

*Ameridrives*

*Bibby Turboflex*

*Boston Gear*

*Delroyd Worm Gear*

*Formsprag Clutch*

*Industrial Clutch*

*Inertia Dynamics*

*Kilian*

*Marland Clutch*

*Nuttall Gear*

*Stieber*

*TB Wood's*

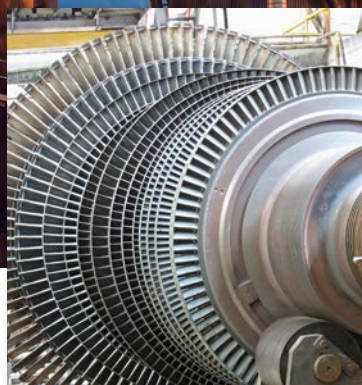
*Twiflex*

*Warner Electric*

*Warner Linear*

*Wichita Clutch*

# Power Transmission Solutions for the Power Generation Industry



# Power Transmission Solutions for the Power Generation Industry

## ALTRA INDUSTRIAL MOTION OFFERS A WIDE ARRAY OF POWER TRANSMISSION PRODUCTS FOR THE POWER GENERATION INDUSTRY.

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

As a leading multinational designer, producer and marketer of a wide range of power transmission products, Altra offers products utilized in critical, high-volume energy applications where reliability and accuracy are necessary to avoid costly downtime and enhance operations and production.



The companies of Altra Industrial Motion are industry leaders in braking, engaging, overrunning, gearing, and load transmitting products. Whether a power transmission coupling is required or a highly engineered torque limiting device is needed, Altra Industrial Motion has the expertise and the knowledge to design and manufacture reliable products with the lowest cost of ownership.

## CUSTOMER SERVICE

Our unrivaled knowledge of applications enables us to assist in the selection of the correct type of product design. With sales and technical support teams located worldwide, Altra is able to provide an incomparable level of responsive customer service.

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



## APPLICATION EXPERTISE

Altra Application Engineers have vast experience in providing the right product to meet the exact power transmission needs of specific power generation applications. From a coupling for a high pressure pump in a nuclear power facility to a holdback for a conveyor at a coal fired plant, Altra has the expertise to perfectly match one of the thousands of our standard products to meet your requirements.

If a standard product comes close but just won't do, we will modify it or design a completely custom product to meet your needs precisely.

Altra products can be found hard at work in Power Generation applications worldwide including...

- Steam Turbines
- Fans and Blowers
- Gas Turbines
- Nuclear Power Pumps
- Wind Turbines
- Coal Fired Plants
- Tidal Power Turbines
- Inclined Conveyors
- Cooling Towers
- Conveyors
- Ethanol Plants



## ALTRA INDUSTRIAL MOTION PROVIDES LEADERSHIP THROUGH INNOVATION

For over a century, the most important breakthroughs in engineered power transmission products have been driven by our family of companies working together to lead the market forward. Developing innovative technologies is the core principal of Altra Industrial Motion.

With a full complement of mechanical and electrical solutions for every type of application, Altra Industrial Motion stands alone as the industry's most fully committed supplier of power transmission solutions.

- World-class engineering
- Rapid deployment of prototypes
- Superior customer service and application support...worldwide
- A common driving force: the Altra Business System
- Extensive training programs
- Global manufacturing to support local customer needs.

Whether you need individual components or packaged systems, choose the brands known throughout the world for quality, innovation, and service.

For detailed information about application specific power transmission solutions from Altra Industrial Motion including case studies, literature, and service manuals, visit

[www.AltraEnergyOilandGas.com](http://www.AltraEnergyOilandGas.com)

## GEARING



### Open and Enclosed Gearing by Boston Gear, Nuttall Gear, and Delroyd Worm Gear

**SU High Speed Gear Drive** design has been proven through millions of hours of operation with approximately 50% of the nuclear power plants that Westinghouse has built. Available with rigid cast iron or welded steel housing. Units feature dynamically balanced, precision double helical gearing for uniform load distribution and quiet running. Oversized split sleeve bearings provide smooth running.

