

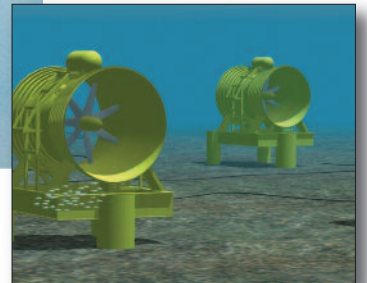
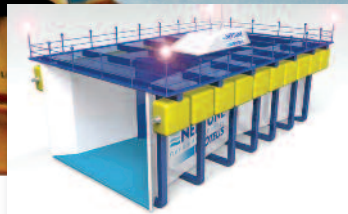
Wichita Clutch

Twiflex Limited

Bibby Turboflex

Ameridrives Couplings

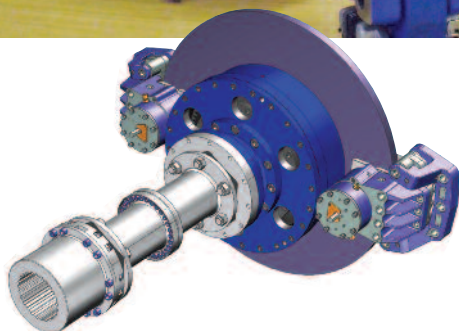
Power Transmission Solutions for the Tidal Turbine Market





Altra Industrial Motion is at the forefront of the leading power transmission technology providers for tidal turbine applications

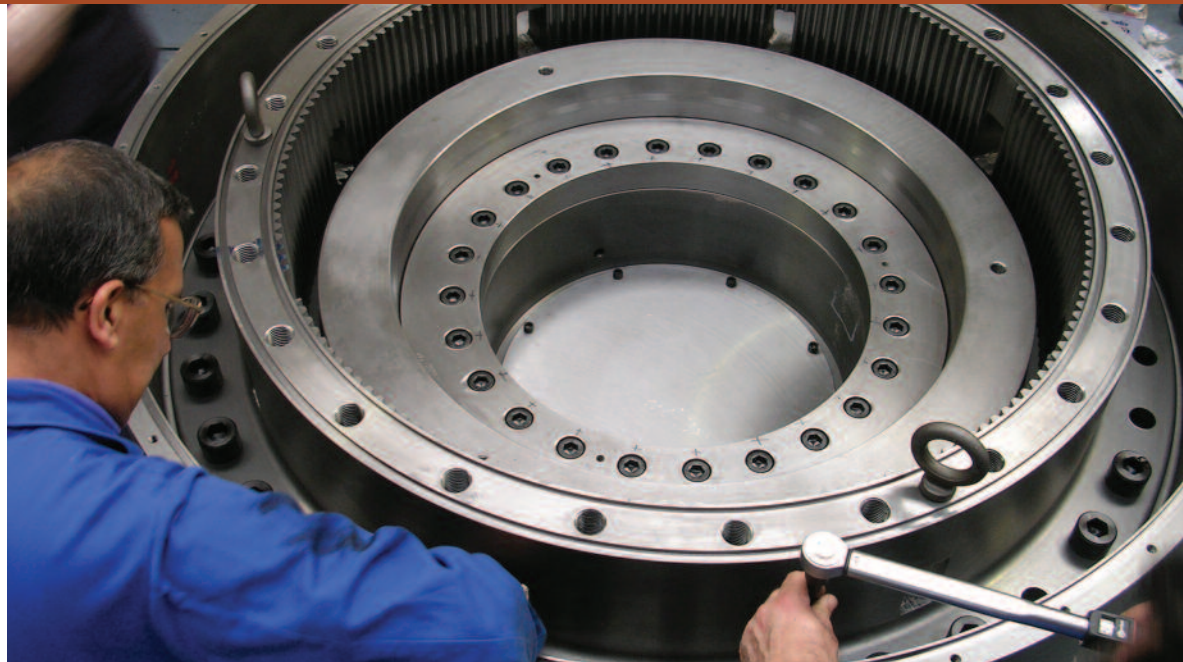
Altra Industrial Motion, as a leading multinational designer and producer of advanced electromechanical power transmission components, has the technology and engineering capability to provide bespoke, state-of-the-art drive and braking solutions for all configurations of tidal turbine. Altra's demonstrated expertise in the wind power industry and other energy sectors perfectly positions its multiple brands to meet the challenges of this demanding marketplace, regardless of the design direction this nascent industry may take.



