DC Tachometer Generators
**Technical Data**

*An Industry Standard for over fifty years.*

A Servo-Tek DC tachometer generator provides a convenient and economical means of converting rotational speed into an isolated analog voltage signal suitable for remote indication and control. While this catalog contains information on our most popular models, we also manufacture countless special tach generators.

**Construction**

Most of our DC tach generators are housed in aluminum casings protected in accordance with Mil-C-5541 or Mil-A-8625 or high performance plastics. Alnico permanent magnets are used. Armature shafts are stainless-steel, and rotate on fully shielded stainless-steel ball bearings. Commutators are manufactured from an alloy containing at least 90% silver. Armature laminations are wound with Isomid insulated wire, over Teflon slot insulation. The entire armature is then baked, resulting in a NEMA Class H insulation system.

**Linearity**

Linearity at any speed is better than 0.1% of the output at that RPM.

**Bidirectional Operation**

All Servo-Tek tachometer generators operate in either rotational direction. That direction can be determined by output voltage polarity. Output (in either direction) is held to a tolerance of 0.25% of the average output.

**Stability**

Optimum brush and commutator combination gives 0.1% stability. Highly stable output gives no evidence of long-term drift.

**Breakdown Voltage**

Servo-Tek DC tachometer generators are factory tested with an AC potential of 1250 volts RMS applied for one second between (either) terminal and shaft. E-Series units are tested with 500 volts.

**Temperature Range**

Most of our DC tachometer generators are designed for continuous operation in ambient temperatures ranging from -55°C to +100°C. Voltage output at 25°C will not deviate by more than 0.01% per degree of change within the range of -20°C to +75°C. All units are temperature compensated, with the exception of D-Series and E-Series tach generators.

**Ripple**

The ripple RMS value will not exceed 3% of the DC value at any speed in excess of 40 RPM on standard units. On the low ripple units, the ripple RMS value will not exceed 1.5% of the DC value. A peak to peak ripple of 1.5% is available on some models.
A-Series
1 to 10 volts/1000 RPM

B-Series
11 to 24 volts/1000 RPM

A-Series Tachometer Generators
Instrument Type:
• 0.120 inch shaft diameter
• Small in size
• Ideally suited to instrumentation applications

Industrial Type:
• 0.187 inch shaft diameter
• Special front-end bearings for radial loads
• Ideal for pulley and belt drive applications

A-Series and B-Series Specifications

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<tbody>
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<td>SA-740A-7</td>
<td>Face</td>
<td>3.0 oz</td>
<td>1.32 x 10⁻⁴</td>
<td>2.6v</td>
<td>12,000</td>
<td>40Ω</td>
<td>0.024h</td>
<td>Fig. 10</td>
<td>Fig. 1</td>
<td>.120</td>
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<td>350Ω</td>
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<td>Fig. 2</td>
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<td>Fig. 1</td>
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<td>SB-757A-2</td>
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<td>7.0v</td>
<td>12,000</td>
<td>350Ω</td>
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<td>Fig. 2</td>
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<td>1000Ω</td>
<td>0.56h</td>
<td>Fig. 10</td>
<td>Fig. 1</td>
<td>.120</td>
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<td>20.8v</td>
<td>8,000</td>
<td>1000Ω</td>
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<td>1000Ω</td>
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<td>Fig. 11</td>
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<td>.187</td>
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B-Series Tachometer Generators
As is the case with the A-Series DC tachometer generator, the B-Series also comes in instrument and industrial configurations. Depending on the unit, the output voltage ranges between 11 and 24 V/1000 RPM. Electrical characteristics, ripple, linearity and temperature effects are the same as the A-Series.

Other shaft sizes and mounting configurations are available for most Servo-Tek generators.
D-Series Tachometer Generators
With rugged construction and high output voltages, the D-Series tach generator is ideally suited to a variety of industrial applications.

The flange mounting arrangement provides a convenient assembly method, and the sturdy .187 shaft diameter permits the heavier loading frequently encountered where pulleys or belt drives are employed. The output bearing is fitted with a seal to help prevent the contamination that can occur in industrial applications.

With output up to 50V/1000 RPM, D-Series generators are ideal for applications where high output voltages are required. Typically, these are slow speed applications.

E-Series Tachometer Generators
The E-Series DC tachometer generator is the smallest tach generator among those offering similar technical characteristics. Many outstanding features make it particularly suitable for use in all types of servo systems. Although the diameter is only 0.760” the E-Series provides up to 3 V/1000 RPM output.

Almost any Servo-Tek DC tachometer generator can be manufactured with special configurations, various electrical specs and shaft modifications such as flats, pinions, holes, etc. Consult sales department regarding your special requirements.

D-Series and E-Series Specifications

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<td>SU-780D-1</td>
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<td>Fig. 5</td>
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<td>Fig. 6</td>
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Maximum Driving Torque for D-Series and E-Series is 0.25 oz-in
Most units listed above are normally in stock
Low Ripple Units (F-Series, H-Series and J-Series)
1 to 30 volts/1000 RPM

**F-Series (1-8 volts/1000 RPM)**
Servo-Tek low ripple DC tachometer generators satisfy the need for a cost effective, very low ripple tachometer. In addition to being the first economical low ripple units of their type, the F-Series tachometers incorporate all the desirable features of the standard units such as temperature compensation, long brush life, excellent linearity, and small dimensions.

The ripple voltage does not exceed 1.5% RMS and 3.5% peak to peak at any speed in excess of 40 RPM on any F-Series, H-Series or J-Series DC tachometer generator.

