

# BISON



We Make Your Products Go

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To download drawings and to verify agency compliance visit [www.bisongear.com](http://www.bisongear.com)



# What's New? take a look.

## **SANIMotor™** pages 28-29

Bison Gear's innovative SANIMotor™ line of stainless steel gearmotors are designed to meet the IP69K extreme washdown rating established by the European IEC for equipment exposed to temperature extremes, constantly wet environments, and the use of harsh cleaning agents.



## **AUTONOmotor™** SENSORLESS • BRUSHLESS pages 12-13

Sensorless Brushless Gearmotors eliminate position sensors and wiring, while increasing efficiency, reliability and noise immunity. These low-voltage variable-speed brushless DC parallel shaft gearmotors offer up to 275 in-lbs continuous torque with simplified installation and advanced DSP drives. Offered in eleven standard versions with gear ratios from 5:1 to 215.6:1 and rated output speeds from 500 to 12 RPM with a 10:1 speed range.



## **TightDrive™** page 80

Bison's 90V PMDC speed control is designed for applications that require a convenient location for the motor control.... right on the motor! Designed to be easily field mounted on Bison PMDC motors, the speed control is mounted within an aluminum extrusion for superior heat dissipation and a simple knob provides a convenient on-off switch.



## **ServoNOW™** pages 78-79

The ServoNOW™ motor design features a closed loop brushless servomotor with built-in power supply drivers, controllers and feedback devices in a single compact package. This unique patent-pending motor has been designed to simplify and streamline the systems integration and product development process.



## pages 60-61

Our maintenance-free Inverter Duty gearmotors are designed for applications which require variable speed and constant torque using high efficient, three-phase input. Verdant Duty™ models offer durability & versatility with torques ranging from 38 in-lbs to 950 in-lbs.



## **100mmAC** page 36 & page 53

For tight-spaces requiring big power, Bison's 100mmAC (4" dia.), 1/8 HP motors offer larger motor power in 30% less volume. Nine single-phase, parallel shaft models up to 350 in-lbs and six single-phase, right angle models up to 104 in-lbs.



# People Relentless

## Welcome to Bison Gear & Engineering

For over 50 years, our innovative associates have been designing and manufacturing fractional horsepower electric motors, gearmotors and gear reducers used in industrial and commercial applications around the world.



Today, Bison is a leader in the power transmission industry because of our commitment to excellence,

which is achieved by providing the best products and solutions to our customers through exceptional engineering capabilities, supported by our Robusticity™ principles. Innovative technology and technically skilled associates ensure that all of the products we manufacture are “engineered to last”. Our commitment to excellence was recognized in our 50th year when we earned the ISO 9001:2008 certification. This certification demonstrates the unwavering dedication and determination of Bison associates and the pride they have in delivering high quality products.

With an extensive product line of more than 500 part numbers, combined with our ability to design custom products, we are confident that we will provide the best solution for our customers’ needs. We know we have a solution that will work for any application. Supported by a knowledgeable and responsive customer service team, and an experienced network of sales representatives and distribution partners throughout North America, your questions will always be answered in a timely manner.

Bison will continue to demonstrate our commitment to quality and we’ll always take **PRIDE** in being a team of “People Relentless In Delivering Excellence.” We look forward to working with you soon.

A handwritten signature in black ink that reads "Ron Bullock".

**Ron Bullock**  
Chairman

A handwritten signature in black ink that reads "Martin Swarbrick".

**Martin Swarbrick**  
CEO / President

### 1960

Bison is founded by three engineers who used the first letter of each of their last names – B, S, & N – to create the Bison name.

The word "BISON" in a bold, white, sans-serif font, with a small silhouette of a bison head integrated into the letter "O".

### 1987

Norm, Ron, Jeff and Larry Bullock purchase Bison Gear. Bison grows 15% compounded for next 12 years.



### 1981

Bison installs first CNC.



### 1989

Bison acquires RAM Tool to manufacture PMDC motors, becoming Bison Electric Corporation.

The word "RAM" in a bold, white, sans-serif font, with a small red logo consisting of two interlocking circles above the letter "A".

## BISON'S LEAN CAPABILITIES

Utilizing a lean system, Bison is able to shrink overall cycle time, allowing for rapid response to customer needs. Lean manufacturing allows Bison to offer customers a cost-effective product while working in a flexible production environment.



# In Delivering Excellence

Each time a customer interacts with Bison we want them to be completely satisfied. To achieve this goal, each employee is empowered, enabled, and encouraged to provide defect-free, highest-value products and services.



**1994**

Bison launches 100 series product line incorporating Robusticity™ design features.



**2000**

Bison plant is converted to a Lean Manufacturing Facility.

**2007**

In-house MSSC (Manufacturing Skill Standards Council) training & certification center is launched.



**2010**

Bison creates Bison Cares for You, a health and wellness initiative.



**2011**

Bison Innopreneurs Institute is created to develop innovative solutions for growth.



**1997**

Bison and Bison Electric move to current facility with a 115,000 square foot plant and \$2M in new equipment.



**2005**

Bison creates BisonCares, aimed at improving the quality of life in our local and global communities.



**2010**

Bison celebrates its 50th year of business.



**2010**

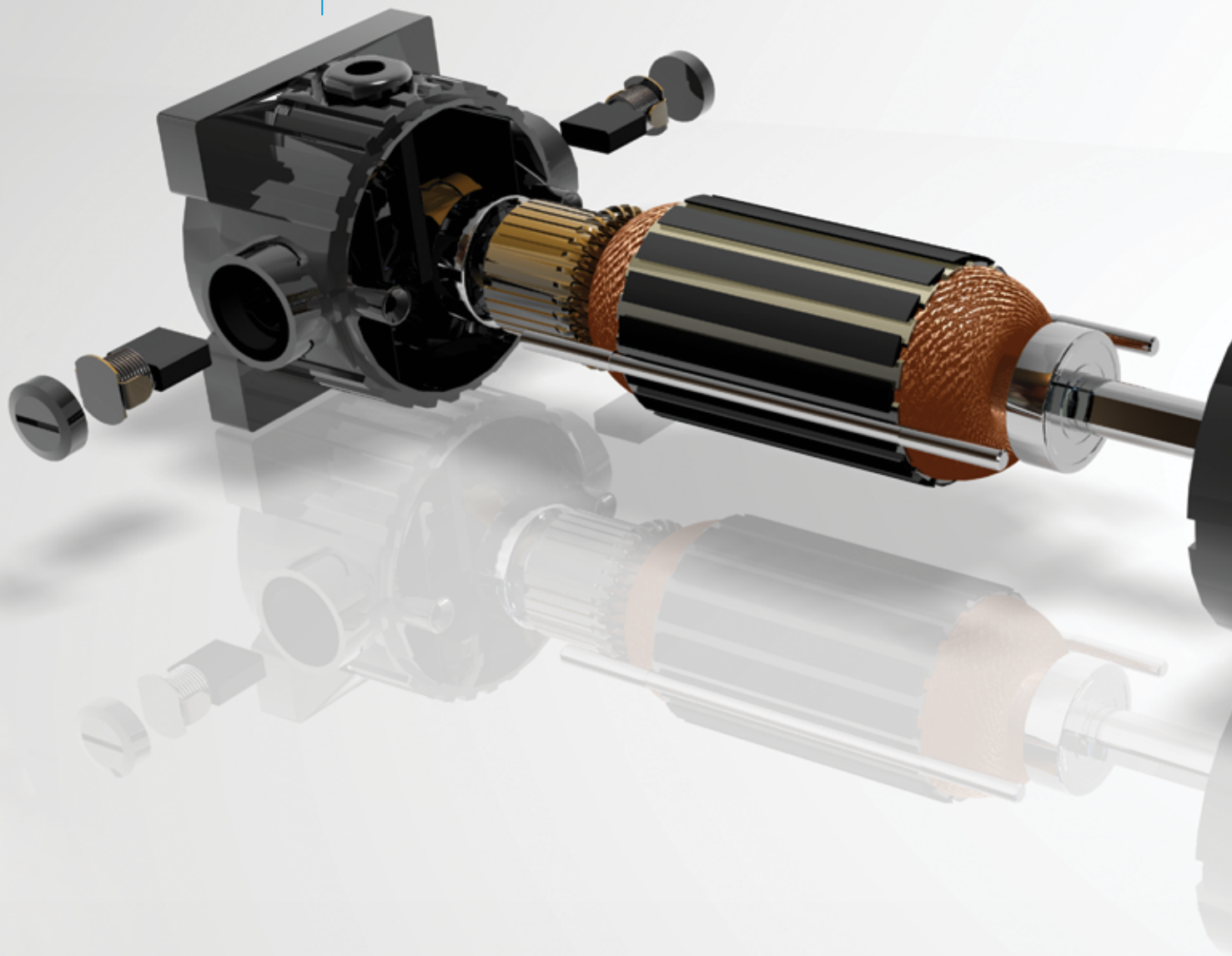
Bison becomes ISO 9001:2008 Certified.



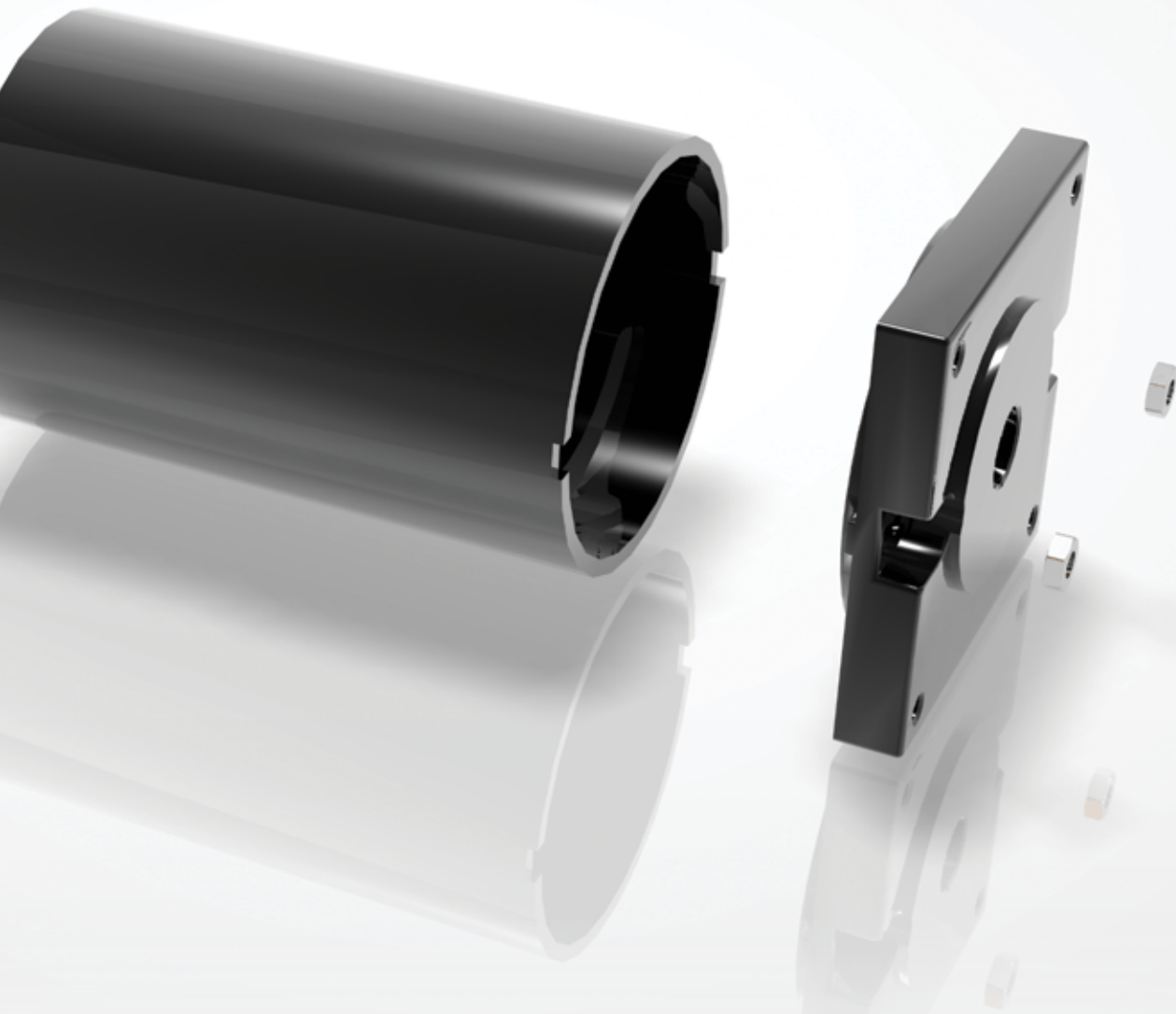
**Bison's Robusticity™ design philosophy** yields gearmotors that are built to be the best from the inside out. Superior quality and design is the reason customers throughout the world have chosen Bison as the driving force behind their products for over 50 years.



# ROBUSTICITY



# PMDC Motors





## 26 Frame Permanent Magnet DC Motors

Motors are available in 12, 24, or 90 volts.  
Power range from 1/53 to 1/9 HP.

### Specifications

Armatures: Dynamically balanced  
Commutators: Tang-type, diamond turned  
Varnishing: Class H polyester trickle varnishing  
Magnets: Highest grade ceramic  
Finish: Gloss black powder coat

Brushes: Oversized with integral shunts  
Replaceable, pg. 86  
Bearings: Double shielded ball  
Shafts: Carbon steel  
Casting: Zinc alloy  
Mounting: Base and face  
Insulation: Class F

### Additional Information

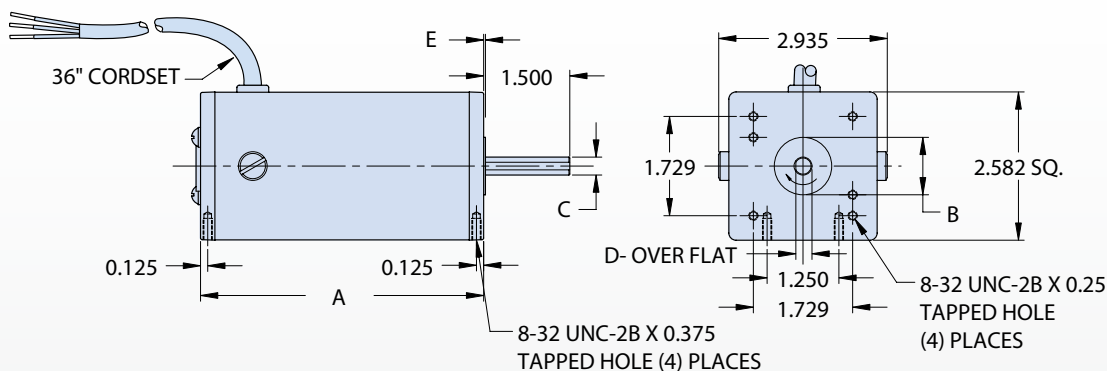
Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)  
**ISIS** - Products available off-shelf  
**SNS** - Min. order quantity and lead time

Wiring diagram pages 88-91

### 26 Frame Permanent Magnet DC Motors

| Part Number  | Volts | HP   | RPM  | Watts | Amps | Form Factor | Torque (oz-in) | Torque Contant | Terminal Resistance | Voltage Contant | Shipping Wt. | Brush |
|--------------|-------|------|------|-------|------|-------------|----------------|----------------|---------------------|-----------------|--------------|-------|
| 051-206-4005 | 12    | 1/44 | 1870 | 31    | 2.61 | 1.3         | 12.7           | 6.713          | 1.069               | 4.963           | 3.75         | F     |
|              | 24    | 1/18 | 4246 | 63    |      |             |                |                |                     |                 |              |       |
| 051-206-4015 | 12    | 1/20 | 1800 | 54    | 4.51 | 1.3         | 28.8           | 7.796          | 0.458               | 5.769           | 5.25         | F     |
|              | 24    | 1/9  | 4000 | 108   |      |             |                |                |                     |                 |              |       |
| 051-206-5005 | 90    | 1/53 | 2475 | 26    | 0.29 | 1.3         | 7.6            | 42.578         | 41.594              | 31.508          | 3.75         | G     |
| 051-206-5015 | 90    | 1/27 | 1810 | 41    | 0.46 | 1.3         | 20.8           | 59.621         | 24.908              | 44.120          | 5.25         | G     |

### 26 Frame PMDC



| Part Number  | A     | B     | C     | D     | E    |
|--------------|-------|-------|-------|-------|------|
| 051-206-4005 | 3.750 | 0.875 | 0.250 | 0.218 | .080 |
| 051-206-4015 | 4.930 | 1.000 | 0.312 | 0.281 | .031 |
| 051-206-5005 | 3.750 | 0.875 | 0.250 | 0.218 | .080 |
| 051-206-5015 | 4.930 | 1.000 | 0.312 | 0.281 | .031 |



## 32 Frame Permanent Magnet DC Motors

Motors are available in 12, 24, 90, or 180 volts.  
Power range from 1/18 HP to 1/3 HP.



### Specifications

Armatures: Dynamically balanced  
Commutators: Tang-type, diamond turned  
Varnishing: Class H polyester trickle varnishing  
Magnets: Highest grade ceramic  
Finish: Gloss black powder coat

Brushes: Oversized with integral shunts  
Replaceable, pg. 86  
Bearings: Double shielded ball  
Shafts: Carbon steel  
Casting: Zinc alloy  
Mounting: Base and face  
Insulation: Class F

### Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)  
**ISIS** - Products available off-shelf  
**SNS** - Min. order quantity and lead time

Wiring diagram pages 88-91

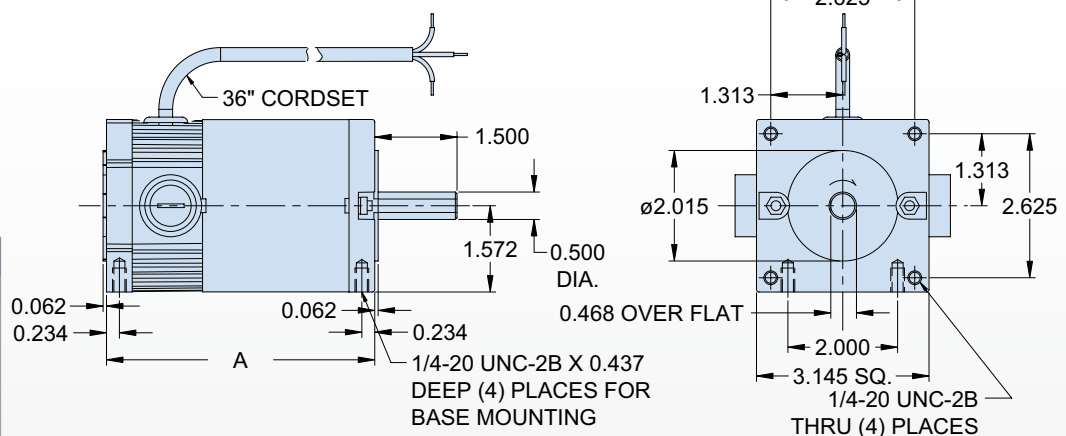
See pages 86-87 for additional accessories

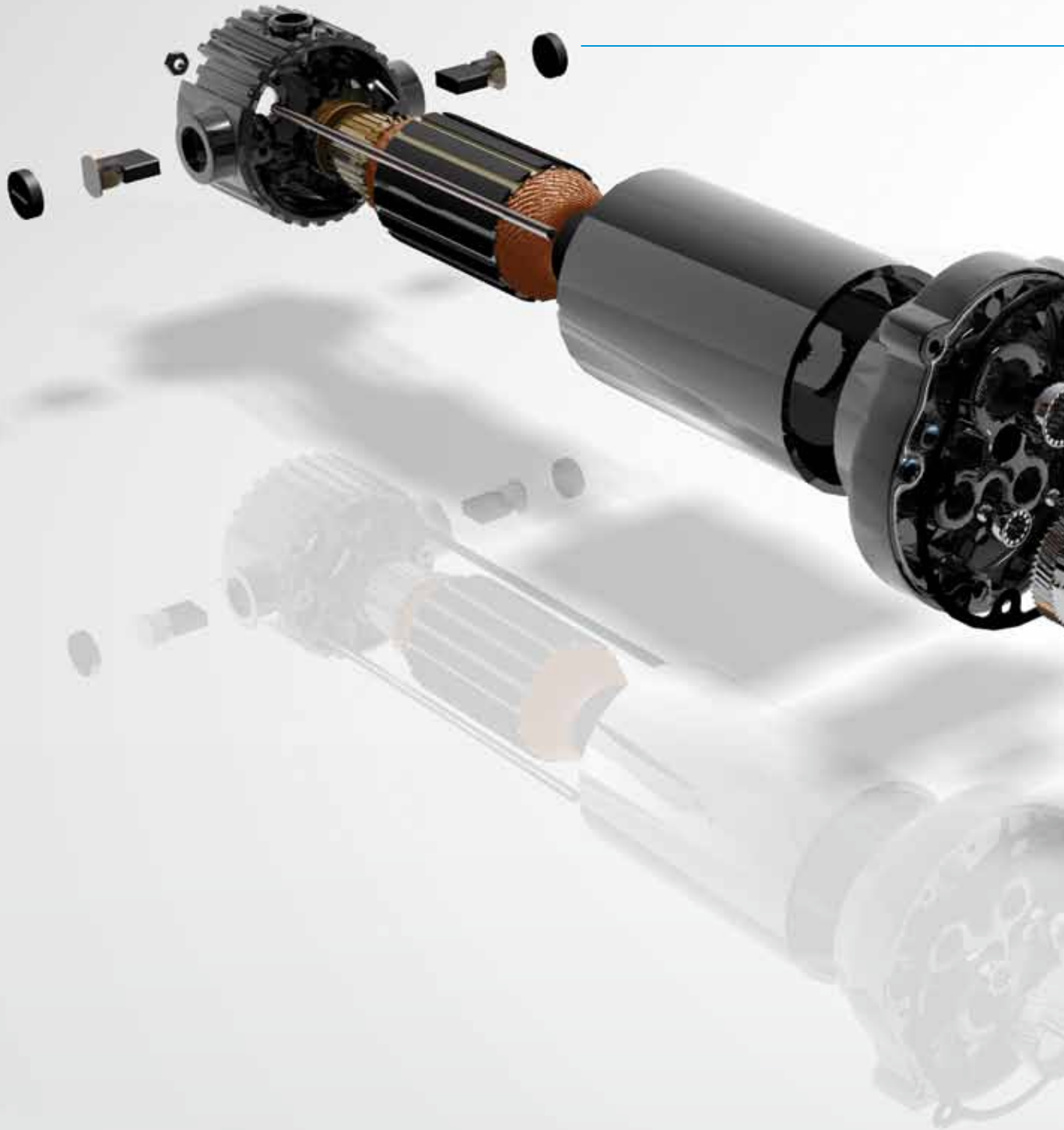
## 32 Frame Permanent Magnet DC Motors

| Part Number  | Volts | HP   | RPM  | Watts | Amps  | Form Factor | Torque (oz-in) | KT (oz-in/A) | RT (ohms) | Arm. Induct. (mh) | KE (V/krpm) | Arm Inertia (oz-in-sec <sup>2</sup> ) | Shipping Wt. | Brush |
|--------------|-------|------|------|-------|-------|-------------|----------------|--------------|-----------|-------------------|-------------|---------------------------------------|--------------|-------|
| 051-203-4025 | 12    | 1/14 | 1750 | 80    | 6.69  | 1.0         | 41.0           | 7.260        | 0.2913    | 1.1393            | 5.368       | 0.0195                                | 8.25         | A     |
|              | 24    | 1/6  | 4200 | 164   | 6.83  | 1.0         | 41.0           | 7.260        | 0.2913    | 1.1393            | 5.368       | 0.0195                                | 8.25         | A     |
| 051-203-4035 | 12    | 1/7  | 1750 | 143   | 11.95 | 1.0         | 90.0           | 8.294        | 0.1563    | 0.6367            | 6.133       | 0.0423                                | 9.25         | A     |
|              | 24    | 1/4  | 3580 | 292   | 12.18 | 1.0         | 90.0           | 8.294        | 0.1563    | 0.6367            | 6.133       | 0.0423                                | 9.25         | A     |
| 051-203-4045 | 12    | 1/6  | 1948 | 170   | 14.17 | 1.0         | 93.4           | 7.209        | 0.1033    | 0.3939            | 5.33        | 0.0524                                | 10.75        | A     |
|              | 24    | 1/3  | 4124 | 345   | 14.36 | 1.0         | 93.4           | 7.209        | 0.1033    | 0.3939            | 5.33        | 0.0524                                | 10.75        | A     |
| 051-203-5025 | 90    | 1/18 | 1800 | 61    | 0.68  | 1.3         | 31.2           | 57.070       | 19.7576   | 74.6886           | 42.199      | 0.0174                                | 8.25         | D     |
| 051-203-5035 | 90    | 1/8  | 1800 | 115   | 1.28  | 1.3         | 70.0           | 61.478       | 6.6323    | 34.2597           | 45.459      | 0.0411                                | 9.25         | D     |
| 051-203-5045 | 90    | 1/6  | 1800 | 155   | 1.72  | 1.3         | 90.0           | 61.197       | 5.1412    | 27.3643           | 45.251      | 0.0515                                | 10.75        | D     |
| 051-203-7005 | 180   | 1/14 | 2350 | 81    | 0.45  | 1.2         | 31.2           | 92.349       | 52.4115   | 195.5731          | 68.285      | 0.0174                                | 8.25         | D     |
| 051-203-7015 | 180   | 1/8  | 1800 | 115   | 0.64  | 1.3         | 70.0           | 122.957      | 29.4829   | 137.0389          | 90.917      | 0.0411                                | 9.25         | D     |
| 051-203-7025 | 180   | 1/6  | 1800 | 155   | 0.86  | 1.3         | 93.4           | 119.48       | 19.5003   | 104.3069          | 88.347      | 0.0515                                | 10.75        | D     |

### 32 Frame PMDC

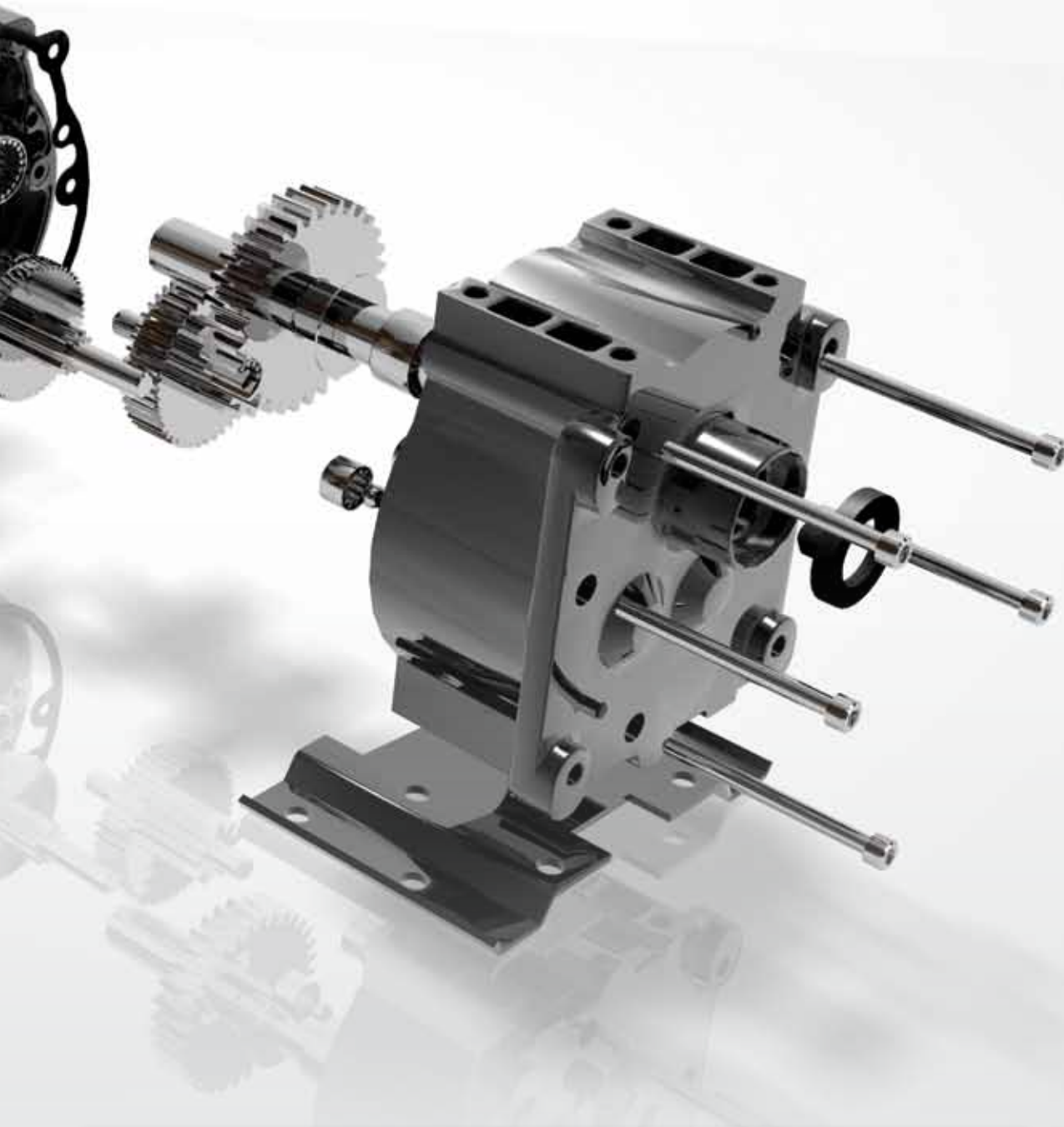
| Part Number  | A     |
|--------------|-------|
| 051-203-4025 | 4.890 |
| 051-203-4035 | 6.890 |
| 051-203-4045 | 7.890 |
| 051-203-5025 | 4.890 |
| 051-203-5035 | 6.890 |
| 051-203-5045 | 7.890 |
| 051-203-7005 | 4.890 |
| 051-203-7015 | 6.890 |
| 051-203-7025 | 7.890 |





# DC Parallel Shaft Gearmotors

DC PARALLEL  
SHAFT  
GEARMOTORS





## AUTONOmotor Brushless DC & Drive

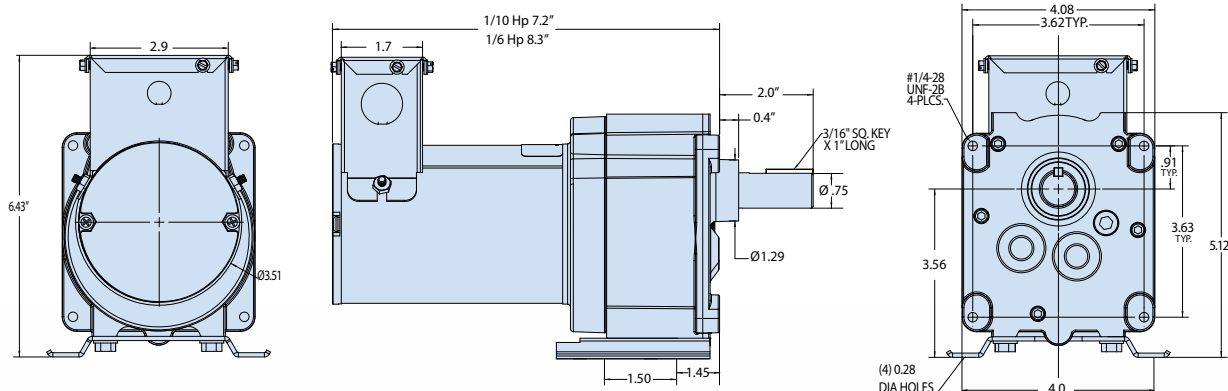
Sensorless, brushless gearmotors eliminate position sensors and wiring, while increasing efficiency, reliability and noise immunity

### 24V BLDC Gearmotor and Drive

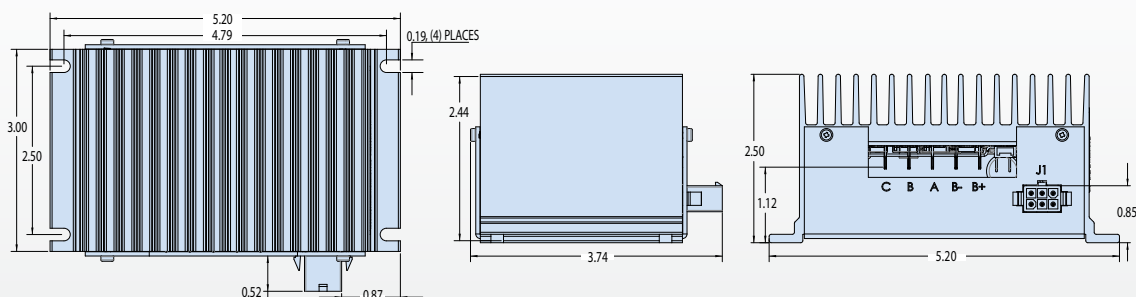
| Gearmotor & Drive # | RPM Hi (2500) | RPM Low (500) | Rated Torque (in-lbs) | Peak Torque (in-lbs) | Motor Input HP | Motor Input Watts | Gear Ratio | # Stages | Shipping Wt. |
|---------------------|---------------|---------------|-----------------------|----------------------|----------------|-------------------|------------|----------|--------------|
| 012-200-9216        | 12            | 2             | 275                   | 310                  | 1/10           | 74                | 215.6      | 3        | 10.5         |
| 012-200-9170        | 15            | 3             | 250                   | 275                  | 1/10           | 74                | 170.0      | 3        | 10.5         |
| 012-200-9102        | 24            | 5             | 242                   | 275                  | 1/10           | 74                | 102.4      | 3        | 10.5         |
| 012-200-9082        | 31            | 6             | 193                   | 250                  | 1/10           | 74                | 81.8       | 3        | 10.5         |
| 012-200-9058        | 43            | 9             | 226                   | 325                  | 1/6            | 124               | 58.3       | 3        | 10.5         |
| 012-200-9043        | 58            | 12            | 166                   | 190                  | 1/6            | 124               | 42.9       | 3        | 10.5         |
| 012-200-9028        | 89            | 18            | 114                   | 145                  | 1/6            | 124               | 28.8       | 2        | 10.5         |
| 012-200-9019        | 131           | 26            | 100                   | 100                  | 1/6            | 124               | 19.1       | 2        | 10.5         |
| 012-200-9015        | 167           | 33            | 80                    | 80                   | 1/6            | 124               | 15.0       | 2        | 10.5         |
| 012-200-9011        | 236           | 47            | 55                    | 55                   | 1/6            | 124               | 10.6       | 2        | 10.5         |
| 012-200-9005        | 500           | 100           | 25                    | 25                   | 1/6            | 124               | 5.0        | 2        | 10.5         |

For speed torque curves and user manual visit [www.bisongear.com](http://www.bisongear.com)

### 24V BLDC Gearmotor



### 24V Sensorless BLDC Drive





## Product Specifications, Features & Benefits

| Gearhead     |                                        | Motor                           | Additional Information                                                                                                                                                                                  |
|--------------|----------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | AGMA class 9 heat treated steel        | Motor Type: Brushless           | Wiring diagram pages 88-91                                                                                                                                                                              |
| Housing:     | Precision machined die cast aluminum   | Rotation: Reversible            |                                                                                                                                                                                                         |
| Lubrication: | Lifetime oil bath, sealed and gasketed | Bearings: Ball                  | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Bearings:    | Needle bearings                        | Insulation: Class F             |                                                                                                                                                                                                         |
| Shafts:      | Hardened steel                         | Enclosure: TENV                 |                                                                                                                                                                                                         |
| Mounting:    | Face or base, any angle                | Finish: Gloss black powder coat |                                                                                                                                                                                                         |

### Drive Features

- Large heat sink on control suitable for 40° C ambient temperatures.
- Digital PWM output, 60 pulses per revolution at motor shaft for PLC control. Servo-like performance with sensorless technology.
- Supplied with 3 foot control cable for PLC or potentiometer hookup. Control velocity, on/off enable, forward reverse, and speed sensing.
- Pre-set current limits optimize performance while protecting your machinery.
- This product is a single quadrant velocity control optimized solution.
- Evaluated to UL 508C and Canadian National Standard C22.2 No. 14-2005, component recognized in E324566.

### Motor Features

- High efficiency NdFeB compression bonded ring magnets used on rotor, painted for long life.
- Class F insulation system evaluated to UL 1449, component recognized in E199928. Construction features meet UL 1004 and Canadian National Standard C22.2 #100 described in E89715.
- Ball bearings on motor and needle bearings in gearcase for robust system.
- Hi-gloss black powder coat paint finish is baked on for durability and superior appearance.
- Highly efficient 24VDC 8-pole stator wound on automated winders at Bison's facility.

### Benefits

- **Save Money!** No feedback cable required thanks to Bison's new control technology.
- **Save Labor!** Simple spade terminal connections for efficient machine assembly. No Hall cable to connect.
- **Improve Reliability!** Sensorless means no Hall cable to shield from power sources.
- **Available Now!** Through Bison's ISIS (In Stock Instant Shipment) nationwide inventory system.

## 24V BLDC Gearmotor and Drive, 1/10 and 1/6 HP (74 to 124 W)

Bison's line of sensorless BLDC gearmotors has been created to minimize the complexity and high cost of traditional BLDC gearmotors.

- Magnetic Hall switch feedback systems comprised of Hall switches, magnet wheels, shielded cables, mechanical registration and labor intensive connection processes have been eliminated with the new patented technology.
- Installation is easy with no feedback cable to worry about.
- Gearmotor and drive rated to operate in 40°C (104°F) ambient temperatures.

## 24V Sensorless BLDC Drive

Created exclusively for Bison's line of gearmotors, the 24V BLDC sensorless drive has been tuned for performance and reliability. Performance curves (available online) show how each matched set of drive and gearmotor will perform over a wide torque range.

- Pre-set current (torque) limits prevent costly machine failures due to unexpected loads. The drive limits the power supplied to the gearmotor minimizing the potential for stall related machine failure.
- The starting torque is robust and easily delivers full torque throughout the published operating range.
- Motor speed range is pre-set at 2500 hi-side and 500 lo-side, with either a potentiometer (supplied) or PLC control (0-5V) to adjust the speed.
- Supplied with 3 foot control cable for PLC or potentiometer hookup. Control velocity, on/off enable, forward reverse and speed sensing. A digital PWM output provides 60 pulses per revolution of the motor shaft for motor speed feedback.





## VWDIR83 DC

12V & 90V PMDC, TENV DESIGN

Our VWDIR83 offers up to 50 in-lbs of torque.

### Specifications

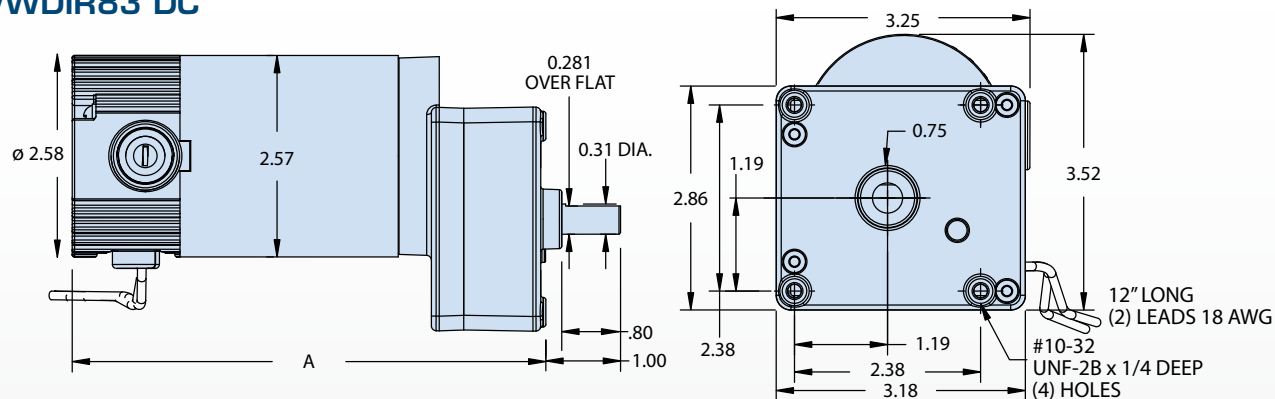
| Gearhead     |                                                     | Motor                                                                                                   | Optional Features                          |
|--------------|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Gearing:     | Powdered metal                                      | Motor Type: Permanent magnet                                                                            | Junction box kit                           |
| Housing:     | Precision machined die cast zinc                    | Rotation: Reversible                                                                                    | Part number: P198-100-9111                 |
| Lubrication: | Grease                                              | Insulation: Class F                                                                                     | <b>Additional Information</b>              |
| Bearings:    | Porous bronze sleeve on gear case;<br>Ball on motor | Finish: Unpainted                                                                                       |                                            |
| Shafts:      | Hardened steel                                      | Enclosure: TENV                                                                                         | See pages 86-87 for additional accessories |
| Mounting:    | All positions                                       | <b>Features</b>                                                                                         |                                            |
|              |                                                     |                                                                                                         |                                            |
|              |                                                     | Units comply with applicable UL & CSA standards                                                         |                                            |
|              |                                                     | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a> |                                            |
|              |                                                     | ISIS - Products available off-shelf                                                                     |                                            |
|              |                                                     | SNS - Min. order quantity and lead time                                                                 |                                            |

### VWDIR83 PMDC 12V & 90V

| Model #         | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps | Shipping Wt. | Brushes |
|-----------------|-------------|-----------------|----------|------------|--------|-----|------|--------------|---------|
| <b>12V PMDC</b> |             |                 |          |            |        |     |      |              |         |
| 011Q507-0031    | 76          | 13              | 1/30     | 32         | 2      | 50  | 2.1  | 5            | C       |
| 011Q507-0063    | 39          | 26              | 1/30     | 62         | 3      | 50  | 2.1  | 5            | C       |
| 011Q507-0098    | 24          | 40              | 1/30     | 100        | 3      | 50  | 2.1  | 5            | C       |
| 011Q507-0161    | 17          | 50**            | 1/30     | 141        | 3      | 50  | 2.1  | 5            | C       |
| 011Q507-0314    | 9           | 50**            | 1/30     | 273        | 4      | 50  | 2.1  | 5            | C       |
| 011Q507-0482    | 6           | 50**            | 1/30     | 430        | 4      | 50  | 2.1  | 5            | C       |
| <b>90V PMDC</b> |             |                 |          |            |        |     |      |              |         |
| 011Q527-0031    | 93          | 13              | 1/30     | 32         | 2      | 50  | 0.35 | 5            | B       |
| 011Q527-0063    | 47          | 26              | 1/30     | 62         | 3      | 50  | 0.35 | 5            | B       |
| 011Q527-0098    | 29          | 40              | 1/30     | 100        | 3      | 50  | 0.35 | 5            | B       |
| 011Q527-0161    | 21          | 50**            | 1/30     | 141        | 3      | 50  | 0.35 | 5            | B       |
| 011Q527-0314    | 11          | 50**            | 1/30     | 273        | 4      | 50  | 0.35 | 5            | B       |
| 011Q527-0482    | 7           | 50**            | 1/30     | 430        | 4      | 50  | 0.35 | 5            | B       |

\*\* Gear Limited (check website for updated information.)

### VWDIR83 DC



| Model Number | A        | Model Number | A        |
|--------------|----------|--------------|----------|
| 011Q507-0031 | 5.7 max. | 011Q527-0031 | 5.7 max. |
| 011Q507-0063 | 5.7 max. | 011Q527-0063 | 5.7 max. |
| 011Q507-0098 | 5.7 max. | 011Q527-0098 | 5.7 max. |
| 011Q507-0161 | 5.7 max. | 011Q527-0161 | 5.7 max. |
| 011Q507-0314 | 6.2 max. | 011Q527-0314 | 6.2 max. |
| 011Q507-0482 | 6.2 max. | 011Q527-0482 | 6.2 max. |

# What Everyone Ought to Know About Custom Gearmotors.

DC PARALLEL  
SHAFT  
GEARMOTORS



## How to get exactly what you need:

Bison has built its business over a half century not only by designing robust gearmotors that offer the best value, but also by listening to customers and giving them exactly what they want. Every Bison gearmotor can be customized to meet your application's specific and unique requirements. You'll never hear Bison tell a customer, *"Sorry, that's not part of our standard offering."*

Plus, Bison's **Robusticity™** design philosophy yields gearmotors that are built to be the best from the inside out. Superior quality and design together with the flexibility and willingness to give the customer exactly what they want is the reason customers throughout the world have chosen Bison as the driving force behind their products for 50 years.





# 100 Series Parallel Shaft DC

UP TO 100 IN-LBS CONTINUOUS

The 100 Series offers a wide speed range and many voltage options in an ultra-compact package.

