

**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*<sup>™</sup> 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<sup>2</sup> 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

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.



*(left) H7 Control Board with Internal Stackable Communication Card*

*(below) Ethernet TCP/IP Communications Module*



### 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 NEMA4/NEMA12 environments.



*Remote-Mount Interface and Terminal Strip*

# SIMPLE...

## **SIMPLE**

### **Advanced Electronic Operator Interface (EOI)**

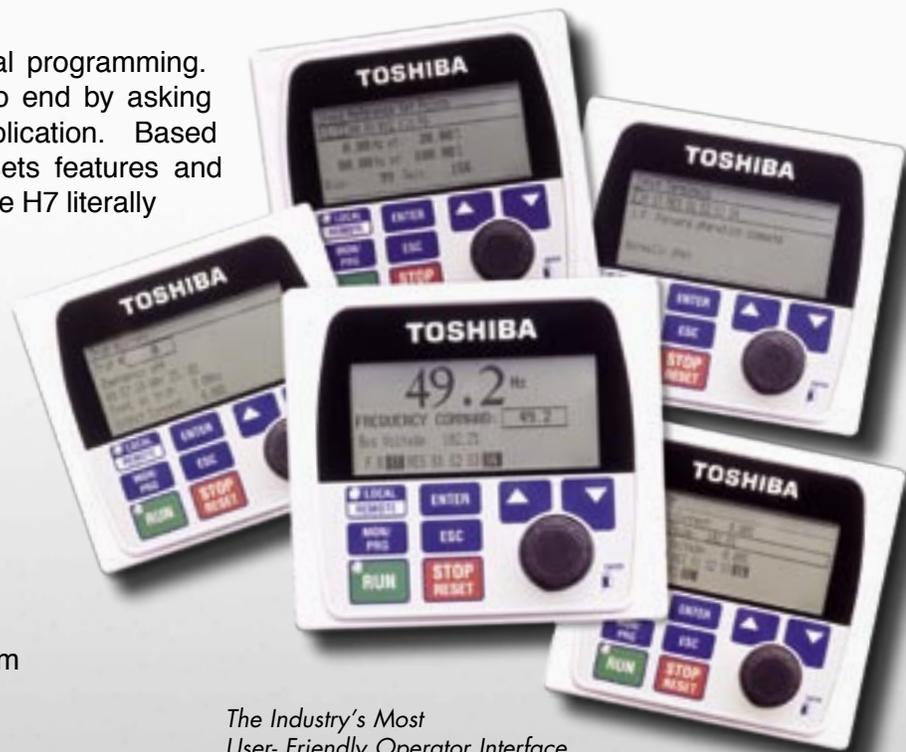
The H7's Electronic Operator Interface (EOI) features a multi-line, graphics capable, plain English, backlit LCD. The EOI is so intuitive that the manual is usually not needed to make drive setting adjustments. The H7 has menu driven programming as well as direct access to the parameters. A high-reliability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

### **Start-up Wizard**

The 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 H7 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.



*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 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 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.



