

# TMdrive-MVe2 MV VFD

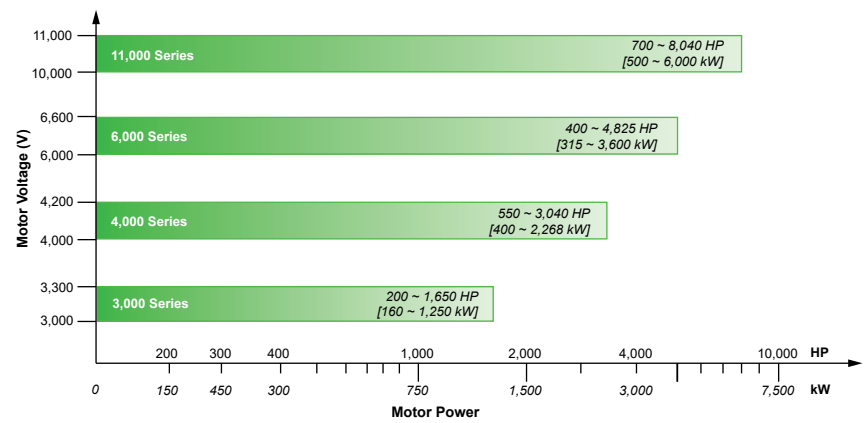


**Reliability and Performance, Delivered.**  
**Up to 8,000 HP, 3.3kV, 4.16kV, 6.6kV to 13.8 kV**

Design Feature	Customer Benefit
Active line side converter	<ul style="list-style-type: none"> <li>• Unity (1.0) power factor across entire speed range</li> <li>• Line side harmonics much lower than IEEE 519-2014</li> <li>• Standard regenerative braking</li> <li>• <b>Reactive power control</b></li> </ul>
Conservative electronic design & dry film-type capacitors	<ul style="list-style-type: none"> <li>• Highly reliable operation, expected 16-year MTBF</li> <li>• No need for periodic capacitor replacement (15-year life)</li> </ul>
Multilevel drive output voltage waveform	<ul style="list-style-type: none"> <li>• No derating of motor for voltage insulation or heating required</li> <li>• Applies easily to existing motors without the need for an expensive output filter</li> <li>• Eliminates the need for special VFD rated cables</li> <li>• No Neutral Shift</li> </ul>
Input isolation transformer	<ul style="list-style-type: none"> <li>• Simplifies design and installation</li> <li>• Less total space required, plus easy integration in MCC building</li> <li>• Better motor protection than transformerless design</li> <li>• High frequency transients are attenuated</li> </ul>
Power conversion module in a single drawer type package	<ul style="list-style-type: none"> <li>• Reduction in spare parts</li> <li>• Minimal personnel training for maintenance</li> <li>• 30 minutes Mean Time to Repair (MTTR)</li> </ul>
Synchronous bumpless transfer of the motor to the utility line	<ul style="list-style-type: none"> <li>• Allows control of multiple motors with one drive</li> <li>• No motor current or torque transients when the motor transitions to the AC line</li> <li>• Dynamic VAR compensation for the synced motor</li> </ul>



## Covering a broad range of medium voltage drive applications



Higher power ratings are available. Please see pages 10 through 13 for details.



power generation

mining

rubber & plastics

water & wastewater

cement

oil & gas

# TMdrive-MVe2 Specifications



## VFD Power Input

Mains input voltage	<ul style="list-style-type: none"> <li>Up to 13.8 kV, 3-phase, <math>\pm 10\%</math></li> <li>Complete power loss ride-thru of 300 ms.</li> </ul>
Input frequency	<ul style="list-style-type: none"> <li>50/60 Hz</li> <li><math>\pm 5\%</math></li> </ul>
Power factor	<ul style="list-style-type: none"> <li>Unity at all loads and speed</li> </ul>
Harmonics	<ul style="list-style-type: none"> <li>Lower than IEEE 519-2014 standard</li> <li>No line-side filters required, <math>&lt; 2\% I_{THD}</math></li> </ul>
Converter type	<ul style="list-style-type: none"> <li>AC fed active front end</li> </ul>
Power semiconductor technology	<ul style="list-style-type: none"> <li>Low loss IGBT</li> </ul>
Transformer	<ul style="list-style-type: none"> <li>Dry type, aluminum wound, H-type</li> </ul>
Auxiliary power	<ul style="list-style-type: none"> <li>Control power (internal)</li> <li>Fan power: 380V-690V (external)</li> </ul>



## VFD Power Output

Output Voltage	<ul style="list-style-type: none"> <li>3/3.3 kV, 4.16 kV, 6/6.6 kV, 10/11 kV</li> </ul>
Output Frequency	<ul style="list-style-type: none"> <li>0-120 Hz for 3/3.3 kV, 4.16 kV, 6/6.6 kV</li> <li>0-72 Hz for 10/11 kV inverters</li> </ul>
Output Voltage Levels	<ul style="list-style-type: none"> <li>9/17-levels for 3/3.3 kV, 4.16 kV</li> <li>13/25 levels for 6/6.6 kV</li> <li>21/41 levels for 10/11 kV</li> </ul>
Number of cell modules in series per phase	<ul style="list-style-type: none"> <li>2 for 3/3.3 kV and 4.16 kV</li> <li>3 for 6/6.6 kV, 5 for 10/11 kV</li> </ul>
Power Semiconductor Technology	<ul style="list-style-type: none"> <li>Low loss IGBT</li> </ul>



