



*More Than Just a Motor Company*



# RIGHT-ANGLE AND PARALLEL SHAFT AC & DC GEARMOTORS

FRACTIONAL AND SUB-FRACTIONAL HORSEPOWER

*Your First Source for Off-The-Shelf or Custom Gearmotors*



P1100 Series  
70 through 1112 inch-pounds  
of output torque.

**BISON/DAYTON**  
DIRECT INTERCHANGE



PZ Series  
10 through 100 inch-pounds of  
output torque.

**BODINE/BISON/DAYTON**  
DIRECT INTERCHANGE



Right-Angle  
10 & 13 Series  
5 through 135 inch-pounds  
of output torque.

**BODINE/DAYTON**  
DIRECT INTERCHANGE



PE350 Series  
25 through 371 inch-pounds  
of output torque.

**BODINE**  
DIRECT  
INTERCHANGE



P240 & P300 Series  
27 through 391 inch-pounds  
of output torque.

**BISON/DAYTON**  
DIRECT INTERCHANGE

# *Gearmotors for Any Application*

## Parallel Shaft AC and DC Gearmotors

Parallel shaft gearmotors are available from stock in both AC and DC designs. All LEESON parallel shaft gearmotors are designed for reliability and long life. Models ranging from 10 through 1100 inch-pounds are available off-the-shelf, from one of LEESON's 35 warehouses.

All LEESON parallel shaft gearmotors are interchangeable with major brands of gearmotors.

## Right-Angle AC and DC Gearmotors

LEESON right-angle gearmotors are rugged and adaptable to meet the needs of industrial applications. For example, all right-angle gearmotors have a reversible output shaft, for easy field conversion from left-hand to right-hand output; the shaft has both a keyway and flat for your convenience; and the motor is rated for continuous duty, so you don't come up short when it comes to durability. Both DC permanent magnet and AC right-angle gearmotors are available from stock.

## Custom Gearmotors

LEESON is a leading manufacturer of customized motors and gearmotors. In addition to stock gearmotors, LEESON manufactures many custom-designed gearmotor solutions meeting customer needs and wants. In-house gear design, technical support and manufacturing facilities are well suited to the modification of an existing design or the design of a 100% tailored solution to your specific application. Using LEESON's industry unique, customer-focused Motor Design Center located in Grafton, just north of Milwaukee, experienced design, manufacturing and application engineers can collaborate with your product development team to develop a fast-track prototype. Dimensional and performance data is usually available by the end of the first work session, allowing your product development to continue. A pre-production prototype is produced to confirm the design team's results. This resource is available to existing and prospective LEESON OEM customers on request.



# *Designed for Heavy-Duty Service*

An industrial-strength gearing and motor package, designed for reliability and long-life in the toughest applications.

- **Dependable LEESON motors.** DC SCR motors are rated for continuous duty over a 60:1 speed range at constant torque on unfiltered, DC full-wave SCR input. Single phase AC motors are permanent split capacitor type (P240 and AC right-angle gearmotors) or capacitor-start (P1100). Three phase P1100, PE350 and inverter duty gearmotors are available from stock; other three phase gearmotor models are available from production. All motors are continuous duty rated with machined fits and ball bearings for demanding industrial and commercial applications.
- **Pressure-cast aluminum gearboxes.** Machined and integrally fitted to the motor. Precision gearing results in minimum noise, maximum load-carrying capability. Parallel shaft models feature all-steel gearing. Right-angle models combine the strength of bronze worm wheels with steel worm shafts.
- **Oversized brushes on DC motors.** Longer-life between maintenance cycles and easily accessible via brush covers on sides of motor.
- **Hardened steel output shafts.** With keyway, or with keyway and flat, for installation ease.
- **Reversible output shaft on right-angle gearmotors.** Easily field convertible from left-hand standard to right-hand output for mounting flexibility.



## P300 Series Gearmotors



DC SCR 90V and  
Low Voltage (12V) Output Torque  
44-353 In-lbs

- Gearbox output shafts are coated with Mirolon 3300 fortified Teflon for superior corrosion resistance.
- Precision machined in-line steel gears with a first stage steel helical gear followed by spur-type gears.
- Lubrication is permanent semi-fluid grease, reducing possibility of leakage.
- Output shafts have needle bearings for high load capacities.

## PE350 Series Gearmotors



DC SCR 90V and  
Low Voltage (12V) Output Torque  
25-341 In-lbs

- Gearbox output shafts are coated with Mirolon 3300 fortified Teflon for superior corrosion resistance.
- Precision machined in-line steel gears with a first stage steel helical gear followed by spur-type gears.
- Lubrication is permanent semi-fluid grease, reducing possibility of leakage.
- Output shafts have needle bearings for high load capacities.

## Right-Angle 13 Series Gearmotors



DC SCR 90V and  
Low Voltage (12V) Output Torque  
50-135 In-lbs

- Gearbox output shafts are 303 stainless steel.
- This worm type right angle gearing features hardened steel worm with bronze worm wheel for long life and quiet operation.
- Lubrication is permanent synthetic oil.
- Output shafts have ball bearings for carrying maximum thrust loads.

