

# AC Servo Systems

**3 Standard Drives ... 8 Standard Motors ... 100W to 3kW  
... over 50 gearboxes (both inline and right angle) with four ratios**



## Drive features

- Main Power and Control Power Inputs
  - Main Power: 230 VAC 1-phase/3-phase (2kW and 3kW systems are 3-phase only)
  - Control Power: 230 VAC Single Phase; 50/60 Hz
- Fully digital with up to 450 Hz velocity loop response
- Easy setup and diagnostics with built-in keypad/display or the SureServo Pro PC-based software
- Five-in-one command options include:
  - $\pm 10V$  torque or velocity command
  - Pulse train or master encoder position command (accepts line driver or open collector) with electronic gearing
  - Built-in indexer for position control using 8 preset positions and/or position setpoint with serial Modbus
- Tuning aids include inertia estimation and easy tuning for up to 10 levels of response
- Optically isolated digital inputs (8) and outputs (5), analog outputs for monitor signals (2), and line driver output for encoder (with scalable resolution)

## SureServo tuning technology

The SureServo drive closes the loop on current, velocity, and position (depending on control mode selection). Proportional gain, integral gain, feed forward compensation, command low pass filter, and a notch filter for resonance suppression are available. There are three tuning modes:

1. "Manual Mode" for user-defined adjustments
2. "Easy Mode" for default settings over a wide range of programmed inertia with 10 response levels
3. "Auto Mode" for automatic adjustment using an estimated (or measured) value of inertia

## Motor features

- Low inertia models:
  - 100W, 200W, 400W, 750W and 1kW
  - Speeds up to 5,000 rpm.
- Medium inertia models:
  - 1kW, 2kW and 3kW
  - Speeds up to 3,000 rpm.
- Square flange mounting with metric dimensions:
  - 40, 60, 80, 100, 130 and 180 mm flanges
- Permanent magnet 3-phase synchronous motor
- Keyless drive shafts support clamp-on style coupling
- Integrated encoder with 2,500 (x4) pulses/revolution plus marker pulse (once per revolution)
- Optional 24 VDC spring-set holding brakes
- Standard hook-up cables for motor power/brake and encoder
- Standard DIN-rail mounted ZIPLink break-out kit for the drive's CN1 connector (with screw terminal connections)

## SureServo built-in motion controller

While the SureServo drives can accept traditional commands from host controls, they can also provide their own internal motion control. For example, up to eight index moves can be pre-defined and stored in the drive and then selected and executed using up to three discrete inputs. The predefined index profiles can also be changed via serial communications. The motion can be incremental or absolute (homing routines are available in the drive) and acceleration can be linear or S-curve.

Multiple drives can be daisy-chained and addressed separately using the drive's serial port. This allows very simple yet powerful control of multi-axis processes that do not need precise path control but only precise starting and stopping points. Applications include press feeds, auger fillers, rotary tables, robots for pick and place, test or assembly operations, drilling, cutting, tapping, and similar applications using simple index moves for single or multi-axis motion.

## SureServo Optional Holding Brake

Each SureServo motor can be ordered with an optional 24VDC spring-set holding brake that holds the motor in place when power is removed.

## SureGear® Precision Gearboxes for Servo motors

### Inertia balancing issue in your design?

The SureGear PGA series easily mates to SureServo motors. Everything you need to mount your SureServo motor is included!



- Four gear ratios available (5, 10, 15, 25:1)
- Mounting hardware included for attaching to SureServo motors
- Industry-standard mounting dimensions
- Thread-in mounting style
- Best-in-class backlash (5 arc-min)
- 5-year warranty

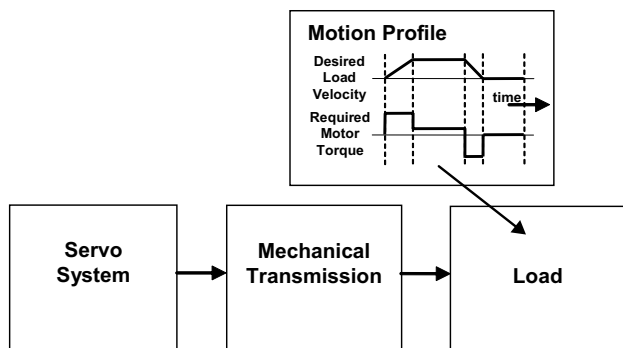
## How to select and apply SureServo systems

The primary purpose of the AC servo system is to precisely control the motion of the load. The most fundamental considerations in selecting the servo system are "reflected" load inertia, servo system maximum speed requirement, servo system continuous torque requirement, and servo system peak torque requirement. In a retrofit application, select the largest torque SureServo system that most closely matches these

parameters for the system being replaced. In a new application, these parameters should be determined through calculation and/or measurement.

AutomationDirect has teamed with Copperhill Technologies to provide free servo-sizing software. "VisualSizer-SureServo" software will assist in determining the correct motor and drive for your application by calculating the reflected load inertia and required speed and torque based on the load configuration. "VisualSizer-SureServo" software can be downloaded from [www.sureservo.com/downloads.htm](http://www.sureservo.com/downloads.htm).

Information for selecting SureServo systems is also included in Appendix B of the SureServo User Manual, which can be downloaded from the AutomationDirect.com website.



### 1. "Reflected" load inertia

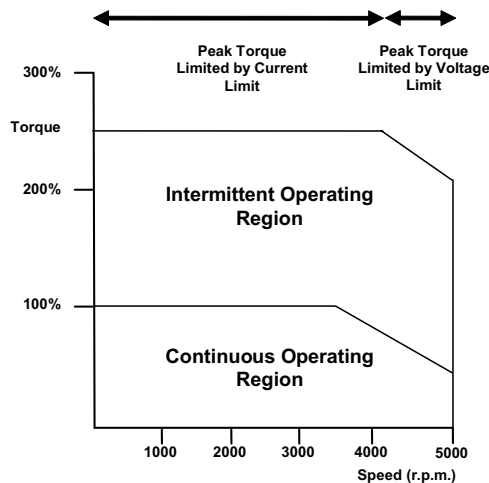
The inertia of everything attached to the servo motor driveshaft needs to be considered and the total "reflected" inertia needs to be determined. This means that all elements of any mechanical transmission and load inertia need to be translated into an equivalent inertia as if attached directly to the motor driveshaft. The ratio of "reflected" load inertia to motor inertia needs to be carefully considered when selecting the servo system.

inertia as low as possible and ideally under 10:1. Systems with ratios as high as 200:1 can be implemented, but corresponding lower bandwidth or responsiveness must be accepted. The servo response including the attached load inertia is determined by the servo tuning. SureServo systems may be tuned manually, adaptively with measurement of the load inertia, or set with default tuning based on a programmed value of load inertia.

In general, applications that need high response or bandwidth will benefit from keeping the ratio of load inertia to motor

### 2. Torque and speed

With knowledge of the motion profile and any mechanical transmission between the motor and load, calculations can be made to determine the required servo motor continuous torque, peak torque, and maximum motor speed. The required amount of continuous torque must fall inside the continuous operating region of the system torque-speed curve (you can check the continuous torque at the average speed of the motion profile). The required amount of peak torque must also fall within the servo system's intermittent operating region of the system torque-speed curve (you need to check this value at the required maximum speed).



## Application tip - coupling considerations

The SureServo motors have keyless shafts that are designed for use with clamp-on or compression style couplings. Couplings using keys and/or set screws should NOT be used with SureServo motors as they are likely to come loose or damage the motor shaft. "Servo-grade" clamp-on or compression style couplings are usually the best choice when you consider the stiffness, torque rating, and inertia. Higher

stiffness (lb-in/radian) is needed for better response but there is a trade-off between the stiffness and the added inertia of the coupling. Concerning the torque rating of the coupling, use a safety factor of 1.25 over the SureServo peak torque requirement of your application.

**Coupling Suppliers:** [www.sureservo.com/couplingconsiderations.htm](http://www.sureservo.com/couplingconsiderations.htm)

## Mechanical transmissions

Common mechanical transmissions include leadscrews, rack & pinion mechanisms, conveyors, gears, and timing belts. The use of leadscrew, rack & pinion, or conveyor are common

ways to translate the rotary motion of the servo motor into linear motion of the load. The use of a speed reducer such as a gearbox or timing belt can be very beneficial as follows:

### 1. Reduction of reflected load inertia

As a general rule, it is beneficial to keep the reflected load inertia as low as possible while using the full range of servo speed. SureServo systems can go up to 5,000 rpm for the low inertia motors and up to 3,000 rpm for the medium inertia motors.

Example: A gearbox reduces the required torque by a factor of the gear ratio, and reduces the reflected load inertia by a factor of the gear ratio squared. A 10:1 gearbox reduces output speed to 1/10, increases output torque 10 times, and decreases reflected inertia to 1/100.

However, when investigating the effect of different speed reduction ratios DO NOT forget to include the added inertia of couplings, gearbox, or timing belt pulleys. These added inertias can be significant, and can negate any inertia reduction due to the speed reduction.

### 2. Low speed and high torque applications

If the application requires low speed and high torque then it is common to introduce a speed reducer so that the servo system can operate over more of the available speed range. This could also have the added benefit of reducing the servo motor torque requirement which could allow you to use a smaller and lower cost servo system. Additional benefits are also possible with reduction in reflected inertia, increased number of motor encoder counts at the load, and increased ability to reject load disturbances due to mechanical advantage of the speed reducer.

### 3. Space limitations and motor orientation

SureServo motors can be mounted in any orientation, but the shaft seal should not be immersed in oil (open-frame gearbox, etc.). Reducers can possibly allow the use of a smaller motor or allow the motor to be repositioned. For example, some reducers would allow for in-line, right angle, or parallel mounting of the motor.

For more information, refer to the website listed below.

[www.sureservo.com/mechanical\\_trans.htm](http://www.sureservo.com/mechanical_trans.htm)

## Ordering guide instructions

The following four pages are your ordering guide for the eight standard SureServo systems. Each of the eight standard systems has a torque-speed curve including the motor inertia for reference. This is the fundamental information that you need to select the servo drive and matching motor for your application.

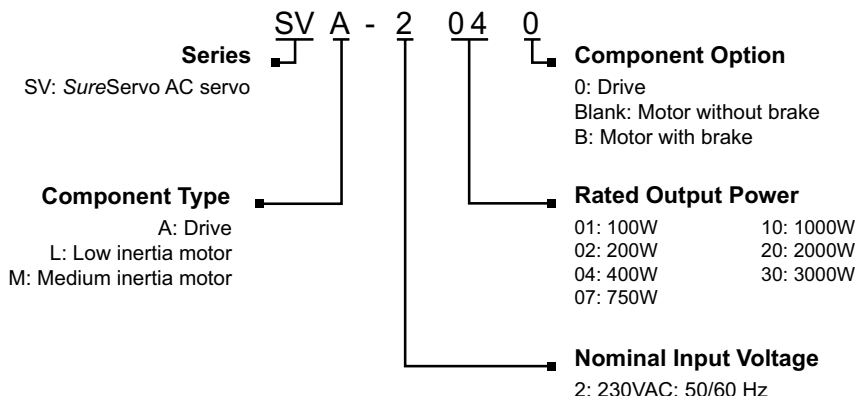
### Don't forget the cables and ZIPLink break-out board kit!

Included in the ordering guide are the available connection cables from the drive to motor in standard lengths from 10 to 60 feet. The break-out board kit includes a 0.5m (19 inch) cable for the CN1 I/O interface, and is listed for your convenience. We highly recommend all five items per system as a minimum. All cables are 100% factory tested to make your system installation as easy and quick as possible. See the Accessories section for regeneration resistors, AC line filters, fuses, contactors, and RF noise filters.



# AC Servo System Configuration

## SureServo series drives and motors part numbering system



Here is what you will need to order a complete servo system:



NOTE: Unit can be programmed via keypad.  
Optional programming software (free download) and optional programming cable available.



