

# Actuator Product Guide

*Rotary Servo Actuators • Linear Actuators • Amplifiers • Transducers*



**A complete product line of actuator solutions for the most demanding applications.**

- Military and Commercial Aircraft
- Target Drones
- Unmanned Vehicles
- Military Land and Sea Vehicles
- Military Security Applications

**MOOG**  
COMPONENTS GROUP

# Rotary Servo Actuators

**Moog Components Group** has been designing and producing specialized high technology and utility electromechanical actuators for over 20 years. Total in-house design, engineering and manufacturing expertise for these products.

## Rotary Servo Actuators

Rotary brush motor servo actuators utilize brush-type DC motors using both Alnico and rare earth magnets. These units have been designed with separate or imbedded analog or digital amplifiers, spur gearing and potentiometers as feedback devices. Typical applications include UAV, RPV, target drones and utility aircraft applications.

### Model 808

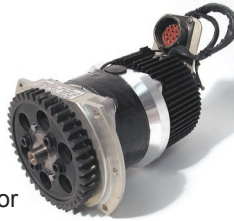
The 808 Rotary Servo Actuator is used to position the control surfaces and utility functions of a reconnaissance unmanned air vehicle and is designed to operate under extreme environmental conditions.



- Size: 1.1 x 2.7 x 4.0 inches
- Power: 28 VDC
- Peak torque: 100 in-lbs max
- Lightweight
- Robust structural design
- High efficiency steel gearing
- Mechanical stops
- Environmental seal
- Embedded controller
- Internal mechanical slip clutch to prevent gear damage when impacting the stops
- Hybrid output stage
- Internal torque limiting
- Surface mount implementation
- RS-422/RS-485 command options
- $\pm 10$  VDC analog command
- R/C command option
- 3 gear ratios available
- No load speed: 150-510 deg/sec depending on gear ratio
- Rated load and speed: consult factory for motor and gear ratios
- Stroke:  $\pm 51.5^\circ$  and others available

### Model 813

The Model 813 Rotary Brushless Actuator is an antenna azimuth drive servo actuator used for airborne radar applications including scan and sector modes.



- Size: 4.33 diameter x 7.76 inches long from back of brake to front of mounting flange
- Power: 28 VDC
- Rated Power Point: 320 in-lbs @ 25 rpm
- Weight: 12.5 lbs
- Rare earth brushless DC resolver commutated motor
- Fail-safe electromagnetic brake with manual disengage
- Robust structural design
- Low endplay
- Harmonic Drive™ gearbox
- Front flange mount
- Stroke: continuous rotation
- No-load speed: 45 rpm
- Low temperature operation to  $-94^\circ$  F with heat blanket

### The Model 817

The Model 817 Rotary Servo Actuator is used to position the control surfaces of a target drone or unmanned air vehicle and is designed to meet the extreme operating and environmental conditions including submersion in water.

- Size: 1.60 x 4.51 x 5.00 inches from front of mounting flange to rear of housing
- Power: 28 VDC
- Rated Power Point: 80 in lbs @ 125 deg/sec
- Weight: 2.8 lbs
- Stall torque: 300 in-lbs
- NFeB brushless DC motor with Hall sensor commutation
- $\pm 10$  VDC or  $\pm 15$  VDC command signal input
- Electronic position and torque limiting
- Position output command
- Current output signal option
- Film position transducer
- Robust structural design
- Low endplay

- High efficiency steel gearing
- Front mount
- Stroke:  $\pm 30^\circ$  Or  $\pm 90^\circ$  electrical stroke
- No-load speed: 137 deg/sec
- Bandwidth to 10 Hz
- Non-jamming mechanical stops
- Sealed to withstand submersion to 10 feet of water

### Model 819 and 820

The 819 and 820 Rotary Servo Actuators are used to position the throttle and control surfaces of a Remotely Piloted Vehicle (RPV). These actuators are designed to operate under extreme environmental conditions.



