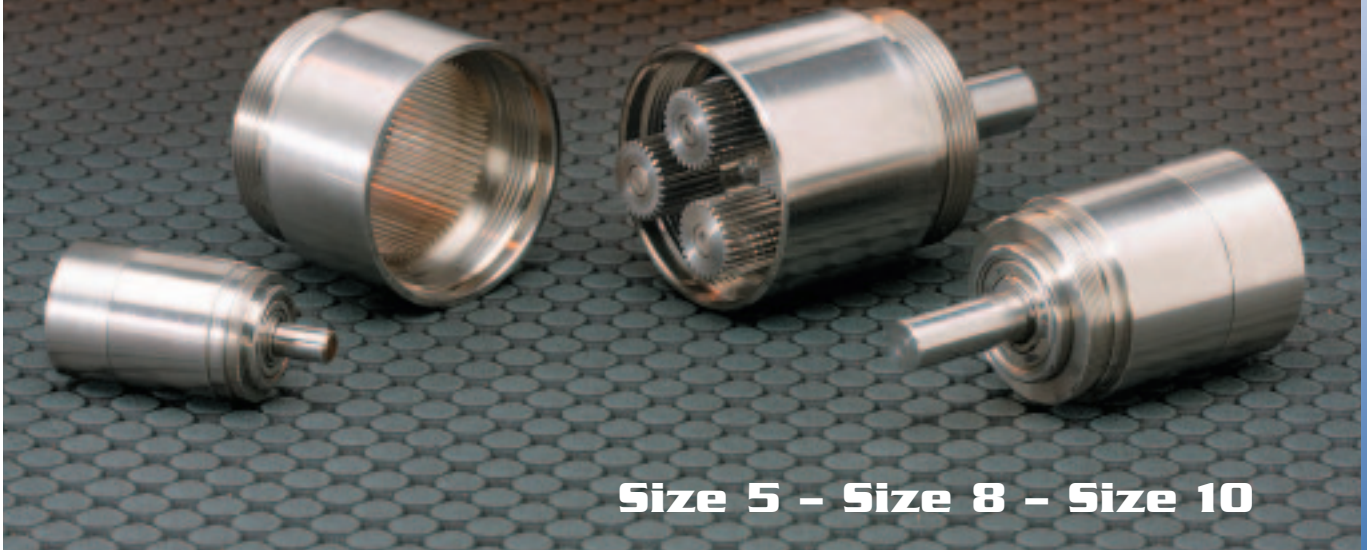


# Planetary Gearheads



**Size 5 – Size 8 – Size 10**

Transicoil's planetary gearheads are designed for high-speed operation. The all stainless-steel construction and permanent lubrication ensure a long, maintenance free life. The planetary design efficiently converts high input speeds into high output torques. Quality Class 10 gearing provides smooth, efficient performance. Precision double-shielded stainless-steel ball bearings complete this rugged design. Contact the factory for an integrated motor/gearhead solution. Custom designs, feedback devices, and other options are also available.

## Design Features

- Sizes 5, 8, and 10
- 1- and 2- stage gearheads
- Ratios from 4:1 to 49:1
- Precision double-shielded stainless-steel ball bearings
- Backlash  $\approx$  1 degree per stage
- Threaded mount compatible with Transicoil's autoclaveable designs

## Options

- Multi-stage gearheads available in production quantities
- Custom ratios available in production quantities
- Custom shafts
- Optical encoders
- Autoclaveable versions available
- Custom lubrications
- Custom bearings



*Integrating the advanced technologies and expertise of Aerospace Display Systems and Transicoil Corp*

[www.TransicoilMotors.com](http://www.TransicoilMotors.com)

