



Precision Servo Gearboxes

SureGear® Servo Gearbox Overview

PGA In-line Series

The SureGear PGA series of high-precision servo gear reducers is an excellent choice for applications that require good accuracy and reliability at an exceptional value. This in-line planetary gear reducer has a thread-in mounting style, along with a level of precision and torque capacity that is best in its class. Offered in a concentric shaft design with a maximum seven arc-min backlash rating, the SureGear PGA series is an accurate, high-performance, and cost effective solution for any OEM.

The machining quality of the SureGear PGA helical planetary gears provides a very quiet and more efficient reducer than other competitive products that are similarly priced. The SureGear PGA series easily mates to SureServo motors, and is the perfect solution for applications such as gantries, injection-molding machines, pick-and-place automation, and linear slides.

PGB Right-angle Series

The SureGear PGB series of high-precision right-angle servo gear reducers is an excellent choice for applications that require a more compact footprint.

The PGB right-angle planetary gear reducers offer similar technical specifications to the PGA series in-line gear reducers, and provides the customer with an excellent solution when space and clearance requirements are limited.

Offered with a six arc-min backlash rating for 2-stage and nine arc-min backlash for 3-stage, the SureGear PGB series performs to OEMs' demanding expectations.

PGD Hub Style In-line Series

The SureGear PGD series sets a new standard in applications requiring extremely high-torque ratings and rigidity. The compact design and hub-style output is ideal for equipment that requires high-speed, high-precision indexing movement. The remarkable torsion stiffness and the low backlash of the planetary gearing combine to provide outstanding positioning accuracy.

With a backlash rating less than 3 arc-minutes and exceptional torque handling capabilities, the PGD series offers a high performance robust planetary solution for OEM customers. The PGD reducer is often used for larger indexing applications and dial tables commonly found in packaging and filling equipment and assembly automation systems.

Features

- Thread-in mounting style
- Best-in-class backlash
- Four gear ratios available (5:1, 10:1, 15:1, 25:1), Two additional for PGD models (35:1 and 50:1)
- Mounting hardware included for attaching to SureServo motors
- Helical-cut planetary gears for quiet operation and reduced vibration
- Right-angle reducer utilizes a spiral bevel gear; motor can be located at a 90° position from the reducer, providing a more compact footprint
- Uncaged needle roller bearings for high rigidity and torque
- Adapter bushing connection for simple and effective attachment to most servo motors
- High-viscosity, anti-separation grease does not migrate away from the gears; no leakage through the seal
- Maintenance free: No need to replace the grease for the life of the unit
- At nominal speed, service life is 20,000 hours
- Can be positioned in any orientation
- IP55 environmental rating
- 5-year warranty



**SureGear
PGA Gearbox**



SureGear PGB Gearbox



**SureGear
Hub Style PGD Gearbox**



**SureGear
2-Stage Cutaway View**

Applications

- Gantries
- Injection-molding machines
- Pick-and-place automation
- Linear slides
- Packaging machines
- Conveyors