- Size: 1.5 x 3.2 x 4.5 inches
- Power: 28 VDC
- Power point:
  - 819 - 4.4 deg/sec @70 in-lbs
  - 820 - 160 deg/sec @80 in-lbs
- Weight: 1.2 lbs
- Peak torque: 150 in-lbs\*
- Brushless DC motor
- Electronic position and torque limiting
- Film position transducer
- Position output signal
- RS-422/RS-485 command options
- $\pm 10$  VDC input command signal
- R/C command option
- Low backlash
- Robust structural design
- Mechanical stops
- High efficiency steel gearing
- No load speed:
  - 819 - 6.0 deg/sec\*
  - 820 - 190 deg/sec\*
- Stroke:  $\pm 45^\circ$ , plus others

\*Typical values. Contact factory for available gear ratios.

### Model 865-66

The Model 865-66 Rotary Servo Actuator is used to position the control surfaces of a reconnaissance unmanned air vehicle, and is designed to operate under extreme environmental conditions.



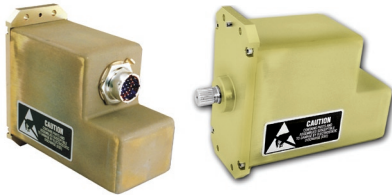
- Size: 2.3 x 4.75 x 5.0 Inches
- Power: 28 VDC and  $\pm 15$  VDC

# Rotary Servo Actuators

- Weight: 3 lbs
- Peak torque: 300 in-lb
- SmCo permanent magnet DC motor
- Electronic position and torque limiting
- Film position transducer
- Position output signal
- ±10 VDC input command signal
- Current output signal
- Low backlash
- Robust structural design
- Mechanical stops
- High efficiency steel gearing
- No load speed: 160-220 deg/sec
- Stroke: ±46°

## Model 905-01-04

The Model 905 Rotary Servo Actuator is used to position the control surfaces of the AQM-37D target drone and is designed to operate under extreme environmental conditions.



- Size: 2.3 x 4.9 x 5.4 inches
- Power: 28 VDC and ±15 VDC
- Power point: 150 in-lbs @ 175 deg/sec
- Weight: 3 lbs
- Peak torque: 300 in-lbs
- Analog command input
- SmCo permanent magnet DC motor
- Electronic position and torque limiting
- Film position transducer
- Fail-safe brake (-01 only)
- ±10 VDC input command signal
- Low backlash
- Robust structural design
- High efficiency steel gearing
- Mechanical stops
- Position output signal
- No load speed: 250 deg/sec
- Stroke: ±33°

## Model 915

The Model 915 Rotary Servo Actuator is used to position the control surfaces of the QF-4 unmanned air vehicle and is designed to operate under extreme environmental conditions.



- Size: 4.95 x 4.5 x 6.2 inches
- Power: 28 VDC
- Weight: 7 lbs
- Peak torque: 300 in-lbs
- Analog command input
- Electronic position and torque limiting
- Film position transducer
- Output shaft disconnect clutch
- Low backlash
- ±10 VDC input command signal
- Robust structural design
- High efficiency steel gearing
- Position output signal
- No load speed: 250 deg/sec
- Stroke: ±46°

## Model 935

The Model 935 Rotary Servo Actuator is used to position the control surfaces plus utility applications unmanned air vehicles. This unit is design to operate under demanding environmental requirements seen worldwide.



- Size: 2.33 x 4.80 x 5.60 inches
- Power: 28 VDC
- Rated Power Point: 350 in lbs @ 120 deg/sec
- Weight: 3.2 lbs
- Stall torque: 600 in lbs
- SMCO permanent magnet DC brush motor or rare earth brushless DC motor
- ±10 VDC analog input command
- R/C command option
- RS-422/RS-485 command options
- Robust structural design
- Low endplay
- High efficiency steel gearing
- Position and current output signal
- Electronic position and torque limiting
- Non-jamming mechanical stops
- Film position transducer

- Front flange mount
- Stroke: ±46° electrical stroke
- No-load speed: 180 deg/sec
- Bandwidth to 8 Hz
- MTBF: 5000 hr

## Model 940

The Model 940 Rotary Brushless Actuator is qualified for airborne applications to control the rotational function of the aircraft's targeting system. The actuator operates as a position servo with an external controller.