Mechanical Specifications	Units	Size 5								Size 8		
		4	5	6	20	24	25	30	36	4	5	7
Reduction Ratio		4	5	6	20	24	25	30	36	4	5	7
Number of Stages		1	1	1	2	2	2	2	2	1	1	1
Input speed (Maximum)	rpm	60,000								50,000		
Peak Torque <sup>2</sup>	oz-in	55.20	21.60	33.60	55.20	55.20	21.60	21.60	33.60	132.00	103.20	60.00
	(N-m)	(0.390)	(0.153)	(0.237)	(0.390)	(0.390)	(0.153)	(0.153)	(0.237)	(0.932)	(0.729)	(0.424)
Continuous Torque (Maximum) <sup>1,2</sup>	oz-in	36.80	14.40	22.40	36.80	36.80	14.40	14.40	22.40	88.00	68.80	40.00
	(N-m)	(0.260)	(0.102)	(0.158)	(0.260)	(0.260)	(0.102)	(0.102)	(0.158)	(0.621)	(0.486)	(0.282)
Output Power (Maximum)	watts	110								250		
Efficiency	%	92%	92%	92%	85%	85%	85%	85%	85%	92%	92%	92%
Backlash	deg	<1	<1	<1	<2	<2	<2	<2	<2	<1	<1	<1
Bearing Type	---	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg
Radial Load Capacity (Static) <sup>3</sup>	oz	168	168	168	168	168	168	168	168	304	304	304
	(N)	(47)	(47)	(47)	(47)	(47)	(47)	(47)	(47)	(85)	(85)	(85)
Radial Load Capacity (Dynamic) <sup>3</sup>	oz	432	432	432	432	432	432	432	432	720	720	720
	(N)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(200)	(200)	(200)
Radial Play (Maximum) <sup>4</sup>	In	0.0019								0.0025		
	(mm)	(0.048)								(0.064)		
Radial Play (Typical) <sup>4</sup>	In	0.0012								0.0009		
	(mm)	(0.030)								(0.023)		
Axial play <sup>5</sup>	In	0.003								0.003		
	(mm)	(0.076)								(0.076)		
Inertia	oz-in-sec <sup>2</sup>	2.90E-07	1.81E-07	1.26E-07	1.69E-07	1.17E-07	1.65E-07	1.14E-07	1.13E-07	1.62E-06	1.10E-06	5.94E-07
	g-cm <sup>2</sup>	(0.020)	(0.013)	(0.009)	(0.012)	(0.008)	(0.012)	(0.008)	(0.008)	(0.114)	(0.078)	(0.042)
Gearhead Weight	oz	0.39	0.39	0.39	0.55	0.55	0.55	0.55	0.55	1.20	1.20	1.20
	(g)	(11.00)	(11.00)	(11.00)	(15.60)	(15.60)	(15.60)	(15.60)	(15.60)	(34.10)	(34.10)	(34.10)
Gearhead Length	In	0.623	0.623	0.623	0.863	0.863	0.863	0.863	0.863	0.791	0.791	0.791
	(mm)	(15.82)	(15.82)	(15.82)	(21.92)	(21.92)	(21.92)	(21.92)	(21.92)	(20.09)	(20.09)	(20.09)

1 - Torque ratings listed are calculated values. Actual performance may vary. Testing within the application is recommended.

3 - Radial load capacities are for a load applied at end of shaft.

5 - Axial play is measured under an 8 oz reversing gage load.

