	30	3	68	15 (2.1)	74 (10.5)
A 2210M0040F	40	3	68	15 (2.1)	74 (10.5)
A 2210M0045F	45	3	68	15 (2.1)	74 (10.5)
A 2210M0050F	50	2	66	20 (2.8)	98 (13.9)
A 2210M0060F	60	2	66	20 (2.8)	98 (13.9)
A 2210M0075F	75	1	66	20 (2.8)	98 (13.9)
A 2210M0100F	100	2	53	29 (4.1)	147 (20.8)
A 2210M0120F	120	3	53	29 (4.1)	147 (20.8)
A 2210M0180F	180	3	53	29 (4.1)	147 (20.8)
A 2210M0200F	200	3	53	29 (4.1)	147 (20.8)
A 2210M0250F	250	2	53	29 (4.1)	147 (20.8)
A 2210M0300F	300	2	53	49 (6.9)	245 (34.7)
A 2210M0360F	360	2	53	49 (6.9)	245 (34.7)
A 2210M0450F	450	1	53	49 (6.9)	245 (34.7)
A 2210M0500F	500	1	53	49 (6.9)	245 (34.7)
A 2210M0750F	750	1	53	49 (6.9)	245 (34.7)
A 2210M1000F	1000	1	53	49 (6.9)	245 (34.7)
A 2210M1500F	1500	3	48	49 (6.9)	245 (34.7)
A 2210M1800F	1800	3	48	49 (6.9)	245 (34.7)
A 2210M3000F	3000	2	48	49 (6.9)	245 (34.7)
A 2210M4000F	4000	2	48	49 (6.9)	245 (34.7)
A 2210M6000F	6000	3	48	49 (6.9)	245 (34.7)

* See pages 11-7 for pinion.

** To be discontinued when present stock is depleted.

22 mm DIAMETER

PHONE: 516.328.3300 • FAX: 516.326.8827 • WWW.SDP-SI.COM

> MATERIAL:

Housing - Stainless Steel
Mating Motor Pinion - Steel

> OPERATING TEMPERATURE:

-10°C to +60°C

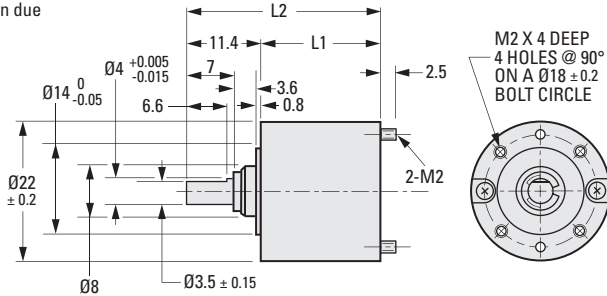
> FEATURES:

Small size, lightweight and compact design.
 The input and output shafts have the same center line.
 Decreased noise and smooth rotation due to the use of high-precision gears.
 Stable quality.

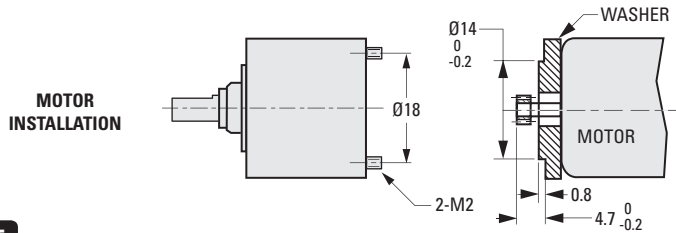
> SPECIFICATIONS:

Radial Play of Shaft: ≤ 0.10 mm
Thrust Play of Shaft: ≤ 0.35 mm

These gearheads can be used as replacements for **D33S57M46C...**, **D33S22MG12...** and **D33S22MG24...** Series gearmotors. See index.



The projections shown are per ISO convention.



METRIC COMPONENT

Catalog Number	Ratio to 1	L1 Length	L2 Overall Length	Efficiency %	Max. Continuous Torque N • m (lb. in.)
Gearheads					
A 2G22MG0005D	4.5	15.5	26.9	81	0.029 (.257)
A 2G22MG0016D	15.58	15.5	26.9	66	0.049 (.434)
A 2G22MG0020D	20.25	15.5	26.9	66	0.049 (.434)
A 2G22MG0024D	23.88	15.5	26.9	66	0.049 (.434)
A 2G22MG0062D	61.5	18.7	30.1	53	0.098 (.867)
A 2G22MG0107D	107.48	18.7	30.1	53	0.098 (.867)
A 2G22MG0243D	242.79	21.9	33.3	43	0.147 (1.30)
A 2G22MG0326D	326.46	21.9	33.3	43	0.147 (1.30)
A 2G22MG0410D	410.06	21.9	33.3	43	0.196 (1.73)
A 2G22MG0484D	483.66	21.9	33.3	43	0.196 (1.73)

Catalog Number	No. of Teeth	Module	P.D.	O.D.	Bore -0.01 -0.03	Face Width	For Ratio to 1
Mating Motor Pinion for Gearheads							
A 1C 8MYSH2016	16	0.25	3.9	4.4	2	2.5	4.5, 20.25, 410.06
A 1C 8MYSH2019	19	0.25	4.75	5.25	2	2.5	15.58, 61.5, 242.79
A 1C 8MYSH2013	13	0.25	3.25	3.75	2	2.5	23.88, 107.48, 326.46, 483.66

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27 mm DIAMETER

PHONE: 516.328.3300 • FAX: 516.326.8827 • WWW.SDP-SI.COM

› **MATERIAL:**

- Housing - Zinc Die Cast
- Shaft & Gears - Steel
- Bearings - Bronze
- Mating Motor Pinion - Brass

› **OPERATING TEMPERATURE:**

-10°C to +60°C

› **SPECIFICATIONS:**

- Radial Play of Shaft: ≤ 0.1 mm
- Thrust Play of Shaft: ≤ 0.18 mm
- Backlash: 1-1/2° at output shaft

› **WEIGHT:**

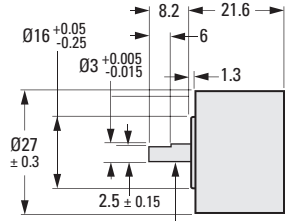
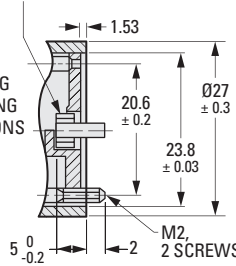
30 g

Gearhead (Mounting Screws supplied)
 These gearheads can be used as replacements for D33S57M46D... Series Gearmotors.



MOTOR PINION DATA (SEE TABLE)

HOUSING MOUNTING DIMENSIONS



OUTPUT *

* Input and output rotation direction is the same

METRIC COMPONENT

Catalog Number **	Gear Ratio to 1	Efficiency %	Maximum Torque N • mm (oz. • in.)	
			Continuous	Momentary
Gearheads with Flat				
A 2G13M0005F	5	81	9.8 (1.4)	49 (6.9)
A 2G13M0008F	8	81	9.8 (1.4)	49 (6.9)
A 2G13M0010F	10	81	9.8 (1.4)	49 (6.9)
A 2G13M0020F	20	66	14.7 (2.1)	73.5 (10.4)
A 2G13M0025F	25	66	14.7 (2.1)	73.5 (10.4)
A 2G13M0030F	30	66	19.6 (2.8)	98.1 (13.9)
A 2G13M0040F	40	66	19.6 (2.8)	98.1 (13.9)
A 2G13M0050F	50	66	39.2 (5.6)	196 (27.8)
A 2G13M0060F	60	66	39.2 (5.6)	196 (27.8)
A 2G13M0075F	75	66	39.2 (5.6)	196 (27.8)
A 2G13M0080F	80	66	39.2 (5.6)	196 (27.8)
A 2G13M0090F	90	66	39.2 (5.6)	196 (27.8)
A 2G13M0100F	100	66	58.8 (8.3)	294.2 (41.7)
A 2G13M0120F	120	66	58.8 (8.3)	294.2 (41.7)
A 2G13M0150F	150	66	58.8 (8.3)	294.2 (41.7)
A 2G13M0200F	200	53	58.8 (8.3)	294.2 (41.7)
A 2G13M0300F	300	53	98.1 (13.9)	490 (69.4)
A 2G13M0500F	500	53	98.1 (13.9)	490 (69.4)
A 2G13M0600F	600	53	98.1 (13.9)	490 (69.4)
A 2G13M0750F	750	53	98.1 (13.9)	490 (69.4)
A 2G13M1000F	1000	53	98.1 (13.9)	490 (69.4)
A 2G13M1200F	1200	53	98.1 (13.9)	490 (69.4)
A 2G13M1500F	1500	53	98.1 (13.9)	490 (69.4)
A 2G13M2000F	2000	43	58.8 (8.3)	294.2 (41.7)
A 2G13M3000F	3000	43	58.8 (8.3)	294.2 (41.7)
A 2G13M3600F	3600	43	58.8 (8.3)	294.2 (41.7)
A 2G13M6000F	6000	43	58.8 (8.3)	294.2 (41.7)

