

TOSHIBA

Leading Innovation >>>

Industrial Products



Pipeline Solutions

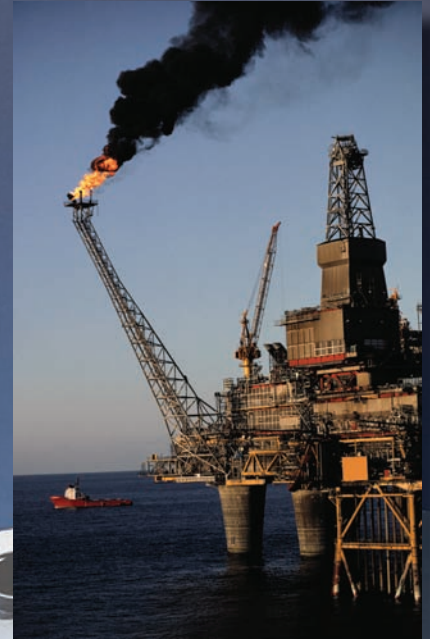


We **OUT-TOUGH** The Industry

TOSHIBA

Leading Innovation >>>

With over 40 years experience in the pipeline industry, Toshiba offers unsurpassed quality and reliability in medium voltage motor and medium voltage drive solutions for oil and gas field applications. Our products are specifically engineered and manufactured to consistently deliver superior performance. We set a new standard for extreme duty allowing our products to out-tough even the pipeline industry.



In addition, our facility has the expertise, solution, and product for your pipeline industry requirements – all under a single roof. Even if your project requires a customized application or integrated system, Toshiba can deliver a solution that consistently exceeds industry expectations. Our engineering and manufacturing capabilities allow us the ultimate flexibility to customize our products, and provide complete, single-sourced solutions with our motor/drive packages.

Toshiba Oil & Gas Severe Duty Resume

Arctic: Siberia, Northern US, & Canada, Including the Athabasca Oil Sands

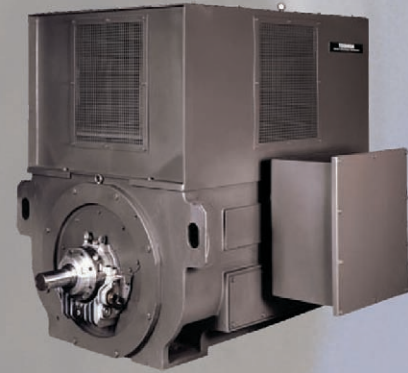
Desert: Middle East & Western Texas

Tropical: South America, Mexico, Central America, & Pacific Rim

Platforms: Gulf of Mexico & Persian Gulf

Medium Voltage Motor Solutions

Toshiba produces a wide range of medium voltage motors for adjustable speed drive applications from 200 to 80,000 HP, at 2,300 through 6,600 V, and across-the-line motors to 50,000 HP at 13,800 V. These motors are uniquely designed with specific performance features required for both liquid and gas pipeline applications.



5000 HP, 900 RPM Medium Voltage Motor & Ariel Compressor Unit

Why Toshiba Medium Voltage Motors for the Pipeline Industry

- Innovative & Conservative Designs
- Advanced Technology & Design for Maximum Efficiency, Energy Savings, & Extended Motor Life
- Advanced Drop-In Core Construction Reduces Electrical Noise, Allows for Easy Maintenance, & Offers Enhanced Cooling & Low Vibration
- Designed for Use with Toshiba Drives
- Three-Year Warranty when Packaged with Toshiba ASD
- Full API-541 4th Edition Capabilities & All Testing Requirements
- Two-Pole Stiff Shaft & Highly Dampened Critical Speed Designs for use with Adjustable Speed Drives

Weather Protected Type II Motor for Liquid Applications

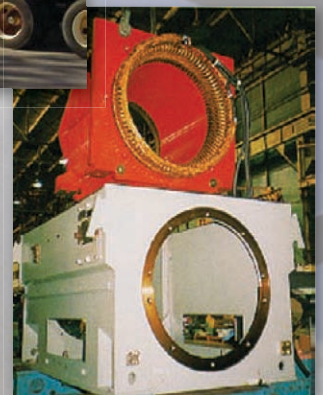
Toshiba's most popular motor offering for liquid applications in the pipeline industry is the Weather Protected Type II option in 2000 through 6000 HP, 2 and 4-pole, at 4 KV. Higher horsepower, different speeds, and voltages up to 13.8 KV are also available. This motor offers the highest evaluated efficiency in the industry, drastically reducing power consumption.

