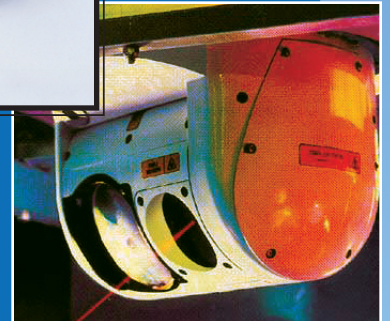
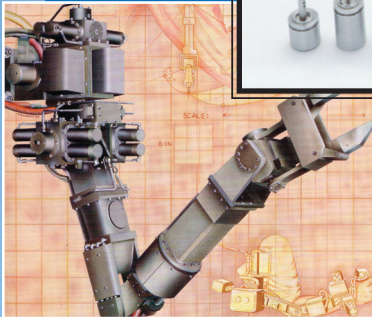
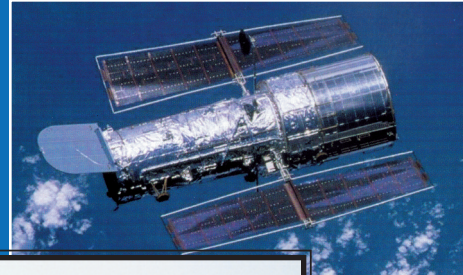


FACILITIES, PRODUCTS AND APPLICATIONS



CDA INTERCORP



This brochure outlines the facilities, products and application heritage of CDA InterCorp's actuator and rotary transducer product lines.



The information contained herein reflects the continuous demand for improved performance, efficiency, and reliability, while simplifying drive techniques, and minimizing size and weight. CDA InterCorp's entire range of products are designed to operate under the most demanding requirements of MIL-STD-810, while maintaining robust, reliable performance characteristics. These actuators and similar products are used in aerospace, space, defense, commercial aviation, "down hole", robotic, nuclear, and high reliability industrial control applications.



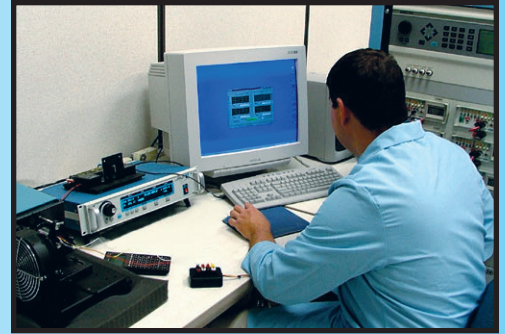
With over 34 years in the industry, CDA InterCorp's core philosophy of modular standardization has withstood the test of time. Each modular design utilizes the same inventoried piece part standards, materials, processes, and construction techniques. Inherent in our standard modules are unequalled reliability and ruggedness, while maintaining flexibility in providing custom motor requirements and extremely responsive prototype and production deliveries.

CDA's quality system is certified to ISO-9001:2000. A government quality representative is available to provide source inspection, as required.

For responsive support of your specific requirements, please write, phone, fax, or e-mail CDA InterCorp directly. CDA's system application engineers are available to visit your facility to assist in the design of the optimum Controllable Drive Actuator for your specific application. CDA also maintains marketing personnel throughout the United States and internationally.

FACILITIES AND CAPABILITIES

For over 34 years, CDA InterCorp has been a leader in the design and manufacture of highly engineered, extremely reliable Controllable Drive Actuators for technologically advanced control systems. Continued business growth has required CDA to triple its size since our founding. Our current facility in Deerfield Florida is a modern, climate-controlled work area ideally equipped to support the design and manufacture of CDA InterCorp's full line of Controllable Drive Actuators.



The CDA engineering department is well versed in all aspects of product application and project engineering. These hands-on professionals work with our customers from the product definition stage, through acceptance testing, and on through post-contract support. Our application engineers are available for on-site support at our customers facilities to help define and select the right actuator or transducer for their application.



Maintaining critical assembly processes in-house assure quality and performance with our highly skilled technicians. Also inherent in this process is the ability to expedite as required, as well as maintain the high standards of assembly and cleanliness we require.



Our machine shop has state-of-the-art machining centers and inspection equipment that can achieve the precision manufacturing tolerances we require for our high reliability actuators. Precision alignment of the mounting surfaces to the rotating elements is obtained through our secondary machining and grinding processes, resulting in high speed, high efficiency rotary components.

