

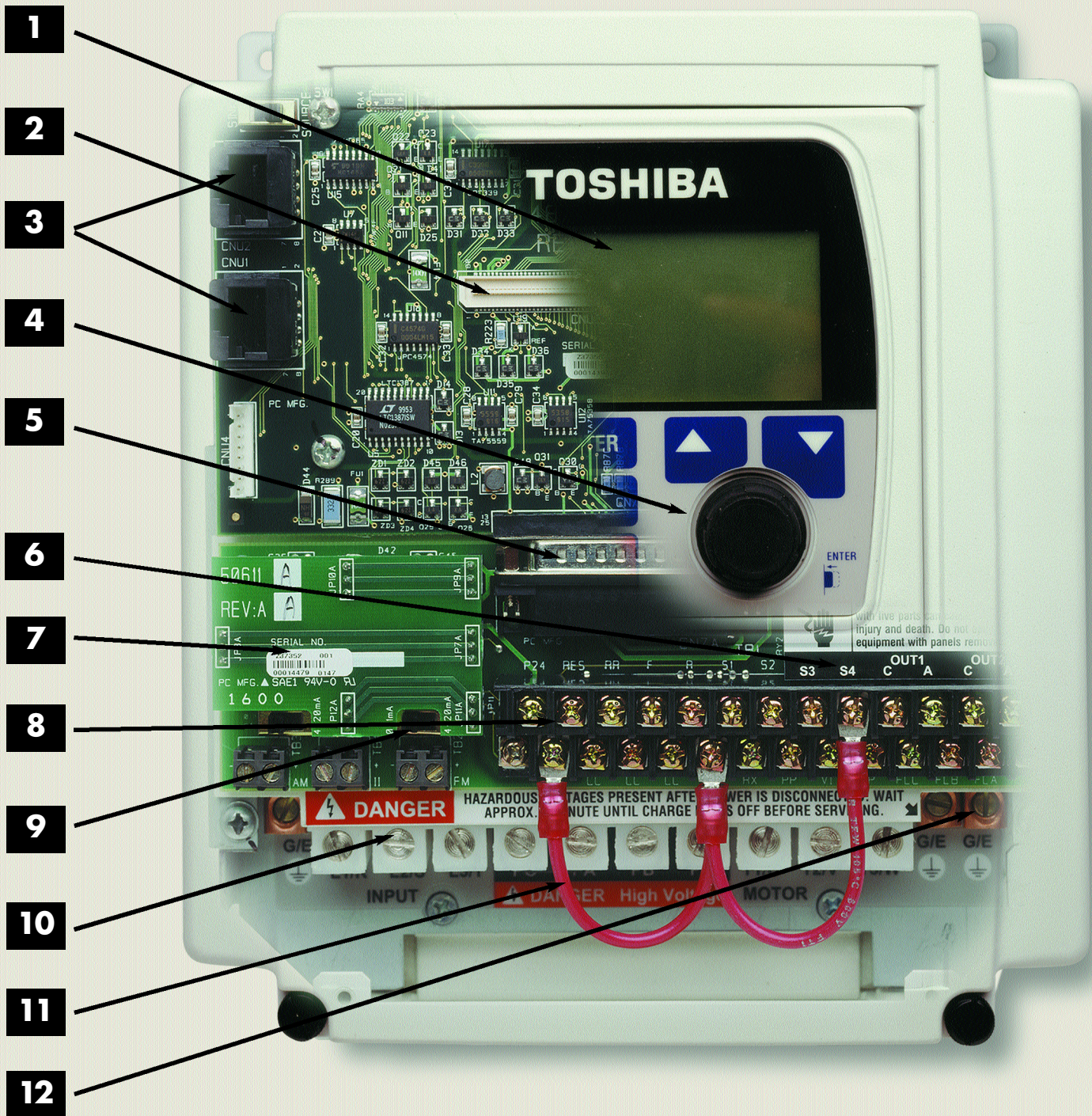
TOSHIBA

G7 Series Adjustable Speed Drive



BUILT4XTREMES

G7 SIMPLY POWERFUL



1. Graphic LCD
2. High Speed OptiBus Option Card Port
3. RS 232/485 & TTL Ports
4. Programming Encoder
5. Remote Mountable Terminal Strip
6. (3) Programmable Output Contacts

7. Signal Isolator Daughter Board (Option)
8. 8 Digital Programmable Input Terminals
9. 0-1 mA/4-20 mA Programmable Outputs
10. Power Terminal Strip
11. Fail Safe Emergency Interlock
12. (3) Easy Access Ground Lugs

TOSHIBA G7

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

The Toshiba G7 Series PWM Adjustable Speed Drive provides flux vector technology with or without encoder feedback. Whether your requirements are a traditional DC drive application or an AC environment, the G7 Series drive is the clear choice. The G7 is engineered to offer tight control over both torque and speed regulation, while offering the industries simplest and most user friendly operator interface. Designed to handle industries most demanding conditions, the G7 drive continues in the 'G' Series tradition of delivering a robust performance platform and will remain the choice of industry for the most demanding applications.