## Specifications

| Gearhead                                                                                      | Motor                                                                                                                                               | Optional Features                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing: 1st-stage helical steel<br>All other stages heat treated powdered metal spur gearing | Motor Type: Permanent magnet<br>Rotation: Reversible<br>Bearings: Ball<br>Insulation: Class F<br>Finish: Gloss black powder coat<br>Enclosure: TENV | <ul style="list-style-type: none"> <li>J-Boxes: P198-100-9111 2.58" dia.</li> <li>Shaft-mount encoder</li> <li>Accessory shaft</li> <li>Footplate P125-100-9998</li> </ul> |
| Housing: Precision machined die cast aluminum                                                 |                                                                                                                                                     |                                                                                                                                                                            |
| Lubrication: Lifetime oil bath, sealed and gasketed                                           |                                                                                                                                                     |                                                                                                                                                                            |
| Bearings: Needle output                                                                       |                                                                                                                                                     |                                                                                                                                                                            |
| Shafts: Hardened steel                                                                        |                                                                                                                                                     |                                                                                                                                                                            |
| Mounting: Face (any angle) or optional footplate                                              |                                                                                                                                                     |                                                                                                                                                                            |
| Finish: Gloss black powder coat                                                               |                                                                                                                                                     |                                                                                                                                                                            |

## Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

**ISIS** - Products available off-shelf

**SNS** - Min. order quantity and lead time

Wiring diagram pages 88-91

See pages 86-87 for additional accessories

## 100 Series PMDC

| Part Number     | Speed 12V RPM | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Shipping Wt. | Brush |
|-----------------|---------------|-----------------|----------|------------|--------|------|------|--------------|-------|
| <b>12V PMDC</b> |               |                 |          |            |        |      |      |              |       |
| 011-190-5096    | 19            | 100**           | 1/20     | 95.5       | 3      | 150  | 3.85 | 8            | C     |
| 011-190-5049    | 36            | 74              | 1/20     | 49.0       | 3      | 130  | 4.73 | 8            | C     |
| 011-190-5025    | 69            | 40              | 1/20     | 25.2       | 2      | 230  | 4.73 | 8            | C     |
| 011-190-5013    | 136           | 20              | 1/20     | 12.9       | 2      | 220  | 4.73 | 8            | C     |
| 011-190-5007    | 261           | 11              | 1/20     | 6.7        | 1      | 200  | 4.73 | 8            | C     |

| Part Number     | Speed 24V RPM | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Shipping Wt. | Brush |
|-----------------|---------------|-----------------|----------|------------|--------|------|------|--------------|-------|
| <b>24V PMDC</b> |               |                 |          |            |        |      |      |              |       |
| 011-190-4096    | 20            | 100**           | 1/20     | 95.5       | 3      | 150  | 2.4  | 8            | C     |
| 011-190-4049    | 37            | 74              | 1/20     | 49.0       | 3      | 130  | 2.4  | 8            | C     |
| 011-190-4025    | 71            | 40              | 1/20     | 25.2       | 2      | 230  | 2.4  | 8            | C     |
| 011-190-4013    | 139           | 20              | 1/20     | 12.9       | 2      | 220  | 2.4  | 8            | C     |
| 011-190-4007    | 269           | 11              | 1/20     | 6.7        | 1      | 200  | 2.4  | 8            | C     |

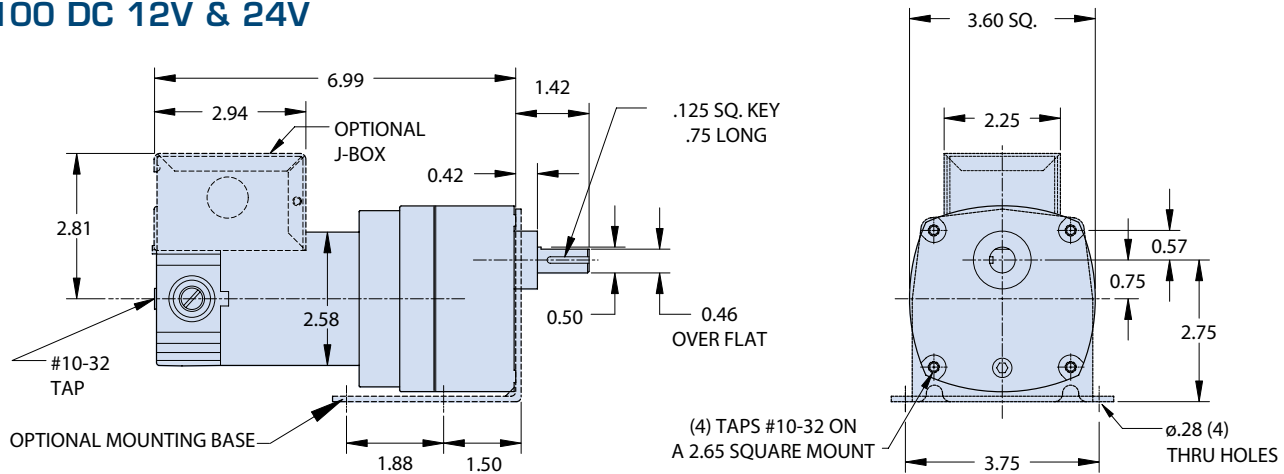
| Part Number             | Speed 90V RPM | Speed 130V RPM*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Shipping Wt. | Brush |
|-------------------------|---------------|-------------------|-----------------|----------|------------|--------|------|------|--------------|-------|
| <b>90V or 130V PMDC</b> |               |                   |                 |          |            |        |      |      |              |       |
| 011-190-1369            | 1.3           | 1.9               | 100**           | 1/40     | 1369.3     | 5      | 115  | 0.13 | 6.25         | B     |
| 011-190-0702            | 2.6           | 3.8               | 100**           | 1/40     | 702.1      | 5      | 115  | 0.15 | 6.25         | B     |
| 011-190-0362            | 4.5           | 6.5               | 100**           | 1/40     | 361.7      | 4      | 115  | 0.19 | 6.25         | B     |
| 011-190-0271            | 6.6           | 10                | 100**           | 1/40     | 271.3      | 4      | 115  | 0.23 | 6.25         | B     |
| 011-190-0186            | 10            | 14                | 100**           | 1/40     | 185.5      | 4      | 85   | 0.28 | 6.25         | B     |
| 011-190-0139            | 13            | 19                | 100**           | 1/40     | 139.1      | 4      | 85   | 0.35 | 6.25         | B     |
| 011-190-0096            | 20            | 29                | 100**           | 1/20     | 95.5       | 3      | 150  | 0.47 | 6.25         | B     |
| 011-190-0072            | 25            | 36                | 100**           | 1/20     | 71.7       | 3      | 150  | 0.58 | 6.25         | B     |
| 011-190-0049            | 37            | 53                | 74              | 1/20     | 49.0       | 3      | 130  | 0.62 | 6.25         | B     |
| 011-190-0037            | 49            | 71                | 55              | 1/20     | 36.7       | 3      | 160  | 0.62 | 6.25         | B     |
| 011-190-0025            | 71            | 103               | 40              | 1/20     | 25.2       | 2      | 230  | 0.62 | 6.25         | B     |
| 011-190-0019            | 95            | 137               | 30              | 1/20     | 18.9       | 2      | 225  | 0.62 | 6.25         | B     |
| 011-190-0013            | 139           | 201               | 20              | 1/20     | 12.9       | 2      | 220  | 0.62 | 6.25         | B     |
| 011-190-0010            | 185           | 267               | 15              | 1/20     | 9.7        | 2      | 218  | 0.62 | 6.25         | B     |
| 011-190-0007            | 269           | 389               | 11              | 1/20     | 6.7        | 1      | 200  | 0.62 | 6.25         | B     |
| 011-190-0005            | 359           | 519               | 8               | 1/20     | 5.0        | 1      | 200  | 0.62 | 6.25         | B     |

\* Maximum overhung load on center of output shaft. \*\* Output torque is gear limited. \*\*\* Units rated for 90V 1.37 form factor drive may be run with 1.05 form factor drive, at 130V



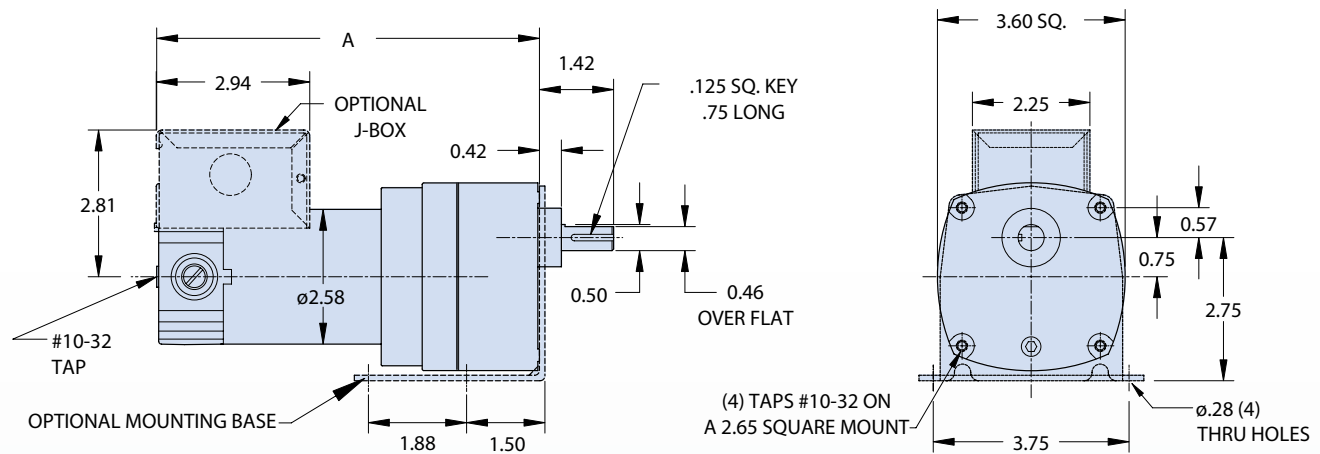
# 100 Series Parallel Shaft DC

## 100 DC 12V & 24V



## 100 DC 90V & 130V

| HP   | Stages  | A    |
|------|---------|------|
| 1/20 | 1, 2, 3 | 7.38 |
| 1/40 | 4, 5    | 7.33 |





# 175 Series Parallel Shaft DC

UP TO 170 IN-LBS CONTINUOUS

The 175 Series offers a wide speed range in an ultra-compact package.

## Specifications

| Gearhead                                                                                                 | Motor                           | Optional Features         |
|----------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------|
| Housing: Precision machined die cast aluminum                                                            | Motor Type: Permanent magnet    | • Footplate P125-100-9998 |
| Lubrication: Lifetime oil bath, sealed and gasketed                                                      | Rotation: Reversible            | • J-Boxes:                |
| Shafts: Hardened steel                                                                                   | Bearings: Ball                  | P198-100-9111 2.58" dia.  |
| Mounting: Face (any angle) or optional footplate                                                         | Insulation: Class F             | P198-100-9121 3.13" dia.  |
| Gearing: 1st stage helical steel. All other stages heat-treated steel and/or powdered metal spur gearing | Finish: Gloss black powder coat | • Shaft-mount encoder     |
|                                                                                                          | Enclosure: TENV                 | • Accessory shaft         |

## Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

Wiring diagram pages 88-91

ISIS - Products available off-shelf

See pages 86-87 for additional accessories

SNS - Min. order quantity and lead time

## 175 Series PMDC 90V or 130V

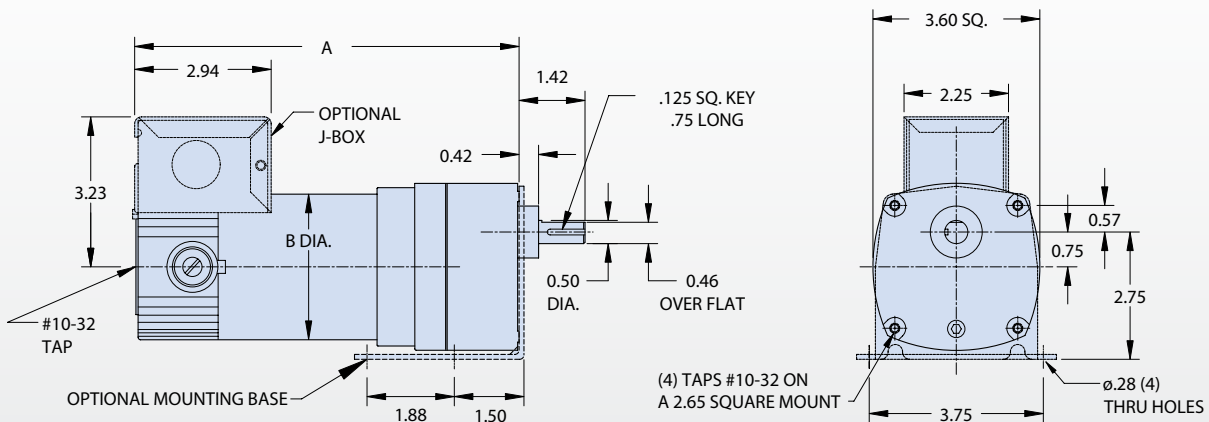
| Part Number  | Speed<br>90V RPM | Speed<br>130V RPM*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Shipping<br>Wt. | Brush |
|--------------|------------------|----------------------|-----------------|----------|------------|--------|------|------|-----------------|-------|
| 011-175-1369 | 1.3              | 1.9                  | 160**           | 1/20     | 1369.3     | 5      | 115  | 0.17 | 8.5             | B     |
| 011-175-0702 | 2.6              | 3.8                  | 130**           | 1/20     | 702.1      | 5      | 95   | 0.21 | 8.5             | B     |
| 011-175-0362 | 4.5              | 6.5                  | 155**           | 1/20     | 361.7      | 4      | 115  | 0.26 | 8.5             | B     |
| 011-175-0271 | 6.6              | 10                   | 160**           | 1/20     | 271.3      | 4      | 115  | 0.30 | 8.5             | B     |
| 011-175-0186 | 10               | 14                   | 170**           | 1/20     | 185.1      | 4      | 85   | 0.40 | 8.5             | B     |
| 011-175-0139 | 13               | 19                   | 170**           | 1/20     | 139.1      | 4      | 85   | 0.49 | 8.5             | B     |
| 011-175-0096 | 19               | 27                   | 150**           | 1/20     | 95.5       | 3      | 150  | 0.58 | 8.5             | B     |
| 011-175-0072 | 25               | 36                   | 111             | 1/20     | 71.7       | 3      | 150  | 0.62 | 8.5             | B     |
| 011-175-0049 | 37               | 53                   | 150             | 1/10     | 49.0       | 3      | 130  | 1.10 | 8.5             | D     |
| 011-175-0037 | 49               | 71                   | 115             | 1/10     | 36.7       | 3      | 160  | 1.10 | 8.5             | D     |
| 011-175-0025 | 71               | 103                  | 83              | 1/10     | 25.2       | 2      | 230  | 1.10 | 8.5             | D     |
| 011-175-0019 | 95               | 137                  | 62              | 1/10     | 18.9       | 2      | 225  | 1.10 | 8.5             | D     |
| 011-175-0013 | 139              | 201                  | 42              | 1/10     | 12.9       | 2      | 220  | 1.10 | 8.5             | D     |
| 011-175-0010 | 185              | 267                  | 32              | 1/10     | 9.7        | 2      | 218  | 1.10 | 8.5             | D     |
| 011-175-0007 | 268              | 387                  | 22              | 1/10     | 6.7        | 1      | 200  | 1.10 | 8.5             | D     |
| 011-175-0005 | 360              | 517                  | 17              | 1/10     | 5.0        | 1      | 200  | 1.10 | 9.0             | D     |

\* Maximum overhung load on center of output shaft. \*\* Output torque is gear limited.

\*\*\* Units rated for 90V 1.37 form factor drive. May be run with 1.05 form factor drive at 130V.

## 175 DC

| HP   | Stages  | A    | B    |
|------|---------|------|------|
| 1/10 | 1, 2, 3 | 8.28 | 3.13 |
| 1/20 | 3       | 7.35 | 2.58 |
| 1/20 | 4, 5    | 8.05 | 2.58 |



# 336 Series Parallel Shaft DC

UP TO 300 IN-LBS CONTINUOUS

For up to 300 in-lbs., our 336 Series offers a wider range of speed and mounting options.



DC PARALLEL  
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## Specifications

| Gearhead     |                                        | Motor                              |                                                           | Optional Features         |
|--------------|----------------------------------------|------------------------------------|-----------------------------------------------------------|---------------------------|
| Gearing:     | AGMA class 9 heat treated steel        | Speed:                             | Variable with appropriate control, (1.37 form factor max) | Junction box kit          |
| Housing:     | Precision machined die cast aluminum   | Rotation:                          | Reversible                                                | Part numbers:             |
| Lubrication: | Lifetime oil bath, sealed and gasketed | Bearings:                          | Ball                                                      | P198-100-9111, 2.58" dia. |
| Bearings:    | Needle and thrust ball                 | Insulation:                        | Class F                                                   | P198-100-9121, 3.13" dia. |
| Shafts:      | Hardened steel                         | Enclosure:                         | TENV                                                      | P198-300-0000, 3.38" dia. |
| Mounting:    | Face or base, any angle                | <b>Features:</b>                   |                                                           | • Shaft-mount encoder     |
| Finish:      | Gloss black powder coat                |                                    |                                                           | • Accessory shaft         |
|              |                                        | Rear tapped hole for encoder mount |                                                           |                           |

## Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

ISIS - Products available off-shelf

SNS - Min. order quantity and lead time

Wiring diagram pages 88-91

See pages 86-87 for additional accessories

## 336 Series PMDC 90V or 130V 5/8" Shaft

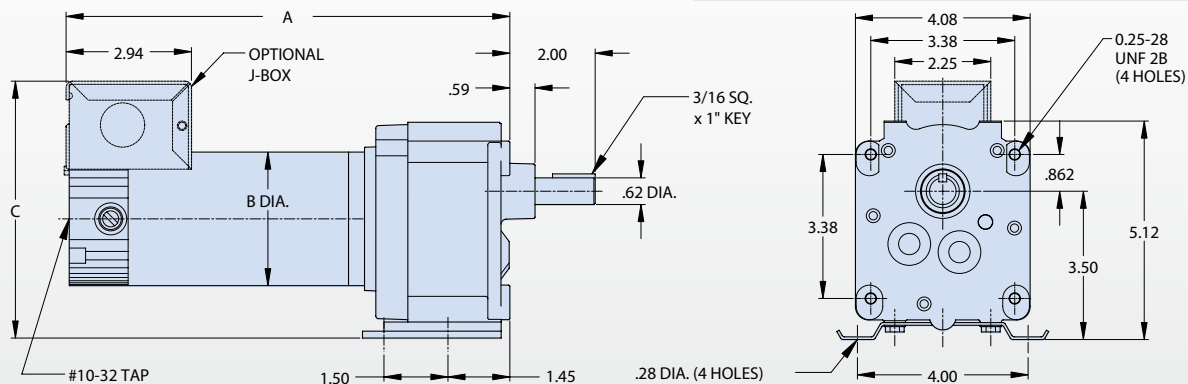
| Part Number  | Speed<br>90V RPM | Speed<br>130V RPM*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Shipping Wt. | Brush |
|--------------|------------------|----------------------|-----------------|----------|------------|--------|------|------|--------------|-------|
| 011-336-1329 | 5.9              | 8.5                  | 183**           | 1/20     | 329.1      | 3      | 400  | 0.33 | 10           | B     |
| 011-336-1208 | 8.7              | 13                   | 293             | 1/20     | 208.0      | 3      | 400  | 0.60 | 10           | B     |
| 011-336-1091 | 20               | 29                   | 140             | 1/20     | 90.9       | 3      | 385  | 0.60 | 10           | B     |
| 011-336-1053 | 34               | 49                   | 85              | 1/20     | 52.9       | 2      | 344  | 0.60 | 10           | B     |
| 011-336-2082 | 22               | 32                   | 300**           | 1/8      | 81.8       | 3      | 322  | 1.16 | 13           | D     |
| 011-336-2060 | 30               | 43                   | 230             | 1/8      | 58.3       | 3      | 291  | 1.33 | 13           | D     |
| 011-336-2043 | 42               | 61                   | 166             | 1/8      | 42.9       | 3      | 250  | 1.33 | 13           | D     |
| 011-336-2028 | 64               | 92                   | 112             | 1/8      | 28.1       | 2      | 264  | 1.33 | 13           | D     |
| 011-336-2019 | 94               | 136                  | 76              | 1/8      | 19.1       | 2      | 242  | 1.33 | 13           | D     |
| 011-336-2015 | 121              | 175                  | 59              | 1/8      | 15.0       | 2      | 225  | 1.33 | 13           | D     |
| 011-336-2011 | 170              | 246                  | 42              | 1/8      | 10.6       | 2      | 208  | 1.33 | 13           | D     |
| 011-336-2005 | 360              | 520                  | 20              | 1/8      | 5.0        | 2      | 200  | 1.33 | 13           | D     |
| 011-336-4043 | 42               | 61                   | 300**           | 1/4      | 42.9       | 3      | 200  | 2.30 | 19.5         | D     |
| 011-336-4029 | 64               | 92                   | 235             | 1/4      | 28.1       | 2      | 236  | 2.51 | 19.5         | D     |
| 011-336-4019 | 94               | 136                  | 160             | 1/4      | 19.1       | 2      | 200  | 2.51 | 19.5         | D     |
| 011-336-4011 | 170              | 246                  | 90              | 1/4      | 10.6       | 2      | 206  | 2.51 | 19.5         | D     |
| 011-336-4005 | 360              | 520                  | 40              | 1/4      | 5.0        | 2      | 170  | 2.51 | 19.5         | D     |

\* Maximum overhung load on center of output shaft. \*\* Output torque is gear limited.

\*\*\* Units rated for 90V 1.37 form factor drive. May be run with 1.05 form factor drive at 130V.

## 336 DC

| HP   | A     | B    | C    |
|------|-------|------|------|
| 1/20 | 8.53  | 2.58 | 5.60 |
| 1/8  | 10.34 | 3.13 | 6.02 |
| 1/4  | 12.27 | 3.38 | 6.23 |





## 348 Series Parallel Shaft DC

UP TO 350 IN-LBS CONTINUOUS

For up to 350 in-lbs., our 348 Series offers more standard voltages, mountings and speeds.

### Specifications

| Gearhead     |                                        | Motor                              |                                                           | Optional Features          |
|--------------|----------------------------------------|------------------------------------|-----------------------------------------------------------|----------------------------|
| Gearing:     | AGMA class 9 heat treated steel        | Speed:                             | Variable with appropriate control, (1.37 form factor max) | Junction box kit           |
| Housing:     | Precision machined die cast aluminum   | Rotation:                          | Reversible                                                | Part numbers:              |
| Lubrication: | Lifetime oil bath, sealed and gasketed | Bearings:                          | Ball                                                      | P198-100-9111, 2 5/8" dia. |
| Bearings:    | Needle and thrust ball                 | Insulation:                        | Class F                                                   | P198-100-9121, 3 1/3" dia. |
| Shafts:      | Hardened steel                         | Enclosure:                         | TENV                                                      | P198-300-0000, 3 3/8" dia. |
| Mounting:    | Face or base, any angle                | <b>Features:</b>                   |                                                           | • Shaft-mount encoder      |
| Finish:      | Gloss black powder coat                | Rear tapped hole for encoder mount |                                                           | • Accessory shaft          |

### Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

Wiring diagram pages 88-91

See pages 86-87 for additional accessories

**ISIS** - Products available off-shelf

**SNS** - Min. order quantity and lead time

### 348 Series PMDC

| Part Number     | Speed 12V RPM | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps  | Shipping Wt. | Brush |
|-----------------|---------------|-----------------|----------|------------|--------|------|-------|--------------|-------|
| <b>12V PMDC</b> |               |                 |          |            |        |      |       |              |       |
| 011-348-3200    | 8.3           | 310**           | 1/6      | 215.6      | 3      | 500  | 5.51  | 16           | A     |
| 011-348-3080    | 22            | 300**           | 1/6      | 81.8       | 3      | 500  | 11.00 | 16           | A     |
| 011-348-3060    | 30            | 285             | 1/6      | 58.3       | 3      | 395  | 13.98 | 16           | A     |
| 011-348-3030    | 64            | 150             | 1/6      | 28.1       | 2      | 290  | 13.98 | 16           | A     |
| 011-348-3015    | 121           | 78              | 1/6      | 15.0       | 2      | 250  | 13.98 | 16           | A     |
| 011-348-3010    | 170           | 57              | 1/6      | 10.6       | 2      | 240  | 13.98 | 16           | A     |
| 011-348-3006    | 360           | 27              | 1/6      | 5.0        | 2      | 210  | 13.98 | 16           | A     |

| Part Number     | Speed 24V RPM | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Shipping Wt. | Brush |
|-----------------|---------------|-----------------|----------|------------|--------|------|------|--------------|-------|
| <b>24V PMDC</b> |               |                 |          |            |        |      |      |              |       |
| 011-348-5200    | 8.3           | 310**           | 1/8      | 215.6      | 3      | 500  | 2.50 | 14           | A     |
| 011-348-5080    | 22            | 300**           | 1/8      | 81.8       | 3      | 500  | 4.50 | 14           | A     |
| 011-348-5060    | 30            | 230             | 1/8      | 58.3       | 3      | 395  | 5.18 | 14           | A     |
| 011-348-5030    | 64            | 112             | 1/8      | 28.1       | 2      | 290  | 5.18 | 14           | A     |
| 011-348-5015    | 121           | 59              | 1/8      | 15.0       | 2      | 250  | 5.18 | 14           | A     |
| 011-348-5010    | 170           | 40              | 1/8      | 10.6       | 2      | 240  | 5.18 | 14           | A     |
| 011-348-5005    | 360           | 19              | 1/8      | 5.0        | 2      | 210  | 5.18 | 14           | A     |

| Part Number             | Speed 90V RPM | Speed 130V RPM*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Shipping Wt. | Brush |
|-------------------------|---------------|-------------------|-----------------|----------|------------|--------|------|------|--------------|-------|
| <b>90V or 130V PMDC</b> |               |                   |                 |          |            |        |      |      |              |       |
| 011-348-4200            | 8.3           | 12                | 310**           | 1/8      | 215.6      | 3      | 500  | 1.33 | 14           | D     |
| 011-348-4170            | 11            | 16                | 310**           | 1/8      | 170.0      | 3      | 500  | 1.33 | 14           | D     |
| 011-348-4100            | 17            | 25                | 350**           | 1/8      | 102.4      | 3      | 500  | 1.33 | 14           | D     |
| 011-348-4080            | 22            | 32                | 300**           | 1/8      | 81.8       | 3      | 500  | 1.33 | 14           | D     |
| 011-348-4060            | 30            | 43                | 300**           | 1/4      | 58.3       | 3      | 395  | 2.30 | 20           | D     |
| 011-348-4050            | 36            | 52                | 300**           | 1/4      | 48.7       | 3      | 350  | 2.30 | 20           | D     |
| 011-348-4040            | 42            | 61                | 300**           | 1/4      | 42.9       | 3      | 350  | 2.30 | 20           | D     |
| 011-348-4030            | 64            | 92                | 235             | 1/4      | 28.1       | 2      | 290  | 2.51 | 20           | D     |
| 011-348-4020            | 94            | 136               | 160             | 1/4      | 19.1       | 2      | 250  | 2.51 | 20           | D     |
| 011-348-4015            | 121           | 175               | 125             | 1/4      | 15.0       | 2      | 250  | 2.51 | 20           | D     |
| 011-348-4010            | 170           | 246               | 90              | 1/4      | 10.6       | 2      | 240  | 2.51 | 20           | D     |
| 011-348-4005            | 360           | 520               | 40              | 1/4      | 5.0        | 2      | 210  | 2.51 | 20           | D     |

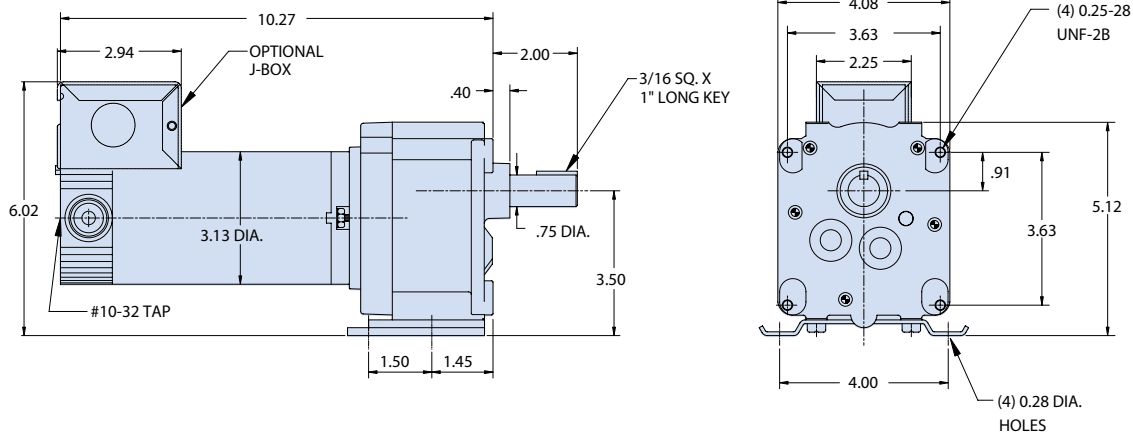
\* Maximum overhung load on center of output shaft. \*\* Output torque is gear limited.

\*\*\* Units rated for 90V 1.37 form factor drive. May be run with 1.05 form factor drive at 130V.

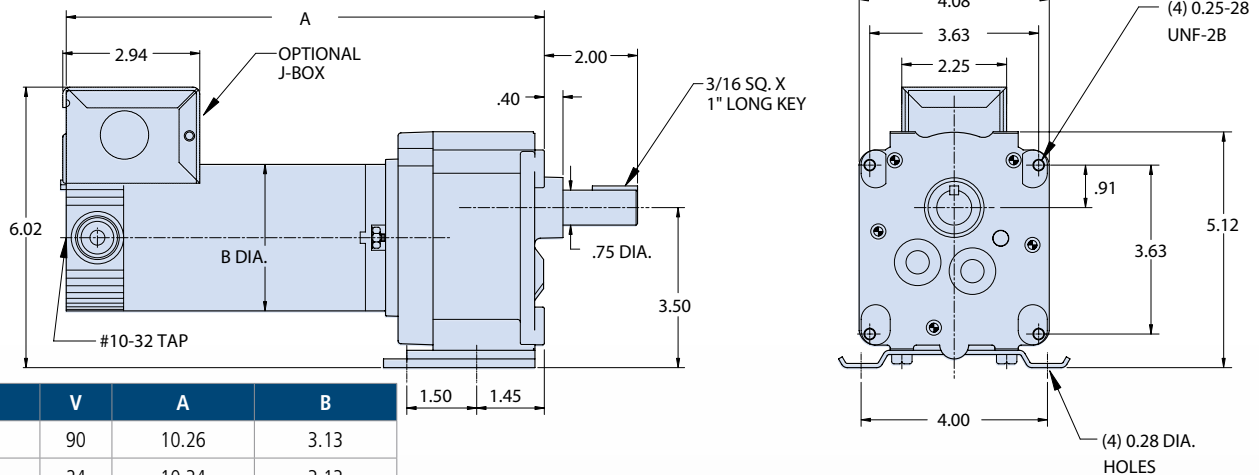


## 348 Series Parallel Shaft DC

### 348 DC 12V



### 348 DC 24V & 90V





## VWDIR84 DC

12V & 90V PMDC TENV DESIGN

Our VWDIR 84 offers up to 500 in-lbs of torque.

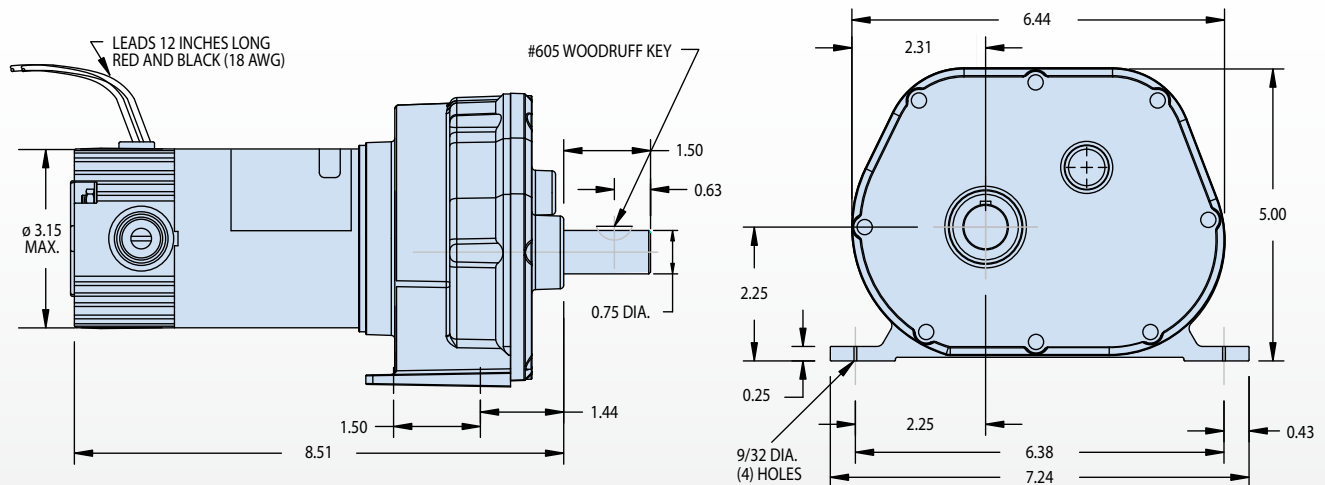
### Specifications

| Gearhead     |                                        | Motor                        | Optional Features                                                                                                                                                                                                                                                                      |
|--------------|----------------------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Phenolic High Speed and Hardened Steel | Motor Type: Permanent magnet | Junction box kit<br>Part number: P198-100-9121                                                                                                                                                                                                                                         |
| Housing:     | Precision machined die cast zinc       | Rotation: Reversible         | <b>Additional Information</b><br>See pages 86-87 for additional accessories<br>Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Lubrication: | Grease                                 | Bearings: Ball               |                                                                                                                                                                                                                                                                                        |
| Bearings:    | Porous Bronze Sleeve                   | Insulation: Class F          | <b>Features</b><br>Units comply with applicable UL & CSA standards                                                                                                                                                                                                                     |
| Shafts:      | Hardened steel                         | Enclosure: TENV              |                                                                                                                                                                                                                                                                                        |
| Mounting:    | All positions                          |                              |                                                                                                                                                                                                                                                                                        |
| Finish:      | Unpainted                              |                              |                                                                                                                                                                                                                                                                                        |

### VWDIR84 PMDC 12V or 90V

| Model #         | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps | Shipping Wt. | Brushes |
|-----------------|-------------|-----------------|----------|------------|--------|-----|------|--------------|---------|
| <b>12V PMDC</b> |             |                 |          |            |        |     |      |              |         |
| 011Q107-0035    | 85          | 50              | 1/10     | 38         | 3      | 250 | 7.7  | 14           | A       |
| 011Q107-0040    | 42          | 75              | 1/15     | 38         | 3      | 250 | 6.2  | 14           | A       |
| 011Q107-0053    | 58          | 75              | 1/10     | 55         | 3      | 250 | 7.7  | 14           | A       |
| 011Q107-0081    | 20          | 150             | 1/15     | 81         | 3      | 250 | 6.2  | 14           | A       |
| 011Q107-0134    | 12          | 250             | 1/15     | 135        | 3      | 250 | 6.2  | 14           | A       |
| 011Q107-0267    | 6           | 500             | 1/15     | 267        | 3      | 250 | 6.2  | 14.5         | A       |
| <b>90V PMDC</b> |             |                 |          |            |        |     |      |              |         |
| 011Q127-0040    | 46          | 75              | 1/15     | 38         | 3      | 250 | 0.84 | 14           | D       |
| 011Q127-0080    | 21          | 150             | 1/15     | 81         | 3      | 250 | 0.84 | 14           | D       |
| 011Q127-0134    | 13          | 250             | 1/15     | 135        | 3      | 250 | 0.84 | 14           | D       |
| 011Q127-0267    | 6.5         | 500             | 1/15     | 267        | 3      | 250 | 0.84 | 14.5         | D       |

### VWDIR84 DC



# 650 Series Parallel Shaft DC

UP TO 710 IN-LBS CONTINUOUS

The 650 Series offers strength and versatility with torque up to 710 in-lbs and speed down to .9 RPM.



DC PARALLEL  
SHAFT  
GEARMOTORS

## Specifications

| Gearhead     |                                        | Motor                                                           | Features                                                                                                            |
|--------------|----------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Hardened steel, AGMA Class 9           | Motor Type: Permanent magnet                                    | Junction box kit                                                                                                    |
| Housing:     | Precision machined die cast aluminum   | Speed: Variable with appropriate control (1.37 form factor max) | <ul style="list-style-type: none"> <li>P198-100-9111, 2.58" dia.</li> <li>P198-300-0000, 3.25" dia.</li> </ul>      |
| Lubrication: | Lifetime oil bath, sealed and gasketed | Rotation: Reversible                                            | Base mounting bracket kit                                                                                           |
| Bearings:    | Needle bearings and thrust balls       | Bearings: Ball                                                  | <ul style="list-style-type: none"> <li>P125-650-5000</li> </ul>                                                     |
| Shafts:      | Hardened steel                         | Insulation: Class F                                             | <b>Other Options</b> <ul style="list-style-type: none"> <li>Accessory shaft</li> <li>Shaft-mount encoder</li> </ul> |
| Mounting:    | Face or base, (optional) any angle     | Enclosure: TEFC                                                 |                                                                                                                     |
| Finish:      | Gloss black powder coat                |                                                                 |                                                                                                                     |

## Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

**ISIS** - Products available off-shelf

**SNS** - Min. order quantity and lead time

Wiring diagram pages 88-91

See pages 86-87 for additional accessories

## 650 Series PMDC 90V or 130V

| Part Number  | Speed 90V RPM | Speed 130V RPM*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Shipping Wt. | Brush |
|--------------|---------------|-------------------|-----------------|----------|------------|--------|------|------|--------------|-------|
| 011-656-2206 | .9            | 1.3               | 710**           | 1/20     | 2206       | 5      | 900  | 0.23 | 21.3         | B     |
| 011-656-1412 | 1.3           | 1.9               | 710**           | 1/20     | 1412.8     | 5      | 900  | 0.31 | 16.5         | B     |
| 011-656-0276 | 6.5           | 9.4               | 710**           | 1/6      | 276.2      | 4      | 900  | 0.96 | 21.3         | D     |
| 011-656-0138 | 13            | 19                | 660**           | 1/6      | 138.1      | 4      | 900  | 1.70 | 21.3         | D     |
| 011-656-0116 | 15            | 22                | 570**           | 1/6      | 115.9      | 4      | 900  | 1.70 | 21.3         | D     |

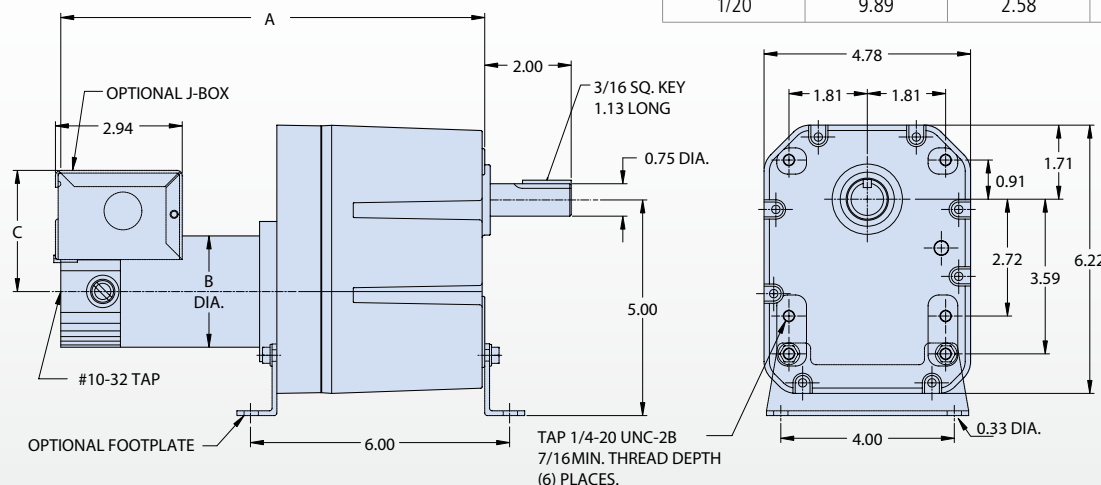
\* Maximum overhung load on center of output shaft.

\*\* Output torque is gear limited.

\*\*\* Units rated for 90V 1.37 form factor drive. May be run with 1.05 form factor drive at 130V.

## 650 DC

| HP   | A     | B    | C    |
|------|-------|------|------|
| 1/6  | 12.43 | 3.25 | 3.36 |
| 1/20 | 9.89  | 2.58 | 2.81 |





## 480 Series Parallel Shaft DC

UP TO 1112 IN-LBS CONTINUOUS

Designed to replace motor-speed reducer combinations, Series 480 parallel shaft gearmotors are more economical and occupy less space.

### Specifications

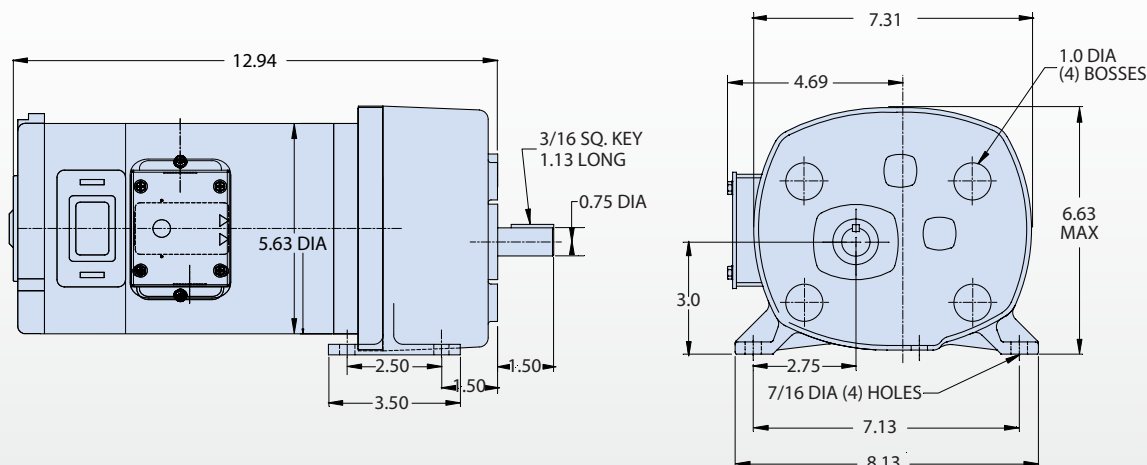
| Gearhead                                                                          | Motor                                                                                              | Additional Information                                                                                     |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Gearing: AGMA class 9 heat treated steel<br>1st-stage helical, balance spur steel | Motor Type: Permanent magnet<br>Speed: Variable with appropriate<br>control (1.37 form factor max) | Current drawings and stock status<br>available at <a href="http://www.bisongear.com">www.bisongear.com</a> |
| Housing: Precision machined die cast<br>aluminum                                  | Rotation: Reversible<br>Bearings: Ball                                                             | ISIS - Products available off-shelf<br>SNS - Min. order quantity and lead time                             |
| Lubrication: Lifetime oil bath, sealed and<br>gasketed                            | Insulation: Class B                                                                                |                                                                                                            |
| Bearings: Needle and thrust ball, ball bearing<br>outboard                        | Enclosures: 1/4 HP TENV<br>1/2 HP TEFC                                                             |                                                                                                            |
| Shafts: Hardened steel                                                            |                                                                                                    |                                                                                                            |
| Mounting: Base, any angle                                                         |                                                                                                    |                                                                                                            |
| Finish: Gloss black powder coat                                                   |                                                                                                    |                                                                                                            |

### 483 Series PMDC 90V

| Part Number  | Speed 90V RPM | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Shipping Wt. | Brush |
|--------------|---------------|-----------------|----------|------------|--------|------|------|--------------|-------|
| 011-483-4197 | 9             | 1087**          | 1/4      | 195.9      | 3      | 800  | 2.00 | 33.5         | E     |
| 011-483-4131 | 14            | 960**           | 1/4      | 130.8      | 3      | 797  | 2.60 | 33.5         | E     |
| 011-483-4087 | 20            | 727             | 1/4      | 86.5       | 3      | 667  | 2.70 | 33.5         | E     |
| 011-483-4041 | 43            | 353             | 1/4      | 41.1       | 3      | 716  | 2.70 | 33.5         | E     |
| 011-483-4028 | 63            | 238             | 1/4      | 27.8       | 3      | 636  | 2.70 | 33.5         | E     |
| 011-483-4018 | 91            | 152             | 1/4      | 19.3       | 2      | 571  | 2.70 | 33.5         | E     |
| 011-483-4012 | 148           | 101             | 1/4      | 11.8       | 2      | 491  | 2.70 | 33.5         | E     |
| 011-483-2087 | 20            | 1112**          | 1/2      | 86.5       | 3      | 667  | 4.2  | 27.25        | E     |
| 011-483-2058 | 34            | 822             | 1/2      | 50.3       | 3      | 682  | 5.0  | 27.25        | E     |
| 011-483-2041 | 40            | 664             | 1/2      | 41.1       | 3      | 716  | 5.0  | 27.25        | E     |
| 011-483-2028 | 60            | 464             | 1/2      | 27.8       | 3      | 636  | 5.0  | 27.25        | E     |
| 011-483-2018 | 90            | 305             | 1/2      | 19.3       | 2      | 571  | 5.0  | 27.25        | E     |
| 011-483-2012 | 144           | 202             | 1/2      | 11.8       | 2      | 491  | 5.0  | 27.25        | E     |

\* Maximum overhung load on center of output shaft. \*\* Output torque is gear limited.

### 483 1/4 HP



# Make sure it's a Bison.



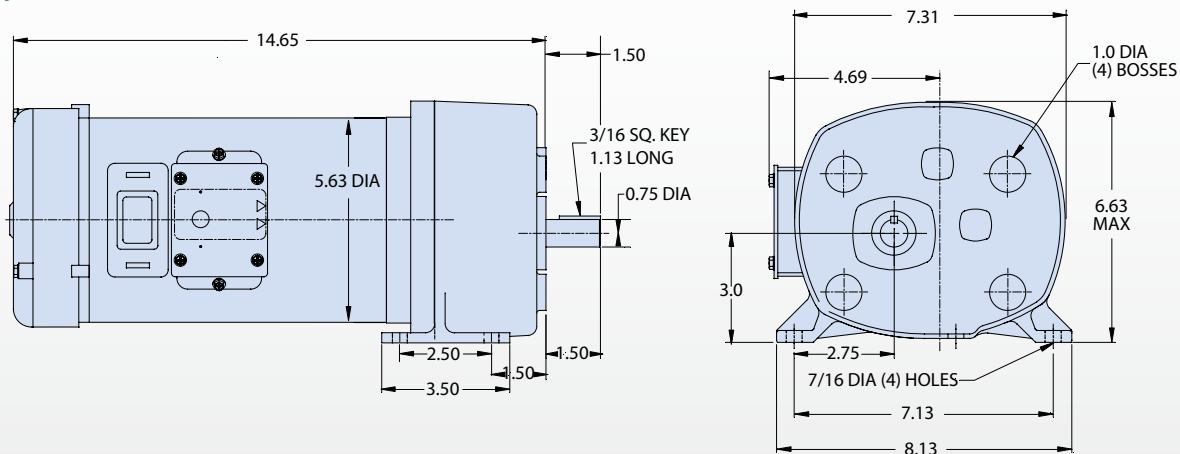
## All Gearmotors are <sup>NOT</sup> Created Equal.



Just because many gearmotors may appear similar from the outside doesn't mean they're built the same on the inside. Take apart a Bison gearmotor, compare it to any others and you'll see the difference. Take permanent magnet DC brushes for instance. Bison's larger size and stainless steel springs mean longer life. Plus, changing brushes is a snap since they're designed for easy maintenance. It's just one small example of how Bison gearmotors are built to last. Bison's Robusticity™ design philosophy yields gearmotors that are built to be the best from the inside out. From components of the highest quality, to innovative design techniques and quality control measures like testing at full rated load and speed, customers have relied on Bison as the driving force behind their products for half a century.