Extensive Application Experience

Major Altra brands working closely with the developing global tidal energy industry include Wichita Clutch, Twiflex Limited, Bibby Turboflex and Ameridrives Couplings. Many product development projects undertaken by these leading Altra companies have provided superior design solutions to leading technology developers. Several tidal turbine brake packages have been tendered to companies developing full-scale, pre-commercial demonstrators and include a number installed at the EMEC (European Marine Energy Centre) test facility, located in Scotland, UK.

Wichita Clutch and Twiflex Limited supply a comprehensive range of clutches and brakes for the marine industry that have been proven in anchor handling, cable-laying, mooring winch, hoist, crane, dredge-pumps and main propulsion drive applications. Their rugged construction is known to provide dependable performance and extended service life in tough marine conditions.



Worldwide Customer Support

Altra engineering teams, manufacturing facilities and commercial offices are strategically located around the world to provide exceptional customer service, engineering and product support. Many of our leading brands have a design and engineering presence in the United Kingdom and are ideally positioned to support this global center of development for many of the early tidal turbine initiatives.

World-class Engineering

Our dedicated teams of market-focused engineering and manufacturing staff provide innovative solutions to the technical and commercial challenges faced daily by tidal technology developers. We utilize a flexible approach to problem solving such challenges, enabling our teams to provide application and technical support from concept to completion.

Many of the power transmission products in our comprehensive range can be customized to meet specific and unique requirements of individual turbine designs.

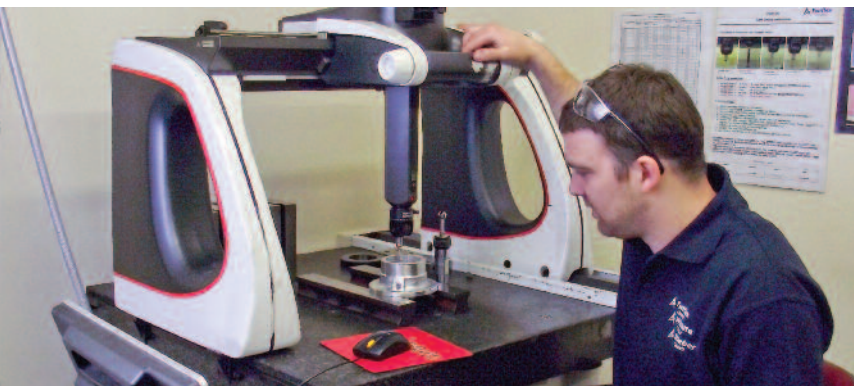
State-of-the-Art Manufacturing Technology

Altra's ISO Certified manufacturing facilities feature the latest technology including precision machining centers.

Our highly skilled manufacturing teams utilize the 'Altra Business System' to ensure that they are focused and aligned around key improvement priorities. ABS tools (e.g., continuous flow, standardized work and kanban) provide the means by which we achieve the improvements as we engage our entire workforce (via Total Associate Involvement) to actively and aggressively drive us towards world-class performance.

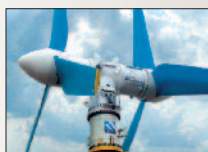
Advanced Testing and Research

Altra group companies have the capability to rapidly produce prototype units for test and evaluation by customers or by using our own computer-controlled testing equipment to simulate the operating conditions of a specific client-defined application. In combination with electronic data acquisition, we can accelerate the design, testing and verification processes in order to meet the demands of shortened product development cycles.