NOTE: If you need a gear box for your configuration, you can do it easily online:  
<http://www.sureservo.com/gearbox-selector>



## SureServo AC servo drive, motor, and cable combinations

| Inertia & Power |       | Drive and Motor         |                                  |                               | Power Cables (from Drive to Motor) |             |             |             | Encoder Feedback Cables |             |             |             | Miscellaneous   |                                       |
|-----------------|-------|-------------------------|----------------------------------|-------------------------------|------------------------------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|---|---------------------------------------|
| Inertia         | Power | Servo Drive             | Servo Motor without brake (note) | Servo Motor with brake (note) | 10 ft                              | 20 ft       | 30 ft       | 60 ft       | 10 ft                   | 20 ft       | 30 ft       | 60 ft       | ZIPLink I/O Interface   | RS-422/485 Serial Communication Cable |
| Low inertia     | 100W  | SVA-2040                | <a href="#">SVL-201</a>          | <a href="#">SVL-201B</a>      | SVC-PFL-010                        | SVC-PFL-020 | SVC-PFL-030 | SVC-PFL-060 | SVC-EFL-010             | SVC-EFL-020 | SVC-EFL-030 | SVC-EFL-060 | ZL-RTB50<br><br>and<br><br>ZL-SVC-CBL50<br>or<br>ZL-SVC-CBL50-1<br>or<br>ZL-SVC-CBL50-2 | SVC-MDCOM-CBL                         |
|                 | 200W  |                         | <a href="#">SVL-202</a>          | <a href="#">SVL-202B</a>      |                                    |             |             |             |                         |             |             |             |   |                                       |
|                 | 400W  |                         | <a href="#">SVL-204</a>          | <a href="#">SVL-204B</a>      |                                    |             |             |             |                         |             |             |             |   |                                       |
|                 | 750W  |                         | <a href="#">SVL-207</a>          | <a href="#">SVL-207B</a>      |                                    |             |             |             |                         |             |             |             |   |                                       |
|                 | 1000W |                         | <a href="#">SVL-210</a>          | <a href="#">SVL-210B</a>      |                                    |             |             |             |                         |             |             |             |   |                                       |
| Medium inertia  | 1000W | SVA-2100                | <a href="#">SVM-210</a>          | <a href="#">SVM-210B</a>      | SVC-PHM-010                        | SVC-PHM-020 | SVC-PHM-030 | SVC-PHM-060 | SVC-EHH-010             | SVC-EHH-020 | SVC-EHH-030 | SVC-EHH-060 | ZL-SVC-CBL50<br>or<br>ZL-SVC-CBL50-1<br>or<br>ZL-SVC-CBL50-2                            | SVC-MDCOM-CBL                         |
|                 | 2000W | SVA-2300                | <a href="#">SVM-220</a>          | <a href="#">SVM-220B</a>      | SVC-PHH-010                        | SVC-PHH-020 | SVC-PHH-030 | SVC-PHH-060 |                         |             |             |             |   |                                       |
|                 | 3000W | <a href="#">SVM-230</a> | <a href="#">SVM-230B</a>         | SVC-PHH-010                   | SVC-PHH-020                        | SVC-PHH-030 | SVC-PHH-060 |             |                         |             |             |             |   |                                       |

Note: Each servo motor requires an encoder feedback cable and a power cable.  
The motor power cable includes brake power wires for the optional motor brake.

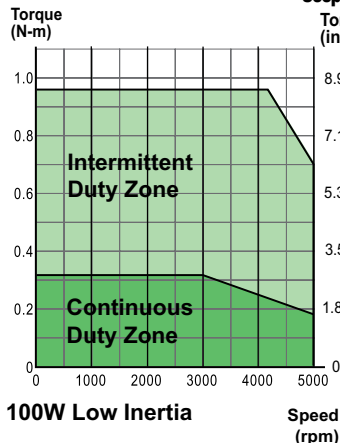


# AC Servo System Configuration

For all systems:

Order programming software & programming cable if needed. See pages SRV-151 & page SRV-163.

## 100W Low Inertia System



Servo Drive **SVA-2040** Retired

100W Low Inertia

Jm= Motor Inertia = 0.000027 lb-in-s<sup>2</sup> (0.000003 kg - m<sup>2</sup>)

### SureServo Motor

2. **SVL-201** Retired  
**SVL-201B (w/brake)** Retired

### Motor Power Cable (1)

3. **SVC-PFL-010 (10')** \$51.00  
**SVC-PFL-020 (20')** \$96.00  
**SVC-PFL-030 (30')** \$121.00  
**SVC-PFL-060 (60')** \$218.00

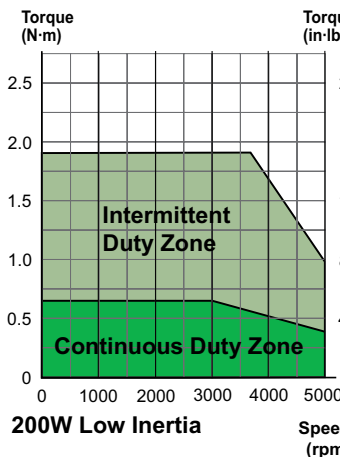
### Motor Encoder Cable (1)

4. **SVC-EFL-010 (10')** Retired  
**SVC-EFL-020 (20')** \$141.00  
**SVC-EFL-030 (30')** \$165.00  
**SVC-EFL-060 (60')** \$209.00

### Z/PLink I/O Interface

5. **ZL-RTB50** \$74.00  
 and one cable below:  
**ZL-SVC-CBL50 (0.5m)** \$48.50  
**ZL-SVC-CBL50-1 (1m)** \$51.00  
**ZL-SVC-CBL50-2 (2m)** \$58.00

## 200W Low Inertia System



Servo Drive **SVA-2040** Retired

200W Low Inertia

Jm= Motor Inertia = 0.00016 lb-in-s<sup>2</sup> (0.000018 kg - m<sup>2</sup>)

### SureServo Motor

2. **SVL-202** Retired  
**SVL-202B (w/brake)** Retired

### Motor Power Cable (1)

3. **SVC-PFL-010 (10')** \$51.00  
**SVC-PFL-020 (20')** \$96.00  
**SVC-PFL-030 (30')** \$121.00  
**SVC-PFL-060 (60')** \$218.00

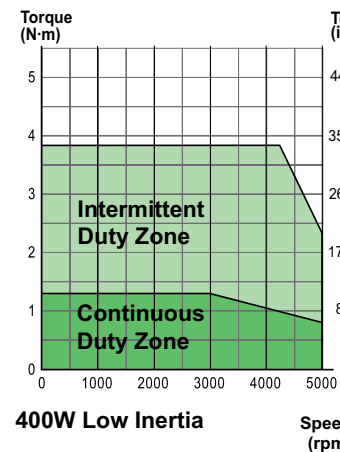
### Motor Encoder Cable (1)

4. **SVC-EFL-010 (10')** Retired  
**SVC-EFL-020 (20')** \$141.00  
**SVC-EFL-030 (30')** \$165.00  
**SVC-EFL-060 (60')** \$209.00

### Z/PLink I/O Interface

5. **ZL-RTB50** \$74.00  
 and one cable below:  
**ZL-SVC-CBL50 (0.5m)** \$48.50  
**ZL-SVC-CBL50-1 (1m)** \$51.00  
**ZL-SVC-CBL50-2 (2m)** \$58.00

## 400W Low Inertia System



Servo Drive **SVA-2040** Retired

400W Low Inertia

Jm= Motor Inertia = 0.0003 lb-in-s<sup>2</sup> (0.000034 kg - m<sup>2</sup>)

### SureServo Motor

2. **SVL-204** Retired  
**SVL-204B (w/brake)** Retired

### Motor Power Cable (1)

3. **SVC-PFL-010 (10')** \$51.00  
**SVC-PFL-020 (20')** \$96.00  
**SVC-PFL-030 (30')** \$121.00  
**SVC-PFL-060 (60')** \$218.00

### Motor Encoder Cable (1)

4. **SVC-EFL-010 (10')** Retired  
**SVC-EFL-020 (20')** \$141.00  
**SVC-EFL-030 (30')** \$165.00  
**SVC-EFL-060 (60')** \$209.00

### Z/PLink I/O Interface

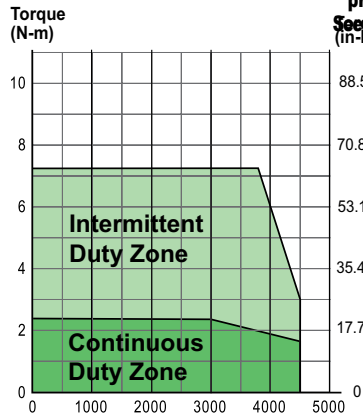
5. **ZL-RTB50** \$74.00  
 and one cable below:  
**ZL-SVC-CBL50 (0.5m)** \$48.50  
**ZL-SVC-CBL50-1 (1m)** \$51.00  
**ZL-SVC-CBL50-2 (2m)** \$58.00



# AC Servo System Configuration

For all systems:

## 750W Low Inertia System



750W Low Inertia

Jm= Motor Inertia = .00096 lb-in-s<sup>2</sup> (0.000108 kg - m<sup>2</sup>)

Order programming software & programming cable if needed. See page SRV-151 & page SRV-163.



Servo Drive **SVA-2100** Retired

SureServo Motor



- 2. **SVL-207** Retired
- SVL-207B (w/brake)** Retired

Motor Power Cable (1)



- 3. **SVC-PFL-010 (10')** \$51.00
- SVC-PFL-020 (20')** \$96.00
- SVC-PFL-030 (30')** \$121.00
- SVC-PFL-060 (60')** \$218.00

Motor Encoder Cable (1)



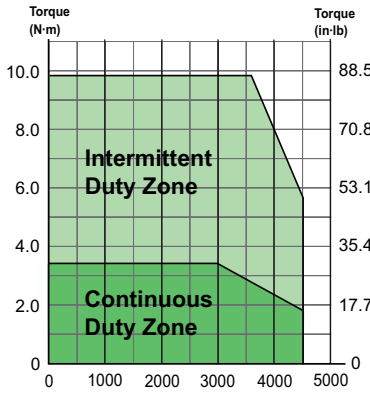
- 4. **SVC-EFL-010 (10')** Retired
- SVC-EFL-020 (20')** \$141.00
- SVC-EFL-030 (30')** \$165.00
- SVC-EFL-060 (60')** \$209.00

Z/PLink I/O Interface



- 5. **ZL-RTB50** \$74.00
- and one cable below:
- ZL-SVC-CBL50 (0.5m)** \$48.50
- ZL-SVC-CBL50-1 (1m)** \$51.00
- ZL-SVC-CBL50-2 (2m)** \$58.00

## 1 kW Low Inertia System



1 kW Low Inertia

Jm= Motor Inertia = .0023 lb-in-s<sup>2</sup> (0.00026 kg - m<sup>2</sup>)



Servo Drive **SVA-2100** Retired

SureServo Motor



- 2. **SVL-210** Retired
- SVL-210B (w/brake)** Retired

Motor Power Cable (1)



- 3. **SVC-PHM-010 (10')** \$160.00
- SVC-PHM-020 (20')** Retired
- SVC-PHM-030 (30')** \$290.00
- SVC-PHM-060 (60')** \$343.00

Motor Encoder Cable (1)



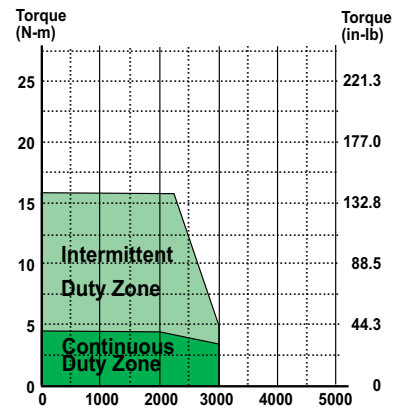
- 4. **SVC-EHH-010 (10')** \$153.00
- SVC-EHH-020 (20')** \$171.00
- SVC-EHH-030 (30')** Retired
- SVC-EHH-060 (60')** \$250.00

Z/PLink I/O Interface



- 5. **ZL-RTB50** \$74.00
- and one cable below:
- ZL-SVC-CBL50 (0.5m)** \$48.50
- ZL-SVC-CBL50-1 (1m)** \$51.00
- ZL-SVC-CBL50-2 (2m)** \$58.00

## 1 kW Medium Inertia System



1 kW Medium Inertia

Jm= Motor Inertia = .0053 lb-in-s<sup>2</sup> (0.000598 kg - m<sup>2</sup>)



Servo Drive **SVA-2100** Retired

SureServo Motor



- 2. **SVM-210** Retired
- SVM-210B (w/brake)** Retired

Motor Power Cable (1)



- 3. **SVC-PHM-010 (10')** \$160.00
- SVC-PHM-020 (20')** Retired
- SVC-PHM-030 (30')** \$290.00
- SVC-PHM-060 (60')** \$343.00

Motor Encoder Cable (1)



- 4. **SVC-EHH-010 (10')** \$153.00
- SVC-EHH-020 (20')** \$171.00
- SVC-EHH-030 (30')** Retired
- SVC-EHH-060 (60')** \$250.00

Z/PLink I/O Interface



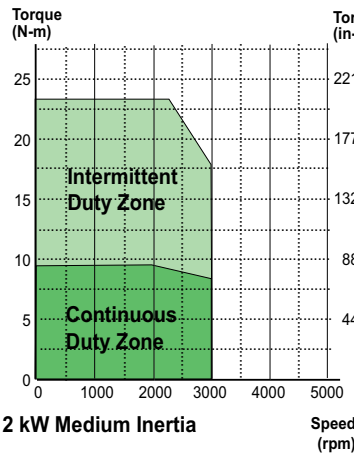
- 5. **ZL-RTB50** \$74.00
- and one cable below:
- ZL-SVC-CBL50 (0.5m)** \$48.50
- ZL-SVC-CBL50-1 (1m)** \$51.00
- ZL-SVC-CBL50-2 (2m)** \$58.00



# AC Servo System Configuration

For all systems:

## 2 kW Medium Inertia System



2 kW Medium Inertia

Jm= Motor Inertia = .014 lb-in-s<sup>2</sup> = (0.00158 kg - m<sup>2</sup>)

Order programming software & programming cable if needed. See [pgs. 151 & 163](#).