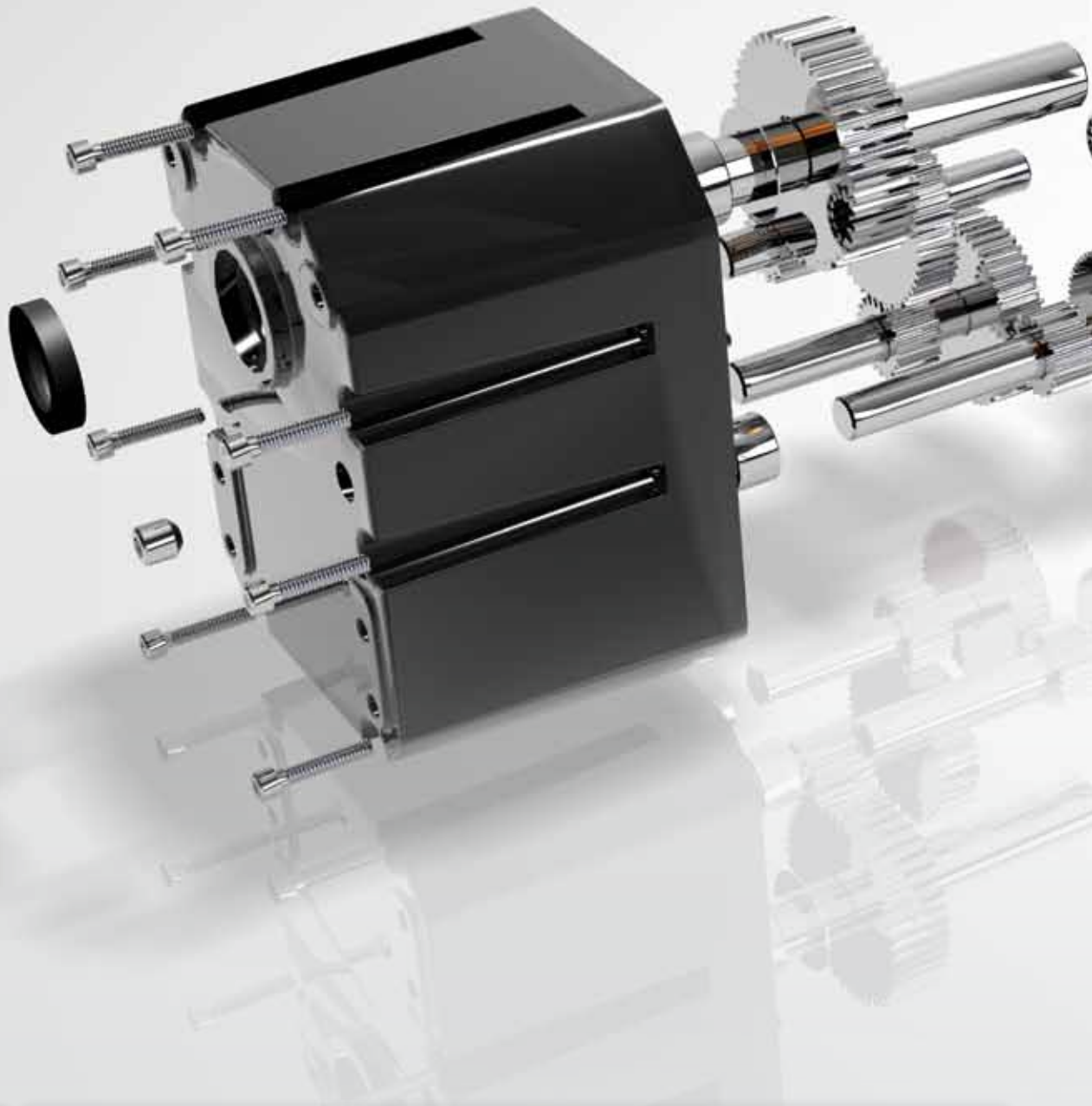
### 483 1/2 HP

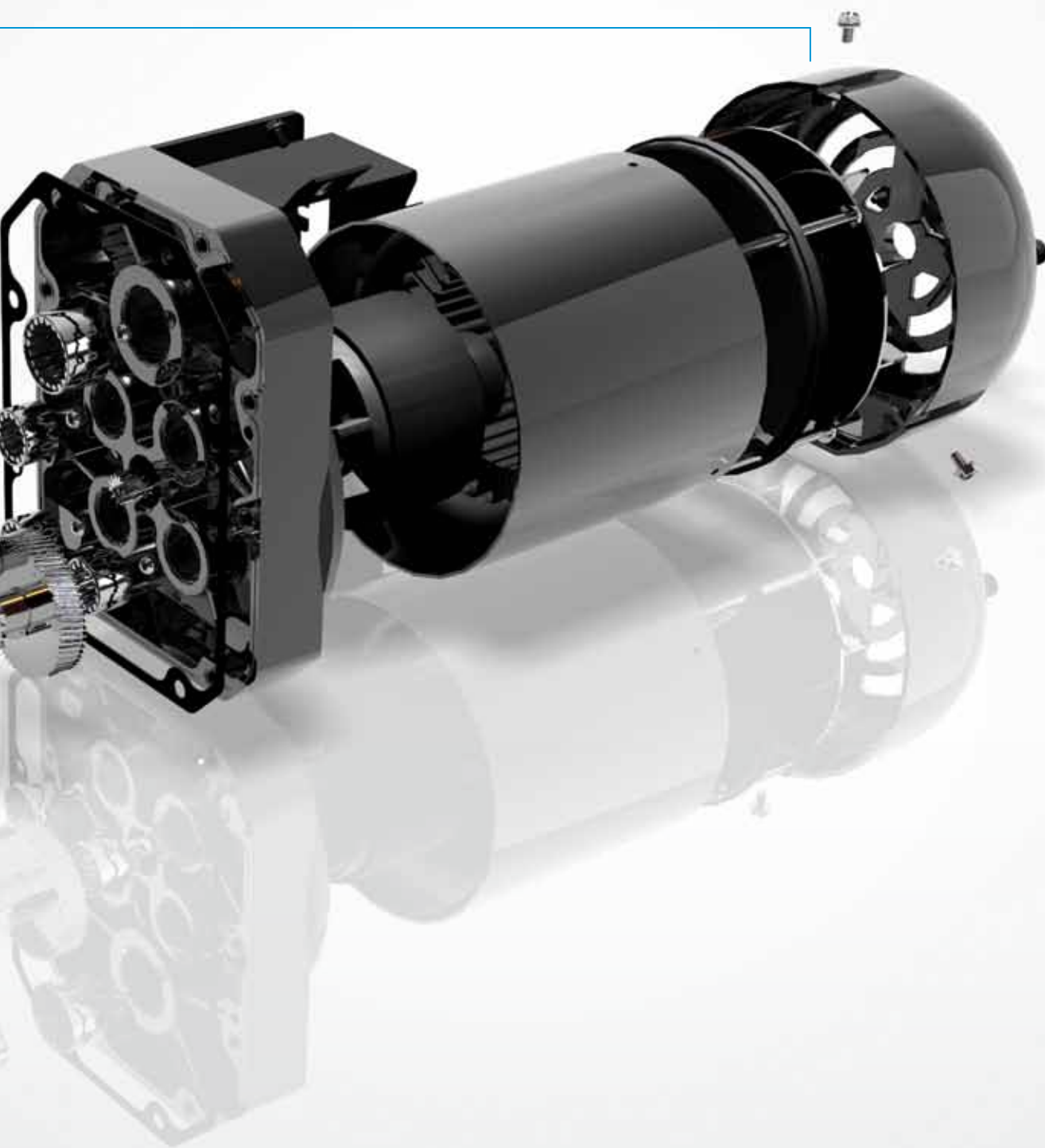




# AC Parallel Shaft Gearmotors

AC PARALLEL  
SHAFT  
GEARMOTORS







## SANIMotor™

IP69K RATED INVERTER DUTY STAINLESS STEEL GEARMOTORS

For use in harsh environments and high pressure, high temperature washdown environments.

\*\* Output torque is gear limited.

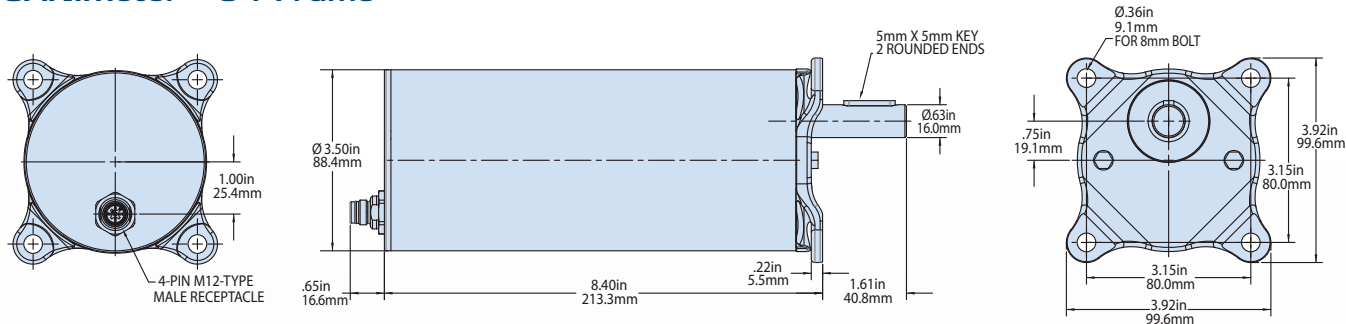
### 34 Frame 230V VFD 3-Phase Inverter Duty

|              | Rated Speed (RPM) |      |      | Rated Torque (in-lbs) |       |       |          |            |        | Amps |      |      |              |
|--------------|-------------------|------|------|-----------------------|-------|-------|----------|------------|--------|------|------|------|--------------|
| Part Number  | 6hz               | 60hz | 90hz | 6hz                   | 60hz  | 90hz  | Input HP | Gear Ratio | Stages | 6hz  | 60hz | 90hz | Shipping Wt. |
| 017-160-0005 | 33.5              | 335  | 500  | 7                     | 7     | 5     | 1/20     | 5          | 1      | .27  | .24  | .19  | 10.5         |
| 017-160-0010 | 17.3              | 173  | 258  | 14                    | 14    | 9     | 1/20     | 10         | 2      | .27  | .24  | .19  | 10.5         |
| 017-160-0019 | 8.9               | 89   | 132  | 27                    | 27    | 17    | 1/20     | 19         | 2      | .27  | .24  | .19  | 10.5         |
| 017-160-0037 | 4.6               | 46   | 68   | 50                    | 50    | 33    | 1/20     | 37         | 3      | .27  | .24  | .19  | 10.5         |
| 017-160-0072 | 2.3               | 23   | 35   | 96                    | 96    | 63    | 1/20     | 72         | 3      | .27  | .24  | .19  | 10.5         |
| 017-160-0139 | 1.2               | 14   | 18   | 160**                 | 160** | 106** | 1/20     | 139        | 4      | .27  | .24  | .19  | 10.5         |
| 017-160-0271 | 0.6               | 7    | 10   | 160**                 | 160** | 160** | 1/20     | 271        | 4      | .24  | .21  | .17  | 10.5         |

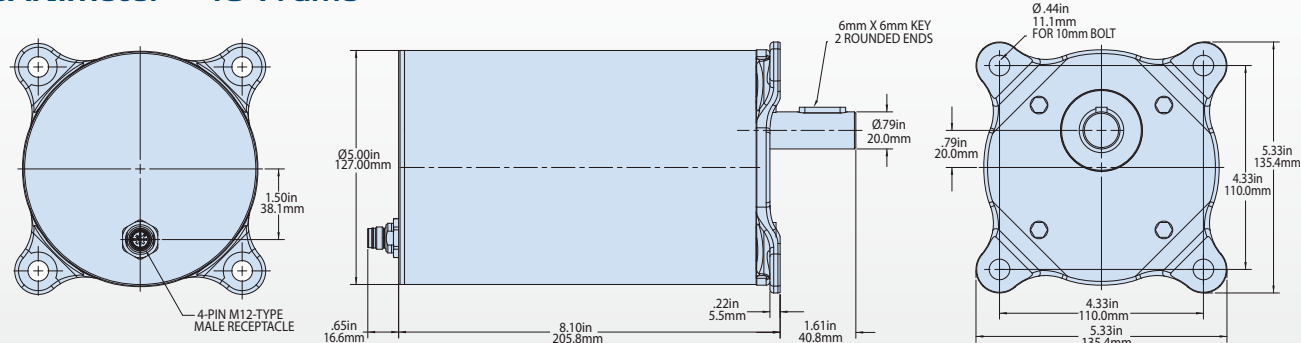
### 49 Frame 230V VFD 3-Phase Inverter Duty

|              | Rated Speed (RPM) |      |      | Rated Torque (in-lbs) |       |       |          |            |        | Amps |      |      |              |
|--------------|-------------------|------|------|-----------------------|-------|-------|----------|------------|--------|------|------|------|--------------|
| Part Number  | 6hz               | 60hz | 90hz | 6hz                   | 60hz  | 90hz  | Input HP | Gear Ratio | Stages | 6hz  | 60hz | 90hz | Shipping Wt. |
| 017-260-0005 | 34.5              | 345  | 518  | 16                    | 16    | 11    | 1/8      | 5          | 2      | .55  | .50  | .44  | 19.5         |
| 017-260-0010 | 17.3              | 173  | 260  | 34                    | 34    | 23    | 1/8      | 10         | 2      | .55  | .50  | .44  | 19.5         |
| 017-260-0019 | 9.1               | 91   | 137  | 70                    | 70    | 46    | 1/8      | 19         | 2      | .55  | .50  | .44  | 19.5         |
| 017-260-0037 | 4.7               | 47   | 71   | 128                   | 128   | 85    | 1/8      | 37         | 2      | .55  | .50  | .44  | 19.5         |
| 017-260-0072 | 2.4               | 24   | 36   | 256                   | 256   | 170   | 1/8      | 72         | 3      | .55  | .50  | .44  | 19.5         |
| 017-260-0140 | 1.2               | 12   | 19   | 500**                 | 500** | 320** | 1/8      | 140        | 3      | .60  | .50  | .44  | 19.5         |
| 017-260-0221 | 0.8               | 8    | 12   | 500**                 | 500** | 500** | 1/8      | 221        | 3      | .60  | .44  | .40  | 19.5         |

### SANIMotor™ 34 Frame



### SANIMotor™ 49 Frame



## Product Features & Benefits

### Motor Encapsulation

- Stator is encapsulated with a thermally conductive 2-part epoxy. Heat dissipates better than a motor without encapsulation, allowing use of TENV construction.
- Gearmotor is suited for use with variable frequency drives in constant torque configuration from 6-60 Hz and constant horsepower configuration from 60-90 Hz. Inverter Duty wire is standard.

### UL Recognized Component

- Construction features meet UL 1004 and C22.2 #100 described in E89715.
- Class Ft insulation system evaluated to UL 1449 described in E199928.
- Class B temperature rise at 40°C rated ambient temperature allows for use in elevated ambient conditions

### Gearmotor Encased in 304 Stainless Steel

- All exterior components are manufactured from 304 stainless steel to provide an exterior shell protecting all interior components.
- Output shaft, supported by sealed ball bearings, is made from 304 stainless steel.
- Laser marked permanent nameplate meets extreme washdown rating.

### Bison Geartrain

- Gear centers are precision machined on automated CNC mills.
- All rotating components supported with sealed ball bearings from the motor to the output shaft.
- Gear pinions are the strongest in the industry, capable of 200% shock loading. Pinions are carburized creating a hard outer surface for wear resistance and a durable inner base to handle high torque loads.
- Geartrain lubricated with NSF H1 registered, DIN 51825 certified, high performance grease for food processing applications.

### Removable IP69K ABS Cordset

- Removable cordset has a stainless steel modular, multi-pin, power connector.

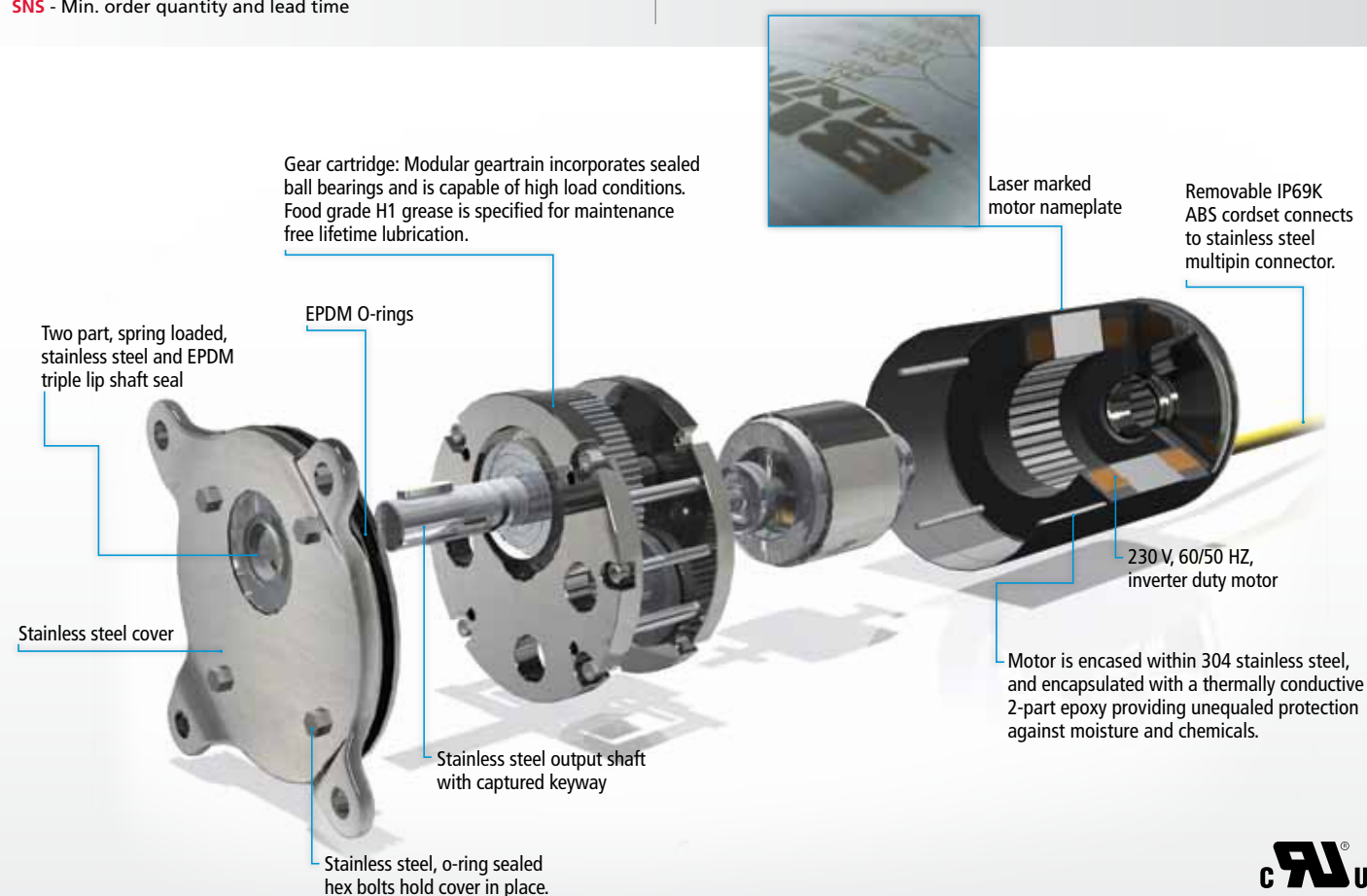
### Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

**ISIS** - Products available off-shelf

**SNS** - Min. order quantity and lead time

Wiring diagram pages 88-91





# VWDIR14 AC

115/230V PSC TENV AC DESIGN

Our VWDIR14 offers up to 50 in-lbs of torque.

AC PARALLEL  
SHAFT  
GEARMOTORS

## Specifications

| Gearhead     |                                  | Motor                                           | Additional Information                                                                                                                                                                                  |  |
|--------------|----------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Gearing:     | Plastic high speed and steel     | Motor Type: Permanent split capacitor           | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |  |
| Housing:     | Precision machined die cast zinc | Rotation: Reversible                            |                                                                                                                                                                                                         |  |
| Lubrication: | Grease                           | Bearings: Ball                                  |                                                                                                                                                                                                         |  |
| Bearings:    | Porous bronze sleeve             | Insulation: Class B minimum                     |                                                                                                                                                                                                         |  |
| Shafts:      | Hardened steel                   | Enclosure: TENV                                 |                                                                                                                                                                                                         |  |
| Mounting:    | All positions                    | Features                                        |                                                                                                                                                                                                         |  |
| Finish:      | Unpainted                        | Units comply with applicable UL & CSA standards |                                                                                                                                                                                                         |  |
|              |                                  | Capacitor and junction box included             |                                                                                                                                                                                                         |  |

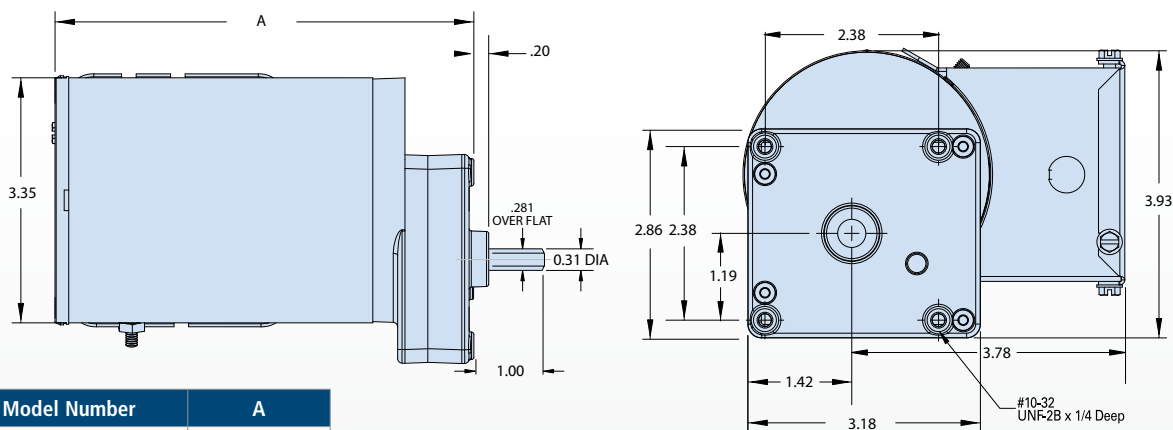
## VWDIR14 PSC 115V/230V

| Model #      | Speed (RPM)* | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps    | Hz    | Shipping Wt. |
|--------------|--------------|-----------------|----------|------------|--------|-----|---------|-------|--------------|
| 016Q507-0018 | 181          | 12              | 1/20     | 10         | 2      | 50  | .62/.38 | 60/50 | 8            |
| 016Q507-0031 | 96           | 20              | 1/20     | 18         | 2      | 50  | .62/.38 | 60/50 | 8            |
| 016Q507-0050 | 68           | 30              | 1/20     | 26         | 2      | 50  | .62/.38 | 60/50 | 8            |
| 016Q507-0098 | 36           | 50**            | 1/20     | 47         | 3      | 50  | .62/.38 | 60/50 | 8            |
| 016Q507-0482 | 7            | 50**            | 1/20     | 239        | 4      | 50  | .62/.38 | 60/50 | 8            |
| 016Q507-0975 | 4            | 50**            | 1/20     | 491        | 4      | 50  | .62/.38 | 60/50 | 8            |

\* All ratings are shown at 60Hz operation. Also operable at 50Hz at 5/6 of the rated speed.

\*\* Gear Limited (check website for updated information.)

## VWDIR14 AC



| Model Number | A    |
|--------------|------|
| 016Q507-0018 | 5.75 |
| 016Q507-0031 | 5.75 |
| 016Q507-0050 | 5.75 |
| 016Q507-0098 | 5.75 |
| 016Q507-0482 | 6.25 |
| 016Q507-0975 | 6.25 |



# VWDIR88 AC

115V SHADED POLE TEFC AC DESIGN

Our VWDIR88 offers up to 113 in-lbs of torque.



## Specifications

| Gearhead     |                                  | Motor                                           | Additional Information                                                                                                                                                                                  |
|--------------|----------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Plastic high speed and steel     | Motor Type: Shaded pole                         | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Housing:     | Precision machined die cast zinc | Rotation: CW facing output shaft                |                                                                                                                                                                                                         |
| Lubrication: | Grease                           | Bearings: Ball                                  |                                                                                                                                                                                                         |
| Bearings:    | Porous bronze sleeve             | Insulation: Class B minimum                     |                                                                                                                                                                                                         |
| Shafts:      | Hardened steel                   | Enclosure: TEFC                                 |                                                                                                                                                                                                         |
| Mounting:    | All positions                    | Features                                        |                                                                                                                                                                                                         |
| Finish:      | Unpainted                        | Units comply with applicable UL & CSA standards |                                                                                                                                                                                                         |

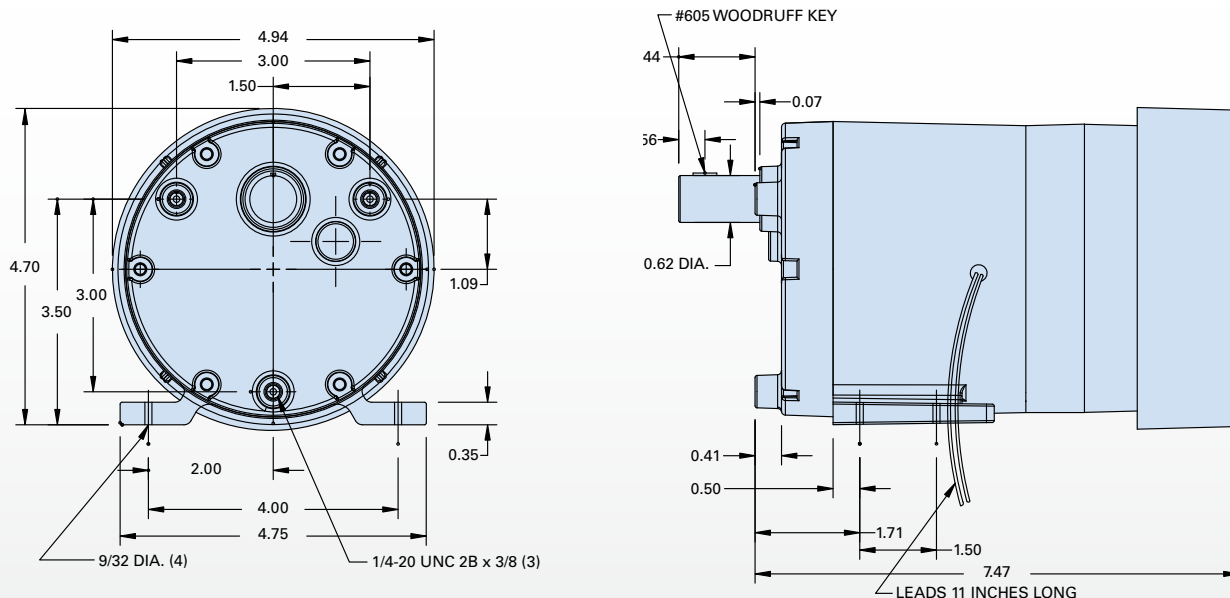
AC PARALLEL  
SHAFT  
GEARMOTORS

## VWDIR88 Shaded Pole 115V

| Model #      | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-----|------|----|--------------|
| 013Q257-0052 | 30          | 42              | 1/20     | 52         | 3      | 150 | 1.6  | 60 | 11.5         |
| 013Q257-0128 | 13          | 113**           | 1/20     | 128        | 3      | 150 | 1.6  | 60 | 11.5         |
| 013Q257-0250 | 7           | 113**           | 1/20     | 250        | 4      | 150 | 1.6  | 60 | 11.5         |
| 013Q257-0750 | 2           | 113**           | 1/20     | 750        | 5      | 150 | 1.6  | 60 | 11.5         |

\*\* Gear Limited (check website for updated information.)

## VWDIR88 AC





## VWDI08 AC

115V SHADED POLE OPEN FAN COOLED AC DESIGN

Our VWDI08 offers up to 113 in-lbs of torque.

### Specifications

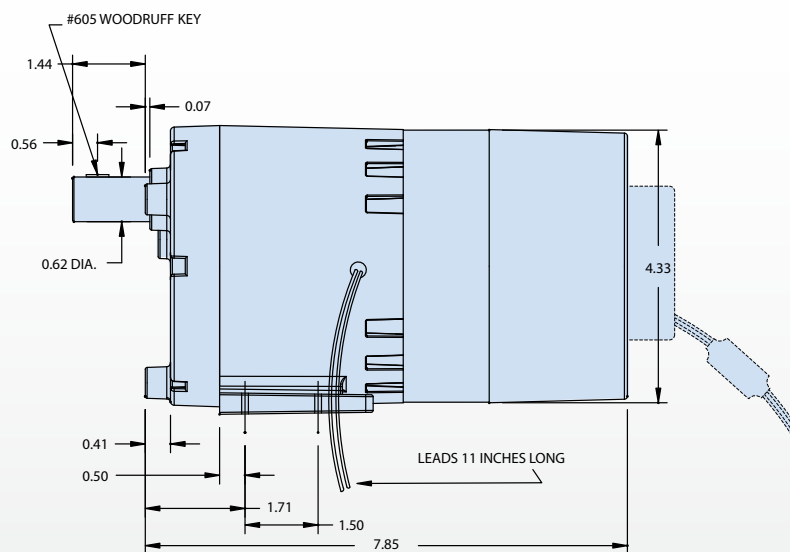
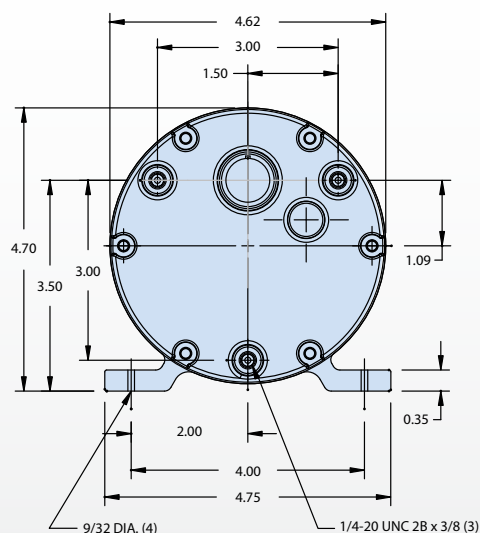
| Gearhead     |                                  | Motor                                           | Additional Information                                                                                                                                                                                  |  |
|--------------|----------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Gearing:     | Plastic high speed and steel     | Motor Type: Shaded pole                         | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |  |
| Housing:     | Precision machined die cast zinc | Rotation: CW facing output shaft                |                                                                                                                                                                                                         |  |
| Lubrication: | Grease                           | Bearings: Ball                                  |                                                                                                                                                                                                         |  |
| Bearings:    | Porous bronze sleeve             | Insulation: Class B minimum                     |                                                                                                                                                                                                         |  |
| Shafts:      | Hardened steel                   | Enclosure: OFC                                  |                                                                                                                                                                                                         |  |
| Mounting:    | All positions                    | Features                                        |                                                                                                                                                                                                         |  |
| Finish:      | Unpainted                        | Units comply with applicable UL & CSA standards |                                                                                                                                                                                                         |  |

### VWDI08 Shaded Pole 115V

| Model #      | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-----|------|----|--------------|
| 013Q227-0027 | 60          | 59              | 1/10     | 27         | 2      | 150 | 2.6  | 60 | 12.5         |
| 013Q227-0052 | 30          | 113**           | 1/10     | 52         | 3      | 150 | 2.6  | 60 | 12.5         |
| 013Q227-0128 | 13          | 113**           | 1/10     | 128        | 3      | 150 | 2.6  | 60 | 12.5         |
| 013Q227-0250 | 7           | 113**           | 1/10     | 250        | 4      | 150 | 2.6  | 60 | 12.5         |
| With Brake   |             |                 |          |            |        |     |      |    |              |
| 013Q207-0027 | 60          | 59              | 1/10     | 27         | 2      | 150 | 2.6  | 60 | 12.5         |
| 013Q207-0052 | 30          | 113**           | 1/10     | 52         | 3      | 150 | 2.6  | 60 | 12.5         |
| 013Q207-0128 | 13          | 113**           | 1/10     | 128        | 3      | 150 | 2.6  | 60 | 12.5         |
| 013Q207-0250 | 7           | 113**           | 1/10     | 250        | 4      | 150 | 2.6  | 60 | 12.5         |
| 013Q207-0750 | 2           | 113**           | 1/10     | 750        | 5      | 150 | 2.6  | 60 | 12.5         |

\*\* Gear Limited (check website for updated information.)

### VWDI08 AC



# The 100MM “Motor in the Middle”

AC PARALLEL  
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GEARMOTORS

49F



39F



34F



## Bigger Power in a Smaller Footprint

Sometimes it's nice to have the best of both worlds. Bison's newest addition to the AC gearmotor lineup, the 100MM AC motor, is perfect for those applications that need more power in tight spaces. As OEM equipment becomes smaller in size and output power requirements increase, the 1/8 HP (93 watt) parallel shaft gearmotor offers 30% less volume than previously available. Plus, the 39F single phase motor is right “in the middle” of our 49F and 34F product offering and provides up to 104 in-lbs (11.8 N-m) of continuous torque.

Bison's Innopreneurial™ philosophy and design engineering capabilities make this product ideally suited to meet today's OEM applications for packaging equipment, conveyor systems, foodservice, stationary agricultural equipment and other specialty machinery.





# 100 & 175 Series Parallel Shaft AC

UP TO 170 IN-LBS CONTINUOUS

The 100 and 175 Series offer a wide speed range and many voltage options in an ultra-compact package.

## Specifications

| Gearhead                                                                                                                                                                                                                                                                                                                                                                                                                                             | Motor                                                                                                                                                                                                                                                                     | Features                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Gearing:</b><br><b>100 Series:</b><br>1st-stage helical steel, balance powdered metal or steel<br><b>175 Series:</b><br>1st-stage helical steel, balance heat treated steel or powdered metal<br><b>Housing:</b> Precision machined die cast aluminum<br><b>Lubrication:</b> Lifetime oil bath, sealed and gasketed<br><b>Bearings:</b> Needle output<br><b>Shafts:</b> Hardened steel<br><b>Mounting:</b> Face or optional footplate (any angle) | <b>Motor Type:</b> Permanent split capacitor and 3 phase<br><b>Rotation:</b> Reversible<br><b>Insulation:</b> Class B minimum<br><b>Finish:</b> Gloss black powder coat<br>175 3-phase unpainted<br><b>Enclosure:</b> Open 1/80 & 1/10 HP<br>TENV 1/20 HP<br>TEFC 1/12 HP | <ul style="list-style-type: none"> <li>Included junction box</li> <li>Included capacitor on PSC units</li> <li>Rear shaft on PSC units</li> <li>175-3 Phase IP 54 enclosure</li> </ul> |

### Optional Features

- Power-off brake for PSC motors
  - Footplate kit
- Part number: P125-100-9998

## Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

Wiring diagram pages 88-91

See pages 86-87 for additional accessories

ISIS - Products available off-shelf

SNS - Min. order quantity and lead time

## 100 Series PSC 115V

| Part Number  | Speed (RPM)*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps    | Hz    | Shipping Wt. |
|--------------|----------------|-----------------|----------|------------|--------|------|---------|-------|--------------|
| 016-102-1369 | 1.2            | 100**           | 1/80     | 1369.3     | 5      | 115  | .30/.32 | 60/50 | 6.5          |
| 016-102-0702 | 2.3            | 100**           | 1/80     | 702.1      | 5      | 115  | .30/.32 | 60/50 | 6.5          |
| 016-102-0362 | 4.5            | 100**           | 1/80     | 361.7      | 4      | 115  | .30/.32 | 60/50 | 6.5          |
| 016-102-0186 | 8.8            | 76              | 1/80     | 185.5      | 4      | 85   | .30/.32 | 60/50 | 6.5          |
| 016-101-0100 | 17             | 100**           | 1/20     | 95.5       | 3      | 150  | .60     | 60    | 7.5          |
| 016-101-0072 | 22             | 100**           | 1/20     | 71.7       | 3      | 150  | .60     | 60    | 7.5          |
| 016-101-0050 | 33             | 96              | 1/20     | 49.0       | 3      | 130  | .60     | 60    | 7.5          |
| 016-101-0037 | 43             | 62              | 1/20     | 36.7       | 3      | 160  | .60     | 60    | 7.5          |
| 016-101-0026 | 63             | 49              | 1/20     | 25.2       | 2      | 230  | .60     | 60    | 7.5          |
| 016-101-0017 | 95             | 30              | 1/20     | 16.8       | 2      | 225  | .60     | 60    | 7.5          |
| 016-101-0013 | 124            | 25              | 1/20     | 12.9       | 2      | 220  | .60     | 60    | 7.5          |
| 016-101-0010 | 154            | 20              | 1/20     | 10.5       | 2      | 218  | .60     | 60    | 7.5          |
| 016-101-0007 | 240            | 13              | 1/20     | 6.7        | 1      | 200  | .60     | 60    | 7.5          |
| 016-101-0005 | 320            | 10              | 1/20     | 5.0        | 1      | 200  | .60     | 60    | 7.5          |

## 107 Series 3-Phase Inverter Duty 230V

For more specifications see page 62

## 175 Series PSC 115V and 115/230V

| Part Number  | Speed (RPM)*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Volts AC | Amps    | Hz    | Shipping Wt. |
|--------------|----------------|-----------------|----------|------------|--------|------|----------|---------|-------|--------------|
| 016-175-1369 | 1.3            | 160**           | 1/20     | 1369.3     | 5      | 115  | 115/230  | .32/.18 | 60/50 | 8.25         |
| 016-175-0702 | 2.5            | 130**           | 1/20     | 702.1      | 5      | 115  | 115/230  | .33/.19 | 60/50 | 8.25         |
| 016-175-0362 | 4.5            | 155**           | 1/20     | 361.7      | 4      | 115  | 115/230  | .38/.21 | 60/50 | 8.25         |
| 016-175-0186 | 8.8            | 170**           | 1/20     | 185.5      | 4      | 85   | 115/230  | .46/.26 | 60/50 | 8.25         |
| 016-175-0096 | 17             | 150**           | 1/20     | 95.5       | 3      | 150  | 115/230  | .56/.29 | 60/50 | 8.25         |
| 016-175-0049 | 33             | 165             | 1/10     | 49.1       | 3      | 130  | 115      | 1.05    | 60    | 10           |
| 016-175-0025 | 63             | 90              | 1/10     | 25.2       | 2      | 230  | 115      | 1.05    | 60    | 10           |
| 016-175-0013 | 124            | 47              | 1/10     | 12.9       | 2      | 220  | 115      | 1.05    | 60    | 10           |
| 016-175-0007 | 240            | 25              | 1/10     | 6.7        | 1      | 200  | 115      | 1.05    | 60    | 10           |

## 175 Series 3-Phase 230/460V

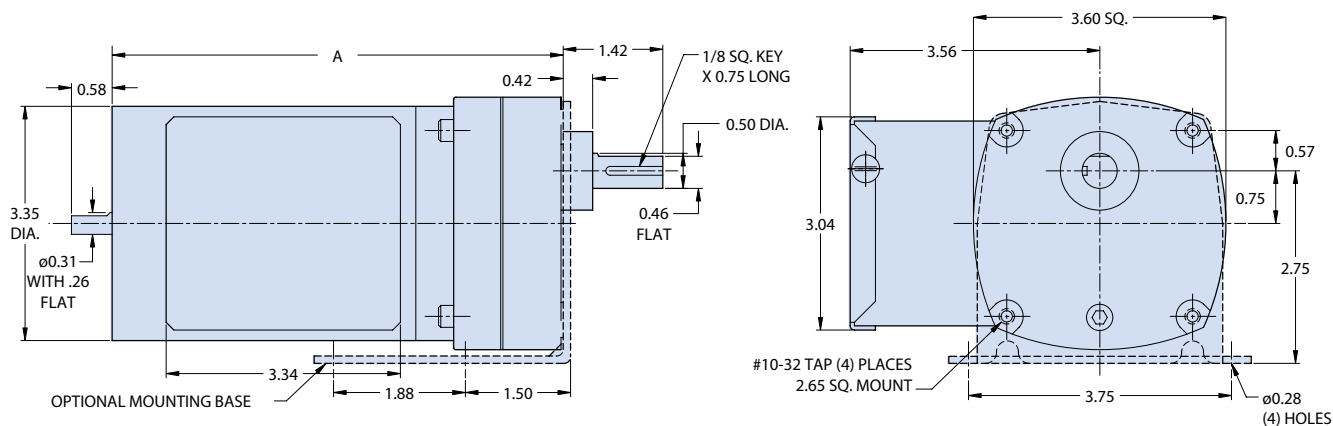
| Part Number  | Speed (RPM)*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps    | Hz    | Shipping Wt. |
|--------------|----------------|-----------------|----------|------------|--------|------|---------|-------|--------------|
| 017-175-0096 | 17             | 150**           | 1/12     | 95.5       | 3      | 150  | .60/.35 | 60/50 | 9            |
| 017-175-0050 | 32             | 138             | 1/12     | 49.0       | 3      | 130  | .60/.35 | 60/50 | 9            |
| 017-175-0025 | 63             | 74              | 1/12     | 25.2       | 2      | 230  | .60/.35 | 60/50 | 9            |
| 017-175-0013 | 122            | 38              | 1/12     | 12.9       | 2      | 220  | .60/.35 | 60/50 | 9            |

\* Maximum overhung load on center of output shaft. \*\* Output torque is gear limited.

\*\*\* All speeds given are at 60 HZ. For dual frequency units, speed will be 5/6 of rated speed.

# 100 & 175 Series Parallel Shaft AC

## 100 & 175 AC



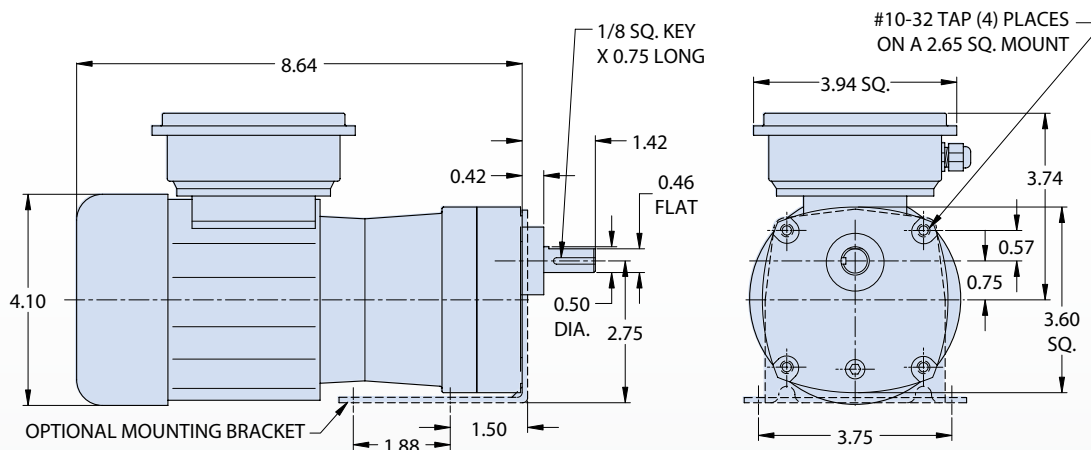
### 100 PSC 115V

| HP   | Stages  | A    |
|------|---------|------|
| 1/20 | 1, 2, 3 | 6.44 |
| 1/80 | 4, 5    | 6.26 |

### 175 PSC 115V and 115/230V

| HP   | Stages  | A    |
|------|---------|------|
| 1/10 | 1, 2, 3 | 7.40 |
| 1/20 | 3       | 6.78 |
| 1/20 | 4, 5    | 7.48 |

## 175 3-Phase







**100mmAC**

## 100mm 200 Series Parallel Shaft AC

UP TO 350 IN-LBS CONTINUOUS

For tight-spaces requiring big power, Bison's 100mmAC (4" dia.), 1/8 HP motors offer larger motor power in 30% less volume.

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SHAFT  
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### Specifications

| Gearhead                                                                     | Motor                                                         | Optional Features           |
|------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------|
| Gearing: AGMA Class 9. heat treated steel<br>1st-stage helical, balance spur | Motor Type: Permanent split capacitor<br>Rotation: Reversible | • Power-off brake available |
| Housing: Precision machined die cast aluminum                                | Insulation: Class B minimum                                   |                             |
| Lubrication: Lifetime oil bath, sealed<br>and gasketed                       | Enclosure: TEFC                                               |                             |
| Bearings: Needle with thrust ball                                            | Finish: Gloss black powder coat                               |                             |
| Shafts: Hardened steel                                                       | Capacitor included in J-box                                   |                             |
| Mounting: Face (any angle)                                                   |                                                               |                             |

### Additional Information

Current drawings and stock status available  
at [www.bisongear.com](http://www.bisongear.com)

ISIS - Products available off-shelf

SNS - Min. order quantity and lead time

Wiring diagram pages 88-91

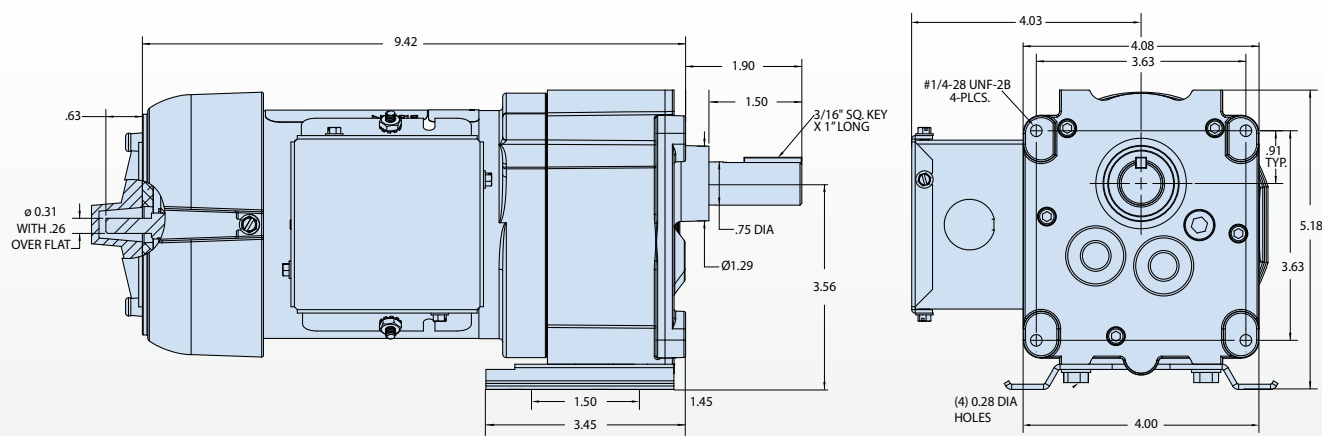
See pages 86-87 for additional  
accessories

### 200 Series PSC 115V

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | # Stages | OHL | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|----------|-----|------|----|--------------|
| 016-246-6316 | 8           | 310**           | 1/8      | 215.6      | 3        | 200 | 1.10 | 60 | 12           |
| 016-246-6302 | 17          | 350**           | 1/8      | 102.4      | 3        | 200 | 1.40 | 60 | 12           |
| 016-246-6382 | 20          | 300**           | 1/8      | 81.8       | 3        | 200 | 1.40 | 60 | 12           |
| 016-246-6358 | 29          | 249             | 1/8      | 58.3       | 3        | 200 | 1.50 | 60 | 12           |
| 016-246-6329 | 59          | 115             | 1/8      | 28.8       | 2        | 200 | 1.50 | 60 | 12           |
| 016-246-6319 | 89          | 74              | 1/8      | 19.1       | 2        | 200 | 1.50 | 60 | 12           |
| 016-246-6315 | 113         | 58              | 1/8      | 15.0       | 2        | 200 | 1.50 | 60 | 12           |
| 016-246-6311 | 160         | 39              | 1/8      | 10.6       | 2        | 200 | 1.50 | 60 | 12           |
| 016-246-6305 | 340         | 16              | 1/8      | 5.0        | 2        | 200 | 1.50 | 60 | 12           |

\*\* Gear Limited (check website for updated information.)

### 100mm 115V



# 200 Series Parallel Shaft AC

UP TO 385 IN-LBS CONTINUOUS

For up to 385 in-lbs, our 200 Series is unmatched in voltage and speed options.