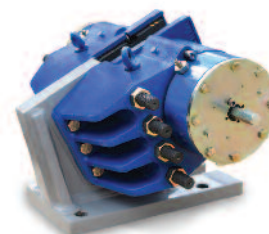


The leading brand names of Altra Industrial Motion can offer expertise in standard and custom product solutions for all types of tidal turbine designs.



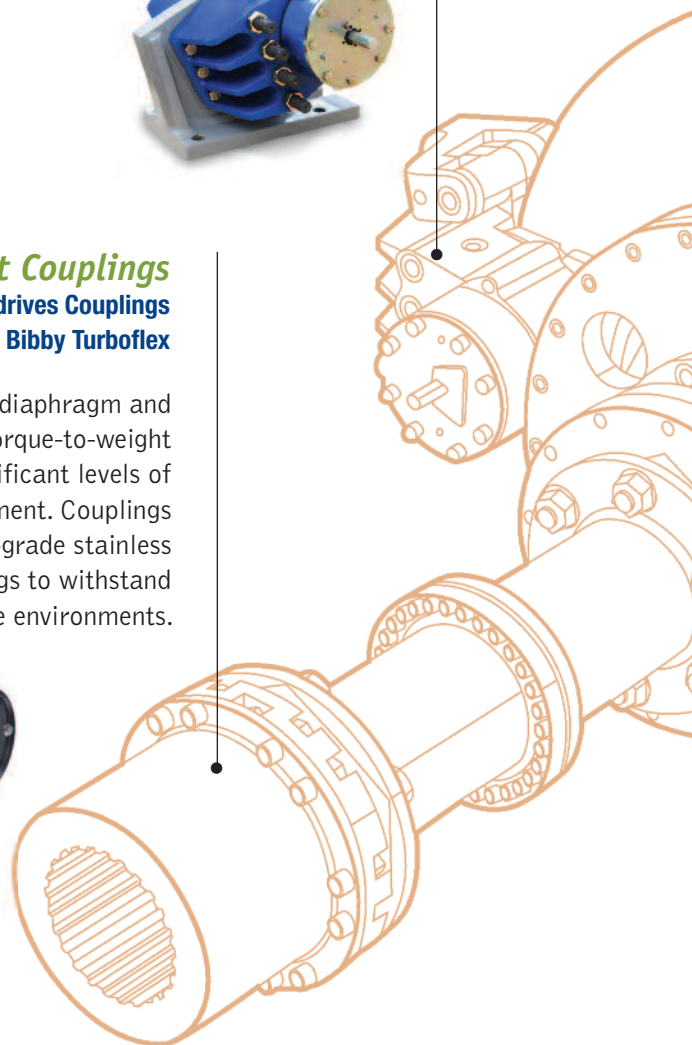
Caliper Disc Brakes by Twiflex Limited

A range of spring-applied and direct-acting, pneumatic or hydraulic, disc brakes for routine dynamic stopping, holding or emergency stopping duties is available. These may be customized with a variety of features and finishes suitable for tidal turbine drive applications and packaged with discs and controls where required.



Shaft Couplings by Ameridrives Couplings and Bibby Turboflex

Custom engineered flexible disc, diaphragm and gear couplings feature high torque-to-weight ratios while accepting significant levels of angular, radial and axial misalignment. Couplings can be manufactured with high-grade stainless steel or proprietary coatings to withstand extreme environments.



Shaft Locking Devices by Ameridrives Couplings

A complete range of Ameriloc shaft locking devices, custom engineered to meet specific customer requirements and provide years of trouble-free service.