- Size: 3.188 x 3.15 x 4.69 inches long from back of brake to rear of mounting flange
- Power: 270 VDC
- Rated Power Point: 165 in lb @ 231 rpm
- Weight: 2.8 lbs
- Rare earth brushless DC resolver commutated motor with thermister
- Fail-safe electromagnetic brake
- Robust structural design
- Low endplay
- High efficiency planetary steel gearing
- Front flange mount (rear surface)
- Stroke: continuous rotation
- Stall torque: 190 in lbs minimum
- No-load speed 312 rpm
- 1 & 5 speed position resolvers

## Model 946-01

(not for new designs)  
The Model 946 Servo System which is qualified for use on the AQM-37C target is configured with three components: a servo amplifier Model 94610000, a Rotary Aileron Actuator Model 94620000 and a Rotary Canard Actuator Model 94630000. The servo accepts an analog command signal to control the actuators output position.



- Size: 2.33 x 4.8 x 4.54 inches
- Voltage: 28 VDC and 28 VDC regulated
- Weight: 4 lbs
- Analog command input
- SmCo permanent magnet DC motor
- Electronic position and torque limiting

# Rotary Servo Actuators

- Film position transducer
- Canard E.M. brake
- Low backlash
- Robust structural design
- High efficiency steel gearing
- Position output signal
- Stroke:  $\pm 36.5^\circ$  Aileron  
43.8° CW Canard / 29.2° CCW Canard



## Model 980-10 and 980-20

The Model 980 Rotary Brushless Actuator System is an antenna azimuth drive servo actuator system consisting of the actuator motor/gearhead, separate controller and interconnecting cables. The system is used for ground vehicle radar applications in full and sector scan modes.

- Size: 4.06 x 4.06 (over mounting flange) x 14.00 inches from rear of motor assembly to front of mounting flange (Model 98000000-10 Actuator)
- Size: 11.0 x 11.0 mounting base x 7.00 inches high (Model 98000000-20 Drive Controller)
- Rated Power Point: 168 in lb @ 183 rpm
- Weight: 17.3 lbs actuator only
- Input Power: 3 Phase 120/208 400 Hz
- Rare earth brushless DC Hall sensor commutated motor with thermistors
- Encoder rate feedback
- Robust structural design
- Low endplay
- High efficiency planetary steel gearing
- Front flange mount
- Stroke: continuous rotation
- Stall point: 1,650 in lbs
- No-load speed: 230 rpm (limited by controller)
- Scan, sector and stare modes
- Bit test outputs
- Separately package drive controller that accepts RS-232 commands

## Model 873

The Model 873 Rotary Brushless Actuator is used to control the rotational function of the aircraft's night vision targeting system.



- Size: 1.6 x 3.5 x 5.8 inches
- Power: 150 VDC and  $\pm 15$  VDC
- Power point: 40 in-lb @ 621 rpm
- Weight: 3.9 lbs
- Peak torque: 135 in-lbs
- $\pm 10$  VDC analog command input
- SmCo permanent magnet DC brushless motor
- 1 & 16 speed resolver
- Fail safe brake
- Very low backlash
- Robust structural design
- High efficiency steel gearing
- No load speed: 660 rpm

## Model 874

The Model 874 Rotary Brushless Actuator is used to control the derotational function of the aircraft's night vision targeting system.



