

**TOSHIBA**

**ADJUSTABLE SPEED DRIVES**

# G9 Series

**Reliability *in motion***<sup>®</sup>



**XT**

# POWERFUL...

## TOSHIBA G9

**POWERFUL... ADVANCED... VERSATILE...**

The G9 adjustable speed drive is the most advanced severe duty drive ever offered by Toshiba. It is a blend of a robust power platform and a state-of-the-art control scheme. With its 115% continuous overload rating and its dual 32-bit processor controls, the G9 provides the ability to operate the toughest of applications while still maintaining a high level of control.



**G9 Family**

### **POWERFUL**

The G9 drive has the highest overload capability available. It is rated at 115% continuous current, 150% up to 120 seconds, and 280% instantaneous current. The Motor-Over-Flux-Braking Technology allows the G9 to provide as much as 25% of its rated power for use in stopping a heavy or high inertia load without dynamic braking resistors.

The G9 can operate in open or closed loop controls. Toshiba's advanced vector control algorithm offers speed regulation of 0.1% sensorless and 0.01% with motor or process feedback. The G9 has the ability to switch on-the-fly between speed, torque, or position control modes. In feedback vector control mode, the G9 generates motor breakdown torque to hold the commanded position even while the equipment is stopped.

# ADVANCED...

## ADVANCED

The G9's removable LCD display allows the user to transfer parameter settings from one drive to another. The encoder allows for quick access to a multitude of parameters and monitoring information. The wide range of monitoring information makes troubleshooting applications and start-up a snap. With the real-time clock fault recording ability, the user can access up to 20 of the previous fault codes.

Toshiba's "My Function" allows the user to access built-in PLC type logic. This allows basic logic function programming of the drive without the use of a PLC.

Speed Search detects the direction and speed of a coasting motor. By matching the ASD output to the direction and speed of the motor, the G9 smoothly restarts the motor and accelerates to the commanded speed. This feature allows for switching between across-the-line power and ASD power without the added expense of brakes, timers, or other stopping methods.



G9 LCD Display

# VERSATILE...

## **VERSATILE**

The built-in Proportional/Integral/Derivative (PID) control loop provides regulation of 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 G9 also provides torque control and drooping control functions to allow precise matching of motor torque for load sharing applications.

Toshiba's G9 provides users with the most adaptable interface in the industry. With eight configurable discrete inputs that can be set to 67 different functions, each discrete input can provide normally open or normally closed operation, and its three multi-function analog inputs have independently adjustable bias and gain.

The G9 drive has an array of stackable option boards available. These boards allow the user to communicate with almost any system. These options include Devicenet, Profibus, Modbus, 120 V discrete, and many others.

### ***Designed with the End User in Mind***

The G9 has been designed with needs of the end user in mind. Toshiba provides Windows® programming software at no additional cost, making set up and documentation easy. Features such as NEC 2005 motor overload retention (no external motor overloads required), UL Type-1 out-of-the-box, integrated input fuses and DC link (20 HP and larger), and the DBR transistor as a standard item make it easy to add dynamic braking resistors to maximize regeneration capabilities while in the field. Toshiba is setting a new industry standard by providing isolated inputs out-of-the-box without requiring any additional hardware.



**G9 Assembly Unit**

# G9 Drive

## G9 Specifications

Model Range	1 to 150 HP	1 to 350 HP
Voltage Rating	200 to 240 V	380 to 480 V
Input Voltage Tolerance	±10%	±10%
Voltage Regulation	Main Circuit Voltage Feedback Control (Automatic Regulation, 'Fixed' and 'Control Off' Selections)	
PWM Carrier Frequency	Adjustable 0.5 to 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	115% Continuous, 150% for Two Minutes up to 100 HP, Consult Factory for Ratings Above 100 HP	
Frequency Setting	Rotary Encoder Integrated into EOI, 0 to 10 V, ±10 V, 4 to 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	
Output Frequency Range	0 to 299 Hz	
Speed Regulation	Closed Loop (Up to 0.01%, 1000:1 Speed Range), Open Loop (Up to 0.1%, 60:1 Speed Range)	
Discrete Input Terminals	Eight Discrete Input Terminals Programmable to 67 Functions; Number of Terminals may be Increased Using Optional Hardware	
Analog Inputs	One 4 to 20 mA, One 0 to 10 V, and One ±10 V	
Discrete Output Contacts	Three Output Contacts Programmable to 127 Functions	
Analog Outputs	One Programmable 4 to 20 mA or 0 to 10 V and One 4 to 20 mA Output	
Control Board Communication Ports	2-Wire/4-Wire RS485	
Power Terminals	Input (L1, L2, L3); Output (T1, T2, T3); DCL(PO,PA); DBR (PA,PB); DC BUS (PA, PC)	
PID (Set Point Control)	Proportional Gain, Integral Gain, Feedback Settings Upper/Lower Deviation Limits, Feedback Source Delay Filter, Feedback Settings Differential Gain	
Retry	ASD can clear some faults upon trip automatically.	
Restart	ASD will catch a coasting motor smoothly.	
Ambient	Operating Temperature: -10 to +40°C; 14 to 104°F Humidity: 95% Non-Condensing	
Installation	NEMA 1 Enclosure Type	

## Electronic Operation Interface (EOI)

LCD EOI (Liquid Crystal Display/ Electronic Operator Interface)	Full English Back-Lit Display
LED EOI	Light Emitting Diode; Seven Segment Display
LED Indicators	Run (Red)/Stop (Green), Local/Remote (Green), DC Bus Charge Indicator (Red)
Keys	Local/Remote, ESC, Run, Mode, Stop/Reset
Rotary Encoder	Encoder with Integrated Enter Key for Frequency and Parameter Adjustments
Monitoring	Main Display Shows Two Monitored Items or can Display up to 17 User-Selected Scrolling Items Including: Output Frequency, Output Current, Output Voltage, Input Power, Output Power, Motor Overload Ratio, DC Bus Voltage, Compensation Frequency, PID Feedback, AM Output, FM Output, Motor Load, ASD Load, Run Time
Selectable Display Units	Completely Configurable along with Scaling Factor Multiple; Current Display Selectable Between Amps or %; Voltage Display Selectable Between Volts or %
EOI Communications Ports	RS232/485 ports standard

## G9 Dimensions

230 V	0.75 to 2 HP	3 to 5 HP	7.5 HP	10 HP	15 to 20 HP	25 to 30 HP	NA	40 to 60 HP	NA	75 HP	100 HP	NA	NA	NA	NA
460 V	1 to 3 HP	5 HP	7.5 to 10 HP	15 HP	20 to 25 HP	30 HP	40 to 50 HP	NA	60 to 100 HP	125 HP	NA	150 HP	200 HP	250 HP	300 to 350 HP
Height (in.)	11.2	12.4	15	15.1	19.3	25.9	30.8	33.1	36.1	51.7	53.1	53.2	63.1	68.5	70
Width (in.)	5.2	6.1	6.9	8.3	9.1	11.1	11.1	14.3	14.3	14.6	14.8	15.7	15	18.9	25.6
Depth (in.)	6.1	6.6	6.6	7.6	7.6	13.2	14.3	15	15.3	17.6	17.6	17.6	17.6	17.6	17.6

# TOSHIBA INTERNATIONAL CORPORATION



North American Headquarters & Manufacturing Facility (Houston, TX)

## TOSHIBA – Quality by Design

Toshiba's 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 domestic and foreign 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](http://www.toshiba.com/ind) for the latest information on Toshiba products and services.

## 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

Available Through:

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