POWERFUL

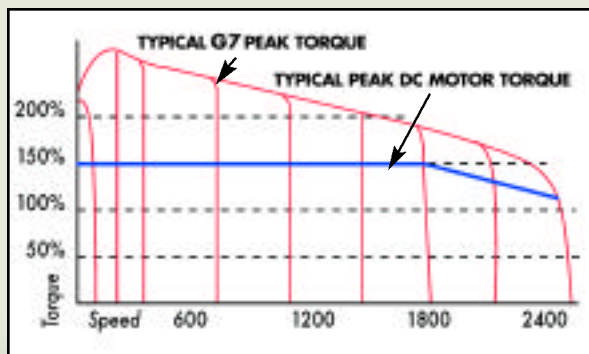
Industrially Hardened: **BUILT XTREMES**

The G7 series of drives by Toshiba has the highest overload ratings available. Rated at 110% continuous, 150% up to 120 seconds and 300% instantaneous, the G7 can withstand load conditions that cause other drives to fail.

With an interrupting current rating of 200 KAIC, and designed for an operating environment of -10 to + 40C from -1000 to +1000 meters of sea level, the G7 is ready for continuous, trouble-free operation in the most demanding manufacturing environments

Torque: When and how you want it

Toshiba's new patented TRUE TORQUE CONTROL²© algorithm gives you improved open and closed loop control over when and how you apply torque to your mechanical systems. With the capability of producing 200% torque at speeds as low as 0.4 Hertz and torque ripple as low as 3%, Toshiba's G7 gives you total control over your processes. You can even control torque with an analog input signal!



Peak Torque vs Speed (4 Pole Motor)



Toshiba Transistor Package

Speed Regulation for Accurate Control

AC drives are engineered to control a motor's speed. Along with frequency regulation of 0.01%, the G7 drive provides programmable slip compensation and Toshiba's proprietary vector control algorithm to offer speed regulation of 0.1% sensor-less and 0.01% with motor or process feedback. For your precise control requirements, the G7 can digitally lock 2 motor shafts together.



Holding Torque for Accurate Positioning

In positioning mode, the G7 can generate motor breakdown torque to hold commanded position even when the equipment is stopped.

Mode Switching

The G7's adaptability is evident in its ability to switch on-the-fly between speed control, torque control, and positioning 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.

VERSATILE Power Terminations

The G7 was designed for systems, giving full access to the DC bus allowing common DC bus, DC link and access to IGBT7 to solve your system and power quality issues.

Built In Communications

In today's fast paced manufacturing world, coordinated systems require communications from drive-to-drive or drive-to-control system operation. Toshiba's G7 has a RS232, RS485, and TTL communications ports as standard.

In addition to the standard communications features, Toshiba offers a number of popular industrial communication protocol options including Profibus, DeviceNet, Modbus RTU, ModbusPlus, and Metasys.

