Medium Voltage Drive
180 - 11,400 kVA

The TMdrive-MVG 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-MVG is available with four voltage classes:

3.3 kV Voltage Class: 3,000 - 3,300 V ac
6.6 kV Voltage Class: 6,000 - 6,600 V ac
10 kV Voltage Class: 10,000 V ac
11 kV Voltage Class: 11,000 V ac

Design Feature	Customer Benefit
• Conservative design using 1700 V IGBTs	• Highly reliable operation, expected 12-year drive MTBF
• High energy efficiency approximately 97%	• Considerable energy savings
• Diode rectifier ensures power factor greater than 95% in the speed control range	• Capacitors not required for power factor correction
• Multi-pulse converter rectifier and phase shifted transformer: 3.3 kV Class: 18 pulse 6.6 kV Class: 36 pulse 10 kV Class: 54 pulse 11 kV Class: 30 pulse	• 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
• Direct drive voltage output level	• No output transformer required, saving cost, mounting space, and energy

TMEiC
We drive industry

TMdrive®-MVG Medium Voltage Drive

Dimensions and Weights

	kVA	Height* mm	Width mm	Depth mm
3.3kV	200 -400	2840	2100	900
	600 - 800	2840	2200	900
	950 - 1100	2895	2800	1000
	1300 - 1500	2895	3100	1100
	1800 - 2000	2895	4000	1100
	2000 - 2200	2895	4100	1100
	2400 - 3000	2895	4600	1300
6.6kV	400 - 800	2840	3200	900
	1200 -1600	2895	4200	900
	1900 - 2200	2895	5000	1000
	2600 - 3000	2895	5100	1100
	3600 - 4400	2895	6100	1200
	4800 - 6000	2895	6300	1400
10kV	600 - 1200	3250	6500	1500
	1500 - 2400	3250	7300	1500
	2800 - 4500	3250	7700	1500
	7200 - 9000	3250	13000	1500
11kV	660 - 1320	3250	6500	1500
	1650 - 2640	3250	7300	1500
	3080 - 5000	3250	7700	1500
	8000 - 10000	3250	13000	1500

Preliminary data

*Height = Panel+Base+Fan

Control I/O

Control Area	Specifications
Analog Inputs	(2) ± 10 V or 4-20 mA, configurable, differential
Analog Outputs	(4) ± 10 V, 8-bit, configurable, 10mA 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, 10 kHz, 5 or 15 V dc diff. input, A Quad B, with marker
LAN Interface Options	Profibus-DP, ISBus, DeviceNet™, TOSLINE®-S20, or Modbus RTU
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 Drive 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 • 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 11 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 Hz 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
- Bottom cable entry

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

Transformer
- Dry type transformer; Air Cooled Type; Multi LV windings

Inverter
- Multi-level inverter cells:
  -three in series for 3.3 kV inverter -six in series for 6.6 kV inverter
  -nine in series for 10 kV inverter -ten in series for 11 kV inverter
- 0-66Hz
- Up to 120 Hz, option for 3/3.3 and 6/6.6kv
- For 10/11kv, maximum frequency 72Hz
- Multi-level output for motor-friendly wave form

Applicable Standards
- IEC61800-4, JIS, JEC, JEM

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: 380/400/440 Vac, 3 phase, 50 Hz or 60 Hz
- Control Power (by user): 220 Vac, 3 phase, 60 Hz or 200 Vac, 3 phase, 50 Hz

Cooling
- Air-cooled with fans on top

Sound
- Approximately 76-83 dBA, at 3.1 ft (1*m*) 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)
- Synchronous motor control (option)

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

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

Enclosure
- IP30 except for fan openings (IEC 60529), NEMAI gasketted equivalent
- Color: Munsell 5Y7/1 (Option: ANSI 61 gray, RAL7032 etc.)