

TOSHIBA

ADJUSTABLE SPEED DRIVES



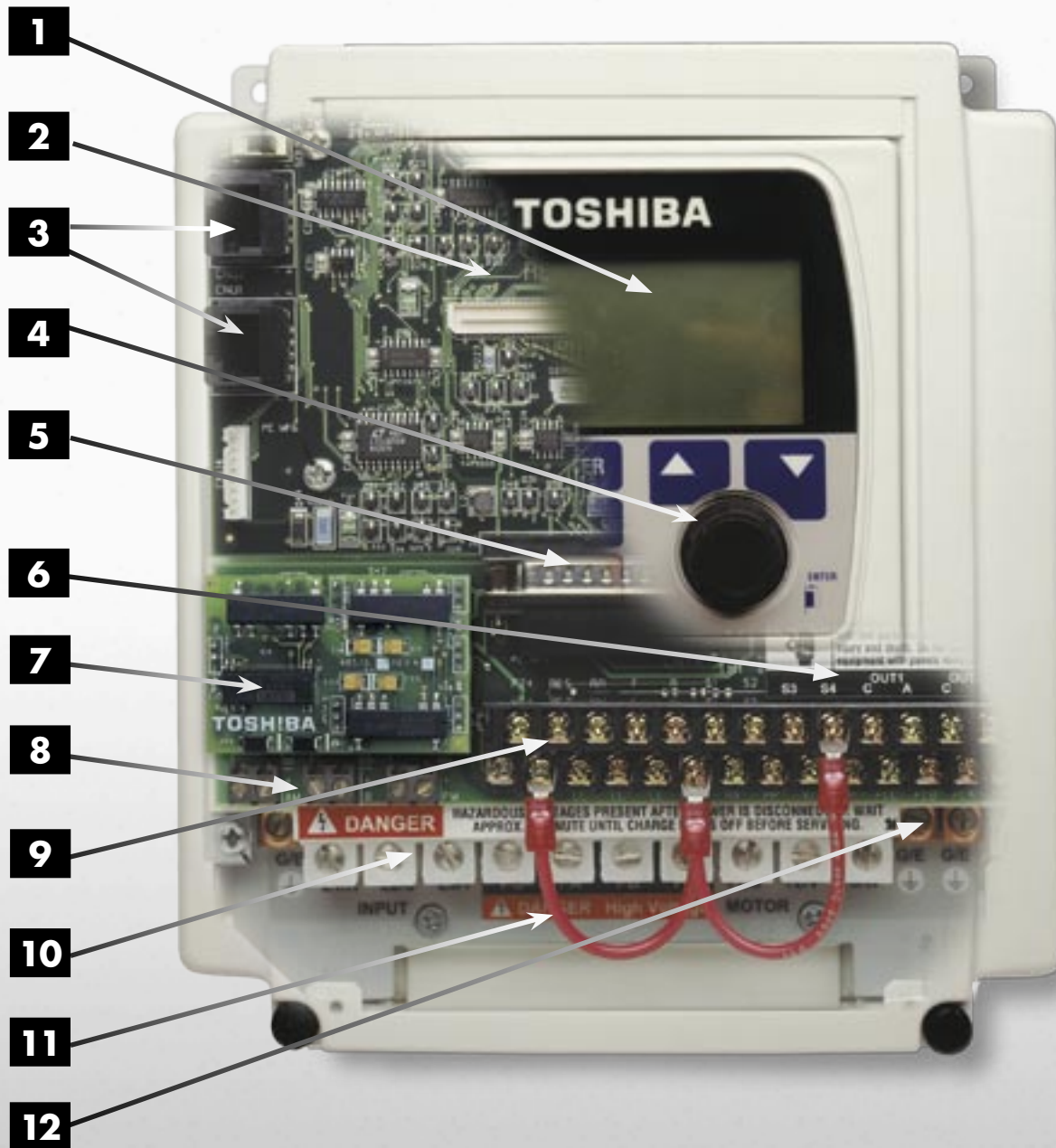
G7 Series

Reliability in motion™

XT

**NOW
AVAILABLE
WITH
ETHERNET IP
MODULE**

G7 SIMPLY POWERFUL



1. Graphics Capable LCD
2. High Speed OptiBus Option Card Port
3. RS 232/485 and TTL Ports
4. Rotary Encoder
5. Remote-Mountable Terminal Strip
6. Three Programmable Output Contacts
7. Signal Isolator Daughter Board (Option)
8. 0-1 mA/4-20 mA Programmable Analog Outputs
9. Eight Discrete Programmable Input Terminals
10. Power Terminal Strip
11. Fail Safe Emergency Interlock
12. Three Easy-Access Ground Lugs

POWERFUL...