- Size: 1.25 x 2.35 x 4.0 inches
- Power: 150 VDC and  $\pm 15$  VDC
- Power point: 12 in-lb @ 660 rpm
- Weight: 1.4 lbs
- Peak torque: 30 in-lbs
- $\pm 10$  VDC analog command input
- SmCo permanent magnet DC brushless motor
- 1 speed resolver
- Tachometer
- Very low backlash
- Robust structural design
- High efficiency steel gearing
- No load speed: 790 rpm

## Model 875

The Model 875 Rotary Brushless Actuator is used to control the shroud function of the aircraft's night vision targeting system.



- Size: 2.2 x 2.6 x 6.8 inches
- Power: 150 VDC and  $\pm 15$  VDC
- Power point: 21 in-lb @ 230 rpm
- Weight: 3.0 lbs
- Peak torque: 46 in-lbs
- $\pm 10$  VDC analog command input
- SmCo permanent magnet DC brushless motor
- 1 speed resolver
- Tachometer
- Fail-safe brake
- Very low backlash
- Robust structural design
- High efficiency steel gearing
- No load speed: 320 rpm

## Model 905-30

The Model 905-30 Rotary Servo Actuator is used to position the control surfaces of a reconnaissance unmanned air vehicle and is designed to operate under extreme environmental conditions.



- Size: 2.3 x 4.9 inch foot print and 5.4 inches long
- Power: 28 VDC
- Power point: 150 in-lb @ 25 rpm
- Weight: 3.0 lbs
- Peak torque: 300 in-lbs
- $\pm 10$  VDC analog command input
- Brushless permanent magnet DC motor
- Electronic position and torque limiting
- Film position transducer
- Position output signal
- Current output signal
- Low backlash
- Robust structural design
- High efficiency steel gearing
- Mechanical stops
- Bandwidth to 10 Hz
- No load speed: 35 rpm
- Stroke:  $\pm 46^\circ$

## Model 917

Our military qualified Model 917 Rotary Brushless Actuator is an azimuth drive servo for an airborne rate and position antenna



# Rotary Servo Actuators

system. The Model 918 Servo Actuator provides the pitch roll-yaw functioning for this system.

- Size: 11.30 x 4.59 x 6.53 inches
- Power: 115 VRMs, 400 Hz
- Weight: 11 lbs
- Command:  $\pm 10$  VDC
- Position feedback: resolver
- High efficiency steel gearing
- Rate feedback: brushless DC tachometer
- Fail-safe brake: optional
- Inertial loads: to 4200 lbs-in<sup>2</sup>
- Scan Modes: 48, 91, 96, 153, 160, 320 480 and 960 rpm
- Sector Mode :  $\pm 48^\circ$
- Bit test outputs
- Robust structural design
- MTBF: 5000 hrs

## Model 918

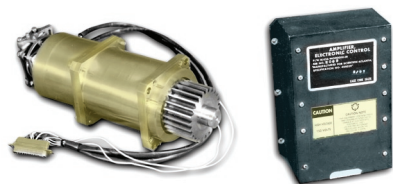
Our military qualified Model 918 Rotary Brushless Stepper Actuator controls the pitch-roll-yaw function of an antenna system in conjunction with the Model 917 azimuth drives.



- Size: 4.06 x 2.50 x 4.35 inches
- Power: 20 VDC
- Weight: 2 lbs
- Command:  $\pm 10$  VDC
- No-load speed: 300 rpm
- Fail-safe brake: none
- Inertial loads: 3 lb-in<sup>2</sup>
- Position accuracy:  $\pm 0.5^\circ$
- Backlash: 30 arc-minutes
- MTBF: 5000 hrs
- Stroke:  $\pm 3600^\circ$
- Robust structural design
- High efficiency steel gearing

## Model 961 and 962

Our Model 961 Rotary Actuator in conjunction with the Model 962 Transconductance Amplifier may be used for the antenna's azimuth and elevation rotary function, or similar high torque applications.



