TMdrive-MV Medium Voltage Drive

Medium Voltage Drive
250 - 6975 HP
(200 - 6000 kVA)

The TMdrive-MV is a medium voltage, ac fed drive designed for high-efficiency and power-friendly operation in a broad range of industrial applications.

High reliability, low harmonic distortion, and high power factor operation are designed into the drive.

The TMdrive-MV is available with two voltage classes:

3.3 kV Voltage Class: 3,000 - 3,300 V ac
6.6 kV Voltage Class: 6,000 - 6,600 V ac

Design Feature	Customer Benefit
• Conservative design using 1700 V IGBTs	• Highly reliable operation, and proven 12 year drive MTBF
• High energy efficiency over 97%	• Considerable energy savings
• Diode rectifier ensures power factor greater than 95% in the speed control range	• Capacitors not required for power factor correction
• 18-pulse converter rectifier and phase shifted transformer	• No harmonic filter required to provide lower harmonic distortion levels than IEEE-519-1992 guidelines
• Multiple level drive output waveform to the motor (seven levels for the 6.6 kV inverter)	• No derating of motor for voltage insulation or heating is required due to motor friendly waveform
• Synchronous transfer to line option with no interruption to motor current	• Allows control of multiple motors with one drive • No motor current or torque transients when the motor transitions to the AC line
• Input isolation transformer included in drive package	• Better motor protection • Less total space required • Simplifies design and installation
• 6.6 kV direct drive voltage output level	• No output transformer required, saving cost, mounting space, and energy

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Dimensions and Weights

	HP (kVA)	Height Inches (mm)	Width Inches (mm)	Depth Inches (mm)	Est. Weight Pounds (kg)
3.3 kV	268-1206 (200-900)	96-103 (2428-2600)	111 (2810)	36-40 (910-1010)	6600-9020 (3000-4100)
	1608-3488 (1200-3000)	96-104 (2428-2630)	166-198 (4220-5020)	40-60 (1010-1510)	15400-20680 (7000-9400)
6.6 kV	536-2412 (400-1800)	96-103 (2428-2600)	127-186 (3220-4720)	36-40 (910-1010)	9240-15400 (4200-7000)
	3216-4824 (2400-3600)	103 (2600)	308 (7820)	40 (1010)	29480 (13400)
	5628-6975 (4200-6000)	104 (2630)	371 (9420)	60 (1510)	48400 (22000)

Control I/O

Control Area	Specifications
Analog Inputs	(2) ±10 V or 4-20 mA, configurable, differential
Analog Outputs	(3) ±10 V, 8-bit, configurable, 10 mA max
Digital Inputs	(2) 24-110 V dc or 48-120 V ac; (6) 24 V dc, configurable
Digital Outputs	(6) 24 V dc open collector 50 mA
Speed Feedback Encoder Input	High-resolution tach, 125 kHz, 5 or 15 V dc diff. input, A Quad B, with marker
LAN Interface Options	Profibus-DP, ISBus, DeviceNet™, or TOSLINE®-S30
Motor Temperature Sensor	High-resolution torque motor temperature feedback: 1 k Ohm platinum resistor or 100 Ohm platinum RTD (uses analog input with signal conditioner)

Display and Diagnostics

	Specifications
PC Configuration	Control System Toolbox 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 multidrop, each drive has its own IP address
Keypad and Display	Backlit LCD, animated displays • Parameter editing • Four configurable bar graphs • Drive control
Instrumentation Interface	Two analog outputs dedicated to motor current feedback, plus five analog outputs that can be mapped to variables for external data logging and analysis

Additional Specifications

Power System Input and Harmonic Data
- Voltage: up to 6.6 kV, 3-phase, +10%/-10%
- Tolerates power dips up to 25% without tripping, complete power loss ride through of 300 msec
- 125% Overload (OL) for 60 seconds; other OL ratings available
- Frequency 50 or 60 Hz, ±5%
- Displacement power factor (PF): 0.95 lag
- True PF: greater than 0.95 lag over 40-100% speed range
- Exceeds the IEEE 519-1992 standard for harmonics, without filters
- Top or bottom cable entry

Converter Type
- AC fed 18-pulse diode using phase shifted transformer

Transformer
- Dry type transformer
- Nine LV windings
- Class H insulation

Inverter
- Multi-level inverter cells: three in series for 3.3 kV inverter; six in series for 6.6 kV inverter
- 1700 Volt IGBTs
- Roll-out phase modules for fast maintenance and repair

Applicable Standards
- IEC146, JIS, JEC, JEM, CE
- 0-66 Hz, up to 120 Hz
- Seven-level output for motor-friendly waveform
- Top or bottom cable entry

Operating Environment and Needs
- Temperature: 0° to +40°C
- Humidity: 85% maximum, non condensing
- Altitude: Up to 1000 m (3300 ft) above sea level
- Fan Power (by user): 220 V ac, 3-phase, 60 Hz, or 200 V ac, 3-phase, 50 Hz

Cooling
- Air-cooled with fans on top

Sound
- Less than 75 dBA, at 3.1 ft *(1m)* from enclosure

Control
- Non-volatile memory for parameters and fault data
- Vector control with or without speed feedback, or Volts/Hz
- Designed to keep running after utility supply transient voltage drop outs of 300 ms
- Synchronous transfer to line option

Vector Control Accuracy and Response
- Speed regulator: 20 rad/sec
- Speed regulation without speed sensor: ± 0.5%
- Torque response: 500 rad/s
- Torque accuracy: ± 3% with temp sensor, ± 10% without

Protective Functions
- Inverter overcurrent, overvoltage
- Low or loss of system voltage
- Motor ground fault
- Motor overload
- Cooling fan abnormal
- Over-temperature
- CPU error

Enclosure
- IP20 (IEC-529), NEMA1 gasketted equivalent
- Color: Munsell 5Y7/1 - ANSI 61 gray

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GEA 14614
Ver. 0, September 2006