## Specifications

| Gearhead                                                                                                |                                                                           | Motor                                                          | Features                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:                                                                                                | Hardened steel, AGMA Class 9. 1st-stage helical metal, balance spur metal | Motor Type: Permanent split capacitor, split phase and 3-phase | <ul style="list-style-type: none"> <li>Included junction box</li> <li>Mounted capacitor on PSC units, mounted external on 1/4" HP, inside J-Box on 1/6" HP</li> <li>Rear shaft extension (1-Phase units only)</li> </ul> |
| Housing:                                                                                                | Precision machined die cast aluminum                                      | Rotation: Reversible                                           |                                                                                                                                                                                                                          |
| Lubrication:                                                                                            | Lifetime oil bath, sealed and gasketed                                    | Bearings: Ball                                                 |                                                                                                                                                                                                                          |
| Bearings:                                                                                               | Needle with thrust ball                                                   | Insulation: Class B minimum                                    |                                                                                                                                                                                                                          |
| Shafts:                                                                                                 | Hardened steel                                                            | Enclosure: TEFC                                                |                                                                                                                                                                                                                          |
| Mounting:                                                                                               | Face (any angle) or baseplate                                             | Finish: Gloss black powder coat/ 3 phase unpainted             | Optional Features                                                                                                                                                                                                        |
|                                                                                                         |                                                                           |                                                                | <ul style="list-style-type: none"> <li>Power-off brake (1-Phase units only)</li> </ul>                                                                                                                                   |
| Additional Information                                                                                  |                                                                           |                                                                |                                                                                                                                                                                                                          |
| Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a> |                                                                           | Wiring diagram pages 88-91                                     | See pages 86-87 for additional accessories                                                                                                                                                                               |
| <b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time            |                                                                           |                                                                |                                                                                                                                                                                                                          |

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## 200 Series PSC 115V/230V (For drawings see page 38)

| Part Number  | Speed (RPM)*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps     | Hz    | Shipping Wt. |
|--------------|----------------|-----------------|----------|------------|--------|------|----------|-------|--------------|
| 016-200-8100 | 15             | 202             | 1/15     | 107.6      | 3      | 175  | 1.2/1.63 | 60/50 | 11.75        |
| 016-200-8050 | 31             | 135             | 1/15     | 52.8       | 2      | 175  | 1.2/1.63 | 60/50 | 11.75        |
| 016-200-8035 | 46             | 92              | 1/15     | 35.4       | 2      | 175  | 1.2/1.63 | 60/50 | 11.75        |
| 016-200-8023 | 69             | 61              | 1/15     | 23.4       | 2      | 175  | 1.2/1.63 | 60/50 | 11.75        |
| 016-200-8017 | 98             | 43              | 1/15     | 16.5       | 2      | 175  | 1.2/1.63 | 60/50 | 11.75        |
| 016-200-8012 | 141            | 30              | 1/15     | 11.5       | 2      | 175  | 1.2/1.63 | 60/50 | 11.75        |

## 242 Series Split Phase 115V (For drawings see page 39)

| Part Number  | Speed (RPM)*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps | Hz | Shipping Wt. |
|--------------|----------------|-----------------|----------|------------|--------|------|------|----|--------------|
| 014-242-9015 | 115            | 84              | 1/6      | 15         | 2      | 175  | 3.8  | 60 | 12           |
| 014-242-9019 | 90             | 107             | 1/6      | 19         | 2      | 175  | 3.8  | 60 | 12           |
| 014-242-9028 | 61             | 158             | 1/6      | 28         | 2      | 175  | 3.8  | 60 | 12           |
| 014-242-9036 | 48             | 193             | 1/6      | 36         | 3      | 175  | 3.8  | 60 | 12           |
| 014-242-9058 | 31             | 278**           | 1/6      | 58         | 3      | 175  | 3.8  | 60 | 12           |
| 014-242-9133 | 13             | 277**           | 1/6      | 133        | 3      | 175  | 3.8  | 60 | 12           |

## 246 Series PSC 115V/230V (For drawings see page 39)

| Part Number  | Speed (RPM)*** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps      | Hz    | Shipping Wt. |
|--------------|----------------|-----------------|----------|------------|--------|------|-----------|-------|--------------|
| 016-246-6216 | 7.7            | 310**           | 1/6      | 215.6      | 3      | 412  | 2.1/1.1   | 60/50 | 16           |
| 016-246-6102 | 16             | 350**           | 1/6      | 102.4      | 3      | 373  | 2.1/1.1   | 60/50 | 16           |
| 016-246-6082 | 20             | 300**           | 1/6      | 81.8       | 3      | 327  | 2.1/1.1   | 60/50 | 16           |
| 016-246-6058 | 28             | 300**           | 1/6      | 58.2       | 3      | 273  | 2.1/1.1   | 60/50 | 16           |
| 016-246-4036 | 47             | 294             | 1/4      | 35.8       | 3      | 215  | 2.35/1.25 | 60/50 | 17.5         |
| 016-246-4029 | 58             | 227             | 1/4      | 28.8       | 2      | 236  | 2.35/1.25 | 60/50 | 17.5         |
| 016-246-4019 | 88             | 163             | 1/4      | 19.1       | 2      | 200  | 2.35/1.25 | 60/50 | 17.5         |
| 016-246-4015 | 113            | 128             | 1/4      | 15.0       | 2      | 195  | 2.35/1.25 | 60/50 | 17.5         |
| 016-246-4011 | 159            | 91              | 1/4      | 10.6       | 2      | 206  | 2.35/1.25 | 60/50 | 17.5         |
| 016-246-4005 | 338            | 41              | 1/4      | 5.0        | 2      | 170  | 2.35/1.25 | 60/50 | 17.5         |

\* Maximum overhung load on center of output shaft. \*\* Output torque is gear limited.

\*\*\* All speed given are at 60 HZ. For 50 HZ operation, speed will be 5/6 of given speed on PSC units.

For 246 Series see next page



## 200 Series Parallel Shaft AC (continued)

UP TO 385 IN-LBS CONTINUOUS

For up to 385 in-lbs, our 200 Series is unmatched in voltage and speed options.

### Specifications

| Gearhead     |                                                                           | Motor                                              | Features                                                                                                                                                              |
|--------------|---------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Hardened steel, AGMA Class 9. 1st-stage helical metal, balance spur metal | Motor Type: Permanent split capacitor and 3-phase  | <ul style="list-style-type: none"> <li>Included junction box</li> <li>Mounted capacitor on PSC units, mounted external on 1/4" HP, inside J-Box on 1/6" HP</li> </ul> |
| Housing:     | Precision machined die cast aluminum                                      | Rotation: Reversible                               | <ul style="list-style-type: none"> <li>Rear shaft extension (1-Phase units only)</li> <li>Relay included on split phase</li> </ul>                                    |
| Lubrication: | Lifetime oil bath, sealed and gasketed                                    | Bearings: Ball                                     |                                                                                                                                                                       |
| Bearings:    | Needle with thrust ball                                                   | Insulation: Class B minimum                        |                                                                                                                                                                       |
| Shafts:      | Hardened steel                                                            | Enclosure: TEFC                                    |                                                                                                                                                                       |
| Mounting:    | Face (any angle) or baseplate                                             | Finish: Gloss black powder coat/ 3 phase unpainted | <b>Optional Features</b> <ul style="list-style-type: none"> <li>Power-off brake (1-Phase units only)</li> </ul>                                                       |

### Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

ISIS - Products available off-shelf

SNS - Min. order quantity and lead time

Wiring diagram pages 88-91

See pages 86-87 for additional accessories

### 246 Series 3-Phase 230/460V

| Part Number  | Speed (RPM)** | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps     | Hz    | Shipping Wt. |
|--------------|---------------|-----------------|----------|------------|--------|------|----------|-------|--------------|
| 017-246-0102 | 16            | 385**           | 1/4      | 102.4      | 3      | 373  | 1.10/.75 | 60/50 | 18           |
| 017-246-0058 | 29            | 278**           | 1/4      | 58.3       | 3      | 273  | 1.10/.75 | 60/50 | 18           |
| 017-246-0036 | 47            | 294**           | 1/4      | 35.8       | 3      | 215  | 1.10/.75 | 60/50 | 18           |
| 017-246-0029 | 60            | 159**           | 1/4      | 28.1       | 2      | 236  | 1.10/.75 | 60/50 | 18           |
| 017-246-0023 | 74            | 184**           | 1/4      | 22.7       | 2      | 225  | 1.10/.75 | 60/50 | 18           |
| 017-246-0019 | 88            | 165             | 1/4      | 19.1       | 2      | 200  | 1.10/.75 | 60/50 | 18           |
| 017-246-0015 | 112           | 129             | 1/4      | 15.0       | 2      | 195  | 1.10/.75 | 60/50 | 18           |
| 017-246-0011 | 159           | 91              | 1/4      | 10.6       | 2      | 206  | 1.10/.75 | 60/50 | 18           |
| 017-246-0005 | 336           | 41              | 1/4      | 5.0        | 2      | 170  | 1.10/.75 | 60/50 | 18           |

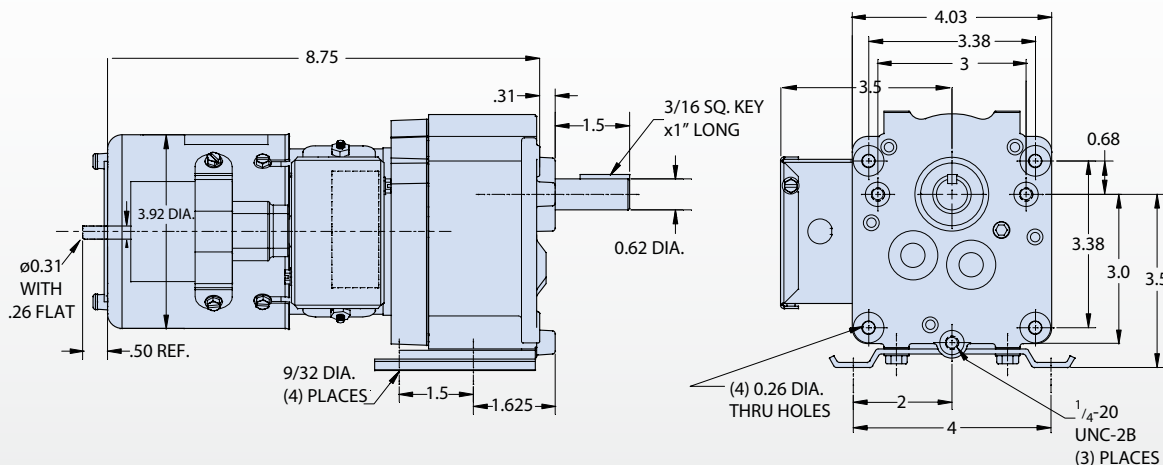
\* Maximum overhung load on center of output shaft. \*\* Output torque is gear limited.

\*\*\* All speed given are at 60 HZ. For 50 HZ operation, speed will be 5/6 of given speed.

### 247 Series 3-Phase Inverter Duty 230V

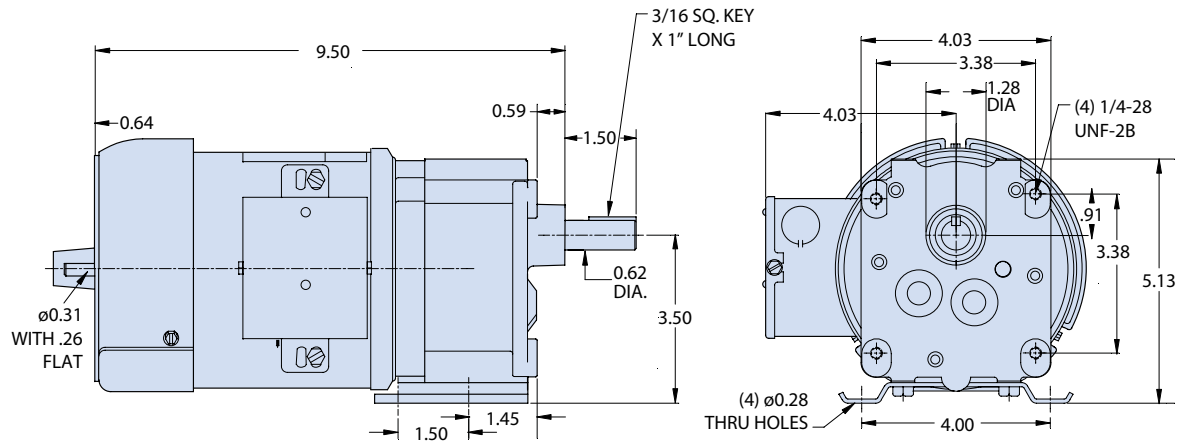
For more specifications see page 62

### 200 PSC 115/230V



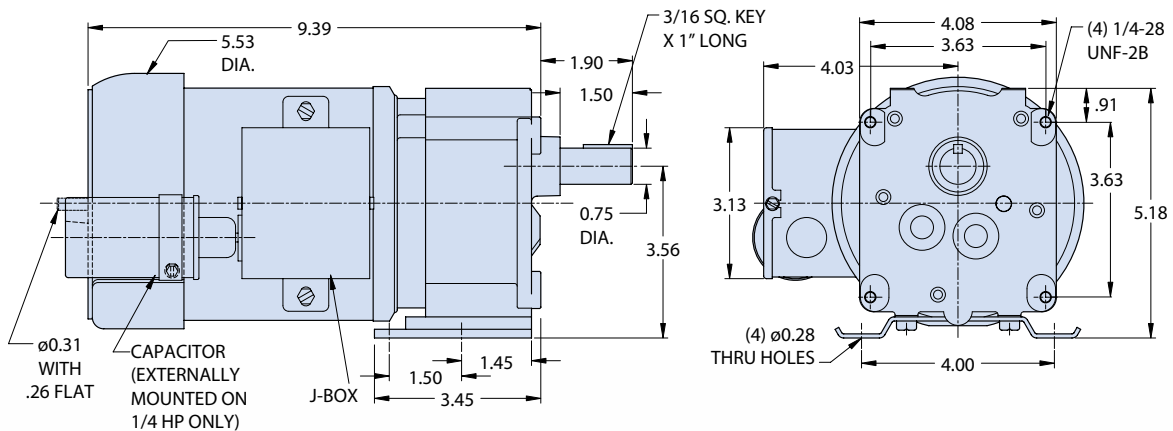
# 200 Series Parallel Shaft AC

## 242 PSC 115V

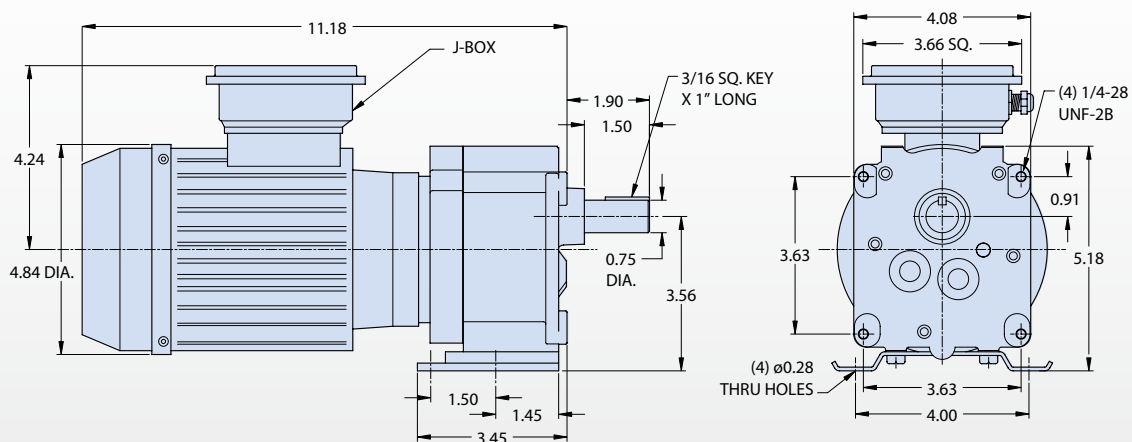


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## 246 PSC 115V/230V



## 246 3-Phase 230V/460V





## VWDIR20 AC

115V SPLIT PHASE OPEN DRIP PROOF AC DESIGN

Our VWDIR20 offers up to 600 in-lbs of torque.

### Specifications

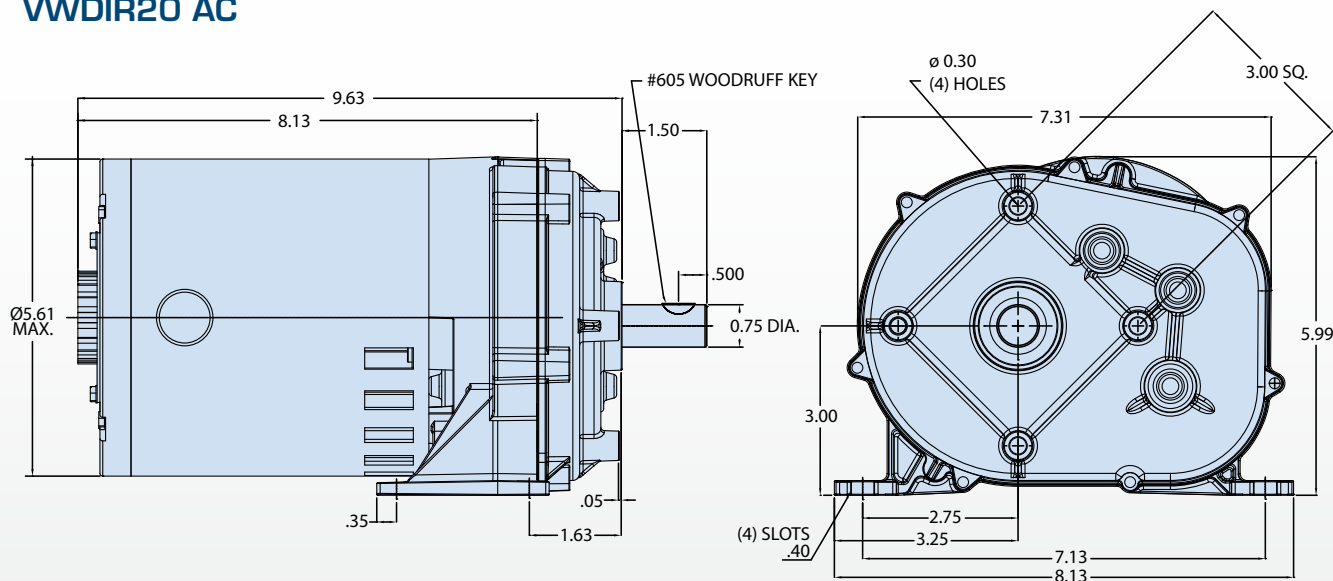
| Gearhead     |                                      | Motor                                           | Additional Information                                                                                  |
|--------------|--------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Gearing:     | Phenolic high speed and steel        | Motor Type: Split phase                         | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a> |
| Housing:     | Precision machined die cast aluminum | Rotation: Reversible                            |                                                                                                         |
| Lubrication: | Grease                               | Bearings: Ball                                  | ISIS - Products available off-shelf                                                                     |
| Bearings:    | Porous bronze sleeve                 | Insulation: Class B minimum                     | SNS - Min. order quantity and lead time                                                                 |
| Shafts:      | Hardened steel                       | Enclosure: ODP                                  |                                                                                                         |
| Mounting:    | All positions                        |                                                 |                                                                                                         |
| Finish:      | Unpainted                            |                                                 |                                                                                                         |
|              |                                      | Features                                        |                                                                                                         |
|              |                                      | Units comply with applicable UL & CSA standards |                                                                                                         |

### VWDIR20 Split Phase 115V

| Model #      | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-----|------|----|--------------|
| 014Q307-0014 | 120         | 100             | 1/4      | 14         | 2      | 110 | 3.9  | 60 | 22           |
| 014Q307-0019 | 90          | 150             | 1/4      | 19         | 2      | 150 | 4.1  | 60 | 22           |
| 014Q307-0029 | 60          | 200             | 1/4      | 29         | 2      | 190 | 3.9  | 60 | 23           |
| 014Q307-0043 | 40          | 330             | 1/4      | 43         | 2      | 190 | 4.1  | 60 | 23           |
| 014Q307-0057 | 30          | 400             | 1/4      | 57         | 3      | 190 | 3.9  | 60 | 23           |
| 014Q307-0096 | 18          | 550**           | 0.19     | 97         | 3      | 300 | 3.6  | 60 | 23           |
| 014Q307-0144 | 12          | 600**           | 0.14     | 144        | 3      | 300 | 3.3  | 60 | 23           |
| 014Q307-0286 | 6           | 600**           | 0.07     | 286        | 3      | 300 | 3.1  | 60 | 24           |

\*\* Gear Limited (check website for updated information.)

### VWDIR20 AC





# VWDIR84 AC

115/230V PSC TEFC AC DESIGN

Our VWDIR84 offers up to 600 in-lbs of torque.



## Specifications

| Gearhead     |                                        | Motor                                 | Features                                                                                                                                                                                                                                 |
|--------------|----------------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Phenolic high speed and hardened steel | Motor Type: Permanent split capacitor | Units comply with applicable UL & CSA standards                                                                                                                                                                                          |
| Housing:     | Precision machined die cast zinc       | Rotation: Reversible                  |                                                                                                                                                                                                                                          |
| Lubrication: | Grease                                 | Bearings: Ball                        | <b>Optional Features</b><br>Power off brake see pages 86-87                                                                                                                                                                              |
| Bearings:    | Porous bronze sleeve                   | Insulation: Class B minimum           |                                                                                                                                                                                                                                          |
| Shafts:      | Hardened steel                         | Enclosure: TEFC                       | <b>Additional Information</b><br>Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Mounting:    | All positions                          |                                       |                                                                                                                                                                                                                                          |
| Finish:      | Unpainted                              | Capacitor included                    |                                                                                                                                                                                                                                          |

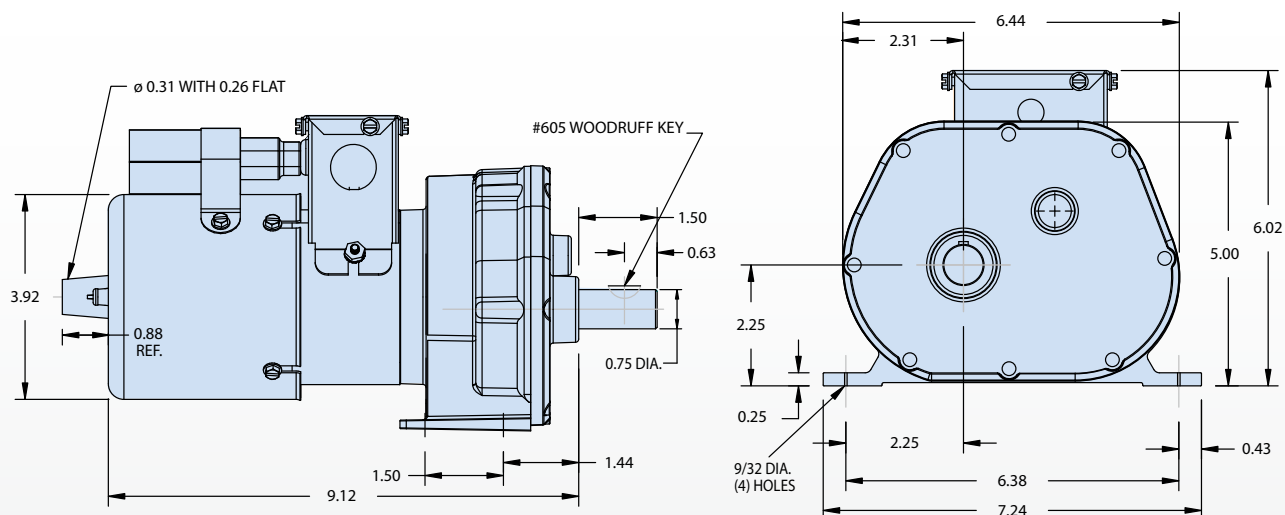
AC PARALLEL  
SHAFT  
GEARMOTORS

## VWDIR84 PSC 115V/230V

| Model #      | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps    | Hz    | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-----|---------|-------|--------------|
| 016Q107-0081 | 20          | 250             | 1/12     | 81         | 3      | 250 | 1.2/.63 | 60/50 | 17           |
| 016Q107-0134 | 12          | 400             | 1/12     | 135        | 3      | 250 | 1.2/.63 | 60/50 | 17           |
| 016Q107-0267 | 6           | 600             | 1/12     | 267        | 3      | 250 | 1.2/.63 | 60/50 | 17.5         |

All ratings are shown at 60Hz operation. Also operable at 50Hz at 5/6 of the rated speed.

## VWDIR84 AC





## 650 Series Parallel Shaft AC

UP TO 710 IN-LBS CONTINUOUS

The 650 Series offers strength and versatility with torques up to 750 in-lbs., and speed down to 1.2RPM.

### Specifications

| Gearhead                                                                    | Motor                                 | Features                                   |
|-----------------------------------------------------------------------------|---------------------------------------|--------------------------------------------|
| Gearing: AGMA class 9 heat treated steel<br>1st-stage helical, balance spur | Motor Type: Permanent split capacitor | • Included junction box                    |
| Housing: Precision machined die cast aluminum                               | Rotation: Reversible                  | • Included capacitor                       |
| Lubrication: Lifetime oil bath, sealed and gasketed                         | Bearings: Ball                        | • Rear shaft on 1/58, 1/6HP                |
| Bearings: Needle and thrust ball                                            | Insulation: Class B minimum           | <b>Optional Features</b>                   |
| Shafts: Hardened steel                                                      | Enclosure: TEFC / TENV                | • Power-off brake on 1/58 HP & 1/6 HP only |
| Mounting: Face (any angle) or optional footplate on 1/58 HP                 | Finish: Gloss black powder coat       | • Footplate kit for 1/58 HP P125-650-5000  |

### Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

Wiring diagram pages 88-91

See pages 86-87 for additional accessories

**ISIS** - Products available off-shelf

**SNS** - Min. order quantity and lead time

### 656 Series PSC 115V/230V

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL* | Amps    | Hz    | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|------|---------|-------|--------------|
| 016-656-1412 | 1.2         | 710**           | 1/58     | 1412.8     | 5      | 900  | .36/.21 | 60/50 | 15.75        |
| 016-656-0276 | 6.0         | 710**           | 1/6      | 276.2      | 4      | 900  | 2.1/1.1 | 60/50 | 22.5         |
| 016-656-0138 | 12          | 700**           | 1/6      | 138.1      | 4      | 900  | 2.1/1.1 | 60/50 | 22.5         |
| 016-656-0116 | 14          | 630**           | 1/6      | 115.9      | 4      | 900  | 2.1/1.1 | 60/50 | 22.5         |
| 016-656-0054 | 30          | 660**           | 1/2      | 53.8       | 3      | 650  | 5.2/2.8 | 60/50 | 28.5         |
| 016-656-0028 | 58          | 490             | 1/2      | 27.7       | 3      | 600  | 5.2/2.8 | 60/50 | 28.5         |
| 016-656-0019 | 81          | 345             | 1/2      | 19.5       | 3      | 550  | 5.2/2.8 | 60/50 | 28.5         |
| 016-656-0014 | 119         | 240             | 1/2      | 13.7       | 2      | 500  | 5.2/2.8 | 60/50 | 28.5         |

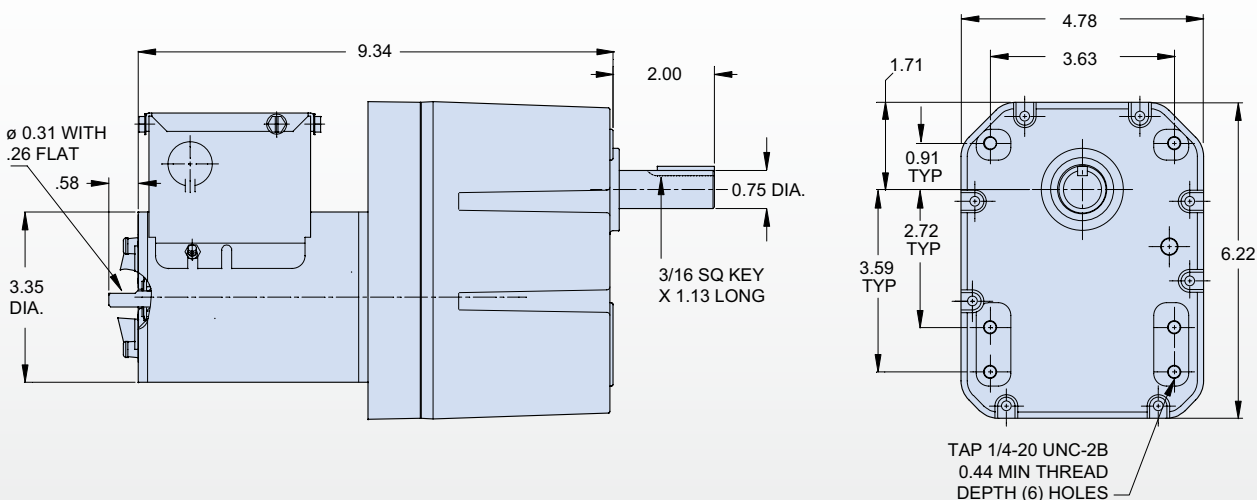
\* Maximum overhung load on center of output shaft. \*\* Output torque is gear limited.

5/6 rated speed @ 50 Hz

### 650 Series 3-Phase Inverter Duty 230V

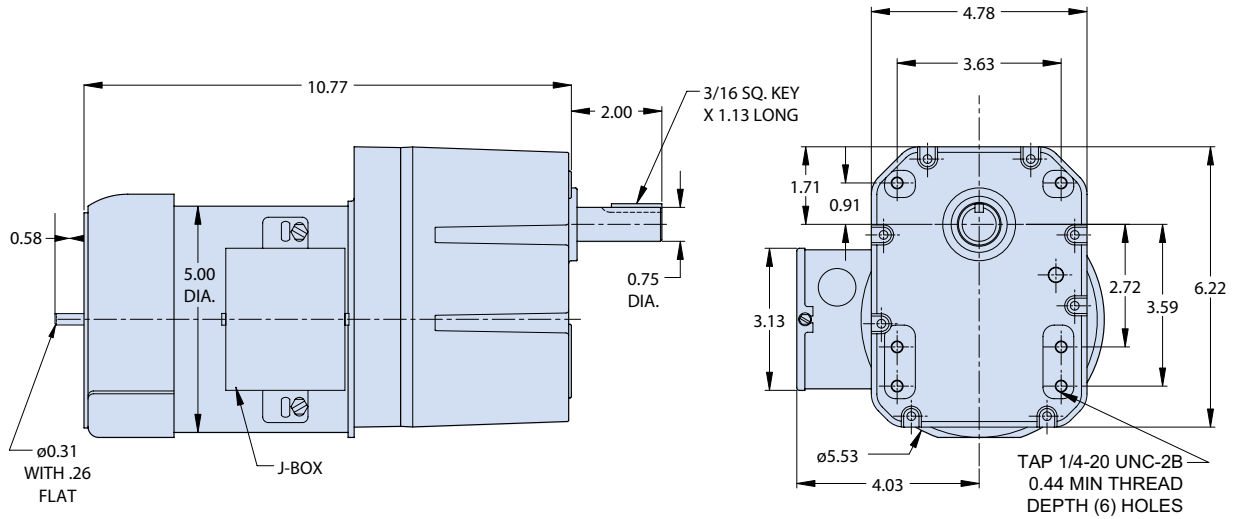
For more specifications see page 64

#### 650 PSC-1/58 HP

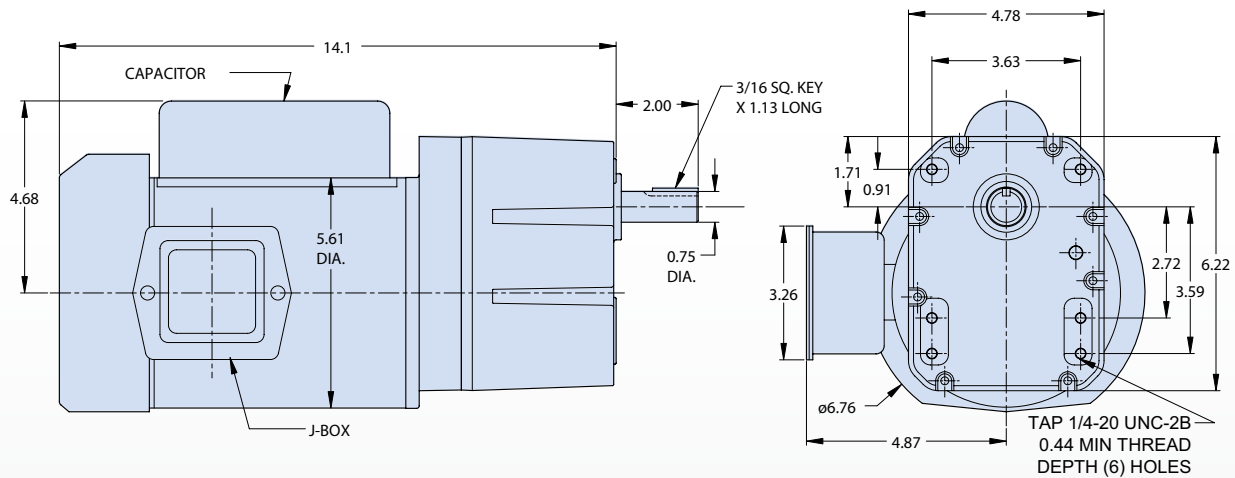


# 650 Series Parallel Shaft AC

## 656 PSC-1/6 HP



## 656 PSC-1/2 HP





## VWDIR40 AC

115V SPLIT PHASE OPEN DRIP PROOF AC DESIGN

Our VWDIR40 offers up to 800 in-lbs of torque.

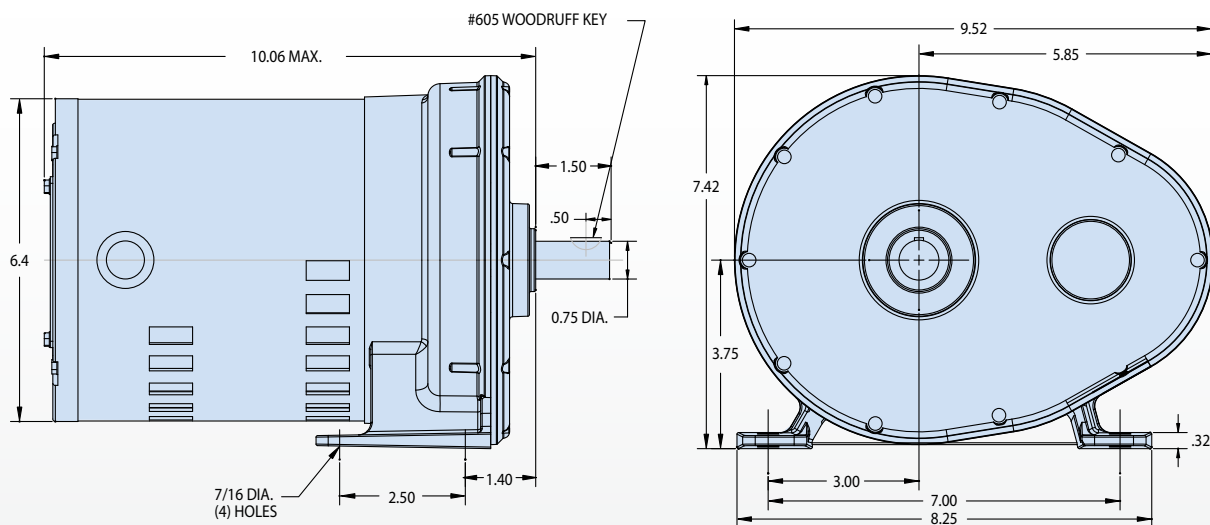
### Specifications

| Gearhead     |                                  | Motor                                                              | Additional Information                                                                                                                                                                                  |
|--------------|----------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Phenolic high speed and steel    | Motor Type: Split phase                                            | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Housing:     | Precision machined die cast zinc | Rotation: Reversible                                               |                                                                                                                                                                                                         |
| Lubrication: | Grease                           | Bearings: Ball                                                     |                                                                                                                                                                                                         |
| Bearings:    | Ball                             | Insulation: Class B minimum                                        |                                                                                                                                                                                                         |
| Shafts:      | Plain                            | Enclosure: ODP                                                     |                                                                                                                                                                                                         |
| Mounting:    | All positions                    | <b>Features</b><br>Units comply with applicable UL & CSA standards |                                                                                                                                                                                                         |
| Finish:      | Unpainted                        |                                                                    |                                                                                                                                                                                                         |

### VWDIR40 Split Phase 115V

| Model #      | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-----|------|----|--------------|
| 014Q407-0019 | 92          | 287             | 1/2      | 19         | 2      | 400 | 8.3  | 60 | 33           |
| 014Q407-0028 | 62          | 400             | 1/2      | 28         | 2      | 400 | 8.3  | 60 | 33           |
| 014Q407-0056 | 31          | 800             | 1/2      | 56         | 2      | 400 | 8.3  | 60 | 34           |

### VWDIR40 Split Phase 115V



# 480 Series Parallel Shaft AC

UP TO 1105 IN-LBS CONTINUOUS

The 480 Series heavy duty gearmotors produce close to 1,200 in-lbs. of output torque, unusual in a very compact fractional horsepower, parallel shaft gearmotor.



## Specifications

| Gearhead     |                                                                    | Motor                                                         | Additional Information                                                                                                                                                                                                                |
|--------------|--------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | AGMA class 9 heat treated steel<br>1st-stage helical, balance spur | Motor Type: Split phase & three phase<br>Rotation: Reversible | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time<br>Wiring diagram pages 88-91 |
| Housing:     | Precision machined die cast aluminum                               | Bearings: Ball                                                |                                                                                                                                                                                                                                       |
| Lubrication: | Lifetime oil bath, sealed and gasketed                             | Insulation: Class B minimum                                   |                                                                                                                                                                                                                                       |
| Bearings:    | Needle and ball on output shaft                                    | Finish: Gloss black powder coat                               |                                                                                                                                                                                                                                       |
| Shafts:      | Hardened steel                                                     | Enclosure: TEFC                                               |                                                                                                                                                                                                                                       |
| Mounting:    | Foot, any angle                                                    |                                                               |                                                                                                                                                                                                                                       |

AC PARALLEL  
SHAFT  
GEARMOTORS

## 482 Series Split Phase 115V

\* Maximum overhung load on center of output shaft. \*\*Gear limited

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL * | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-------|------|----|--------------|
| 014-482-4316 | 5.4         | 1087**          | 1/4      | 315.6      | 3      | 797   | 3.97 | 60 | 28           |
| 014-482-4211 | 8.0         | 974**           | 1/4      | 210.0      | 3      | 797   | 3.97 | 60 | 28           |
| 014-482-4143 | 12          | 992             | 1/4      | 142.9      | 3      | 797   | 3.97 | 60 | 28           |
| 014-482-4095 | 18          | 800             | 1/4      | 95.1       | 3      | 797   | 3.97 | 60 | 28           |
| 014-482-4064 | 27          | 500             | 1/4      | 63.5       | 3      | 600   | 3.97 | 60 | 28           |
| 014-482-4029 | 60          | 240             | 1/4      | 28.6       | 2      | 636   | 3.97 | 60 | 28           |
| 014-482-4012 | 135         | 100             | 1/4      | 12.7       | 2      | 491   | 3.97 | 60 | 28           |
| 014-482-3095 | 18          | 1025**          | 1/3      | 95.1       | 3      | 797   | 5.50 | 60 | 28           |
| 014-482-3042 | 41          | 513             | 1/3      | 42.1       | 2      | 716   | 5.50 | 60 | 28           |
| 014-482-3019 | 91          | 211             | 1/3      | 19.0       | 2      | 571   | 5.50 | 60 | 28           |
| 014-482-3011 | 157         | 125             | 1/3      | 11.0       | 2      | 491   | 5.50 | 60 | 28           |
| 014-482-3006 | 282         | 70              | 1/3      | 6.0        | 2      | 409   | 5.50 | 60 | 28           |
| 014-482-2080 | 22          | 1105**          | 1/2      | 78.9       | 3      | 682   | 7.81 | 60 | 30           |
| 014-482-2042 | 41          | 720             | 1/2      | 42.1       | 2      | 716   | 7.81 | 60 | 30           |
| 014-482-2029 | 60          | 482             | 1/2      | 28.6       | 2      | 636   | 7.81 | 60 | 30           |
| 014-482-2019 | 91          | 320             | 1/2      | 19.0       | 2      | 571   | 7.81 | 60 | 30           |
| 014-482-2012 | 135         | 215             | 1/2      | 12.7       | 2      | 491   | 7.81 | 60 | 30           |

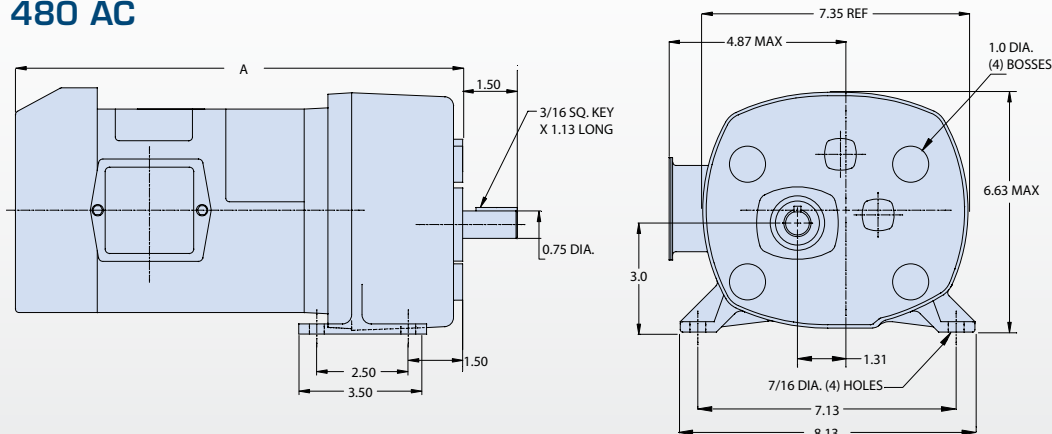
## 482 Series 3-Phase 230V/460V

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL * | Amps     | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-------|----------|----|--------------|
| 017-482-0143 | 12          | 992**           | 1/2      | 142.9      | 3      | 797   | 1.63/.81 | 60 | 40           |
| 017-482-0095 | 22          | 1017**          | 1/2      | 78.9       | 3      | 797   | 1.63/.81 | 60 | 40           |
| 017-482-0053 | 33          | 846             | 1/2      | 52.6       | 2      | 682   | 1.63/.81 | 60 | 40           |
| 017-482-0042 | 40          | 708             | 1/2      | 42.8       | 2      | 716   | 1.63/.81 | 60 | 40           |
| 017-482-0029 | 60          | 481             | 1/2      | 28.6       | 2      | 636   | 1.63/.81 | 60 | 40           |
| 017-482-0019 | 91          | 319             | 1/2      | 19.0       | 2      | 571   | 1.63/.81 | 60 | 40           |
| 017-482-0013 | 136         | 213             | 1/2      | 12.7       | 2      | 491   | 1.63/.81 | 60 | 40           |
| 017-482-0006 | 283         | 103             | 1/2      | 6.1        | 2      | 409   | 1.63/.81 | 60 | 40           |

## 485 Series 3-Phase Inverter Duty 230V

For more specifications see page 62

### 480 AC

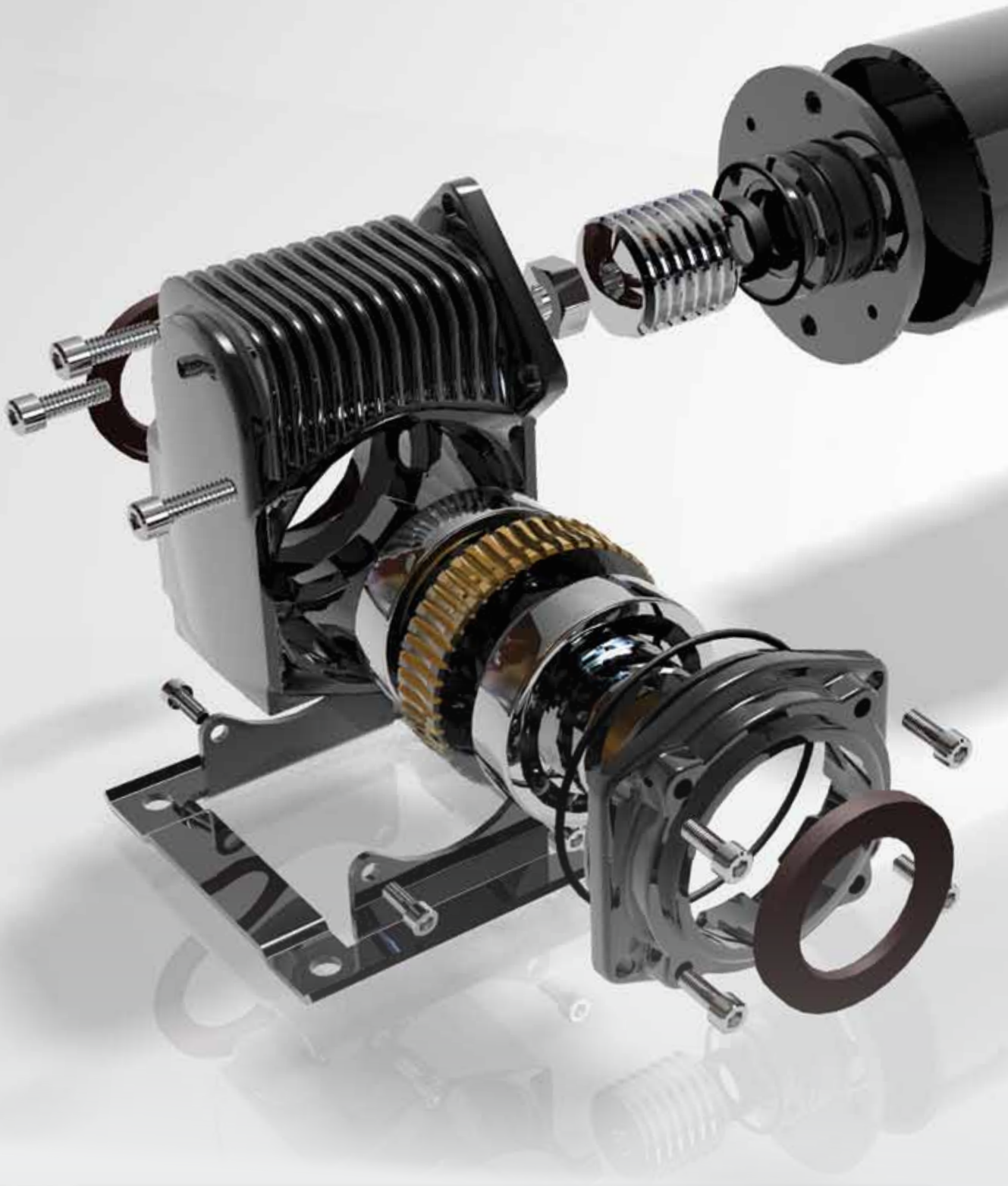


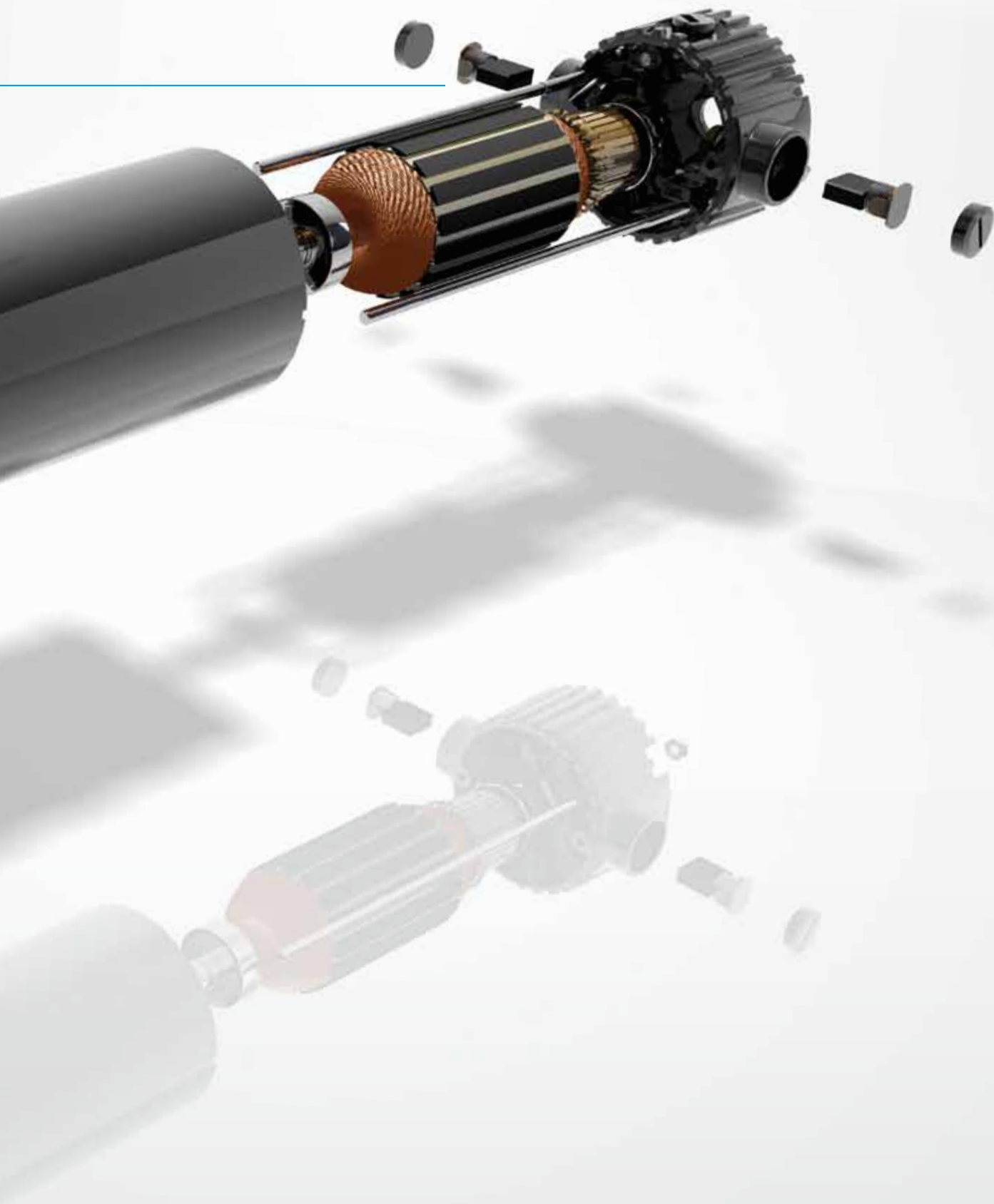
| HP       | A     |
|----------|-------|
| 1/2      | 12.76 |
| 1/4, 1/3 | 12.33 |



# Right Angle Gearmotors

RIGHT ANGLE  
GEARMOTORS







## 746 Series Right Angle DC

UP TO 68 IN-LBS CONTINUOUS

The 746 Series is our smallest right angle offering, with up to 68 in-lbs continuous torque, and is available in both right and left shaft orientations.

