TMdrive®-MVe2 Product Application Guide

Medium Voltage Multilevel IGBT Drive
Up to 8,000 HP (7,350 kVA), 3.3 kV, 4.16 kV, to 11 kV
Reliability and Performance

The TMdrive®-MVe2 is an enhancement to the family of TMEIC medium voltage general purpose drives offering:

- Regeneration
- Dynamic Reactive Power Compensation
- Unity line-side power factor
- Reduced part-count
- High availability

<table>
<thead>
<tr>
<th>Design Feature</th>
<th>Customer Benefit</th>
</tr>
</thead>
</table>
| Active line side converter | • Unity (1.0) power factor across entire speed range  
  • Line side harmonics much lower than IEEE 519-2014  
  • Standard regenerative braking  
  • Reactive power control |
| Conservative electronic design & dry film-type capacitors | • Highly reliable operation, expected 16-year MTBF  
  • No need for periodic capacitor replacement (15-year life) |
| Multilevel drive output voltage waveform | • No derating of motor for voltage insulation or heating required  
  • Applies easily to existing motors without the need for an expensive output filter  
  • Eliminates the need for special VFD rated cables  
  • No Neutral Shift |
| Input isolation transformer | • Simplifies design and installation  
  • Less total space required, plus easy integration in MCC building  
  • Better motor protection than transformerless design  
  • High frequency transients are attenuated |
| Power conversion module in a single drawer type package | • Reduction in spare parts  
  • Minimal personnel training for maintenance  
  • 30 minutes Mean Time to Repair (MTTR) |
| Synchronous bumpless transfer of the motor to the utility line | • Allows control of multiple motors with one drive  
  • No motor current or torque transients when the motor transitions to the AC line  
  • Dynamic VAR compensation for the synchro motor |

Covering a broad range of medium voltage drive applications

<table>
<thead>
<tr>
<th>Motor Voltage (V)</th>
<th>Motor Power kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>11,000</td>
<td>10,000</td>
</tr>
<tr>
<td>750 ~ 8,500 HP</td>
<td>500 ~ 6,000 kW</td>
</tr>
</tbody>
</table>

Oil & Gas

For Oil and Gas applications, the MVe2 family of variable frequency drives seamlessly integrates with the rest balance of process with a choice of 3/3.3 kV, 4.16 kV, 6/6.6 kV, 10kV or 11 kV options. The MVe2 can be applied to existing motors and cabling, making them an excellent option in modernization/retrofit applications, including:

- Oil pumps
- Expanders
- Gas compressors
- Extruders
- Fans
- Mixers

Power Generation

Traditional mechanical methods of controlling flow are inefficient and require considerable maintenance. In the Power Generation/Utilities industry, the MVe2 provides more reliable, accurate and energy-efficient control of flow while eliminating the maintenance associated with dampers, vanes or valves for:

- Induced and forced draft fans
- Primary and secondary air fans
- Boiler feed water pumps
- Condensate extraction pumps

Mining

Accurate torque control is a key in controlling large conveyors. The MVe2’s flux vector algorithm provides the accuracy and response for constant torque applications. Mining applications include:

- Raw material conveyor
- Grinding mills
- Pumps
- Crushers
- Shredders
- Hoists

Industrial

Regardless of the torque profile, MVe2 drives are designed to meet motor control needs in a variety of industries:

- Steel
- Water & wastewater treatment
- Rubber & plastics
- Test stands
- Agriculture
- Paper & pulp
- Recreational/Entertainment
A Look Inside

**Differentiating Features**

- Compact design saves valuable floor space making retrofits of old equipment easier
- Compartmentalized panels provide voltage class segregation and top or bottom cable feeds
- Integral isolation transformer provides reliable operation and simplifies installation.
- Significant reduction in parts, reducing spare parts requirements

**Input Power Disconnect Option**†
- A visible, bolted pressure, isolation switch offers mechanical interlocking to allow for maintenance personnel to service the drive.
- The fused (Class E rated) vacuum contactor provides critical fault current protection to the drive.

**Main Power Input**
Four voltage levels are available:
- 3-3.3 kV, 3-phase, 50/60 Hz
- 4-4.16 kV, 3-phase, 50/60 Hz
- 6-6.6 kV, 3-phase, 50/60 Hz
- 10-11 kV, 3-phase, 50/60 Hz

**Internal Pre-Charge AC Reactor***
An ac reactor and medium voltage contactor mitigate the transformer magnetizing inrush current, minimizing stress on the fusing and power components.