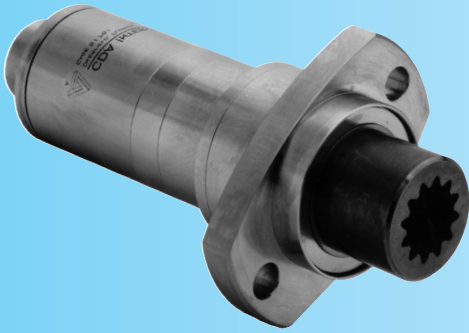


Our final assembly technicians are fully cross-trained for all module assemblies. Dedicated test equipment is also modularized for ease of set-up and transportability.

InterCorp's clean room facility exceeds ISO Class 7 requirements with laminar flow benches that exceed Class 5 requirements. Complete vacuum bake-out, parts cleaning and inspection to IEST-STD-1246 is available for critical applications that require high cleanliness standards. Functional performance, dimensional inspection and packaging is conducted in the clean room area. CDA InterCorp has supplied mission critical actuators on the most demanding optical systems including the Hubble Space Telescope.



Our Deerfield Florida location has easy access to three international airports. Please contact our marketing department to arrange your personal tour of our manufacturing facility.



SINGLE STANDARD OF DESIGN CONCEPT

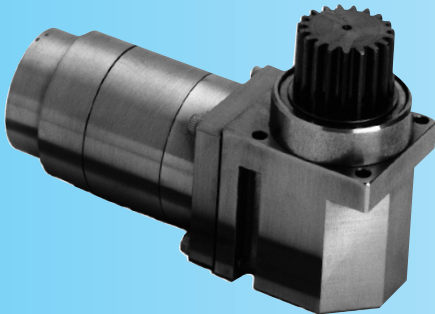
Beneath the outward appearance of our custom designed actuators, we begin with a core philosophy of module standardization. Each module design utilizes the same fundamental inventoried piece parts, materials, and construction techniques. This provides our customers many advantages:

- Reduced design and development time
- Reduced development expense
- Extremely responsive prototype deliveries
- Shorter production lead times
- Ability to expedite on request
- Zero risk for new design applications
- Extensive historical data base
- Qualification and environmental heritage



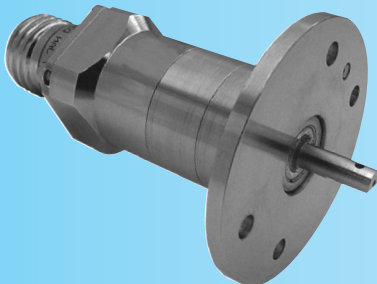
FLEXIBILITY TO ACCOMMODATE CUSTOM REQUIREMENTS

Although our modular standardization increases reliability and effectiveness, CDA can also provide a full range of custom mechanical and electrical configurations to accommodate specific system requirements. Mounting configurations can be specifically tailored to facilitate installation, provide a hard-mounted connector or upgrade an existing system with a state-of-the-art actuator. All of the custom mechanical interfaces shown here are based on a standard motor, gearbox, or rotary transducer. Every product is designed and wound to provide specific electrical performance, based on system requirements.

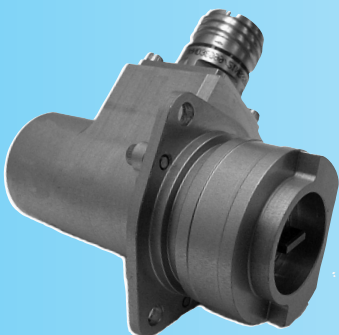


RUGGED LONG LIFE CONTROLLABLE DRIVE ACTUATORS FOR A WIDE RANGE OF APPLICATIONS

Based upon proven technology and manufactured under the most exacting quality assurance standards, CDA InterCorp's Controllable Drive Actuators are designed for the most demanding applications. Defense, Aerospace, Space, and High Reliability Industrial systems manufacturers have come to rely on CDA InterCorp with flight control actuators for primary control, stability augmentation, artificial feel generation, aircraft engine control, weather and fire control radar, pump drives, deployment systems, focus and field of view mechanisms, and other actuation systems where performance and reliability are critical.