Suregear® Precision Servo Gearboxes

SureGear® Servo Gearbox Selection

SureGear® Servo Gearbox Selection											
Sure Servo Motor	Gear Ratio	SureGear Gearbox	Frame Size (mm)	Motor Nominal Output Torque		Combo Nominal Output Torque		Nominal Output Speed (rpm)	Max Output Speed (rpm)	Available Load Inertia @ 5:1 Mismatch *	
				N-m	lb-in	N-m	lb-in			kg-cm ²	lb-in-s ²
SVL-201(B)	5:1	PGD047-05A1	47	0.32	2.83	1.52	13.44	600	1,000	2.68	0.002
		PGA050-05A1	50							2.85	0.003
		PGA070-05A1	70							1.83	0.002
		PGB070-05A1	70							-2.50**	-0.002**
	10:1	PGD047-10A1	47			3.04	26.89	300	500	11.80	0.010
		PGA050-10A1	50							12.00	0.011
		PGA070-10A1	70							9.40	0.008
		PGB070-10A1	70							-8.00**	-0.007**
	15:1	PGA050-15A1	50			4.32	38.21	200	333	25.88	0.023
		PGA070-15A1	70							21.38	0.019
		PGB070-15A1	70							17.33	0.015
	25:1	PGD047-25A1	47			7.20	63.68	120	200	72.50	0.064
		PGA050-25A1	50							72.50	0.064
		PGA070-25A1	70							60.63	0.054
		PGB070-25A1	70							49.38	0.044
	50:1	PGD064-50A1	64			14.40	127.35	60	100	252.50	0.223
SVL-202(B)	5:1	PGD064-05A2	64	0.64	5.7	3.04	27.08	600	1,000	20.00	0.018
		PGA070-05A2	70							20.58	0.018
		PGB070-05A2	70							16.25	0.014
	10:1	PGD064-10A2	64			6.08	54.15	300	500	83.80	0.074
		PGA070-10A2	70							84.40	0.075
		PGB070-10A2	70							67.00	0.059
	15:1	PGA070-15A2	70			8.64	76.95	200	333	190.13	0.168
		PGB070-15A2	70							186.08	0.165
		PGB090-15A2	90							126.00	0.112
	25:1	PGD064-25A2	64			14.40	128.25	120	200	528.75	0.468
		PGA070-25A2	70							529.38	0.468
		PGB070-25A2	70							518.13	0.459
		PGB090-25A2	90							362.50	0.321
	50:1	PGD090-25A2	90			14.40	128.25	14.40	128.25	481.25	0.426
		PGD090-50A2	90							2000.00	1.770
		PGD110-50A2	110							1250.00	1.106
SVL-204(B)	5:1	PGD064-05A2	64	1.27	11.2	6.03	53.20	600	1,000	40.00	0.035
		PGA070-05A2	70							40.58	0.036
		PGB070-05A2	70							36.25	0.032
	10:1	PGD064-10A2	64			12.07	106.40	300	500	163.80	0.145
		PGA070-10A2	70							164.40	0.145
		PGB070-10A2	70							147.00	0.130
	15:1	PGA070-15A2	70			17.15	151.20	200	333	370.13	0.328
		PGB070-15A2	70							366.08	0.324
		PGB090-15A2	90							306.00	0.271
	25:1	PGD064-25A2	64			28.58	252.00	120	200	1028.75	0.910
		PGA070-25A2	70							1029.38	0.911
		PGB070-25A2	70							1018.13	0.901
		PGB090-25A2	90							862.50	0.763
	50:1	PGD090-25A2	90			28.58	252.00	28.58	252.00	981.25	0.868
		PGD090-50A2	90							4000.00	3.540
		PGD110-50A2	110							3250.00	2.876
SVL-207(B)	5:1	PGA070-05A3	70	2.39	21.2	11.35	100.70	600	1000	133.08	0.118
		PGB090-05A3	90							11.11	0.080
		PGD090-05A3	90							11.35	0.107
	10:1	PGA090-10A3	90			22.71	201.40	300	500	511.00	0.452
		PGB090-10A3	90							22.23	0.328
		PGD090-10A3	90							22.71	0.449
	15:1	PGA090-15A3	90			32.27	286.20	200	333	1185.75	1.049
		PGB090-15A3	90							31.55	1.008
		PGA090-25A3	90							53.78	2.921
	25:1	PGB090-25A3	90			52.58	466.40	120	200	3175.00	2.810
		PGA090-25A3	90							53.78	2.600
		PGD110-25A3	110							107.55	954.00
	50:1	PGD110-50A3	110			107.55	954.00	60	100	12500.00	11.063

* Available load inertia is calculated based on servo motor inertia using the formula: Available Inertia = (5 x Motor Inertia - Gearbox Inertia) x (Gear Ratio)²
 A 5:1 inertia mismatch is a good target for design purposes. Systems with lower or higher mismatch may be possible, depending on operating conditions.