**H-Series (5-16 volts/1000 RPM)**
The H-Series DC tachometer generators are low ripple units possessing all the same traits as the F-Series, but with the B-length armature. This means a slightly higher output voltage.

**J-Series (16-30 volts/1000 RPM)**
The J-Series DC tachometer generators are low ripple units possessing all the same traits as the F-Series, but with the D-length armature. These generators are ideal for applications where high output voltages with low ripple signals are required.

Other shaft sizes and mounting configurations are available.

**F-Series, H-Series and J-Series Specifications**

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<td>1.32 x 10⁻⁴</td>
<td>7.0v ± 3%</td>
<td>12,000</td>
<td>500Ω</td>
<td>0.38h</td>
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<td>Fig. 1</td>
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<td>CS-7514F-51C</td>
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<td>Fig. 3</td>
<td>.250</td>
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<td>1.96 x 10⁻⁴</td>
<td>16.0v ± 3%</td>
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<td>800Ω</td>
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<td>Flange</td>
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<td>30v ± 1%</td>
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<td>1050Ω</td>
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<td>.187</td>
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Maximum Driving Torque for F-Series, H-Series and J-Series is 0.25 oz-in at 25°C
Most units listed above are normally in stock
Sealed DC Tachometers
1 to 45 volts/1000 RPM

Servo-Tek’s Ruggedized
PY Alternative (Up to 50 volts)

Sealed Tachometer Generators
Servo-Tek manufactures a complete line of sealed units which are resistant against the harmful effects of fluids. These units employ a one-piece housing, a special shaft seal, and a form-fitted rubber boot on the terminal end. Servo-Tek sealed units meet electrical specifications after storage at 49°C with 95% relative humidity for 24 hours. These units are capable of enduring vibration with amplitudes up to 0.03” total excursion at frequencies from 4 Hz to 55 Hz in each of three mutually perpendicular axes with no evidence of physical damage. These units are available with a low ripple output up to 30V/1000 RPM.

Sealed DC Tachometer Generator Specifications

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<td>1.32 x 10⁻⁴</td>
<td>2.6v</td>
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<td>40Ω</td>
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<td>Fig. 8</td>
<td>Fig. 8</td>
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<td>7.0v</td>
<td>12,000</td>
<td>350Ω</td>
<td>0.18h</td>
<td>Fig. 8</td>
<td>Fig. 8</td>
<td>.120</td>
</tr>
<tr>
<td>ST-7336B-1</td>
<td>Face</td>
<td>4.0 oz</td>
<td>2.27 x 10⁻⁴</td>
<td>20.8v</td>
<td>8,000</td>
<td>1000Ω</td>
<td>0.56h</td>
<td>Fig. 8</td>
<td>Fig. 8</td>
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<td>ST-7337A-2</td>
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<td>12,000</td>
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<td>1000Ω</td>
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<tr>
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<td>45v</td>
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Maximum Driving Torque for a sealed DC tachometer generator is 0.7 oz-in
Most units listed above are normally in stock.
Overhung Tachometer
1 to 24 volts/1000 RPM

ST-7565 Series
Introducing Servo-Tek’s new low-cost overhung tachometer. This bearingless tach-generator is small in size and has a black delrin housing and end plate. Because the Servo-Tek overhung unit is self-generating and provides an analog output, it makes for an excellent alternative to the encoder. No D-A conversion will be necessary! Mounts easily using a 10-32 threaded shaft. No coupling or mounting brackets will be required.

Part Number: ST-7565A-2
Output Voltage: 7 VDC ± 5%, no load, per 1000 RPM at 25ºC
Internal Resistance: 270 Ohms typical at 25ºC
Ripple: 5% RMS of DC output voltage at speeds over 40 RPM
Linearity: 0.1% max., 0 to 4000 RPM
Bidirectional Output: 0.5% of nominal output in both CW and CCW directions
Polarity: Red wire positive with CCW rotation viewing shaft end
Temperature Coefficient: 0.05% per ºC of nominal output at 25ºC from -20ºC to 50ºC

Accessories
Rubber Couplings
ST-9502-1 fits .120 shafts and ST-9502-2 fits .187 shafts. The tapered tang is molded to fit a straight slot 0.167”±.005” wide and 3/16” deep.

Flexible Couplings
ST-9776 fits shaft diameters of up to .375 shafts. They may be ordered in any mixed or matched configuration. When ordering, please specify both hole sizes.

Other Products
ST50 Optical Encoder
The ST50, a 2 inch hollow shaft encoder, accepts motor shafts from .236 to .625 inches OD. It combines 3 phase brushless commutation pulses, 2 data channels and reference index pulse in a single package.

ST20 Optical Encoder
The ST20, a 2 inch shaft encoder, is a low cost, heavy duty solution to digital feedback. This unit is available in single or dual channel with nearly unlimited mounting patterns.

Request a Servo-Tek RC-800 catalog for our complete product line of encoders.
Mounting and Outline Dimensions

Figure 1 SA Face Mount

Figure 2 SB Flange Mount

Figure 3 SD Modified Synchro

Figure 4 SM Aircraft Mount

Figure 5 SU Large Flange Mount

Figure 6 SS Synchro Mount

Figure 7 Aircraft Configuration

Figure 8 Sealed Configuration

Figure 9 Flat Shaft Configuration

Figure 10 Instrument/Industrial Configuration

Figure 11 Industrial Configuration

Figure 12 E-Series Tachometers