TOSHIBA

ADJUSTABLE SPEED DRIVES

H7 Series

Reliability *in motion*®

NOW AVAILABLE WITH ETHERNET IP MODULE

POWERFUL...

TOSHIBA H7

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

POWERFUL **Reliability** *in motion*®

Industrially Hardened

The H7 adjustable speed drive 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.

Speed Regulation

The capabilities of adjustable speed drives keep getting better. Toshiba's proprietary vector control algorithm offers speed regulation of 0.1% sensorless and 0.01% with motor feedback. Furthermore, costly gear transmissions can be eliminated by using H7 ASDs that can be digitally locked together for precise control requirements.

Transistor Package

Torque: When and How You Want It

Toshiba's patented TRUE TORQUE CONTROL^2 algorithm provides improved torque control in both sensorless and feedback vector control modes. The H7 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.

Dynamic Mode Switching

The H7's dynamic mode switching allows you to change between speed and torque control or position control modes on-the-fly for seamless operation. Toshiba can show you how to maximize the efficiency and performance of your process control.

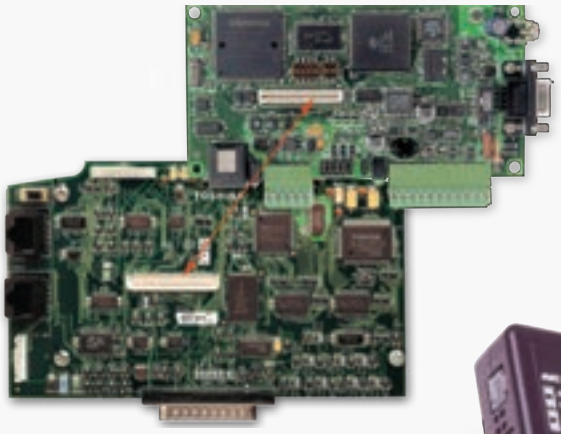
Superior Design

The H7 is designed to operate with or without the use of DC link reactors. The robust capacitor bank ensures efficient operation. Oversized power semiconductors provide higher tolerances and longer life. In addition, standard phase-to-phase metal oxide varistors result in extra front-end protection from utility power surges.

VERSATILE...

VERSATILE

Built-In Communications



(left) H7 Control Board with Internal Stackable Communication Card

(below) Ethernet TCP/IP Communications Module

In today's fast-paced manufacturing world, coordinated systems require communications from drive-to-drive or drive-to-control systems. Toshiba's H7 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 H7 allow precise matching of motor torque for load sharing applications.

Adaptability

The H7'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 H7'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 H7'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 NEMA 4/NEMA 12 environments.

Remote–Mount Interface and Terminal Strip

SIMPLE...

SIMPLE
Advanced Electronic Operator Interface (EOI)

The H7's Electronic Operator Interface (EOI) features a multi-line, graphics capable, plain English, back-lit LCD. The EOI is so intuitive that the manual is usually not needed to make drive setting adjustments. The H7 has menu-driven programming as well as direct access to the parameters. A high-reliability rotary encoder makes programming easy.

Start-up Wizard

The Start-up 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 H7 literally programs itself!

Configurable

- Easy to 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 Custom Application-Specific Wizards

The Industry's Most User-Friendly Operator Interface

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. H7 Series drives, along with a variety of other Toshiba drives and motors, are manufactured at our ISO 9001 manufacturing facility in Houston, Texas.

TOSHIBA H7
Reliability *in motion*®

Turn-Key Solutions

Toshiba's H7 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.

Integrated Toshiba Motor/Drive Packages

Full Time Online Automatic Tuning

The H7 drive has an online automatic tuning function that corrects the motor constants when operating in the vector control modes. This allows the H7 to accurately control motor stability and torque without being affected by motor temperature, load, or process variations.

Bidirectional Speed Search (Flying Restart)

Speed search detects the direction and rotational speed of a free-wheeling motor. By matching the ASD output to the direction and speed of the motor, the H7 smoothly restarts the motor and accelerates to the commanded speed. This feature allows for power source switching between commercial power and drive operation without the added expense of brakes, timers, or other methods of stopping the motor.