Servo Drive  
**SVA-2300 Retired**

SureServo Motor



- SVM-220** \$1,000.00  
**SVM-220B (w/brake)** \$1,367.00

Motor Power Cable (1)



- SVC-PHH-010 (10')** \$192.00  
**SVC-PHH-020 (20')** \$253.00  
**SVC-PHH-030 (30')** \$312.00  
**SVC-PHH-060 (60')** Retired

Motor Encoder Cable (1)



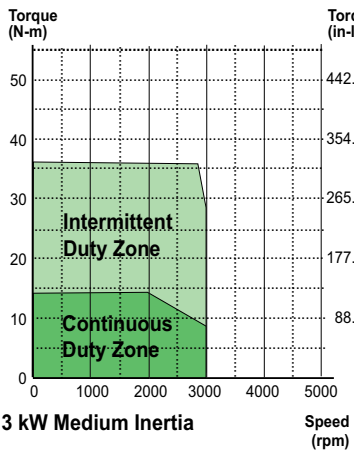
- SVC-EHH-010 (10')** \$153.00  
**SVC-EHH-020 (20')** \$171.00  
**SVC-EHH-030 (30')** Retired  
**SVC-EHH-060 (60')** \$250.00

ZIPLink I/O Interface



- ZL-RTB50** \$74.00  
**and one cable below:**  
**ZL-SVC-CBL50 (0.5m)** \$48.50  
**ZL-SVC-CBL50-1 (1m)** \$51.00  
**ZL-SVC-CBL50-2 (2m)** \$58.00

## 3 kW Medium Inertia System



3 kW Medium Inertia

Jm= Motor Inertia = 0.038 lb-in-s<sup>2</sup> = (0.00433 kg - m<sup>2</sup>)



Servo Drive  
**SVA-2300 Retired**

SureServo Motor



- SVM-230** Retired  
**SVM-230B (w/brake)** \$1,741.00

Motor Power Cable (1)



- SVC-PHH-010 (10')** \$192.00  
**SVC-PHH-020 (20')** \$253.00  
**SVC-PHH-030 (30')** \$312.00  
**SVC-PHH-060 (60')** Retired

Motor Encoder Cable (1)



- SVC-EHH-010 (10')** \$153.00  
**SVC-EHH-020 (20')** \$171.00  
**SVC-EHH-030 (30')** Retired  
**SVC-EHH-060 (60')** \$250.00

ZIPLink I/O Interface



- ZL-RTB50** \$74.00  
**and one cable below:**  
**ZL-SVC-CBL50 (0.5m)** \$48.50  
**ZL-SVC-CBL50-1 (1m)** \$51.00  
**ZL-SVC-CBL50-2 (2m)** \$58.00



NOTE: All Motor Power Cables include brake power wires for the optional motor brake.

## SureServo Communications Cables for Multi-drop Networks

| Product                             | Price   | Description   |
|-------------------------------------|---------|---|
| <a href="#">SVC-MDCOM-CBL</a>       | \$43.00 | RS-422/485 serial communication cable for use with multidrop networks; 3ft length; IEEE 1394 plug to unterminated wires; compatible with all SureServo systems. Facilitates connection between the SureServo drive serial port and host controllers.          |
| <a href="#">SVC-232RJ12-CBL-2</a> * | \$12.50 | ZIPLink SureServo Drives cable with 6-pin RJ12 connector to a 6-pin IEEE 1394 connector, shielded, twisted pair, 2.0 meter (6.6 ft.) length. For RS-232 connection to all SureServo amplifiers.   |
| <a href="#">SVC-485RJ12-CBL-2</a> * | \$15.00 | ZIPLink SureServo amplifier communication cable, RJ12 male to 6-pin IEEE 1394 connector, shielded, twisted pair, 2.0 meter (6.6 ft.) length. Cable used in conjunction with ZL-CDM-RJ12xxx distribution module can access a compatible RS-485 device network. |
| <a href="#">SVC-485HD15-CBL-2</a> * | \$13.50 | ZIPLink SureServo Drives cable with a HD 15-pin male to a 6-pin IEEE 1394 connector, shielded, twisted pair, 2.0 meter (6.6 ft.) length. For RS-485 connection to all SureServo amplifiers.   |



\* Refer to the ZIPLinks Wiring Solutions section for complete information regarding the ZIPLink cables.



# AC Servo System Software

## SureServo Pro configuration software

SureServo Pro is an optional free downloadable configuration software package for the SureServo drives. With SureServo Pro installed, the personal computer may be directly connected to the servo drive's serial port via the PC's RS-232 serial port\*. A six-foot configuration cable (SVC-PCCFG-CBL, \$37.50) is available to make the connection between the drive serial port and PC DB-9 serial port simple.

*\*Note: Use our [USB-RS232](#) converter cable in conjunction with the [SVC-PCCFG-CBL](#) cable on PCs having only USB ports.*

### Features

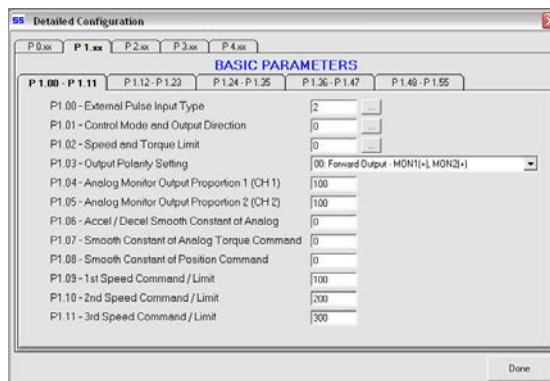
- Quick Start - The basic setup when you have limited time and just want to get up and running ASAP.
- Maintenance keypad allows the user to operate the servo system from the PC. This is a great aid during start-up to allow the servo to perform some basic motion and to check the I/O.
- Detailed - The complete setup for all the drive parameters
- Tune and check the servo response live using the scope feature.
- Upload and download the drive setup. Save the drive setup as a file for future use.
- Edit the drive setup
- View all drive faults
- Trend drive variables in real time

## Parameter views

The SureServo Pro configuration tool logically organizes over 165 servo drive parameters into five tabbed groups. Each parameter has a factory default that usually allows the servo to run "out-of-the-box".

The parameters can be easily changed with available options or setting ranges displayed. Tuning modes and parameters can also be changed using SureServo Pro. After the parameters have been defined, the complete setup can be stored and archived. Drive configurations can be uploaded, edited, saved, and downloaded as often as necessary.

### Parameter View Example Screen - Basic Parameters



## SureServo Software and Configuration Cables

| Product                                 | Price   | Description   |
|---|---------|---|
| <b><a href="#">SV-PRO</a></b>           | Free    | SureServo Pro configuration software for use with all SureServo servo systems. FREE download from <a href="http://www.sureservo.com">www.sureservo.com</a> or <a href="http://www.automationdirect.com">www.automationdirect.com</a> websites.  |
| <b><a href="#">SVC-PCCFG-CBL</a></b>    | \$37.50 | Six-foot RS-232 communications cable; connects servo drive serial port to PC DB-9 serial port. For PCs having only USB ports, use our <a href="#">USB-RS232</a> converter cable in conjunction with the <a href="#">SVC-PCCFG-CBL</a> cable.  |
| <b><a href="#">SVC-485CFG-CBL-2</a></b> | \$18.50 | ZIPLink SureServo amplifier configuration cable, 6-pin IEEE 1394 connector to RJ45 connector, shielded, twisted pair, 2.0 meter (6.6 ft.) length. Use this cable in conjunction with our <a href="#">USB-485M</a> serial adapter to connect any SureServo amplifier to a PC. Eliminates the need to reprogram networked servo drives from RS485 to RS232 when connecting to a PC. |

\* Refer to the ZIPLinks Wiring Solutions section for complete information regarding ZIPLink cable [SVC-485CFG-CBL-2](#).