These durable actuators have been qualified to the most demanding environmental requirements of MIL-STD-810 including random, sine and gunfire vibration, shock, humidity, salt fog, rain, dust, temperature altitude and explosive atmosphere to name a few. Additionally, CDA is qualified to operate at 3 Kelvin (-270° C), and up to +290° C on an intermittent basis. Specific qualification heritage may be obtained by contacting InterCorp's engineering department.



Whether your requirement is for a military system, space application, aviation, down hole or industrial application, CDA can provide a controllable drive actuator to meet your requirements.

Product Modules

Motor Modules:

- Brushless Permanent Magnet Motors
- AC Induction Motors
- Stepper Motors
- Square Wave Driven AC Motors
- Damped Rotary Switches
- Housed Limited Angle Torquers
- Synchronous Motors

Eddy Current Dampers:

- Rotary
- Linear
- In-Line or Right Angle
- Damping "enable" option

Gearing Modules:

Rotary:

- High Torque Planetary
- Right-Angle Gearing
- High Accuracy Zero Backlash Gearing
- Precision Indexing Drive Gearing

Linear:

- Ball Screw Actuation
- ACME Lead Screw Actuation
- Planetary Roller Screw Actuation
- In-Line, Right-Angle, or U-Drive

Brakes:

- DC Friction Brakes
- Permanent Magnet Detent Brakes
- DC Magnetic Induction Brakes

Transducers:

Position Transducers:

- Brushless Resolvers
- Single Speed
- Multiple Speed
- Tandem or Cluster Redundant
- With or without Gearing
- *OnAxis* Resolvers
- RVDTs
- Tandem or Cluster

Redundancy

- With or without Gearing
- *OnAxis* RVDT

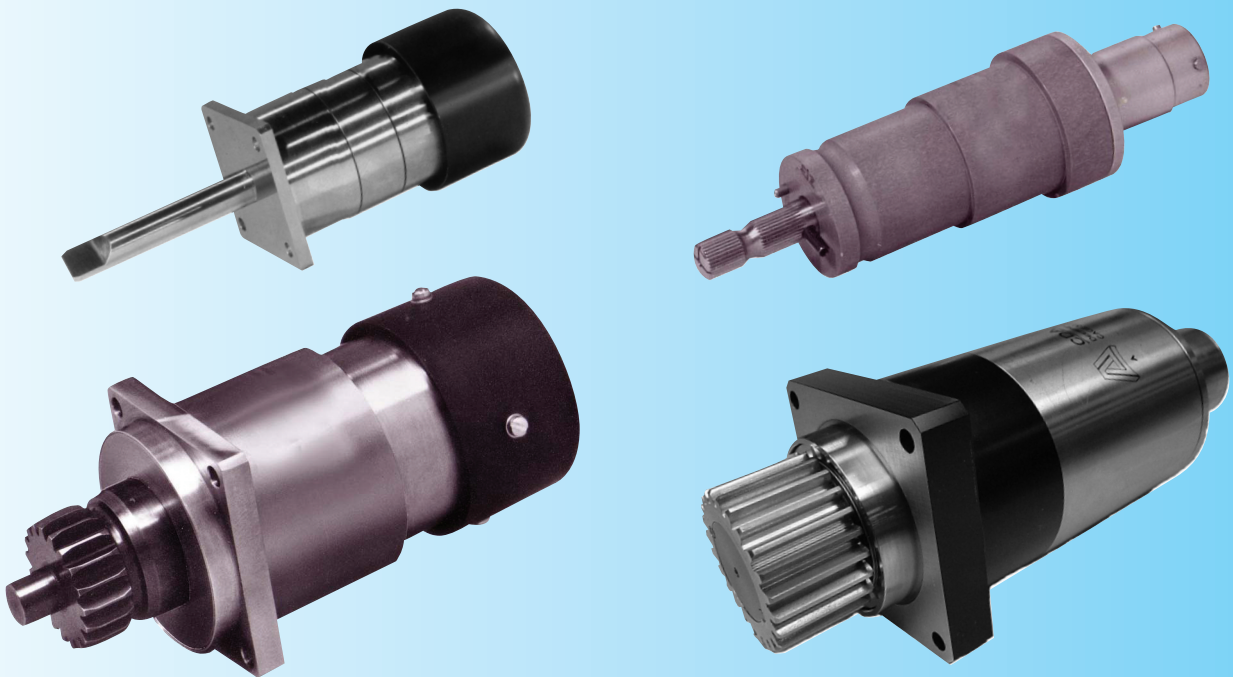
Velocity Transducers:

- AC Tachometers
- Damping Tachs
- Rate Tachs
- Permanent Magnet Alternators
- Single Speed
- Multiple Speed
- With or without Gearing

Acceleration Transducers:

- Brushless DC Rotary Accelerometers
- DC Excited Rotary Accelerometers

CDA InterCorp can combine these standard modules into multi-function integrated actuators and assemblies. Environmental qualification is often satisfied through similarity to previous applications which utilized the same field proven MIL and Space qualified modules. Exposure to risk is virtually eliminated by avoiding unproven concepts.



Defense, Aviation and Space

Once solely a defense component manufacturer, CDA InterCorp had increased its product and application base to include other high reliability, extreme condition requirements. In addition to Military applications, CDA's rugged components are used in commercial aviation, business jet applications as well as demanding deep space applications.

CDA InterCorp's Controllable Drive Actuators, Eddy Current Dampers, and complementary Rotary Transducers are being utilized in many performance critical applications for aerospace and related support applications. CDA's standard modular design concept, with off-the-shelf-technology, provides high reliability aerospace-heritage components with unparalleled performance per unit volume. A substantial benefit with



- High Grade Stainless Steel Construction
- Class H220 Insulation System
- Low Outgassing Materials
- Optional Redundant Windings
- Rugged Construction
- High Torque Precision Gearing



CDA InterCorp can combine our standard modules into multi-function integrated actuators. Actuators with these advanced features have been selected on the most critical development and advanced systems. CDA has produced flight safety critical actuators for systems such as the Joint Strike Fighter Concept Demonstrator Aircraft and for science missions in the Space Shuttle bay. Additionally, our actuators were selected to deploy the corrective optics on the Hubble Space Telescope and have been used on numerous development systems for NASA's James Webb Space Telescope.

CDA's modular design is the multi-function tasking capabilities within a single drive assembly. Every module within CDA's product line is an established, qualified component. A new application can derive the benefit of custom performance with qualified modular hardware.

Demanding applications require performance reliability, precision and low risk. CDA can satisfy these demands and more.

While critical internal materials and processes are standard, the external mounting configurations and winding characteristics can readily be tailored to satisfy specific system performance and mechanical interface requirements. Most of our current applications are mission critical and some are even flight safety critical.

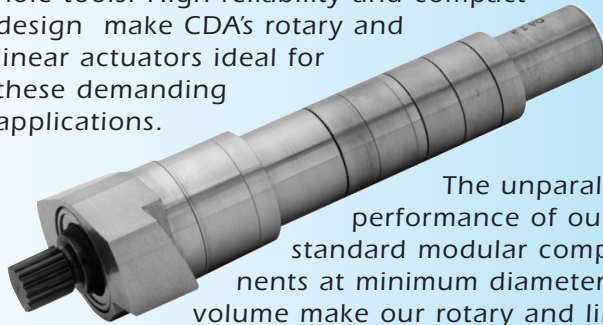


Standard Qualified Modular Design

- Temperature Range:
 - 80°C to +220° C (Wet Lube)
 - Down to 3 K (Dry Lube)
 - Up to 290° C intermittent

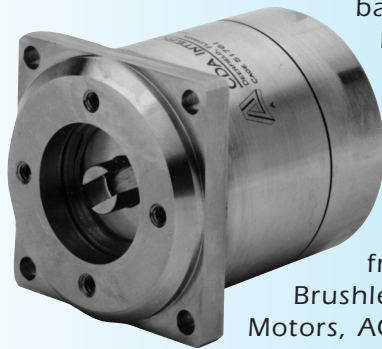
Down Hole and High Reliability Industrial

Significant advantages have been realized in the field of oil exploration and other related industries by utilizing state of the art electro-mechanical components for electro-mechanical actuation or on hydraulic pump drives for advanced down hole tools. High reliability and compact design make CDA's rotary and linear actuators ideal for these demanding applications.