**NEW!**

## WASHGUARD SUB-FRACTIONAL MOTOR GEARMOTORS

### *Enhanced Performance in Wet and Humid Areas*

These new units are designed and manufactured to provide enhanced performance in wet and humid areas. This product offering is a perfect addition to LEESON's market-leading WASHGUARD motors, known to "shed water like a duck." Both the motors and gearmotors meet IP55 environmental conditions.

The gearmotor styles include both parallel and right-angle output shaft configurations. The parallel units have ratio options from 5:1 up to 336:1 with full load torque ratings exceeding 300 in-lbs. The right-angle ratio options range from 5:1 up to 60:1 (all single stage) and full load torques up to 135 in-lbs. All the WASHGUARD gearmotor mounting dimensions have "drop-in" dimensions that match LEESON's current stock offerings for easy direct interchange to the WASHGUARD units. LEESON's WASHGUARD gearmotor critical mounting dimensions "match-up" exactly with several major competitors like Bison, Bodine and WWG.



### *Features*

- 300 Series stainless steel output shafts on the right-angle gearmotors for long, rust-free life.
- Parallel shaft gearmotors have Mirolon 3300 fortified Teflon with ceramic coating on the output shaft to provide similar rust-free life.
- Double O-rings to prevent water entrance at the threaded brush covers on 12-volt units.
- Spring-loaded lip seals used on gearbox output shafts.
- Immersion-proof breather to allow water vapor from condensation to be vented.
- Sealed bearings in the motors.
- All units are white-epoxy painted.

### *Applications*

LEESON WASHGUARD motors are designed for extended life in applications requiring regular washdown or otherwise wet environments. Typical applications are in material handling (conveyors, auger and pumps), food processing and packaging (conveyors, stretch wrap machines).

#### Application Notes

- WASHGUARD motors retard the entrance of water. Extra protection for the motor's interior prevents rust and corrosion build-up and releases trapped moisture to insure a longer life than possible with a standard motor.
- Cast conduit box with threaded conduit holes and Nitrile gaskets keep water out.
- Conduit box cover is made from 304 stainless steel.
- One-way stainless steel vapor vent is provided for any condensation that may accumulate inside the motor.
- All hardware is stainless steel.
- Motor is painted with white epoxy for superior corrosion resistance and protection.
- Machined fits between the endbells and motor frame are sealed with gaskets.
- Thru-bolt heads and nuts sealed with fiber washers.
- O-rings are under each threaded brush cover.







# STOCK SUB-FHP THREE PHASE INVERTER RATED GEARMOTORS

## *Superior Protection Against Voltage Spikes*

Sub-FHP AC Gearmotors  
Inverter Rated



Includes Gearmotor Series PZ, P240, PE350,  
and 13 Series Right-Angle  
Three Phase 230V  
12-391 In-lbs Output Torque

### Design Specifications

Three phase motors totally enclosed for continuous duty, general purpose applications.

Standard on all these ratings is the exclusive Inverter Rated Insulation System (IRIS). This provides superior protection against voltage spikes induced by variable frequency drives.

Many superior mechanical features for both the motor and gearbox. Double shielded ball bearings in the motor. Needle bearings in the parallel shaft gearboxes and ball bearings in the right angle (worm) gearboxes. Steel conduit box provided as standard. Complete gearmotor furnished with high gloss hardened black enamel paint.

### Application Notes

These motors are designed with high temp insulation (Class F) to avoid over heating when operated with a PWM inverter down to a 10:1 speed range from the printed gearmotor output RPM.

## SM Series Sub-Micro Inverter Drives



For applications requiring a simpler drive without a lot of advanced features. Provides 11 isolate I/O terminals with one Form A relay output.



## FHP Series AC Drives



Chassis Mount  
Single Phase Input/Single or  
Three Phase Output

LEESON's Inverter Rated Insulation System (IRIS™) provides superior protection against voltage spikes induced by variable frequency drives. This total insulation system protects better than spike-resistant magnet wire alone. Sleeved connections (from the leads all the way into the turns), and deep-penetrating, non-hygroscopic, high temperature varnish are just a few features contributing to extra protection. All this plus second generation spike-resistant magnet wire. The IRIS™ total insulation system is standard at no extra cost.



## SPECIAL PURPOSE STOCK DC GEARMOTORS

### *Gearmotors for Special Applications*

#### Electrical Specifications – SCR Rated Gearmotors

Totally enclosed, permanent magnet DC gearmotors, performance matched for continuous duty service over a 60:1 speed range. All have constant torque throughout the range when powered by a full-wave unfiltered SCR-type adjustable speed control having a typical form factor of 1.3 to 1.4.

#### Low Voltage Gearmotors

Totally enclosed, permanent magnet DC gearmotors, performance matched for continuous duty. Motors are designed for battery power or can be used with a low voltage controller with form factor up to 1.05.

#### Mechanical Specifications

Precision machined steel gears, with a first stage steel helical gear followed by spur-type gears. Lubrication is permanent semi-fluid grease, reducing possibility of leakage. Output shafts have needle bearings for high load capacities. Shafts are hardened steel.