*Integrated Toshiba Motor/Drive Packages*

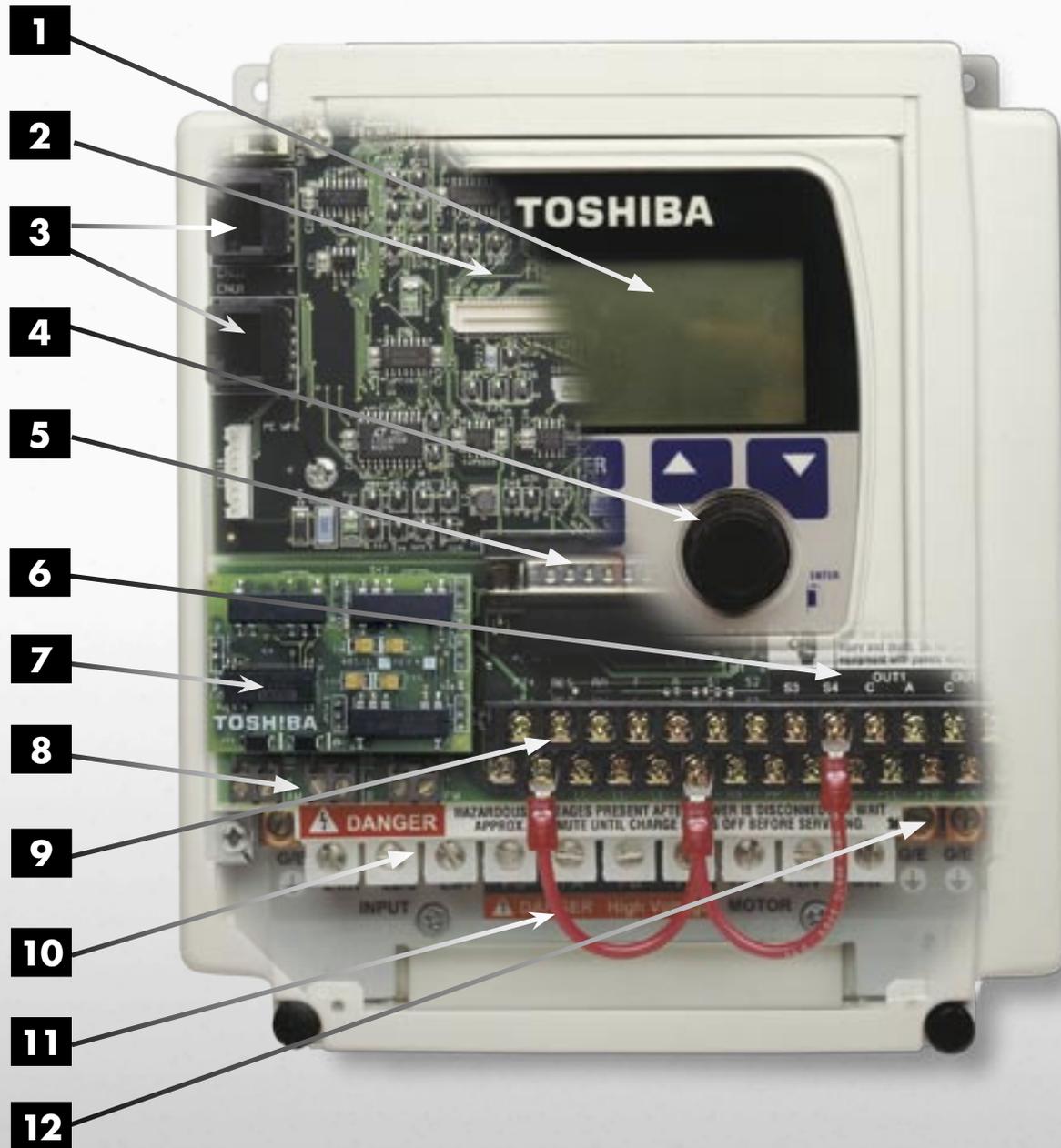


*H7 Assembly Unit*



*Windows Software*

# 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. 0-1 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

# H7 Series

H7 ASD Standard Specifications				
Model Range	3 - 150 HP	5 - 400 HP	3 - 15 HP	20 - 350 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	100% continuous or 120% for one minute			
Frequency Setting	Rotary Encoder integrated into the 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 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 Discrete 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 allows control power ride-through during momentary power loss (Except 600 V 100 HP and larger)			
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 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)				
LCD EOI (Liquid Crystal Display/ Electronic Operator Interface)	240 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			

H7B Dimensions H x W x D (inches)								
230 V	3 - 7.5 HP	10 - 25 HP	30 HP	40 - 50 HP	60 HP	75 - 100 HP	125 - 150 HP	
460 V	5 - 10 HP	15 - 50 HP		60 - 100 HP	125 HP	150 - 200 HP	250 - 350 HP	400 HP
600 V	3 - 15 HP	20 - 60 HP		75 - 100 HP		125 - 200 HP	200 - 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.

# 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](http://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**

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