** To be discontinued when present stock is depleted.

Catalog Number	Number of Teeth	Module	P.D.	O.D.	Bore -0.01 -0.03	Face Width
Mating Motor Pinion for Gearheads						
A 1B 8MYS02020	20	0.2	4.1	4.5	2	2.8

27 mm DIAMETER

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> MATERIAL:

- Housing** - Zinc Die Cast
- Flange** - Machined Aluminum
- Shafts & Gears** - Steel
- Bearings** - Bronze

> OPERATING TEMPERATURE:

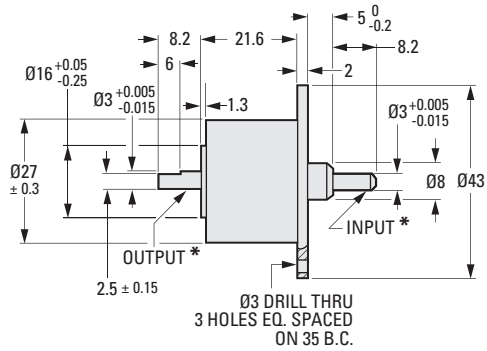
-10°C to +60°C

> SPECIFICATIONS:

- Radial Play of Shaft:** ≤ 0.1 mm
- Thrust Play of Shaft:** ≤ 0.18 mm
- Backlash:** 1-1/2° at output shaft

> WEIGHT:

40 g



METRIC COMPONENT

Catalog Number **	Ratio to 1	Efficiency %	Maximum Torque N • mm (oz. in.)	
			Continuous	Momentary
Speed Reducers with Flat				
A 2Z13M0005F	5	81	9.8 (1.4)	49 (6.9)
A 2Z13M0008F	8	81	9.8 (1.4)	49 (6.9)
A 2Z13M0010F	10	81	9.8 (1.4)	49 (6.9)
A 2Z13M0020F	20	66	14.7 (2.1)	73.5 (10.4)
A 2Z13M0025F	25	66	14.7 (2.1)	73.5 (10.4)
A 2Z13M0030F	30	66	19.6 (2.8)	98.1 (13.9)
A 2Z13M0040F	40	66	19.6 (2.8)	98.1 (13.9)
A 2Z13M0050F	50	66	39.2 (5.6)	196 (27.8)
A 2Z13M0060F	60	66	39.2 (5.6)	196 (27.8)
A 2Z13M0075F	75	66	39.2 (5.6)	196 (27.8)
A 2Z13M0080F	80	66	39.2 (5.6)	196 (27.8)
A 2Z13M0090F	90	66	39.2 (5.6)	196 (27.8)
A 2Z13M0100F	100	66	58.8 (8.3)	294.2 (41.7)
A 2Z13M0120F	120	66	58.8 (8.3)	294.2 (41.7)
A 2Z13M0150F	150	66	58.8 (8.3)	294.2 (41.7)
A 2Z13M0200F	200	53	58.8 (8.3)	294.2 (41.7)
A 2Z13M0300F	300	53	98.1 (13.9)	490 (69.4)
A 2Z13M0500F	500	53	98.1 (13.9)	490 (69.4)
A 2Z13M0600F	600	53	98.1 (13.9)	490 (69.4)
A 2Z13M0750F	750	53	98.1 (13.9)	490 (69.4)
A 2Z13M1000F	1000	53	98.1 (13.9)	490 (69.4)
A 2Z13M1200F	1200	53	98.1 (13.9)	490 (69.4)
A 2Z13M1500F	1500	53	98.1 (13.9)	490 (69.4)
A 2Z13M2000F	2000	43	58.8 (8.3)	294.2 (41.7)
A 2Z13M3000F	3000	43	58.8 (8.3)	294.2 (41.7)
A 2Z13M3600F	3600	43	58.8 (8.3)	294.2 (41.7)
A 2Z13M6000F	6000	43	58.8 (8.3)	294.2 (41.7)

* Shaft rotation is the same on input and output shaft.
 ** To be discontinued when present stock is depleted.

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37 mm DIAMETER

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➤ **MATERIAL:**

- Housing - Die Cast Aluminum
- Gears - Steel
- Mating Motor Pinion - Brass

➤ **OPERATING TEMPERATURE:**

-10°C to +60°C

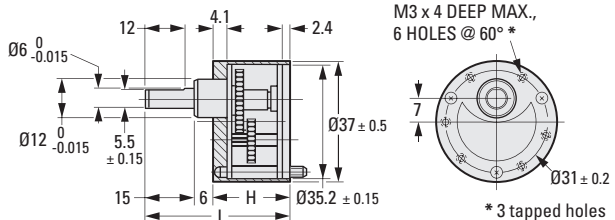
➤ **FEATURES:**

- Small size and high output.
- The input and output shafts have different center lines.
- Decreased noise and smooth rotation due to the use of high-precision gears.
- Stable quality.
- Excellent durability.

➤ **SPECIFICATIONS:**

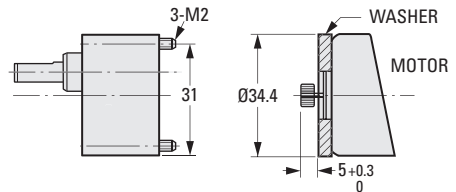
- Radial Play of Shaft: ≤ 0.1 mm
- Thrust Play of Shaft: ≤ 0.35 mm

These gearheads can be used as replacements for **D33S35M...** and **D33S57M35A...** Series gearmotors.



The projections shown are per ISO convention.

MOTOR INSTALLATION



METRIC COMPONENT

Catalog Number	Gear Ratio to 1	H	L	Efficiency %	Maximum Torque N • m (lb • in.)	
					Continuous	Momentary
Gearheads with Flat						
A 2G23MA0006	6	19	40	81	0.10 (0.9)	0.29 (2.6)
A 2G23MA0010	10	19	40	81	0.10 (0.9)	0.29 (2.6)
A 2G23MA0018	18	21.5	42.5	73	0.10 (0.9)	0.29 (2.6)
A 2G23MA0030	30	21.5	42.5	73	0.20 (1.8)	0.59 (5.2)
A 2G23MA0050	50	24	45	66	0.29 (2.6)	0.88 (7.8)
A 2G23MA0060	60	24	45	66	0.29 (2.6)	0.88 (7.8)
A 2G23MA0075	75	24	45	66	0.39 (3.4)	1.18 (10.4)
A 2G23MA0100	100	24	45	66	0.59 (5.2)	1.77 (15.7)
A 2G23MA0120	120	26.5	47.5	59	0.59 (5.2)	1.77 (15.7)
A 2G23MA0150	150	26.5	47.5	59	0.59 (5.2)	1.77 (15.7)
A 2G23MA0180	180	26.5	47.5	59	0.59 (5.2)	1.77 (15.7)
A 2G23MA0200	200	26.5	47.5	59	0.59 (5.2)	1.77 (15.7)
A 2G23MA0250	250	26.5	47.5	59	0.59 (5.2)	1.77 (15.7)
A 2G23MA0300	300	26.5	47.5	59	0.59 (5.2)	1.77 (15.7)
A 2G23MA0400	400	29	50	53	0.59 (5.2)	1.77 (15.7)
A 2G23MA0500	500	29	50	53	0.59 (5.2)	1.77 (15.7)
A 2G23MA0600	600	29	50	53	0.59 (5.2)	1.77 (15.7)
A 2G23MA0750	750	29	50	53	0.59 (5.2)	1.77 (15.7)
A 2G23MA1000	1000	29	50	53	0.59 (5.2)	1.77 (15.7)
A 2G23MA1500	1500	31.5	52.5	48	0.59 (5.2)	1.77 (15.7)
A 2G23MA3000	3000	31.5	52.5	48	0.59 (5.2)	1.77 (15.7)