** This gearbox is NOT a suitable choice at a 5:1 mismatch. If inertia balancing is a selection criteria for your end use, please use a mismatch of 8:1 to 10:1.

Suregear® Precision Servo Gearboxes

SureGear® Servo Gearbox Selection (continued)

SureGear® Servo Gearbox Selection											
Sure Servo Motor	Gear Ratio	SureGear Gearbox	Frame Size (mm)	Motor Nominal Output Torque		Combo Nominal Output Torque		Nominal Output Speed (rpm)	Max Output Speed (rpm)	Available Load Inertia @ 5:1 Mismatch *	
				N-m	lb-in	N-m	lb-in			kg-cm ²	lb-in-s ²
SVL-210(B)	5:1	PGA090-05A4	90	3.3	29.2	15.68	138.70	600	1000	315.00	0.279
		PGB090-05A4	90			15.35	135.78			280.00	0.248
		PGD090-05A4	90			15.68	138.70			313.00	0.277
	10:1	PGA090-10A4	90			31.45	277.40	300	500	1271.00	1.125
		PGB090-10A4	90			30.69	271.56			1131.00	1.001
		PGD090-10A4	90			31.35	277.40			1267.00	1.121
	15:1	PGA120-15A4	120			44.55	394.20	200	333	2828.25	2.503
		PGB120-15A4	120			43.56	385.44			2418.75	2.141
	25:1	PGD110-25A4	110			74.25	657.00	120	200	7687.50	6.803
		PGA120-25A4	120			72.60	642.40			7887.50	6.980
		PGB120-25A4	120			72.60	642.40			6762.50	5.985
	50:1	PGD110-50A4	110			148.50	1314.00	60	100	31500.00	27.878
SVM-210(B)	5:1	PGA090-05A5	90	4.8	42.5	22.80	201.88	600	1000	737.50	0.653
		PGD090-05A5	90			22.32	197.63			735.50	0.651
		PGB120-05A5	120			22.32	197.63			622.00	0.550
	10:1	PGA090-10A5	90			45.60	403.75	300	500	2961.00	2.620
		PGD110-10A5	110			44.64	395.25			2957.00	2.617
		PGB120-10A5	120			44.64	395.25			2544.00	2.251
	15:1	PGA120-15A5	120			64.80	573.75	200	333	6630.75	58.68
		PGB120-15A5	120			63.36	561.00			6221.25	5.506
	25:1	PGD110-25A5	110			108.00	956.25	120	200	18250.00	16.151
		PGA120-25A5	120			105.60	935.00			18450.00	16.328
		PGB120-25A5	120			105.60	935.00			17325.00	15.333
	35:1	PGD110-35A5	110			151.20	1338.75	86	143	35770.00	31.656
SVM-220(B)	5:1	PGD110-05A6	110	9.4	83.2	44.65	395.20	600	1000	5355.00	4.739
		PGA120-05A6	120			43.71	386.88			5372.50	4.755
		PGB120-05A6	120			43.71	386.88			5287.00	4.679
		PGB155-05A6	155			43.71	386.88			4989.75	4.416
	10:1	PGD110-10A6	110			89.30	790.40	300	500	21540.00	19.063
		PGA120-10A6	120			87.42	773.76			21555.00	19.076
		PGB120-10A6	120			87.42	773.76			21204.00	18.766
		PGB155-10A6	155			87.42	773.76			20184.00	17.863
	15:1	PGA155-15A6	155			126.90	1123.20	200	333	48420.00	42.852
		PGB155-15A6	155			124.08	1098.24			47272.50	41.836
	25:1	PGA155-25A6	155			211.50	1872.00	120	200	134625.00	119.143
		PGB155-25A6	155			206.80	1830.40			131468.75	116.350
SVM-230(B)	5:1	PGD110-05A6	110	14.3	12.6	67.93	601.35	600	1000	5355.00	4.739
		PGA120-05A6	120			66.50	588.69			5372.50	4.755
		PGB120-05A6	120			66.50	588.69			5287.00	4.679
	10:1	PGD110-10A6	110			135.85	1202.70	300	500	21540.00	19.063
		PGA120-10A6	120			132.99	1177.38			21555.00	19.076
		PGB120-10A6	120			132.99	1177.38			21204.00	18.766
		PGB155-10A6	155			132.99	1177.38			20184.00	17.863
	15:1	PGA155-15A6	155			193.05	1709.10	200	333	48420.00	42.852
		PGB155-15A6	155			188.76	1671.12			47272.50	41.836
	25:1	PGA155-25A6	155			321.75	2848.50	120	200	134625.00	119.143
		PGB155-25A6	155			314.60	2785.20			131468.75	116.350