# Precision Servo Gearboxes

## SureGear® Servo Gearbox Overview

### **PGA In-line Series**

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

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

### **PGB Right-angle Series**

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

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

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

### **PGD Hub Style In-line Series**

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

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

## Features

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



**SureGear  
PGA Gearbox**



**SureGear PGB Gearbox**



**SureGear  
Hub Style PGD Gearbox**



**SureGear  
2-Stage Cutaway View**

## Applications

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



# Precision Servo Gearboxes

| SureGear® Servo Gearbox Selection |            |                             |                 |                             |       |                             |        |                              |                          |   |          |         |        |         |         |
|-----------------------------------|------------|-----------------------------|-----------------|-----------------------------|-------|-----------------------------|--------|------------------------------|--------------------------|---|----------|---------|--------|---------|---------|
| Servo Motor                       | Gear Ratio | SureGear Gearbox            | Frame Size (mm) | Motor Nominal Output Torque |       | Combo Nominal Output Torque |        | Nominal Output Speed ( rpm ) | Max Output Speed ( rpm ) | Available Load Inertia @ 5:1 Mismatch * |          |         |        |         |         |
|                                   |            |                             |                 | N-m                         | lb-in | N-m                         | lb-in  |                              |                          | kg-cm2                                  | lb-in-s2 |         |        |         |         |
| SV2L-201(x)<br>APMC-FAL01xxx      | 5:1        | <a href="#">PGD047-05A1</a> | 47              | 0.32                        | 2.83  | 1.52                        | 13.44  | 600                          | 1200.00                  | 6.76                                    | 0.006    |         |        |         |         |
|                                   |            | <a href="#">PGA050-05A1</a> | 50              |                             |       |                             |        |                              |                          | 6.94                                    | 0.006    |         |        |         |         |
|                                   |            | <a href="#">PGA070-05A1</a> | 70              |                             |       |                             |        |                              |                          | 5.91                                    | 0.005    |         |        |         |         |
|                                   |            | <a href="#">PGB070-05A1</a> | 70              |                             |       |                             |        |                              |                          | 1.59**                                  | 0.001**  |         |        |         |         |
|                                   | 10:1       | <a href="#">PGD047-10A1</a> | 47              |                             |       | 3.04                        | 26.89  |                              |                          | 2.98                                    | 26.32    | 300     | 600.00 | 28.15   | 0.025   |
|                                   |            | <a href="#">PGA050-10A1</a> | 50              |                             |       |                             |        |                              |                          |   |          |         |        | 28.35   | 0.025   |
|                                   |            | <a href="#">PGA070-10A1</a> | 70              |                             |       |                             |        |                              |                          |   |          |         |        | 25.75   | 0.023   |
|                                   |            | <a href="#">PGB070-10A1</a> | 70              |                             |       |                             |        |                              |                          |   |          |         |        | 8.35**  | 0.007** |
|                                   | 15:1       | <a href="#">PGA050-15A1</a> | 50              |                             |       | 4.32                        | 38.21  | 4.22                         | 37.36                    | 200                                     | 400.00   | 62.66   | 0.055  |         |         |
|                                   |            | <a href="#">PGA070-15A1</a> | 70              |                             |       |                             |        |                              |                          |   |          | 58.16   | 0.051  |         |         |
|                                   |            | <a href="#">PGB070-15A1</a> | 70              |                             |       |                             |        |                              |                          |   |          | 54.11   | 0.048  |         |         |
|                                   | 25:1       | <a href="#">PGD047-25A1</a> | 47              |                             |       | 7.20                        | 63.68  | 7.04                         | 62.26                    | 120                                     | 240.00   | 174.69  | 0.155  |         |         |
|                                   |            | <a href="#">PGA050-25A1</a> | 50              |                             |       |                             |        |                              |                          |   |          | 174.69  | 0.155  |         |         |
|                                   |            | <a href="#">PGA070-25A1</a> | 70              |                             |       |                             |        |                              |                          |   |          | 162.81  | 0.144  |         |         |
|                                   |            | <a href="#">PGB070-25A1</a> | 70              |                             |       |                             |        |                              |                          |   |          | 151.56  | 0.134  |         |         |
|                                   | 50:1       | <a href="#">PGD064-50A1</a> | 64              |                             |       | 14.40                       | 127.35 | 14.40                        | 127.35                   | 60                                      | 120.00   | 661.25  | 0.585  |         |         |
| SV2L-202(x)                       | 5:1        | <a href="#">PGD064-05A2</a> | 64              | 0.64                        | 5.7   | 3.04                        | 27.08  | 600                          | 1200.00                  | 28.75                                   | 0.025    |         |        |         |         |
|                                   |            | <a href="#">PGA070-05A2</a> | 70              |                             |       |                             |        |                              |                          | 29.33                                   | 0.026    |         |        |         |         |
|                                   |            | <a href="#">PGB070-05A2</a> | 70              |                             |       |                             |        |                              |                          | 2.98                                    | 0.022    |         |        |         |         |
|                                   | 10:1       | <a href="#">PGD064-10A2</a> | 64              |                             |       | 6.08                        | 54.15  |                              |                          | 5.95                                    | 53.01    | 300     | 600.00 | 118.80  | 0.105   |
|                                   |            | <a href="#">PGA070-10A2</a> | 70              |                             |       |                             |        |                              |                          |   |          |         |        | 119.40  | 0.106   |
|                                   |            | <a href="#">PGB070-10A2</a> | 70              |                             |       |                             |        |                              |                          |   |          |         |        | 102.00  | 0.090   |
|                                   | 15:1       | <a href="#">PGA070-15A2</a> | 70              |                             |       | 8.64                        | 76.95  | 8.45                         | 75.24                    | 200                                     | 400.00   | 268.88  | 0.238  |         |         |
|                                   |            | <a href="#">PGB070-15A2</a> | 70              |                             |       |                             |        |                              |                          |   |          | 264.83  | 0.234  |         |         |
|                                   |            | <a href="#">PGB090-15A2</a> | 90              |                             |       |                             |        |                              |                          |   |          | 204.75  | 0.181  |         |         |
|                                   | 25:1       | <a href="#">PGD064-25A2</a> | 64              |                             |       | 14.40                       | 128.25 | 14.08                        | 125.40                   | 120                                     | 240.00   | 747.50  | 0.662  |         |         |
|                                   |            | <a href="#">PGA070-25A2</a> | 70              |                             |       |                             |        |                              |                          |   |          | 748.13  | 0.662  |         |         |
|                                   |            | <a href="#">PGB070-25A2</a> | 70              |                             |       |                             |        |                              |                          |   |          | 736.88  | 0.652  |         |         |
|                                   |            | <a href="#">PGB090-25A2</a> | 90              |                             |       |                             |        |                              |                          |   |          | 581.25  | 0.514  |         |         |
|                                   |            | <a href="#">PGD090-25A2</a> | 90              |                             |       |                             |        |                              |                          |   |          | 14.40   | 128.25 | 700.00  | 0.620   |
|                                   | 50:1       | <a href="#">PGD090-50A2</a> | 90              |                             |       | 28.80                       | 256.50 | 28.80                        | 256.50                   | 60                                      | 120.00   | 2875.00 | 2.544  |         |         |
|                                   |            | <a href="#">PGD110-50A2</a> | 110             |                             |       |                             |        |                              |                          |   |          | 2125.00 | 1.881  |         |         |
| SV2L-204(x)                       | 5:1        | <a href="#">PGD064-05A2</a> | 64              | 1.27                        | 11.2  | 6.03                        | 53.20  | 600                          | 1200.00                  | 53.75                                   | 0.048    |         |        |         |         |
|                                   |            | <a href="#">PGA070-05A2</a> | 70              |                             |       |                             |        |                              |                          | 54.33                                   | 0.048    |         |        |         |         |
|                                   |            | <a href="#">PGB070-05A2</a> | 70              |                             |       |                             |        |                              |                          | 5.91                                    | 0.044    |         |        |         |         |
|                                   | 10:1       | <a href="#">PGD064-10A2</a> | 64              |                             |       | 12.07                       | 106.40 |                              |                          | 11.81                                   | 104.16   | 300     | 600.00 | 218.80  | 0.194   |
|                                   |            | <a href="#">PGA070-10A2</a> | 70              |                             |       |                             |        |                              |                          |   |          |         |        | 219.40  | 0.194   |
|                                   |            | <a href="#">PGB070-10A2</a> | 70              |                             |       |                             |        |                              |                          |   |          |         |        | 202.00  | 0.179   |
|                                   | 15:1       | <a href="#">PGA070-15A2</a> | 70              |                             |       | 17.15                       | 151.20 | 16.76                        | 147.84                   | 200                                     | 400.00   | 493.88  | 0.437  |         |         |
|                                   |            | <a href="#">PGB070-15A2</a> | 70              |                             |       |                             |        |                              |                          |   |          | 489.83  | 0.433  |         |         |
|                                   |            | <a href="#">PGB090-15A2</a> | 90              |                             |       |                             |        |                              |                          |   |          | 429.75  | 0.380  |         |         |
|                                   | 25:1       | <a href="#">PGD064-25A2</a> | 64              |                             |       | 28.58                       | 252.00 | 27.94                        | 246.40                   | 120                                     | 240.00   | 1372.50 | 1.215  |         |         |
|                                   |            | <a href="#">PGA070-25A2</a> | 70              |                             |       |                             |        |                              |                          |   |          | 1373.13 | 1.215  |         |         |
|                                   |            | <a href="#">PGB070-25A2</a> | 70              |                             |       |                             |        |                              |                          |   |          | 1361.88 | 1.205  |         |         |
|                                   |            | <a href="#">PGB090-25A2</a> | 90              |                             |       |                             |        |                              |                          |   |          | 1206.25 | 1.068  |         |         |
|                                   |            | <a href="#">PGD090-25A2</a> | 90              |                             |       |                             |        |                              |                          |   |          | 28.58   | 252.00 | 1325.00 | 1.173   |
|                                   | 50:1       | <a href="#">PGD090-50A2</a> | 90              |                             |       | 57.15                       | 504.00 | 57.15                        | 504.00                   | 60                                      | 120.00   | 5375.00 | 4.757  |         |         |
|                                   |            | <a href="#">PGD110-50A2</a> | 110             |                             |       |                             |        |                              |                          |   |          | 4625.00 | 4.093  |         |         |

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

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



# Precision Servo Gearboxes

| SureGear® Servo Gearbox Selection |            |                             |                 |                             |       |                             |         |                            |                        |   |          |
|-----------------------------------|------------|-----------------------------|-----------------|-----------------------------|-------|-----------------------------|---------|----------------------------|------------------------|---|----------|
| Servo Motor                       | Gear Ratio | SureGear Gearbox            | Frame Size (mm) | Motor Nominal Output Torque |       | Combo Nominal Output Torque |         | Nominal Output Speed (rpm) | Max Output Speed (rpm) | Available Load Inertia @ 5:1 Mismatch * |          |
|                                   |            |                             |                 | N-m                         | lb-in | N-m                         | lb-in   |                            |                        | kg-cm2                                  | lb-in-s2 |
| SV2L-207(x)                       | 5:1        | <a href="#">PGA070-05A3</a> | 70              | 2.39                        | 21.2  | 11.35                       | 100.70  | 600                        | 1200.00                | 186.83                                  | 0.165    |
|                                   |            | <a href="#">PGB090-05A3</a> | 90              |                             |       | 11.11                       | 98.58   |                            |                        | 143.75                                  | 0.127    |
|                                   |            | <a href="#">PGD090-05A3</a> | 90              |                             |       | 11.35                       | 100.70  |                            |                        | 174.25                                  | 0.154    |
|                                   | 10:1       | <a href="#">PGA090-10A3</a> | 90              |                             |       | 22.71                       | 201.40  | 300                        | 600.00                 | 726.00                                  | 0.643    |
|                                   |            | <a href="#">PGB090-10A3</a> | 90              |                             |       | 22.23                       | 197.16  |                            |                        | 586.00                                  | 0.519    |
|                                   |            | <a href="#">PGD090-10A3</a> | 90              |                             |       | 22.71                       | 201.40  |                            |                        | 722.00                                  | 0.639    |
|                                   | 15:1       | <a href="#">PGA090-15A3</a> | 90              |                             |       | 32.27                       | 286.20  | 200                        | 400.00                 | 1669.50                                 | 1.478    |
|                                   |            | <a href="#">PGB090-15A3</a> | 90              |                             |       | 31.55                       | 279.84  |                            |                        | 1622.25                                 | 1.436    |
|                                   |            | <a href="#">PGD110-25A3</a> | 110             |                             |       | 53.78                       | 477.00  |                            |                        | 4643.75                                 | 4.110    |
|                                   | 25:1       | <a href="#">PGB090-25A3</a> | 90              |                             |       | 52.58                       | 466.40  | 120                        | 240.00                 | 4518.75                                 | 3.999    |
|                                   |            | <a href="#">PGD110-25A3</a> | 110             |                             |       | 53.78                       | 477.00  |                            |                        | 4281.25                                 | 3.789    |
|                                   |            | <a href="#">PGD110-50A3</a> | 110             |                             |       | 107.55                      | 954.00  |                            |                        | 17875.00                                | 15.819   |
| SV2L-210(x)                       | 5:1        | <a href="#">PGA090-05A4</a> | 90              | 3.18                        | 28.15 | 15.11                       | 133.69  | 600                        | 1000.00                | 321.25                                  | 0.284    |
|                                   |            | <a href="#">PGB090-05A4</a> | 90              |                             |       | 14.79                       | 130.88  |                            |                        | 286.25                                  | 0.253    |
|                                   |            | <a href="#">PGD090-05A4</a> | 90              |                             |       | 15.11                       | 133.69  |                            |                        | 319.25                                  | 0.283    |
|                                   | 10:1       | <a href="#">PGA090-10A4</a> | 90              |                             |       | 30.21                       | 267.38  | 300                        | 500.00                 | 1296.00                                 | 1.147    |
|                                   |            | <a href="#">PGB090-10A4</a> | 90              |                             |       | 29.57                       | 261.75  |                            |                        | 1156.00                                 | 1.023    |
|                                   |            | <a href="#">PGD090-10A4</a> | 90              |                             |       | 30.21                       | 267.38  |                            |                        | 1292.00                                 | 1.143    |
|                                   | 15:1       | <a href="#">PGA120-15A4</a> | 120             |                             |       | 42.93                       | 379.96  | 200                        | 333.33                 | 2884.50                                 | 2.553    |
|                                   |            | <a href="#">PGB120-15A4</a> | 120             |                             |       | 41.98                       | 371.52  |                            |                        | 2475.00                                 | 2.190    |
|                                   |            | <a href="#">PGD110-25A4</a> | 110             |                             |       | 71.55                       | 633.27  |                            |                        | 7843.75                                 | 6.942    |
|                                   | 25:1       | <a href="#">PGA120-25A4</a> | 120             |                             |       | 69.96                       | 619.20  | 120                        | 200.00                 | 8043.75                                 | 7.119    |
|                                   |            | <a href="#">PGB120-25A4</a> | 120             |                             |       | 69.96                       | 619.20  |                            |                        | 6918.75                                 | 6.123    |
|                                   |            | <a href="#">PGD110-50A4</a> | 110             |                             |       | 143.10                      | 1266.54 |                            |                        | 32125.00                                | 28.431   |
| SV2M-210(x)                       | 5:1        | <a href="#">PGA090-05A5</a> | 90              | 4.77                        | 42.22 | 22.66                       | 200.54  | 400.00                     | 600.00                 | 1041.25                                 | 0.922    |
|                                   |            | <a href="#">PGD090-05A5</a> | 90              |                             |       | 22.18                       | 196.31  |                            |                        | 1039.25                                 | 0.920    |
|                                   |            | <a href="#">PGB120-05A5</a> | 120             |                             |       | 22.18                       | 196.31  |                            |                        | 925.75                                  | 0.819    |
|                                   | 10:1       | <a href="#">PGA090-10A5</a> | 90              |                             |       | 45.32                       | 401.07  | 200.00                     | 300.00                 | 4176.00                                 | 3.696    |
|                                   |            | <a href="#">PGD110-10A5</a> | 110             |                             |       | 44.36                       | 392.63  |                            |                        | 4172.00                                 | 3.692    |
|                                   |            | <a href="#">PGB120-10A5</a> | 120             |                             |       | 44.36                       | 392.63  |                            |                        | 3759.00                                 | 3.327    |
|                                   | 15:1       | <a href="#">PGA120-15A5</a> | 120             |                             |       | 64.40                       | 569.94  | 133.33                     | 200.00                 | 9364.50                                 | 8.288    |
|                                   |            | <a href="#">PGB120-15A5</a> | 120             |                             |       | 62.96                       | 557.28  |                            |                        | 8955.00                                 | 7.925    |
|                                   |            | <a href="#">PGD110-25A5</a> | 110             |                             |       | 107.33                      | 949.91  |                            |                        | 25843.75                                | 22.872   |
|                                   | 25:1       | <a href="#">PGA120-25A5</a> | 120             |                             |       | 104.94                      | 928.80  | 80.00                      | 120.00                 | 26043.75                                | 23.049   |
|                                   |            | <a href="#">PGB120-25A5</a> | 120             |                             |       | 104.94                      | 928.80  |                            |                        | 24918.75                                | 22.053   |
|                                   |            | <a href="#">PGD110-35A5</a> | 110             |                             |       | 150.26                      | 1329.87 |                            |                        | 50653.75                                | 44.829   |