TOSHIBA G7

POWERFUL... SIMPLE... VERSATILE...

Whether your requirements are a DC drive application retrofit or a new AC installation, the G7 Series PWM Adjustable Speed Drive is the clear choice. The G7 Series provides flux vector technology with or without using encoder feedback. It is engineered to offer tight control over both torque and speed while offering the industry's most user-friendly operator interface. Designed to handle the most demanding conditions, the G7 drive continues the 'G' Series tradition of delivering a robust performance platform. The G7 continues to be the best choice in the industry for the most demanding applications.

POWERFUL

Industrially Hardened

The G7 Series has the highest overload capabilities available. Rated at 110% continuous current, 150% up to 120 seconds* and 280% instantaneous current, the G7 can withstand load conditions that would cause other drives to fail.

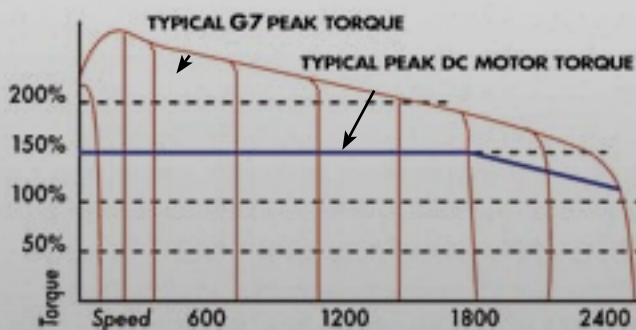
The G7 is ready for continuous, trouble-free operation in the most demanding manufacturing environments. It has an interrupting current rating of 200 KAIC. In addition, it is designed for an operating environment of -10 to 40°C at elevations of -1000 to 1000 meters.

Torque: When and How You Want It

Toshiba's patented TRUE TORQUE CONTROL² algorithm provides improved torque control in both sensorless and feedback vector control modes. The G7 is capable of producing 200% torque at speeds as low as 0.4 Hz and torque ripple as low as 2%. Toshiba gives you total control over your processes. You can even decide when and how you apply torque to your mechanical systems with an analog input signal.



Transistor Package



Peak Torque vs Speed (4 Pole Motor)

Speed Regulation for Accurate Control

AC drives are engineered to precisely control a motor's speed. The G7 drive provides programmable slip compensation and, coupled with Toshiba's proprietary vector control algorithm, offers speed regulation of 0.1% sensorless and 0.01% with motor or process feedback. For precise control requirements, the G7 can digitally lock two motor shafts together.

*Up to 100 HP

SIMPLE...

Holding Torque for Accurate Positioning

In feedback vector control mode, the G7 generates motor breakdown torque to hold the commanded position even when the equipment is stopped.

Mode Switching

The G7's adaptability is evident through its ability to switch on-the-fly between speed and torque control or position control modes. Centrifuges, stamping presses, machine tools and shuttle cars are examples of the types of equipment that benefit from the G7's dynamic operating mode switching.

SIMPLE

Advanced Electronic Operator Interface

The G7's Electronic Operator Interface (EOI) features a multi-line, graphics capable, plain English, backlit LCD. The EOI is so intuitive that the manual is usually not needed to make drive setting adjustments. The G7 has menu driven programming as well as direct access to the parameters. A high-reliability rotary encoder makes programming easy.

Startup Wizard

The Startup Wizard helps facilitate initial programming. The wizard leads you from beginning to end by asking a few simple questions about your application. Based on the answers provided, the wizard sets features and parameters suitable for your process. The G7 literally programs itself!

Configurable

- Easy to remote-mount the display (up to 1000 feet)
- Real-Time Clock option
- Graphics capable LCD to aid in diagnostics
- Flash Upgradeable EOI Software
- Toshiba can help develop your custom application-specific wizards.



VERSATILE...

VERSATILE

Power Terminations

The G7 is designed to provide easy access to the DC bus. This allows for the implementation of common DC bus designs, access to the DC link and access to the dynamic braking IGBT, which is standard on the G7 drive. The Toshiba design solves your system and power quality issues.



(left) G7 Control Board with Internal Stackable Communication Card

(below) Ethernet TCP/IP Communications Module

Built-In Communications

In today's fast-paced manufacturing world, coordinated systems require communications from drive-to-drive or drive-to-control systems. Toshiba's G7 comes standard with RS232/485 and TTL communications ports. In addition to the standard communications features, Toshiba offers a number of popular industrial communication protocol options including: Modbus RTU, Modbus Plus, Ethernet TCP/IP, Ethernet IP, Profibus DP, DeviceNet and Johnson Controls Metasys N2.