**Input Isolation Transformer Standard.**
The input transformer has multiple secondary windings to feed IGBT inverters (cell inverters). This design provides galvanic isolation between the power system and the motor-inverter system.

**Kirk Key Interlocks†**
For additional safety, Kirk key locks are provided standard on all drives.

**Blower Assemblies**
Quiet (<85 dBA at 1m), fans circulate air throughout enclosures pulling air from the front filter assemblies and venting it out the top of the cabinets. Redundant fan assemblies can be provided as an option.

**Control**
- Single 32-bit microprocessor-based control board combines several key drive functions:
  - Power semiconductor gating
  - Speed and torque regulation
  - Motor and drive protection
  - I/O mapping
  - Diagnostic functions
  - High speed data capture buffering
  - Hosting of optional LAN interface
- Drive is configured from the TMdrive-Navigator

**Communications**
An optional communications card can be provided to connect the VFD to the DCS/SCADA system.

**Application Specific Controls**
Each drive is matched to project requirements with custom control components.

**Remote Connectivity Module Standard.**
On-board Windows® based computer provides access to live variables, parameters & historical fault data.

**Power & Motor Cabling Terminations**
Conveniently located power cable terminations can be accessed from the front or rear. A metal cover prevents exposure to live parts when drive is running.

**Lightning Arrestors†**
Incoming power is protected by distribution class lightning arrestors for suppression of transient surges.

**Control & Power Cables**
Gland plates are provided to enable cable entry. Top and bottom entry options are selectable onsite.

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* Available in select frame sizes
† For 4 kV drive, CSA listed in U.S. and Canada only.

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4 A phase leg assembly can be easily racked out and replaced in 30 minutes in case of failure.
The power regeneration function enables stopping of large inertia loads in a short time. During deceleration the rotational energy is returned to the power supply. This reduces energy consumption and electricity costs versus conventional models that can only provide for a coasting stop.

**Improved Power Factor:**
Due to active front end converter and intelligent control, the TMdrive-MVe2 can be sized and configured to supply leading reactive power (VAR) back to the utility to compensate for the other lagging loads on the same bus, or at the point of common coupling, thereby significantly improving the power factor as seen by the utility.

**Utility Interruption Protection.**
Momentary power loss & voltage unbalances can cause harmful effects to a motor. The MVe2 can regain motor control of a spinning load.

**Extremely Low Harmonics. No line-side filter required.**
The MVe2 line side harmonics are much lower than IEEE 519-2014 requirements. Less than 2% current distortion is seen by utility.

**Utility Energy Return**
The power regeneration function enables stopping of large inertia loads in a short time. During deceleration the rotational energy is returned to the power supply. This reduces energy consumption and electricity costs versus conventional models that can only provide for a coasting stop.

**Rapid Acceleration / Deceleration**
The standard regenerative braking function provides for rapid acceleration and deceleration with quick speed response.
**System Configurations**

**Flexible and Scalable.**

The MVe2 can be applied to your process in flexible configurations.

<table>
<thead>
<tr>
<th>Running duty</th>
<th>Running and/or starting duty</th>
<th>Single motor, single drive</th>
<th>Multiple motors, single/multiple drives</th>
</tr>
</thead>
</table>

- **TMdrive-MVe2 Architecture**
  - Simplified.

- **Switching Devices**
  - Insulated gate bipolar transistors (IGBT)
  - Motor Control Centers
  - Control Systems

- **DC Link Long Life Capacitors**
  - Dry film type capacitors eliminate need for replacement (no electrolytic capacitors)

- **Rack In-Rack Out**
  - **Easy Rack-Out**
    - Convenient handles enable easy removal of power modules
  - **Cooling Heat Sink**
    - Heat is transferred from the switching device to the heat sink
  - **Input Fuse**
    - Fused inputs to converter

- **TMdrive-MVe2 for Reactive Power Compensation**
  - Single motor, single drive
    - **Leading VARs**
      - Mains
      - Electric motor
  - **Lagging VARs**
    - During motor starting
  - **Multiple motors, single/multiple drives**
    - **Leading VARs**
      - During motor running
    - **Lagging VARs**
      - During motor starting

- **Power supply**
  - Three-phase
  - 50/60 Hz

- **Series connected identical inverter cells**

- **3-Level (6-peak) Cell inverter module**
  - A patented technology of TMEIC.