## Control I/O

Digital Input	Qty. (5)
Dedicated Function Input	Qty. (1)
Configurable (programmable) Function Input	Qty. (4)
Digital Relay Output	Qty. (8)
Digital 24V Outputs	Qty. (4)
Speed feedback encoder input	High resolution tach, 10 kHz, 5 or 15 V DC diff. input, A quad B, with marker
LAN interface options	Profibus-DP, DeviceNet™, or Modbus RTU, TC-Net I/O, CC-link. Others available.
Motor temperature sensor option	High resolution temperature protection relay: 100 Ohm platinum RTD, 14 channels



## Display and Diagnostics

PC Configuration	TMdrive-Navigator for configuration, local and remote monitoring, animated block diagrams, dynamic live and capture buffer based trending, fault diagnostics, commissioning wizard, and regulator tune-up wizards. Ethernet 10 Mbps point to point or multi-drop, each drive has its own IP address.
Keypad and Display	Backlit LCD, animated displays <ul style="list-style-type: none"> <li>Four configurable bar graphs</li> <li>Optional multilingual display</li> <li>Parameter editing</li> <li>Drive control</li> </ul>
<b>RCM</b> ®	<i>Remote Connectivity Module</i> Fanless industrial computer in the VFD with proprietary fault upload software for troubleshooting and diagnostics

For specifications not mentioned here, contact TMEIC.




## Environmental

Operating Temperature	<ul style="list-style-type: none"> <li>0° to 40°C (32° to 104°F) at rated load</li> <li>Up to 50°C with derating</li> </ul>
Storage Temperature	<ul style="list-style-type: none"> <li>-25° to +70°C, indoor storage only</li> </ul>
Relative Humidity	<ul style="list-style-type: none"> <li>Up to 95%, non-condensing</li> </ul>
Altitude	<ul style="list-style-type: none"> <li>Up to 1000m (3300 ft)</li> <li>Higher altitude available with derating</li> </ul>
Vibration	<ul style="list-style-type: none"> <li>0.3G max</li> <li>2Hz&lt;f&lt;9Hz: Half amplitude sine wave is within 0.9m</li> <li>9Hz&lt;f&lt;100Hz: Vibration acceleration is <math>&lt; 3m/s^2</math></li> </ul>
Cooling	<ul style="list-style-type: none"> <li>Air-cooled with fans on top and air intake on front</li> <li>For 10/11kV inverter, air intake in rear also</li> </ul>



## Mechanical

Enclosure	<ul style="list-style-type: none"> <li>NEMA 1, Gasketed</li> <li>IP 30, except fan opening</li> <li>Color: Munsell 5Y7/1</li> </ul>
Cable Entrance	<ul style="list-style-type: none"> <li>Top or bottom</li> <li>Selectable on-site</li> </ul>
Noise	<ul style="list-style-type: none"> <li>~76-80 dBA at 3.1 ft from enclosure</li> </ul>
Mean Time To Repair (MTTR)	<ul style="list-style-type: none"> <li>30 minutes to replace power module</li> </ul>
Mean Time Between Failure (MTBF)	<ul style="list-style-type: none"> <li>16 years</li> </ul>
Code conformance	<ul style="list-style-type: none"> <li>Applicable IEC, JIS, JEM, UL, CSA and NEMA standards</li> </ul>
Equipment marking	<ul style="list-style-type: none"> <li> 4.16 kV variant only</li> </ul>



## Motor Control and Protection

Vector Control Accuracy	<ul style="list-style-type: none"> <li>Speed response: 20 rad/sec</li> <li>Speed regulation without speed sensor <math>\pm 0.5\%</math></li> <li>Speed Control Range: 5 - 100%</li> </ul>
Control	<ul style="list-style-type: none"> <li>Non-volatile memory for parameters and fault data</li> <li>Vector control with/without speed feedback, or Volts/Hz</li> <li>Designed to keep running after utility supply transient voltage drop outs of 300 ms</li> <li>Synchronous transfer to line (option)</li> <li>Synchronous motor control (option)</li> </ul>
Major Protective Functions	<ul style="list-style-type: none"> <li>Inverter overcurrent, overvoltage</li> <li>Cooling fan abnormal</li> <li>Motor ground fault</li> <li>Low or loss of system voltage</li> <li>Over-temperature</li> <li>DC bus voltage</li> <li>Voltage/current unbalance</li> <li>5/20 min. overload</li> <li>Loss of speed reference</li> <li>Input Voltage phase loss</li> <li>VFD output open</li> <li>Transformer overheat</li> </ul>

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