### Specifications

| Gearhead     |                                        | Motor                                                           | Optional Features                                                                                                                      |
|--------------|----------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Hardened steel worm bronze gear        | Motor Type: Permanent magnet                                    | Mounting base kit for 746 Series                                                                                                       |
| Housing:     | Precision machined die cast aluminum   | Speed: Variable with appropriate control (1.37 form factor max) | Part number: P125-746-0500                                                                                                             |
| Lubrication: | Lifetime oil bath, sealed and o-ringed | Rotation: Reversible                                            | Junction box kit - Part numbers: P198-100-9111                                                                                         |
| Bearings:    | Ball and needle                        | Bearings: Ball                                                  | <b>Other Options</b> <ul style="list-style-type: none"> <li>Accessory shaft</li> <li>Shaft-mount encoder</li> <li>Footplate</li> </ul> |
| Shafts:      | Hardened steel                         | Insulation: Class F                                             |                                                                                                                                        |
| Mounting:    | Base, any angle                        | Enclosure: TENV                                                 |                                                                                                                                        |
|              |                                        | Finish: Gloss black powder coat                                 |                                                                                                                                        |

### Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

Wiring diagram pages 88-91

See pages 86-87 for additional accessories

ISIS - Products available off-shelf

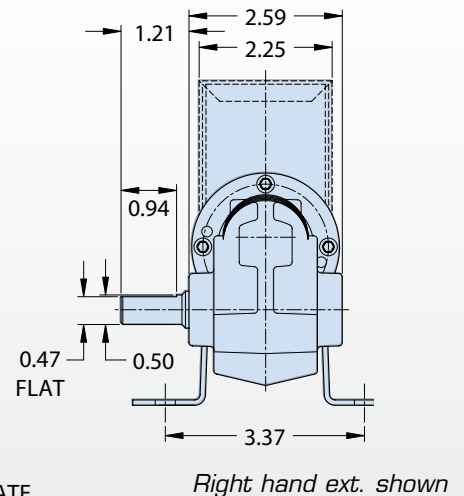
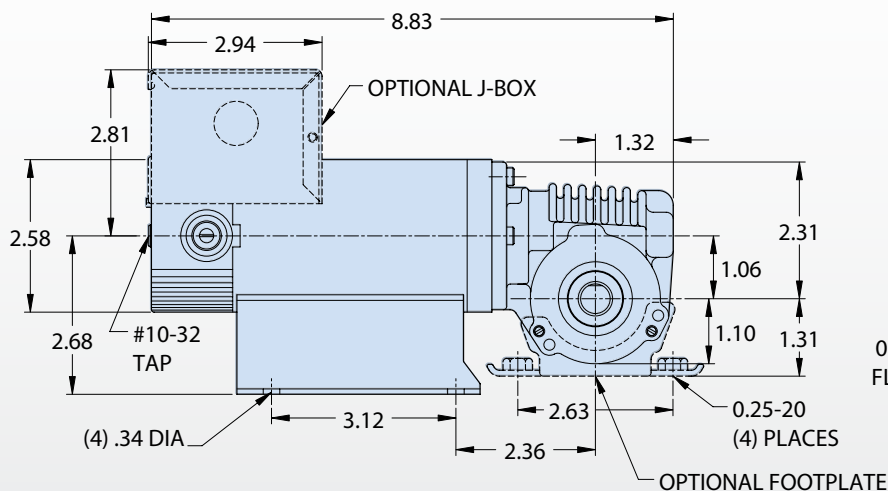
SNS - Min. order quantity and lead time

### 746 Series PMDC 90V or 130V

| Part Number             | Speed 90V RPM | Speed 130V RPM*** | Torque (in-lbs) | Input HP | Gear Ratio | OHL* | Amps | Shipping Wt. | Brush |
|-------------------------|---------------|-------------------|-----------------|----------|------------|------|------|--------------|-------|
| <b>Right Shaft Ext.</b> |               |                   |                 |          |            |      |      |              |       |
| 021-746-9060            | 30            | 43                | 68              | 1/15     | 60.0       | 224  | 0.77 | 7.5          | B     |
| 021-746-9040            | 45            | 65                | 52              | 1/15     | 40.0       | 224  | 0.77 | 7.5          | B     |
| 021-746-9030            | 59            | 85                | 41              | 1/15     | 30.0       | 224  | 0.77 | 7.5          | B     |
| 021-746-9020            | 87            | 126               | 30              | 1/15     | 20.5       | 224  | 0.77 | 7.5          | B     |
| 021-746-9015            | 120           | 173               | 26              | 1/15     | 15.5       | 222  | 0.77 | 7.5          | B     |
| 021-746-9010            | 180           | 260               | 15              | 1/15     | 10.3       | 197  | 0.77 | 7.5          | B     |
| 021-746-9005            | 360           | 520               | 9               | 1/15     | 5.0        | 197  | 0.77 | 7.5          | B     |
| <b>Left Shaft Ext.</b>  |               |                   |                 |          |            |      |      |              |       |
| 021-746-9360            | 30            | 43                | 68              | 1/15     | 60.0       | 224  | 0.77 | 7.5          | B     |
| 021-746-9340            | 45            | 65                | 52              | 1/15     | 40.0       | 224  | 0.77 | 7.5          | B     |
| 021-746-9330            | 59            | 85                | 41              | 1/15     | 30.0       | 224  | 0.77 | 7.5          | B     |
| 021-746-9320            | 87            | 126               | 30              | 1/15     | 20.0       | 224  | 0.77 | 7.5          | B     |
| 021-746-9315            | 120           | 173               | 26              | 1/15     | 15.0       | 222  | 0.77 | 7.5          | B     |
| 021-746-9310            | 180           | 260               | 15              | 1/15     | 10.0       | 197  | 0.77 | 7.5          | B     |
| 021-746-9305            | 360           | 520               | 9               | 1/15     | 5.0        | 197  | 0.77 | 7.5          | B     |

\* Maximum overhung load on center of output shaft. \*\*\* Units rated for 90V 1.37 form factor drive. May be run with 1.05 form factor drive at 130V.

### 746 DC





The strength of  
Bison will always  
be there.



## Solar Power Innovation Driven By Bison

For solar equipment applications, downtime is not an option. That's why more and more solar equipment manufacturers choose Bison gearmotors as the driving force behind their products. They know that Bison gearmotors are built to last longer than any other manufacturer's gearmotors, and that makes all the difference.

Bison's Robusticity™ design philosophy produces gearmotors that are built to be the best from the inside out. From components of the highest quality to innovative design techniques and unequaled quality control measures, solar equipment designers know that the strength of Bison will always be there.





## 750 Series Right Angle DC

UP TO 120 IN-LBS CONTINUOUS

The 750 Series line of hollow shaft gearmotors allows hundreds of mounting configurations enabling engineers to optimize their assemblies. Industry standard mounts are available for drop-in requirements, and a hollow shaft style is available to use with optional accessories to meet your specifications.

### Specifications

| Gearhead     |                                        | Motor                                                           | Optional Features                                                                                                                                                                  |
|--------------|----------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Hardened steel worm, cast bronze gear  | Motor Type: Permanent magnet                                    | Junction box kit - Part numbers:<br>P198-100-9121, 1/8 HP<br>P198-300-0000, 1/4 HP<br>Standard footplate P125-750-1000                                                             |
| Housing:     | Precision machined die cast aluminum   | Speed: Variable with appropriate control (1.37 form factor max) | <b>Other Options</b> <ul style="list-style-type: none"> <li>Accessory shaft</li> <li>Shaft-mount encoder</li> <li>Various output shafts</li> <li>Flange mount available</li> </ul> |
| Lubrication: | Lifetime oil bath, sealed and o-ringed | Rotation: Reversible                                            |                                                                                                                                                                                    |
| Bearings:    | Ball                                   | Bearings: Ball                                                  |                                                                                                                                                                                    |
| Shafts:      | Hardened steel                         | Insulation: Class F                                             |                                                                                                                                                                                    |
| Mounting:    | Face or base, any angle                | Enclosure: TENV                                                 |                                                                                                                                                                                    |
|              |                                        | Finish: Gloss black powder coat                                 |                                                                                                                                                                                    |

### Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

ISIS - Products available off-shelf

SNS - Min. order quantity and lead time

Wiring diagram pages 88-91

See pages 56-57 or 86-87 for additional accessories

## 756 Series PMDC 90V

| Part Number                            | Speed 90V RPM | Torque (in-lbs) | Input HP | Gear Ratio | OHL* | Amps | Shipping Wt. | Brush |
|----------------------------------------|---------------|-----------------|----------|------------|------|------|--------------|-------|
| <b>Hollow / No Footplate</b>           |               |                 |          |            |      |      |              |       |
| 021-756-8460                           | 30            | 94              | 1/8      | 60.0       | 300  | 1.28 | 13           | D     |
| 021-756-8445                           | 40            | 82              | 1/8      | 45.0       | 300  | 1.28 | 13           | D     |
| 021-756-8430                           | 60            | 60              | 1/8      | 30.0       | 300  | 1.28 | 13           | D     |
| 021-756-8420                           | 90            | 49              | 1/8      | 20.5       | 300  | 1.28 | 13           | D     |
| 021-756-8413                           | 135           | 35              | 1/8      | 13.0       | 300  | 1.28 | 13           | D     |
| 021-756-8410                           | 180           | 27              | 1/8      | 10.3       | 300  | 1.28 | 13           | D     |
| 021-756-8405                           | 360           | 14              | 1/8      | 5.2        | 270  | 1.28 | 13           | D     |
| 021-756-4430                           | 60            | 120**           | 1/4      | 30.0       | 300  | 2.33 | 18           | D     |
| 021-756-4420                           | 90            | 100             | 1/4      | 20.5       | 300  | 2.33 | 18           | D     |
| 021-756-4413                           | 135           | 70              | 1/4      | 13.0       | 300  | 2.33 | 18           | D     |
| 021-756-4410                           | 180           | 55              | 1/4      | 10.3       | 300  | 2.33 | 18           | D     |
| 021-756-4405                           | 360           | 30              | 1/4      | 5.2        | 270  | 2.33 | 18           | D     |
| <b>Standard Shaft / With Footplate</b> |               |                 |          |            |      |      |              |       |
| 021-756-8560                           | 30            | 94              | 1/8      | 60.0       | 300  | 1.28 | 14.5         | D     |
| 021-756-8545                           | 40            | 82              | 1/8      | 45.0       | 300  | 1.28 | 14.5         | D     |
| 021-756-8530                           | 60            | 60              | 1/8      | 30.0       | 300  | 1.28 | 14.5         | D     |
| 021-756-8520                           | 90            | 49              | 1/8      | 20.5       | 300  | 1.28 | 14.5         | D     |
| 021-756-8513                           | 135           | 35              | 1/8      | 13.0       | 300  | 1.28 | 14.5         | D     |
| 021-756-8510                           | 180           | 27              | 1/8      | 10.3       | 300  | 1.28 | 14.5         | D     |
| 021-756-8505                           | 360           | 14              | 1/8      | 5.2        | 270  | 1.28 | 14.5         | D     |
| 021-756-4530                           | 60            | 120**           | 1/4      | 30.0       | 300  | 2.33 | 19.75        | D     |
| 021-756-4520                           | 90            | 100             | 1/4      | 20.5       | 300  | 2.33 | 19.75        | D     |
| 021-756-4513                           | 135           | 70              | 1/4      | 13.0       | 300  | 2.33 | 19.75        | D     |
| 021-756-4510                           | 180           | 55              | 1/4      | 10.3       | 300  | 2.33 | 19.75        | D     |
| 021-756-4505                           | 360           | 30              | 1/4      | 5.2        | 270  | 2.33 | 19.75        | D     |

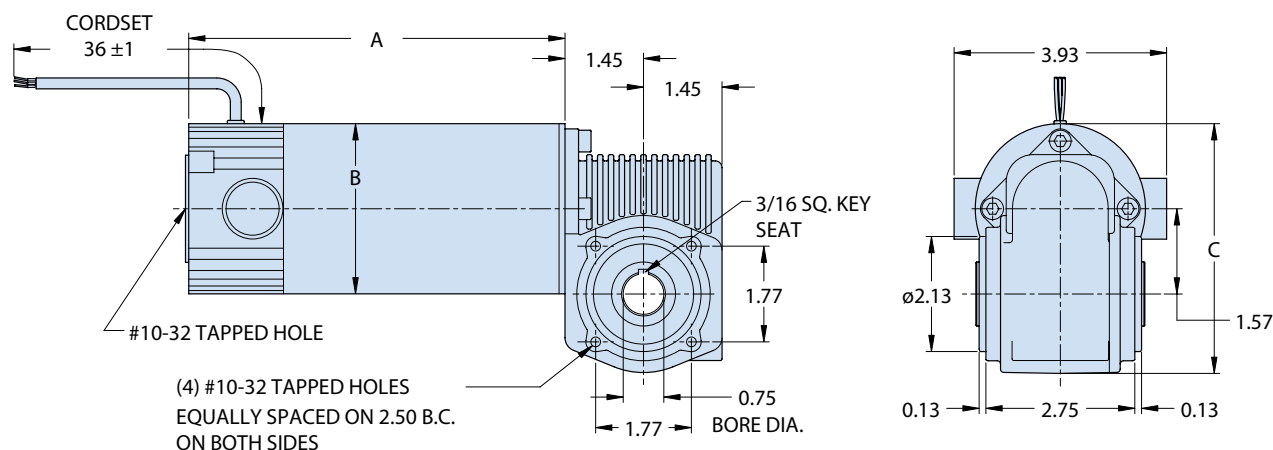
## 756 Series DC 12V

| Hollow Shaft & Pilot Mount | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | OHL* | Amps | Shipping Wt. | Brush |
|----------------------------|-------------|-----------------|----------|------------|------|------|--------------|-------|
| 021-756-3405               | 360         | 14              | 1/8      | 5.2        | 270  | 10.2 | 11.5         | A     |
| 021-756-3410               | 180         | 27              | 1/8      | 10.3       | 300  | 10.2 | 11.5         | A     |
| 021-756-3413               | 135         | 35              | 1/8      | 13.3       | 300  | 10.2 | 11.5         | A     |
| 021-756-3420               | 90          | 49              | 1/8      | 20.5       | 300  | 10.2 | 11.5         | A     |
| 021-756-3430               | 60          | 60              | 1/8      | 30.0       | 300  | 10.2 | 11.5         | A     |
| 021-756-3445               | 40          | 82              | 1/8      | 45.0       | 300  | 10.2 | 11.5         | A     |
| 021-756-3460               | 30          | 94              | 1/8      | 60.0       | 300  | 10.2 | 11.5         | A     |

\* Maximum overhung load located 2.5" from centerline of gearbox. \*\* Output torque is gear limited.

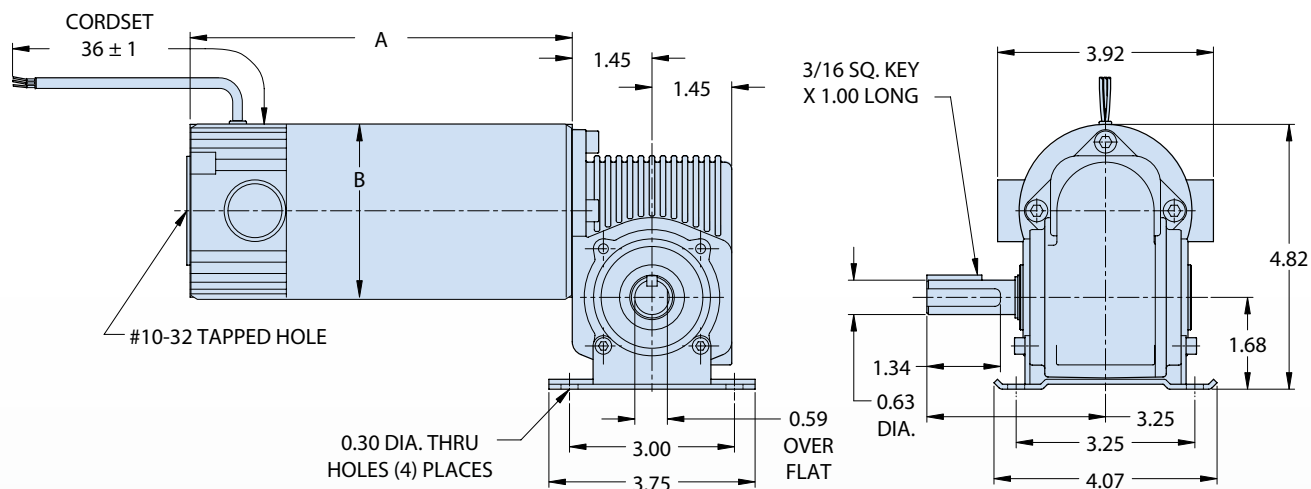
# 750 Series Right Angle DC

## 756 DC Hollow



| HP  | A    | B    | C    |
|-----|------|------|------|
| 1/8 | 6.95 | 3.14 | 4.61 |
| 1/4 | 8.83 | 3.38 | 4.73 |

## 756 DC Standard Shaft



| HP  | A    | B    | C    |
|-----|------|------|------|
| 1/8 | 6.95 | 3.14 | 4.82 |
| 1/4 | 8.83 | 3.38 | 4.94 |

## 756 Series DC 24V

| With Mounting Bracket & Output Shaft | Hollow Shaft & Pilot Mount | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | OHL* | Amps | Shipping Wt. | Brush |
|--------------------------------------|----------------------------|-------------|-----------------|----------|------------|------|------|--------------|-------|
| 021-756-5505                         | 021-756-5405               | 360         | 14              | 1/8      | 5.2        | 270  | 5.18 | 14.5         | A     |
| 021-756-5510                         | 021-756-5410               | 180         | 27              | 1/8      | 10.3       | 300  | 5.18 | 14.5         | A     |
| 021-756-5513                         | 021-756-5413               | 135         | 35              | 1/8      | 13.3       | 300  | 5.18 | 14.5         | A     |
| 021-756-5520                         | 021-756-5420               | 90          | 49              | 1/8      | 20.5       | 300  | 5.18 | 14.5         | A     |
| 021-756-5530                         | 021-756-5430               | 60          | 60              | 1/8      | 30.0       | 300  | 5.18 | 14.5         | A     |
| 021-756-5545                         | 021-756-5445               | 40          | 82              | 1/8      | 45.0       | 300  | 5.18 | 14.5         | A     |
| 021-756-5560                         | 021-756-5460               | 30          | 94              | 1/8      | 60.0       | 300  | 5.18 | 14.5         | A     |

\* Maximum overhung load located 2.5" from centerline of gearbox.





## VWDIR23 DC

90V PMDC TENV DESIGN

Our VWDIR23 offers up to 250 in-lbs of torque.

RIGHT ANGLE  
GEARMOTORS

### Specifications

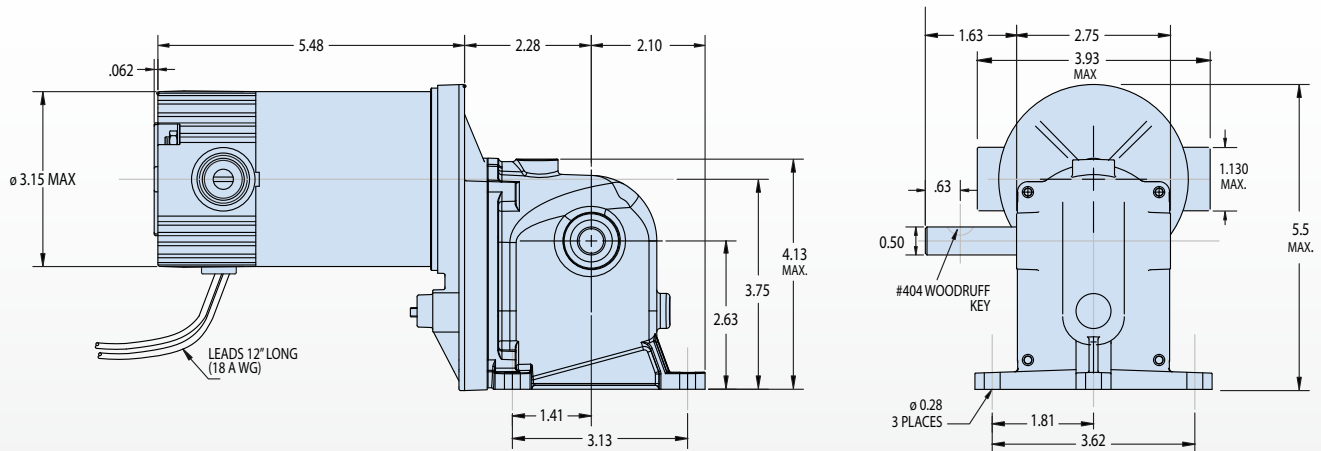
| Gearhead     |                                                                      | Motor                                                | Features                                                                                                                                                                                                                                                                           |
|--------------|----------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Steel, <b>Worm:</b> Hardened Steel,<br><b>Output Gear:</b> Cast Iron | Motor Type: Permanent magnet<br>Rotation: Reversible | Units comply with applicable UL & CSA standards                                                                                                                                                                                                                                    |
| Housing:     | Precision machined die cast aluminum                                 | Bearings: Ball                                       | <b>Additional Information</b><br><br>Junction box P198-100-9121<br><br>Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Lubrication: | Grease                                                               | Insulation: Class F                                  |                                                                                                                                                                                                                                                                                    |
| Bearings:    | Porous bronze sleeve                                                 | Enclosure: TENV                                      |                                                                                                                                                                                                                                                                                    |
| Shafts:      | Hardened steel                                                       | Finish: Powdered coat black                          |                                                                                                                                                                                                                                                                                    |
| Mounting:    | All positions                                                        |                                                      |                                                                                                                                                                                                                                                                                    |

### VWDIR23 PMDC 90V

| Model #      | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps | Shipping Wt. | Brush |
|--------------|-------------|-----------------|----------|------------|--------|-----|------|--------------|-------|
| 021Q607-0037 | 90          | 34              | 1/10     | 37         | 3      | 100 | 1.14 | 10           | D     |
| 021Q607-0038 | 45          | 56              | 1/20     | 37         | 3      | 100 | 0.59 | 10           | D     |
| 021Q607-0070 | 24          | 102             | 1/20     | 70         | 3      | 100 | 0.59 | 10           | D     |
| 021Q607-0167 | 10          | 228             | 1/20     | 161        | 3      | 100 | 0.59 | 10           | D     |
| 021Q607-0275 | 6           | 177**           | 1/20     | 275        | 3      | 100 | 0.59 | 10           | D     |
| 021Q607-0525 | 3           | 250**           | 1/20     | 525        | 3      | 100 | 0.59 | 10           | D     |

\*\* Gear Limited (check website for updated information.)

### VWDIR23 PMDC 90V





**100mmAC**

## 100mm 750 Series Right Angle AC

UP TO 100 IN-LBS CONTINUOUS

For tight-spaces requiring big power, Bison's 100mmAC (4" dia.), 1/8 HP motors offer larger motor power in 30% less volume.

### Specifications

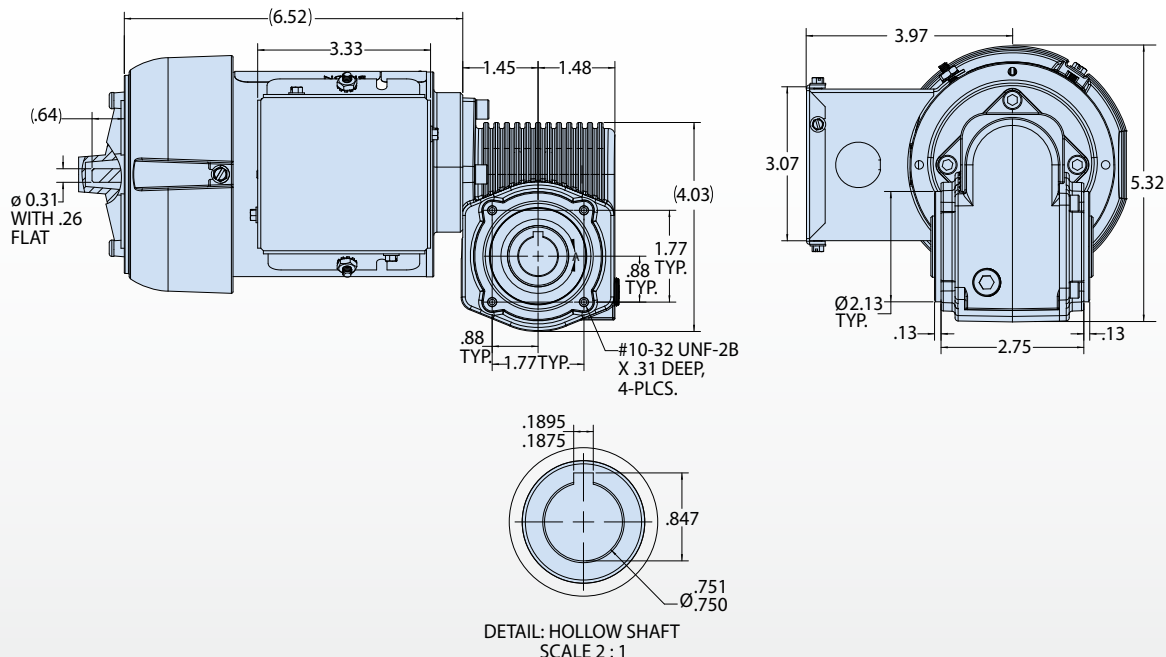
| Gearhead     |                                         | Motor                                                                                           | Additional Information                                                                                  |
|--------------|-----------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Gearing:     | Hardened steel worm, forged bronze gear | Motor Type: Permanent split capacitor                                                           | See pages 56-57 or 86-87 for additional accessories                                                     |
| Housing:     | Precision machined die cast aluminum    | Rotation: Reversible                                                                            | Footplate P/N P125-750-1000                                                                             |
| Lubrication: | Lifetime oil bath, sealed and gasketed  | Bearings: Ball                                                                                  | Wiring diagram pages 88-91                                                                              |
| Bearings:    | Ball                                    | Insulation: Class B minimum                                                                     | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a> |
| Shafts:      | Hardened steel                          | Enclosure: TEFC                                                                                 | ISIS - Products available off-shelf                                                                     |
| Mounting:    | Face or base, any angle                 | Finish: Gloss black powder coat                                                                 | SNS - Min. order quantity and lead time                                                                 |
|              |                                         | Capacitor included                                                                              |                                                                                                         |
|              |                                         | Features                                                                                        |                                                                                                         |
|              |                                         | Motors are supplied with mounted junction box and capacitor, and rear shaft extension for brake |                                                                                                         |

RIGHT ANGLE  
GEARMOTORS

### 750 Series PSC 115V

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-----|----|--------------|
| 026-756-3560 | 28          | 100             | 1/8      | 60.0       | 1      | 300 | 60 | 14.75        |
| 026-756-3545 | 37          | 80              | 1/8      | 45.0       | 1      | 300 | 60 | 14.75        |
| 026-756-3530 | 56          | 67              | 1/8      | 30.0       | 1      | 300 | 60 | 14.75        |
| 026-756-3520 | 82          | 43              | 1/8      | 20.5       | 1      | 300 | 60 | 14.75        |
| 026-756-3510 | 164         | 21              | 1/8      | 10.3       | 1      | 200 | 60 | 14.75        |
| 026-756-3505 | 327         | 11              | 1/8      | 5.2        | 1      | 270 | 60 | 14.75        |

### 750 PSC 115V





## 750 Series Right Angle AC

UP TO 130 IN-LBS CONTINUOUS

The 750 Series line of hollow shaft gearmotors allows hundreds of mounting configurations enabling engineers to optimize their assemblies. Industry standard mounts are available for drop-in requirements, and a hollow shaft style is available to use with optional accessories to meet your specifications.

### Specifications

RIGHT ANGLE  
GEARMOTORS

| Gearhead     |                                         | Motor                                                                                            | Additional Information                                                                                                                                                                                  |
|--------------|-----------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Hardened steel worm, forged bronze gear | Motor Type: Permanent split capacitor                                                            | Wiring diagram pages 88-91                                                                                                                                                                              |
| Housing:     | Precision machined die cast aluminum    | Rotation: Reversible                                                                             | See pages 56-57 or 88-89 for additional accessories                                                                                                                                                     |
| Lubrication: | Lifetime oil bath, sealed and o-ringed  | Bearings: Ball                                                                                   |                                                                                                                                                                                                         |
| Bearings:    | Ball                                    | Insulation: Class B                                                                              | Footplate P/N P125-750-1000                                                                                                                                                                             |
| Shafts:      | Hardened steel                          | Enclosure: TEFC                                                                                  |                                                                                                                                                                                                         |
| Mounting:    | Face or base, any angle                 | Finish: Gloss black powder coat                                                                  | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Finish:      | Gloss black powder coat                 |                                                                                                  |                                                                                                                                                                                                         |
|              |                                         |                                                                                                  |                                                                                                                                                                                                         |
|              |                                         | <b>Features</b>                                                                                  |                                                                                                                                                                                                         |
|              |                                         | Motors are supplied with mounted junction box and capacitor, and rear shaft extension for brake. |                                                                                                                                                                                                         |

### 756 AC PSC 115V/230V

| Part Number                            | Speed (RPM) | Torque (in lbs.) | Input HP | Gear Ratio | Stages | OHL* | Amps      | Hz    | Shipping Wt. |
|----------------------------------------|-------------|------------------|----------|------------|--------|------|-----------|-------|--------------|
| <b>Hollow / No Footplate</b>           |             |                  |          |            |        |      |           |       |              |
| 026-756-4460                           | 28          | 120**            | 1/4      | 60.0       | 1      | 300  | 2.40/1.32 | 60/50 | 16.75        |
| 026-756-4445                           | 36          | 120**            | 1/4      | 45.0       | 1      | 300  | 2.40/1.32 | 60/50 | 16.75        |
| 026-756-4430                           | 55          | 130              | 1/4      | 30.0       | 1      | 300  | 2.40/1.32 | 60/50 | 16.75        |
| 026-756-4420                           | 80          | 108              | 1/4      | 20.5       | 1      | 300  | 2.40/1.32 | 60/50 | 16.75        |
| 026-756-4413                           | 124         | 76               | 1/4      | 1.3        | 1      | 300  | 2.40/1.32 | 60/50 | 16.75        |
| 026-756-4410                           | 160         | 62               | 1/4      | 10.3       | 1      | 300  | 2.40/1.32 | 60/50 | 16.75        |
| 026-756-4405                           | 330         | 30               | 1/4      | 5.2        | 1      | 270  | 2.40/1.32 | 60/50 | 16.75        |
| <b>Standard Shaft / With Footplate</b> |             |                  |          |            |        |      |           |       |              |
| 026-756-4660                           | 28          | 120**            | 1/4      | 60.0       | 1      | 300  | 2.40/1.32 | 60/50 | 19.75        |
| 026-756-4645                           | 36          | 120**            | 1/4      | 45.0       | 1      | 300  | 2.40/1.32 | 60/50 | 19.75        |
| 026-756-4630                           | 55          | 130              | 1/4      | 30.0       | 1      | 300  | 2.40/1.32 | 60/50 | 19.75        |
| 026-756-4620                           | 80          | 108              | 1/4      | 20.5       | 1      | 300  | 2.40/1.32 | 60/50 | 19.75        |
| 026-756-4613                           | 124         | 76               | 1/4      | 1.3        | 1      | 300  | 2.40/1.32 | 60/50 | 19.75        |
| 026-756-4610                           | 160         | 62               | 1/4      | 10.3       | 1      | 300  | 2.40/1.33 | 60/50 | 19.75        |
| 026-756-4605                           | 330         | 30               | 1/4      | 5.2        | 1      | 270  | 2.40/1.33 | 60/50 | 19.75        |

\* Maximum overhung load located 2.5" from centerline of gearbox.

\*\* Output torque is gear limited.

\*\*\* 60Hz speed shown

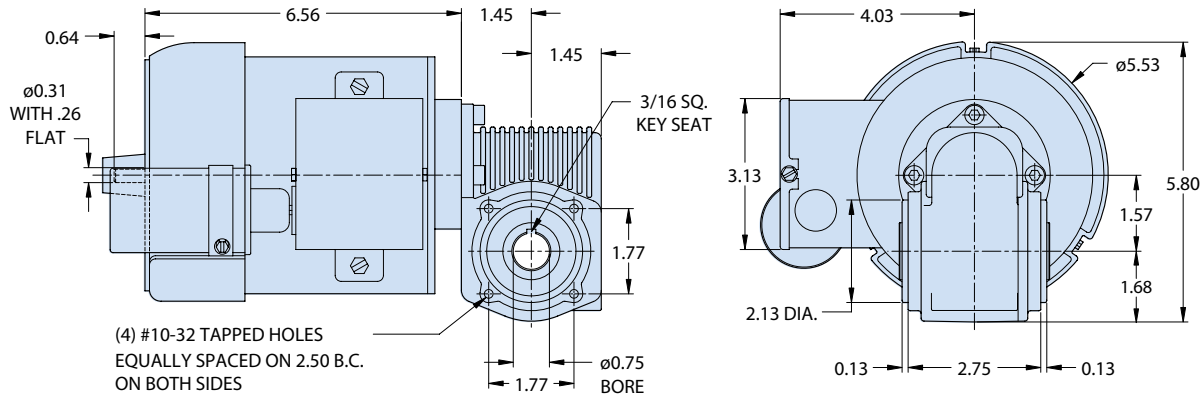
Also operable @ 50 Hz @ 5/6 of rated speed

### 750 Series 3-Phase Inverter Duty 230V

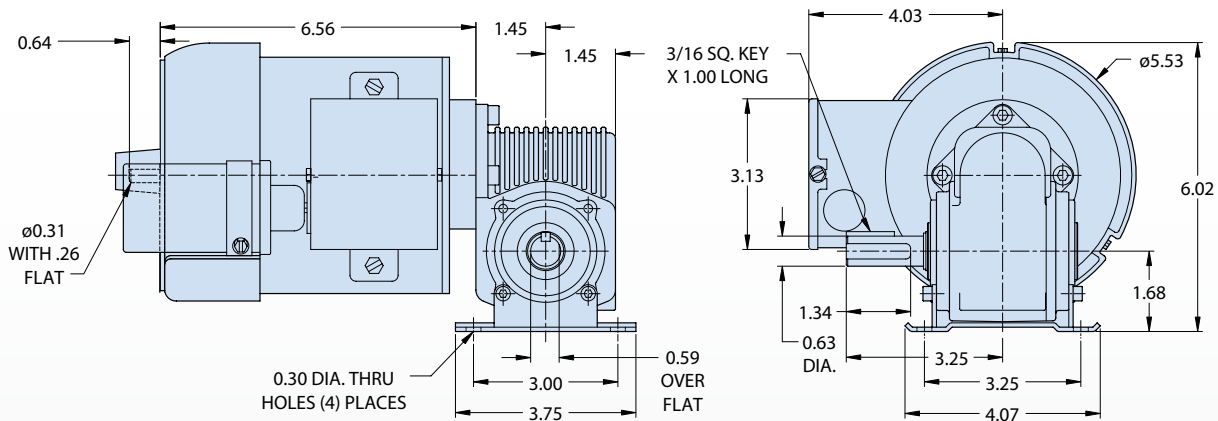
For more specifications see page 64

# 750 Series Right Angle AC

## 756 PSC 115V/230V Hollow



## 756 PSC 115V/230V Standard Shaft



Capacitor in junction box

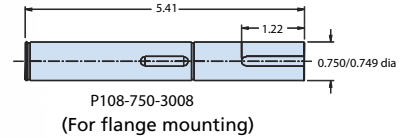
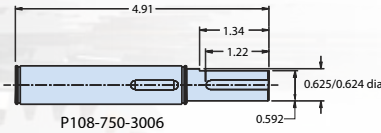
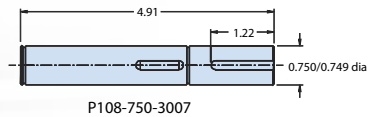
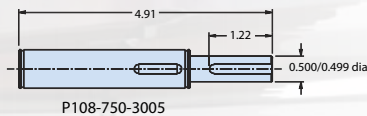
RIGHT ANGLE  
GEARMOTORS





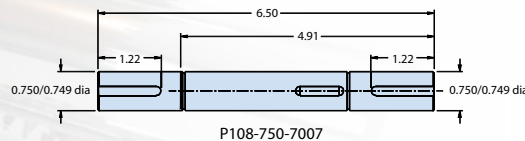
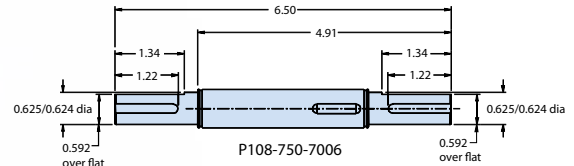
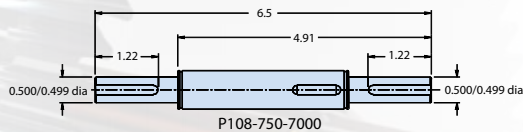
# 750 DC & AC Right Angle Gearmotor - Accessories

## Single Shafts



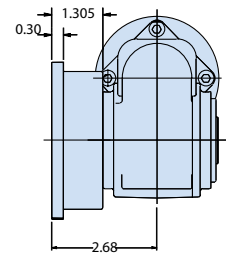
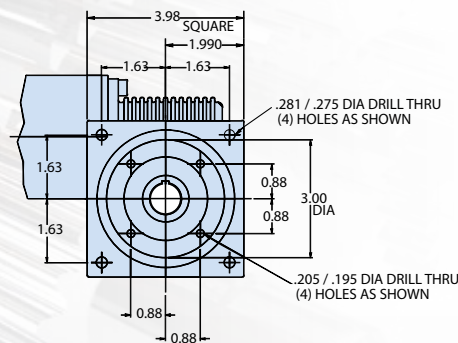
All shafts come standard with required keyways and retaining rings.

## Double Shafts



All shafts come standard with required keyways and retaining rings.

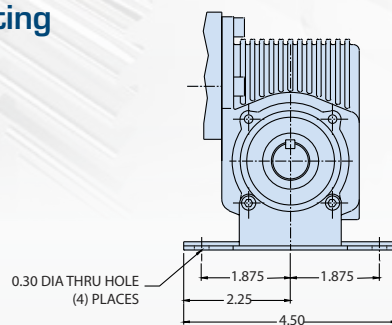
## Flange Mounting



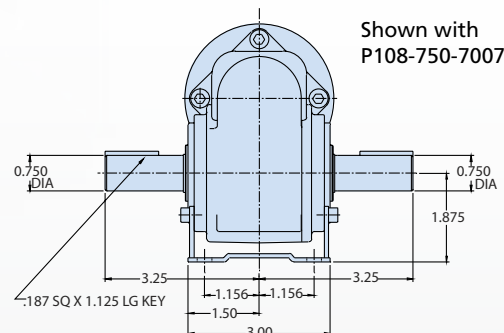
## Competitive Mounting

Standard Bison footplate  
P125-750-1000

Part#: P125-750-2000



Shown with  
P108-750-7007 shaft



## Mount it Your Way

Bison's 750 Series line of hollow shaft gearmotors allows hundreds of mounting configurations enabling engineers to optimize their assemblies. Industry standard mounts are available for drop-in requirements, and a hollow shaft style is available to use with optional accessories to meet your specification!

Assembled units are available either in the traditional Bison mounting or the hollow shaft style. Optional shafts and mounting brackets are available as accessories for field installation.

## Accessory Friendly

Following Bison's tradition, some AC units come standard with brake shaft extension for optional AC power-off brakes. DC units have tapped armature shafts to allow mounting of shaft extension kits and optical encoders.

Can't find what you're looking for?  
[www.bisongear.com](http://www.bisongear.com)



## VWDIR33 AC

115/230V PSC TEFC AC DESIGN

Our VWDIR33 offers up to 200 in-lbs of torque.

RIGHT ANGLE  
GEARMOTORS

### Specifications

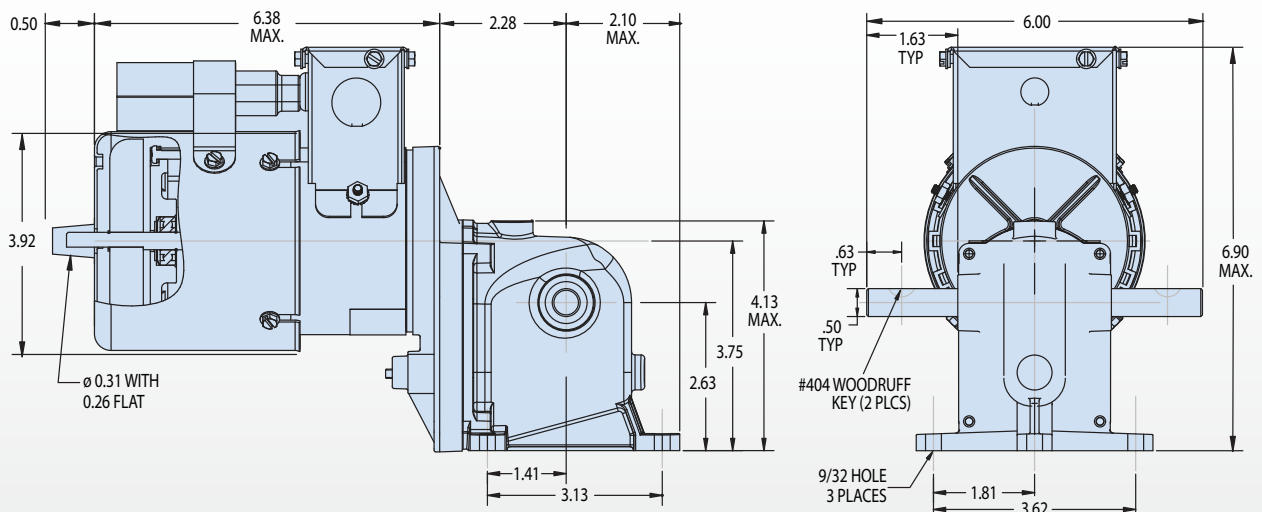
| Gearhead     |                                                                      | Motor                                                         | Features                                                                                                |
|--------------|----------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Gearing:     | Steel, <b>Worm:</b> Hardened Steel,<br><b>Output Gear:</b> Cast Iron | Motor Type: Permanent split capacitor<br>Rotation: Reversible | Units comply with applicable UL & CSA standards                                                         |
| Housing:     | Precision machined die cast aluminum                                 | Bearings: Ball                                                | <b>Optional Features</b>                                                                                |
| Lubrication: | Grease                                                               | Insulation: Class B minimum                                   | Power off brake                                                                                         |
| Bearings:    | Porous bronze sleeve                                                 | Finish: Powdered coat black                                   | <b>Additional Information</b>                                                                           |
| Shafts:      | Hardened steel                                                       | Enclosure: TEFC                                               | See pages 86-87 for additional accessories                                                              |
| Mounting:    | All positions                                                        |                                                               | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a> |
|              |                                                                      | Capacitor included                                            | <b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time            |

### VWDIR33 PSC 115V/230V

| Model #      | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps    | Hz    | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-----|---------|-------|--------------|
| 026Q607-0037 | 40          | 89              | 1/12     | 37         | 3      | 100 | 1.2/.63 | 60/50 | 13.5         |
| 026Q607-0070 | 21          | 170             | 1/12     | 70         | 3      | 100 | 1.2/.63 | 60/50 | 13.5         |
| 026Q607-0167 | 9.5         | 200             | 1/12     | 161        | 3      | 100 | 1.2/.63 | 60/50 | 12.5         |
| 026Q607-0275 | 5.6         | 200             | 1/12     | 275        | 3      | 100 | 1.2/.63 | 60/50 | 12.5         |
| 026Q607-0525 | 3           | 200             | 1/12     | 525        | 3      | 100 | 1.2/.63 | 60/50 | 12.5         |
| 026Q607-1255 | 1.5         | 250             | 1/12     | 1205       | 3      | 100 | 1.2/.63 | 60/50 | 12.5         |

All ratings are shown at 60Hz operation. Also operable at 50Hz at 5/6 of the rated speed.

### VWDIR33 PSC 115V/230V





# WVDIRO3 Universal

115V UNIVERSAL VENTED DESIGN

Our WVDIRO3 offers up to 250 in-lbs of torque for AC or DC.

## Specifications

| Gearhead     |                                                                      | Motor                                         | Additional Information                                                                                                                                                                                  |
|--------------|----------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | Steel, <b>Worm:</b> Hardened Steel,<br><b>Output Gear:</b> Cast Iron | Motor Type: AC and DC<br>Rotation: Reversible | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Castings:    | Zinc die castings                                                    | Bearings: Ball                                |                                                                                                                                                                                                         |
| Housing:     | Precision machined die cast aluminum                                 | Insulation: Class B minimum                   |                                                                                                                                                                                                         |
| Lubrication: | Grease                                                               | Finish: Powdered coat black                   |                                                                                                                                                                                                         |
| Bearings:    | Porous bronze sleeve                                                 | Enclosure: OPEN                               |                                                                                                                                                                                                         |
| Shafts:      | Hardened steel                                                       |                                               |                                                                                                                                                                                                         |
| Mounting:    | All positions                                                        |                                               |                                                                                                                                                                                                         |

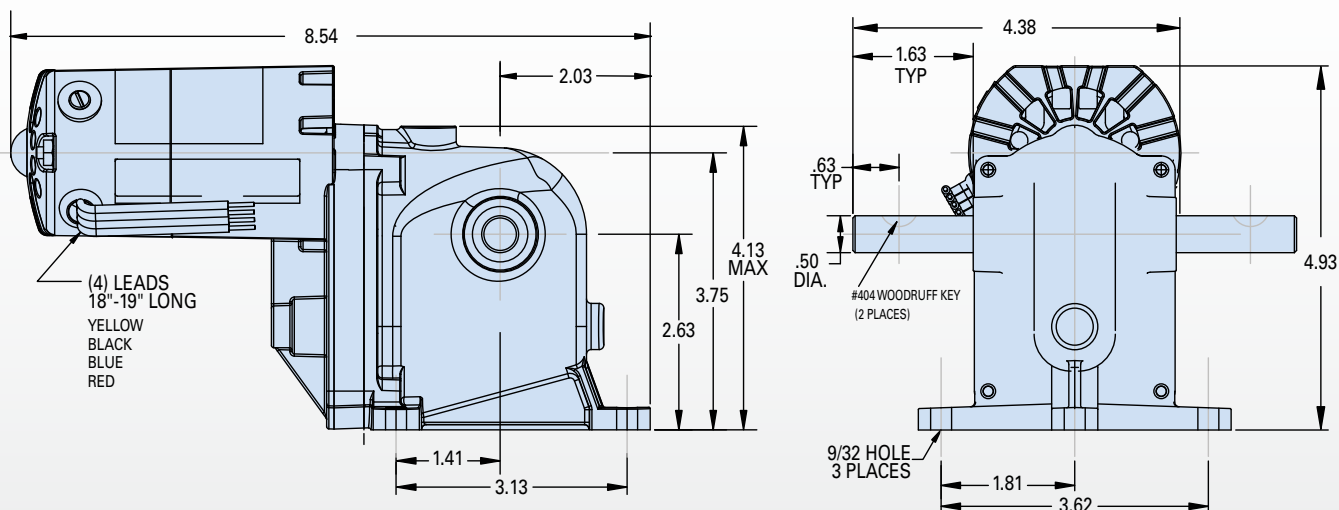
RIGHT ANGLE  
GEARMOTORS

## WVDIRO3 Universal 115V

| Model #        | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | OHL | Amps | Hz    | Shipping Wt. | Brush |
|----------------|-------------|-----------------|----------|------------|--------|-----|------|-------|--------------|-------|
| 022Q607-0052L  | 90          | 18              | 1/15     | 52         | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0052R  | 90          | 18              | 1/15     | 52         | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0100L  | 52          | 39              | 1/15     | 100        | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0100R  | 52          | 39              | 1/15     | 100        | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0238D* | 24          | 85              | 1/15     | 229        | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0238L  | 24          | 85              | 1/15     | 229        | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0238R  | 24          | 85              | 1/15     | 229        | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0390L  | 13          | 84              | 1/15     | 391        | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0390R  | 13          | 84              | 1/15     | 391        | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0745L  | 8           | 150             | 1/15     | 747        | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-0745R  | 8           | 150             | 1/15     | 747        | 3      | 100 | 1.3  | 60/50 | 7            | H     |
| 022Q607-1787L  | 4.5         | 250**           | 1/15     | 1714       | 3      | 100 | 1.1  | 60/50 | 7            | H     |
| 022Q607-1787R  | 4.5         | 250**           | 1/15     | 1714       | 3      | 100 | 1.1  | 60/50 | 7            | H     |

\* Double Shaft Only \*\* Gear Limited

## WVDIRO3 Universal



# Inverter Duty AC Gearmotors

## VARIABLE SPEED CONSTANT TORQUE

### Sturdy. Reliable. Efficient.

Three words that have defined Robusticity™ for more than 50 years now define Bison's energy efficient, three-phase Verdant Duty gearmotors. For applications where greater efficiencies or heavy inverter service are required, Bison's premium-efficiency inverter duty gearmotors consistently deliver Bison durability.