This motor utilizes Toshiba's proprietary core isolation system which reduces vibration to extremely low levels. As a result, users operating a motor in conjunction with an adjustable speed drive are not forced to skip frequencies at a motor's critical speed within the operating speed range due to vibration concerns. Lower vibrations mean two very important things to the pipeline industry -- lower maintenance and higher reliability.

Toshiba motors also address noise pollution concerns through their low noise design. In fact, Toshiba's 2-pole motors test at or below 85 DBA.



4000 HP Medium Voltage Motor & Reciprocating Ariel Compressor Unit Being Transported



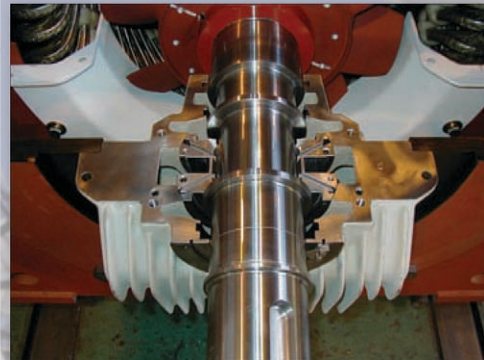
Advanced Drop-In Core Construction Reduces Electrical Noise, Allows for Easy Maintenance, & Offers Enhanced Cooling & Low Vibration

Weather Protected Type II Motor for Gas Applications

Toshiba's most common motor solution for gas applications in the pipeline industry is the Weather Protected Type II option in 2000 through 9000 HP, 1200 and 900 RPM, 4 through 13.8 KV.

This highly engineered motor offers the largest shaft dimensions in the pipeline industry as standard and utilizes high strength 4142 shaft material, allowing the motor to easily handle torsional concerns and current pulsations associated with many compressors. In fact, Toshiba shafts are typically up to 2.25 inches larger than the shafts offered as standard by our competitors. These motors come with torsional and current pulsation data at no extra charge.

Toshiba uses large diameter, high tensile strength shafts for reciprocating compressor applications.



Toshiba exclusively uses RENK on all sleeve bearing applications.

As a result of impeccable design and manufacturing techniques, Toshiba motors provide a longer life, more consistent operation, and increased safety. This reduces issues associated with premature motor failure such as lost production revenue, and the high costs of motor replacement.

Medium Voltage Drive Solutions

Toshiba's medium voltage drives range from 300 to 10,000 HP and 2.4 to 6.6 KV. Our T300MVi and MTX NEMA 3R set a new benchmark in innovation, reliability, size, and safety and are fully equipped to handle the stringent requirements of the pipeline industry.



Why Toshiba Medium Voltage Drives for the Pipeline Industry

- Capability to Start Motors Without Inrush Current
- Drop-In Core Design Allows for Less Parts, Easier Alignment, & Easier Maintenance
- Toshiba's Proprietary Synchronous Transfer Software, Included as Standard, Allows a Single Drive to Control Multiple Motors with Amazing Flexibility Resulting in:
 - Elimination of In-Rush Problems Associated with Across-the-Line & Solid State Starters
 - Eliminates the Need to Use a Medium Voltage Drive for Each Motor
 - Energy Savings
 - Unlimited Starts per Hour
 - Process Control
- Air-Cooled Technology Offers a Lower Initial Cost, Longer Life, & Lower Maintenance
- Capable of Connection to any Power Grid with Low Reflected Harmonics/IEEE-519 Compliance
- Can be Applied to Existing Motors & Cables with No Temperature Rise Or Bearing Shaft Voltage Increase