Catalog Number	Number of Teeth	Module	P.D.	O.D.	Bore -0.02 -0.04	Face Width
Mating Motor Pinion for Gearheads						
A 1B 8MYS05010	10	0.5	5.24	6.24	2	4

> MATERIAL:

- Housing** - Die Cast Aluminum
- Gears** - Steel
- Mating Motor Pinion** - Steel

> OPERATING TEMPERATURE:

-10°C to +60°C

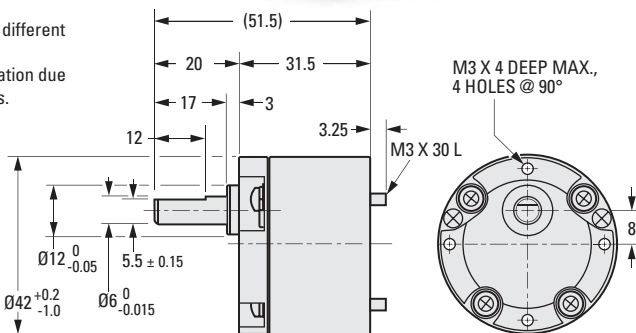
> FEATURES:

- Small size and high output.
- The input and output shafts have different center lines.
- Decreased noise and smooth rotation due to the use of high-precision gears.
- Stable quality.
- Excellent durability.

> SPECIFICATIONS:

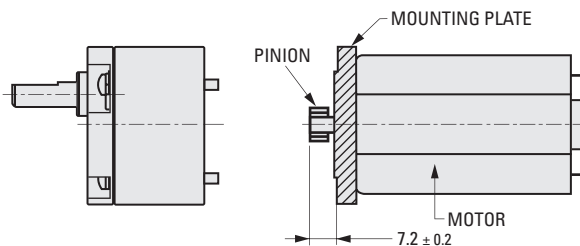
- Radial Play of Shaft:** ≤ 0.1 mm
- Thrust Play of Shaft:** ≤ 0.35 mm

These gearheads can be used as replacements for **D33S38M...** Series gearmotors. See index.



The projections shown are per ISO convention.

MOTOR INSTALLATION



METRIC COMPONENT

Catalog Number *	Gear Ratio to 1	Efficiency %	Max. Continuous Torque Nm (lbf in.)
Gearheads			
A 2G33M0011	11.73	73	0.29 (2.57)
A 2G33M0030	30	66	0.49 (4.34)
A 2G33M0033	33.16	66	0.49 (4.34)
A 2G33M0050	50	66	0.88 (7.79)
A 2G33M0062	62.31	66	0.98 (8.67)
A 2G33M0090	90	66	0.98 (8.67)
A 2G33M0099	99.47	59	0.98 (8.67)
A 2G33M0150	150	59	0.98 (8.67)
A 2G33M0186	186.92	59	0.98 (8.67)
A 2G33M0270	270	59	0.98 (8.67)

* To be discontinued when present stock is depleted.

Catalog Number	Motor Shaft Dia.	No. of Teeth	Module	P.D.	O.D.	Bore -0.014 -0.030	Face Width
Mating Motor Pinion for Gearheads							
A 1C 8MYS04014A	3	14	0.4	5.84	6.64	3	4.5
A 1C 8MYS04014B	4	14	0.4	5.84	6.64	4	4.5

42 mm DIAMETER
LIGHT-DUTY

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> MATERIAL:

- Housing - Steel, Zinc Chromate Finish
- Shaft & Gears - Steel
- Bearings - Bronze
- Mating Motor Pinion - Brass



SPEED REDUCER

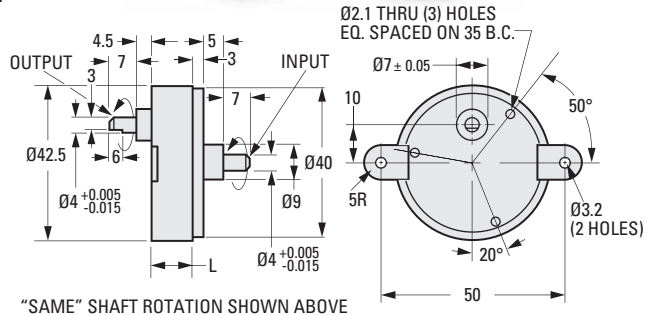
GEARHEAD Δ

> OPERATING TEMPERATURE:

-10°C to +60°C

> SPECIFICATIONS:

- Radial Play of Shaft: ≤ 0.1 mm
- Thrust Play of Shaft: ≤ 0.35 mm
- Backlash: 2° at output shaft



"SAME" SHAFT ROTATION SHOWN ABOVE

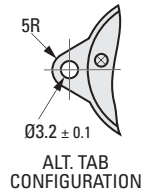
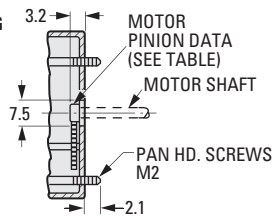
> WEIGHT:

65 g

- Δ Gearhead
- Less Flange & Pinion
- Mounting Screws supplied

HOUSING MOUNTING DIMENSIONS

The projections shown are per ISO convention.



METRIC COMPONENT

Catalog Number *		Gear Ratio to 1	L	Shaft Rotation	Efficiency %	Maximum Torque N • m (lb. in.)	
Speed Reducers	Gearheads Only					Continuous	Momentary
A 2Z15M00020	A 2G15M00020	20	11.3	Same	81	0.01 (.09)	0.05 (.44)
A 2Z15M00030	A 2G15M00030	30	11.3	Same	81	0.02 (.18)	0.1 (.90)
A 2Z15M00050	-	50	11.3	Reverse	73	0.04 (.35)	0.2 (.18)
A 2Z15M00060	A 2G15M00060	60	11.3	Reverse	73	0.04 (.35)	0.2 (.18)
A 2Z15M00100	A 2G15M00100	100	11.3	Reverse	73	0.06 (.53)	0.3 (2.7)
A 2Z15M00150	A 2G15M00150	150	11.3	Reverse	73	0.06 (.53)	0.3 (2.7)
A 2Z15M00200	A 2G15M00200	200	11.3	Same	66	0.08 (.71)	0.4 (3.5)
A 2Z15M00250	A 2G15M00250	250	11.3	Same	66	0.08 (.71)	0.4 (3.5)
A 2Z15M00300	-	300	11.3	Same	66	0.08 (.71)	0.4 (3.5)
A 2Z15M00400	A 2G15M00400	400	11.3	Same	66	0.08 (.71)	0.4 (3.5)
A 2Z15M00500	A 2G15M00500	500	11.3	Same	66	0.1 (.89)	0.5 (4.4)
A 2Z15M00750	A 2G15M00750	750	11.3	Same	66	0.1 (.89)	0.5 (4.4)
A 2Z15M01000	A 2G15M01000	1000	11.3	Reverse	59	0.1 (.89)	0.5 (4.4)
A 2Z15M01500	A 2G15M01500	1500	11.3	Reverse	59	0.1 (.89)	0.5 (4.4)
A 2Z15M02000	A 2G15M02000	2000	11.3	Reverse	59	0.1 (.89)	0.5 (4.4)
A 2Z15M03000	A 2G15M03000	3000	11.3	Reverse	59	0.1 (.89)	0.5 (4.4)
A 2Z15M15000	A 2G15M15000	15000	14.4	Same	-	0.1 (.89)	0.5 (4.4)
-	A 2G15M30000	30000	14.4	Reverse	-	0.1 (.89)	0.5 (4.4)
-	A 2G15M90000	90000	14.4	Reverse	-	0.1 (.89)	0.5 (4.4)

* To be discontinued when present stock is depleted.