**Verdant Duty from Bison, a new standard in Robusticity™.**



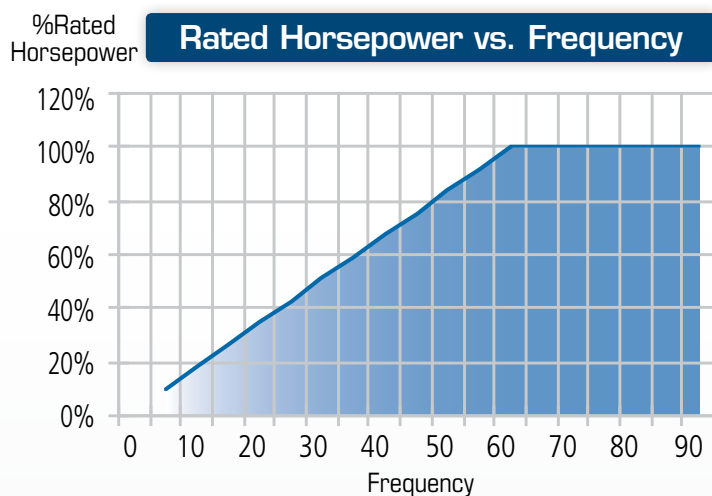
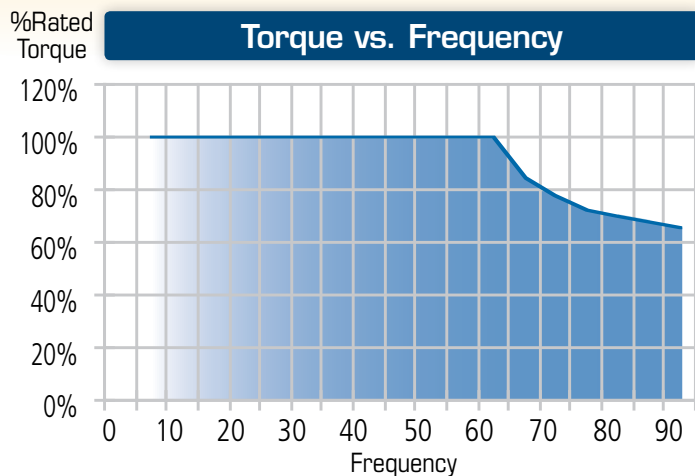
INVERTER DUTY  
GEARMOTORS



- **Shielded ball bearings** (permanently lubricated, electric motor grade) on motor maximize overhung load capability. Preload spring minimizes end play, reducing vibration and noise.
- **Class F UL recognized insulation system** designed to meet NEMA MG 1 Section 31 offer superior protection against voltage spikes induced by variable frequency drives, enhancing system life.
- **High pressure die cast rotor** is heat shrunk to a precision machined motor shaft and dynamically balanced for minimal vibration and audible noise.
- **Fan and Fan Shroud** provide maximum airflow, minimizing motor temperature rise. Fan shroud vents meet UL safety requirements.
- **Large junction box** has multiple knockouts, providing wiring flexibility.
- **Thermostat leads** (signal type, normally closed) provide overload protection when coupled with the proper inverter.
- **Rear shaft extension** for brake mount option.
- **Baked on epoxy powder coat paint finish**, high gloss black, for durability and maximum heat transfer.

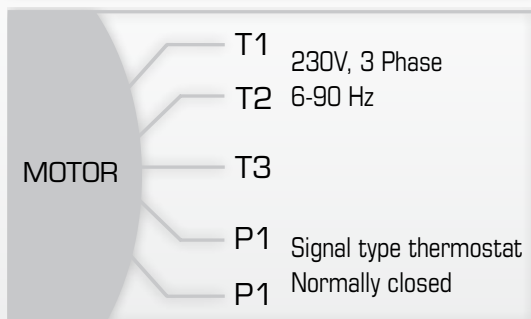
## IMPORTANT GUIDELINES

- Maximum cable length between inverter drive and motor not to exceed 50 feet. Longer cable lengths may require special filters.
- 10:1 Constant Torque Speed Range.
- 1.5:1 Constant Horsepower Range.
- Gearmotors will provide rated torque at low frequency inputs with proper voltage boost. Boost must be adjusted to prevent cogging or stall conditions.
- UL and CUL marked for construction.
- Signal type thermostat leads provided.



## Wiring Diagram

Motor  
Specs



## 107 Series 1/20 HP

Torques up to 100 in-lbs.  
and ratios up to 96:1.



## 247 Series 1/4 HP

Torques up to 350 in-lbs.  
and ratios up to 216:1.



## 485 Series 1/2 HP

Torques up to 950 in-lbs.  
and ratios up to 131:1.



INVERTER DUTY  
GEARMOTORS

## 650 Series 1/4 or 1/2 HP

Torques for the 1/2 HP  
up to 423 in-lbs., and  
for the 1/4 HP torques  
up to 722 in-lbs., with  
ratios up to 215:1.



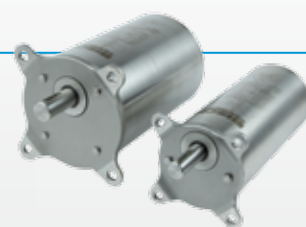
## 750 Series 1/4 HP

Torques up to 120 in-lbs.  
and ratios up to 60:1.



## SANIMotor™

See page 28 for  
more information.





# Inverter Duty AC Gearmotors

DESIGNED FOR ROBUSTICITY™

## Specifications

| Gearhead     |                                              | Motor                                                | Product Line Features                                                                                                                                                                                                  |
|--------------|----------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | AGMA class 9 heat treated steel              | Motor Type: 230V, 3 phase, 6-90 Hz                   | <ul style="list-style-type: none"> <li>Global safety recognition: UL, CUL</li> <li>Insulation system designed to meet NEMA MG 1 Section 31</li> <li>Ambient temperature 0° to 40°C</li> <li>Continuous duty</li> </ul> |
| Geartrain:   | Engineered to handle up to 200% shockloading | Rotation: Reversible                                 |                                                                                                                                                                                                                        |
| Housing:     | Precision machined die cast aluminum         | Bearings: Double shielded ball bearing support       |                                                                                                                                                                                                                        |
| Lubrication: | Lifetime oil bath                            | Insulation: Class F (155°C)                          |                                                                                                                                                                                                                        |
| Bearings:    | Needle and thrust ball, or ball bearing      | Enclosure: TENV for 1/20 HP, TEFC for 1/4 and 1/2 HP |                                                                                                                                                                                                                        |
| Shafts:      | Precision ground shaft seal diameters        | Thermostat: Signal type; closed                      |                                                                                                                                                                                                                        |
| Mounting:    | All position                                 |                                                      |                                                                                                                                                                                                                        |

## Additional Information

|                                                                                                         |                            |                                            |
|---------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------|
| Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a> | Wiring diagram pages 88-91 | See pages 86-87 for additional accessories |
| ISIS - Products available off-shelf                                                                     |                            |                                            |
| SNS - Min. order quantity and lead time                                                                 |                            |                                            |

INVERTER DUTY GEARMOTORS

## 107 Series 3-Phase Inverter Duty 230V

| Part Number  | Rated Speed<br>RPM @ 6hz | Rated Speed<br>RPM @ 60hz | Rated Speed<br>RPM @ 90hz | Rated Torque<br>in-lbs @ 6hz | Rated Torque<br>in-lbs @ 60hz | Rated Torque<br>in-lbs @ 90hz | Input<br>HP | Gear<br>Ratio | Amps | Shipping<br>Wt. |
|--------------|--------------------------|---------------------------|---------------------------|------------------------------|-------------------------------|-------------------------------|-------------|---------------|------|-----------------|
| 017-107-0007 | 24                       | 245                       | 368                       | 12                           | 12                            | 7                             | 1/20        | 6.7           | 0.24 | 7.5             |
| 017-107-0013 | 12                       | 127                       | 191                       | 23                           | 23                            | 14                            | 1/20        | 12.9          | 0.24 | 7.5             |
| 017-107-0025 | 6.3                      | 65                        | 98                        | 45                           | 45                            | 27                            | 1/20        | 25.2          | 0.24 | 7.5             |
| 017-107-0049 | 3.3                      | 33                        | 50                        | 84                           | 84                            | 53                            | 1/20        | 49.0          | 0.24 | 7.5             |
| 017-107-0096 | 1.7                      | 17                        | 26                        | 100**                        | 100**                         | 100**                         | 1/20        | 95.5          | 0.24 | 7.5             |

## 247 Series 3-Phase Inverter Duty 230V

| Part Number  | Rated Speed<br>RPM @ 6hz | Rated Speed<br>RPM @ 60hz | Rated Speed<br>RPM @ 90hz | Rated Torque<br>in-lbs @ 6hz | Rated Torque<br>in-lbs @ 60hz | Rated Torque<br>in-lbs @ 90hz | Input<br>HP | Gear<br>Ratio | Amps | Shipping<br>Wt. |
|--------------|--------------------------|---------------------------|---------------------------|------------------------------|-------------------------------|-------------------------------|-------------|---------------|------|-----------------|
| 017-247-0005 | 35                       | 350                       | 526                       | 38                           | 38                            | 25                            | 1/4         | 5.0           | 0.75 | 12              |
| 017-247-0011 | 16.5                     | 165                       | 248                       | 80                           | 80                            | 53                            | 1/4         | 10.6          | 0.75 | 12              |
| 017-247-0019 | 9.2                      | 92                        | 138                       | 144                          | 144                           | 96                            | 1/4         | 19.1          | 0.75 | 12              |
| 017-247-0028 | 6.2                      | 62                        | 93                        | 215                          | 215                           | 148                           | 1/4         | 28.1          | 0.75 | 12              |
| 017-247-0058 | 3.0                      | 30                        | 45                        | 300**                        | 300**                         | 272**                         | 1/4         | 58.3          | 0.75 | 12              |
| 017-247-1102 | 1.7                      | 17                        | 25                        | 350**                        | 350**                         | 350**                         | 1/4         | 102.4         | 0.75 | 12              |
| 017-247-0216 | 0.8                      | 8.1                       | 12                        | 310**                        | 310**                         | 310**                         | 1/4         | 215.6         | 0.75 | 12              |

## 485 Series 3-Phase Inverter Duty 230V

| Part Number  | Rated Speed<br>RPM @ 6hz | Rated Speed<br>RPM @ 60hz | Rated Speed<br>RPM @ 90hz | Rated Torque<br>in-lbs @ 6hz | Rated Torque<br>in-lbs @ 60hz | Rated Torque<br>in-lbs @ 90hz | Input<br>HP | Gear<br>Ratio | Amps | Shipping<br>Wt. |
|--------------|--------------------------|---------------------------|---------------------------|------------------------------|-------------------------------|-------------------------------|-------------|---------------|------|-----------------|
| 017-485-0006 | 29                       | 291                       | 437                       | 91                           | 91                            | 61                            | 1/2         | 5.9           | 1.60 | 43              |
| 017-485-0010 | 18                       | 178                       | 267                       | 150                          | 150                           | 100                           | 1/2         | 9.8           | 1.60 | 43              |
| 017-485-0020 | 9.0                      | 90                        | 135                       | 296                          | 296                           | 187                           | 1/2         | 19.4          | 1.60 | 43              |
| 017-485-0028 | 6.3                      | 63                        | 94                        | 423                          | 423                           | 283                           | 1/2         | 27.8          | 1.60 | 43              |
| 017-485-0060 | 3.0                      | 30                        | 45                        | 818                          | 818                           | 545                           | 1/2         | 59.1          | 1.60 | 43              |
| 017-485-0089 | 2.0                      | 20                        | 30                        | 950**                        | 950**                         | 950**                         | 1/2         | 88.8          | 1.60 | 43              |
| 017-485-0131 | 1.3                      | 13                        | 20                        | 950**                        | 950**                         | 950**                         | 1/2         | 130.8         | 1.60 | 43              |

\*\* Output torque is gear limited.

For 650 and 750 Series see pages 64-65

**INVERTER DUTY  
GEARMOTORS**

Technical drawing of a 1/2 inch NPT female fitting, showing two views: a side view and a front view.

**Side View Dimensions:**

- Overall Length: 7.29
- Overall Height: 3.35
- Keyway Dimensions: 1/8 SQ. KEY x 3/4 LONG KEY 130-485-0212 ?
- Keyway Tolerance: .42
- Keyway Depth: .45 ± .01
- Keyway Diameter: 0.50 DIA.

**Front View Dimensions:**

- Outer Diameter: 3.60 SQ
- Inner Diameter: 2.65
- Center Hole Diameter: 1.12 DIA
- Four 1/8 NPT PIPE PLUGS
- Bottom View Hole: (4) #10-32 UNF-2B TAPPED HOLES x .40 DEPTH, LOCATED AS SHOWN

The technical drawing shows two views of the motor:

- Side View (Left):** Shows the motor's profile with dimensions including a total length of 11.28, a mounting flange diameter of  $\phi 0.31$  WITH 0.26 FLAT, and a shaft diameter of 0.7498 / 0.7493.
- Front View (Right):** Shows the circular face of the motor with four mounting holes labeled (4)  $\frac{1}{4}$ -28 UNF-2B and a central shaft hole of  $\phi 1.28$ .

Technical drawing of a motor assembly, showing front and side views with dimensions.

**Front View Dimensions:**

- Overall width: 13.86
- Overall height: 6.63
- Top flange width: 7.31
- Top flange inner width: 3.94
- Top flange outer width: 4.87
- Top flange thickness: 3.26
- Top flange hole diameter: 0.75 DIA.
- Top flange hole spacing: 2.75 (center-to-center), 1.33 (edge-to-center)
- Top flange hole diameter: (4) HOLES  $\phi 0.44$
- Top flange hole depth: 1.50
- Top flange hole diameter: 3/16 SQ. KEY X 1.13 LONG
- Top flange hole diameter: 0.75 DIA.
- Top flange hole depth: 3.00
- Top flange hole diameter: 2.50
- Top flange hole diameter: 3.50
- Top flange hole diameter: 1.50
- Top flange hole diameter: 5.61 DIA.

**Side View Dimensions:**

- Overall width: 13.86
- Overall height: 6.63
- Top flange width: 7.31
- Top flange inner width: 3.94
- Top flange outer width: 4.87
- Top flange thickness: 3.26
- Top flange hole diameter: 0.75 DIA.
- Top flange hole spacing: 2.75 (center-to-center), 1.33 (edge-to-center)
- Top flange hole diameter: (4) HOLES  $\phi 0.44$
- Top flange hole depth: 1.50
- Top flange hole diameter: 3/16 SQ. KEY X 1.13 LONG
- Top flange hole diameter: 0.75 DIA.
- Top flange hole depth: 3.00
- Top flange hole diameter: 2.50
- Top flange hole diameter: 3.50
- Top flange hole diameter: 1.50
- Top flange hole diameter: 5.61 DIA.

# Inverter Duty AC Gearmotors (continued)

DESIGNED FOR ROBUSTICITY™

## Specifications

| Gearhead                                                | Motor                                          | Product Line Features                                                                                                                                                                                                  |
|---------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing: AGMA class 9 heat treated steel                | Motor Type: 230V, 3 phase, 6-90 Hz             | <ul style="list-style-type: none"> <li>Global safety recognition: UL, CUL</li> <li>Insulation system designed to meet NEMA MG 1 Section 31</li> <li>Ambient temperature 0° to 40°C</li> <li>Continuous duty</li> </ul> |
| Geartrain: Engineered to handle up to 200% shockloading | Rotation: Reversible                           |                                                                                                                                                                                                                        |
| Housing: Precision machined die cast aluminum           | Bearings: Double shielded ball bearing support |                                                                                                                                                                                                                        |
| Lubrication: Lifetime oil bath                          | Insulation: Class F (155°C)                    |                                                                                                                                                                                                                        |
| Bearings: Needle and thrust ball, or ball bearing       | Enclosure: TEFC                                |                                                                                                                                                                                                                        |
| Shafts: Precision ground shaft seal diameters           | Thermostat: Signal type; closed                |                                                                                                                                                                                                                        |
| Mounting: All position                                  |                                                |                                                                                                                                                                                                                        |

## Additional Information

|                                                                                                         |                            |                                            |
|---------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------|
| Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a> | Wiring diagram pages 88-91 | See pages 86-87 for additional accessories |
| ISIS - Products available off-shelf                                                                     |                            |                                            |
| SNS - Min. order quantity and lead time                                                                 |                            |                                            |

INVERTER DUTY  
GEARMOTORS

## 650 Series 3-Phase Inverter Duty 230V

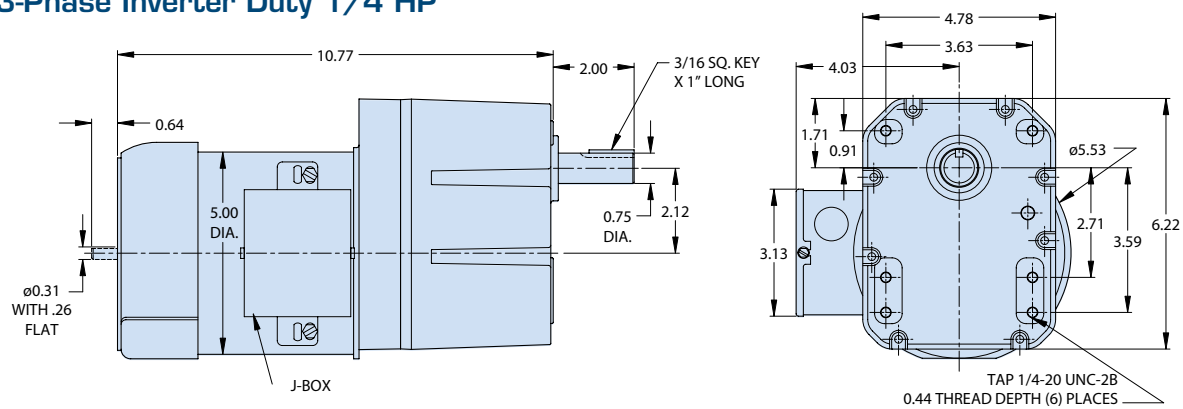
| Part Number  | Rated Speed<br>RPM @ 6hz | Rated Speed<br>RPM @ 60hz | Rated Speed<br>RPM @ 90hz | Rated Torque<br>in-lbs @ 6hz | Rated Torque<br>In-lbs @ 60hz | Rated Torque<br>In-lbs @ 90hz | Input<br>HP | Gear<br>Ratio | Amps | Shipping<br>Wt. |
|--------------|--------------------------|---------------------------|---------------------------|------------------------------|-------------------------------|-------------------------------|-------------|---------------|------|-----------------|
| 017-650-0029 | 6.0                      | 60                        | 90                        | 222                          | 222                           | 148                           | 1/4         | 28.9          | 0.75 | 23              |
| 017-650-0070 | 2.5                      | 25                        | 38                        | 490                          | 490                           | 327                           | 1/4         | 69.7          | 0.75 | 23              |
| 017-650-0090 | 1.7                      | 17                        | 26                        | 722**                        | 722**                         | 442                           | 1/4         | 89.8          | 0.75 | 23              |
| 017-650-0214 | 0.8                      | 7.9                       | 12                        | 650**                        | 650**                         | 650**                         | 1/4         | 214.5         | 0.75 | 23              |
| 017-651-0028 | 6.3                      | 63                        | 95                        | 423                          | 423                           | 282                           | 1/2         | 27.6          | 1.60 | 29              |

## 750 Series 3-Phase Inverter Duty 230V

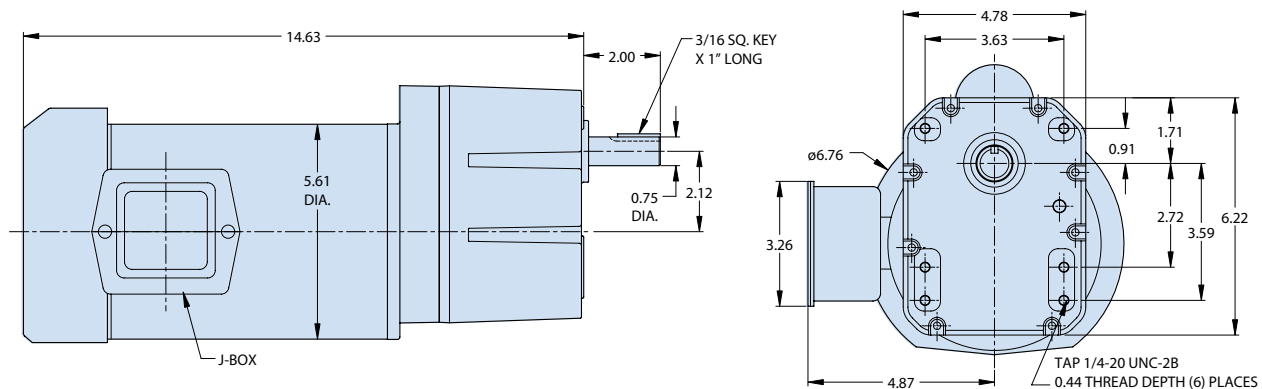
| Part Number                                     | Rated Speed<br>RPM @ 6hz | Rated Speed<br>RPM @ 60hz | Rated Speed<br>RPM @ 90hz | Rated Torque<br>in-lbs @ 6hz | Rated Torque<br>In-lbs @ 60hz | Rated Torque<br>In-lbs @ 90hz | Input<br>HP | Gear<br>Ratio | Amps | Shipping<br>Wt. |
|-------------------------------------------------|--------------------------|---------------------------|---------------------------|------------------------------|-------------------------------|-------------------------------|-------------|---------------|------|-----------------|
| <b>With Mounting Bracket &amp; Output Shaft</b> |                          |                           |                           |                              |                               |                               |             |               |      |                 |
| 027-756-4005                                    | 33                       | 330                       | 495                       | 30                           | 30                            | 20                            | 1/4         | 5.2           | 0.75 | 19.8            |
| 027-756-4010                                    | 16                       | 160                       | 240                       | 58                           | 58                            | 39                            | 1/4         | 10.3          | 0.75 | 19.8            |
| 027-756-4013                                    | 12.4                     | 124                       | 186                       | 76                           | 76                            | 51                            | 1/4         | 13.0          | 0.75 | 19.8            |
| 027-756-4020                                    | 8                        | 80                        | 120                       | 108                          | 108                           | 72                            | 1/4         | 20.5          | 0.75 | 19.8            |
| 027-756-4030                                    | 5.5                      | 55                        | 83                        | 130                          | 130                           | 87                            | 1/4         | 30.0          | 0.75 | 19.8            |
| 027-756-4045                                    | 3.8                      | 38                        | 57                        | 120**                        | 120**                         | 80**                          | 1/4         | 45.0          | 0.75 | 19.8            |
| 027-756-4060                                    | 2.8                      | 28                        | 42                        | 100**                        | 100**                         | 67**                          | 1/4         | 60.0          | 0.75 | 19.8            |
| <b>Hollow Shaft &amp; Pilot Mount</b>           |                          |                           |                           |                              |                               |                               |             |               |      |                 |
| 027-756-4405                                    | 33                       | 330                       | 495                       | 30                           | 30                            | 20                            | 1/4         | 5.2           | 0.75 | 16.8            |
| 027-756-4410                                    | 16                       | 160                       | 240                       | 58                           | 58                            | 39                            | 1/4         | 10.3          | 0.75 | 16.8            |
| 027-756-4413                                    | 12.4                     | 124                       | 186                       | 76                           | 76                            | 51                            | 1/4         | 13.0          | 0.75 | 16.8            |
| 027-756-4420                                    | 8                        | 80                        | 120                       | 108                          | 108                           | 72                            | 1/4         | 20.5          | 0.75 | 16.8            |
| 027-756-4430                                    | 5.5                      | 55                        | 83                        | 130                          | 130                           | 87                            | 1/4         | 30.0          | 0.75 | 16.8            |
| 027-756-4445                                    | 3.8                      | 38                        | 57                        | 120**                        | 120**                         | 80**                          | 1/4         | 45.0          | 0.75 | 16.8            |
| 027-756-4460                                    | 2.8                      | 28                        | 42                        | 100**                        | 100**                         | 67**                          | 1/4         | 60.0          | 0.75 | 16.8            |

\*\* Output torque is gear limited.

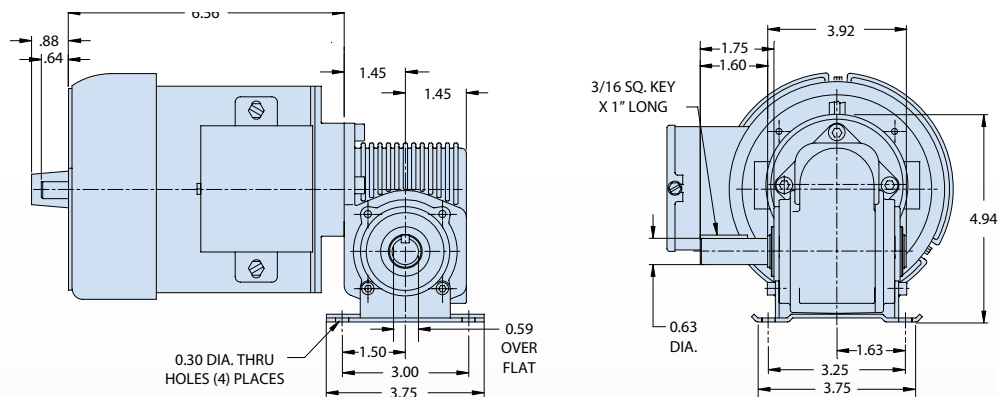
## 650 3-Phase Inverter Duty 1/4 HP



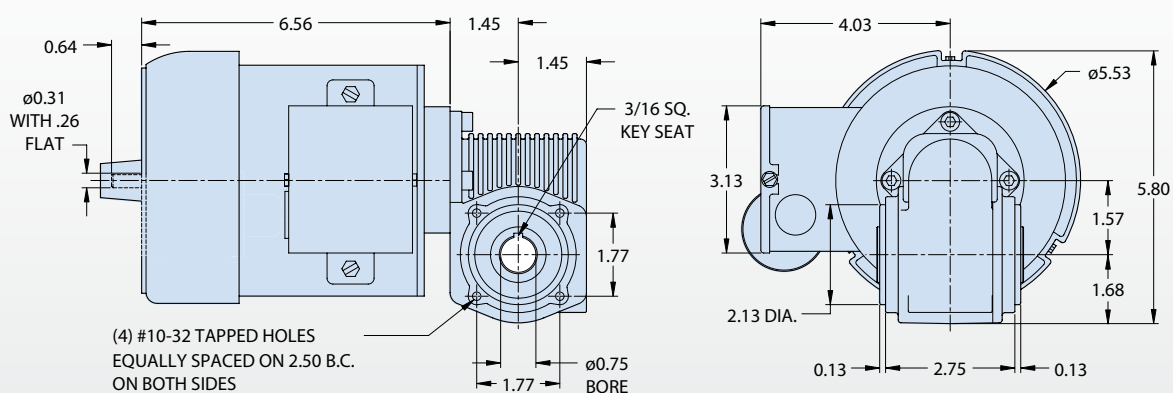
## 650 3-Phase Inverter Duty 1/2 HP



## 750 3-Phase Inverter Duty Standard Shaft 1/4 HP



## 750 3-Phase Inverter Duty Hollow Shaft 1/4 HP







# Hollow Shaft Offset Gearmotors



HOLLOW SHAFT  
OFFSET  
GEARMOTORS



## 562 Series Parallel Shaft AC or DC

UP TO 1100 IN-LBS CONTINUOUS

The 562 Series offers versatility and flexibility in a small package while delivering high torques. The 562 has ratios available from 27.9 to 1397 in 3 or 4 stages of gearing. In addition, the 562 can be shaft mounted utilizing the hollow output shaft which can reduce overall cost by eliminating couplings.

### Specifications

| Gearhead     |                                                                                                              | Motor                                                                                                                                                                     | Shaft Options                                                                                                                             |
|--------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | AGMA class 9 heat treated steel 1st-stage helical, balance spur                                              | Motor Type: PSC, PMDC                                                                                                                                                     | Size: <b>3/4" diameter:</b> hollow standard; <b>3/4" diameter or smaller:</b> double output; <b>1" diameter or smaller:</b> single output |
| Housing:     | Precision machined die cast aluminum                                                                         | Rotation: Reversible                                                                                                                                                      | Materials: Carbon steel                                                                                                                   |
| Lubrication: | Grease                                                                                                       | Bearings: Ball                                                                                                                                                            | <b>Additional Information</b>                                                                                                             |
| Bearings:    | <b>Output shaft:</b> supported by ball bearings; <b>Intermediate gearing:</b> supported with needle bearings | Insulation: Class B minimum on AC, Class F typical on DC                                                                                                                  |                                                                                                                                           |
| Stages:      | 3 or 4 stages                                                                                                | Enclosure: TENV                                                                                                                                                           | For shaft detail see page 57                                                                                                              |
| Mounting:    | Shaft mount, base mount, or face mount, any angle                                                            | Finish: Gloss black powdered coat                                                                                                                                         | See pages 86-87 for additional accessories                                                                                                |
| Finish:      | Unpainted                                                                                                    | <b>Features</b>                                                                                                                                                           |                                                                                                                                           |
|              |                                                                                                              | <ul style="list-style-type: none"> <li>Standard hollow shaft or solid shaft insert out of either side of housing</li> <li>Terminal boxes or cordsets available</li> </ul> |                                                                                                                                           |
|              |                                                                                                              |                                                                                                                                                                           | Wiring diagram pages 88-91                                                                                                                |
|              |                                                                                                              |                                                                                                                                                                           | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a>                                   |
|              |                                                                                                              |                                                                                                                                                                           | ISIS - Products available off-shelf                                                                                                       |
|              |                                                                                                              |                                                                                                                                                                           | SNS - Min. order quantity and lead time                                                                                                   |

### 562 Series PSC 115VAC

\*\* Gear Limited (check website for updated information.)

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|------|----|--------------|
| 016-562-1397 | 1.2         | 1100**          | 1/20     | 1397.1     | 4      | 0.59 | 60 | 12           |
| 016-562-0401 | 4.1         | 676             | 1/20     | 402.2      | 3      | 0.59 | 60 | 12           |
| 016-562-0285 | 5.8         | 478             | 1/20     | 284.2      | 3      | 0.59 | 60 | 12           |
| 016-562-0151 | 11          | 253             | 1/20     | 150.8      | 3      | 0.59 | 60 | 12           |
| 016-562-0121 | 14          | 204             | 1/20     | 121.4      | 3      | 0.59 | 60 | 12           |
| 016-562-0084 | 20          | 142             | 1/20     | 84.3       | 3      | 0.59 | 60 | 12           |
| 016-562-0043 | 38          | 72              | 1/20     | 43.0       | 3      | 0.59 | 60 | 12           |

### 562 Series 12VDC

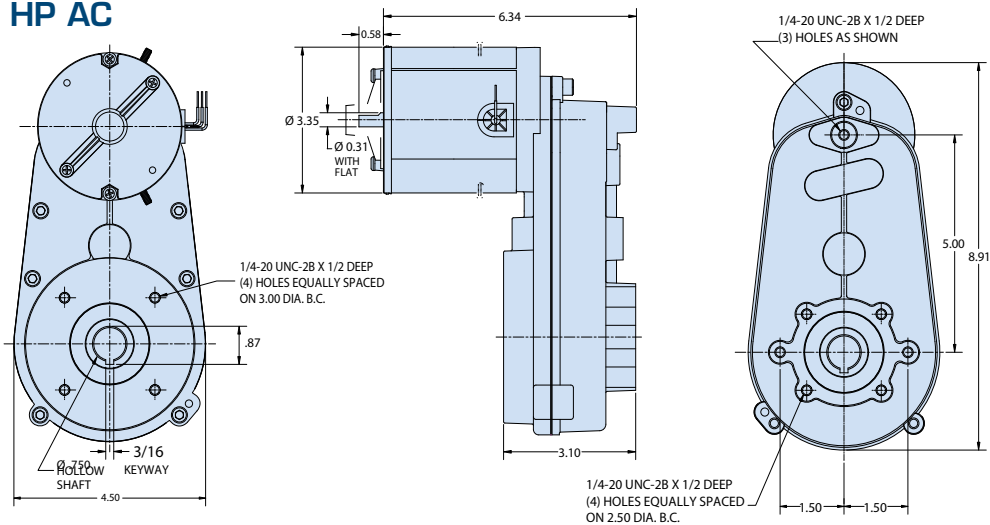
| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | Amps  | Shipping Wt. | Brush |
|--------------|-------------|-----------------|----------|------------|--------|-------|--------------|-------|
| 011-562-3397 | 1.3         | 1100**          | 1/20     | 1397.1     | 4      | 3.00  | 10           | C     |
| 011-562-3401 | 4.5         | 620             | 1/20     | 402.2      | 3      | 4.73  | 10           | C     |
| 011-562-3285 | 6.3         | 438             | 1/20     | 284.2      | 3      | 4.73  | 10           | C     |
| 011-562-3151 | 12          | 232             | 1/20     | 150.8      | 3      | 4.73  | 10           | C     |
| 011-562-3121 | 15          | 187             | 1/20     | 121.4      | 3      | 4.73  | 10           | C     |
| 011-562-3084 | 21          | 130             | 1/20     | 84.3       | 3      | 4.73  | 10           | C     |
| 011-562-3043 | 42          | 66              | 1/20     | 43.0       | 3      | 4.73  | 10           | C     |
| 011-562-3261 | 6.9         | 1005            | 1/8      | 261.0      | 3      | 10.20 | 10           | A     |
| 011-562-3184 | 9.8         | 709             | 1/8      | 184.1      | 3      | 10.20 | 10           | A     |
| 011-562-3111 | 16          | 428             | 1/8      | 111.1      | 3      | 10.20 | 10           | A     |
| 011-562-3079 | 23          | 303             | 1/8      | 78.7       | 3      | 10.20 | 10           | A     |
| 011-562-3055 | 33          | 210             | 1/8      | 54.6       | 3      | 10.20 | 10           | A     |
| 011-562-3028 | 65          | 107             | 1/8      | 27.9       | 3      | 10.20 | 10           | A     |

### 562 Series 90VDC

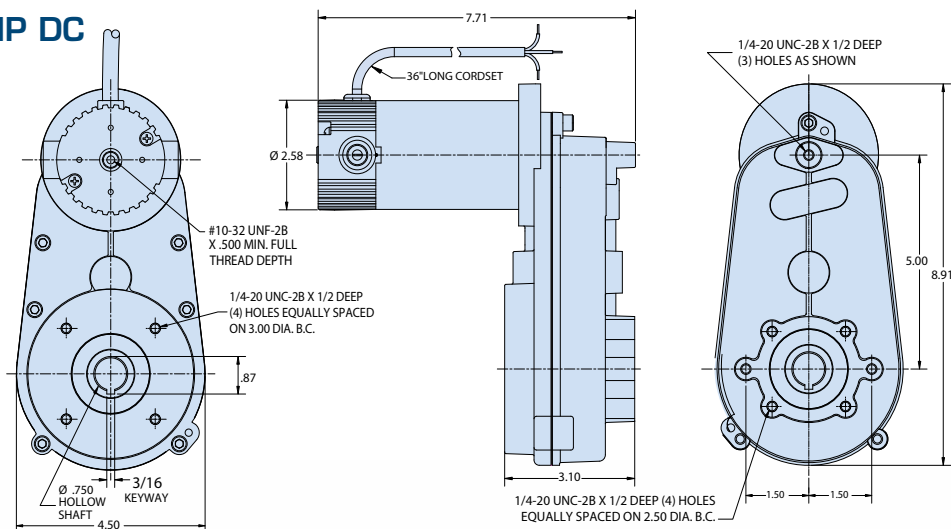
| Part Number  | Speed 90V (RPM) | Speed 130V (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | Amps | Shipping Wt. | Brush |
|--------------|-----------------|------------------|-----------------|----------|------------|--------|------|--------------|-------|
| 011-562-1397 | 1.3             | 1.9              | 1100**          | 1/20     | 1397.1     | 4      | 0.50 | 10           | B     |
| 011-562-0401 | 4.5             | 6.4              | 620             | 1/20     | 402.2      | 3      | 0.72 | 10           | B     |
| 011-562-0285 | 6.3             | 9                | 438             | 1/20     | 284.2      | 3      | 0.72 | 10           | B     |
| 011-562-0151 | 12              | 17               | 232             | 1/20     | 150.8      | 3      | 0.72 | 10           | B     |
| 011-562-0121 | 15              | 21               | 187             | 1/20     | 121.4      | 3      | 0.72 | 10           | B     |
| 011-562-0084 | 21              | 31               | 130             | 1/20     | 84.3       | 3      | 0.72 | 10           | B     |
| 011-562-0043 | 42              | 60               | 66              | 1/20     | 43.0       | 3      | 0.72 | 10           | B     |
| 011-562-2261 | 6.9             | 9.9              | 1005            | 1/8      | 261.0      | 3      | 1.41 | 10           | D     |
| 011-562-2184 | 9.8             | 14               | 709             | 1/8      | 184.1      | 3      | 1.41 | 10           | D     |
| 011-562-2111 | 16              | 23               | 428             | 1/8      | 111.1      | 3      | 1.41 | 10           | D     |
| 011-562-2079 | 23              | 33               | 303             | 1/8      | 78.7       | 3      | 1.41 | 10           | D     |
| 011-562-2055 | 33              | 47               | 210             | 1/8      | 54.6       | 3      | 1.41 | 10           | D     |
| 011-562-2028 | 65              | 93               | 107             | 1/8      | 27.9       | 3      | 1.41 | 10           | D     |

# 562 Series Parallel Shaft AC or DC

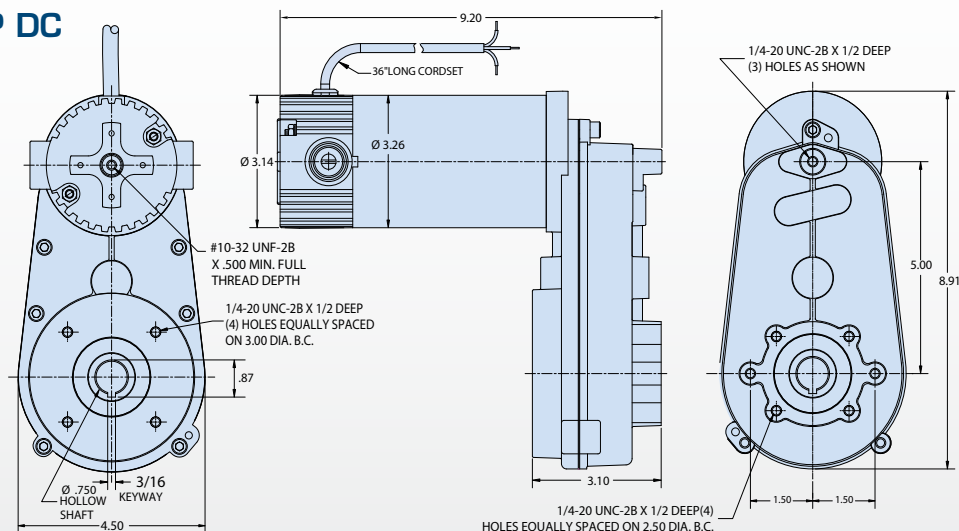
## 562 1/20 HP AC



## 562 1/20 HP DC



## 562 1/8 HP DC



HOLLOW SHAFT  
OFFSET  
GEARMOTORS



## 762 Series Parallel Shaft AC

UP TO 2500 IN-LBS CONTINUOUS

The 762 Series hollow shaft offset AC gearmotors are available in single and three-phase from 1/20 to 1/2 HP with speeds to 1 rpm and 2500 in-lbs torque output.

### Specifications

| Gearhead     |                                                                                                              | Motor                                                  | Optional Accessories                                                                                                                                                                                                                                                           |
|--------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | AGMA class 9 heat treated steel 1st-stage helical, balance spur                                              | Motor Type: PSC, Split Phase, 3-Phase Inverter Duty    | Output shaft<br>Part Number: P108-762-1250                                                                                                                                                                                                                                     |
| Housing:     | Precision machined die cast aluminum                                                                         | Rotation: Reversible                                   | <b>Additional Information</b><br><br>Wiring diagram pages 88-91<br><br>Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Lubrication: | Lifetime oil bath                                                                                            | Bearings: Ball                                         |                                                                                                                                                                                                                                                                                |
| Bearings:    | <b>Output shaft:</b> supported by ball bearings; <b>Intermediate gearing:</b> supported with needle bearings | Insulation: Class B minimum                            |                                                                                                                                                                                                                                                                                |
|              |                                                                                                              | Finish: All cast aluminum                              |                                                                                                                                                                                                                                                                                |
| Mounting:    | All positions                                                                                                | Enclosure: TENV for 1/20 HP<br>TEFC for 1/4 and 1/2 HP |                                                                                                                                                                                                                                                                                |

### 762 Series PSC 115V

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|------|----|--------------|
| 016-762-1645 | 1           | 2500            | 1/20     | 1644.9     | 4      | 0.6  | 60 | 28           |
| 016-762-1264 | 1.2         | 1822            | 1/20     | 1263.6     | 4      | 0.6  | 60 | 28           |
| 016-762-0835 | 1.8         | 1250            | 1/20     | 835.0      | 4      | 0.6  | 60 | 28           |
| 016-762-0736 | 2           | 1050            | 1/20     | 736.0      | 4      | 0.6  | 60 | 28           |
| 016-762-0418 | 3.5         | 625             | 1/20     | 418.0      | 4      | 0.6  | 60 | 28           |

### 762 Series PSC 115V/230V

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | Amps      | Hz    | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|-----------|-------|--------------|
| 016-762-0267 | 6           | 2020            | 1/4      | 267.7      | 4      | 2.35/1.25 | 60/50 | 32           |
| 016-762-0150 | 11          | 1175            | 1/4      | 152.2      | 3      | 2.35/1.25 | 60/50 | 32           |

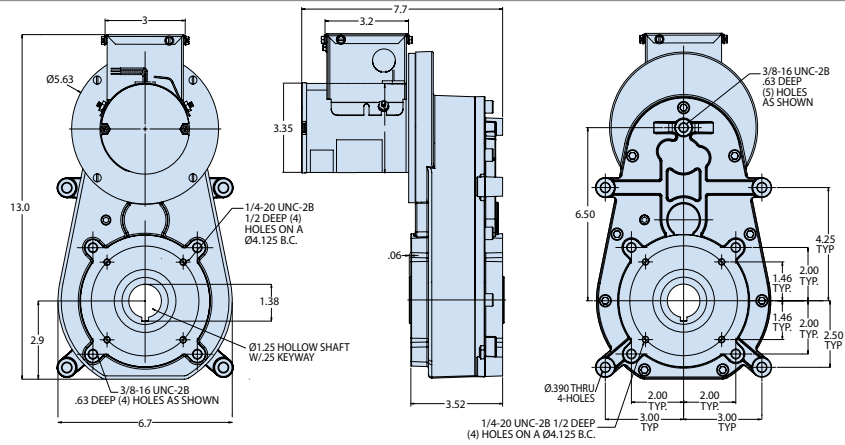
### 762 Series Split Phase 115V

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|------|----|--------------|
| 014-762-0100 | 17          | 1776            | 1/2      | 99.4       | 3      | 7.9  | 60 | 34           |
| 014-762-0078 | 21          | 1375            | 1/2      | 78.5       | 3      | 7.9  | 60 | 34           |
| 014-762-0055 | 30          | 998             | 1/2      | 55.5       | 3      | 7.9  | 60 | 34           |
| 014-762-0028 | 60          | 498             | 1/2      | 27.9       | 3      | 7.9  | 60 | 34           |

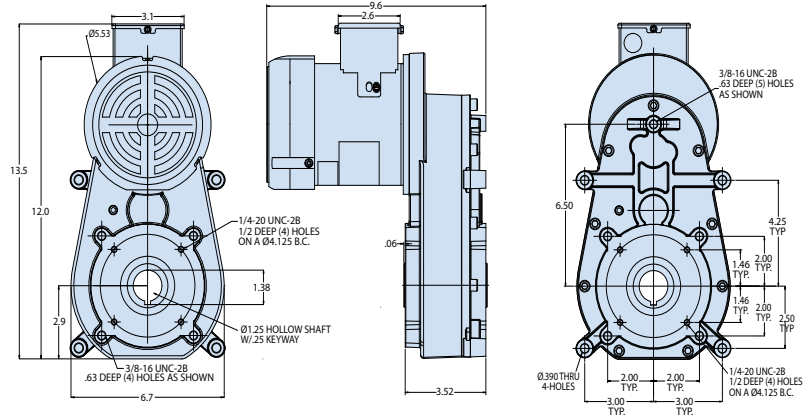
### 762 Series 3-Phase Inverter Duty 230V

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | Amps | Hz | Shipping Wt. |
|--------------|-------------|-----------------|----------|------------|--------|------|----|--------------|
| 017-762-1100 | 17          | 1529            | 1/2      | 99.4       | 3      | 1.6  | 60 | 34           |
| 017-762-1078 | 21          | 1207            | 1/2      | 78.5       | 3      | 1.6  | 60 | 34           |
| 017-762-1055 | 30          | 855             | 1/2      | 55.5       | 3      | 1.6  | 60 | 34           |
| 017-762-1028 | 60          | 430             | 1/2      | 27.9       | 3      | 1.6  | 60 | 34           |

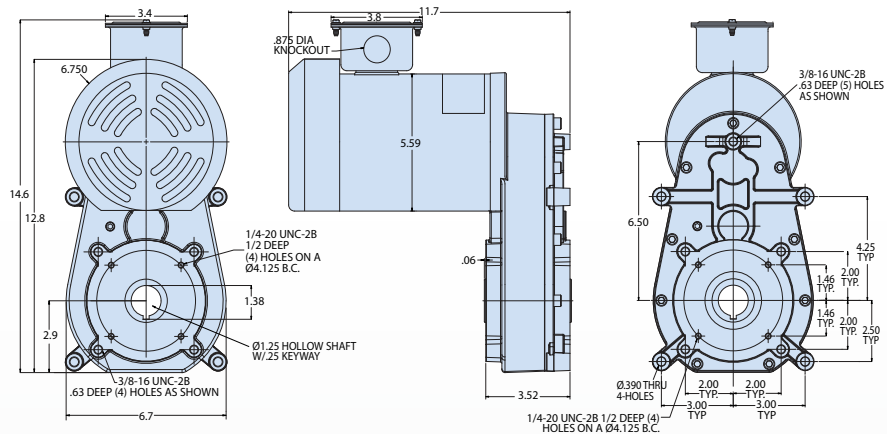
## 762 1/20 HP 115V 1 Phase 1-4 RPM



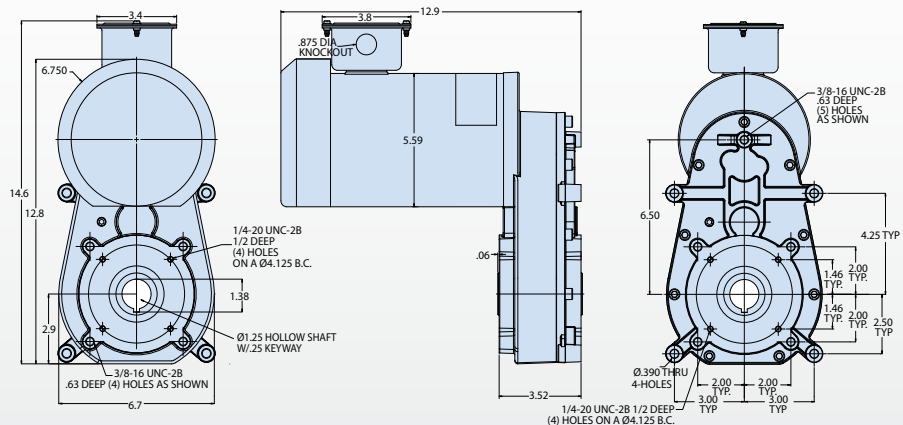
## 762 1/4 HP 115V/230V 1 Phase 6-11 RPM



## 762 1/2 HP 115V 1 Phase 17-60 RPM



## 762 1/2 HP 230V 3 Phase Inverter Duty 17-60 RPM



HOLLOW SHAFT  
OFFSET  
GEARMOTORS



## 762 Series Parallel Shaft DC

UP TO 1805 IN-LBS

The 762 Series hollow shaft offset DC gearmotors are available in single phase 90V from 1/20 to 1/2 HP with speeds to 1.2 rpm and 1805 in-lbs torque output.