* Available load inertia is calculated based on servo motor inertia using the formula: Available Inertia = (5 x Motor Inertia - Gearbox Inertia) x (Gear Ratio)²
 A 5:1 inertia mismatch is a good target for design purposes. Systems with lower or higher mismatch may be possible, depending on operating conditions.

Suregear® Precision Servo Gearboxes

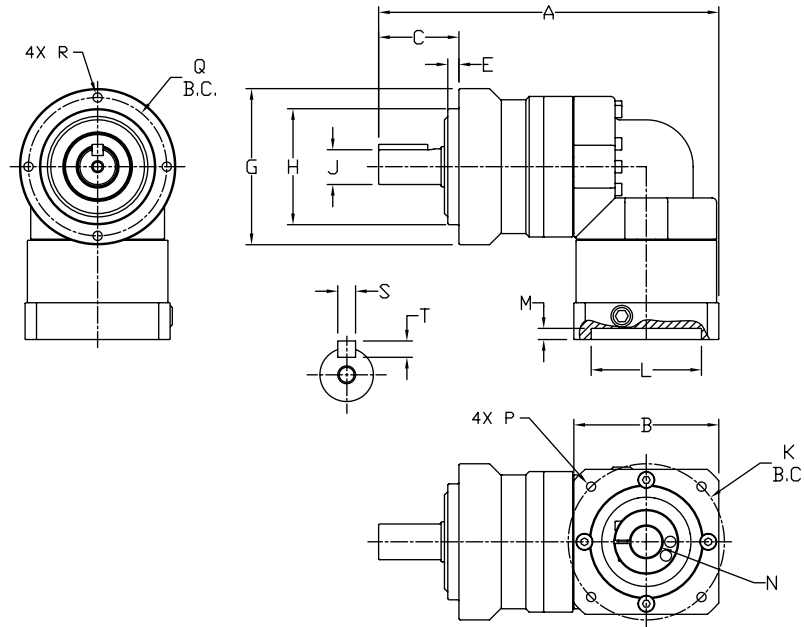
Pricing & Specifications – Right-Angle Shaft PGB Series