- **3-Level (0-peak) Cell inverter module**

- **TMdrive-MVe2 as a soft starter**
  - Running duty
  - Starting duty

- **TMdrive-MVe2 as a soft starter**
  - Mains
  - Input VFD
  - Electric motor
  - Bypass

- **Switching Devices**
  - Board passes pulse width modulated control signal to gate drivers
  - Gate driver circuit boards connect directly to IGBTs

- **Control Board**
  - Power supply
  - Three-phase
  - 50/60 Hz

- **Power supply**
  - Three-phase
  - 50/60 Hz

- **Control Board**
  - Power supply
  - Three-phase
  - 50/60 Hz

- **Input Fuse**
  - Fused inputs to converter
### Frame Sizes to Fit Your Application

#### 4-4.16 kV UL/CSA

<table>
<thead>
<tr>
<th>VFD Outline</th>
<th>Maximum Weight lbs. (kg)</th>
<th>Approximate Motor Shaft HP (kW) at 4.16 kV</th>
<th>Rated Output Current (A) I phase AC*</th>
<th>Inverter kVA output at 4.16 kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame 100</td>
<td>9,300 (4,218)</td>
<td>536 (400)</td>
<td>69</td>
<td>500</td>
</tr>
<tr>
<td>Frame 200</td>
<td>9,300 (4,218)</td>
<td>1,085 (810)</td>
<td>138</td>
<td>1,000</td>
</tr>
<tr>
<td>Frame 300</td>
<td>14,285 (6,480)</td>
<td>2,145 (1,600)</td>
<td>262</td>
<td>1,890</td>
</tr>
<tr>
<td>Frame 400</td>
<td>18,960 (8,600)</td>
<td>3,040 (2,268)</td>
<td>385</td>
<td>2,770</td>
</tr>
<tr>
<td>Dual Frame 400</td>
<td>Consult TMEIC</td>
<td>3,950 (2,946)</td>
<td>500</td>
<td>3,602</td>
</tr>
<tr>
<td>Dual Frame 500</td>
<td>Consult TMEIC</td>
<td>5,778 (4,310)</td>
<td>732</td>
<td>5,271</td>
</tr>
</tbody>
</table>

* 1: 110% OL for 60 sec. Panel heights include cooling fans. VFD capable of 80% regeneration at nominal voltage at unity power factor.

#### 3-3.3 kV/4.16 kV (non UL/CSA)

<table>
<thead>
<tr>
<th>VFD Outline</th>
<th>Maximum Weight lbs. (kg)</th>
<th>Approximate Motor Shaft HP (kW) at 3.3 kV</th>
<th>Rated Output Current (A) I phase AC*</th>
<th>Inverter kVA output at 3.3 kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame 100</td>
<td>8,400 (3,800)</td>
<td>220 (164)</td>
<td>35</td>
<td>200</td>
</tr>
<tr>
<td>Frame 200</td>
<td>8,800 (4,000)</td>
<td>330 (246)</td>
<td>53</td>
<td>300</td>
</tr>
<tr>
<td>Frame 300</td>
<td>11,700 (5,300)</td>
<td>440 (328)</td>
<td>70</td>
<td>400</td>
</tr>
<tr>
<td>Frame 400</td>
<td>12,350 (5,600)</td>
<td>660 (492)</td>
<td>105</td>
<td>600</td>
</tr>
<tr>
<td>Dual Frame 300</td>
<td>Consult TMEIC</td>
<td>880 (656)</td>
<td>140</td>
<td>800</td>
</tr>
<tr>
<td>Dual Frame 400</td>
<td>Consult TMEIC</td>
<td>1,040 (776)</td>
<td>192</td>
<td>1,100</td>
</tr>
<tr>
<td>Dual Frame 600</td>
<td>Consult TMEIC</td>
<td>1,400 (1,044)</td>
<td>227</td>
<td>1,300</td>
</tr>
<tr>
<td>Dual Frame 600</td>
<td>Consult TMEIC</td>
<td>1,650 (1,230)</td>
<td>263</td>
<td>1,500</td>
</tr>
</tbody>
</table>

* 1: 110% OL for 60 sec. Panel heights include cooling fans. VFD capable of 80% regeneration at nominal voltage at unity power factor.