**Helical Speed Reducers** feature high quality, custom gear drives by providing a wide selection of housing and gearing options, sizes, ratios and accessories. Nuttall Gear can offer custom engineered gearboxes to provide torque capacities up to 6,000,000 lb.-in.

**800 Series** helical reducers contains a focused selection of compact, heavy duty helical gear drives that offer long-life performance and simplified maintenance.

**Open Gearing** including thousands of spur, helical, miter, bevel, worms and worm gears, are available for immediate shipment. Custom gears can be designed and manufactured to the strictest standards for the highest quality.

### Typical Applications

- Steam Turbines
- Gas Turbines
- Nuclear Power Pumps
- Wind Turbines
- Coal Fired Plants
- Ethanol Plants

## COUPLINGS



### Elastomeric Couplings by TB Wood's

**Sure-Flex Plus®** couplings utilize a rubber or Hytrel™ thermoplastic flex element (sleeve) to transmit torque and accommodate shaft misalignments. These couplings feature 4-way flexing action which absorbs virtually all types of shock, vibration, misalignment, and end float. Torque up to 8.20 kNm; 72,480 in.lbs.

**Dura-Flex®** couplings "split-in-half" element design allows for easy element installation/replacement without moving connected equipment or disturbing the shaft connection. Highly flexible and able to accommodate shaft misalignment while minimizing vibration and preventing damage to connected equipment. Torque up to 4.50 kNm; 39,500 in.lbs.

**L-Jaw** couplings are an economical, proven solution for general purpose use. Jaw couplings are easy to install and require no lubrication or maintenance. Four flexible insert types are available. Torque up to 0.70 kNm; 6,228 in.lbs.

### Typical Applications

- Fans and Blowers
- Nuclear Power Pumps
- Ethanol Plants



### Grid and Gear Couplings by TB Wood's and Ameridrives

**G-Flex** couplings from TB Wood's feature state-of-the-art design from Bibby Turboflex, the original grid coupling manufacturer. G-Flex is an all-metal coupling that provides positive protection against the damaging effects of shock loads and vibration. Aluminum horizontal cover (T10), and all-steel vertical cover (T20) designs are available. G-Flex tapered grid couplings are an excellent choice where torsional flexibility/vibration damping are primary concerns. Torque up to 169 kNm; 1,500,000 in.lbs.

**Amerigear** couplings feature fully-crowned gear teeth which provide maximum load-carrying capacity with minimum size, maximum reliability and long life. Both "O" ring and metal seal models are available. Units also feature a strong, rigid floating sleeve, precision-machined identical hubs, and positive dust-tight seals.

**Series II** couplings have fully-crowned gear teeth providing maximum contact at the strongest part of the tooth. Models available for use on vertical and/or horizontal shafts. Bore capacity up to 510 mm. Torque up to 147 kNm; 1,300,000 in.lbs.

### Typical Applications

- Fans and Blowers
- Nuclear Power Pumps
- Inclined Conveyors
- Conveyors



## Disc Couplings

by TB Wood's, Bibby, and Ameridrives

**Form-Flex®** metal disc couplings consist of two hubs, a spacer and two high strength carbon or stainless steel flexible discs. Modified and special designs are commonly supplied to meet specific application conditions. Available in carbon steel, stainless steel or with corrosion resistant coatings. Close couple, spacer and floating shaft designs are also available. Units require no maintenance and feature zero backlash and easy interchangeability. Torque up to 270 kNm; 2,400,000 in.lbs.

**Turboflex GC®** couplings feature unitized flex packs with straight-sided flexible discs for faster, easier installation. These couplings provide increased torque capacity per size by taking advantage of the latest materials and design technologies. Units are interchangeable with industry standard designs and provide lower cost of ownership. Torque up to 180 kNm; 1,600,000 in.lbs. Special designs available for higher torque applications.

### Typical Applications

- Fans and Blowers
- Nuclear Power Pumps
- Inclined Conveyors
- Cooling Towers
- Conveyors
- Compressors

**Torsiflex®** couplings are specifically designed for pump and general industrial use. Torsiflex features all-metal construction, requiring no lubrication. A plug-in feature allows installation and removal without disturbing the pump alignment. Custom designs including close coupled, long spacer arrangements are available. Standard units are compliant with API 610 (American Petroleum Institute) and the more demanding API 671 standard can be achieved. In addition, the coupling is certified to meet ATEX 94/9/EC. Units require no maintenance and feature zero backlash and easy interchangeability. Torque up to 60 kNm; 530,000 in.lbs.