Process Control

The built-in Proportional/Integral/Derivative (PID) control loop provides regulation of many processes without the need for external devices. Deviation limits, online switching and delay filtering functions are included to enhance the flexibility and the reliability of PID process control. The torque control and drooping control functions of the G7 allow precise matching of motor torque for load sharing applications.

Adaptability

The G7's programmable discrete inputs may be configured to any of 68 different functions and are independently selectable for normally open or normally closed operation.

The G7's four multi-function analog inputs have independently adjustable bias and gain. From common potentiometers for speed control to analog summing for trim and process control, the configurability of the G7's analog inputs are adaptable to your processes.

The removable control terminal strip is available in dry contact, TTL or 120 VAC configurations and may be optionally DIN Rail mounted. The operator interface can be easily mounted remotely and configured for NEMA4/NEMA12 environments.



Remote-Mount Interface and Terminal Strip

TOSHIBA G7

Reliability *in motion*™

Toshiba Understands Motors

As a world leader in motor and drive manufacturing, Toshiba has a unique perspective into why and how motors perform and react to the ever-changing conditions encountered in modern manufacturing. Toshiba has married the extensive knowledge gained from being an integrated manufacturer of both motors and drives. With a true knowledge of how these products interact, Toshiba has developed the most powerful variable frequency drive available. G7 Series drives, along with a variety of other Toshiba drives and motors, are manufactured at our ISO 9001 manufacturing facility in Houston, Texas.



Integrated Toshiba Motor/Drive Packages

Turnkey Solutions

Toshiba's G7 assembly units simplify installation by allowing you to order turnkey drive packages that combine commonly requested items such as bypass, line filters and common control schemes in preconfigured assemblies.

Full Time Online Automatic Tuning

The G7 drive has an online automatic tuning function that corrects the motor constants when operating in the vector control modes. This allows the G7 to accurately control motor stability and torque without being affected by motor temperature, motor load or process variations.

Bidirectional Speed Search (Flying Restart)

Speed search detects the direction and speed of a free-wheeling motor. By matching the ASD output to the direction and speed of the motor, the G7 smoothly restarts the motor and accelerates to the commanded speed. This feature allows switching between commercial power and drive operation without the added expense of brakes, timers or other methods of stopping the motor.

Internal logic and cooling fan power comes from the DC bus which eliminates the need for control transformers, improves drive efficiencies and allows for extended ride-through capabilities.