Applicable for CSA listed VFD in U.S. and Canada. Frame designation indicates power cell rating for replacement parts and other purposes.
### Frame Sizes to Fit Your Application

**6-6.6 kV**

<table>
<thead>
<tr>
<th>VFD Outline</th>
<th>Maximum Weight lbs. (kg)</th>
<th>Approximate Motor Shaft hp (kW) at 6.6 kV</th>
<th>Rated Output Current (A) I phase AC*</th>
<th>Inverter kVA output at 6.6 kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame 600</td>
<td>2x600 (4.16 kV only)</td>
<td>2,850 (2,126)</td>
<td>227</td>
<td>2,600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3,300 (2,460)</td>
<td>263</td>
<td>3,000</td>
</tr>
<tr>
<td>Frame 300</td>
<td>2x300, 2x400</td>
<td>2,850 (2,126)</td>
<td>227</td>
<td>2,600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3,300 (2,460)</td>
<td>263</td>
<td>3,000</td>
</tr>
<tr>
<td>Frame 100</td>
<td>100, 200</td>
<td>2,850 (2,126)</td>
<td>227</td>
<td>2,600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3,300 (2,460)</td>
<td>263</td>
<td>3,000</td>
</tr>
<tr>
<td>Frame 50</td>
<td>300, 400</td>
<td>2,850 (2,126)</td>
<td>227</td>
<td>2,600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3,300 (2,460)</td>
<td>263</td>
<td>3,000</td>
</tr>
</tbody>
</table>

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**10-11 kV**

<table>
<thead>
<tr>
<th>VFD Outline</th>
<th>Max. Weight lbs. (kg)</th>
<th>Approx. Motor Shaft HP (kW) at 11 kV</th>
<th>Rated Output Current (A) I phase AC*</th>
<th>Inverter kVA output at 11 kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame 100</td>
<td>17,200 - 17,600</td>
<td>700 (522)</td>
<td>35</td>
<td>660</td>
</tr>
<tr>
<td></td>
<td>(7,800 - 8,000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 50</td>
<td>17,200 - 17,600</td>
<td>1,100 (820)</td>
<td>53</td>
<td>990</td>
</tr>
<tr>
<td></td>
<td>(7,800 - 8,000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 30</td>
<td>17,200 - 17,600</td>
<td>1,400 (1,044)</td>
<td>70</td>
<td>1,320</td>
</tr>
<tr>
<td></td>
<td>(7,800 - 8,000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 15</td>
<td>29,500 - 29,800</td>
<td>2,200 (1,640)</td>
<td>105</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td>(13,150 - 13,500)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 10</td>
<td>29,500 - 29,800</td>
<td>3,400 (2,536)</td>
<td>162</td>
<td>3,080</td>
</tr>
<tr>
<td></td>
<td>(13,150 - 13,500)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 5</td>
<td>29,500 - 29,800</td>
<td>4,700 (3,500)</td>
<td>226</td>
<td>4,290</td>
</tr>
<tr>
<td></td>
<td>(13,150 - 13,500)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 2</td>
<td>5,710 (2,040)</td>
<td>5,500 (4,100)</td>
<td>263</td>
<td>5,000</td>
</tr>
<tr>
<td></td>
<td>(2,040)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 1</td>
<td>40,785 (18,500)</td>
<td>6,580 (4,908)</td>
<td>315</td>
<td>6,000</td>
</tr>
<tr>
<td></td>
<td>(18,500)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 2</td>
<td>8,040 (6,000)</td>
<td>8,400 (6,000)</td>
<td>385</td>
<td>7,350</td>
</tr>
</tbody>
</table>

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### Cabinet Minimum Clearance Space