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



# Precision Servo Gearboxes

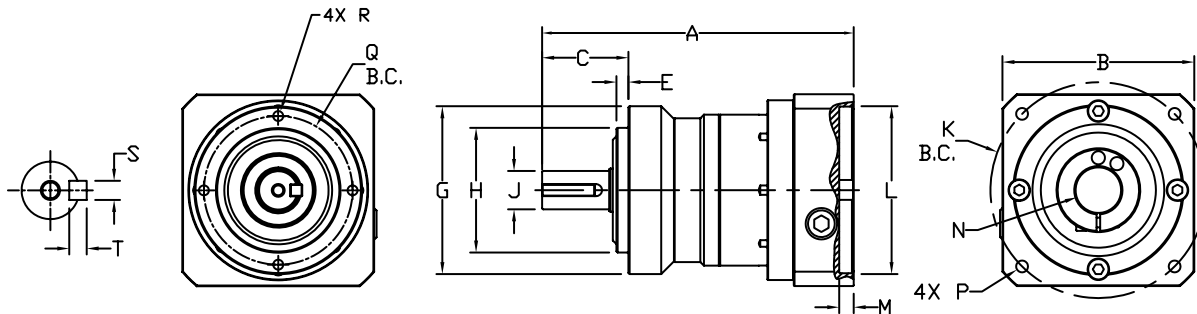
## Pricing & Specifications – In-Line Shaft PGA Series

| SureGear® Precision Servo Gearboxes – In-Line Shaft PGA Series |            |                 |       |           |                                     |  |                                     |                    |                           |                        |                                |                                |   |                |                          |                         |                      |                                       |
|--|------------|-----------------|-------|-----------|-------------------------------------|--|-------------------------------------|--------------------|---------------------------|------------------------|--------------------------------|--------------------------------|---|----------------|--------------------------|-------------------------|----------------------|---------------------------------------|
| Part Number  | Price      | Frame Size (mm) | Ratio | Reduction | Nominal Output Torque (N·m [lb-in]) | Max. Acceleration Torque (N·m [lb-in]) | Emergency Stop Torque (N·m [lb-in]) | Backlash (arc-min) | Nominal Input Speed (rpm) | Max. Input Speed (rpm) | Allowable Radial Load (N [lb]) | Allowable Thrust Load (N [lb]) | Moment of Inertia (kg·cm <sup>2</sup> ) | Efficiency (%) | Max. Housing Temperature | Approx Weight (kg [lb]) | Environmental Rating | Fits SureServo Servo Motor (SV & SV2) |
| <a href="#">PGA050-05A1</a>                                    | \$465.00   | 50              | 5:1   | single    | 9 [80]                              | 18 [159]                               | 35 [310]                            | 5                  | 4000                      | 8000                   | 290 [65]                       | 330 [74]                       | 0.036                                   | 95             | 90 °C [194 °F]           | 0.7 [1.5]               | IP55                 | SV(2)L-201(B)                         |
| <a href="#">PGA050-10A1</a>                                    | \$490.00   |                 | 10:1  | single    | 6 [53]                              | 12 [106]                               | 30 [266]                            |                    |                           |                        | 360 [81]                       | 450 [101]                      | 0.030                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA050-15A1</a>                                    | \$672.00   |                 | 15:1  | double    | 6 [53]                              | 12 [106]                               | 30 [266]                            |                    |                           |                        | 410 [92]                       | 540 [121]                      | 0.035                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA050-25A1</a>                                    | \$672.00   |                 | 25:1  | double    | 9 [80]                              | 18 [159]                               | 35 [310]                            |                    |                           |                        | 490 [110]                      | 640 [144]                      | 0.034                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA070-05A1</a>                                    | \$465.00   | 70              | 5:1   | single    | 27 [239]                            | 50 [443]                               | 100 [885]                           | 7                  | 3000                      | 6000                   | 510 [115]                      | 390 [88]                       | 0.077                                   | 95             | 90 °C [194 °F]           | 1.5 [3.3]               | IP55                 | SV(2)L-201(B)                         |
| <a href="#">PGA070-10A1</a>                                    | \$490.00   |                 | 10:1  | single    | 18 [159]                            | 35 [310]                               | 80 [708]                            |                    |                           |                        | 640 [144]                      | 530 [119]                      | 0.056                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA070-15A1</a>                                    | \$672.00   |                 | 15:1  | double    | 18 [159]                            | 35 [310]                               | 80 [708]                            |                    |                           |                        | 740 [166]                      | 630 [142]                      | 0.055                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA070-25A1</a>                                    | \$672.00   |                 | 25:1  | double    | 27 [239]                            | 50 [443]                               | 100 [885]                           |                    |                           |                        | 870 [196]                      | 790 [178]                      | 0.053                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA070-05A2</a>                                    | \$508.00   | 70              | 5:1   | single    | 27 [239]                            | 50 [443]                               | 100 [885]                           | 7                  | 3000                      | 6000                   | 510 [115]                      | 390 [88]                       | 0.160                                   | 95             | 90 °C [194 °F]           | 1.5 [3.3]               | IP55                 | SV(2)L-202(B)<br>SV(2)L-204(B)        |
| <a href="#">PGA070-10A2</a>                                    | \$508.00   |                 | 10:1  | single    | 18 [159]                            | 35 [310]                               | 80 [708]                            |                    |                           |                        | 640 [144]                      | 530 [119]                      | 0.140                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA070-15A2</a>                                    | \$696.00   |                 | 15:1  | double    | 18 [159]                            | 35 [310]                               | 80 [708]                            |                    |                           |                        | 740 [166]                      | 630 [142]                      | 0.140                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA070-25A2</a>                                    | \$696.00   |                 | 25:1  | double    | 27 [239]                            | 50 [443]                               | 100 [885]                           |                    |                           |                        | 870 [196]                      | 790 [178]                      | 0.130                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA070-05A3</a>                                    | \$508.00   | 70              | 5:1   | single    | 27 [239]                            | 50 [443]                               | 100 [885]                           | 7                  | 3000                      | 6000                   | 510 [115]                      | 390 [88]                       | 0.360                                   | 95             | 90 °C [194 °F]           | 1.5 [3.3]               | IP55                 | SV(2)L-201(B)                         |
| <a href="#">PGA090-10A3</a>                                    | \$601.00   |                 | 10:1  | single    | 50 [443]                            | 80 [708]                               | 200 [1770]                          |                    |                           |                        | 1200 [270]                     | 1600 [360]                     | 0.750                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA090-15A3</a>                                    | \$794.00   |                 | 15:1  | double    | 50 [443]                            | 80 [708]                               | 200 [1770]                          |                    |                           |                        | 1400 [315]                     | 1900 [427]                     | 0.720                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA090-25A3</a>                                    | \$794.00   |                 | 25:1  | double    | 75 [664]                            | 125 [1106]                             | 250 [2213]                          |                    |                           |                        | 1600 [360]                     | 2200 [495]                     | 0.710                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA090-05A4</a>                                    | \$600.00   | 90              | 5:1   | single    | 75 [664]                            | 125 [1106]                             | 250 [2213]                          | 5                  | 3000                      | 6000                   | 960 [216]                      | 1200 [270]                     | 2.900                                   | 95             | 90 °C [194 °F]           | 3.5 [7.7]               | IP55                 | SV(2)L-210(B)                         |
| <a href="#">PGA090-10A4</a>                                    | \$600.00   |                 | 10:1  | single    | 50 [443]                            | 80 [708]                               | 200 [1770]                          |                    |                           |                        | 1200 [270]                     | 1600 [360]                     | 2.800                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA090-05A5</a>                                    | \$600.00   |                 | 5:1   | single    | 75 [664]                            | 125 [1106]                             | 250 [2213]                          |                    |                           |                        | 960 [216]                      | 1200 [270]                     | 2.900                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA090-10A5</a>                                    | \$600.00   |                 | 10:1  | single    | 50 [443]                            | 80 [708]                               | 200 [1770]                          |                    |                           |                        | 1200 [270]                     | 1600 [360]                     | 2.800                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA120-15A4</a>                                    | \$997.00   | 120             | 15:1  | double    | 120 [1062]                          | 225 [1991]                             | 500 [4425]                          | 5                  | 2000                      | 4000                   | 2300 [517]                     | 3000 [674]                     | 2.800                                   | 90             | 90 °C [194 °F]           | 8.7 [19.2]              | IP55                 | SV(2)L-210(B)                         |
| <a href="#">PGA120-25A4</a>                                    | \$997.00   |                 | 25:1  | double    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 2700 [607]                     | 3700 [832]                     | 2.800                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA120-15A5</a>                                    | \$997.00   |                 | 15:1  | double    | 120 [1062]                          | 225 [1991]                             | 500 [4425]                          |                    |                           |                        | 2300 [517]                     | 3000 [674]                     | 2.800                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA120-25A5</a>                                    | \$997.00   |                 | 25:1  | double    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 2700 [607]                     | 3700 [832]                     | 2.800                                   |                |                          |                         |                      |                                       |
| <a href="#">PGA120-05A6</a>                                    | \$795.00   | 120             | 5:1   | single    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          | 5                  | 2000                      | 4000                   | 1600 [360]                     | 1900 [427]                     | 11.000                                  | 95             | 90 °C [194 °F]           | 7.8 [17.2]              | IP55                 | SV(2)M-220(B)<br>SV(2)M-230(B)        |
| <a href="#">PGA120-10A6</a>                                    | \$795.00   |                 | 10:1  | single    | 120 [1062]                          | 225 [1991]                             | 500 [4425]                          |                    |                           |                        | 2000 [450]                     | 2500 [562]                     | 11.000                                  |                |                          |                         |                      |                                       |
| <a href="#">PGA155-10A6</a>                                    | \$982.00   |                 | 10:1  | single    | 240 [2124]                          | 470 [4160]                             | 1000 [8851]                         |                    |                           |                        | 4700 [1057]                    | 4100 [922]                     | 11.000                                  |                |                          |                         |                      |                                       |
| <a href="#">PGA155-15A6</a>                                    | \$1,336.00 |                 | 15:1  | double    | 240 [2124]                          | 470 [4160]                             | 1000 [8851]                         |                    |                           |                        | 5400 [1214]                    | 4900 [1102]                    | 11.000                                  |                |                          |                         |                      |                                       |
| <a href="#">PGA155-25A6</a>                                    | \$1,336.00 | 155             | 25:1  | double    | 360 [3186]                          | 700 [6196]                             | 1250 [11063]                        | 5                  | 2000                      | 4000                   | 6400 [1439]                    | 6100 [1371]                    | 11.000                                  | 90             | 90 °C [194 °F]           | 18 [40.0]               | IP55                 | SV(2)M-220(B)<br>SV(2)M-230(B)        |
|  |            |                 | 25:1  | double    | 360 [3186]                          | 700 [6196]                             | 1250 [11063]                        |                    |                           |                        | 6400 [1439]                    | 6100 [1371]                    | 11.000                                  |                |                          |                         |                      |                                       |