Brake Discs and Hubs

**by Twiflex Limited
and Wichita Clutch**

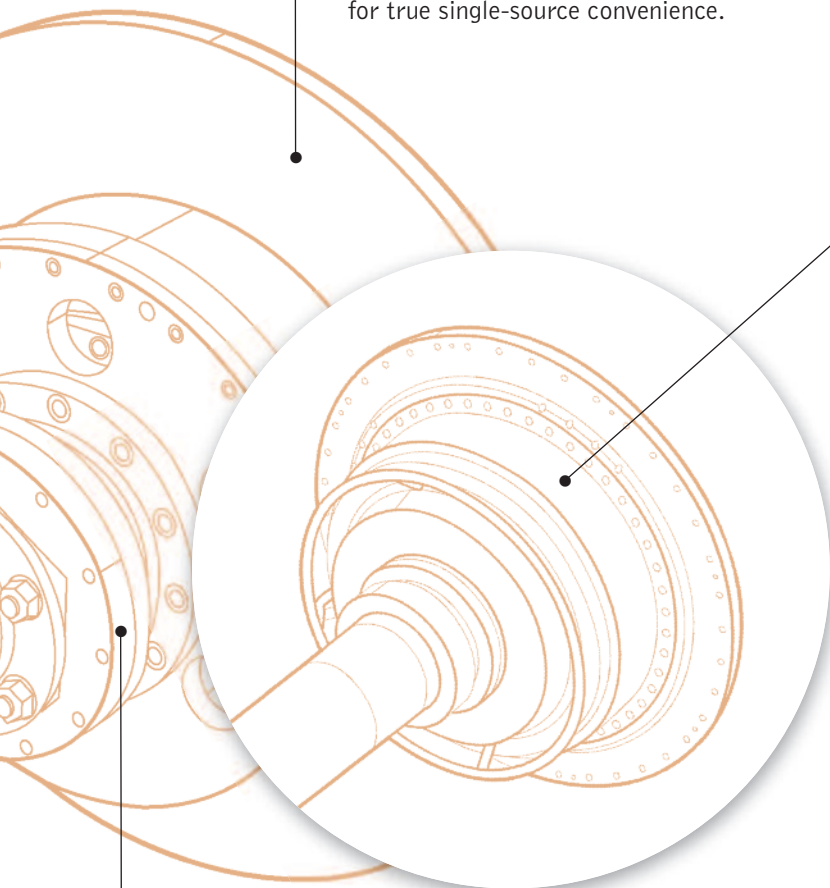
Complimentary powertrain components, including discs and hubs (as well as status monitoring switches and mounting pedestals), can be provided by Altra companies for true single-source convenience.



Multi-plate Brakes and Clutches

by Wichita Clutch

'Wet' plate brakes generate torque through shearing of the oil layer, with negligible lining wear, and are therefore ideal for the low maintenance requirements of sub-sea installations. Similar 'dry' units are available, including water-cooled versions for high-energy stop applications.



