TOSHIBA

MEDIUM VOLTAGE DRIVES

T300MVi®

Reliability *in motion*®

XT

- Small Footprint
- Reduced Component Count
- IEEE-519 1992 Compliant with 24-Pulse Harmonic Cancellation
- Additive PWM Output Voltage with No Neutral Shift
- May be Used with Standard Motors
- Ten-Year Mean Time Between Failures

Built in Harmonic Reduction, Without Filtering or Concern for Long Lead Lengths

Toshiba's T300MVi contains specially designed transformer and rectifier schemes that provide phase-shift cancellation capabilities, eliminating issues concerning harmonic injections into bus-fed equipment. Instead, the T300MVi medium voltage drive simply looks like a linear load on the incoming AC line. The drive also exceeds IEEE-519 requirements without the addition of any harmonic filters.

Other Benefits:

- Topology Provides Isolation from Ground Faults and Line Surges
- Design Obtains Higher Displacement Power Factor (0.96) than Running Motor Across the Line
- Motor Torque Ripple Negligible Due to Extremely Small Harmonic Current Contents, Reducing Need for Damping Devices, e.g., Couplings, Flywheels
- Reduces Possibility of Drive-Induced Torsional Vibration in Driven Equipment

TOSVERT-300MVi® NPC ADJUSTABLE SPEED DRIVE 2000 HP 4.16 KV

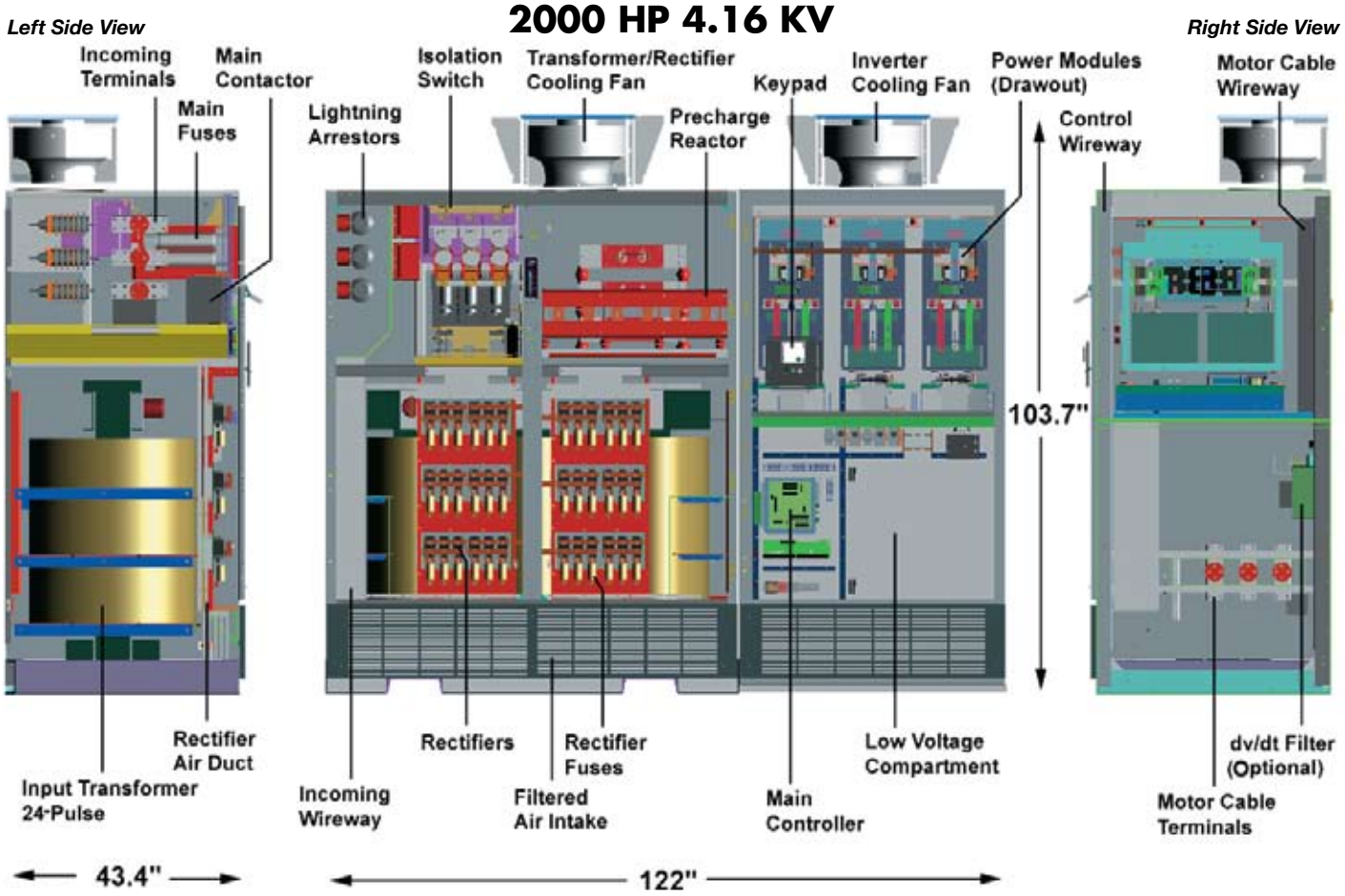


Diagram represents standard product offering: T300MVi medium voltage drive 1000 to 2000 HP, 4160 V Input. This product was designed to have one of the smallest footprints offered by any manufacturer.

Stable Speed Control Without a Speed-Sensing Device

- Provides V/Hz or Vector Control Performance Without a Motor-Mounted Digital or Analog Sensor
- Controls Industrial Processes Utilizing an Internal, High Speed Algorithm
- Capable of Closed-Loop Vector Control for Super High Performance Applications

Continuous Operation During Momentary Power Failures

- Operates with 30% Undervoltage Condition (Trip Time Based on Drive Overload)
- Five-Cycle Ride-Through During Complete Outages
- Contains Automatic Ride-Through Control
- Allows Restarting into Rotating Load upon Restoration of AC Line Power Following Total Power Loss

Highly Advanced Control Systems