- Size: 3.055 x 3.055 x 8.24 (961 only)
- Power point: 750 in-lb @ 30 rpm
- Weight: 13.6 lbs
- Peak torque: 1100 in-lbs
- Qualified design
- Rugged construction
- Brushless permanent magnet DC motor
- Broad operating temperature range
- E.M. brake with manual operation
- 150 VDC system
- $\pm 10$  VDC position command signal
- No load speed: 40 rpm

## Model 965

The Model 965 Rotary Servo Actuator is used to position the control surfaces plus utility applications in unmanned air vehicles.



This unit is designed to operate under the demanding environmental requirements seen worldwide.

- Size: 3.50 x 7.10 x 8.90 inches long from front of mounting flange to rear of housing
- Power: 28 VDC
- Rated Power Point: 2200 in lbs @ 35 deg/sec
- Weight: 10.7 lbs
- Peak torque: 2500 in lbs
- SMC permanent magnet DC brush motor
- $\pm 10$  VDC analog input command
- Robust structural design
- Low endplay
- High efficiency steel gearing
- Position output signal
- Electronic position and torque limiting
- Non-jamming mechanical stops
- Film position transducer
- Front flange mount
- Stroke:  $\pm 45^\circ$  electrical stroke
- Bandwidth to 8 Hz
- No-load speed: 87 deg/sec
- MTBF: 5000 hr

## Model 971

Our military qualified Model 971 Rotary, Brushless, Stepper Motor. Limited Rotation Trim Actuator for the military helicopter.



- Size: 3.0 x 3.48 x 6.56 inches
- Power: 28 VDC
- Weight: 3.2 lbs
- Holding torque: 200 in-lbs
- Command: four phase stepper motor control from an external amplifier
- Stroke:  $\pm 30^\circ$
- Step rate: 1 rpm
- Step size:  $0.1^\circ$
- Load rate: 15 in-lbs @ 0.6 rpm
- Eddy current damper
- Backlash:  $0.15^\circ$
- MTBF: 5000 hrs

## Model 993

Our Model 993 Rotary Servo Actuator provides mechanical valve control of the aircraft's hydraulic flight control surfaces.

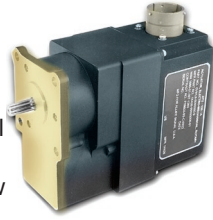


- Size: 4.10 inch diameter x 7.9 inches
- Power: 28 VDC
- Power point: 200 in-lb @ 96 deg/sec
- Weight: 7.4 lbs
- Peak torque: 205 in-lb
- Brushless motor with Hall sensor electronic commutation
- Brushless RVDT position transducer
- Derived tach signal
- BIT logic outputs
- Robust structural design
- Clutched output
- High efficiency spur gearing
- Pulse width modulated motor power
- Tach signal output
- $\pm 10$  VDC input command signal to position signal output
- Torque output limit electronics
- Position or rate servo operation
- Low backlash
- High reliability - 60,000 hour MTBF
- No load speed: 110 deg/sec
- Stroke:  $\pm 120^\circ$

# Rotary Servo Actuators / Linear Actuators

## Model 995

Our 995 Rotary Servo Actuator provides mechanical control of the aircraft's rudder yaw dampening function during autopilot engagement.



- Size: 4.50 x 5.70 x 2.70 inches
- Power: 28 VDC
- Power point: 60 in-lb @ 60 deg/sec
- Weight: 3.96 lbs
- Peak torque: 70 in-lb
- Brushless motor with Hall sensor electronic commutation
- Brushless RVDT position transducer
- Derived tach signal
- BIT logic outputs
- Robust structural design
- Clutched output
- High efficiency spur gearing
- Pulse width modulated motor power
- Tach signal output
- ±10 VDC input command signal to position signal output
- Torque output limit electronics
- Position or rate servo operation
- Low backlash
- High reliability - 60,000 hour MTBF
- No load speed: 80 deg/sec
- Stroke: ±21°

## Model 996

The Model 996 Rotary Servo Actuator provides auto throttle operation as derived by the aircraft's flight control surfaces.