### Specifications

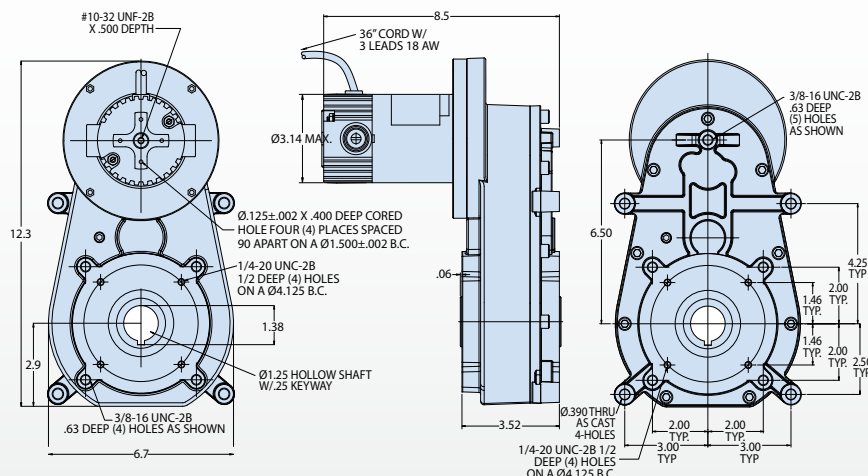
| Gearhead     |                                                                                                              | Motor                                                                                                                                                                    | Additional Information                                                                                                                                                                                                                                    |
|--------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearing:     | AGMA class 9 heat treated steel 1st-stage helical, balance spur                                              | Motor Type: PMDC                                                                                                                                                         | See pages 86-87 for additional accessories<br><br>Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br><b>ISIS</b> - Products available off-shelf<br><b>SNS</b> - Min. order quantity and lead time |
| Housing:     | Precision machined die cast aluminum                                                                         | Rotation: Reversible                                                                                                                                                     |                                                                                                                                                                                                                                                           |
| Lubrication: | Lifetime oil bath                                                                                            | Bearings: Ball                                                                                                                                                           |                                                                                                                                                                                                                                                           |
| Bearings:    | <b>Output shaft:</b> supported by ball bearings; <b>Intermediate gearing:</b> supported with needle bearings | Insulation: Class F                                                                                                                                                      |                                                                                                                                                                                                                                                           |
|              |                                                                                                              | Finish: Cast aluminum                                                                                                                                                    |                                                                                                                                                                                                                                                           |
|              |                                                                                                              | Enclosure: TENV                                                                                                                                                          |                                                                                                                                                                                                                                                           |
| Mounting:    | All positions                                                                                                | <div>Optional Accesories</div> <ul style="list-style-type: none"><li>• Shaft mount encoder on 1/20 and 1/4 HP</li><li>• Accessory shaft</li><li>• Junction box</li></ul> |                                                                                                                                                                                                                                                           |

### 762 Series PMDC 90V

| Part Number  | Speed (RPM) | Torque (in-lbs) | Input HP | Gear Ratio | Stages | Amps | Shipping Wt. | Brush |
|--------------|-------------|-----------------|----------|------------|--------|------|--------------|-------|
| 011-762-2264 | 1.2         | 1335            | 1/20     | 1263.6     | 4      | 0.6  | 28           | D     |
| 011-762-2736 | 2.2         | 755             | 1/20     | 736.0      | 4      | 0.6  | 28           | D     |
| 011-762-2418 | 4           | 515             | 1/20     | 418.0      | 4      | 0.6  | 28           | D     |
| 011-762-3267 | 7           | 1805            | 1/4      | 267.7      | 4      | 2.6  | 28           | D     |
| 011-762-3150 | 12          | 1075            | 1/4      | 152.2      | 3      | 2.6  | 28           | D     |
| 011-762-4100 | 18          | 1330            | 1/2      | 99.4       | 3      | 5.0  | 38           | E     |
| 011-762-4078 | 23          | 1050            | 1/2      | 78.5       | 3      | 5.0  | 38           | E     |
| 011-762-4055 | 32          | 775             | 1/2      | 55.5       | 3      | 5.0  | 38           | E     |
| 011-762-4028 | 66          | 427             | 1/2      | 27.9       | 3      | 5.0  | 38           | E     |

HOLLOW SHAFT  
OFFSET  
GEARMOTORS

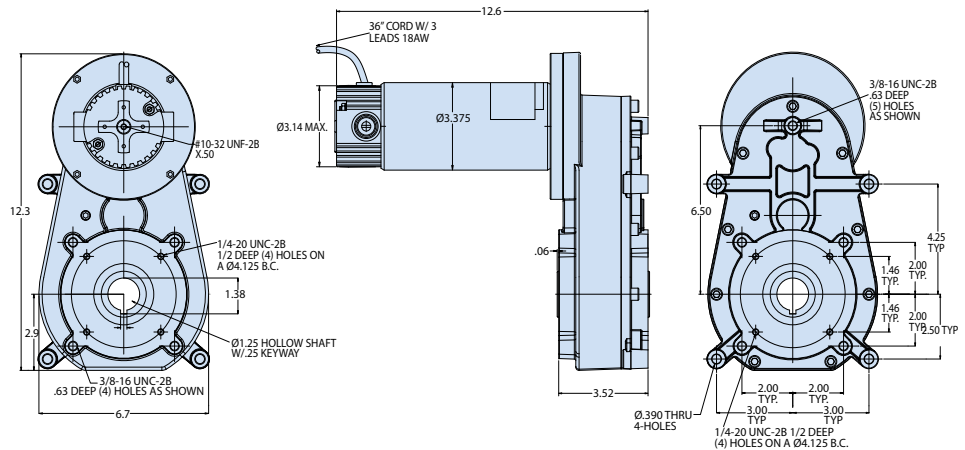
### 762 1/20 HP 1-4 RPM



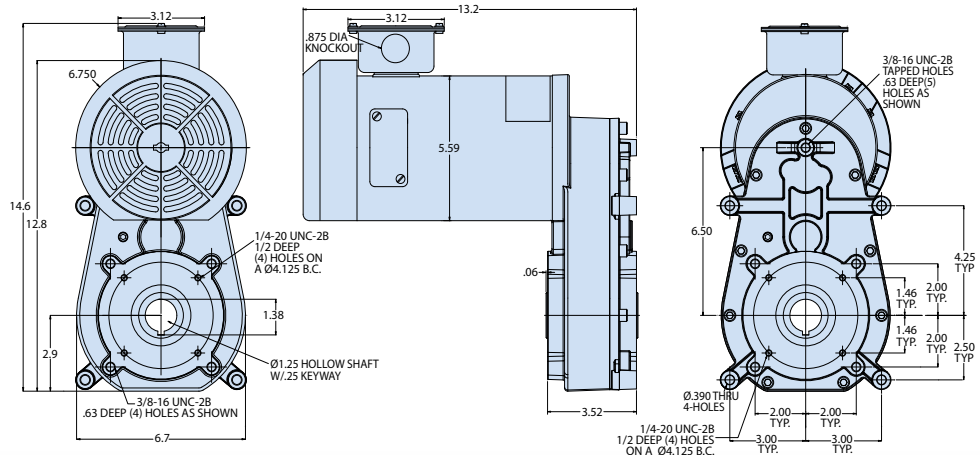


# 762 Series Parallel Shaft DC

## 762 1/4 HP 7-12 RPM



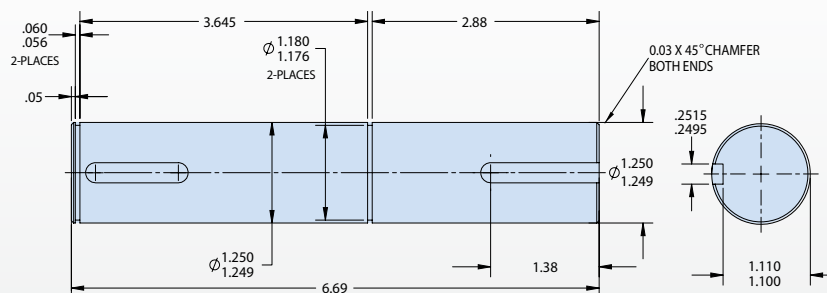
## 762 1/2 HP 18-65 RPM



HOLLOW SHAFT  
OFFSET  
GEARMOTORS

## 762 Output Shaft

P108-762-1250 (Includes Keys and Retaining Rings)





## 250 Series Parallel Shaft Reducers

UP TO 295 IN-LBS

Capable of adapting to a number of input motors, these versatile reducers can handle a wide range of applications. Available to handle a shaft input and a NEMA 42C flange input.

### Specifications

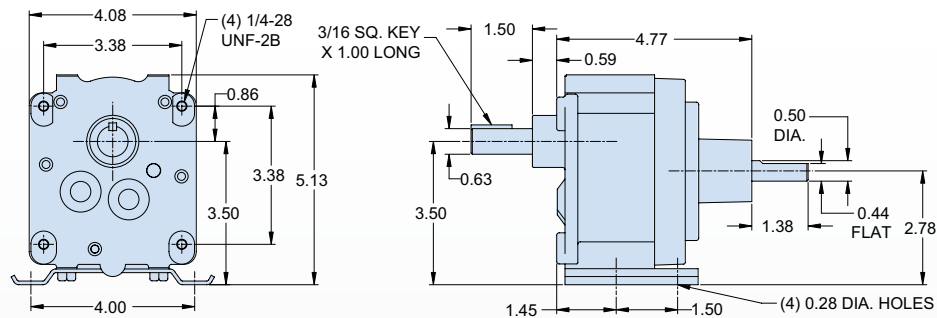
| 250Z & 250CZ |                                        |                 |                                | Additional Information                                                                                                                                                                    |  |  |  |
|--------------|----------------------------------------|-----------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Gearing:     | Hardened steel, AGMA Class 9           | Shafts:         | Hardened steel                 | Current drawings and stock status available at <a href="http://www.bisongear.com">www.bisongear.com</a><br>ISIS - Products available off-shelf<br>SNS - Min. order quantity and lead time |  |  |  |
| Housing:     | Precision machined die cast aluminum   | Mounting:       | Face or base, any angle        |                                                                                                                                                                                           |  |  |  |
| Lubrication: | Lifetime oil bath, sealed and gasketed | Weight:         | Shaft: 4.5 lbs.<br>42C: 5 lbs. | See pages 86-87 for additional accessories                                                                                                                                                |  |  |  |
| Bearings:    | Ball, needle and thrust ball           | Input Features: | Input shaft or 42 CZ motor     |                                                                                                                                                                                           |  |  |  |

### 250Z & 250CZ Series Parallel Shaft Reducers

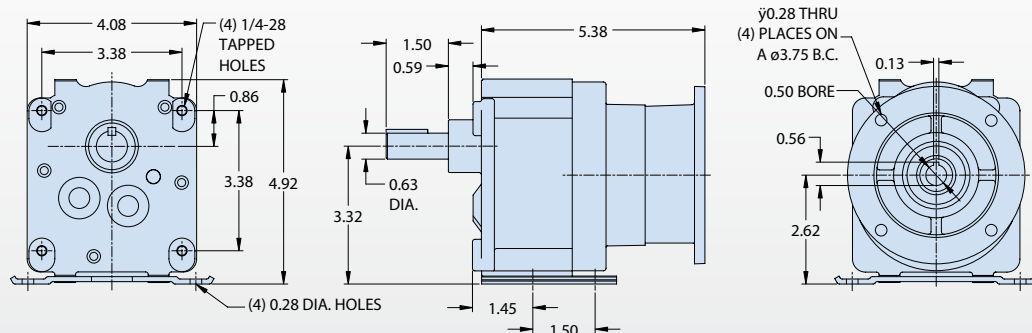
| Part Number  | Input | Ratio | Stages | Output Speed (RPM)*** | 1/40HP | 1/10HP | 1/8HP | 1/6HP | 1/4HP | 1/3HP | MAX Torque (in lbs.) | OHL* | Shipping Wt. |
|--------------|-------|-------|--------|-----------------------|--------|--------|-------|-------|-------|-------|----------------------|------|--------------|
| 030-255-0133 | Shaft | 133.3 | 3      | 13                    | 112    | 277**  |       |       |       |       | 277                  | 390  | 5.5          |
| 030-256-0133 | 42C   | 133.3 | 3      | 13                    | 112    | 277**  |       |       |       |       | 277                  | 390  | 6.25         |
| 030-255-0095 | Shaft | 95.0  | 3      | 18                    | 80     | 283**  |       |       |       |       | 283                  | 335  | 5.5          |
| 030-256-0095 | 42C   | 95.0  | 3      | 18                    | 80     | 283**  |       |       |       |       | 283                  | 335  | 6.25         |
| 030-255-0051 | Shaft | 50.8  | 3      | 34                    | 43     | 167    | 209** |       |       |       | 209                  | 270  | 5.5          |
| 030-256-0051 | 42C   | 50.8  | 3      | 34                    | 43     | 167    | 209** |       |       |       | 209                  | 270  | 6.25         |
| 030-255-0036 | Shaft | 35.8  | 3      | 48                    | 30     | 119    | 148   | 200   | 295** |       | 295                  | 210  | 5.5          |
| 030-256-0036 | 42C   | 35.8  | 3      | 48                    | 30     | 119    | 148   | 200   | 295** |       | 295                  | 210  | 6.25         |
| 030-255-0029 | Shaft | 28.1  | 2      | 60                    | 25     | 97     | 121   | 162   | 242** |       | 242                  | 230  | 5.5          |
| 030-256-0029 | 42C   | 28.1  | 2      | 60                    | 25     | 97     | 121   | 162   | 242** |       | 242                  | 230  | 6.25         |
| 030-255-0023 | Shaft | 22.7  | 2      | 76                    | 20     | 76     | 96    | 128   | 190** |       | 190                  | 220  | 5.5          |
| 030-256-0023 | 42C   | 22.7  | 2      | 76                    | 20     | 76     | 96    | 128   | 190** |       | 190                  | 220  | 6.25         |
| 030-255-0019 | Shaft | 19.1  | 2      | 90                    | 16     | 65     | 81    | 108   | 161   | 215   | 226                  | 190  | 5.5          |
| 030-256-0019 | 42C   | 19.1  | 2      | 90                    | 16     | 65     | 81    | 108   | 161   | 215   | 226                  | 190  | 6.25         |
| 030-255-0013 | Shaft | 12.7  | 2      | 136                   | 11     | 43     | 53    | 71    | 107   | 142   | 176                  | 170  | 5.5          |
| 030-256-0013 | 42C   | 12.7  | 2      | 136                   | 11     | 43     | 53    | 71    | 107   | 142   | 176                  | 170  | 6.25         |

\* Maximum overhung load on center of output shaft \*\* Output torque is gear limited \*\*\*RPM based on 1725 input

#### 250Z-Shaft Input



#### 250CZ-Nema 42C Input



# 881 Series Parallel Shaft Reducers

UP TO 1195 IN-LBS



## Specifications

### 881

|                   |                                                                        |
|-------------------|------------------------------------------------------------------------|
| Gearing:          | Hardened steel helical and spur AGMA Class 9                           |
| Housing:          | Precision machined die cast aluminum                                   |
| Lubrication:      | Lifetime oil bath, sealed and gasketed                                 |
| Bearings:         | Ball and needle                                                        |
| Shafts:           | Hardened steel                                                         |
| Mounting:         | Face or base, any angle; 56C flange input<br>Mounting plates available |
| Footplate Option: | P125-880-0003                                                          |

### Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

**ISIS** - Products available off-shelf

**SNS** - Min. order quantity and lead time

See pages 86-87 for additional accessories

## 881 Series Parallel Shaft Reducers

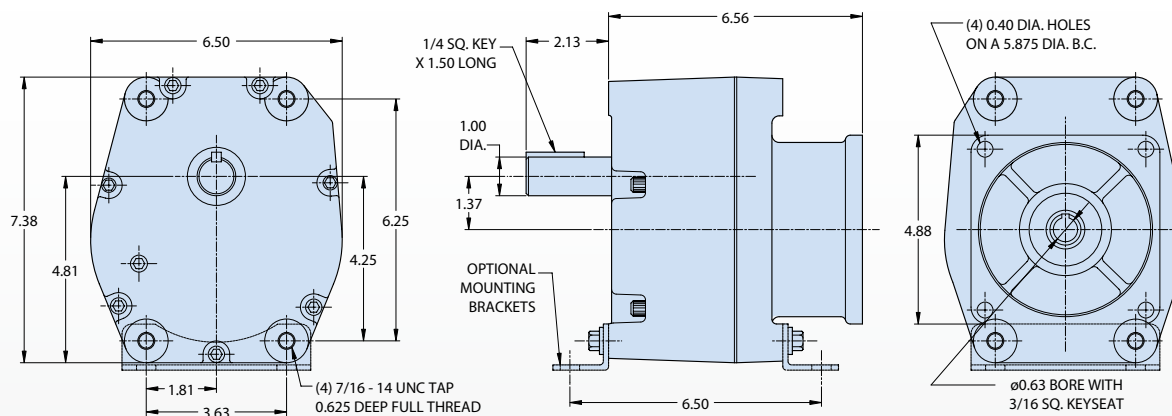
| Part Number  | Ratio | Stages | Output Speed (RPM)*** | Torque (in-lbs.) at listed HP |       |        |        |     | MAX Torque (in lbs.) | OHL * | Shipping Wt. |
|--------------|-------|--------|-----------------------|-------------------------------|-------|--------|--------|-----|----------------------|-------|--------------|
|              |       |        |                       | 1/4HP                         | 1/3HP | 1/2HP  | 3/4HP  | 1HP |                      |       |              |
| 060-881-0143 | 142.9 | 3      | 12                    | 992**                         |       |        |        |     | 992                  | 1383  | 16.5         |
| 060-881-0079 | 79.0  | 3      | 22                    | 630                           | 840   | 1195** |        |     | 1195                 | 1165  | 16.5         |
| 060-881-0053 | 53.9  | 3      | 33                    | 420                           | 560   | 845    | 1100** |     | 1100                 | 942   | 16.5         |
| 060-881-0041 | 41.1  | 3      | 42                    | 330                           | 440   | 660    | 990    |     | 1139                 | 858   | 16.5         |
| 060-881-0029 | 27.8  | 3      | 60                    | 223                           | 295   | 447    | 670    | 894 | 1139                 | 838   | 16.5         |
| 060-881-0018 | 17.8  | 2      | 97                    | 149                           | 199   | 299    | 448    | 598 | 802**                | 680   | 16.5         |
| 060-881-0012 | 11.8  | 2      | 146                   | 99                            | 132   | 199    | 298    | 397 | 596**                | 573   | 16.5         |
| 060-881-0007 | 6.8   | 2      | 253                   | 57                            | 76    | 115    | 172    | 229 | 344**                | 506   | 16.5         |
| 060-881-0004 | 3.8   | 2      | 457                   | 32                            | 42    | 63     | 95     | 127 | 190**                | 425   | 16.5         |

\* Maximum overhung load on center of output shaft.

\*\* Output torque is gear limited.

\*\*\* RPM based on 1725 input

## 881 Reducer



GEAR  
REDUCERS



## Multi-Tech Reducers

REDUCERS UP TO 350 IN-LBS

Add your own stepper or servomotor to our NEMA gearboxes. Highly efficient - helical-spur geartrains transmit 96% of the available power per stage, leading the industry. Low backlash ratings - less than 60 arc-minutes, create the ideal gear reducer for applications such as process conveyors, pumps, and dispensers. Shock load capability 200% - is standard in the Multi-Tech product offering, as it is in all of Bison's products. Gloss black powder coat finish - provides the durability needed for demanding environments. Grease lubricated for all position mounting.

### Specifications

#### 185 & 385 Multi-Tech Reducers

|              |                                      |
|--------------|--------------------------------------|
| Gearing:     | Hardened steel, AGMA Class 9         |
| Housing:     | Precision machined die cast aluminum |
| Lubrication: | Grease filled, sealed and gasketed   |
| Bearings:    | Needle and thrust ball               |

|                 |                                                                                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shafts:         | Hardened steel                                                                                                                                                                         |
| Mounting:       | Face or base, any angle                                                                                                                                                                |
| Input Features: | <ul style="list-style-type: none"> <li>• 1/4" diameter, for NEMA 23 mounting</li> <li>• 3/8" or 1/2" diameter, for NEMA 34 mounting</li> <li>• 3000 RPM maximum input speed</li> </ul> |

#### Optional Features

- Footplate
  - 185 series  
Part number: P125-100-9998
  - 385 series  
Part number: P125-287-0200

#### Additional Information

See pages 86-87 for additional accessories

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

ISIS - Products available off-shelf

SNS - Min. order quantity and lead time

### 185 NEMA 23 Input

| Part Number  | Ratio   | Rated Torque |       | Radial Load |      | Axial Load |      | Inertia    |        | Backlash |
|--------------|---------|--------------|-------|-------------|------|------------|------|------------|--------|----------|
|              |         | In-Lbs       | N-m   | lb          | kg   | lb         | kg   | oz-in-sec2 | kg-m2  |          |
| 060-185-0003 | 3.0065  | 20           | 2.26  | 200         | 90.9 | 25         | 11.4 | 4X10-4     | 6X10-6 | 60       |
| 060-185-0005 | 4.9573  | 32           | 3.62  | 200         | 90.9 | 25         | 11.4 | 9X10-5     | 6X10-7 | 60       |
| 060-185-0007 | 6.6667  | 45           | 5     | 200         | 90.9 | 25         | 11.4 | 7X10-5     | 5X10-7 | 60       |
| 060-185-0013 | 12.9411 | 90           | 10.16 | 200         | 90.9 | 25         | 11.4 | 5X10-5     | 4X10-7 | 60       |
| 060-185-0025 | 25.2381 | 90           | 10.16 | 200         | 90.9 | 25         | 11.4 | 4X10-5     | 3X10-7 | 60       |
| 060-185-0049 | 48.9916 | 150**        | 16.95 | 130         | 59.1 | 25         | 11.4 | 4X10-5     | 3X10-7 | 60       |
| 060-185-0096 | 95.5442 | 150**        | 16.95 | 150         | 68.2 | 25         | 11.4 | 3X10-5     | 4X10-7 | 60       |

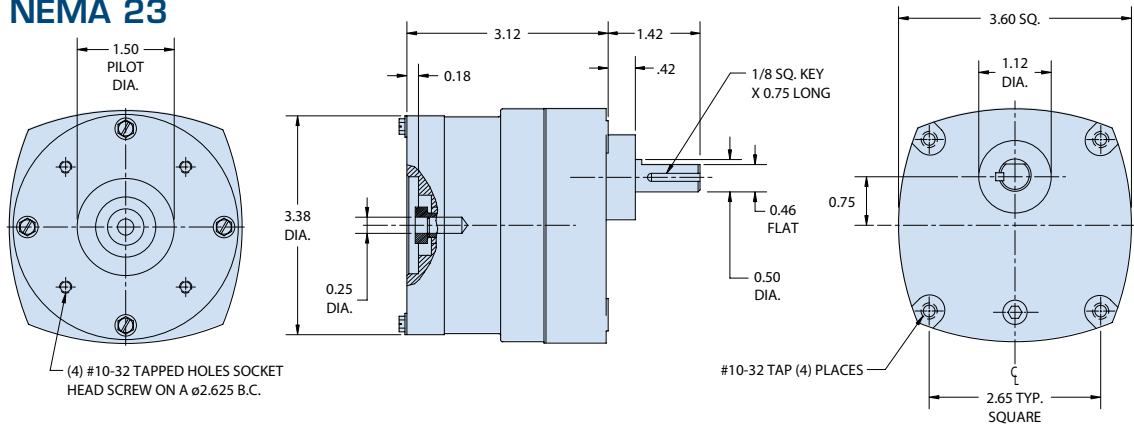
### 385 NEMA 34 Input

| Part Number  | Input            | Ratio   | Rated Torque |       | Radial Load |       | Axial Load |      | Inertia    |        | Backlash |
|--------------|------------------|---------|--------------|-------|-------------|-------|------------|------|------------|--------|----------|
|              |                  |         | In-Lbs       | N-m   | lb          | kg    | lb         | kg   | oz-in-sec2 | kg-m2  |          |
| 060-385-0003 | 3/8" Input Shaft | 3.0625  | 88           | 9.94  | 170         | 77.3  | 40         | 18.2 | 1X10-3     | 9X10-6 | 60       |
| 060-385-0005 | 3/8" Input Shaft | 4.5208  | 130          | 14.69 | 170         | 77.3  | 40         | 18.2 | 1X10-3     | 8X10-6 | 60       |
| 060-385-0011 | 3/8" Input Shaft | 10.8889 | 300**        | 34    | 200         | 90.9  | 40         | 18.2 | 8X10-4     | 6X10-6 | 60       |
| 060-385-0015 | 3/8" Input Shaft | 15.3013 | 300**        | 34    | 220         | 100   | 40         | 18.2 | 7X10-4     | 5X10-6 | 60       |
| 060-385-0021 | 3/8" Input Shaft | 20.7958 | 300**        | 34    | 230         | 104.5 | 40         | 18.2 | 7X10-4     | 5X10-6 | 60       |
| 060-385-0030 | 3/8" Input Shaft | 29.8324 | 300**        | 34    | 250         | 113.6 | 40         | 18.2 | 7X10-4     | 5X10-6 | 60       |
| 060-385-0050 | 3/8" Input Shaft | 50.0889 | 350**        | 40    | 250         | 113.6 | 40         | 18.2 | 6X10-4     | 5X10-6 | 60       |
| 060-385-1003 | 1/2" Input Shaft | 3.0625  | 88           | 9.94  | 170         | 77.3  | 40         | 18.2 | 1X10-3     | 9X10-6 | 60       |
| 060-385-1005 | 1/2" Input Shaft | 4.5208  | 130          | 14.69 | 170         | 77.3  | 40         | 18.2 | 1X10-3     | 8X10-6 | 60       |
| 060-385-1011 | 1/2" Input Shaft | 10.8889 | 300**        | 34    | 200         | 90.9  | 40         | 18.2 | 8X10-4     | 6X10-6 | 60       |
| 060-385-1015 | 1/2" Input Shaft | 15.3013 | 300**        | 34    | 220         | 100   | 40         | 18.2 | 7X10-4     | 5X10-6 | 60       |
| 060-385-1021 | 1/2" Input Shaft | 20.7958 | 300**        | 34    | 230         | 104.5 | 40         | 18.2 | 7X10-4     | 5X10-6 | 60       |
| 060-385-1030 | 1/2" Input Shaft | 29.8324 | 300**        | 34    | 250         | 113.6 | 40         | 18.2 | 7X10-4     | 5X10-6 | 60       |
| 060-385-1050 | 1/2" Input Shaft | 50.0889 | 350**        | 40    | 250         | 113.6 | 40         | 18.2 | 6X10-4     | 5X10-6 | 60       |

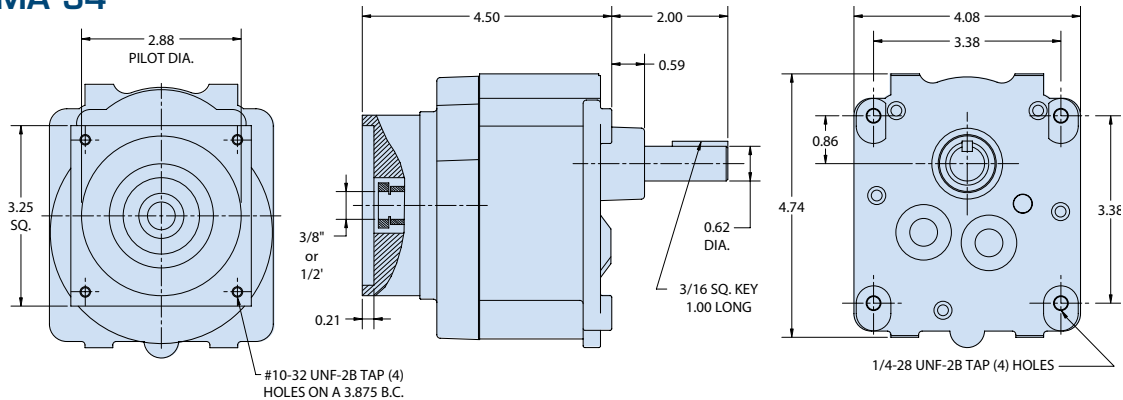
\*\* Gear limited. Visit [www.bisongear.com](http://www.bisongear.com) for more details.

# Multi-Tech Reducers

## 185 NEMA 23



## 385 NEMA 34



## Superior Seals

### DID YOU KNOW?

Since most Bison gearboxes are oil lubricated for life, we understand the importance of precision ground seal areas. Bison shafts are hardened prior to grind in order to minimize wear on the seal journal. After heat treat, shafts are plunge ground on an automated grinding wheel, maintaining tight tolerances on grind diameter, lead, surface finish, and roundness. This superior seal grind coupled with spring loaded lip seals provides dependable, leak-free performance and the flexibility to mount all Bison gearmotors in any orientation.

# Perfection DRIVEN

1-800-AT-BISON





## ServoNOW™ Motor and Controller

110 / 220VAC UNIVERSAL POWER

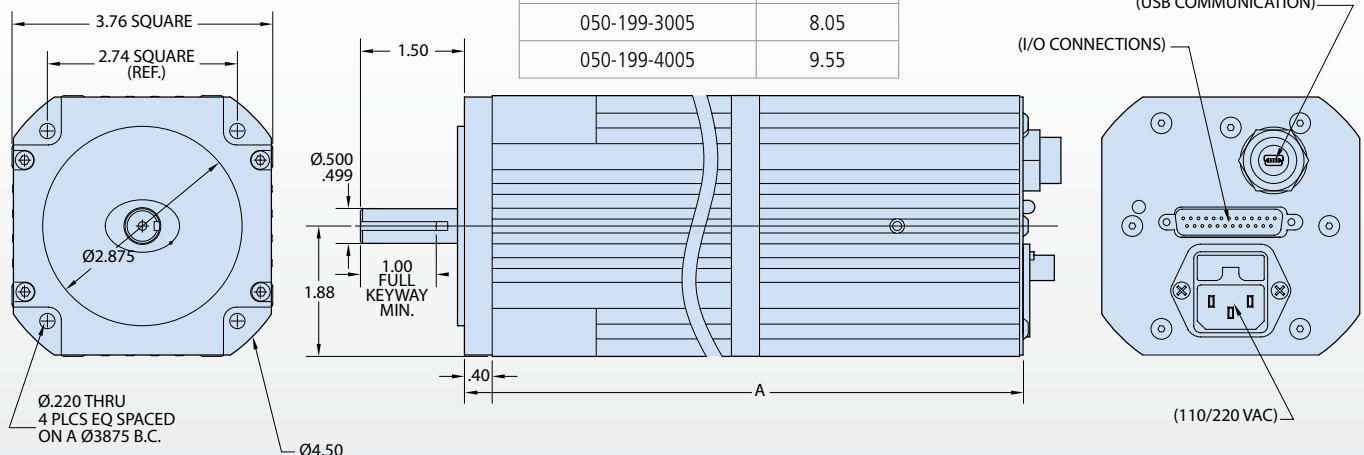
The ServoNOW™ is a complete motor and programmable control system in one package. Motion is programmed into the servo controller with easy to use software that can be loaded on any PC. Once programmed, the unit operates without the host PC performing the programmed motions. The programmed motions are selected based on the status of the digital inputs or switches connected to the unit. Analog inputs can also be selected and setup to control the position or velocity of the system when desired. Because this is a servo system it has extremely good control of the speed and position of the motor despite large variations or fluctuations in the load. This results in exceptionally good control, even at low speed, for devices like actuators, pumps, conveyors and automated equipment as compared to other control methods.

### ServoNOW™ Motor and Drive

|                         | 34 Frame Short Stack Motor |                             | 34 Frame Medium Stack Motor |                             | 34 Frame Long Stack Motor   |
|-------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Models                  | 050-199-0005<br>Highspeed  | 050-199-1005<br>High Torque | 050-199-2005<br>Highspeed   | 050-199-3005<br>High Torque | 050-199-4005<br>High Torque |
| Rated Voltage (VAC)     | 110/220                    | 110/220                     | 110/220                     | 110/220                     | 110/220                     |
| Rated Horsepower        | 0.40                       | 0.24                        | 0.50                        | 0.38                        | 0.54                        |
| Peak Horsepower         | 0.55                       | 0.31                        | 0.58                        | 0.48                        | 0.63                        |
| Rated Power (Wattage)   | 300                        | 178                         | 370                         | 281                         | 401                         |
| Peak Power (Wattage)    | 409                        | 229                         | 431                         | 355                         | 468                         |
| Rated Torque (in oz)    | 75                         | 90                          | 90                          | 160                         | 195                         |
| Peak Torque (in oz)     | 140                        | 215                         | 165                         | 310                         | 305                         |
| Rated Speed (RPM)       | 5417                       | 2677                        | 5559                        | 2374                        | 2778                        |
| Peak Speed (RPM)        | 6900                       | 3600                        | 6900                        | 3600                        | 3600                        |
| Rated Current (Amps AC) | 6.5/3.3                    | 4.5/2.3                     | 6.8/3.4                     | 6/3                         | 7.5/3.8                     |
| Peak Current (Amps AC)  | 10/5                       | 10/5                        | 10/5                        | 10/5                        | 10/5                        |
| Weight (Lbs)            | 5 lbs                      | 5 lbs                       | 6 lbs                       | 6 lbs                       | 7 lbs                       |

### ServoNOW™ Motor and Drive

| Model Number | A    |
|--------------|------|
| 050-199-0005 | 7.30 |
| 050-199-1005 | 7.30 |
| 050-199-2005 | 8.05 |
| 050-199-3005 | 8.05 |
| 050-199-4005 | 9.55 |





## Product Features & Benefits

### Features

- 110/220VAC universal power
- Universal inputs & outputs (I/O), 5-24VDC
- Programmable I/O, current sourcing & sinking
- 32 Index motion profiles in velocity or position
- Easy to use indexing drive
- Fully integrated brushless servo system
- Plug & Play: out of the box
- Flexible & easy to use
- Easily integrates both velocity & positioning control applications
- Defines motion profile requirements with a few clicks of the mouse

### Parameter Programmability

- Input & output scale factors for defining units of measure for speed & position
- Input & output offsets
- Loop gains for servo compensation
- Command & internal state limiters

### Digital Inputs

Enable/Disable Drive, Homing, 4 Programmable Inputs

### Digital Outputs

Motor Enabled, Motor Fault, 4 Assignable Outputs

### Analog I/O

- 1 Programmable Input (0 to 10 VDC or 4 to 20 MA, 12 bit)
- 1 Programmable Output (0 to 10 VDC or 4 to 20 MA, 12 bit)

### Additional Information

Current drawings and stock status available at [www.bisongear.com](http://www.bisongear.com)

**ISIS** - Products available off-shelf

**SNS** - Min. order quantity and lead time

## Key Features

- NEMA 34 C Face Mount & Side Mount
- 5 Different Models
- Speeds 0 to 6900 rpm
- Peak Torque 300 oz-in
- 6-Digital Inputs, 6-Digital Outputs, 1-Analog Input, 1 Analog Output
- Programmable I/O: 5-24 Volts, Current Sourcing, Current Sinking
- Position Resolution 4096 cnts/rev
- 32 Index Motion Profiles

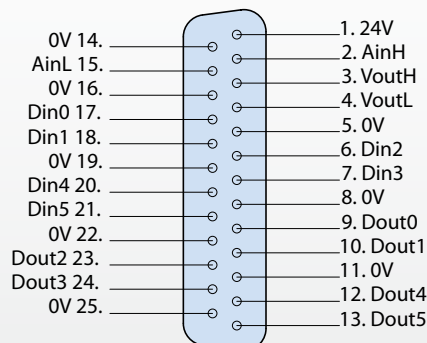
## Additional Accessories Available:

- Interconnect Board - Output connector with screw terminals to connect input and output (I/O's)  
**Part number: 170-199-0002**
- Integration Test Board – Tests function ability of all inputs and outputs  
**Part number: 170-199-0001**

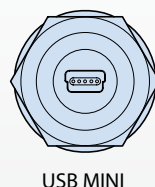


SERVOES  
& DRIVES

### I/O Connector

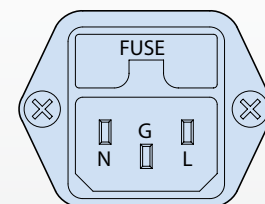


### USB Communication



USB MINI

### Power Connector





## Motor Mounted Speed Control

1/8 HP, 90 VDC, 2.5 AMPS, FIELD INSTALLED

Designed to be easily field mounted on Bison PMDC motors, the speed control is mounted within an aluminum extrusion for superior heat dissipation. A simple knob provides a convenient on-off switch. Three adjustable potentiometers provide settings for minimum RPM, maximum RPM, and current limit. A pre-wired three foot long cord with plug is provided for use with 115V, 60 Hz.

- **Simple Mounting and Assembly.** Allows the drive to start working for you in the field as quickly as possible
- **Easy Operation.** Speed is controlled with a simple on/off potentiometer in conjunction with current limit, min. speed, and max. speed settings
- **All Metal Enclosure.** Durable aluminum housing with steel cover plates disperses heat more efficiently
- **Includes Power Cord with Plug.** Three foot power cord is included with a NEMA 5-15P plug for use with 115VAC 60Hz
- **More Consistent Speed Under All Loads.** SCR circuitry provides much more consistent speed throughout the motor's rated torque
- **Specifications.** Up to 2.5 AMPS (1/8 HP @ 90VDC)

### TightDrive Motor Mounted Speed Control

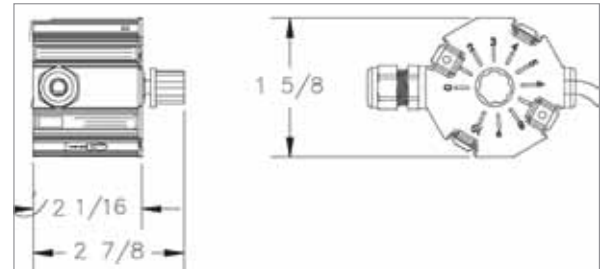
| Part Number  | Input Voltage                 | Output Voltage          | Max Current | Max Output Power | Enclosure Rating | Reversible?    | Form Factor | UL / CUL | CE  | ROHS |
|--------------|-------------------------------|-------------------------|-------------|------------------|------------------|----------------|-------------|----------|-----|------|
| 170-113-0003 | 115 Volt, Single Phase, 60 Hz | 90 Volt, Direct Current | 2.5 Amps    | 1/6 HP, 124 Watt | IP 30            | Non-Reversible | 1.37        | Pending  | Yes | Yes  |

#### Operational Specifications

|                            |         |
|----------------------------|---------|
| Input Voltage @ 50/60 Hz   | 115 VAC |
| Maximum Output Voltage     | 90VDC   |
| Maximum Continuous Duty HP | 1/8     |

#### Feature Specifications

|               |      |
|---------------|------|
| Speed Range   | 20:1 |
| On/Off Switch | Yes  |



## SCR Drives

### SCR DC Chassis / NEMA 4X

Bison's SCR speed controls are dual voltage drives that can control speed or torque. When torque mode is selected, the functions of the speed and torque pots change. The external potentiometer sets the torque reference, the on-board torque pot sets maximum speed and the on-board Max Speed pot sets maximum torque.

- Accel / Decel Range 0.5 to 17 seconds
- User adjustable calibration pots: IR compensation, min speed, max speed, torque, acceleration and deceleration.
- Diagnostics: LEDs for power and current limit status
- Stopping Modes: coast to minimum speed or to stop with selectable N.O. or N.C. inhibit contacts. Decelerate to minimum speed via the pot circuit. Braking on enclosed reversing models.
- Spade and screw terminals: easy to use spade terminals on chassis; screw terminals on enclosed units.
- Flexible inhibit: Select with jumper pins the preferred inhibit functionality.



### Dual Voltage SCR Speed Control

| Part Number  | HP Rating 230VAC | Output Amps (DC) | Configuration |
|--------------|------------------|------------------|---------------|
| 170-103-0002 | 1/10-1/4         | 1.5              | Chassis       |
| 170-103-0010 | 1/4-2            | 10.0*            | Chassis       |
| 170-143-0002 | 1/10-1/4         | 1.5              | NEMA 4X       |
| 170-143-0010 | 1/4-2            | 10.0*            | NEMA 4X       |

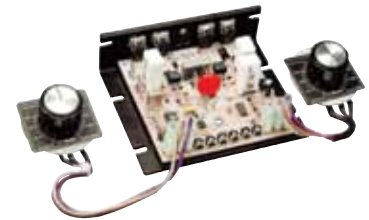
\*Heatsink #170-990-0100 required above 5 amp DC

#### Dual Voltage SCR Speed Controls

|                               |                                           |
|-------------------------------|-------------------------------------------|
| Input Voltage                 | 115/230VAC +/- 10%, 60/50Hz, single phase |
| Output Voltage                | 0-90 or 0-180 VDC                         |
| Form Factor (AC amps/DC Amps) | 1.37                                      |

## Dual SCR Chassis

The Dual SCR drive provides the power of two drives in one! Now with one DC drive, you can control two different DC motors either independently or in a ratio mode. In independent mode, each side of the drive can be controlled differently with different trimmer pot settings and different speeds. In speed ratio mode, one speed potentiometer sets the main speed while the other one determines the ratio of the speeds between the motors. In this mode, the drive replaces two single drives and possibly a separate master/follower card resulting in extreme cost and panel space savings!



- Ability to control two different DC motors at once: Jumper selectable independent or speed ratio mode.
- Industry Standard footprint for chassis mount
- User adjustable calibration pots: Two each of minimum speed, maximum speed, IR compensation, current limit and acceleration / deceleration.
- Stopping Modes: Decelerate or coast (jumper selectable) using inhibit function (N.O.)
- Speed or Torque Mode: Jumper selectable. Speed mode regulates speed and limits current. Torque mode regulates current and limits speed.
- Microprocessor based: Can custom program the trimmer pot ranges and inhibit for OEM applications.
- Spade and screw terminals: easy to use spade terminals on chassis.
- Panel Space Saving: Replace two DC drives with one compact package.

## Chassis SCR Speed Control for Two Motors

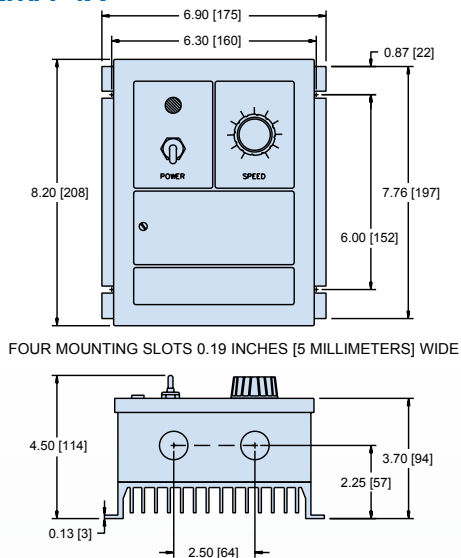
| Part Number  | HP Rating           | Max Total HP | Output Amps (DC) each side | Max Total Amps of Both Sides | Configuration |
|--------------|---------------------|--------------|----------------------------|------------------------------|---------------|
| 170-101-0212 | 1/15-1/2 (per side) | 5/8          | 10.0*                      | 11.5*                        | Chassis       |

\*Heatsink #170-990-0100 required whenever one side is more than 5 amps or the total of both sides is more than 6.5 amps

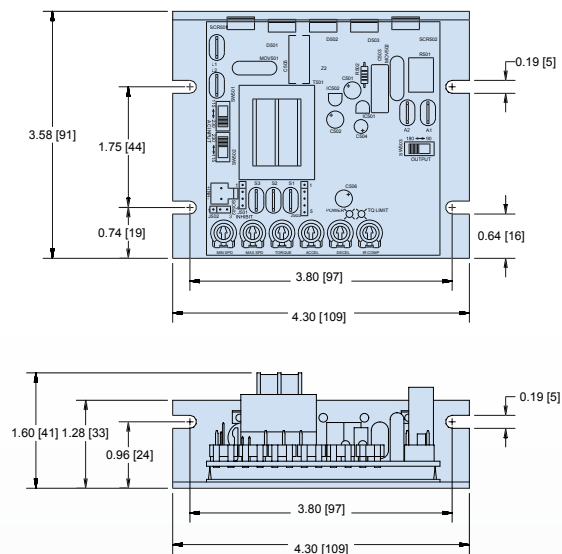
### Chassis SCR Speed Control for Two Motors

|                               |                            |
|-------------------------------|----------------------------|
| Input Voltage                 | 115VAC, 60Hz, single phase |
| Output Voltage                | 0-90 VDC                   |
| Form Factor (AC amps/DC Amps) | 1.37                       |

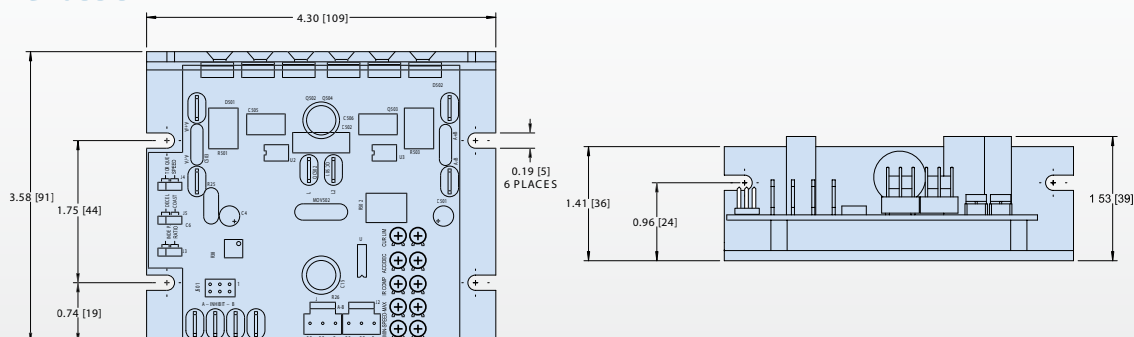
## SCR NEMA 4X



## SCR DC Chassis



## Dual SCR Chassis



# PWM Drives

## PWM DC NEMA 4X

Bison's filtered pulse-width-modulated (PWM) variable speed DC drives provide exceptional performance. This series of drives, housed within a NEMA 4X enclosure, guarantees protection from washdown, corrosive material, windblown dust, incidental contact with enclosed equipment, or unwanted external solid objects.

