

*Ameridrives*

*Formsprag Clutch*

*Nuttall Gear*

# Power Transmission Solutions for the Nuclear Power Industry



**Altra**<sup>®</sup>  
Industrial Motion

**NUTTALL GEAR, AMERIDRIVES AND FORMSPRAG CLUTCH—**  
THE LEADING BRAND NAMES OF ALTRA INDUSTRIAL MOTION  
CAN OFFER EXPERTISE IN CUSTOM PRODUCT SOLUTIONS FOR A  
WIDE VARIETY OF NUCLEAR POWER APPLICATIONS INCLUDING:



- Boiler Feed Pumps
- High Pressure Pumps
- Low Pressure Pumps
- Auxiliary Pumps
- Generator Drives
- Dual Drives
- Cooling Fan Backstops
- Fan Drives
- Pressurized Water Reactor Anti-rotation Device (ARD)
- Other Rotating Equipment

As the world's demand for nuclear power grows, the infrastructure and equipment necessary to produce and distribute it will come under increasing pressure to perform. As industry leaders in electromechanical power transmission products, the companies in the Altra Industrial Motion family are uniquely positioned to leverage their products' reputations, reliability and technologies to help achieve the necessary nuclear power production the world requires.

As a leading multinational designer, producer and marketer of a wide range of electromechanical power transmission products, Altra offers products utilized in critical, safety-related nuclear power applications where reliability and accuracy are necessary to avoid costly downtime, assure safe operations and production output.

**[www.AltraMotion.com](http://www.AltraMotion.com)**





## High Speed Gear Increaser and Reducer Drives

### Nuttall Gear

Originally developed in the 1940's, the Nuttall Gear (formerly Westinghouse Gearing Division) SU High Speed Gear design has been proven through millions of hours of operation with approximately 50% of the nuclear power plants that Westinghouse built using Nuttall Gear units. Nuttall Gear SU High Speed Gear Drives continue to be supported through new units, replacement gearing and parts. Nuttall Gear can also rebuild your existing unit to OEM specifications.

### New Applications

Nuttall Gear also excels in designing to AGMA standards high speed drives for custom applications such as compressors, fans, pumps, and turbines.

### Standard Nuttall Gear design features:

- Rigid cast iron or welded steel housing
- Dynamically balanced precision double helical gearing for uniform load distribution and quiet running
- Oversized split sleeve bearings for smooth, efficient running
- Split labyrinth non contact oil seals for long life
- Self-contained forced oil lubricated gears and bearings

### Options are available and can include:

- Multi-speed (shifters)
- Remote mounted lubrication consoles
- Monitoring systems to measure temperature, pressure, and vibration



## Engineered High Performance Diaphragm and Disc Couplings

### Ameridrive

- Designed for infinite life for critical applications
- Ratings up to 6,000,000 in.lbs.
- Designed and manufactured in compliance with API-671
- Low repeatable unbalance
- Non-lubricated for maintenance free operation

Introduced in 1971, the Ameriflex multiple convoluted diaphragm coupling has set new standards for life and reliability in high performance applications for the power generation market, particularly in critical applications like generator sets and boiler feed pumps.

The Ameridisc high performance coupling features multi-scalloped, optimized disc profiles for even stress distribution and maximum power density and is particularly suited to applications requiring reduced overhung moments.

### Standard Ameriflex diaphragm coupling design features:

- 15-5 PH shot-peened stainless steel diaphragms, for improved fatigue strength and stress corrosion resistance
- Multiple separated diaphragms in a pack to provide power transmission redundancy and design flexibility
- Field replaceable flex elements

### Standard Ameridisc coupling design features:

- Largest bore capacity to coupling OD ratio in the industry
- Proprietary disc coating to prevent fretting and corrosion
- Low bending and axial reaction loads



## Centrifugally Disengaged Vertical Backstop Anti-Rotation Device (ARD)

### Formsprag Clutch

### Formsprag Clutch

- Holding torque exceeding 500,000 ft.lbs.
- Virtually unlimited continuous speed capability through lift-off sprags
- Many units with greater than 200,000 hours of maintenance-free operation

Formsprag Clutch was instrumental in the development of the long-life Anti-Rotation Device (ARD) on the reactor coolant pumps of pressure water reactors and continues to support the installed base of ARDs by offering field inspections, factory rebuilding and new ARDs with improved bearing performance.

### Standard Formsprag ARD design features:

- Lift-off sprags for no-contact running, no heat generation and long-life exceeding 10-year maintenance-free operation between recommended inspections
- Dynamically balanced hydrodynamic babbitted bearings and races for minimal wear and heat generation
- Accommodation for pressurized oil flow, and monitoring systems to measure temperature, pressure, and vibration to ensure performance
- Balanced torque arm to positively prevent reverse rotation
- 100% dynamically tested at the factory
- ISO 9001:2000 and AS9100 Rev. B

### Other Formsprag Clutch Nuclear Power Industry applications include:

- Backstops for various pumping systems
- Cooling tower fan backstops
- Overrunning clutches in turning gear drives

## A Global Footprint to Support Customers Around the World

- ★ Altra Headquarters
- Altra Manufacturing Facilities
- Light Manufacturing, Assembly, Regional Warehouse
- ▲ Altra Shared Services and ECB Technology Center

## The Brands of Altra Industrial Motion

### Couplings

**Ameridrives**  
www.ameridrives.com

**Bibby Turboflex**  
www.bibbyturboflex.com

**Guardian Couplings**  
www.guardiancouplings.com

**Huco**  
www.huco.com

**Lamiflex Couplings**  
www.lamiflexcouplings.com

**Stromag**  
www.stromag.com

**TB Wood's**  
www.tbwoods.com

**Geared Cam Limit Switches**  
**Stromag**  
www.stromag.com

### Electric Clutches & Brakes

**Inertia Dynamics**  
www.idicb.com

**Matrix**  
www.matrix-international.com

**Stromag**  
www.stromag.com

**Warner Electric**  
www.warnerelectric.com

**Linear Products**  
**Warner Linear**  
www.warnerlinear.com

**Engineered Bearing Assemblies**  
**Kilian**  
www.kilianbearings.com

### Heavy Duty Clutches & Brakes

**Industrial Clutch**  
www.indclutch.com

**Twiflex**  
www.twiflex.com

**Stromag**  
www.stromag.com

**Svendborg Brakes**  
www.svendborg-brakes.com

**Wichita Clutch**  
www.wichitaclutch.com

**Belted Drives**  
**TB Wood's**  
www.tbwoods.com

### Gearing

**Bauer Gear Motor**  
www.bauergears.com

**Boston Gear**  
www.bostongear.com

**Delroyd Worm Gear**  
www.delroyd.com

**Nuttall Gear**  
www.nuttallgear.com

**Overrunning Clutches**  
**Formsprag Clutch**  
www.formsprag.com

**Marland Clutch**  
www.marland.com

**Stieber**  
www.stieberclutch.com

**Altra**<sup>®</sup>  
*Industrial Motion*

www.altramotion.com

## Customer Support

**Ameridrives**  
1-814-480-5000

**Formsprag Clutch**  
1-800-927-3262

**Nuttall Gear**  
1-800-724-6710