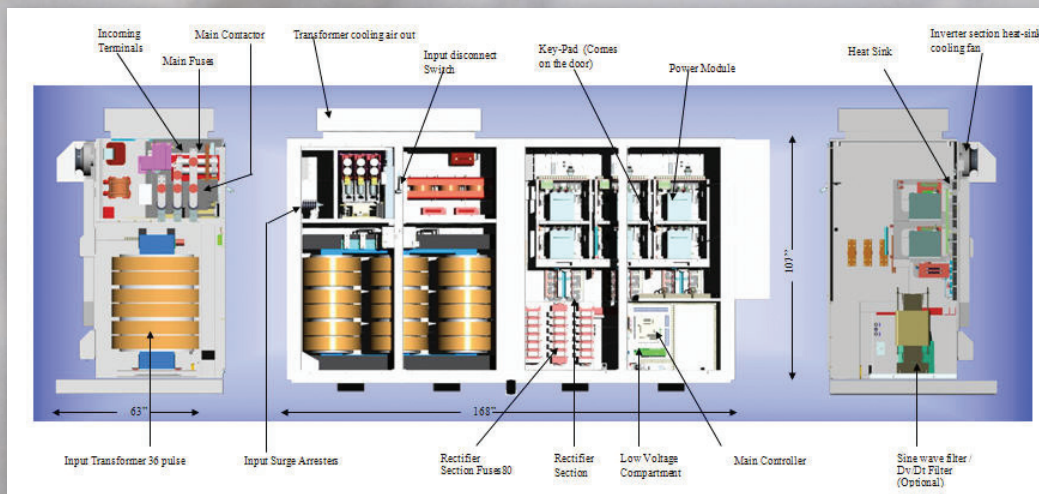
T300MVi

The T300MVi medium voltage adjustable speed drive is the most advanced drive in the industry. No other drive in the market offers the latest technology of a PWM five-level design, which allows for a small footprint, reduced component count, and ultimately a lower cost. The T300MVi can be retrofitted into almost any installation using the existing motors and is compatible with all power systems. In addition, it incorporates all of the latest safety technology making it one of the safest designs on the market.



Motor Control Center Line-Up

The T300MVi's six-cell design eliminates the need for water-cooling. With no water coolant filters to maintain or water leaks to repair, users can avoid week-long shutdowns for water line replacements which result in lost revenue every four to six years.

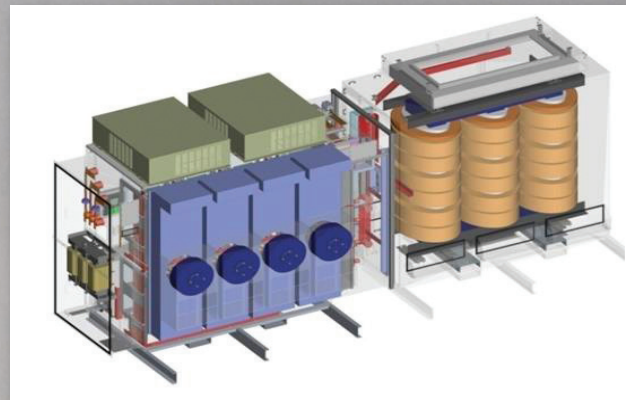


This diagram represents Toshiba's T300MVi (1000 to 2000 HP, 4160 V input) standard product offering. The T300MVi has one of the smallest footprints in the industry.

MTX NEMA 3R

The MTX NEMA 3R is the world's first ASD specifically designed for outdoor installations and remote applications or applications where a building does not exist. It features an innovative enclosure design and power section topology that is unprecedented in the medium voltage ASD arena.

The MTX consists of two enclosure types married together: an isolation transformer section and an inverter section. The isolation transformer is convection cooled. There are no moving parts, and heat is eliminated through passive vents at the top of the drive. The inverter section is forced cooled. Power modules are designed with the heat sinks out-the-back to send waste heat to the atmosphere. The interior of the inverter section is cooled using plate-type heat exchanger(s) so it remains cool and clean without introducing outside air.



Rear View of the MTX NEMA 3R's Construction & Heat Sinks

The new topology is a logical progression of the proven T300MVi design in a UL raintight enclosure. Additionally, users will achieve a lower cost of ownership with the MTX because heat removal from a building-based drive is eliminated. Costs associated with drives installed in a building are dramatically reduced by the unique feature of the MTX design.

TOSHIBA INTERNATIONAL CORPORATION



North American Headquarters and Manufacturing Facility (Houston, TX)

TOSHIBA — Quality by Design

Toshiba's culture and history are strongly rooted in quality. Our designs are technologically innovative, and our products are manufactured from start to end using only the highest quality domestic and foreign parts.

Product Warranty

Toshiba offers a comprehensive warranty program on its full line of industrial products. Consult your salesperson or the factory for specific information.

Need to Know More?

Be sure to visit our website located at www.toshiba.com/ind for the latest information on Toshiba products and services.

Customer Support Services

Toshiba offers 24-hour service nationwide. For assistance of any type call: 1-800-231-1412.



MOTORS ADJUSTABLE SPEED DRIVES CONTROLS UPS INSTRUMENTATION PLC

TOSHIBA

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