- Size: 5.80 x 4.80 x 5.60 inches
- Power: 28 VDC
- Power point: 210 in-lb @ 30 deg/sec
- Weight: 6.7 lbs
- Peak torque: 220 in-lbs
- Brushless motor with Hall sensor electronic commutation
- 26 VAC, 400 Hz synchro position transducer
- ±10 VDC rate signal
- Derived tach signal
- BIT logic outputs

- Robust structural design
- Worm and worm wheel output (irreversible)
- High efficiency spur gearing
- Tach signal output
- Torque output limit electronics
- Low backlash
- High reliability - 60,000 hour MTBF
- Mechanical interface with cable shaves, clutches and pilots throttle quadrant
- No load speed: 33 deg/sec

## Linear Actuators

Linear Actuators translate rotary motion to linear motion. They have the same features and similar applications as rotary units.

### Model 310

The model 310 linear actuator was designed to control the cyclic and collective feel on a helicopter.



- Size: 2.0 x 3.34 x 8.42 inches
- Power: 28 VDC
- Power point: 300 lbs @ 0.45 in/sec
- Weight: 4.5 lbs
- Peak force: 1000 lbs
- Uses C-13 rare earth permanent magnet brush motor
- Limit switches
- Robust design with steel gearing and power screw
- Environmentally sealed
- EMI filter
- Fail-safe brake
- No load speed: 0.6 in/sec
- Stroke: 3 in

### Model 801/973

The Model 801/973 Linear Servo Actuator is used to position the pitch of the rotor blades on a tilt rotor unmanned aerial vehicle. It is designed to operate under extreme environmental and endurance conditions. The controller servo amplifier is externally located.



- (Model 801) Size: 3.25 x 3.56 x 10.42 inches retracted
- (Model 973) Size: 3.25 wide x 3.56 x 11.17 inches retracted

- Power: 28 VDC
- Rated power point:
  - 185 lb @ 1.60 in/sec (Model 801)
  - 350 lb @ 1.50 in/sec (Model 973)
- Weight: 6.3 lb
- Two NFeB permanent magnet DC brush motor/tachometers
- Two RVDT's
- Robust structural design
- Low endplay
- High efficiency steel gearing
- Monoball end-fitting mount
- Ball screw/nut power screw assembly
- Stroke:
  - (Model 801) 4.78 inches Electrical stroke
  - (Model 973) 4.50 inches Electrical stroke
- Stall load: 1,120 lbs

### Model 802

The Model 802 Linear Servo Actuator is used to position the nacelles on a tilt rotor unmanned aerial vehicle during flight conversion modes. It is designed to operate under extreme environmental and endurance conditions.

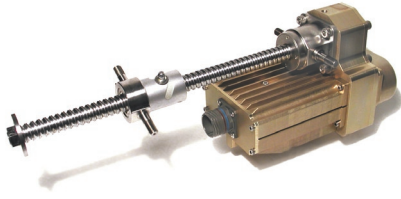


- Size: 3.33 x 3.56 x 17.44 inches long
- Power: 28 VDC
- Stroke: 11.70 inches electrical stroke
- Rated Power Point: 800 lb @ 0.75 in/sec
- Weight: 8.0 lbs
- Two NFeB permanent magnet DC brush motor/tachometers
- Two RVDT's
- Robust structural design
- Low endplay
- High efficiency steel gearing
- Monoball fixed end fitting and two bushings on traveling nut for mounting
- Ball screw/nut power screw assembly

### Model 974

The Model 974 Linear Servo Actuator is used to position the nacelles on a tilt rotor unmanned aerial vehicle during flight conversion modes. It is designed to operate under extreme environmental and endurance conditions.