SureGear® Precision Servo Gearboxes – Right-Angle Shaft PGB Series																		
Part Number	Price	Frame Size (mm)	Ratio	Reduction	Nominal Output Torque (N·m [lb·in.])	Max. Acceleration Torque (N·m [lb·in.])	Emergency Stop Torque (N·m [lb·in.])	Backlash (arc-min)	Nominal Input Speed (rpm)	Max. Input Speed (rpm)	Allowable Radial Load (N [lb.])	Allowable Thrust Load (N [lb.])	Moment of Inertia (kg·cm ²)	Efficiency (%)	Max. Housing Temperature	Approx Weight (kg [lb.])	Environmental Rating	Fits SureServo Servo Motor
PGB070-05A1	\$674.00	70	5:1	double	22 [195]	40 [354]	80 [708]	6	3000	6000	510 [115]	390 [88]	0.250	93	90 °C [194 °F]	1.9 [4.2]	IP55	SVM-201(B)
PGB070-10A1	\$674.00		10:1	double	16 [142]	32 [283]	65 [575]				640 [144]	530 [119]	0.230					
PGB070-15A1	\$852.00		15:1	triple	16 [142]	32 [283]	65 [575]	9			740 [166]	630 [142]	0.073	88		1.7 [3.7]		
PGB070-25A1	\$852.00		25:1	triple	24 [212]	45 [398]	90 [797]				870 [196]	790 [178]	0.071					
PGB070-05A2	\$674.00		5:1	double	22 [195]	40 [354]	80 [708]	6			510 [115]	390 [88]	0.320	93		1.9 [4.2]		
PGB070-10A2	\$674.00		10:1	double	16 [142]	32 [283]	65 [575]				640 [144]	530 [119]	0.300					
PGB070-15A2	\$852.00		15:1	triple	16 [142]	32 [283]	65 [575]	9			740 [166]	630 [142]	0.118	88		1.7 [3.7]		
PGB070-25A2	\$852.00		25:1	triple	24 [212]	45 [398]	90 [797]				870 [196]	790 [178]	0.115					
PGB090-15A2	\$1,040.00	90	15:1	triple	45 [398]	65 [575]	170 [1505]	9	1400 [314]	1900 [427]	0.410	88	4.3 [9.5]					
PGB090-25A2	\$1,040.00		25:1	triple	65 [575]	110 [974]	220 [1947]		1600 [360]	2200 [495]	0.400							
PGB090-05A3	\$797.00		5:1	double	65 [575]	90 [797]	220 [1947]	6	960 [216]	1200 [270]	2.130	93		4.9 [10.8]				
PGB090-10A3	\$797.00		10:1	double	45 [398]	65 [575]	170 [1505]		1200 [270]	1600 [360]	2.020							
PGB090-15A3	\$1,040.00		15:1	triple	45 [398]	65 [575]	170 [1505]	9	1400 [314]	1900 [427]	0.600	88			4.3 [9.5]			
PGB090-25A3	\$1,040.00		25:1	triple	65 [575]	110 [974]	220 [1947]		1600 [360]	2200 [495]	0.590							
PGB090-05A4	\$797.00		5:1	double	65 [575]	90 [797]	220 [1947]	6	960 [216]	1200 [270]	4.260	93				4.9 [10.8]		
PGB090-10A4	\$797.00		10:1	double	45 [398]	65 [575]	170 [1505]		1200 [270]	1600 [360]	4.150							
PGB120-15A4	\$1,293.00	15:1	triple	110 [974]	200 [1770]	450 [3983]	9	2300 [517]	3000 [674]	4.700	88	10 [22]						
PGB120-25A4	\$1,293.00	25:1	triple	150 [1328]	300 [2655]	550 [4868]		2700 [607]	3700 [832]	4.640								
PGB120-05A5	\$1,040.00	5:1	double	120 [1062]	240 [2124]	500 [4425]	6	1600 [360]	1900 [427]	6.610	93		10.2 [22.5]					
PGB120-10A5	\$1,040.00	10:1	double	110 [974]	200 [1770]	450 [3983]		2000 [450]	2500 [562]	6.050								
PGB120-15A5	\$1,293.00	15:1	triple	110 [974]	200 [1770]	450 [3983]	9	2300 [517]	3000 [674]	4.700	88			10 [22]				
PGB120-25A5	\$1,293.00	25:1	triple	150 [1328]	300 [2655]	550 [4868]		2700 [607]	3700 [832]	4.640								
PGB120-05A6	\$1,040.00	5:1	double	120 [1062]	240 [2124]	500 [4425]	6	1600 [360]	1900 [427]	13.690	93				10.2 [22.5]			
PGB120-10A6	\$1,040.00	10:1	double	110 [974]	200 [1770]	450 [3983]		2000 [450]	2500 [562]	13.120								
PGB155-15A6	\$1,514.00	155	15:1	triple	200 [1770]	400 [3540]	750 [6638]	9	2000	4000	5400 [1214]	4900 [1102]				15.070	88	20.4 [45.0]
PGB155-25A6	\$1,514.00		25:1	triple	300 [2655]	600 [5310]	1100 [9736]				6400 [1439]	6100 [1371]				14.820		
PGB155-05A6	\$1,198.00		5:1	double	200 [1770]	400 [3540]	1100 [9736]	6			3800 [854]	3000 [674]	21.280			93	19.8 [43.7]	
PGB155-10A6	\$1,198.00		10:1	double	200 [1770]	400 [3540]	750 [6638]				4700 [1057]	4100 [922]	19.030					