**Drive**

<table>
<thead>
<tr>
<th>Drive Class</th>
<th>Frame Size</th>
<th>Front Side Space</th>
<th>Rear Side Space</th>
<th>Upper Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-3.3 class</td>
<td>300, 400</td>
<td>1,700 mm (6.69 ft)</td>
<td>210 mm (6.88 ft)</td>
<td>300 mm (9.84 ft)</td>
</tr>
<tr>
<td>3-3.3 class/16 kV</td>
<td>300, 400</td>
<td>1,700 mm (6.69 ft)</td>
<td>210 mm (6.88 ft)</td>
<td>300 mm (9.84 ft)</td>
</tr>
<tr>
<td>4-4.16 kV class</td>
<td>300, 400</td>
<td>1,700 mm (6.69 ft)</td>
<td>210 mm (6.88 ft)</td>
<td>300 mm (9.84 ft)</td>
</tr>
<tr>
<td>6-6.6 class</td>
<td>300, 400</td>
<td>1,700 mm (6.69 ft)</td>
<td>210 mm (6.88 ft)</td>
<td>300 mm (9.84 ft)</td>
</tr>
<tr>
<td>10-11 class</td>
<td>300, 400</td>
<td>1,700 mm (6.69 ft)</td>
<td>210 mm (6.88 ft)</td>
<td>300 mm (9.84 ft)</td>
</tr>
</tbody>
</table>

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*Footnotes:

- *1: 110% OL for 60 sec. Panel heights include cooling fans. VFD capable of 80% regeneration at nominal voltage at unity power factor. Frame designation indicates power cell rating for replacement parts and other purposes.*
Frame Sizes to Fit Your Application

<table>
<thead>
<tr>
<th>Inverter Power (kVA)</th>
<th>Motor Shaft Power (kW)</th>
<th>Motor pf</th>
<th>Motor Eff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Output Current</td>
<td>Inverter Power (kVA)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Ratings based on motor pf =0.87, Motor Eff = 0.94, ambient temperature is 32°F–104°F (0°C–40°C)

1. Redundant cooling fans available as an option.
2. Optional bypass circuit can be separately mounted.
3. Reduced cooling fans available as an option.
4. No rear access required except for 10-11 kV VFDs or 13.8 kV VFDs.
5. Inverter power cabling and motor cabling are bottom entry, top entry is standard for CSA design, option for IEC.
6. Air is pulled through the filters in the cabinet doors and vented out top.
7. Available options include motor cooling fan control, cabinet space heater, sync motor control, smooth transfer to and from utility, motor space heater control, RTD, monitor redundant fans, output heater, sync motor control, smooth transfer to and from utility, motor space heater control, RTD, monitor redundant fans, output heater, sync motor control, smooth transfer to and from utility.
8. The panels include channel bases attached to the cabinets before shipment.
9. This table presents only a sample of voltages and horsepower ratings. Other options such as 13.8 kV input are available.

Puissance VFD à entrée standard de la commande

- Surchage basé sur le taux de puissance moteur = 0.87, taux d'efficacité du moteur = 0.94, température ambiante = 32°F–104°F (0°C–40°C)

1. Ventilation redondante disponible en option.
2. Circuit optionnel de raccordement alternatif peut être monté séparément.
3. Ventilation réduite disponible en option.
4. Aucun accès arrière requis excepté pour les VFDs de 10-11 kV et 13.8 kV.
5. Le câblage de puissance de l'inverseur et le câblage du moteur sont entrée inférieure, sortie supérieure est standard pour le design CSA, option pour l'IEC.
6. L'air est tiré à travers les filtres dans les portes du cabinet et évacué en haut.
7. Les options disponibles incluent le contrôle de la ventilation du moteur, la température ambiante du cabinet, le contrôle synchrone du moteur, le transfert doux depuis et jusqu'au réseau, le contrôle synchrone du moteur, le transfert doux depuis et jusqu'au réseau, le contrôle synchrone du moteur, le transfert doux depuis et jusqu'au réseau.
8. Les panneaux incluent des bases de canaux attachées aux cabinets avant expédition.
9. Cette table présente seulement un échantillon de tensions et de puissances. D'autres options telles que 13.8 kV d'entrée sont disponibles.
Empower Your Crew: Local and Remote Control

The Navigator tool helps maintain TMEIC drives in the field. Any user can easily access current drive expertise & know-how. Compatible with OS Windows 7 and Professional 32-bit

High speed data is automatically captured and saved in the event of a drive fault. Users can capture high speed data based on their own trigger conditions or perform high resolution real-time trending.

Live block diagrams provide a real-time graphical view of drive functions. Functions can be configured directly from the graphical view.