# Linear Actuators / Amplifiers / Transducers



- Size: 3.88 x 4.75 x 14.75 inches long
- Power: 28 VDC
- Rated power point: 1500 lb @ 0.26 in/sec
- Weight: 8.1 lbs
- Two NFeB Permanent Magnet DC brush motors
- Two failsafe electromagnetic brakes
- Robust structural design
- Low endplay
- High efficiency steel gearing
- Trunnion mount for fixed end and traveling nut endfitting
- Ball screw/nut power screw assembly
- Stroke: 7.25 inches electrical stroke
- No-load speed: 0.87 in/sec

## Amplifiers

Amplifiers are used to control the actuators when the drive electronics are located separately outside the actuators.



### Model 871-01

150 VDC transconductance amplifier used with the Model 873 Rotary Actuator.

### Model 911-01

270 VDC brushless motor controller for a pump system on a military armored vehicle.

### Model 944-01

150 VDC transconductance amplifier used with the Model 875 Rotary Actuator.

### Model 962-01

150 VDC transconductance amplifier used with the Model 961 Rotary Actuator.

## Transducers

Transducers have been employed on both military and commercial aircraft to provide position feedback information of flight control surfaces to the flight computers, autopilots and cockpit displays.

### Model 800-XX

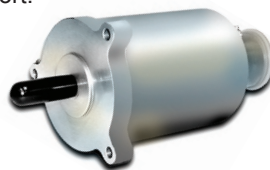
Our Model 800 Series Position Transmitter monitors the stabilizer position of the Boeing 757 and 767 commercial aircraft.



- Input voltage: 28 VRMS, 400 Hz
- Position switches (up to 6)
- Rotary variable differential transformer (RVDT)
- 1 speed synchro
- Flame arrestor
- Anti-backlash gearing
- Robust structural design
- High efficiency steel gearing
- Size: 4 inch OD x 5.2 inches long

### Model 932-02

The Model 932-02 is designed for shaft position sensing such as aileron and elevator cable position on the C5 military transport.



- Input voltage: 26 VAC, 400 Hz
- Consists of 3 synchros and input shaft
- 1:1 gearing
- Single electrical connector for interfacing the excitation voltages and the synchro output signals

### Model 933-01

The flap position transducer is used in C-5 military transports to convert the mechanical position of the flaps to appropriate electrical signals for position indication.



- Input voltage: 26 VAC, 400 Hz
- Consists of 2 synchros and input shaft
- 4:1 gearing
- Single electrical connector for interfacing the excitation voltages and the synchro output signals

### Model 943-XX

The Model 943 Position Transmitter monitors the stabilizer position of the Boeing 747- 400 commercial aircraft.



- Input voltage: 28 VRMS, 400 Hz
- Rotary variable differential transformer (RVDT)
- 1 speed synchro
- Flame arrestor
- Anti-backlash gearing
- Robust structural design
- High efficiency steel gearing

### Model 976

The Model 976 position transducer monitors the position of the nacelle of an unmanned aerial vehicle (UAV).



- Voltage 6 VAC, 3000 Hz
- 5:4 gearing
- Consists of two rotary variable differential transformers (RVDT)
- Single electrical connector for interfacing the excitation voltages and RVDT output signals