Catalog Number	Number of Teeth	Module	P.D.	O.D.	Bore -0.02 -0.04	Face Width
Mating Motor Pinion for Gearheads						
A 1B 8MYS03010	10	0.3	3.15	3.75	2	2

43 mm SQUARE HOUSING

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> MATERIAL:

- Housing** - Machined Aluminum
- Gears** - Steel
- Mating Motor Pinion** - Steel

> OPERATING TEMPERATURE:

-10°C to +60°C

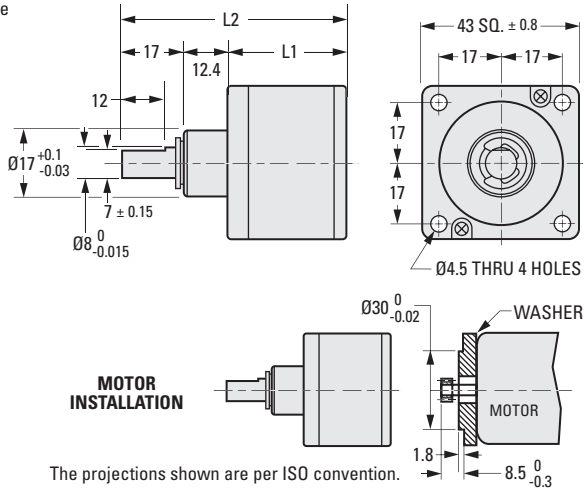
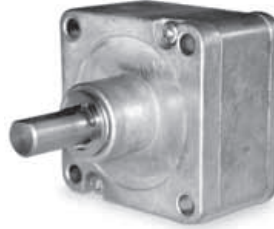
> FEATURES:

- Small size and high output.
- Decreased noise and smooth rotation due to the use of high-precision gears.
- Stable quality.
- Excellent durability.

> SPECIFICATIONS:

- Radial Play of Shaft:** ≤ 0.1 mm
- Thrust Play of Shaft:** ≤ 0.5 mm

These gearheads can be used as replacements for **D33S43ME38... & D33S43MFST...** Series gearmotors. See index.



MOTOR INSTALLATION

The projections shown are per ISO convention.

METRIC COMPONENT

Catalog Number *	Ratio to 1	L1 Length	L2 Overall Length	Efficiency %	Max. Continuous Torque N • m (lb. in.)
Gearheads					
A 2G32ME0014	14	25.9	55.3	66	0.88 (7.79)
A 2G32ME0017	17.3	25.9	55.3	66	0.88 (7.79)
A 2G32ME0024	24	25.9	55.3	66	0.88 (7.79)
A 2G32ME0049	49	32.7	62.1	53	1.96 (17.35)
A 2G32ME0061	60.7	32.7	62.1	53	1.96 (17.35)
A 2G32ME0104	104	32.7	62.1	53	1.96 (17.35)
A 2G32ME0144	144	32.7	62.1	53	1.96 (17.35)
A 2G32ME0213	212.3	39.4	68.8	43	1.96 (17.35)
A 2G32ME0294	294	39.4	68.8	43	1.96 (17.35)
A 2G32ME0624	624	39.4	68.8	43	1.96 (17.35)
A 2G32ME0864	864	39.4	68.8	43	1.96 (17.35)

* To be discontinued when present stock is depleted.

Catalog Number *	No. of Teeth	Module	P.D.	O.D.	Bore -0.015 -0.035	Face Width	For Ratio to 1
Mating Motor Pinion for Gearheads							
A 1C 8MYS06012	12	0.6	7.2	8.4	4	4	24, 84, 104, 144, 294, 504, 624, 864
A 1C 8MYS06018	18	0.6	10.7	11.9	4	4	17.3, 60.7, 212.3
A 1C 8MYS06024	24	0.6	14.3	15.5	4	4	14, 49

* To be discontinued when present stock is depleted.

48 mm SQUARE HOUSING

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> MATERIAL:

- Housing - Machined Aluminum
- Shafts & Gears - Steel
- Bearings - Bronze
- Mating Motor Pinion - Steel

> OPERATING TEMPERATURE:

-10°C to +60°C

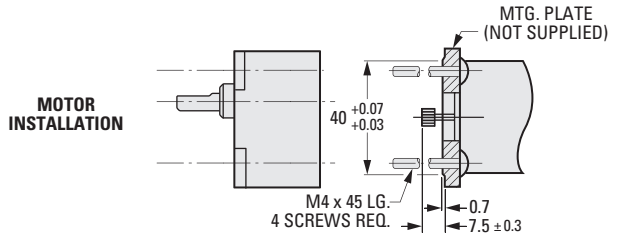
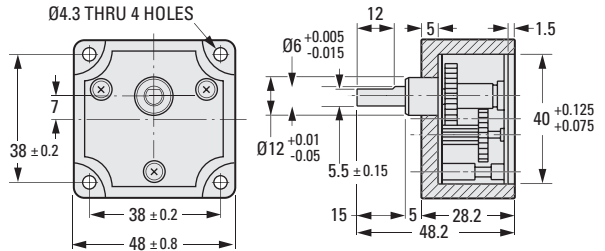
> FEATURES:

- Small size and high output.
- The input and output shafts have different center lines.
- Decreased noise and smooth rotation due to the use of high-precision gears.
- Stable quality.
- Excellent durability.

> SPECIFICATIONS:

- Radial Play of Shaft: ≤ 0.1 mm
- Thrust Play of Shaft: ≤ 0.3 mm

These gearheads can be used as replacements for **D33S40M...** and **D33S57M40B...** Series gearmotors.



METRIC COMPONENT

Catalog Number *	Ratio to 1	Shaft Rotation	Efficiency %	Maximum Torque N • m (lb. in.)	
				Continuous	Momentary
Gearheads					
A 2G31MB0013	12.67	Same	81	0.29 (2.6)	0.88 (7.8)
A 2G31MB0026	26.31	Reverse	73	0.49 (4.3)	1.47 (13)
A 2G31MB0030	29.56	Reverse	73	0.49 (4.3)	1.47 (13)
A 2G31MB0051	50.66	Reverse	73	0.49 (4.3)	1.47 (13)
A 2G31MB0152	152	Same	66	0.98 (8.7)	2.94 (26)

* To be discontinued when present stock is depleted.

Catalog Number	Number of Teeth	Module	P.D.	O.D.	Bore -0.014 -0.030	Face Width
Mating Motor Pinion for Gearheads						
A 1C 8MYS04012	12	0.4	4.88	5.68	3	4

60 mm SQUARE HOUSING
HIGH TORQUE

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> MATERIAL:

- Housing** - Machined Aluminum
- Shafts & Gears** - Steel
- Bearings** - Bronze
- Mating Motor Pinion** - Brass

> OPERATING TEMPERATURE:

-10°C to +60°C

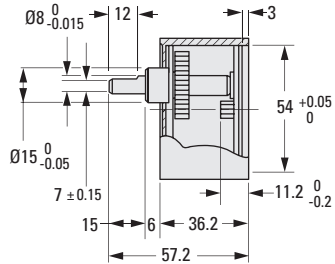
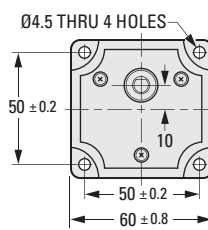
> FEATURES:

- Small size and high output.
- The input and output shafts have different center lines.
- Decreased noise and smooth rotation due to the use of high-precision gears.
- Stable quality.
- Excellent durability.

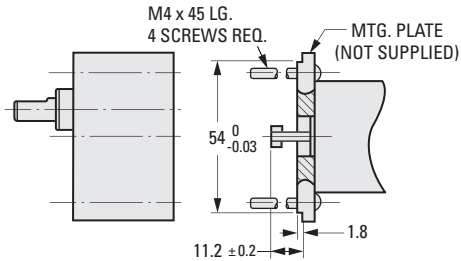
> SPECIFICATIONS:

- Radial Play of Shaft:** ≤ 0.1 mm
- Thrust Play of Shaft:** ≤ 0.5 mm

These gearheads can be used as replacements for **D33S52M...** and **D33S57M54D...** Series gearmotors.