Product documentation is integrated into tool. Users can capture their own notes to benefit future troubleshooting.

An optional touch screen display is available with 9 languages built in. The graphic display is easy to read and understand and contains all of the same functions as the standard keypad.

Field Installation

...Made Easy.

Maintenance

...quick and safe.

TMdrive Navigator

The MVe2 keypad, coupled with the Windows® based TMdrive Navigator brings productivity to your commissioning and maintenance activities.

High speed data is automatically captured and saved in the event of a drive fault. Users can capture high speed data based on their own trigger conditions or perform high resolution real-time trending.

Compatible with OS Windows 7 and Professional 32-bit

An optional lifter cart enables the operator to quickly rack-in/out the power modules.

A convenient isolation switch (option) kills the main power to the VFD to allow for safe servicing.

Drawer type cell inverters shorten MTTR to 30 minutes

Aluminum mesh air filters can be removed and cleaned while the VFD is running.

Operator Keypad (Standard)

High Function Display
- LCD backlight gives great visibility & long life
- Bar graphs, icons, menus, and digital values combine to provide concise status information, often eliminating the need for traditional analog meters
- RJ-45 Ethernet port is used for the TMdrive Navigator

Instrumentation Interface
- Two analog outputs are dedicated to motor current feedback
- Five analog outputs are mapped to variables for external data logging and analysis

Easy to understand navigation buttons allow quick access to information without resorting to a PC based tool

Local indicator of DC Bus status advises when it is safe to open the VFD cabinet

Switch to local mode to operate the equipment from the keypad

Multilingual Keypad (Optional)

An optional touch screen display is available with 9 languages built in. The graphic display is easy to read and understand and contains all of the same functions as the standard keypad.
At TMEIC, we provide highly reliable automation systems, additionally TMEIC offers remote connectivity with RCM®. Protection for your investment, by reducing downtime and lowering repair costs.

Remote drive connectivity requires an internet connection between your facility and TMEIC for retrieval of fault logs and files for diagnosing drive upsets. The RCM® enables seamless integration between drives and support engineers.

**Features**

- **Reduced downtime & mean-time-to-repair**
  - Quick support saves thousands in lost production
  - TMEIC engineers can quickly connect to the drive and diagnose many issues in minutes.

- **Secured connection**
  - Customer-controlled access
  - All remote activity is conducted with permission of the customer. Drive start/stop is not permitted remotely.

- **Fault upload utility**
  - Proprietary fault upload software
  - RCM® can monitor key real-time parameters. Historical drive faults are pushed automatically to the computer. This enables TMEIC engineers to analyze the issue resulting in the fault and provide a more coherent solution.

- **Industrial computer**
  - Rugged computer for the most demanding applications
  - Fanless computer withstands high vibration and temperature ranges in a small DIN-rail mounted footprint

- **Multiple ethernet/serial ports**
  - Flexible connectivity
  - The module can be connected to two separate LANs along with a host of serial talking USB devices.

**Benefits**

- Reduces Service Call Costs
- Reduces downtime & mean-time-to-repair
- Quick support saves thousands in lost production
- Customer-controlled access
- All remote activity is conducted with permission of the customer. Drive start/stop is not permitted remotely.
- Proprietary fault upload software
- RCM® can monitor key real-time parameters. Historical drive faults are pushed automatically to the computer. This enables TMEIC engineers to analyze the issue resulting in the fault and provide a more coherent solution.
- Rugged computer for the most demanding applications
- Fanless computer withstands high vibration and temperature ranges in a small DIN-rail mounted footprint
- The module can be connected to two separate LANs along with a host of serial talking USB devices.

**Customer Service**

**North American Sales and Service Network**

Whether the equipment is up and running or experiencing downtime, live help from TMEIC is a phone call away. With bases in North America and around the world, regional TMEIC companies and TMEIC motor service shops provide reliable support whenever needed.

- 77 TMEIC VFD Service Engineers
- 43 Motor service locations
- Authorized VFD service providers
- Authorized MV Motor Repair Technicians

**Service 24/7 – Talk to a service engineer, we’re available when you need us**
### TMEIC AC Drives Offer Complete Coverage

![Drive Output Voltage/Motor Voltage Diagram]

#### Drive Cooling Method
- **Air-cooled**
- **Water-cooled**

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