**Floating Shaft** couplings are custom designed for long span (horizontal or vertical) applications from 24" to over 300". Available with steel, stainless steel, or composite tubes. Torque up to 270 kNm; 2,400,000 in.lbs. Composite tubes weigh up to 80% less than steel and can eliminate the cost of bearing supports and other structures. Composite tubes can be specified for spans up to 220" (6 meters).

### Typical Applications

- Fans and Blowers
- Vertical Pumping Systems
- Inclined Conveyors
- Cooling Towers
- Conveyors
- Compressors



## High Performance Disc and Diaphragm Couplings

by Ameridrives and Bibby

**Ameriflex®** couplings feature a unique diaphragm design which permits high-torque density and low weight. Designed for years of dependable, low maintenance performance. Multiple, separated, convoluted diaphragms allow greatest design flexibility for most demanding applications. Ideal for high axial travel requirements. Torque over 678 kNm; 6,000,000 in.lbs.

**Ameridisc®** couplings feature an optimized disc profile for even stress distribution. Proprietary disc coating to prevent fretting and corrosion. Designed for years of dependable, low maintenance performance. Torque over 140 kNm; 1,240,000 in.lbs.

**TurboFlex HP** torsionally stiff, light weight couplings are capable of transmitting high torques at high speeds while accepting significant levels of angular, radial, and axial misalignment. Units are easy to install, suitable for hostile environments, require no lubrication and feature a high torque to weight ratio. Torque up to 600 kNm; 5,300,000 in.lbs.

### Typical Applications

- Steam Turbines
- Fans and Blowers
- Gas Turbines
- Nuclear Power Pumps
- Wind Turbines
- Inclined Conveyors
- Cooling Towers
- Conveyors

## CLUTCHES



### Backstopping and Overrunning Clutches by Marland, Formsprag, and Stieber

**Model HSB** (High Speed Backstop) clutches are used to prevent rotation in the opposite direction from the normal driving direction.

**Model RSCI** is a centrifugal lift-off sprag type freewheel with the inner race rotating. Only the inner race is designed for freewheeling. Primarily designed as a backstop, these units can be also used as an overrunning clutch in crawl drives, where the overrunning speed is high but the driving speed is low.

**BCMA Holdback** for low speed conveyor head shaft mounting. Provides positive protection against reverse torque runaways of inclined conveyors. Units feature Taconite seals and removable torque arm. Bore ranges up to 600 mm. Torque up to 1626 kNm.

**CECON** units are available with a disconnect feature that provides physical separation of the input and output shafts. This allows maintenance to be performed on the non-energized driver while the disconnect CECON is locked out in the disconnect position. Designed for high-speed, continuous operation.

### Typical Applications

- Steam Turbines
- Gas Turbines
- Nuclear Power Pumps
- Wind turbines
- Coal Fired Plants
- Inclined Conveyors
- Cooling Towers



**Model FSO** sprag overrunning ball-bearing clutches with a torque range up to 27,000 ft.lbs. These self enclosed clutches contain lip type seals, require no lubrication, and are ready for installation. Increased speed capabilities are possible with the use of steel labyrinth seals.

**Centrifugally Disengaged Vertical Backstop Anti-Rotation Devices (ARDs)** for use on reactor coolant pumps of pressure water reactors were developed by Formsprag with standard features including:

- 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

### Typical Applications

- Steam Turbines
- Fans and Blowers
- Gas Turbines
- Nuclear Power Pumps
- Coal Fired Plants
- Conveyors

## TORQUE LIMITERS



### Torque Limiters and Overload Clutches by Bibby and Boston Gear

**Bibbigard** safety element torque limiters incorporate a number of safety element modules of a specific size mounted between two flanges and preset to release at a specified torque value in order to protect the drive system from expensive damage and lost production. They can be used with various types of drive mediums. Release torque capacity is virtually unlimited. Torque up to 169 kNm; 38,000 ft.lbs.