# Precision Servo Gearboxes

## Dimensions – In-Line Shaft PGA Series



SureGear PGA Series In-Line Shaft Gearboxes Dimension Drawing

| SureGear® Precision Servo Gearbox Dimensions – In-Line Shaft PGA Series ( dimensions = mm [in] ) |         |        |        |        |         |         |         |         |         |        |         |         |         |         |        |        |
|--|---------|--------|--------|--------|---------|---------|---------|---------|---------|--------|---------|---------|---------|---------|--------|--------|
| Part Number  | A       | B      | C      | E      | G       | H       | J       | K       | L       | M      | N       | P       | Q       | R       | S      | T      |
| PGA050-05A1  | 88.5    | 42.0   | 24.5   | 4.0    | Ø50.0   | Ø35.0   | Ø12.0   | Ø46.0   | Ø30.0   | 5.0    | Ø8.0    | M4-     | Ø44.0   | M4-     | 4.0    | 4.0    |
| PGA050-10A1  | [3.48]  | [1.65] | [0.96] | [0.16] | [Ø1.97] | [Ø1.38] | [Ø0.47] | [Ø1.81] | [Ø1.18] | [0.20] | [Ø0.31] | 0.7x9   | [Ø1.73] | 0.7x8   | [0.16] | [0.16] |
| PGA050-15A1  | 105.0   | 42.0   | 24.5   | 4.0    | Ø50.0   | Ø35.0   | Ø12.0   | Ø46.0   | Ø30.0   | 5.0    | Ø8.0    | M4-     | Ø44.0   | M4-     | 4.0    | 4.0    |
| PGA050-25A1  | [4.13]  | [1.65] | [0.96] | [0.16] | [Ø1.97] | [Ø1.38] | [Ø0.47] | [Ø1.81] | [Ø1.18] | [0.20] | [Ø0.31] | 0.7x9   | [Ø1.73] | 0.7x8   | [0.16] | [0.16] |
| PGA070-05A1  | 112.0   | 52.0   | 36.0   | 5.0    | Ø70.0   | Ø52.0   | Ø16.0   | Ø46.0   | Ø30.0   | 5.0    | Ø8.0    | M4-     | Ø62.0   | M5-     | 5.0    | 5.0    |
| PGA070-10A1  | [4.41]  | [2.05] | [1.42] | [0.20] | [Ø2.76] | [Ø2.05] | [Ø0.63] | [Ø1.81] | [Ø1.18] | [0.20] | [Ø0.31] | 0.7x9   | [Ø2.44] | 0.8x10  | [0.20] | [0.20] |
| PGA070-05A2  | 115.0   | 65.0   | 36.0   | 5.0    | Ø70.0   | Ø52.0   | Ø16.0   | Ø70.0   | Ø50.0   | 5.0    | Ø14.0   | M5-     | Ø62.0   | M5-     | 5.0    | 5.0    |
| PGA070-10A2  | [4.53]  | [2.56] | [1.42] | [0.20] | [Ø2.76] | [Ø2.05] | [Ø0.63] | [Ø2.76] | [Ø1.97] | [0.20] | [Ø0.55] | 0.8x11  | [Ø2.44] | 0.8x10  | [0.20] | [0.20] |
| PGA070-05A3  | 130.0   | 80.0   | 36.0   | 5.0    | Ø70.0   | Ø52.0   | Ø16.0   | Ø90.0   | Ø70.0   | 6.0    | Ø19.0   | M6-     | Ø62.0   | M5-     | 5.0    | 5.0    |
| PGA070-15A1  | [5.12]  | [3.15] | [1.42] | [0.20] | [Ø2.76] | [Ø2.05] | [Ø0.63] | [Ø3.54] | [Ø2.76] | [0.24] | [Ø0.75] | 1.0x13  | [Ø2.44] | 0.8x10  | [0.20] | [0.20] |
| PGA070-15A2  | 131.0   | 52.0   | 36.0   | 5.0    | Ø70.0   | Ø52.0   | Ø16.0   | Ø46.0   | Ø30.0   | 5.0    | Ø8.0    | M4-     | Ø62.0   | M5-     | 5.0    | 5.0    |
| PGA070-25A1  | [5.16]  | [2.05] | [1.42] | [0.20] | [Ø2.76] | [Ø2.05] | [Ø0.63] | [Ø1.81] | [Ø1.18] | [0.20] | [Ø0.31] | 0.7x9   | [Ø2.44] | 0.8x10  | [0.20] | [0.20] |
| PGA070-15A2  | 136.0   | 65.0   | 36.0   | 5.0    | Ø70.0   | Ø52.0   | Ø16.0   | Ø70.0   | Ø50.0   | 5.0    | Ø14.0   | M5-     | Ø62.0   | M5-     | 5.0    | 5.0    |
| PGA070-25A2  | [5.35]  | [2.56] | [1.42] | [0.20] | [Ø2.76] | [Ø2.05] | [Ø0.63] | [Ø2.76] | [Ø1.97] | [0.20] | [Ø0.55] | 0.8x11  | [Ø2.44] | 0.8x10  | [0.20] | [0.20] |
| PGA090-10A3  | 153.0   | 80.0   | 46.0   | 7.0    | Ø90.0   | Ø68.0   | Ø22.0   | Ø90.0   | Ø70.0   | 6.0    | Ø19.0   | M6-     | Ø80.0   | M6-     | 6.0    | 6.0    |
| PGA090-05A4  | [6.02]  | [3.15] | [1.81] | [0.28] | [Ø3.54] | [Ø2.68] | [Ø0.87] | [Ø3.54] | [Ø2.76] | [0.24] | [Ø0.75] | 1.0x13  | [Ø3.15] | 1.0x12  | [0.24] | [0.24] |
| PGA090-05A4  | 170.0   | 100.0  | 46.0   | 7.0    | Ø90.0   | Ø68.0   | Ø22.0   | Ø115.0  | Ø95.0   | 8.0    | Ø22.0 * | M8-     | Ø80.0   | M6-     | 6.0    | 6.0    |
| PGA090-10A4  | [6.69]  | [3.94] | [1.81] | [0.28] | [Ø3.54] | [Ø2.68] | [Ø0.87] | [Ø4.53] | [Ø3.74] | [0.31] | [Ø0.87] | 1.25x17 | [Ø3.15] | 1.0x12  | [0.24] | [0.24] |
| PGA090-05A5  | 165.0   | 130.0  | 46.0   | 7.0    | Ø90.0   | Ø68.0   | Ø22.0   | Ø145.0  | Ø110.0  | 8.0    | Ø22.0 * | M8-     | Ø80.0   | M6-     | 6.0    | 6.0    |
| PGA090-10A5  | [6.50]  | [5.12] | [1.81] | [0.28] | [Ø3.54] | [Ø2.68] | [Ø0.87] | [Ø5.71] | [Ø4.33] | [0.31] | [Ø0.87] | 1.25x17 | [Ø3.15] | 1.0x12  | [0.24] | [0.24] |
| PGA090-15A3  | 175.0   | 80.0   | 46.0   | 7.0    | Ø90.0   | Ø68.0   | Ø22.0   | Ø90.0   | Ø70.0   | 6.0    | Ø19.0   | M6-     | Ø80.0   | M6-     | 6.0    | 6.0    |
| PGA090-25A3  | [6.89]  | [3.15] | [1.81] | [0.28] | [Ø3.54] | [Ø2.68] | [Ø0.87] | [Ø3.54] | [Ø2.76] | [0.24] | [Ø0.75] | 1.0x13  | [Ø3.15] | 1.0x12  | [0.24] | [0.24] |
| PGA120-05A6  | 225.0   | 180.0  | 70.0   | 9.0    | Ø120.0  | Ø90.0   | Ø32.0   | Ø200.0  | Ø114.0  | 8.0    | Ø35.0 * | M12-    | Ø108.0  | M8-     | 10.0   | 8.0    |
| PGA120-10A6  | [8.86]  | [7.09] | [2.76] | [0.35] | [Ø4.72] | [Ø3.54] | [Ø1.26] | [Ø7.87] | [Ø4.49] | [0.31] | [Ø1.38] | 1.75x25 | [Ø4.25] | 1.25x16 | [0.39] | [0.31] |
| PGA120-15A4  | 231.5   | 100.0  | 70.0   | 9.0    | Ø120.0  | Ø90.0   | Ø32.0   | Ø115.0  | Ø95.0   | 8.0    | Ø22.0 * | M8-     | Ø108.0  | M8-     | 10.0   | 8.0    |
| PGA120-25A4  | [9.11]  | [3.94] | [2.76] | [0.35] | [Ø4.72] | [Ø3.54] | [Ø1.26] | [Ø4.53] | [Ø3.74] | [0.31] | [Ø0.87] | 1.25x17 | [Ø4.25] | 1.25x16 | [0.39] | [0.31] |
| PGA120-15A5  | 231.5   | 130.0  | 70.0   | 9.0    | Ø120.0  | Ø90.0   | Ø32.0   | Ø145.0  | Ø110.0  | 8.0    | Ø22.0 * | M8-     | Ø108.0  | M8-     | 10.0   | 8.0    |
| PGA120-25A5  | [9.11]  | [5.12] | [2.76] | [0.35] | [Ø4.72] | [Ø3.54] | [Ø1.26] | [Ø5.71] | [Ø4.33] | [0.31] | [Ø0.87] | 1.25x17 | [Ø4.25] | 1.25x16 | [0.39] | [0.31] |
| PGA155-10A6  | 264.0   | 180.0  | 97.0   | 12.0   | Ø155.0  | Ø120.0  | Ø40.0   | Ø200.0  | Ø114.0  | 8.0    | Ø35.0 * | M12-    | Ø140.0  | M10-    | 12.0   | 8.0    |
| PGA155-15A6  | [10.39] | [7.09] | [3.82] | [0.47] | [Ø6.10] | [Ø4.72] | [Ø1.57] | [Ø7.87] | [Ø4.49] | [0.31] | [Ø1.38] | 1.75x25 | [Ø5.51] | 1.50x28 | [0.47] | [0.31] |
| PGA155-15A6  | 298.5   | 180.0  | 97.0   | 12.0   | Ø155.0  | Ø120.0  | Ø40.0   | Ø200.0  | Ø114.0  | 8.0    | Ø35.0 * | M12-    | Ø140.0  | M10-    | 12.0   | 8.0    |
| PGA155-25A6  | [11.75] | [7.09] | [3.82] | [0.47] | [Ø6.10] | [Ø4.72] | [Ø1.57] | [Ø7.87] | [Ø4.49] | [0.31] | [Ø1.38] | 1.75x25 | [Ø5.51] | 1.50x28 | [0.47] | [0.31] |

\* Dimension with supplied bushing

NOTE: See our website: [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings.



# Precision Servo Gearboxes

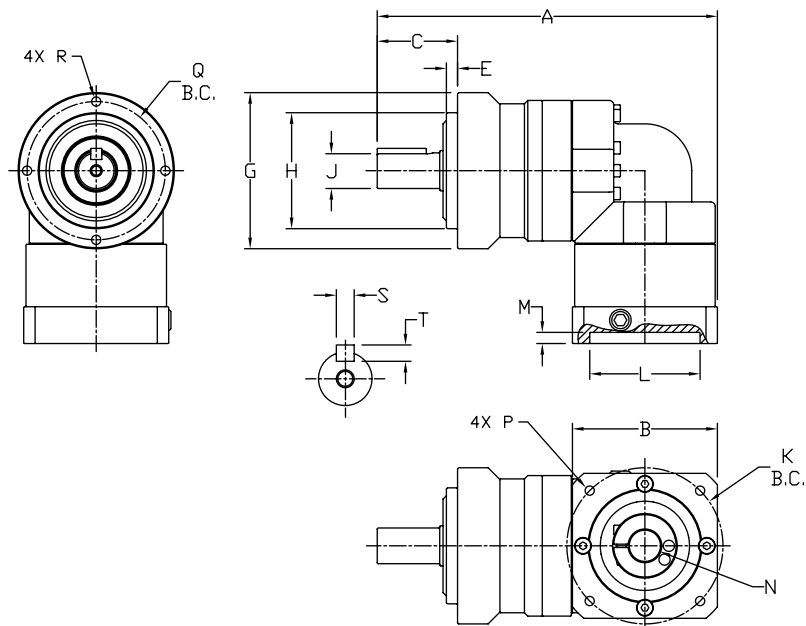
## Pricing & Specifications – Right-Angle Shaft PGB Series