MOTOR INSTALLATION



METRIC COMPONENT

Catalog Number *	Ratio to 1	Shaft Rotation	Efficiency %	Maximum Torque N • m (lb. in.)	
				Continuous	Momentary
Gearheads					
A 2G30MD0030	30	Reverse	73	0.78 (6.9)	2.35 (20.8)
A 2G30MD0060	60	Same	66	1.96 (17.3)	5.88 (52)
A 2G30MD0090	90	Same	66	1.96 (17.3)	5.88 (52)
A 2G30MD0140	140	Same	66	1.96 (17.3)	5.88 (52)
A 2G30MD0160	160	Same	66	1.96 (17.3)	5.88 (52)

* To be discontinued when present stock is depleted.

Catalog Number	Number of Teeth	Module	P.D.	O.D.	Bore -0.02 -0.04	Face Width
Mating Motor Pinion for Gearheads						
A 1B 8MYS05012	12	0.5	6.2	7.2	4	4

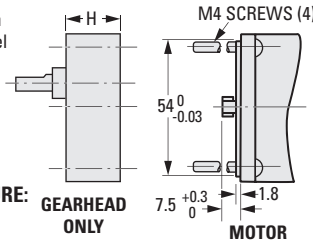
60 mm SQUARE HOUSING

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> MATERIAL:

- Housing** - Die Cast Aluminum
- Bracket** - Steel, Black Enamel
- Shaft** - Steel
- Gears** - Steel & Phenolic
- Bearings** - Input - Ball
- Output - Bronze
- Mating Motor Pinion** - Brass

The projections shown are per ISO convention.



> OPERATING TEMPERATURE:

-10°C to +60°C

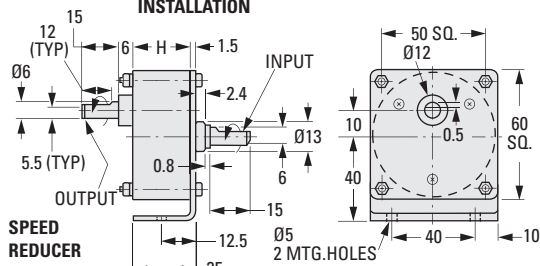
> SPECIFICATIONS:

- Radial Play of Shaft: ≤ 0.1 mm
- Thrust Play of Shaft: ≤ 0.3 mm

> APPROX. WEIGHT:

0.026 kg (Speed Reducer)

These gearheads can be used as replacements for A 3G25M... & D33S54M... Series gearmotors



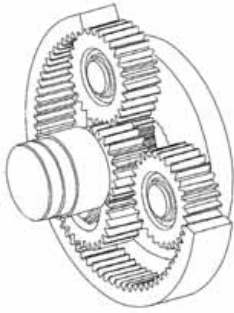
"SAME" SHAFT ROTATION SHOWN ABOVE

METRIC COMPONENT

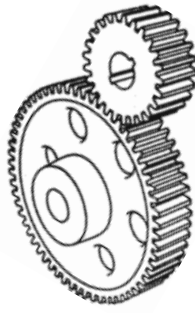
Catalog Number *		Gear Ratio to 1	Shaft Rotation	H	Efficiency %	Maximum Torque N • m (lb. in.)	
Speed Reducers	Gearheads Only					Continuous	Momentary
A 2Z25M0006	-	6	Same	19	81	0.1 (0.9)	0.3 (2.7)
A 2Z25M0008	A 2G25M0008	7.5	Same	19	81	0.1 (0.9)	0.3 (2.7)
A 2Z25M0010	A 2G25M0010	10	Same	19	81	0.2 (1.8)	0.6 (5.3)
A 2Z25M0012H	A 2G25M0012H	12.5	Reverse	19	81	0.2 (1.8)	0.6 (5.3)
A 2Z25M0020	A 2G25M0020	20	Same	19	81	0.3 (2.7)	0.9 (8.0)
A 2Z25M0025	A 2G25M0025	25	Reverse	21.5	73	0.4 (3.5)	1.18 (10.4)
A 2Z25M0030	A 2G25M0030	30	Reverse	21.5	73	0.4 (3.5)	1.18 (10.4)
A 2Z25M0036	A 2G25M0036	36	Reverse	21.5	73	0.4 (3.5)	1.18 (10.4)
A 2Z25M0040	A 2G25M0040	40	Reverse	21.5	73	0.4 (3.5)	1.18 (10.4)
A 2Z25M0050	A 2G25M0050	50	Reverse	21.5	73	0.7 (6.2)	2.07 (18.3)
A 2Z25M0060	A 2G25M0060	60	Reverse	21.5	73	0.7 (6.2)	2.07 (18.3)
A 2Z25M0100	A 2G25M0100	100	Reverse	21.5	73	1 (8.9)	2.96 (26.2)
A 2Z25M0120	A 2G25M0120	120	Same	24	66	1 (8.9)	2.96 (26.2)
A 2Z25M0150	A 2G25M0150	150	Same	24	66	1 (8.9)	2.96 (26.2)
A 2Z25M0180	A 2G25M0180	180	Same	24	66	1 (8.9)	2.96 (26.2)
A 2Z25M0200	A 2G25M0200	200	Same	24	66	1 (8.9)	2.96 (26.2)
A 2Z25M0250	A 2G25M0250	250	Same	24	66	1 (8.9)	2.96 (26.2)
A 2Z25M0300	A 2G25M0300	300	Same	24	66	1 (8.9)	2.96 (26.2)
A 2Z25M0360	A 2G25M0360	360	Same	24	66	1 (8.9)	2.96 (26.2)
A 2Z25M0450	A 2G25M0450	450	Reverse	26.5	59	1 (8.9)	2.96 (26.2)
A 2Z25M0500	A 2G25M0500	500	Same	24	66	1 (8.9)	2.96 (26.2)
A 2Z25M0750	A 2G25M0750	750	Reverse	26.5	59	1 (8.9)	2.96 (26.2)
A 2Z25M0900	A 2G25M0900	900	Reverse	26.5	59	1 (8.9)	2.96 (26.2)
A 2Z25M1000	A 2G25M1000	1000	Reverse	26.5	59	1 (8.9)	2.96 (26.2)
A 2Z25M1200	A 2G25M1200	1200	Reverse	26.5	59	1 (8.9)	2.96 (26.2)
A 2Z25M1500	A 2G25M1500	1500	Reverse	26.5	59	1 (8.9)	2.96 (26.2)
A 2Z25M1800	A 2G25M1800	1800	Reverse	26.5	59	1 (8.9)	2.96 (26.2)
A 2Z25M2000	A 2G25M2000	2000	Reverse	26.5	59	1 (8.9)	2.96 (26.2)

* To be discontinued when present stock is depleted.

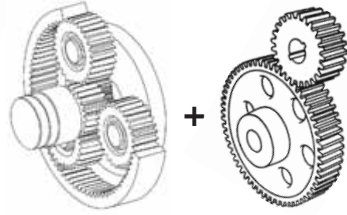
Catalog Number	Number of Teeth	Module	P.D.	O.D.	Bore -0.02 -0.04	Face Width
Mating Motor Pinion for Gearheads						
A 1B 8MYS05012	12	0.5	6.2	7.2	4	4



TRUE PLANETARY



SPUR GEAR



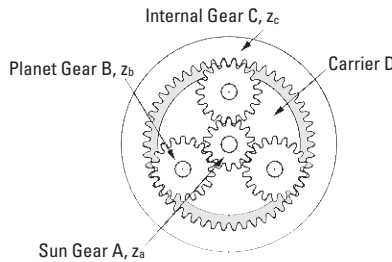
HYBRID

How to choose the type of gearhead depends primarily on the application. Some of the factors to be considered to make proper trade-offs between cost and performance are shown below. The hybrid design of planetary and spur gears are not offered by us but are available on the market, and are included for comparison purposes.

DESIGN FACTORS	GEARHEAD TYPE			
	Planetary	Low Cost Planetary	Spur	Hybrid
Torque Capacity	High	Medium	Low	Medium limited by spur gear pair strength
Load Sharing	Yes	Yes	No	Planetary Section Only
Power to Weight Ratio	High	Medium	Low	Medium
Power to Size Ratio	High	Medium	Low	Medium
Torsional Stiffness	High	Medium	Low	Medium
Backlash	Low 6-10 minutes	Medium 7-14 minutes	High 30 min. max.	Medium
Available Number of Gear Ratios	Low	Low	High	Medium
Cost	High	Medium	Low	Medium

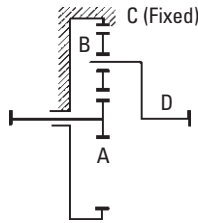


Planetary Gear System



The basic form of planetary gear system is shown above. It consists of a sun gear A, planetary gears B, internal gear C and carrier D. In our gearheads the internal gear is fixed, the sun gear is the input pinion, and the output shaft is part of the carrier.