H7 Assembly Unit

Windows Software

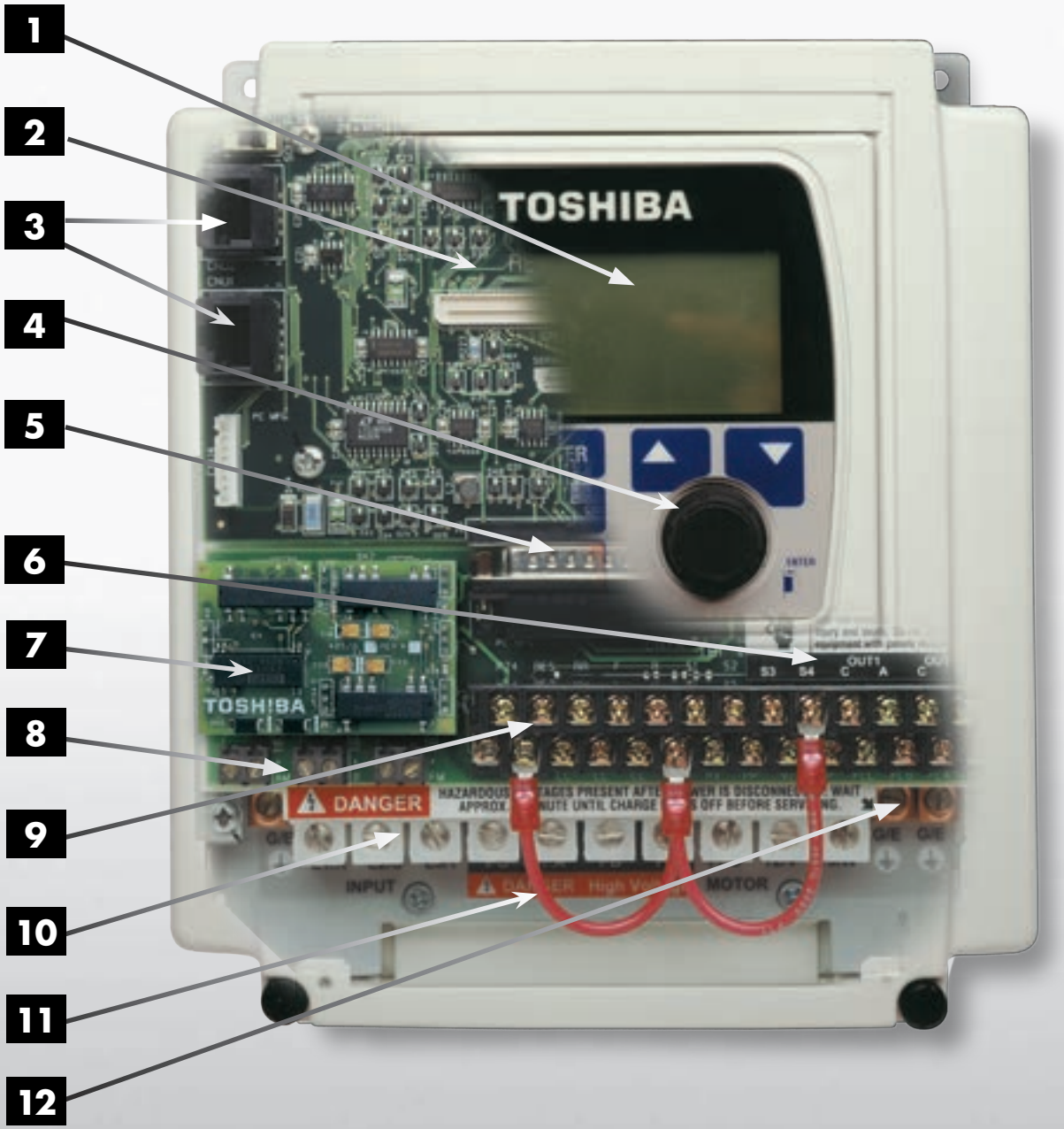
H7 Series

H7 ASD Standard Specifications				
Model Range	3 to 150 HP	5 to 400 HP	3 to 15 HP	20 to 350 HP
Voltage Rating	200 to 240 V	380 to 480 V	520 to 600 V	520 to 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 through 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	100% Continuous or 120% for One Minute			
Frequency Setting	Rotary Encoder Integrated into the 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			
Frequency Command Resolution	0.01 Hz Operation Panel, 0.1 Hz Analog Input; 10 to 12-Bit A to D Converter			
Output Frequency Range	0 to 299 Hz			
Speed Regulation	Closed Loop (0.01%, 1000:1 Speed Range), Open Loop (up to 0.1%, 60:1 Speed Range)			
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; Number of Terminals may be Increased Using Optional Hardware.			
Analog Inputs	One 4 to 20 mA, One ±10 V, and Two 0 to 10 V (One of which is Commonly Used with a Potentiometer)			
Discrete Output Contacts	Three Discrete Output Contacts Programmable to 60 Functions			
Analog Outputs	Two 4 to 20 mA; 0 to 1 mA Outputs Programmable to 33 Functions			
Signal Isolation	Optional Three-Channel Signal Isolation for 4 to 20 mA inpu; 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 Allows Control Power Ride-through During Momentary Power Loss (Except 600 V 100 HP and Larger)			
Protective Functions	Fault Input And Outputs 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 Retries.			
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)				
Liquid Crystal Display/ Electronic Operator Interface (LCD EOI)	124 x 64 Graphics Capable, Back-Lit LCD can Display Multiple Parameters Simultaneously; Keypad may be Operated from 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' from ASD			

H7B Dimensions HxWxD (Inches)								
230 V	3 to 7.5 HP	10 to 25 HP	30 HP	40 to 50 HP	60 HP	75 to 100 HP	125 to 150 HP	
460 V	5 to 10 HP	15 to 50 HP		60 to 100 HP	125 HP	150 to 200 HP	250 to 350 HP	400 HP
600 V	3 to 15 HP	20 to 60 HP		75 to 100 HP		125 to 200 HP	200 to 350 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.

H7 SIMPLY POWERFUL



1. Graphics Capable LCD
2. High Speed OptiBus Option Card Port
3. RS 232/485 & TTL Ports
4. Rotary Encoder
5. Remote-Mountable Terminal Strip
6. Three Programmable Output Contacts
7. Signal Isolator Daughter Board (Option)
8. 0 to 1 mA/4 to 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

TOSHIBA INTERNATIONAL CORPORATION

North American Headquarters & Manufacturing Facilities (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 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

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