Hydraulic Power Units

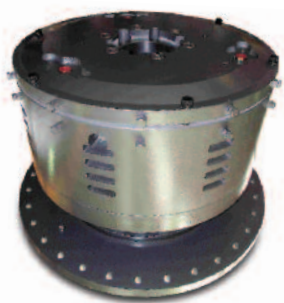
by Twiflex Limited

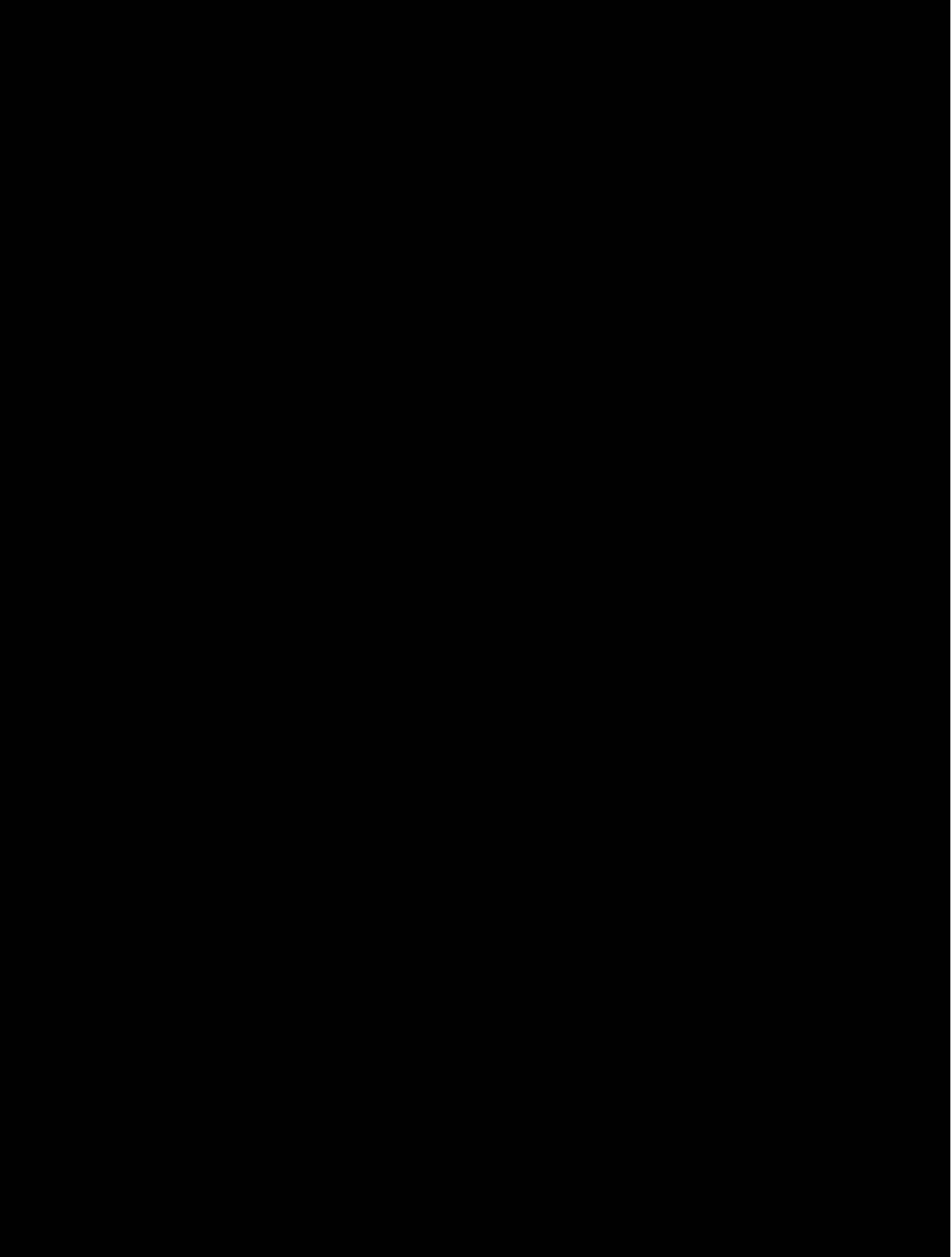
Custom designed electro-hydraulic power packs can be supplied to enable actuation and control of spring-applied (or direct acting) hydraulic brakes. The systems may be configured to provide controlled deceleration, without inducing excessive shock loads in the drivetrain, in the event of power loss.

Torque Limiting Clutches

by Wichita Clutch

Based on designs proven in industrial applications around the world, bespoke high-speed torque limiting clutches are specified to protect the drive system from excessive loads should the generator short-circuit.