# Actuator Product Overview

Product Type	Model Number	Size (inches)	Load	Stroke	Weight
<b>Rotary Actuator</b>			<b>Torque (in-lbs)</b>		
Rotary	<b>808</b>	1.1 x 2.7 x 4.0	100 in-lbs Peak	±51.5° Plus Others	13 oz
Rotary	<b>813</b>	4.33 dia. x 7.76	320 in-lbs Rated	Continuous Rotation	12.5 lbs
Rotary	<b>817</b>	1.6 x 4.51 x 5.0	80 in-lbs Rated	±30° Plus Others	2.8 lbs
Rotary	<b>819 / 820</b>	1.5 x 3.2 x 4.5	80 in-lbs Rated 150 in-lbs Peak	±45° Plus Others	2.8 lbs
Rotary	<b>865-66</b>	2.3 x 4.75 x 5.0	300 in-lbs Stall	±46°	3 lbs
Rotary	<b>905-01 / -04</b>	2.3 x 4.9 x 5.4	150 in-lbs Rated 300 in-lbs Peak	±33°	3 lbs
Rotary	<b>915</b>	4.95 x 4.5 x 6.2	300 in-lbs Peak	±46°	7 lbs
Rotary	<b>935</b>	2.3 x 4.8 x 5.6	350 in-lbs Rated 600 in-lbs Peak	±46°	3.2 lbs
Rotary	<b>940</b>	3.18 x 3.15 x 4.69	165 in-lbs Rated	Continuous Rotation	2.8 lbs
Rotary	<b>946-01</b>	2.33 x 4.8 x 4.54	150 in-lbs Stall	±36.5° Plus Others	4 lbs
Rotary	<b>980-10 / 980-20</b>	4.06 x 4.06 x 14.0	168 in-lbs Rated	Continuous Rotation	17.3 lbs Act. Only
Rotary	<b>873</b>	1.6 x 3.5 x 5.8	40 in-lbs Rated 130 in-lbs Peak	Continuous Rotation	3.9 lbs
Rotary	<b>874</b>	1.25 x 2.35 x 4.0	12 in-lbs Rated 30 in-lbs Peak	Continuous Rotation	1.4 lbs
Rotary	<b>875</b>	2.2 x 2.6 x 6.8	21 in-lbs Rated 46 in-lbs Peak	Continuous Rotation	3.0 lbs
Rotary	<b>905-30</b>	2.3 x 4.9 x 5.4	150 in-lbs Rated 30 in-lbs Peak	±46°	3.0 lbs
Rotary	<b>917</b>	11.30 x 4.59 x 6.53	32 oz-in @ 960 rpm	Continuous Rotation	11 lbs
Rotary	<b>918</b>	4.06 x 2.50 x 4.35	5.8 oz-in @ 300 rpm	±3600°	2 lbs
Rotary	<b>961 / 962</b>	3.055 x 3.055 x 8.24	750 in-lbs Rated 1,100 in-lbs Peak	Continuous Rotation	13.6
Rotary	<b>965</b>	3.50 x 7.10 x 8.90	2,200 in-lbs Rated 2,500 in-lbs Peak	±45°	10.7 lbs
Rotary	<b>971</b>	3.0 x 3.48 x 6.56	15 in-lbs Rated 200 in-lbs Stall	±30°	3.2 lbs Act. Only
Rotary	<b>993</b>	4.10 Diameter x 7.9	205 in-lbs Stall	±120°	7.4
Rotary	<b>995</b>	4.50 x 5.70 x 2.70	70 in-lbs Stall	±21°	3.96
Rotary	<b>996</b>	5.80 x 4.80 x 5.60	220 in-lbs Stall	Continuous Rotation	6.7
<b>Linear Actuator</b>			<b>Force (lbs)</b>		
Linear	<b>310</b>	2.0 x 3.34 x 8.42	300 lbs Rated 100 lbs Peak	3 in	4.5 lbs
Linear	<b>801</b>	3.25 x 3.56 x 10.42	185 lbs Rated 1,120 lbs Peak	4.78 in	6.3 lbs
Linear	<b>802</b>	3.33 x 3.56 x 17.44	800 lbs Rated	11.70 in	8.0 lbs
Linear	<b>973</b>	3.25 x 3.56 x 11.17	350 lbs Rated 1,120 lbs Stall	4.5 in	6.3 lbs
Linear	<b>974</b>	3.88 x 4.75 x 14.75	1,500 lbs Rated	7.25 in	8.1 lbs

Specifications and information are subject to change without prior notice.  
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Note: Some specifications may vary slightly. Please contact us for any questions.

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