The T300MVi drive includes advanced electronics to reduce chip count and increase performance and reliability. This feature alone makes this product the highest quality and most reliable in the industry.

- Control Circuitry Includes Industry Leading Toshiba PP7 High Speed Processor Using 32-Bit CPU
- Enhanced Reliability through Surface-Mount and Multi-Level Printed Circuit Board Technology

Designed with the Customer in Mind

The T300MVi proves that medium voltage drive process control programming does not have to be complex. The operator panel and electronic interfaces combine to make programming processes quick, simple, and easily modified.

Keypad and Display Include:

- Front-Mounted Control Panel with Eight-Line, Graphical, Nine-Key, Large LCD for Monitoring Operations, Diagnostics, and Trouble Shooting

Optional Electronic Interfaces:

- Utilize Fiber Optic and RS232 Ports for Data Transmission
- Offer Toshiba Tosline®S-20 Communication Protocol
- Offer Devicenet®, Profibus®, or Other Communication Protocol as Optional Connectivity Features

The T300MVi® Medium Voltage Drive -- Capable of Using a Windows® Interface for Easy Start-up and Monitoring

Menu-Driven, Windows®-Based:

- Programming of Parameters Prior to and During Installation
- Adjustment Support:
  - Block Diagram Display (Adjustment, Maintenance, Diagnosis)
  - Bar Graph Display
  - Test Operation
  - Report of Adjustment Data
- Data Loading/Saving/Editing
- Trouble Shooting
- Trace Back
- On-Line Manual
- Trend Display
- First Fault Display
- Trouble Record
- Saving and Loading Set Data

IGBT Technology: Tried and True

Over the years, IGBT technology has proven to be the most reliable and best performing means of speed control in low voltage drives. Toshiba has mastered this technology, and continues to excel at it. The T300MVi is designed using both diodes and IGBTs in the main power circuit. We offer a control circuit topology providing higher performance than our competition while using fewer parts. What does this mean to our customers? Plain and simple -- fewer parts equals lower maintenance. This philosophy is integrated into our modular vertical design to provide power module interchangeability and smaller footprints than offered by competitors.