- AC input power is dual voltage dual frequency 115/230VAC +/- 10%, 60/50Hz, single phase
- Output voltage is 0-130 or 0-240 VDC
- Form factor, (AC amps / DC Amps) at rated output power is 1.05
- NEMA 4X enclosure: Protects against external corrosive material and incidental contact.
- User adjustable calibration pots: IR compensation, min speed, max speed, current limit, acceleration and deceleration.
- Diagnostics: LED for power on front of enclosure
- Stopping modes: Coast to a stop with Power On/Off switch or via inhibit terminals (N.O.).
- Speed range and regulation: 1% regulation over 100:1 speed range.



### Dual Voltage PWM Speed Controls NEMA 4X

| Part Number  | HP Rating 120 VAC | HP Rating 240 VAC | Field Supply (VCD) | Output Amps (DC) | Configuration |
|--------------|-------------------|-------------------|--------------------|------------------|---------------|
| 170-243-0003 | 1/20-1/3          | 1/8-1/2           | 50/100/200 (1 Amp) | 3.0              | NEMA 4X       |

#### Dual Voltage SCR Speed Controls NEMA 4X

|                                 |                                           |
|---------------------------------|-------------------------------------------|
| Input Voltage                   | 115/230VAC +/- 10%, 60/50Hz, single phase |
| Output Voltage                  | 0-130 or 0-240 VDC                        |
| Form Factor (AC amps / DC amps) | 1.05                                      |

## PWM DC CHASSIS

Bison's filtered pulse-width-modulated (PWM) variable speed DC drives output nearly pure DC power to brush type motors and feature the same footmount as the SCR controls.

- User adjustable calibration pots: IR compensation, min speed, max speed, current limit, acceleration and deceleration.
- Diagnostics: LEDs for power and current limit status
- Cage Clamp Terminal Block: Quick and easy wire terminations reduce installation time!
- Spade and screw terminals: easy to use spade terminals on chassis
- 16.5 kHz switching frequency: A high switching frequency means a quiet motor.
- Speed range and regulation: 1% regulation over 100:1 speed range.



### Dual Voltage PWM Speed Control Chassis Style

| Part Number  | HP Rating 120 VAC | HP Rating 240 VAC | Output Amps (DC) | Configuration |
|--------------|-------------------|-------------------|------------------|---------------|
| 170-203-0002 | 1/20 to 1/4       | 1/10 to 1/2       | 2.0              | Chassis       |
| 170-203-0005 | 1/4 to 1/2        | 1/2 to 1          | 5.0              | Chassis       |

#### Dual Voltage SCR Speed Controls Chassis Style

|                                 |                                           |
|---------------------------------|-------------------------------------------|
| Input Voltage                   | 120/240VAC +/- 10%, 60/50Hz, single phase |
| Output Voltage                  | 0-130 or 0-240 VDC                        |
| Form Factor (AC amps / DC amps) | 1.05                                      |

## Low Voltage PWM DC

Bison's DC in/DC out PWM chassis drives include inhibit for remote starting and stopping, a power LED, and trimmer pot adjustments for minimum speed, maximum speed, acceleration, IR comp, and current limit. All trimmer pots are non-interactive making calibration quick and easy.

- Speed range and regulation: 1% regulation over 80:1 speed range
- User adjustable calibration pots: IR compensation, min speed, max speed, current limit and acceleration.
- Diagnostics: LED for power
- Stopping Modes: The user can coast the motor to a stop (N.O.) using inhibit circuitry.
- Spade and screw terminal block: easy to use
- DC Input Voltage Range: Accepts DC inputs and outputs DC voltage up to 95% of the input with near perfect form factor.
- One Drive for two motor voltages: On board jumper to select 12 or 24V motor.
- Ideal for battery powered equipment: Maintains variable speed control even as battery voltage declines. Extends total running time of equipment.
- Additional features include extruded chassis and non-interactive trimmer pots.



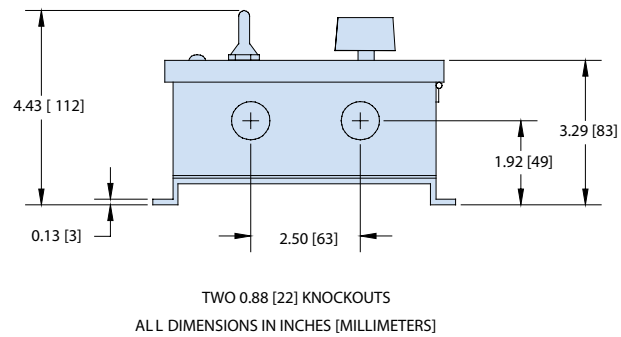
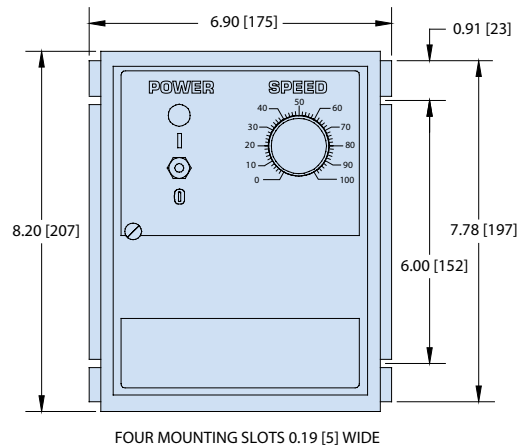
### DC to DC PMW Controller for 12V & 24V Motor

| Part Number  | HP Rating  | Output Amps (DC) | Configuration |
|--------------|------------|------------------|---------------|
| 170-205-0016 | 1/4 to 1/2 | 16.0             | Chassis       |

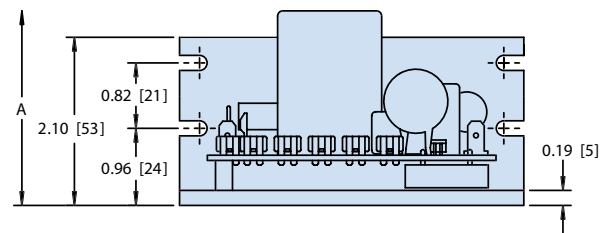
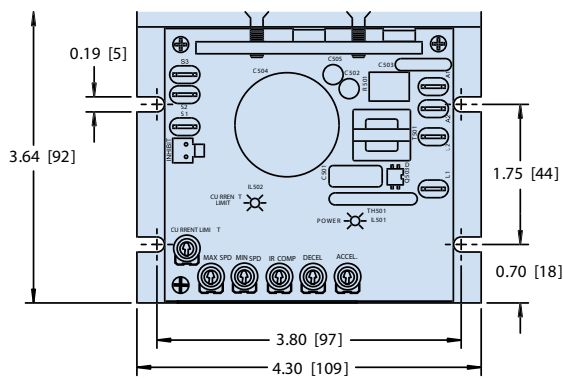
#### DC to DC PWM Controller for 12 & 24V Motor

|                                 |                            |
|---------------------------------|----------------------------|
| Input Voltage                   | 10 to 32 VDC               |
| Output Voltage                  | Up to 95% of input voltage |
| Form Factor (AC amps / DC amps) | 1.01                       |

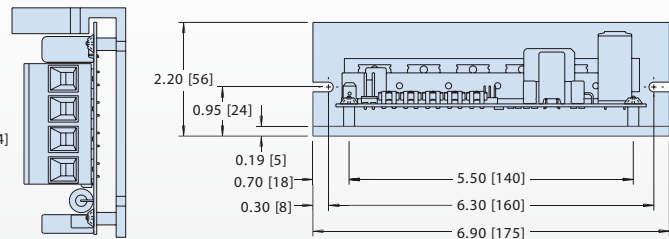
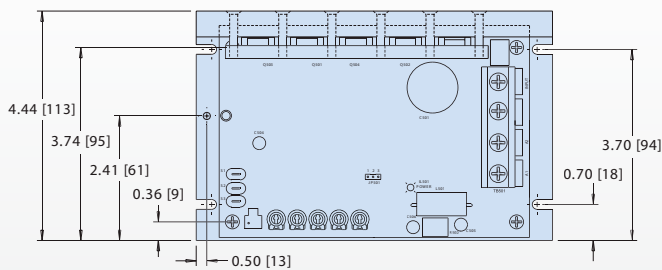
## PWM DC NEMA 4X



## PWM DC Chassis



## Low Voltage PWM DC



# Regenerative Drives

## SCR DC Regen CHASSIS / NEMA 4X

Bison's Regen Drives consist of full-wave, four-quadrant regenerative SCR controls to provide smooth motoring and braking torque for brush-type DC motors. Control motors from 1/20 through 1 HP for single or bi-directional variable speed, without using mechanical contactors.

- Speed Range and Regulation: 1% regulation over 50:1 speed range.  
1% regulation over 60:1 speed range with the addition of a tachometer for feedback.
- 4 Quadrant Reversing: Regenerative / 4 quadrant drives have the ability to perform quick, contactorless, reversing on-the-fly.
- Stopping Modes: User can decelerate (N.O.), regeneratively brake (N.O.) or coast the motor to a stop (N.O.). User can also decelerate to minimum speed (N.O.).
- Cage Clamp terminal block: Quick and easy wire terminations.
- User adjustable calibration pots: IR compensation, forward torque, reverse torque, tachometer, min speed, max speed, forward acceleration, reverse acceleration and deadband.
- Additional Features: Dual voltage AC input, switch selectable armature or tachometer feedback mode and field supply for shunt wound motors.
- On board fusing: No need to add external fusing for protection of your motor or drive.



## SCR Four Quadrant Regenerative Drives

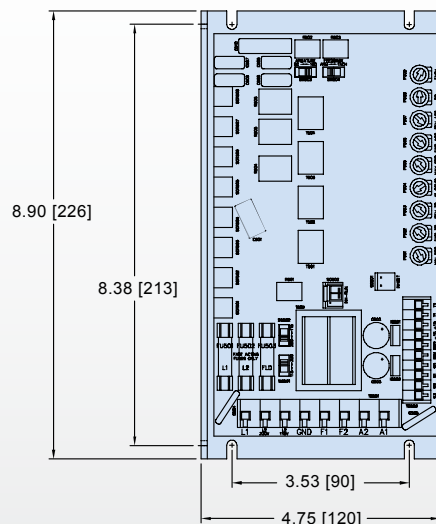
| Part Number  | Horsepower | Output | Configuration |
|--------------|------------|--------|---------------|
| 170-303-0003 | 1/20-1/8   | 3.0    | Chassis       |
| 170-303-0010 | 1/8-1      | 10.0*  | Chassis       |
| 170-343-0003 | 1/20-1/8   | 3.0    | NEMA 4X       |
| 170-343-0010 | 1/8-1      | 10.0   | NEMA 4X       |

\* Heatsink #170-990-0300 required above 7Amps DC.

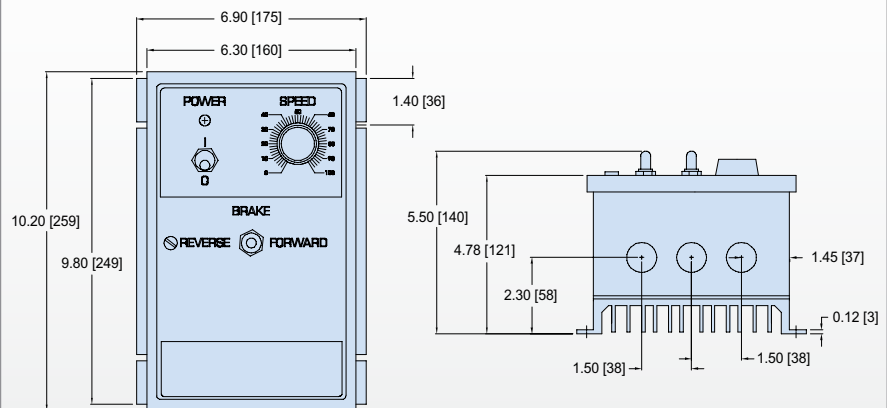
### SCR Four Quadrant Regenerative Drives

|                                 |                                           |
|---------------------------------|-------------------------------------------|
| Input Voltage                   | 115/230VAC +/- 10%, 60/50Hz, single phase |
| Output Voltage                  | 0-90 or 0-180 VDC                         |
| Form Factor (AC amps / DC amps) | 1.37                                      |
| Field Supply Voltage            | 50/100/200                                |

### Chassis



### NEMA 4X





# Variable Frequency Drives

## Isolated PWM AC NEMA 4X

Bison's variable frequency Drives feature a lightweight, plastic NEMA 4X enclosure, an isolated front end, minimum speed adjustment potentiometer (pot), output voltage doubling, DC injection braking, and automatic or manual restart when power is restored.

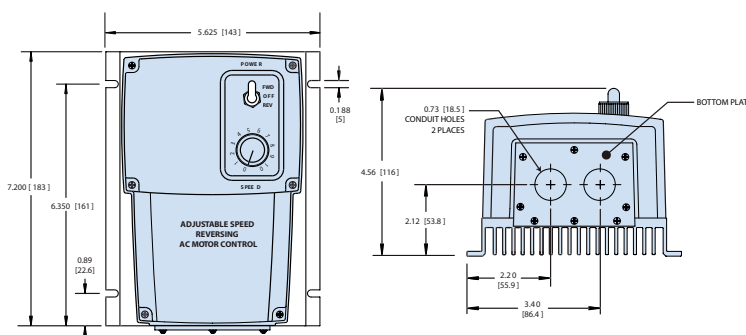
- NEMA 4x enclosure: Compact, easy to mount, black plastic enclosure.
- Isolated inputs: Accepts floating or grounded signals 0-10VDC, 0-5VDC or 4-20 mA
- User adjustable calibration pots: Minimum speed, maximum speed, current limit, acceleration, deceleration, slip compensation, boost, zero set, brake current, and brake time.
- Diagnostic LED's: Power, fault, and torque limit
- Stopping modes: DC injection braking or coast (jumper schedule)
- Adjustable 4 to 16 kHz switching frequency; Quiet motor operation or reduced electrical noise.
- Quick Disconnect terminal block: Allows up to 200% torque to overcome intermittent peak loads.
- Additional features: Auto or manual restart after low input voltage fault (jumper selectable), line fusing, enable and direction inputs.



## Variable Frequency AC Chassis Drive

| Part Number  | Input Voltage            | HP Rating  | Output Current | Output Frequency | Configuration |
|--------------|--------------------------|------------|----------------|------------------|---------------|
| 170-503-0002 | 115 or 230V Single Phase | 1/6 to 1/2 | 2.4A           | 0-120 Hz         | Chassis       |

### PWM NEMA 4X



### PWM AC Chassis

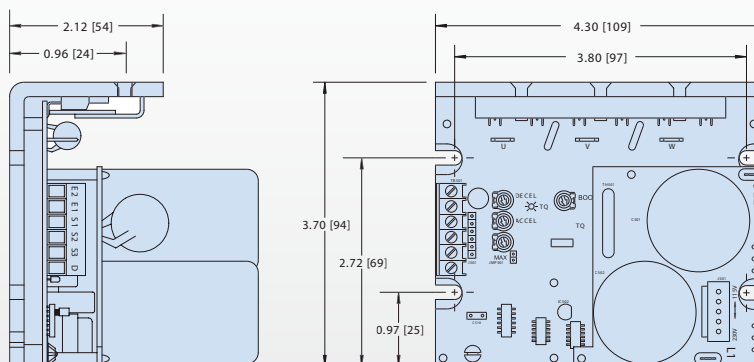
The cost-conscious and compact chassis design of Bison VFD Chassis Drives maintain the industry standard for mounting hole location and the coded LEDs make it easy to visually determine the drive status. With its compact design and application flexibility, this is an excellent choice for most AC applications.

- Compact Size: 4.3" x 3.7" Easy to mount in small spaces with industry standard mounting hole pattern.
- Easy to Calibrate & set up: On board trimmer pot adjustments for boost, maximum speed, acceleration, deceleration.
- Torque "foldback" feature: Allows up to 200% torque for short periods to overcome intermittent peak loads, then reduces the torque to a preset safe level.
- 16kHz switching frequency, with option to change between 4 and 16 kHz in the field: A high switching frequency results in quiet motor operation. Adjustments to a lower frequency if desired can be done in the field.

## Variable Frequency AC Chassis Drive

| Part Number  | Input Voltage            | HP Rating  | Output Current | Output Frequency | Configuration |
|--------------|--------------------------|------------|----------------|------------------|---------------|
| 170-503-0002 | 115 or 230V Single Phase | 1/6 to 1/2 | 2.4A           | 0-120 Hz         | Chassis       |

### PWM Chassis



# Accessories

## Bison Shaft Mount Encoder

| Part Number   | Voltage | Pulses | Channels | Weight |
|---------------|---------|--------|----------|--------|
| P208-010-0012 | 5       | 12     | 1        | 1      |
| P208-010-0030 | 5       | 30     | 1        | 1      |
| P208-010-0100 | 5       | 100    | 1        | 1      |
| P208-010-2030 | 5       | 30     | 2        | 1      |

All mounting hardware and stub shaft included

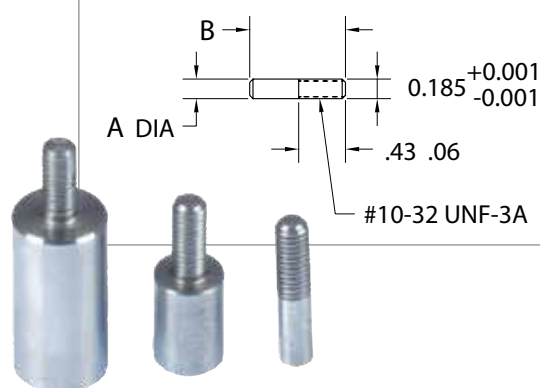


## Armature Shaft Extension Kit

| Part Number  | A          | B    | Weight |
|--------------|------------|------|--------|
| 108-100-0316 | .184/.186" | 0.88 | 1      |
| 108-100-0416 | .246/.248" | 0.88 | 1      |
| 108-100-0516 | .309/.311" | 1.03 | 1      |
| 108-100-0616 | .371/.373" | 1.03 | 1      |
| 108-100-0716 | .434/.436" | 1.43 | 1      |
| 108-100-0816 | .496/.498" | 1.43 | 1      |

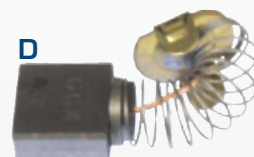
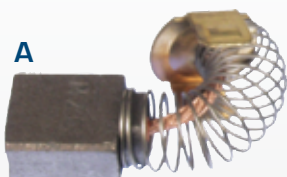
Threaded stub shafts fit Bison's PMDC Gearmotors under 1/2 HP.

Threaded Stub Shaft for 1/40-1/4HP DC Motors



## Replacement Brushes

| Part Number   | Key |
|---------------|-----|
| P158-200-2001 | A   |
| P158-200-2600 | B   |
| P158-200-2615 | C   |
| P158-200-9000 | D   |
| P158-406-0008 | E   |
| P158-200-2624 | F   |
| P158-200-2690 | G   |
| P158-060-2000 | H   |



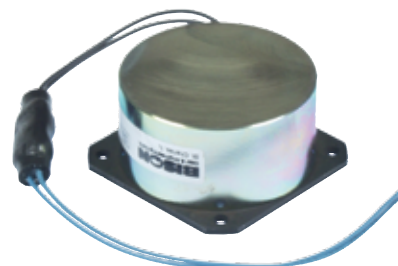
## Power-Off Brakes\*

| Part Number   | Voltage | Bolt Circle | Bore  | Static Holding Torque (In-Lbs.) | Weight |
|---------------|---------|-------------|-------|---------------------------------|--------|
| P133-100-0003 | 115V    | 2.88        | 5/16" | 3                               | 2      |
| P133-540-0007 | 115V    | 2.88        | 5/16" | 7                               | 2      |
| P133-550-0018 | 115V    | 2.88        | 5/16" | 18                              | 2      |

All mounting hardware included

\* Power off brakes should be used with the AC gearmotors only. Does not mount to 1/4 HP-480 Series motors, 1/2 HP or 1 HP motors. Call Bison at 1-800-AT-BISON to talk to an application engineer today.

The holding torque listed is specified at the motor shaft. Motor shaft holding torque can be calculated by dividing the gear ratio into the static output shaft torque, less 5% per stage of gearing.



## Shaft Bushing 5/8" to 7/8"

| Part Number  | Weight |
|--------------|--------|
| 134-158-0200 | 1      |



## Mounting Base 100 Series

| Part Number   | Gearcase | Shipping Wt. |
|---------------|----------|--------------|
| P125-100-9998 | 100      | 1            |

## Mounting Base 650 Series

| Part Number   | Gearcase | Shipping Wt. |
|---------------|----------|--------------|
| P125-650-5000 | 650      | 1            |

## Mounting Base 746 Series

| Part Number   | Gearcase | Shipping Wt. |
|---------------|----------|--------------|
| P125-746-0500 | 746      | 1            |

## Mounting Base 881 Series

| Part Number   | Gearcase | Shipping Wt. |
|---------------|----------|--------------|
| P125-880-0003 | 881      | 1            |



P125-100-9998 shown.  
See website for additional mounting boxes.

ACCESSORIES

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**PRODUCT SEARCH BY SPECIFICATION**  
Choose one or more of the following, all fields are required:

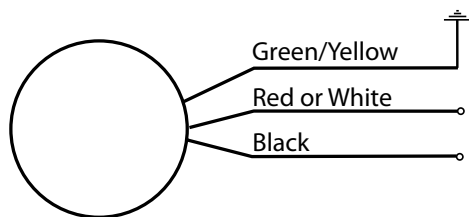
|                                       |                                                                            |             |                                     |
|---------------------------------------|----------------------------------------------------------------------------|-------------|-------------------------------------|
| Type:                                 | <input checked="" type="checkbox"/> Choose<br><input type="checkbox"/> Any | Torque:     | <input type="text" value="Choose"/> |
| RPM:                                  | <input type="text" value="Choose"/>                                        | Voltage:    | <input type="text" value="Choose"/> |
| HP:                                   | <input type="text" value="Choose"/>                                        | Gear Ratio: | <input type="text" value="Choose"/> |
| <input type="button" value="SEARCH"/> |                                                                            |             |                                     |

PRODUCT CATEGORIES: [MOTORS](#) [GEAR REDUCERS](#) [MOUNTING BASES](#) [ACCESSORIES](#)

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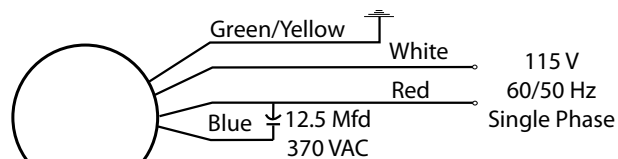
# Wiring Diagrams

## PMDC Motors



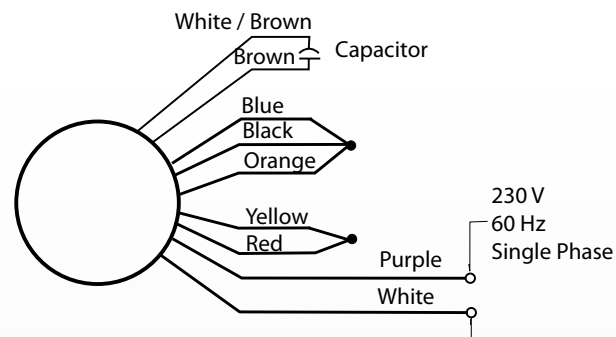
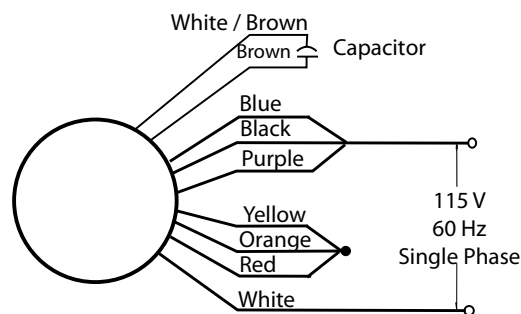
To Reverse, interchange Red and Black leads.  
Note: Some motors have white and black leads.

## 175 Series PSC 115 V 1/10 HP



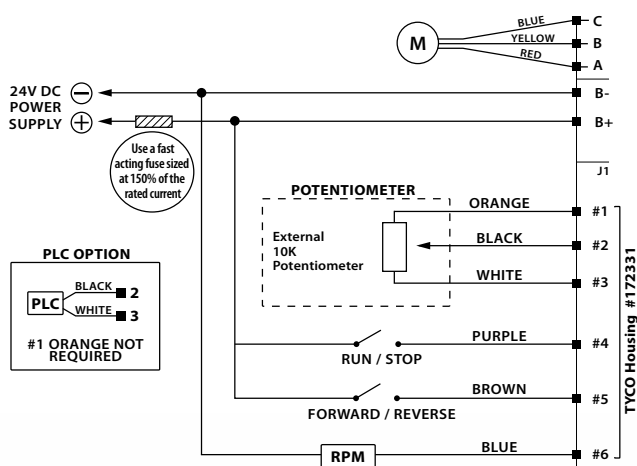
To reverse direction interchange red and blue leads.

## 175 Series PSC 115/230 V 1/20 HP

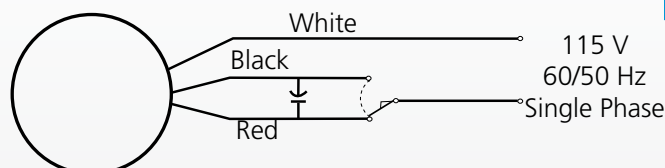


To Reverse, interchange red and blue leads.

## AUTONOmotor™



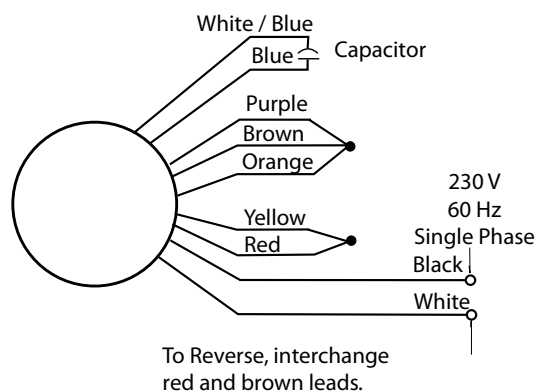
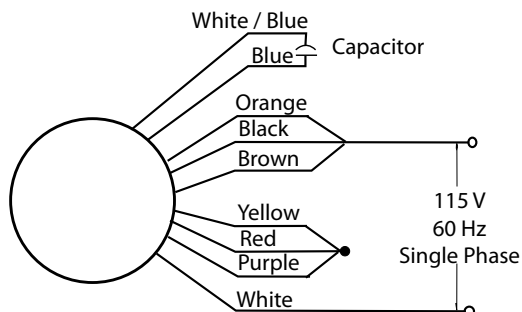
## 100 Series PSC 115 V 1/80 and 1/20 HP



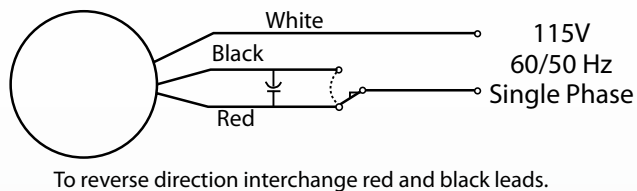
To Reverse direction interchange red and black leads.

**Note:** Direction of rotation has not been listed by gearmotor part number. Rotation of direction varies on the number of stages within the specific geartrain.

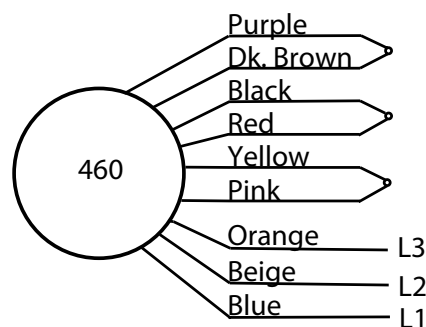
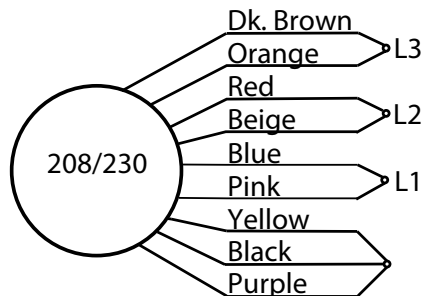
## 200 and 746 Series PSC 115/230 V 1/15 HP



## 100mm 200 and 756 Series



## Three Phase 482 Series



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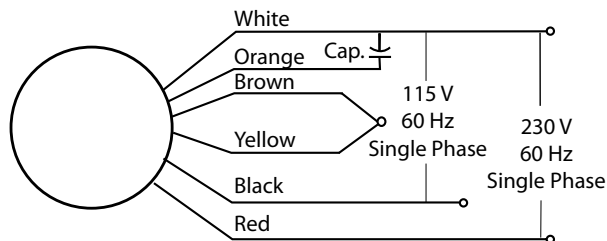
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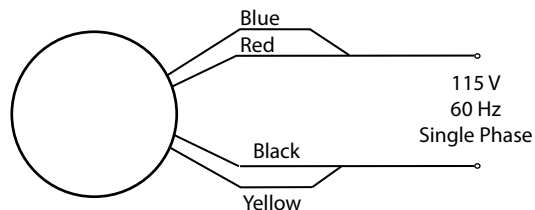
# Wiring Diagrams

## 246 and 650 Series PSC 115/230 V 1/6 HP



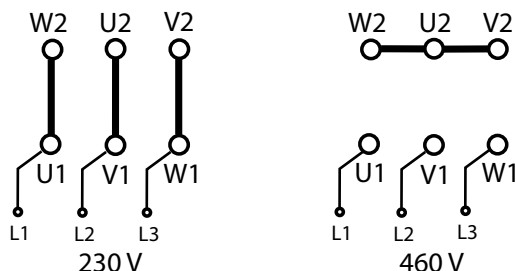
To reverse, interchange yellow and orange leads.  
Insulate Red lead for 115 V configuration.  
Insulate black lead for 230V configuration.

## 480 Series Split Phase 115 V AC 1/4, 1/3 and 1/2 HP

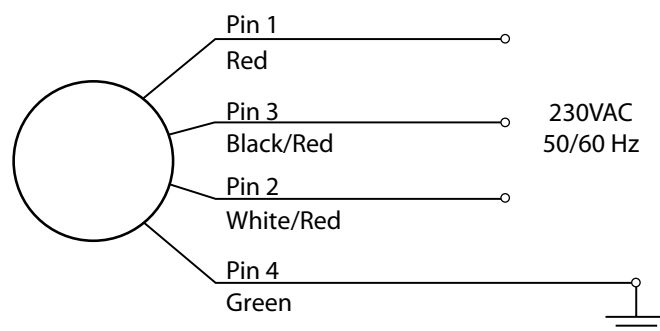


To Reverse, interchange blue and yellow leads.

## Three Phase IEC Motors and 246 Series 230-460 V Constant Speed

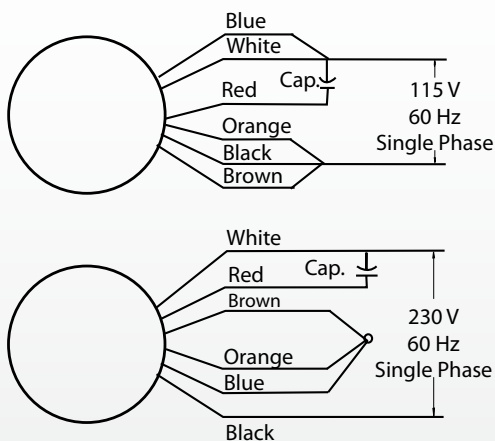


## SANIMotor™



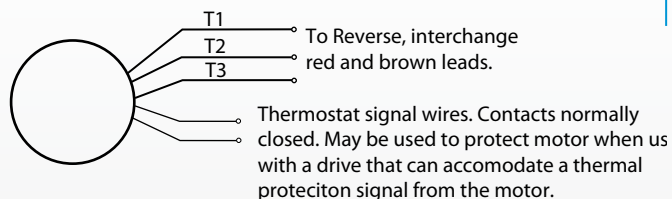
To Reverse, interchange any two motor leads

## 246 and 756 Series PSC 115/230 V 1/4 HP



To Reverse, interchange red and brown leads.

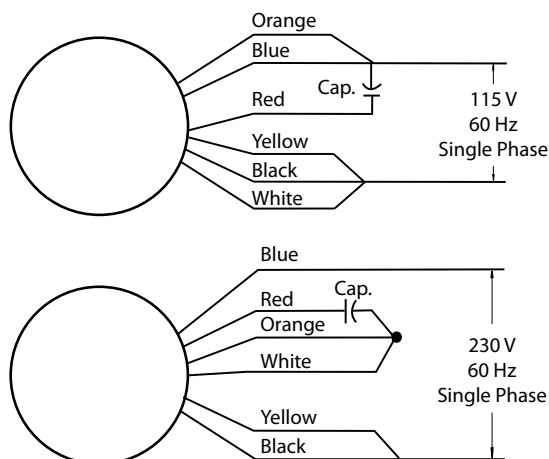
## Inverter Duty Three Phase 230V 6 to 90 Hz





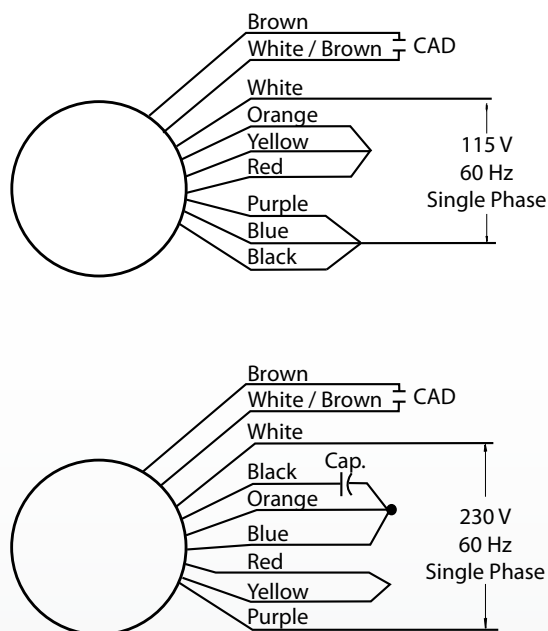
**Note:** Direction of rotation has not been listed by gearmotor part number. Rotation of direction varies on the number of stages within the specific geartrain.

## 650 Series PSC 115/230 V 1/2 HP



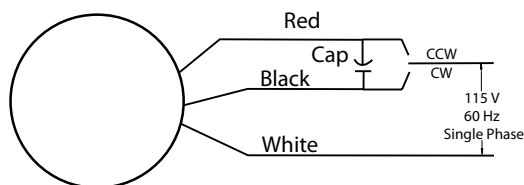
To Reverse, interchange red and black leads.

## 650 Series PSC 115/230 V 1/58 HP



To reverse, interchange blue and red leads.

## 756 Series PSC 115 V 1/8 HP



To reverse, interchange red and black leads.

# Convenient, printable diagrams online.

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# Engineering Fundamentals

## Determining Torque

Selecting the proper gearmotor is a matter of matching output speed and torque to an application's needs. RPM is determined by the driven machine's requirements and should be known. That leaves torque to be determined.

For machines where the load is primarily friction, running torque and starting torque are approximately the same. Here's an easy method of determining starting torque.

1. Attach a pulley securely to the shaft of the machine the gearmotor is required to drive.
2. Wrap a cord securely around the pulley and fasten the end to a spring scale.
3. Pull on the scale noting the weight at the time the shaft begins to turn. Do this several times and average the reading.
4. Then multiply the reading in pounds or ounces, depending upon the scale used, by the radius of the pulley in inches. The resulting figure will be torque either in inch-pounds or inch-ounces. Metric measurements, of course, may be used as well.

$$T \text{ (torque)} = F \text{ (force)} \times R \text{ (radius)}$$

## Gearmotor Load Factors

After determining output and speed requirements, the performance life of a gearmotor must be considered. Performance life is a function of three key factors: duty cycle, shock load, and overhung load.

Bison's published ratings are for continuous duty. Therefore, they may be increased by the factor indicated when applications call for less than continuous loads.

| Usage*                                                                                     | Factor |
|--------------------------------------------------------------------------------------------|--------|
| Continuous duty – 8 to 10 hours per day.                                                   | 1.00   |
| Intermittent loads – several minutes per hour.                                             | 1.25   |
| Occasional loads – 15 to 30 minutes per day with a maximum of two minutes at any one time. | 1.50   |

\*As defined by AGMA. Bison gearmotors and reducers can generally run continuously for up to 24 hours a day without rating loss. Specific applications should be reviewed by Bison application engineers.

## Overhung Load

A pinion, sprocket, pulley or crank mounted to a gearmotor output shaft exerts a force perpendicular to it. This force is termed overhung load (OHL) and care should be taken to make sure the OHL does not exceed the maximum load shown on the appropriate Performance/Ratings Specifications. Note that ratings shown on charts are for loads applied perpendicular to the output shaft at the center of key, or flat on the output shaft.

### The formula for overhung load

$$\text{OHL (pounds)} = \frac{T \text{ (torque in-lbs.)} \times K \text{ (load factor)}}{R \text{ (radius of pulley or sprocket)}}$$

## OHL load factors

| Drive Type         | "K" Factor |
|--------------------|------------|
| Chain and Sprocket | 1.00       |
| Gear               | 1.25       |
| V-Belt             | 1.50       |

## Shock Load

Some applications subject gearmotors to unusually heavy, erratically occurring loads. Cubes in an ice cube dispenser, for example, occasionally clump together. A large tree root may require a greater than average torque from a power rodder. Heavy objects that may be accidentally dropped on a conveyor can also be a problem. Under these circumstances, the extent of the "shock" and its duration become important considerations when determining proper gearmotor or reducer size. While Bison gearmotors have little difficulty handling maximum momentary shock loads as much as 200% higher than running loads, an application analysis may indicate the need for higher rated units.

You may, at this point, refer to the torques and output speeds listed for each gearmotor series shown in this catalog and select from among those whose speed and output torque ratings fall within your parameters. The following equations are provided for those interested in gearmotor design considerations.

## Input Horsepower

Once torque and output speed are known, a further calculation determines the horsepower of the input motor required to produce that torque and speed.

$$\text{HP (input motor)} = \frac{\text{RPM (gearmotor output)} \times T \text{ (in-lbs.)}}{63025 \text{ (a constant)} \times E \text{ (gearmotor efficiency)}}$$

## Input Speed

After calculating the input motor horsepower it may be necessary to determine the motor (input) speed.

$$\text{Input Speed (RPM)} = \text{Output Speed (RPM)} \times mg$$

where mg = gear ratio

**Note:** When speed at 50 Hz is required, multiply the 60 Hz speed by 5/6.

## Gearmotor Efficiency

Gearmotor efficiency is a function of the number of stages in the case of an in-line or parallel shaft gearmotor. A conservative formula for efficiency for in-line gearmotors is:

$$\text{Gearmotor efficiency} = .96^N$$

where N = number of stages

The number of stages is listed on the performance chart for each series.

The efficiency of right angle gearmotors can vary greatly with size and ratio. A conservative formula for estimating efficiency of worm gears is:

$$E = \frac{74 - .66 \text{ mg}}{100}$$

where mg = gear ratio

## Torque Conversion Table

| MULTIPLY        | BY       | TO OBTAIN        |
|-----------------|----------|------------------|
| Foot-Pounds     | 12       | Inch-Pounds      |
| Foot-Pounds     | 16       | Foot-Ounces      |
| Foot-Pounds     | 192      | Inch-Ounces      |
| Foot-Pounds     | 0.1383   | Meter-Kilograms  |
| Foot-Pounds     | 1.355    | Newton-Meters    |
| Foot-Pounds     | 13,830   | Centimeter-Grams |
| Inch-Pounds     | 1.333    | Foot-Ounces      |
| Inch-Pounds     | 16       | Inch-Ounces      |
| Inch-Pounds     | .113     | Newton-Meters    |
| Inch-Pounds     | 1,152    | Centimeter-Grams |
| Foot-Ounces     | 12       | Inch-Ounces      |
| Foot-Ounces     | 0.00864  | Centimeter-Grams |
| Inch-Ounces     | 0.000720 | Meter-Kilograms  |
| Inch-Ounces     | 72       | Centimeter-Grams |
| Meter-Kilograms | 100,000  | Centimeter-Grams |
| Newton-Meters   | .738     | Foot-Pounds      |
| Newton-Meters   | 8.85     | Inch-Pounds      |
| Newton-Meters   | 141.6    | Inch-Ounces      |

## Output Horsepower

Output horsepower may be determined with the following formula:

$$\text{HP (output)} = \frac{T \text{ (in-lbs.)} \times \text{RPM (output)}}{63,025} \quad \text{or,}$$

$$\text{HP (output)} = \frac{T \text{ (in-oz.)} \times \text{RPM (output)}}{1,008,400}$$

## Wattage Measurements

(1 HP = 746 Watts)

Watts Input = DC Volts x Amps

Watts Out = HP (output) x 746

Due to the nature of AC motor characteristics (power factor) no single formula can be easily applied. It is best to measure AC watts with a wattmeter. Because of the power factor, amperage is not a true indication of load change. Thus a wattmeter is necessary to measure load change.

$$\text{Overall Efficiency} = \frac{\text{Watts Out}}{\text{Watts In}}$$

$$\% \text{ Overall Efficiency} = \frac{\text{Watts Out} \times 100}{\text{Watts In}}$$

## Form Factor

Longer brush life and a cooler running motor are benefits of a lower form factor. A form factor of up to 1.37 is generally considered acceptable.

To measure the form factor of a DC power supply, you will need an ammeter with both DC and RMS capability. Connect the ammeter in series with motor lead and take DC and RMS current readings. Then calculate form factor with the formula:

$$\text{Form Factor} = \frac{\text{amps RMS}}{\text{amps DC}}$$

## Can we help?

Our staff of application engineers are available through phone, fax or email. Challenge us with your application!

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630-377-6777

info@bisongear.com

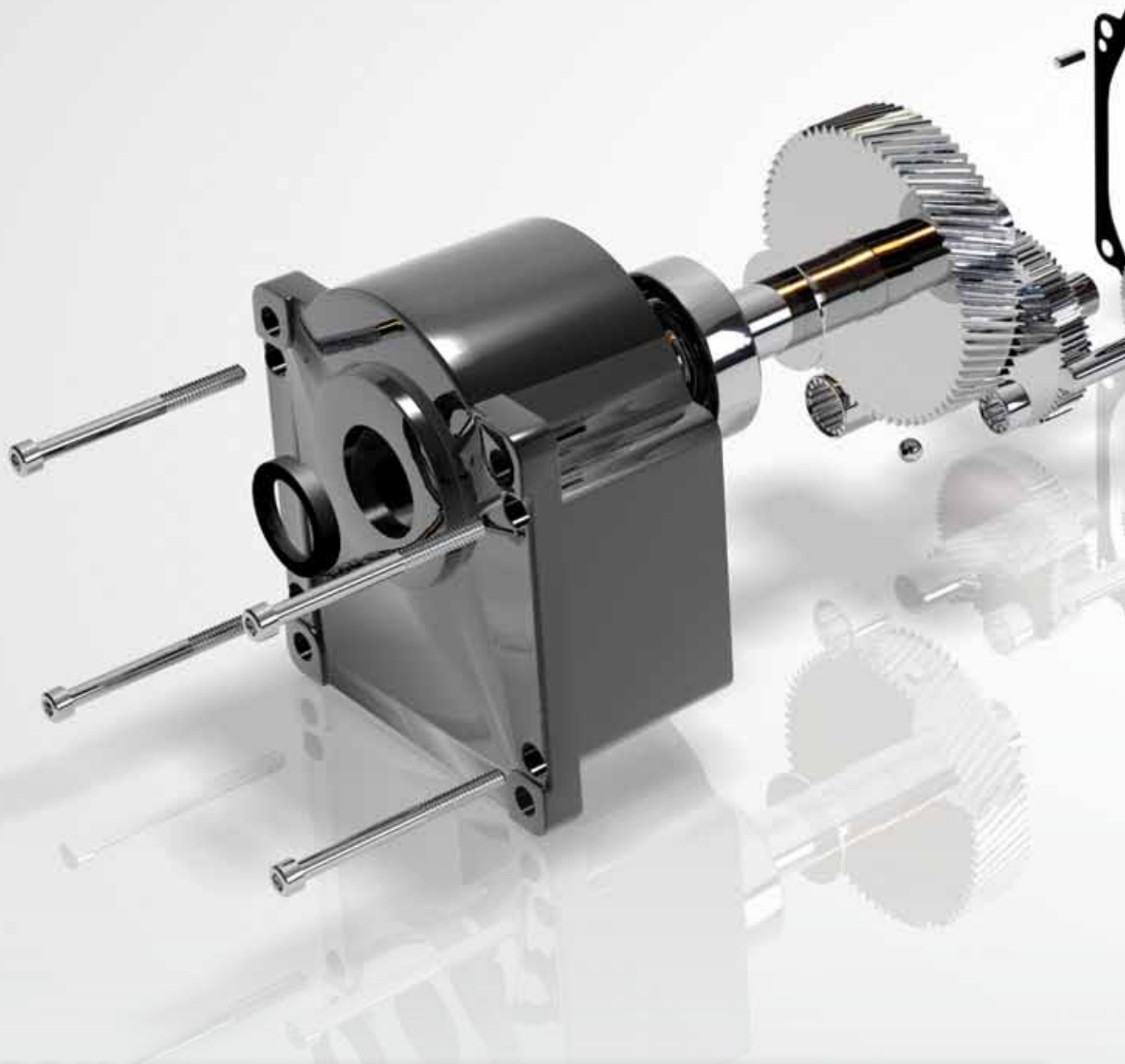
## Specialists for Difficult Applications

Bison has been focusing on supplying manufacturers who incorporate motors, gearmotors, or reducers in their products for over 50 years. In that time we've become an industry leader in manufacturing motors, gearmotors and reducers under the Bison Gear & Engineering Corporation name in St. Charles, Illinois. And, because more companies around the world are discovering that Bison offers more advantages than others, our growth is continuing. Bison power transmission

products are currently being used in conveyors, icemaker-dispensers, food preparation equipment, food dispensers, hot melt dispensers, chemical mixers, door openers, automatic feeders, ventilation systems, exercise equipment, metal cutting equipment, packaging equipment, medical pumping and positioning equipment, battery powered vehicles, military applications, and more.

# Custom Capabilities

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# What Everyone Ought to Know About Custom Gearmotors...

Bison has built its business over a half century not only by designing robust gearmotors that offer the best value, but also by listening to customers and giving them exactly what they want. Every Bison gearmotor can be customized to meet your application's specific and unique requirements.

## How To Get Exactly What You Need

We have a team of engineers dedicated to providing optimized solutions for your specific requirements. These solutions range from modified assemblies of standard components to complete custom designs.

Our lean manufacturing environment accommodates short-run, unique components and assemblies. We build customs everyday. Let one of our Application Engineers review your design.

## Have Something in Mind?

Contact us today at 1-800-AT-BISON to discuss your requirements.



Bison's ISO 9001:2008 certification means that all our work, including our custom products, meets a standard of excellence that's recognized around the world.





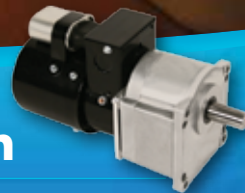
# Notes

Handwriting practice lines consisting of multiple horizontal dotted lines across the page.

The strength of  
Bison will always  
be there.



## Medical Innovation Driven By Bison



For today's medical equipment applications, downtime is not an option. That's why more and more medical equipment manufacturers choose Bison gearmotors as the driving force behind their innovative products. They know that Bison gearmotors are built to last longer than any other manufacturer's gearmotors, and that makes all the difference.

Bison's Robusticity™ design philosophy produces gearmotors that are built to be the best from the inside out. From components of the highest quality to innovative design techniques and unequalled quality control measures, medical equipment designers know that the strength of Bison will always be there.



# Bison Online Resources



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- ✓ Fax

## UPS SHIPPING METHOD

- ✓ Ship Ground
- ✓ Ship Red
- ✓ Use My UPS Acct#

## SHIPS SAME DAY

For orders received  
before 12pm CST



**SNS** signifies a model number that is available, but now has a lead time with a minimum order quantity.



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