<p>Electromagnetic Clutches and Brakes</p> <p>Warner Electric <i>Electromagnetic Clutches and Brakes</i> New Hartford, CT - USA 1-800-825-6544 <i>For application assistance: 1-800-825-9050</i></p> <p>St Barthelemy d'Anjou, France +33 (0) 2 41 21 24 24</p> <p><i>Precision Electric Coils and Electromagnetic Clutches and Brakes</i></p> <p>Columbia City, IN - USA 1-260-244-6183</p> <p>Matrix International <i>Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes</i> Brechtin, Scotland +44 (0) 1356 602000 New Hartford, CT - USA 1-800-825-6544</p> <p>Inertia Dynamics <i>Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes</i> New Hartford, CT - USA 1-800-800-6445</p>	<p>Couplings</p> <p>Ameridrives Couplings <i>Mill Spindles, Ameriflex, Ameridisc</i> Erie, PA - USA 1-814-480-5000</p> <p><i>Gear Couplings</i> San Marcos, TX - USA 1-800-458-0887</p> <p>Bibby Turboflex <i>Disc, Gear, Grid Couplings, Overload Clutches</i> Dewsbury, England +44 (0) 1924 460801 Boksburg, South Africa +27 11 918 4270</p> <p>TB Wood's <i>Elastomeric Couplings</i> Chambersburg, PA - USA 1-888-829-6637 – Press #5 <i>For application assistance: 1-888-829-6637 – Press #7</i></p> <p><i>General Purpose Disc Couplings</i> San Marcos, TX - USA 1-888-449-9439</p> <p>Ameridrives Power Transmission <i>Universal Joints, Drive Shafts, Mill Gear Couplings</i> Green Bay, WI - USA 1-920-593-2444</p> <p>Huco Dynatork <i>Precision Couplings and Air Motors</i> Hertford, England +44 (0) 1992 501900 Charlotte, NC - USA 1-800-825-6544</p>	<p>Heavy Duty Clutches and Brakes</p> <p>Wichita Clutch <i>Pneumatic Clutches and Brakes</i> Wichita Falls, TX - USA 1-800-964-3262 Bedford, England +44 (0) 1234 350311</p> <p>Twiflex Limited <i>Caliper Brakes and Thrusters</i> Twickenham, England +44 (0) 20 8894 1161</p> <p>Industrial Clutch <i>Pneumatic and Oil Immersed Clutches and Brakes</i> Waukesha, WI - USA 1-262-547-3357</p> <p>Gearing</p> <p>Boston Gear <i>Enclosed and Open Gearing, Electrical and Mechanical P.T. Components</i> Charlotte, NC - USA 1-800-825-6544 <i>For application assistance: 1-800-816-5608</i></p> <p>Bauer Gear Motor <i>Geared Motors</i> Esslingen, Germany +49 (711) 3518-0</p> <p>Nuttall Gear and Delroyd Worm Gear <i>Worm Gear and Helical Speed Reducers</i> Niagara Falls, NY - USA 1-716-298-4100</p>	<p>Overrunning Clutches</p> <p>Formsprag Clutch <i>Overrunning Clutches and Holdbacks</i> Warren, MI - USA 1-800-348-0881 – Press #1 <i>For application assistance: 1-800-348-0881 – Press #2</i></p> <p>Marland Clutch <i>Roller Ramp and Sprag Type Overrunning Clutches and Backstops</i> Burr Ridge, IL - USA 1-800-216-3515</p> <p>Stieber Clutch <i>Overrunning Clutches and Holdbacks</i> Heidelberg, Germany +49 (0) 6221 30 47 0</p> <p>Belted Drives and Sheaves</p> <p>TB Wood's <i>Belted Drives</i> Chambersburg, PA - USA 1-888-829-6637 – Press #5 <i>For application assistance: 1-888-829-6637 – Press #7</i></p> <p>Engineered Bearing Assemblies</p> <p>Kilian Manufacturing <i>Engineered Bearing Assemblies</i> Syracuse, NY - USA 1-315-432-0700</p> <p><i>For information concerning our sales offices in Asia Pacific check our website www.altramotion.com.cn</i></p>
<p>Linear Products</p> <p>Warner Linear <i>Linear Actuators</i> Belvidere, IL - USA 1-800-825-6544 <i>For application assistance: 1-800-825-9050</i></p> <p>St Barthelemy d'Anjou, France +33 (0) 2 41 21 24 24</p>			