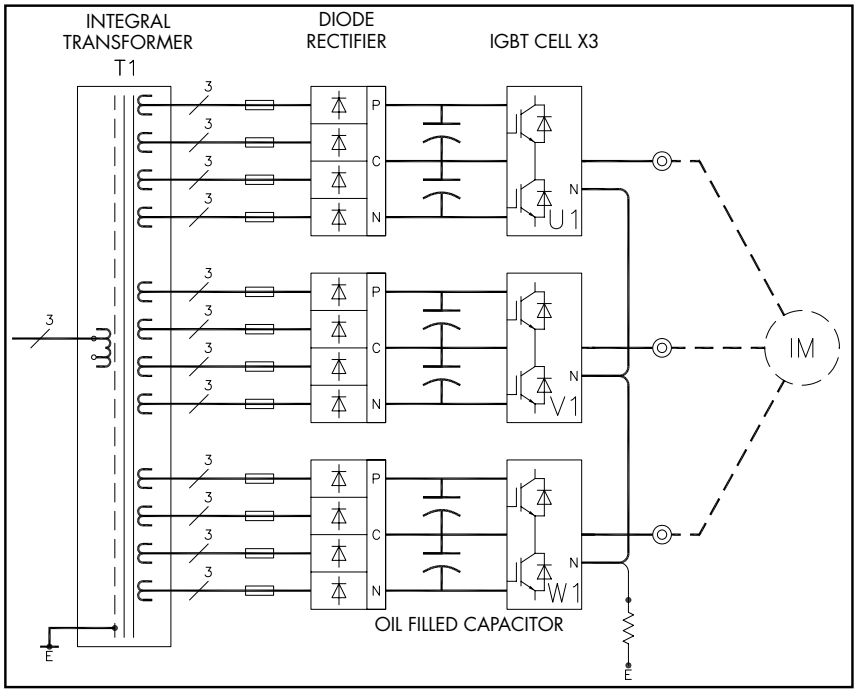
Other Advantages of IGBT Technology:

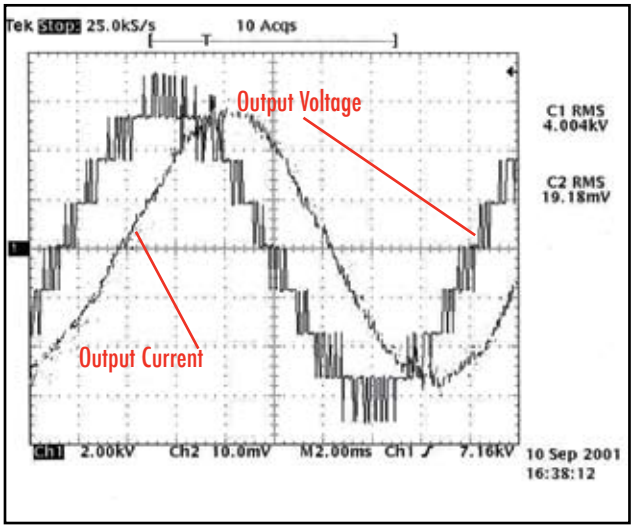
- Inherent Short Circuit and Ground-Fault Immunity at Output
- Lower Gating Power Requirements
- Small Snubber Circuitry Required

All T300MVi drives use a three-power module design for reduced MTTR. The special racking mechanism extends from the drive to allow module inspection. In addition, the drive does not contain fans, contactors, or large electrolytic capacitors.

Toshiba guarantees the T300MVi product line will meet or exceed IEEE-519 standards at input to the drive. As a result, the drive appears to be a linear load to the power system.

The T300MVi design eliminates the need for costly and time-consuming harmonic analysis.





Multi-Level PWM Output Closely Simulates True Sinewave

The T300MVi drive employs several layers of switching devices to provide a smooth output wave to the motor. The multi-step output closely simulates sine wave shape, virtually eliminating motor failures due to insulation stress and long lead-length issues.

The T300MVi drive's topology allows retrofitting to existing medium voltage motors without upgrading motor insulation. It also:

- Eliminates Need for an Output Transformer, Reducing Cost and Size
- Allows Use of Standard Bearings Without Grounding or Isolation Means
- Operates Motor at Design Rating (Maximum)
- Enables Easy Retrofit