| SureGear® Precision Servo Gearboxes – Right-Angle Shaft PGB Series |            |                 |       |           |                                     |  |                                     |                    |                           |                        |                                |                                |   |                |                          |                         |                                |                                       |
|--|------------|-----------------|-------|-----------|-------------------------------------|--|-------------------------------------|--------------------|---------------------------|------------------------|--------------------------------|--------------------------------|---|----------------|--------------------------|-------------------------|--------------------------------|---------------------------------------|
| Part Number  | Price      | Frame Size (mm) | Ratio | Reduction | Nominal Output Torque (N·m [lb-in]) | Max. Acceleration Torque (N·m [lb-in]) | Emergency Stop Torque (N·m [lb-in]) | Backlash (arc-min) | Nominal Input Speed (rpm) | Max. Input Speed (rpm) | Allowable Radial Load (N [lb]) | Allowable Thrust Load (N [lb]) | Moment of Inertia (kg-cm <sup>2</sup> ) | Efficiency (%) | Max. Housing Temperature | Approx Weight (kg [lb]) | Environmental Rating           | Fits SureServo Servo Motor (SV & SV2) |
| <a href="#">PGB070-05A1</a>  | \$788.00   | 70              | 5:1   | double    | 22 [195]                            | 40 [354]                               | 80 [708]                            | 6                  | 3000                      | 6000                   | 510 [115]                      | 390 [88]                       | 0.250                                   | 90 °C [194 °F] | 1.9 [4.2]                | IP55                    | SV(2)L-201(B)                  |                                       |
| <a href="#">PGB070-10A1</a>  | \$788.00   |                 | 10:1  | double    | 16 [142]                            | 32 [283]                               | 65 [575]                            |                    |                           |                        | 640 [144]                      | 530 [119]                      | 0.230                                   |                |                          |                         |                                |                                       |
| <a href="#">PGB070-15A1</a>  | \$997.00   |                 | 15:1  | triple    | 16 [142]                            | 32 [283]                               | 65 [575]                            | 740 [166]          |                           |                        | 630 [142]                      | 0.073                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB070-25A1</a>  | \$997.00   |                 | 25:1  | triple    | 24 [212]                            | 45 [398]                               | 90 [797]                            | 870 [196]          |                           |                        | 790 [178]                      | 0.071                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB070-05A2</a>  | \$788.00   |                 | 5:1   | double    | 22 [195]                            | 40 [354]                               | 80 [708]                            | 510 [115]          |                           |                        | 390 [88]                       | 0.320                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB070-10A2</a>  | \$788.00   |                 | 10:1  | double    | 16 [142]                            | 32 [283]                               | 65 [575]                            | 640 [144]          |                           |                        | 530 [119]                      | 0.300                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB070-15A2</a>  | \$997.00   |                 | 15:1  | triple    | 16 [142]                            | 32 [283]                               | 65 [575]                            | 740 [166]          |                           |                        | 630 [142]                      | 0.118                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB070-25A2</a>  | \$997.00   |                 | 25:1  | triple    | 24 [212]                            | 45 [398]                               | 90 [797]                            | 870 [196]          |                           |                        | 790 [178]                      | 0.115                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB090-15A2</a>  | \$1,217.00 | 90              | 15:1  | triple    | 45 [398]                            | 65 [575]                               | 170 [1505]                          | 9                  | 3000                      | 6000                   | 1400 [314]                     | 1900 [427]                     | 0.410                                   | 90 °C [194 °F] | 4.3 [9.5]                | IP55                    | SV(2)L-202(B)<br>SV(2)L-204(B) |                                       |
| <a href="#">PGB090-25A2</a>  | \$1,217.00 |                 | 25:1  | triple    | 65 [575]                            | 110 [974]                              | 220 [1947]                          |                    |                           |                        | 1600 [360]                     | 2200 [495]                     | 0.400                                   |                |                          |                         |                                |                                       |
| <a href="#">PGB090-05A3</a>  | \$932.00   |                 | 5:1   | double    | 65 [575]                            | 90 [797]                               | 220 [1947]                          | 960 [216]          |                           |                        | 1200 [270]                     | 2.130                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB090-10A3</a>  | \$932.00   |                 | 10:1  | double    | 45 [398]                            | 65 [575]                               | 170 [1505]                          | 1200 [270]         |                           |                        | 1600 [360]                     | 2.020                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB090-15A3</a>  | \$1,217.00 |                 | 15:1  | triple    | 45 [398]                            | 65 [575]                               | 170 [1505]                          | 1400 [314]         |                           |                        | 1900 [427]                     | 0.600                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB090-25A3</a>  | \$1,217.00 |                 | 25:1  | triple    | 65 [575]                            | 110 [974]                              | 220 [1947]                          | 1600 [360]         |                           |                        | 2200 [495]                     | 0.590                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB090-05A4</a>  | \$932.00   |                 | 5:1   | double    | 65 [575]                            | 90 [797]                               | 220 [1947]                          | 960 [216]          |                           |                        | 1200 [270]                     | 4.260                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB090-10A4</a>  | \$932.00   |                 | 10:1  | double    | 45 [398]                            | 65 [575]                               | 170 [1505]                          | 1200 [270]         |                           |                        | 1600 [360]                     | 4.150                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB120-15A4</a>  | \$1,512.00 | 120             | 15:1  | triple    | 110 [974]                           | 200 [1770]                             | 450 [3983]                          | 9                  | 3000                      | 6000                   | 2300 [517]                     | 3000 [674]                     | 4.700                                   | 90 °C [194 °F] | 10 [22]                  | IP55                    | SV(2)L-210(B)                  |                                       |
| <a href="#">PGB120-25A4</a>  | \$1,512.00 |                 | 25:1  | triple    | 150 [1328]                          | 300 [2655]                             | 550 [4868]                          |                    |                           |                        | 2700 [607]                     | 3700 [832]                     | 4.640                                   |                |                          |                         |                                |                                       |
| <a href="#">PGB120-05A5</a>  | \$1,217.00 |                 | 5:1   | double    | 120 [1062]                          | 240 [2124]                             | 500 [4425]                          | 1600 [360]         |                           |                        | 1900 [427]                     | 6.610                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB120-10A5</a>  | \$1,217.00 |                 | 10:1  | double    | 110 [974]                           | 200 [1770]                             | 450 [3983]                          | 2000 [450]         |                           |                        | 2500 [562]                     | 6.050                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB120-15A5</a>  | \$1,512.00 |                 | 15:1  | triple    | 110 [974]                           | 200 [1770]                             | 450 [3983]                          | 2300 [517]         |                           |                        | 3000 [674]                     | 4.700                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB120-25A5</a>  | \$1,512.00 |                 | 25:1  | triple    | 150 [1328]                          | 300 [2655]                             | 550 [4868]                          | 2700 [607]         |                           |                        | 3700 [832]                     | 4.640                          |   |                |                          |                         |                                |                                       |
| <a href="#">PGB120-05A6</a>  | \$1,217.00 |                 | 5:1   | double    | 120 [1062]                          | 240 [2124]                             | 500 [4425]                          | 1600 [360]         |                           |                        | 1900 [427]                     | 13.690                         |   |                |                          |                         |                                |                                       |
| <a href="#">PGB120-10A6</a>  | \$1,217.00 |                 | 10:1  | double    | 110 [974]                           | 200 [1770]                             | 450 [3983]                          | 2000 [450]         |                           |                        | 2500 [562]                     | 13.120                         |   |                |                          |                         |                                |                                       |
| <a href="#">PGB155-15A6</a>  | \$1,770.00 | 155             | 15:1  | triple    | 200 [1770]                          | 400 [3540]                             | 750 [6638]                          | 9                  | 2000                      | 4000                   | 5400 [1214]                    | 4900 [1102]                    | 15.070                                  | 90 °C [194 °F] | 20.4 [45.0]              | IP55                    | SV(2)M-220(B)<br>SV(2)M-230(B) |                                       |
| <a href="#">PGB155-25A6</a>  | \$1,770.00 |                 | 25:1  | triple    | 300 [2655]                          | 600 [5310]                             | 1100 [9736]                         |                    |                           |                        | 6400 [1439]                    | 6100 [1371]                    | 14.820                                  |                |                          |                         |                                |                                       |
| <a href="#">PGB155-05A6</a>  | \$1,401.00 |                 | 5:1   | double    | 200 [1770]                          | 400 [3540]                             | 1100 [9736]                         | 3800 [854]         |                           |                        | 3000 [674]                     | 21.280                         |   |                |                          |                         |                                |                                       |
| <a href="#">PGB155-10A6</a>  | \$1,401.00 |                 | 10:1  | double    | 200 [1770]                          | 400 [3540]                             | 750 [6638]                          | 4700 [1057]        |                           |                        | 4100 [922]                     | 19.030                         |   |                |                          |                         |                                |                                       |



# Precision Servo Gearboxes

## Dimensions – Right-Angle Shaft PGB Series



SureGear PGB Series Right-Angle Shaft Gearboxes Dimension Drawing

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

\* Dimension with supplied bushing

NOTE: See our website: [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings.