- Accurate release torque repeatability
- Simple fast manual re-engagement
- Low-cost maintenance
- Versatile mounting capability

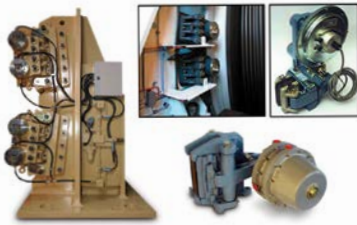
**Series CCC** (Centric centrifugal overload clutch) features controlled, soft-start acceleration with automatic engagement and disengagement. Delayed engagement produces a "no load start" with no slippage at full running speed. Protects against shock loads during start-up. 100% efficient at rated speed.

### Typical Applications

- Steam Turbines
- Fans and Blowers
- Gas Turbines
- Wind Turbines
- Coal Fired Plants
- Inclined Conveyors
- Cooling Towers



## BRAKES



**Disc Brake Calipers**  
by Twiflex

### Spring applied models

**Model VCS** is a modular caliper brake. These reliable brakes provide 20-60 kN braking force.

**Model VMS DP** is a modular safety brake with a 730 kN braking force. Compact design.

**Model VKSD** is a modular disc brake with a braking force of 50-119 kN.

**Model VMS2** is a modular disc brake with a 300 kN braking force.

**Model GMR/GMR-SD** are caliper brakes with a 15-35 kN braking force. Lightweight, modular design.

### Spring released models

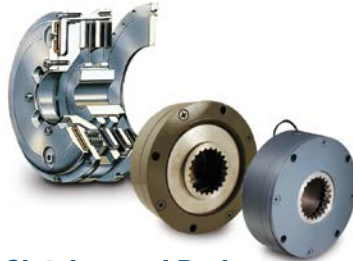
**Model MX-EA** is a modular caliper brake with a 6 kN braking force.

**Model VCH** is a caliper brake which provides 60 kN braking force.

**Models T20/T40** are spring-applied, hydraulically released modular disc brakes with up to 40 kN braking force.

### Typical Applications

- Steam Turbines
- Fans and Blowers
- Gas Turbines
- Wind Turbines
- Coal Fired Plants
- Inclined Conveyors
- Cooling Towers
- Conveyors



**Clutches and Brakes**  
by Warner Electric and  
Wichita Clutch

**Model ERS 57** is designed for static hold operations and automatically engages when power is turned off. Holding torque rating of 34 lb.ft. Units feature quick, quiet response for rapid engagement and a space-saving compact, low profile design. Splined hub available in five bore sizes.

**Model ERS 68** serves primarily as a brake for wind turbine applications that require both "static" holding power and the ability to withstand high inertia dynamic stops in an emergency situation. The ERS 68 brake offers 100 ft. lbs. of static torque with a maximum of 2,000 RPM and a brake release time of 0.2 sec.

**Model LI/SSB** low inertia brakes feature a 'Fail to safety' design for high cyclic and general stopping and holding duties on conveyors. The LI/SSB is designed for end-shaft or through-shaft mounting. Start/Stop parts have a low inertia which reduces acceleration times and allows more cycles per minute while reducing the amount of heat generated.

### Typical Applications

- Wind Turbines
- Inclined Conveyors
- Conveyors



**Belt Drives**  
by TB Wood's

### Variable Pitch V-Belt Drives

feature all cast iron construction with capacities from fractional to over 600 HP. Drives will not freeze or stick and allow for easy, accurate speed changes. Utilizes light duty, classical and narrow V-belts.

### Classic and Narrow V-Belt Drives

are carefully engineered to assure maximum performance over a long life span. Units are constructed of fine grain, high tensile cast iron. Capacities up to 600 HP from stock, even higher HP with special belts, sheaves, and materials. Bore sizes from 1/2 to 8-1/2 inches. Utilizes single or banded V-belts with either wrapped or cog construction.

**Synchronous Drives** combine the best of both chain and belt drives, providing positive power transmission and accurate speeds while requiring little maintenance. Load capacities scale up to 1200 HP at 1750 RPM.

### Typical Applications

- Fans and Blowers
- Inclined Conveyors
- Cooling Towers
- Ethanol Plants

## 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



www.altramotion.com