This relationship can be represented schematically as shown on the right. The speed ratio is given by the equation:



$$\text{Gear Ratio} = \frac{1 + \frac{z_a}{z_c}}{\frac{z_a}{z_c}} = \frac{z_a + z_c}{z_a} = \frac{z_c}{z_a} + 1$$

where: z_a = number of teeth in sun gear A, and
 z_c = number of teeth in internal gear C.

For the example shown in the above illustration (where $z_a = 14$, $z_b = 18$ and $z_c = 50$), the Gear Ratio is 4.6:1.

For a double-stage planetary gearhead, the carrier of the first stage becomes the sun gear of the second stage.

The advantages of the planetary gearheads are:

1. The input and output axes are in the same line.
2. The planet gears used in a planetary system share the load, allowing for a much higher torque capacity unit than the comparable size spur gearheads.
3. The unit is compact and inertially balanced.

The disadvantages are:

1. The mechanism is complex.
2. The components require high-precision manufacturing.
3. The cost is considerably more than comparable size spur gearheads.

► USEFUL FORMULAS

The maximum output HP of Gearhead = $\frac{(\text{Maximum continuous torque}) \times (\text{Maximum rated output rpm})}{63025}$

The maximum allowable output HP of the motor = $\frac{\text{The maximum output HP of gearhead}}{0.90 \text{ (single stage) or } 0.85 \text{ (double stage)}}$

Effective inertia = $(\text{gear ratio})^2 \frac{\text{load inertia}}{\text{inertia}} + \frac{\text{gearhead}^\Delta}{\text{inertia}} + \text{pinion}^\Delta$

For very fast response, the effective inertia should be one to three times larger than the motor inertia (including the pinion).

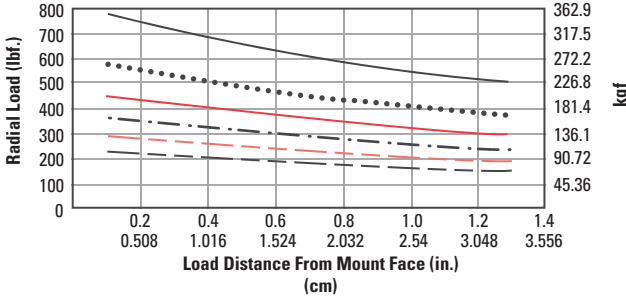
For acceptably fast response, the effective inertia should be less than ten times larger than the motor inertia (including the pinion).

Δ Inertia values shown in this catalog include both the gearhead and pinion values.



> PRX TYPE

023/060 PRX Bearing Radial Load Limits

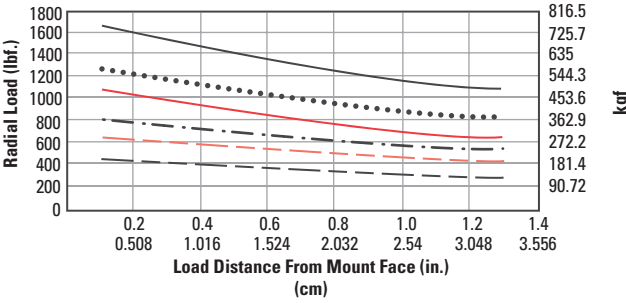


KEY

- 50 rpm
- 125 rpm
- 250 rpm
- - - 500 rpm
- - - 1000 rpm
- - - 2000 rpm

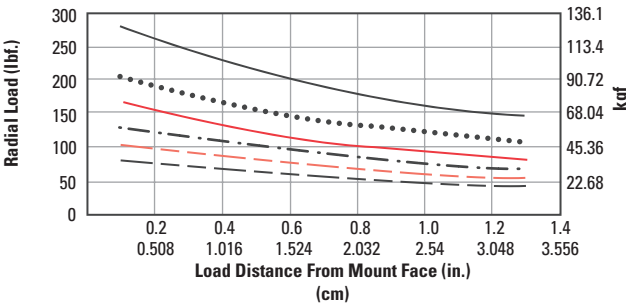
The graphs display allowable radial load at a given distance from the gearhead face based on an L₁₀ bearing life of; 20,000 hours (PRX), 15,000 hours (RTX)

034/090 PRX Bearing Radial Load Limits

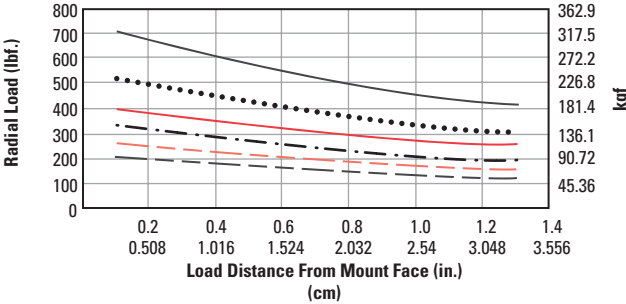


> RTX TYPE

023/060 RTX Bearing Radial Load Limits



034/090 RTX Bearing Radial Load Limits



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PRECISION SERIES
SINGLE & DOUBLE STAGE

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► **MATERIAL:**

- Housing** - Stainless Steel
- Mounting Flanges** - Red Anodized Aluminum (Front)
Aluminum (Back)
- Output Shafts** - Stainless Steel
- Gears** - Alloy and Stainless Steel
- Bearings** - Ball and Angular Contact Bearings

► **FEATURES:**

- Standard METRIC Sizes
- High Torque Design with Optimized Gear Geometry
- High Torsional Stiffness
- Sealed to extend service life
- Captive, Bearing supported input pinion
- Simplified quick installation
- Single-piece construction
- Alloy Steel key is supplied

► **SPECIFICATIONS:**

- Max. Input Speed:** 6500 rpm
- Shaft Loading:**
Axial: 226.8 kgf Value shown is for loads into the gearhead face. For loads away from the face, reduce by 50%
- Radial:** See graph on page: 11-21

Min. Efficiency:

- Single Stage:** 95 %
- Double Stage:** 90 %

Backlash:

- Single Stage:** 4 arc min.
- Double Stage:** 6 arc min.

Operating Temperature:

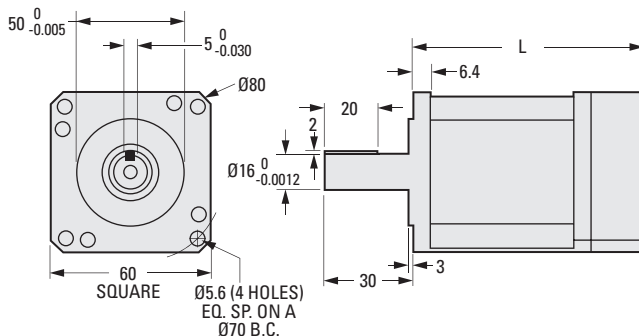
-40°C to +121°C

Weight:

- Single Stage:** 1.27 kg
- Double Stage:** 1.72 kg

Torsional Stiffness:

23.04 kgf cm/arc min.



METRIC COMPONENT

Catalog Number	Gear Ratio	L Max.	Max. Rated Continuous Torque N • m	Max. Momentary Torque N • m	Max. Stopping Torque N • m	Gearhead Moment of Inertia* kg • m ²
S9160AMPRX004	4:1	82 Single Stage	48	60	121	1.5578 x 10 ⁻⁵
S9160AMPRX005	5:1		41	51	118	1.3369 x 10 ⁻⁵
S9160AMPRX007	7:1		28	36	109	1.1765 x 10 ⁻⁵
S9160AMPRX010	10:1		19	24	81	1.0945 x 10 ⁻⁵
S9160AMPRX016	16:1		48	60	121	1.3085 x 10 ⁻⁵
S9160AMPRX020	20:1	111 Double Stage	48	60	121	1.1800 x 10 ⁻⁵
S9160AMPRX025	25:1		41	51	118	1.1715 x 10 ⁻⁵
S9160AMPRX028	28:1		48	60	121	1.0952 x 10 ⁻⁵
S9160AMPRX035	35:1		41	51	118	1.0910 x 10 ⁻⁵
S9160AMPRX040	40:1		48	60	121	1.0543 x 10 ⁻⁵
S9160AMPRX050	50:1		41	51	118	1.0522 x 10 ⁻⁵
S9160AMPRX070	70:1		32	41	109	1.0508 x 10 ⁻⁵
S9160AMPRX100	100:1		22	27	81	1.0501 x 10 ⁻⁵

* Values shown include pinion, clamp and sleeve and are for standard METRIC mountings. Efficiency rated at 3000 rpm input speed, at nominal rated torque. All torque ratings are based upon 3000 rpm nominal input speed and 20,000 hours minimum service life.