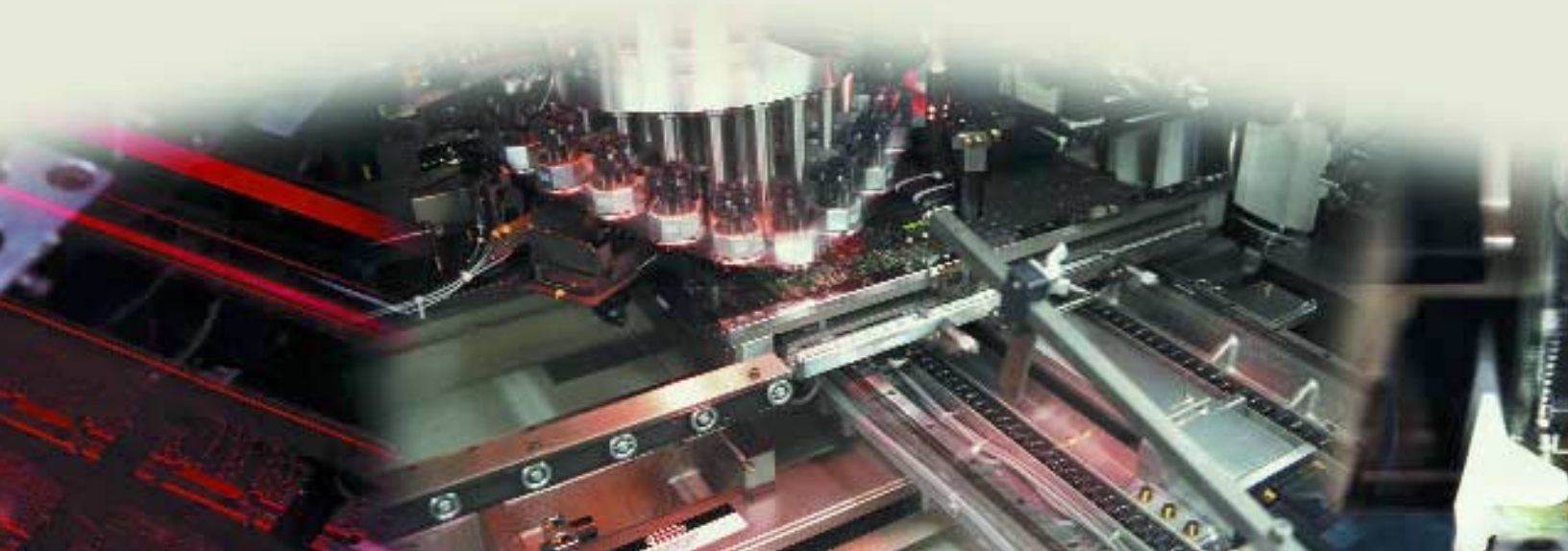


G7 Control Board

Process Control

The built-in proportional/integral/differential (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 process PID control.

For load sharing applications, Drooping control and Toshiba's torque control functions allow precise matching of motor torque.



Adaptability

The G7's programmable digital 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 120V AC configurations and may be optionally DIN Rail mounted. The operator interface can be easily remote mounted and configured for NEMA4/NEMA12 environments.



Remote mount Interface and Terminal Strip

SIMPLE

Advanced Electronic Operator Interface (EOI)

The multi-line, graphical real English, back lit LCD is so intuitive, the manual is usually not needed to make drive setting adjustments. Also featuring direct access parameters, menu driven programmability and high reliability encoder pot to make programming easy.

Start-up Wizard

Toshiba's G7 contains start-up wizards to facilitate initial programming. The drive leads you from beginning to end by asking a few simple questions about your application. Based on the answers provided, the G7 sets features and parameters suitable for your process. Toshiba's G7 literally programs itself!

Configurable

- Easy to Remote Mount (up to 1000 feet)
- Real Time Clock option
- Graphic LCD to Aid in Diagnostics
- Flash Upgradeable EOI Software
- We can help develop your custom application specific wizards!



Operator Interface



Toshiba Understands Motors

As the world's leading motor and drive manufacturer, 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 we have developed the most powerful variable frequency drive available. Both Toshiba motors and G7 series drives are manufactured to the highest standards at our ISO 9001 manufacturing facility in Houston, Texas.



Integrated motor drive packages

Turn Key Solutions

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

Full Time on-line Automatic Tuning

The G7 series has an online automatic tuning function that corrects the motor constants when operating in 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.

Speed Search (Flying Load Start)

Speed Search detects the direction and rotational speed of a free-wheeling motor. By matching the output to the direction and speed of the motor, Toshiba's 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 is derived from the DC bus, which eliminates the need for control transformers, improves drive efficiencies, and allows extended ride-through capabilities.