#### Electrical Specifications

Both SCR (90 volt) and Low Voltage (12 volt) right angle gearmotors. The 90 volt motors are performance matched for continuous service over a 60:1 speed range. All have constant torque throughout the speed range when powered by a full-wave, unfiltered SCR-type 115 volt input adjustable speed control having a typical form factor of 1.3 to 1.4. The low voltage motors are also performance matched for continuous duty. Motors are designed for battery power or can be used with a low voltage controller with form factor up to 1.05.

#### Mechanical Specifications

This worm-type right-angle gearing features hardened, steel worm with bronze worm wheel for long life and quiet operation. Single-piece die cast aluminum alloy housing is vacuum impregnated with Resinol RT for protection and sealing. This gearbox combines light weight with high tensile strength along with being precision machined for alignment of bearings and gearing. For optimum seal life, we use high-temperature Nitrile seals. Gearbox provided with solid output shaft, but can be converted to a hollow output shaft mounting by using snap-ring pliers and remove the snap ring and solid output shaft. Also the T-base feet are bolted to the gearbox, but can easily be removed and converted to face mounting.

#### OS300 Series Gearmotors Off-Set Shaft



DC SCR 90V and Low Voltage (12V)  
130-268 In-lbs Output Torque

#### Bravo Series 12 Sub-FHP Right Angle DC Gearmotors

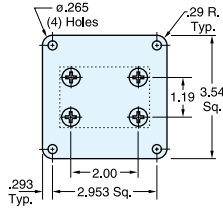


DC SCR 90V and Low Voltage (12V)  
46-134 In-lbs Output Torque

# ACCESSORIES

## Sub-FHP Gearmotor Right-Angle Base Kit

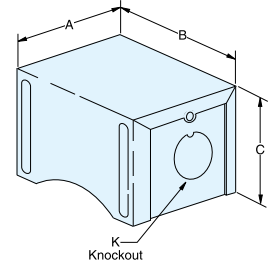
This Optional Base Kit can be used with the 10 Series right-angle gearmotors. (Includes screws for mounting to gearbox, but not the application.)



Cat. No. M1760006

## Sub-FHP Gearmotor Conduit Boxes

Optional steel conduit or junction boxes are available. The boxes are painted and mount in holes using screws provided with all stock gearmotors.



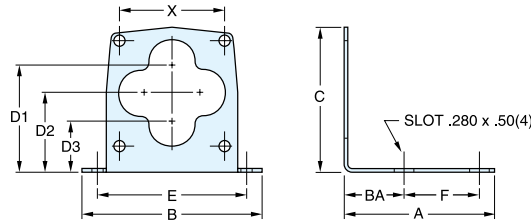
Cat. No. M1760000

Catalog Number	For Motor Frames	DIMENSIONS (Inches)			
		A	B	C	K
M1760000*	25	2.09	2.45	2.23	0.875
M1760021*	30/31	3.13	2.63	2.28	0.875
M1760007	34	3.13	2.63	2.28	0.875
M1760012	38	4.75	2.75	2.00	1.125
175893	42	4.75	2.75	2.00	1.125

\* For gearmotor catalog numbers beginning with M1115XXX, check frame size. For 25 frame, use Kit M176000, for 30 frame, use Kit M1760021.

## Sub-FHP Gearmotor "L" Mounting Bracket

Optional "L" brackets can be used to mount parallel shaft type PZ or PE350 gearmotors. Of steel construction, they are painted and include screws for mounting to the motor, but not the application.



Catalog Number	For Motors	A	B	C	D'	DIMENSIONS (Inches)					
						D <sup>2</sup>	D <sup>3</sup>	X	BA	F	E
M1760003*	PZ Gearmotors	3.75	4.50	3.935	3.00	2.25	1.50	2.645	1.50	1.875	3.75
M1760011**	PE350 Gearmotors	4.50	6.00	5.520	4.00	3.10	2.20	3.625	1.50	2.500	5.00
M1760029Δ	PE350 Gearmotors	4.50	6.00	5.520	4.00	3.10	2.20	3.625	1.50	2.500	5.00

\* Maximum radial load no greater than 50 lbs. This bracket can also be used on DC motors in the 34 frame having the style C mounting.

\*\* Maximum radial load no greater than 200 lbs.

Δ Washguard PE350 L-Bracket



## FRACTIONAL AND INTEGRAL HP REDUCERS AND GEARMOTORS



Look to LEESON for your larger gear reducer and gearmotor needs, too. The 800 Series IRONMAN® cast iron worm gear reducers are built to withstand the rigors of the toughest industrial environments. Or check out the 500 Series Bravo® aluminum reducer line for commercial or industrial applications requiring compact size or lighter weight. Plus, couple either an IRONMAN® or Bravo® reducer to a dependable LEESON motor, and you create a pre-engineered Gear+Motor™ package that can't be beat. For more information, request Cast Iron Worm Gear Catalog 8050 or Aluminum Gear Reducer Catalog 5050.



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