The unparalleled performance of our standard modular components at minimum diameter and volume make our rotary and linear actuators ideal for high reliability tool applications which are exposed to hostile down hole environments. CDA's polyimide based insulation system, high grade stainless steel construction motors, gearboxes and rotary transducers, provide ideal controllable drive actuator solutions for rotary and linear systems used in down hole high temperature and pressure environment applications. Standard design features include class H225 insulation system, matched coefficient of thermal expansion materials and high strength gearing. The typical operational environment for our down hole applications include +200° C ambient temperature, at 20,000 psi of pressure. Higher operating temperatures and pressures are available on request.

Our entire product line is based on rugged modular design concepts.



At the heart of our actuators are high performance, high capacity motors. We are able to configure any of our seven frame size motors as

Brushless Permanent Magnet Motors, AC Induction Motors, or DC (Permanent Magnet) Stepper

Motors. Any of these motors may be complemented with our equally durable rate transducers. Precision machining of the motor interface to the high strength gearing modules assures reliable, high efficiency performance and operation.

A distinct advantage of CDA's modular product line is the high torque and power output capacity within an extremely small diameter actuator package. This advantage makes our actuators ideal for down hole applications where cross section diameter is at a premium.

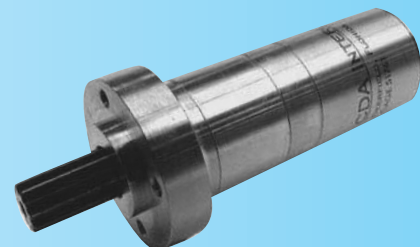
Custom windings, operational voltages, frequencies, motor drive configurations and mechanical interface options increase design flexibility for tool design engineers who must work with line losses, space limitations, and limited electronic control options. In addition to the motor types listed above, CDA has developed a winding lay-in configuration which develops sinusoidal currents from square wave voltage sources. This technique provides simple electronic control of AC induction Motors from DC voltage sources allowing limited line connections with inherent brushless motor reliability.



These inherent features also make our products well suited for other High Reliability Industrial applications such as Robotics, High End Capital Equipment, Nuclear and Medical.

Robotic applications can benefit from our high density performance by providing high torque capacity actuators with low mass; these attributes are ideal for elbow, wrist and gripper requirements.

Integral rotary transducers help complete the package with optional position, velocity or rotary acceleration transducers.



A Partial listing of CDA's customer involvement include:

Customers(and Industry):

- ABB(Down-Hole)
- BAE Systems(Defense)
- Baker Hughes(Down-Hole)
- Ball Aerospace(Space and Defense)
- Battelle(Various)
- Boeing(Commercial Aviation)
- Cessna(Business Jet Aviation)
- Cincinnati Electronics(Defense)
- Cubic Defense(Defense)
- Halliburton(Down-Hole)
- Honeywell(Aviation and Defense)
- Indra(Defense)
- JPL(Space)
- Kongsberg(Space)
- Lockheed Martin(Defense)
- MD Robotics(Robotics and Space)
- MIT Lincoln Labs(Space)
- NASA(Space)
- Northrop Grumman(Aviation and Defense)
- Oerlikon Contraves(Industrial & Space)
- Thales(Aviation and Defense)
- Raytheon(Defense)
- Rockwell Collins(Commercial Aviation)
- Schlumberger(Down-Hole)
- Speed Fam - IPEC(Capital Equipment)

... and many more...

Programs and Platforms:

- APO 158 Radar
- AWADS Radar
- Blue Vixen Radar
- C17
- Comanche Electro Optical
- Euro Fighter Radar
- F/A-18 OBOGS
- F/A-18 ATFLIR
- F117 FLIR
- F15E OBOGS
- F22
- Gripen Recon-Pod

- Hubble Space Telescope:
 - Advanced Camera for Surveys
 - Cosmic Origins Spectrometer
 - COSTAR
 - Fine Guidance Sensor
 - Near Infrared Camera
 - Space Telescope Imaging Spectrometer
 - Wide Field Camera III

- JAS-39 Radar
- James Webb Space Telescope
- Joint Strike Fighter (F35)
- Rosetta
- SBIRS High
- 727, 737, 747, 757, 767

... and many more...



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