G7 Assembly Unit



G7 Standard Specification

Model Range	2015 - 2330	4015 - 435K	6015 - 6160	6220-625K
Voltage Rating	200V - 240V	380V - 480V	520V - 600V	520V - 600V
Input Voltage Tolerance	-10% / +10%	-10% / +10%	-10% / +5%	-10% / +10%
Voltage Regulation	Main Circuit Voltage feedback control. (Automatic regulation, 'fixed' and 'control off' selections)			
PWM Carrier Frequency	Adjustable between 0.5kHz to 15kHz adjustable. Current derate above 8kHz < 150HP. CF otherwise			
Control System	Sine Wave PWM System - Flux Field Current Vector Control			
V/Hz pattern	Open Loop Vector, Closed Loop Vector, Constant Torque, Variable Torque, Auto Torque Boost, Manual Torque Boost, 5 point V/Hz custom curve setting			
Overload Rating	110% continuous, 150% 2 minutes (up to 100HP). CF otherwise			
Frequency Setting	Encoder Potentiometer integrated into EOI, 0-10V, + / -10V, 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. 10-12 bit A-D Converter			
Output Frequency Range	0 - 400Hz			
Speed Regulation	Closed Loop (0.01%, 1000:1 Speed Range) / Open Loop (Up to 0.1%, 60:1 Speed Range)			
Torque Setting	+ / - 250% of Rated Torque			
Torque Regulation	Closed Loop (5%, Ripple < 2%, 50% to 100% Range), Open Loop (10%, Ripple < 3%, 50% to 100% Range)			
Input Terminals	8 input terminals programmable to 67 functions			
Analog Inputs	(1) 4-20mA, (1) 0-10V or 1 to 10KOHM Potentiometer connections, (1) + / -10V or + / - 5V, Optional 2 or 4 or 6 channel encoder input			
Output Contacts	3 output terminals programmable to 52 functions. Form C contacts rated 250V AC 2 amps inductive			
Analog Outputs	(2) 4-20mA outputs programmable to 31 functions			
Signal Isolation	Available (3) channel signal isolation for AM / FM outputs and II input rated at 750V			
Control Board Communications Ports	RS232 / RS485, 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 except 6220 and above. 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 automatically clear fault upon trip, programmable to 10 times with wait time up to 10 seconds between retry			
Restart	ASD will smoothly catch a freewheeling motor			
Ambient	Temperature: -10 to 40 Degrees Celsius, 14 to 104 Degrees Fahrenheit. Humidity 95% non-condensing			
Installation	NEMA			
Electronic Operator Interface (EOI)				
LCD EOI (Liquid Crystal Display / Electronic Operator Interface)	64 x 240 Pixel Graphical Backlit LCD, 32mm x 72mm viewing area. Ability to display multiple parameters on one screen. Keypad may be operated from an external power source and software is flash upgradeable			
LED Indications	Run (Red) / Stop (Green), Remote / Local (Green) , DC Bus Charge Indication (Red)			
Keys	Local / Remote, Monitor / Program, Run, Enter, ESC, Stop / Reset, Up, Down			
Encoder Programmer	Digital encoder with integrated enter key for frequency setting and parameter adjustment			
Monitoring	Main Display shows 2 monitoring items continually or scrolls up to 40 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	User 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	RS485, TTL Ports Standard			
Remote Mount	Remote Mount up to 1000'			

SIMPLY POWERFUL



Adjustable Speed Drives

The past 25 years have brought growth and change to Toshiba's Adjustable Speed Drives (ASD). From the very beginning, we set the standard in the industry with the design of our Insulated Gate Bipolar Transistor (IGBT). We introduced this technology and quickly gained a reputation for high quality, reliability and product innovation.

Building on our reputation as an industry leader, Toshiba began U.S. production of the G1 series constant torque ASD in 1987. Toshiba combined the rigorous testing and stringent requirements of the Quality Circles of Japan with the innovative style of American management. Uncompromised commitment to design excellence, quality manufacturing and responsive customer support, has given us the foundation on which all else is built. In July of 1995, we celebrated the U.S. production of our 100,000th ASD. Our Houston factory proudly supports Toshiba's US, Canadian, Mexican, South American and European markets.

Toshiba's ASD manufacturing operation consists of assembly lines for small, medium, and large capacity models. All units are produced one-at-a-time, and are checked and rechecked at every stage of the production process. We even go a step further and 100% load test every unit to ensure exceptional reliability and performance.

At Toshiba, we go the extra mile because we take our reputation and our commitment to our customers seriously.



Toshiba International Corporation's Industrial Division, a leading edge world manufacturer, is ISO 9001 certified. From raw material to finished product, customers are assured of exacting quality, engineering excellence and stringent testing to meet international performance standards.

Product Warranty

Toshiba offers a comprehensive warranty program on its full line of industrial products. Consult your salesperson or the factory for specific information.

Customer Support Services

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

Need to Know More?

With more than a half a million square feet under one roof, Toshiba's facility in Houston, Texas is one of the largest drive and motor manufacturing facilities in the U.S. From this facility, Toshiba offers solutions which include integrated motor drive packages, turnkey bypass assemblies and custom jobs built to your specification. Be sure to visit our web site at www.tic.toshiba.com for the latest information on Toshiba products.



ADJUSTABLE SPEED DRIVES MOTORS CONTROLS UPS INSTRUMENTATION PLC

TOSHIBA

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