Size 8						Size 10								
16	20	25	28	35	49	4	5	7	16	20	25	28	35	49
2	2	2	2	2	2	1	1	1	2	2	2	2	2	2
50,000						40,000								
132.00	132.00	103.20	132.00	103.20	60.00	348.00	266.40	148.80	348.00	348.00	266.40	348.00	266.40	148.80
(0.932)	(0.932)	(0.729)	(0.932)	(0.729)	(0.424)	(2.457)	(1.881)	(1.051)	(2.457)	(2.457)	(1.881)	(2.457)	(1.881)	(1.051)
88.00	88.00	68.80	88.00	68.80	40.00	232.00	177.60	99.20	232.00	232.00	177.60	232.00	177.60	99.20
(0.621)	(0.621)	(0.486)	(0.621)	(0.486)	(0.282)	(1.638)	(1.254)	(0.701)	(1.638)	(1.638)	(1.254)	(1.638)	(1.254)	(0.701)
250						400								
85%	85%	85%	85%	85%	85%	92%	92%	92%	85%	85%	85%	85%	85%	85%
<2	<2	<2	<2	<2	<2	<1	<1	<1	<2	<2	<2	<2	<2	<2
Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg	Ball Brg
304	304	304	304	304	304	1168	1168	1168	1168	1168	1168	1168	1168	1168
(85)	(85)	(85)	(85)	(85)	(85)	(325)	(325)	(325)	(325)	(325)	(325)	(325)	(325)	(325)
720	720	720	720	720	720	2480	2480	2480	2480	2480	2480	2480	2480	2480
(200)	(200)	(200)	(200)	(200)	(200)	(689)	(689)	(689)	(689)	(689)	(689)	(689)	(689)	(689)
0.0025						0.0025								
(0.064)						(0.064)								
0.0009						0.0009								
(0.023)						(0.023)								
0.003						0.003								
(0.076)						(0.076)								
1.54E-06	1.04E-06	1.02E-06	5.63E-07	5.52E-07	3.39E-07	6.34E-06	4.31E-06	2.33E-06	6.17E-06	4.21E-06	4.07E-06	2.27E-06	2.20E-06	2.15E-06
(0.109)	(0.074)	(0.072)	(0.040)	(0.039)	(0.024)	(0.447)	(0.305)	(0.164)	(0.436)	(0.297)	(0.287)	(0.160)	(0.156)	(0.152)
1.64	1.64	1.64	1.64	1.64	1.64	2.37	2.37	2.37	3.11	3.11	3.11	3.11	3.11	3.11
(46.50)	(46.50)	(46.50)	(46.50)	(46.50)	(46.50)	(67.30)	(67.30)	(67.30)	(88.20)	(88.20)	(88.20)	(88.20)	(88.20)	(88.20)
1.117	1.117	1.117	1.117	1.117	1.117	1.228	1.228	1.228	1.743	1.743	1.743	1.743	1.743	1.743
(28.37)	(28.37)	(28.37)	(28.37)	(28.37)	(28.37)	(31.19)	(31.19)	(31.19)	(44.27)	(44.27)	(44.27)	(44.27)	(44.27)	(44.27)

2 - Maximum continuous torque rating was calculated for infinite life; no tooth breakage or durability failure.

4 - Radial play is measured .100" from face of bearing, under 8 oz reversing gage load applied at tip of shaft.

### Size 05 Gearhead

36:1	.863
30:1	
25:1	
24:1	
20:1	
6:1	.623
5:1	
4:1	
RATIO	"A"

Notes:  
1. Axial shaft end play shall be .000 to .003 under 8 oz. reversing load.  
2. Radial play .002 T.I.R. measured not more than .125 from bearing face with 8 oz load applied at same location.  
3. Gearhead intended for use with Transicoil motors, consult factory.  
Custom applications / configurations welcome, consult factory.

Dimensions in Inches

### Size 08 Gearhead

49:1	1.117
35:1	
28:1	
25:1	
20:1	
16:1	.791
7:1	
5:1	
4:1	.791
RATIO	

Notes:  
1. Axial shaft end play shall be .000 to .003 under 8 oz. reversing load.  
2. Radial play .002 T.I.R. measured not more than .125 from bearing face with 8 oz load applied at same location.  
3. Gearhead intended for use with Transicoil motors, consult factory.  
Custom applications / configurations welcome, consult factory.

Dimensions in Inches

### Size 10 Gearhead

49:1	1.743
35:1	
28:1	
25:1	
20:1	
16:1	1.228
7:1	
5:1	
4:1	1.228
RATIO	

Notes:  
1. Axial shaft end play shall be .000 to .003 under 8 oz. reversing load.  
2. Radial play .002 T.I.R. measured not more than .125 from bearing face with 8 oz load applied at same location.  
3. Gearhead intended for use with Transicoil motors, consult factory.  
Custom applications / configurations welcome, consult factory.