Precision Servo Gearboxes

Dimensions – Right-Angle Shaft PGB Series



SureGear PGB Series Right-Angle Shaft Gearboxes Dimension Drawing

SureGear® Precision Servo Gearbox Dimensions – Right-Angle Shaft PGA Series (dimensions = mm [in])																
Part Number	A	B	C	E	G	H	J	K	L	M	N	P	Q	R	S	T
PGB070-05A1 PGB070-10A1	151.5 [5.96]	52.0 [2.05]	36.0 [1.42]	5.0 [0.20]	Ø70.0 [Ø2.76]	Ø52.0 [Ø2.05]	Ø16.0 [Ø0.63]	Ø46.0 [Ø1.81]	Ø30.0 [Ø1.18]	5.0 [0.20]	Ø8.0 [Ø0.31]	M4-0.7x9	Ø62.0 [Ø2.44]	M5-0.8x10	5.0 [0.20]	5.0 [0.20]
PGB070-05A2 PGB070-10A2		65.0 [2.56]						Ø70.0 [Ø2.76]	Ø50.0 [Ø1.97]		Ø14.0 [Ø0.55]	M5-0.8x11				
PGB070-15A1 PGB070-25A1	158.0 [6.22]	52.0 [2.05]	36.0 [1.42]	5.0 [0.20]	Ø70.0 [Ø2.76]	Ø52.0 [Ø2.05]	Ø16.0 [Ø0.63]	Ø46.0 [Ø1.81]	Ø30.0 [Ø1.18]	5.0 [0.20]	Ø8.0 [Ø0.31]	M4-0.7x9	Ø62.0 [Ø2.44]	M5-0.8x10	5.0 [0.20]	5.0 [0.20]
PGB070-15A2 PGB070-25A2	163.5 [6.44]	65.0 [2.56]						Ø70.0 [Ø2.76]	Ø50.0 [Ø1.97]		Ø14.0 [Ø0.55]	M5-0.8x11				
PGB090-15A2 PGB090-25A2	204.5 [8.05]	80.0 [3.15]	46.0 [1.81]	7.0 [0.28]	Ø90.0 [Ø3.54]	Ø68.0 [Ø2.68]	Ø22.0 [Ø0.87]	Ø70.0 [Ø2.76]	Ø50.0 [Ø1.97]	6.0 [0.24]	Ø19.0 [Ø0.75]	M6-1.0x13	Ø80.0 [Ø3.15]	M6-1.0x12	6.0 [0.24]	6.0 [0.24]
PGB090-05A3 PGB090-10A3	205.5 [8.09]							Ø90.0 [Ø3.54]	Ø70.0 [Ø2.76]		Ø19.0 [Ø0.75]	M6-1.0x13				
PGB090-15A3 PGB090-25A3	210.5 [8.29]	100.0 [3.94]	46.0 [1.81]	7.0 [0.28]	Ø90.0 [Ø3.54]	Ø68.0 [Ø2.68]	Ø22.0 [Ø0.87]	Ø90.0 [Ø3.54]	Ø70.0 [Ø2.76]	6.0 [0.24]	Ø19.0 [Ø0.75]	M6-1.0x13	Ø80.0 [Ø3.15]	M6-1.0x12	6.0 [0.24]	6.0 [0.24]
PGB090-05A4 PGB090-10A4	205.5 [8.09]							Ø115.0 [Ø4.53]	Ø95.0 [Ø3.74]		Ø22.0 * [Ø0.87]	M8-1.25x17				
PGB120-15A4 PGB120-25A4	272.0 [10.71]	130.0 [5.12]	70.0 [2.76]	9.0 [0.35]	Ø120.0 [Ø4.72]	Ø90.0 [Ø3.54]	Ø32.0 [Ø1.26]	Ø115.0 [Ø4.53]	Ø95.0 [Ø3.74]	8.0 [0.31]	Ø22.0 * [Ø0.87]	M8-1.25x17	Ø108.0 [Ø4.25]	M8-1.25x16	10.0 [0.39]	8.0 [0.31]
PGB120-05A5 PGB120-10A5	266.0 [10.47]							Ø145.0 [Ø5.71]	Ø110.0 [Ø4.33]							
PGB120-15A5 PGB120-25A5	272.0 [10.71]	180.0 [7.09]	70.0 [2.76]	9.0 [0.35]	Ø120.0 [Ø4.72]	Ø90.0 [Ø3.54]	Ø32.0 [Ø1.26]	Ø145.0 [Ø5.71]	Ø110.0 [Ø4.33]	8.0 [0.31]	Ø22.0 * [Ø0.87]	M8-1.25x17	Ø108.0 [Ø4.25]	M8-1.25x16	10.0 [0.39]	8.0 [0.31]
PGB120-05A6 PGB120-10A6	268.5 [10.57]															
PGB155-05A6 PGB155-10A6	341.0 [13.43]	180.0 [7.09]	97.0 [3.82]	12.0 [0.47]	Ø155.0 [Ø6.10]	Ø120.0 [Ø4.72]	Ø40.0 [Ø1.57]	Ø200.0 [Ø7.87]	Ø114.0 [Ø4.50]	8.0 [0.31]	Ø35.0 * [Ø1.38]	M12-1.75x25	Ø140.0 [Ø5.51]	M10-1.5x20	12.0 [0.47]	8.0 [0.31]
PGB155-15A6 PGB155-25A6	364.0 [14.33]							Ø200.0 [Ø7.87]	Ø114.0 [Ø4.50]		Ø140.0 [Ø5.51]	M10-1.5x20				