T300MVi® Specifications

Standard Specifications																	
Item																	
Voltage Class	**4160 V**																
Drive Rating (A):	62	74	87	99	112	124	155	186	217	248	279	310	372	434	496	558	620
4160 Drive Output (kVA):	447	536	625	715	804	893	1116	1340	1563	1786	2010	2233	2680	3126	3573	4019	4466
Nominal HP 4160 V**	500	600	700	800	900	1000	1250	1500	1750	2000*	2250	2500	3000	3500	4000	4500	5000
Dimensions H x W x D (in)	104 x 74 x 44						104 x 122 x 44				104 x 164 x 50		104 x 174 x 50		104 x 222 x 50		
Voltage Class	**2400 V**																
Drive Rating (A):	64	75	86	97	107	129	150	172	193	215	269	322	376	430	504	537	
2400 V Drive Output (kVA):	268	313	357	402	447	536	625	715	804	893	1116	1340	1563	1786	2010	2233	
Nominal HP 2400 V**	300	350	400	450	500	600	700	800	900	1000	1250	1500	1750	2000	2250	2500	
Dimensions H x W x D (in)	104 x 74 x 44					104 x 122 x 44					104 x 174 x 50				104 x 222 x 50		

Power Requirements	
Output Frequency (Hz)	0 to 120 Hz
Main Circuit	Three-Phase 4160 V Input Isolation Transformer 24-Pulse Design with Input-Fused Disconnect and Vacuum Contactor, IGBT Output
Control Circuit	Integral to Main Transformer; Includes 120 V and 460 V
Tolerance	Voltage: ± 10%; Frequency ± 5%

Control Specifications Input	
Control Method	Multi-Level Pulse Width Modulated (PWM) Output Control
Frequency Precision	Analong Input: ± 0.5% of Maximum Output Frequency; Digital Input: 0.01%
V/F Control	V/Hz, Sensorless Vector Control, Variable Torque, Closed-Loop Vector Control, Constant Torque (Option)
Acceleration/Deceleration	0.1 to 6000 Seconds
Main Control Functions	Soft Stall (Automatic Load Reduction Control During Overload)
	Restart into Rotating Motor
Main Protective Functions	Current Limit, Overcurrent, Overcharge, Overload, Undervoltage, Overvoltage, Ground Fault, CPU Error, Abnormal Cooling Fan
Data Transmission	Ethernet, Optional Profibus, Modbus RTU, Modbus, TCP/IP, TOSLINE-S20, and DeviceNet Available
Overload Ratio	115% FLA for 60 Seconds (2000 HP, 4160 V, 110%)*

Interface	
Liquid Crystal Display/ Electronic Operator (LCD EOI)	4 x 20 Graphical Backlit LCD Display; Ability to Display Multiple Parameters on One Screen; Flash-Upgradeable Software Includes Multi-Function Rotary Encoder and Ethernet PC Interface
LED Indications	Run (Red)/Stop (Green), Remote/Local, Indication of Inverter Status
Keys	Local/Remote, Monitor/Program, Run, Enter, ESC, Stop/Reset, Up, Down
Push Button	Illuminated Interlock and Fault Reset Push Buttons
Analog Outputs	Eight Selectable Voltage or Current Output Signals with Programmable Functions
Analog Inputs	Two Selectable Voltage or Current Input Signals
Digital Inputs	Eight Digital Inputs with Programmable Functions
Digital Outputs	Six Available Digital Outputs with Programmable Functions (One Internal to Drive)

Construction	
Enclosure	NEMA 1, IP20, IEC-529, Gasketed and Filtered
Panel Construction	Free-Standing, Front Maintenance Type, Top or Bottom Access for Motor and Power Cables
Cooling	Forced-Air Cooled with Optional Redundant Fans
Color	ANSI-61 Gray

Ambient Conditions	
Ambient Temperature	0 to 40˚; 32 to 104˚F
Humidity	Maximum 95% (Non-Condensing)
Altitude	1000 Meters Above Sea Level or Less
Installation	Indoor, No Direct Sunlight, Protect from Corrosive Gases, Explosive Gases
Typical Applications	Fan, Blower, Pump, Compressor, Extruder, Options for Submersible Pumping Applications
Standards	Electrical Performance: NEC, ANSI
Components and Others	NEC, NEMA, UL

***Typical HP Rating of 4-Pole Motor; Contact Factory for Applications on Constant Torque Loads*

TOSHIBA INTERNATIONAL CORPORATION

North American Headquarters & Manufacturing Facility (Houston, TX)

TOSHIBA - Quality by Design

Our company 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 foreign and domestic 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.

Customer Support Services

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

ADJUSTABLE SPEED DRIVES MOTORS CONTROLS UPS INSTRUMENTATION PLC

TOSHIBA

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