PRECISION SERIES
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► MATERIAL:

- Housing** - Stainless Steel
- Mounting Flanges** - Red Anodized Aluminum (Front)
Aluminum (Back)
- Output Shafts** - Stainless Steel
- Gears** - Alloy and Stainless Steel
- Bearings** - Ball Bearings

► FEATURES:

- Standard METRIC Sizes
- High Torque Design with Optimized Gear Geometry
- High Torsional Stiffness
- Sealed to extend service life
- Captive, Bearing supported input pinion
- Simplified quick installation
- Single-piece construction
- Alloy Steel key is supplied

► SPECIFICATIONS:

- Max. Input Speed:** 6500 rpm
- Shaft Loading:**
 - Axial:** 158.75 kgf Value shown is for loads into the gearhead face. For loads away from the face, reduce by 50%
 - Radial:** See graph on page: 11-21

Min. Efficiency:

- Single Stage:** 95 %
- Double Stage:** 90 %
- Triple Stage:** 85 %

Backlash:

- Single Stage:** 4 arc min.
- Double Stage:** 6 arc min.
- Triple Stage:** 8 arc min.

Operating Temperature:

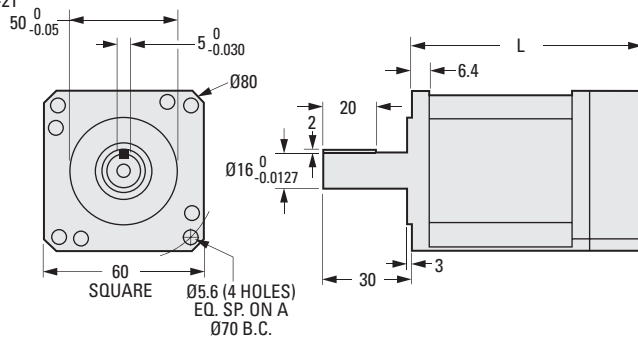
-40°C to +121°C

Weight:

- Single Stage:** 1.49 kg
- Double Stage:** 1.77 kg
- Triple Stage:** 2.13 kg

Torsional Stiffness:

17.28 kgf-cm/arc min.



* Values shown include pinion, clamp and sleeve and are for standard METRIC mountings. Efficiency rated at 3000 rpm input speed, at nominal rated torque. All torque ratings are based upon 3000 rpm nominal input speed and 15,000 hours minimum service life.

METRIC COMPONENT

Catalog Number	Gear Ratio	L Max.	Max. Rated Continuous Torque N • m	Max. Momentary Torque N • m	Max. Stopping Torque N • m	Gearhead Moment of Inertia* kg • m ²
S9160AMRTX004	4:1	86 Single Stage	45	53	107	1.3191 x 10 ⁻⁵
S9160AMRTX005	5:1		38	45	105	1.1863 x 10 ⁻⁵
S9160AMRTX007	7:1		26	32	97	1.0861 x 10 ⁻⁵
S9160AMRTX010	10:1		17	22	81	1.0345 x 10 ⁻⁵
S9160AMRTX016	16:1	108 Double Stage	45	53	107	1.2019 x 10 ⁻⁵
S9160AMRTX020	20:1		45	53	107	1.1122 x 10 ⁻⁵
S9160AMRTX025	25:1		38	45	105	1.1065 x 10 ⁻⁵
S9160AMRTX028	28:1		45	53	107	1.0486 x 10 ⁻⁵
S9160AMRTX035	35:1		38	45	105	1.0458 x 10 ⁻⁵
S9160AMRTX040	40:1		45	53	107	1.0162 x 10 ⁻⁵
S9160AMRTX050	50:1		38	45	105	1.0147 x 10 ⁻⁵
S9160AMRTX070	70:1		30	36	97	1.0140 x 10 ⁻⁵
S9160AMRTX100	100:1	131 Triple Stage	20	25	81	1.0133 x 10 ⁻⁵
S9160AMRTX160	160:1		45	53	107	1.0147 x 10 ⁻⁵
S9160AMRTX280	280:1		45	53	107	1.0133 x 10 ⁻⁵
S9160AMRTX400	400:1		45	53	107	1.0133 x 10 ⁻⁵
S9160AMRTX500	500:1		38	45	105	1.0133 x 10 ⁻⁵
S9160AMRTX700	700:1		30	36	97	1.0133 x 10 ⁻⁵



► **MATERIAL:**

- Housing** - Stainless Steel
- Mounting Flanges** - Red Anodized Aluminum (Front)
Aluminum (Back)
- Output Shafts** - Stainless Steel
- Gears** - Alloy and Stainless Steel
- Bearings** - Ball and Angular Contact Bearings

► **FEATURES:**

- Standard METRIC Sizes
- High Torque Design with Optimized Gear Geometry
- High Torsional Stiffness
- Sealed to extend service life
- Captive, Bearing supported input pinion
- Simplified quick installation
- Single-piece construction
- Alloy Steel key is supplied



► **SPECIFICATIONS:**

Max. Input Speed: 6500 rpm

Shaft Loading:

Axial: 340.2 kgf Value shown is for loads into the gearhead face. For loads away from the face, reduce by 50%

Radial: See graph on page: 11-21

Min. Efficiency:

- Single Stage:** 95 %
- Double Stage:** 90 %

Backlash:

- Single Stage:** 4 arc min.
- Double Stage:** 6 arc min.

Operating Temperature:

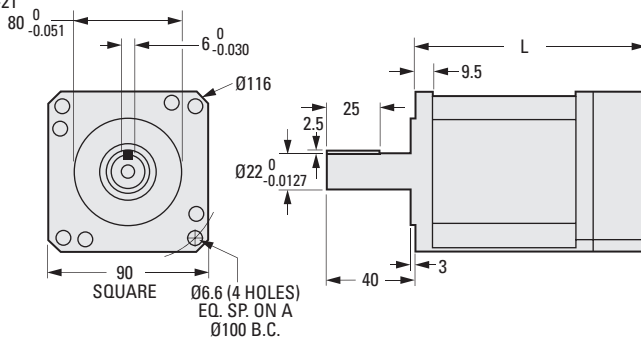
-40°C to +121°C

Weight:

- Single Stage:** 4.13 kg
- Double Stage:** 5.76 kg

Torsional Stiffness:

92.17 kgf-cm/arc min.



METRIC COMPONENT

Catalog Number	Gear Ratio	L Max.	Max. Rated Continuous Torque N • m	Max. Momentary Torque N • m	Max. Stopping Torque N • m	Gearhead Moment of Inertia* kg • m ²
S9190AMPRX004	4:1	120 Single Stage	168	212	401	1.0995 x 10 ⁻⁴
S9190AMPRX005	5:1		150	189	393	0.9265 x 10 ⁻⁴
S9190AMPRX007	7:1		101	127	334	0.7895 x 10 ⁻⁴
S9190AMPRX010	10:1		66	83	290	0.7196 x 10 ⁻⁴
S9190AMPRX016	16:1	165 Double Stage	168	212	401	0.9201 x 10 ⁻⁴
S9190AMPRX020	20:1		168	212	401	0.8114 x 10 ⁻⁴
S9190AMPRX025	25:1		150	189	393	0.8043 x 10 ⁻⁴
S9190AMPRX028	28:1		168	212	401	0.7309 x 10 ⁻⁴
S9190AMPRX035	35:1		150	189	393	0.7273 x 10 ⁻⁴
S9190AMPRX040	40:1		168	212	401	6.9048 x 10 ⁻⁵
S9190AMPRX050	50:1		150	189	393	6.8872 x 10 ⁻⁵
S9190AMPRX070	70:1		116	146	334	6.8738 x 10 ⁻⁵
S9190AMPRX100	100:1		76	96	290	6.8667 x 10 ⁻⁵

* Values shown include pinion, clamp and sleeve and are for standard METRIC mountings. Efficiency rated at 3000 rpm input speed, at nominal rated torque. All torque ratings are based upon 3000 rpm nominal input speed and 20,000 hours minimum service life.