* Dimension with supplied bushing

NOTE: See our website: www.AutomationDirect.com for complete engineering drawings.

Suregear® Precision Servo Gearboxes

SureGear® Servo Gearbox Replacement Parts



SureGear® Precision Servo Gearboxes – Replacement Parts		
Part Number	Price	Description
PG050-KEY	\$4.00	Output Shaft Key, replacement, 4 x 4 x 14 mm, for SureGear PGA050 series gearboxes.
PG070-KEY	\$4.00	Output Shaft Key, replacement, 5 x 5 x 22 mm, for SureGear PGA070 and PGB070 series gearboxes.
PG090-KEY	\$4.00	Output Shaft Key, replacement, 6 x 6 x 28 mm, for SureGear PGA090 and PGB090 series gearboxes.
PG120-KEY	\$4.00	Output Shaft Key, replacement, 10 x 8 x 45 mm, for SureGear PGA120 and PGB120 series gearboxes.
PG155-KEY	\$4.00	Output Shaft Key, replacement, 12 x 8 x 65 mm, for SureGear PGA155 and PGB155 series gearboxes.
PGA4-A5-BUSH	\$19.00	Input Shaft Bushing, replacement, 28 x 22 x 30.5 mm, for all SureGear gearboxes using SVL-210(B) and SVM-210(B) SureServo motors.
PGA6-BUSH	\$19.00	Input Shaft Bushing, replacement, 38 x 35 x 36 mm, for all SureGear gearboxes using SVM-220(B) and SVM-230(B) SureServo motors.