G7 Assembly Unit

G7 Series

G7 ASD Standard Specifications				
Model Range	1 - 150 HP	1 - 350 HP	1 - 15 HP	20 - 300 HP
Voltage Rating	200 - 240 V	380 - 480 V	520 - 600 V	520 - 600 V
Input Voltage Tolerance	±10%	±10%	+5% / -10%	±10%
Voltage Regulation	Main Circuit Voltage feedback control (automatic regulation, 'fixed' and 'control off' selections)			
PWM Carrier Frequency	Adjustable between 0.5 - 15 kHz (ASD specific, consult factory)			
Control System	Sine Wave PWM System- Flux Field Current Vector Control			
V/f Pattern	Open Loop Vector, Closed Loop Vector, Constant Torque, Variable Torque, Auto Torque Boost, Manual Torque Boost, 5-point V/f custom curve setting			
Overload Current Rating	110% continuous, 150% for two minutes up to 100 HP, consult factory for ratings above 100 HP			
Frequency Setting	Rotary Encoder integrated into EOI, 0 - 10 V, ±10 V, 4-20 mA, Binary Input, Motorized Potentiometer Input			
Frequency Precision	Analog Input ±0.2% of the maximum output frequency, Digital Input ±0.01% of the maximum output frequency			
Frequency Command Resolution	0.01 Hz Operation Panel, 0.1 Hz Analog Input, 10 to 12-bit A-D Converter			
Output Frequency Range	0 - 299 Hz			
Speed Regulation	Closed Loop (0.01%, 1000:1 speed range), Open Loop (up to 0.1%, 60:1 speed range)			
Torque Setting	±250% of the Rated Torque			
Torque Regulation	Closed Loop (5%, ripple < 2%, ±100 range), Open Loop (10%, ripple < 3%, 50% to 100% range)			
Discrete Input Terminals	Eight Discrete Input Terminals programmable to 68 functions. The number of terminals may be increased using optional hardware.			
Analog Inputs	One 4 - 20 mA, one ±10 V and two 0 - 10 V (one of which is commonly used with a potentiometer)			
Discrete Output Contacts	Three Output Contacts programmable to 60 functions			
Analog Outputs	Two 4 - 20 mA/0 - 1 mA outputs programmable to 33 functions			
Signal Isolation	Optional Three-Channel Signal Isolation for 4 - 20 mA input and the AM and FM outputs rated at 750 V			
Control Board Communications Ports	RS232/485 and TTL Ports standard			
Power Terminals	Input (L1, L2, L3), Output (T1, T2, T3), DCL (PO, PA), DBR (PA, PB), DC BUS (PA, PC)			
Set Point Control (PID)	Proportional Gain, Integral Gain, Feedback Settings Upper / Lower Deviation Limits, Feedback Source Delay Filter, Feedback Settings Differential Gain			
Control Power	DC Bus Control-Power for units up to the 6750B, allows control power ride-through during momentary power loss			
Protective Functions	Fault input and outputs are fail-safe configured. Fault codes include: Overcurrent, Overvoltage, Heatsink Overheat, Load-side Short Circuit, Load Side Ground Fault, ASD Overload, Overcurrent During Start-Up, EEPROM Error, RAM Error, ROM Error, Communications Error, Armature Short, Auto-Tuning Error, Dynamic Braking Overcurrent, Dynamic Braking Resistor Overload, Emergency Stop, Undervoltage, Overtorque, Open Output Phase, Motor Overload, Loss of Feedback			
Retry	ASD can clear fault upon trip automatically. Programmable to 10 times with wait time up to 10 seconds between retry			
Restart	ASD will catch a freewheeling motor smoothly.			
Ambient	Temperature: -10 to +40°C, 14 to 104°F, Humidity: 95% non-condensing			
Installation	NEMA 1			
Electronic Operator Interface (EOI)				
LCD EOI (Liquid Crystal Display / Electronic Operator Interface)	124 x 64 graphics capable, back-lit LCD can display multiple parameters simultaneously. Keypad may be operated from an external power source. Software is flash upgradeable.			
LED Indications	Run (Red) / Stop (Green), Local / Remote (Green), DC Bus Charge Indication (Red)			
Keys	Local / Remote, Monitor / Program, Run, Enter, ESC, Stop / Reset, Up, Down			
Rotary Encoder	Encoder with integrated Enter Key for Frequency and Parameter adjustments			
Monitoring	Main Display shows two monitored items or can display up to 45 user-selected scrolling items including: Terminal Input / Output Status, Forward / Reverse, Frequency Setting Value, Output Frequency, Output Current, Output Voltage, Input Power, Output Power, Torque Current, Past Faults, Excitation Current, DBR Overload Ratio, ASD Overload Ratio, Motor Overload Ratio, PID Feedback Value, DC Voltage			
Selectable Display Units	Completely configurable along with Scaling Factor Multiplier, Current Display selectable between Amps or %, Voltage Display selectable between Volts or %			
EOI Communications Ports	RS232/485 and TTL Ports standard			
Remote-Mount Display	Remote mountable up to 1000' away from the ASD			

G7B Dimensions H x W x D (inches)								
230 V	0.75 - 7.5 HP	10 - 20 HP	25 HP	30 - 40 HP	50 HP	60 - 75 HP	100 - 150 HP	
460 V	1 - 10 HP	15 - 40 HP		50 - 75 HP	100 HP	125 - 150 HP	200 - 300 HP	350 HP
600 V	1 - 15 HP	20 - 50 HP		60 - 75 HP		100 - 150 HP	200 - 300 HP	
HEIGHT	8.47	14.22	15.72	24.63	26.47	38.63	50.00	73.00
WIDTH	7.28	12.16	12.16	17.50	17.50	17.50	24.15	24.00
DEPTH	7.33	11.23	11.23	12.81	12.81	13.78	20.00	20.00

*All dimensions are for "B" units.

TOSHIBA INTERNATIONAL CORPORATION



North America Headquarters & Manufacturing Facilities (Houston, TX)



TOSHIBA - Quality by Design

Our company culture and history is 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.tic.toshiba.com 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

TOSHIBA INTERNATIONAL CORPORATION

INDUSTRIAL DIVISION

13131 West Little York Road, Houston, Texas 77041

Tel 713/466-0277 Fax 713/466-8773

US 800/231-1412 Canada 800/872-2192 Mexico 01/800/527-1204

www.toshiba.com/ind

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