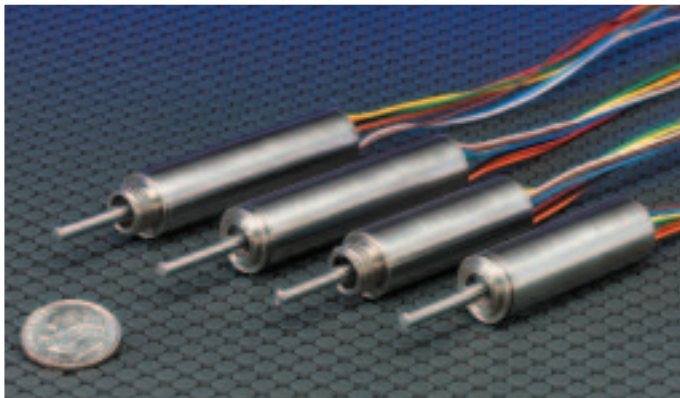
Dimensions in Inches

## A Superior Resource for Brushless DC Motors and Motion Control

For nearly 60 years, Transicoil has been a leading manufacturer of rotating electromechanical components, precision motion controllers, instrumentation, and transducers. Over this time, Transicoil has established an exceptional reputation for developing and manufacturing products involving micro-mechanics, high precision machining, and sophisticated electronics. Transicoil brushless DC motors and gearheads are found around the world in demanding applications where high quality, reliability, precise control, and value are needed. Transicoil motors and gearheads are used in a wide range of commercial, aerospace, military, medical, and automation applications.

## State-of-the-Art Design, Prototyping, and Production Facilities.

Transicoil has plants in the United States and Malaysia. U.S. operations are located in modern facilities outside of Philadelphia, with state-of-the-art design, prototyping, analysis and simulation, manufacturing and system integration capabilities.



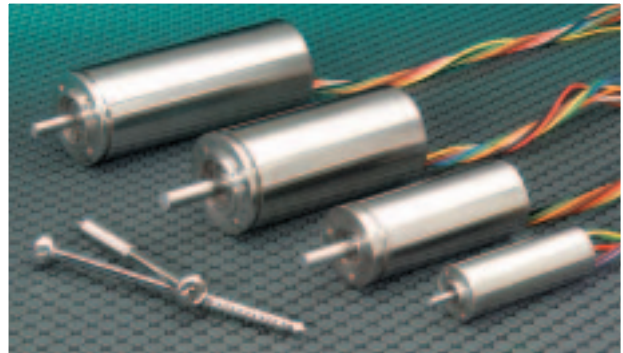
## Transicoil Offers a Full Range of Solutions.

In addition to the gearheads detailed here, Transicoil can economically provide modified standard or full-custom motor and gearhead designs, with prototypes available for quick delivery. Other available items include:

- Feedback devices, including resolvers, synchros, RVDTs and LVDTs, and custom devices
- Autoclaveable motors
- Customized integral electronics
- Custom assemblies and motion control packages

...be sure to ask about our brushless DC motors.

## Autoclaveable Motors



Transicoil's motors can meet the demanding specifications required for medical devices. Typical applications in the medical field include: bone cutting devices, drills, arthroscopic shavers, reciprocating saws, reamers, ophthalmic instruments, dental devices, orthopedic and cranial drills, cast cutters, otolaryngeal tools, and oscillating saws as well as implantable pumps and other motorized devices. The motors also are ideal for devices used in food processing, pharmaceutical manufacturing, "white rooms," and other areas where tools must be sterile.

Transicoil autoclaveable motors have been tested to withstand over 1,000 autoclave cycles, as opposed to other motors that claim autoclaveability of 200 to 500 cycles. Typical designs include:

- Winding temperature ranges from  $-55^{\circ}$  to  $+220^{\circ}\text{C}$
- Precision balanced rotors with speeds to 100,000 RPM
- Hall Effect devices rated  $-55^{\circ}$  to  $+150^{\circ}\text{C}$
- Precision double-shielded stainless-steel ball bearings
- 4-pole rotors featuring samarium cobalt magnets

Transicoil can offer an extensive array of custom options including extended shaft lengths, special windings, threaded housings and shafts, various sealing options, chemically inert designs, and packaging options to help conform to size, mounting, and orientation configurations.

Due to Transicoil's commitment to constant product improvement, all specifications and construction details are subject to change without notice. Please contact the factory to verify the latest specifications and information.

**Contact our Motor Design Team  
to discuss your specific needs.**



*Integrating the advanced  
technologies and expertise of  
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