# Precision Servo Gearboxes

## Pricing & Specifications – Hub Style In-Line PGD Series

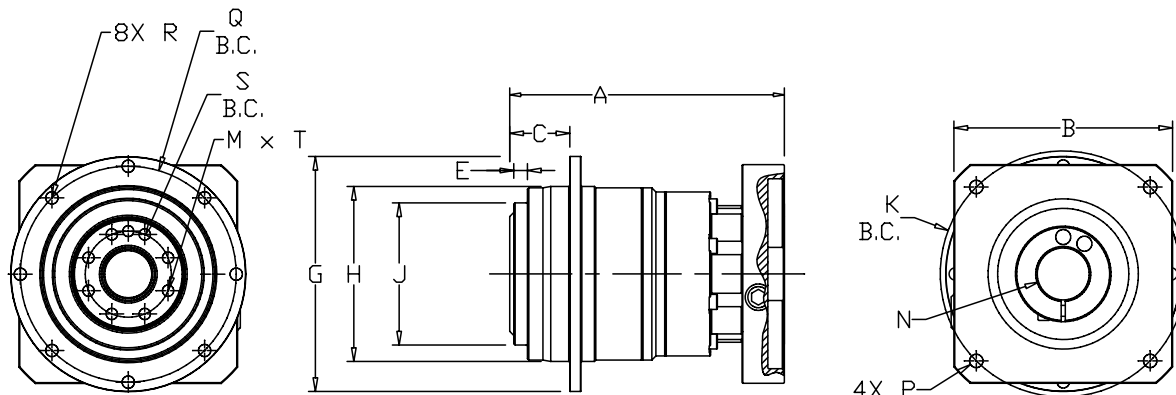
| SureGear® Precision Servo Gearboxes – Hub Style In-Line PGD Series |            |                 |       |           |                                     |  |                                     |                    |                           |                        |                                |                                |   |                |                          |                         |                                |                                |
|--|------------|-----------------|-------|-----------|-------------------------------------|--|-------------------------------------|--------------------|---------------------------|------------------------|--------------------------------|--------------------------------|---|----------------|--------------------------|-------------------------|--------------------------------|--------------------------------|
| Part Number  | Price      | Frame Size (mm) | Ratio | Reduction | Nominal Output Torque (N·m [lb-in]) | Max. Acceleration Torque (N·m [lb-in]) | Emergency Stop Torque (N·m [lb-in]) | Backlash (arc-min) | Nominal Input Speed (rpm) | Max. Input Speed (rpm) | Allowable Radial Load (N [lb]) | Allowable Thrust Load (N [lb]) | Moment of Inertia (kg-cm <sup>2</sup> ) | Efficiency (%) | Max. Housing Temperature | Approx Weight (kg [lb]) | Ingress Protection (IP) Rating | Fits SureServo Servo Motor     |
| <a href="#">PGD047-05A1</a>  | \$843.00   | 47              | 5:1   | single    | 9 [80]                              | 18 [159]                               | 35 [310]                            | ≤ 3                | 4000                      | 8000                   | 300 [67]                       | 330 [74]                       | 0.043                                   | 95             |                          | 0.7 [1.5]               |                                | SV(2)L-201(B)                  |
| <a href="#">PGD047-10A1</a>  | \$843.00   |                 | 10:1  | single    | 6 [53]                              | 12 [106]                               | 30 [266]                            |                    |                           |                        | 370 [83]                       | 450 [101]                      | 0.032                                   |                |                          |                         |                                |                                |
| <a href="#">PGD047-25A1</a>  | \$1,056.00 |                 | 25:1  | double    | 9 [80]                              | 18 [159]                               | 35 [310]                            |                    |                           |                        | 510 [115]                      | 550 [124]                      | 0.034                                   |                |                          |                         |                                |                                |
| <a href="#">PGD064-50A1</a>  | \$1,277.00 | 64              | 50:1  | double    | 27 [239]                            | 50 [443]                               | 100 [885]                           |                    |                           |                        | 850 [191]                      | 750 [169]                      | 0.049                                   | 90             |                          | 1.6 [3.5]               |                                | SV(2)L-202(B)<br>SV(2)L-204(B) |
| <a href="#">PGD064-05A2</a>  | \$1,090.00 |                 | 5:1   | single    | 27 [239]                            | 50 [443]                               | 100 [885]                           |                    |                           |                        | 400 [90]                       | 390 [88]                       | 0.1                                     |                |                          |                         |                                |                                |
| <a href="#">PGD064-10A2</a>  | \$1,090.00 |                 | 10:1  | single    | 18 [159]                            | 35 [310]                               | 80 [708]                            |                    |                           |                        | 500 [112]                      | 530 [119]                      | 0.062                                   |                |                          |                         |                                |                                |
| <a href="#">PGD064-25A2</a>  | \$1,277.00 |                 | 25:1  | double    | 27 [239]                            | 50 [443]                               | 100 [885]                           |                    |                           |                        | 680 [153]                      | 750 [169]                      | 0.054                                   | 90             |                          | 1.6 [3.5]               |                                |                                |
| <a href="#">PGD090-25A2</a>  | \$1,464.00 | 90              | 25:1  | double    | 75 [664]                            | 125 [1106]                             | 250 [2213]                          |                    |                           |                        | 1300 [292]                     | 1400 [315]                     | 0.130                                   | 90             | 90 °C [194 °F]           | 4 [8.8]                 | IP54                           | SV(2)L-207(B)                  |
| <a href="#">PGD090-50A2</a>  | \$1,464.00 |                 | 50:1  | double    | 75 [664]                            | 125 [1106]                             | 250 [2213]                          |                    |                           |                        | 1700 [382]                     | 1700 [382]                     | 0.099                                   |                |                          |                         |                                |                                |
| <a href="#">PGD090-05A3</a>  | \$1,277.00 |                 | 5:1   | single    | 75 [664]                            | 125 [1106]                             | 250 [2213]                          |                    |                           |                        | 780 [175]                      | 680 [153]                      | 0.580                                   |                |                          |                         |                                |                                |
| <a href="#">PGD090-10A3</a>  | \$1,277.00 |                 | 10:1  | single    | 50 [443]                            | 80 [708]                               | 200 [1770]                          |                    |                           |                        | 980 [220]                      | 920 [207]                      | 0.330                                   | 95             |                          | 3.6 [7.9]               |                                |                                |
| <a href="#">PGD090-05A4</a>  | \$1,277.00 |                 | 5:1   | single    | 75 [664]                            | 125 [1106]                             | 250 [2213]                          |                    |                           |                        | 780 [175]                      | 680 [153]                      | 0.580                                   | 95             |                          | 3.6 [7.9]               |                                |                                |
| <a href="#">PGD090-10A4</a>  | \$1,277.00 |                 | 10:1  | single    | 50 [443]                            | 80 [708]                               | 200 [1770]                          |                    |                           |                        | 980 [220]                      | 920 [207]                      | 0.330                                   | 95             |                          | 3.6 [7.9]               |                                |                                |
| <a href="#">PGD090-05A5</a>  | \$1,277.00 |                 | 5:1   | single    | 75 [664]                            | 125 [1106]                             | 250 [2213]                          | ≤ 3                | 3000                      | 6000                   | 780 [175]                      | 680 [153]                      | 0.580                                   | 95             |                          | 3.6 [7.9]               |                                | SV(2)M-210(B)                  |
| <a href="#">PGD110-50A2</a>  | \$1,868.00 | 110             | 50:1  | double    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 10000 [2248]                   | 6800 [1529]                    | 0.400                                   | 90             |                          | 8.6 [19]                |                                | SV(2)L-202(B)<br>SV(2)L-204(B) |
| <a href="#">PGD110-25A3</a>  | \$1,868.00 |                 | 25:1  | double    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 8200 [1843]                    | 5500 [1236]                    | 0.700                                   |                |                          |                         |                                |                                |
| <a href="#">PGD110-50A3</a>  | \$1,868.00 |                 | 50:1  | double    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 10000 [2248]                   | 6800 [1529]                    | 0.400                                   |                |                          |                         |                                |                                |
| <a href="#">PGD110-25A4</a>  | \$1,868.00 |                 | 25:1  | double    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 8200 [1843]                    | 5500 [1236]                    | 0.700                                   | 90             |                          | 8.6 [19]                |                                | SV(2)L-207(B)                  |
| <a href="#">PGD110-50A4</a>  | \$1,868.00 |                 | 50:1  | double    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 10000 [2248]                   | 6800 [1529]                    | 0.400                                   | 90             |                          | 8.6 [19]                |                                |                                |
| <a href="#">PGD110-10A5</a>  | \$1,588.00 |                 | 10:1  | single    | 120 [1062]                          | 225 [1991]                             | 500 [4425]                          |                    |                           |                        | 6200 [1394]                    | 4200 [944]                     | 1.100                                   | 95             |                          | 7.8 [17.2]              |                                |                                |
| <a href="#">PGD110-25A5</a>  | \$1,868.00 |                 | 25:1  | double    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 8200 [1843]                    | 5500 [1236]                    | 0.700                                   | 90             |                          | 8.6 [19]                |                                | SV(2)M-210(B)                  |
| <a href="#">PGD110-35A5</a>  | \$1,868.00 |                 | 35:1  | double    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 9000 [2023]                    | 6100 [1371]                    | 0.700                                   | 90             |                          | 8.6 [19]                |                                |                                |
| <a href="#">PGD110-05A6</a>  | \$1,588.00 |                 | 5:1   | single    | 180 [1593]                          | 330 [2921]                             | 625 [5532]                          |                    |                           |                        | 5000 [1124]                    | 3400 [427]                     | 2.300                                   | 95             |                          | 7.8 [17.2]              |                                | SV(2)M-220(B)<br>SV(2)M-230(B) |
| <a href="#">PGD110-10A6</a>  | \$1,588.00 |                 | 10:1  | single    | 120 [1062]                          | 225 [1991]                             | 500 [4425]                          |                    |                           |                        | 6200 [1394]                    | 4200 [944]                     | 1.100                                   | 95             |                          | 7.8 [17.2]              |                                |                                |





# Precision Servo Gearboxes

## Dimensions – Hub Style In-Line PGD Series



SureGear PGD Series Hub Style In-Line Gearboxes Dimension Drawing

| SureGear® Precision Servo Gearbox Dimensions – Hub Style In-Line PGD Series ( dimensions = mm [in] ) |                            |                   |                  |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  |                            |                            |  |                  |             |  |  |          |           |
|--|----------------------------|-------------------|------------------|------------------|-----------------|-------------------|-------------------|-------------------|-------------------|----|------------------|------------|--------------------|---------------|--------------------|------------|--|--|----------------------------|----------------------------|--|------------------|-------------|--|--|----------|-----------|
|  | Part Number                | A*                | B*               | C                | E               | G                 | H                 | J                 | K                 | M  | N**              | P          | Q                  | R             | S                  | T          |  |  |                            |                            |  |                  |             |  |  |          |           |
| 1  | PGD047-05A1<br>PGD047-10A1 | 66.5<br>[2.62]    | 42.0<br>[1.65]   | 19.5<br>[0.7677] | 3.0<br>[0.1181] | Ø72.0<br>[Ø2.83]  | Ø47.0<br>[Ø1.85]  | Ø28.0<br>[Ø1.102] | Ø46.0<br>[Ø1.811] | 4  | Ø8.0<br>[Ø0.31]  | M4-0.7x9   | Ø67.0<br>[Ø2.6378] | 3.4<br>[0.13] | Ø20.0<br>[Ø0.7874] | M3-0.5x6.5 |  |  |                            |                            |  |                  |             |  |  |          |           |
| 2  | PGD047-25A1                |                   |                  |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  |                            |                            |  |                  |             |  |  |          |           |
| 2  | PGD064-50A1                | 98.0<br>[3.86]    | 52.0<br>[2.05]   | 30.0<br>[1.1811] | 6.0<br>[0.236]  | Ø86.0<br>[Ø3.385] | Ø64.0<br>[Ø2.52]  | Ø40.0<br>[Ø1.575] | Ø70.0<br>[Ø2.756] | 8  | Ø8.0<br>[Ø0.31]  | M5-0.8x11  | Ø79.0<br>[Ø3.11]   | 4.5<br>[0.18] | Ø31.5<br>[Ø1.24]   | M5-0.8x10  |  |  |                            |                            |  |                  |             |  |  |          |           |
| 1  | PGD064-05A2<br>PGD064-10A2 | 82.0<br>[3.228]   |                  |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  |                            |                            |  |                  |             |  |  | M5-0.8x4 |           |
| 2  | PGD064-25A2                | 103.0<br>[4.055]  | 65.0<br>[2.56]   |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  |                            |                            |  |                  |             |  |  |          | M5-0.8x10 |
| 2  | PGD090-25A2<br>PGD090-50A2 | 122.0<br>[4.803]  |                  | 29.0<br>[1.142]  | 6.0<br>[0.236]  | Ø118.0<br>[Ø4.65] | Ø90.0<br>[Ø3.54]  | Ø63.0<br>[Ø2.48]  | Ø90.0<br>[Ø3.543] | 8  | Ø14.0<br>[Ø0.55] | M6-1.0x13  | Ø109.0<br>[Ø4.30]  |               | Ø50.0<br>[Ø1.9685] |            |  |  |                            |                            |  |                  |             |  |  |          |           |
| 1  | PGD090-05A3<br>PGD090-10A3 | 110.0<br>[4.33]   | 80.0<br>[3.15]   |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  |                            |                            |  |                  |             |  |  |          |           |
| 1  | PGD090-05A4<br>PGD090-10A4 |                   | 100.0<br>[3.94]  |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  |                            | Ø115.0<br>±0.2<br>[Ø4.528] |  |                  | M8-1.25x17  |  |  |          |           |
| 1  | PGD090-05A5                | 127.0<br>[5.0]    | 130.0<br>[5.12]  |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  |                            | Ø145.0<br>±0.2<br>[Ø5.709] |  |                  |             |  |  |          |           |
| 2  | PGD110-50A2                | 159.5<br>[6.28]   | 65.0<br>[2.56]   | 29.0<br>[1.142]  | 6.0<br>[0.236]  | Ø145.0<br>[Ø5.70] | Ø110.0<br>[Ø4.33] | Ø80.0<br>[Ø3.15]  | Ø70.0<br>[Ø2.756] | 15 | Ø14.0<br>[Ø0.55] | M8-1.25x17 | Ø135.0<br>[Ø5.315] | 5.5<br>[0.22] | Ø63.0<br>[Ø2.48]   | M6-1.0x12  |  |  |                            |                            |  |                  |             |  |  |          |           |
| 2  | PGD110-25A3<br>PGD110-50A3 | 169.5<br>[6.673]  | 80.0<br>[3.15]   |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  | Ø90.0<br>[Ø3.543]          |                            |  |                  |             |  |  |          |           |
| 2  | PGD110-25A4<br>PGD110-50A4 | 186.5<br>[7.3425] | 100.0<br>[3.94]  |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  | Ø115.0<br>±0.2<br>[Ø4.528] |                            |  |                  |             |  |  |          |           |
| 1  | PGD110-10A5                | 159.0<br>[6.26]   |                  |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  | Ø145.0<br>±0.2<br>[Ø5.709] |                            |  |                  |             |  |  |          |           |
| 2  | PGD110-25A5<br>PGD110-35A5 | 186.5<br>[7.3425] | 130.0<br>[5.12]  |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  |                            |                            |  |                  |             |  |  |          |           |
| 1  | PGD110-05A6<br>PGD110-10A6 | 180.0<br>[7.087]  | 180.0<br>[7.087] |                  |                 |                   |                   |                   |                   |    |                  |            |                    |               |                    |            |  |  | Ø200.0<br>±0.2<br>[Ø7.874] |                            |  | Ø38.0<br>[Ø1.45] | M12-1.75x25 |  |  |          |           |

\* Length will vary depending on motor

\*\* Bushing will be inserted to adapt to motor shaft

NOTE: See our website: [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings.



# Precision Servo Gearboxes

## SureGear® Servo Gearbox Replacement Parts



| SureGear® Precision Servo Gearboxes – Replacement Parts |         |   |
|---|---------|---|
| Part Number   | Price   | Description   |
| <b><u>PG050-KEY</u></b>                                 | \$4.50  | Output Shaft Key, replacement, 4 x 4 x 14 mm, for SureGear PGA050 series gearboxes.   |
| <b><u>PG070-KEY</u></b>                                 | \$4.50  | Output Shaft Key, replacement, 5 x 5 x 22 mm, for SureGear PGA070 and PGB070 series gearboxes.  |
| <b><u>PG090-KEY</u></b>                                 | \$4.50  | Output Shaft Key, replacement, 6 x 6 x 28 mm, for SureGear PGA090 and PGB090 series gearboxes.  |
| <b><u>PG120-KEY</u></b>                                 | \$4.50  | Output Shaft Key, replacement, 10 x 8 x 45 mm, for SureGear PGA120 and PGB120 series gearboxes.   |
| <b><u>PG155-KEY</u></b>                                 | \$4.50  | Output Shaft Key, replacement, 12 x 8 x 65 mm, for SureGear PGA155 and PGB155 series gearboxes.   |
| <b><u>PGA4-A5-BUSH</u></b>                              | \$22.50 | Input Shaft Bushing, replacement, 28 x 22 x 30.5 mm, for all SureGear gearboxes using SV(2)L-210(B) and SV(2)M-210(B) SureServo motors. |
| <b><u>PGA6-BUSH</u></b>                                 | \$22.50 | Input Shaft Bushing, replacement, 38 x 35 x 36 mm, for all SureGear gearboxes using SV(2)M-220(B) and SV(2)M-230(B) SureServo motors.   |