NEW

PRECISION SERIES
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► MATERIAL:

- Housing - Stainless Steel
- Mounting Flanges - Red Anodized Aluminum (Front)
Aluminum (Back)
- Output Shafts - Stainless Steel
- Gears - Alloy and Stainless Steel
- Bearings - Ball Bearings

► FEATURES:

- Standard METRIC Sizes
- High Torque Design with Optimized Gear Geometry
- High Torsional Stiffness
- Sealed to extend service life
- Captive, Bearing supported input pinion
- Simplified quick installation
- Single-piece construction
- Alloy Steel key is supplied

► SPECIFICATIONS:

- Max. Input Speed: 6500 rpm
- Shaft Loading:
 - Axial: 249.48 kgf. Value shown is for loads into the gearhead face. For loads away from the face, reduce by 50%
 - Radial: See graph on page: 11-21

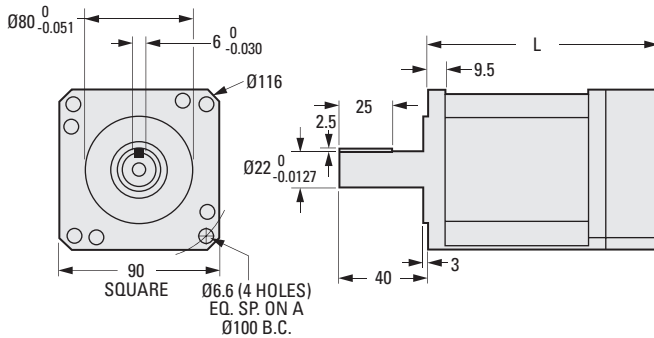
- Min. Efficiency:
 - Single Stage: 95 %
 - Double Stage: 90 %
 - Triple Stage: 85 %

- Backlash:
 - Single Stage: 4 arc min.
 - Double Stage: 6 arc min.
 - Triple Stage: 8 arc min.

- Operating Temperature:
 - 40°C to +121°C

- Weight:
 - Single Stage: 4.35 kg
 - Double Stage: 5.89 kg
 - Triple Stage: 7.39 kg

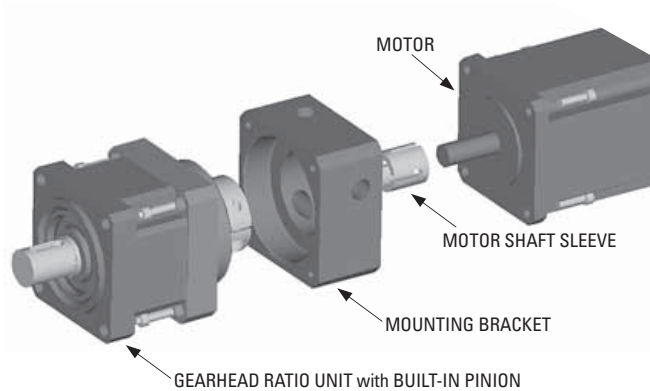
- Torsional Stiffness:
 - 80.64 kgf-cm/arc min.



* Value shown include pinion, clamp and sleeve and are for standard METRIC mountings. Efficiency rated at 3000 rpm input speed, at nominal rated torque. All torque ratings are based upon 3000 rpm nominal input speed and 15,000 hours minimum service life.

METRIC COMPONENT

Catalog Number	Gear Ratio	L Max.	Max. Rated Continuous Torque N • m	Max. Momentary Torque N • m	Max. Stopping Torque N • m	Gearhead Moment of Inertia* kg • m ²
S9190AMRTX004	4:1	122 Single Stage	164	207	392	0.9159 x 10 ⁻⁴
S9190AMRTX005	5:1		144	181	375	0.7916 x 10 ⁻⁴
S9190AMRTX007	7:1		98	123	319	0.6932 x 10 ⁻⁴
S9190AMRTX010	10:1	158 Double Stage	63	80	277	0.6437 x 10 ⁻⁴
S9190AMRTX016	16:1		164	207	392	0.8474 x 10 ⁻⁴
S9190AMRTX020	20:1		164	207	392	0.7478 x 10 ⁻⁴
S9190AMRTX025	25:1		144	181	375	0.7429 x 10 ⁻⁴
S9190AMRTX028	28:1		164	207	392	0.6707 x 10 ⁻⁴
S9190AMRTX035	35:1		144	181	375	0.6682 x 10 ⁻⁴
S9190AMRTX040	40:1	194 Triple Stage	164	207	392	0.6316 x 10 ⁻⁴
S9190AMRTX050	50:1		144	181	375	0.6303 x 10 ⁻⁴
S9190AMRTX070	70:1		112	141	319	0.6293 x 10 ⁻⁴
S9190AMRTX100	100:1		73	92	277	0.6299 x 10 ⁻⁴
S9190AMRTX160	160:1		164	207	392	0.6309 x 10 ⁻⁴
S9190AMRTX280	280:1		164	207	392	0.6291 x 10 ⁻⁴
S9190AMRTX400	400:1		164	207	392	0.6298 x 10 ⁻⁴
S9190AMRTX500	500:1	144	181	375	0.6298 x 10 ⁻⁴	
S9190AMRTX700	700:1	112	141	319	0.6297 x 10 ⁻⁴	



All of our NEMA and Metric sized gearheads, except NEMA size 17, are offered using a ready-to-mount system of attaching the motor to the gearhead. The gearhead ratio unit includes a preinstalled pinion and a self-aligning input clamp. This allows the gearhead to maintain concentricity with the motor shaft and eliminates the need to set the pinion.

The procedure for selecting a complete gearhead solution is simple:

- Step 1. Select your motor and determine the appropriate frame size for the gearhead.**
- Step 2. Measure the pilot diameter E, pilot length (from motor), bolt circle, shaft OD and shaft length of your motor.**
- Step 3. Based on your measurements and frame size selection, go to the page that lists the mounting bracket and sleeve that you require.**
- Step 4. Choose the reduction ratio and complete the part number.**

Example: You have a size 60 motor and you measure the pilot diameter to be 50.4 mm, the pilot length to be 3.8 mm, the bolt circle to be 67 mm, the shaft diameter to be 10 mm and the shaft length to be 30 mm. If your required reduction is 30:1 then you would select mounting bracket "1" and sleeve "G". Therefore the part number you would need to order is: S9160TM0301G

NOTE: The mounting brackets and motor shaft sleeves listed in this catalog complement 90% of the motors currently available. If your motor does not meet our gearhead specifications, please contact our engineering staff to arrange for a custom mounting bracket or motor shaft sleeve.

> MOUNTING INSTRUCTIONS:

- A) Using the screws provided, bolt the mounting bracket to the input end of the gearhead ratio unit.
- B) Slide the motor shaft sleeve into the input clamp and align the slot in the sleeve with the slot in the clamp.
- C) Rotate the clamp to align the mounting bracket access holes with the clamping bolts.
- D) Place the motor on a solid work surface with the output shaft pointing up. Slide the assembled gearhead onto the motor shaft.
- E) Using a torque wrench, tighten the clamp bolts to the pretightening torque values listed below.
- F) Using the screws provided, bolt the gearhead to the motor.
- G) Using an alternating pattern, gradually tighten the clamp bolts until you reach the final tightening torque listed below.



Clamp Bolt Tightening Torques

Gearhead Frame Size	Pretightening Torque		Final Tightening Torque	
	lb. in.	N • m	lb. in.	N • m
NEMA 23	2	0.2	39	4.4
NEMA 34	4	0.4	76	8.5
NEMA 42	16	1.8	316	36
Metric 60	2	0.2	39	4.4
Metric 90	4	0.4	76	8.5
Metric 115	16	1.8	316	36