

Frequently Asked Questions

General

Q: I did not receive an Installation and Operation Manual with my ASD. How can I get one?

A: The *H9 ASD Quick Start Guide* and the *H9 ASD Installation and Operation Manual* can be downloaded from our website at www.toshiba.com/ind. To request a hard-copy of either document contact the Toshiba Customer Support Center or your local Toshiba distributor.

Q: Does Toshiba offer training courses?

A: Yes. Training courses are offered at TIC headquarters in Houston, Texas. There are two types of training — maintenance and repair (nominal fee), and applications (free). Our instructors have years of hands-on experience in their respective fields and are continually being trained on new products. Students will gain valuable experience on the equipment and troubleshoot real faults that may be incurred during normal ASD setup, operation, and maintenance. For a listing of upcoming training courses or to register, visit our website at www.toshiba.com/ind and click on the training tab.

Q: Where can I find additional information about Toshiba International Corporation (TIC) and TIC products?

A: Additional information can be found on our website, www.toshiba.com/ind. You may also contact TIC for additional information by writing to 13131 West Little York Rd., Houston, Texas, 77041, via telephone at (713) 466-0277, or via fax at (713) 937-9349.

Application Specific

Q: Who is considered qualified personnel?

A: A qualified person is one who has the skills and knowledge about the construction, installation, operation, and maintenance of the equipment and has received safety training on the hazards involved. Qualified personnel are able to recognize and properly address hazards associated with the application of motor-driven equipment, and are trained to safely energize, de-energize and ground said equipment, to safely lockout/tagout circuits and equipment, and clear faults in accordance with established safety practices.

Q: What do I do if my motor is rotating in the wrong direction?

A: Qualified personnel should reverse any two of the three ASD output power leads (U/T1, V/T2, or W/T3) connected to the motor.

Q: For safety and application-specific reasons I need to remotely mount the ASD. How do I accomplish this?

A: Select a mounting location that is easily accessible by the user and mark the location of the screw holes. After drilling the screw holes, attach and secure the Electronic Operator Interface (EOI) to the front side of the mounting location. Connect the extension cable. For information on required hardware or for instructions on remote mounting using a Remote Mounting Kit, consult the *H9 ASD Installation and Operation Manual*. If further assistance is required, contact the Toshiba Customer Support Center.

Q: I followed all of the instructions but my motor will not run. What now?

A: Ensure that the input power to the ASD is connected and that the voltage at R/L1, S/L2, and T/L3 are as specified for your unit. Ensure that the terminals of the terminal board are configured correctly for your application. Perform a Reset (to factory default settings). Ensure that the Local/Remote key is as required for your application and that you have provided a run command. If further assistance is required, contact the Toshiba Customer Support Center.

Q: During system operation I receive error messages that I do not understand. Where can I find information about trips/faults/alarms and troubleshooting?

A: A complete list of LED and LCD screen displays, trip/fault/alarm descriptions and a list of possible causes of all trips/faults/alarms can be found in the *H9 ASD Installation and Operation Manual*.

H9 ASD Simple Start Guide

The H9 ASD Simple Start Guide provides instructions on installation and operating procedures only. For additional information regarding your new H9 ASD, consult the *H9 ASD Installation and Operation Manual*.

DO NOT attempt to install or operate the H9 ASD until you have read and understood all of the user directions contained in this guide, and the product safety information and product labels contained in the *H9 ASD Installation and Operation Manual*. Equipment warning labels provide useful information and indicate an imminently hazardous situation that may result in serious injury, severe property and equipment damage, or loss of life if safe procedures are not followed. Installation and operation shall be performed by qualified personnel only.

TOSHIBA

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H9 ASD

Simple Start Guide

H9 ASD Simple Start Guide

1. Receipt & Identification

Inspect the equipment for damage that may have occurred during shipping.

DO NOT install or energize equipment that has been damaged.

Ensure that the rated capacity and model number on the nameplate conform to order specifications.

Use proper lifting techniques when moving the H9 ASD.

Contact your Toshiba Sales Representative to report discrepancies or for assistance if required.

H9 ASD Nameplate

TRANSISTOR INVERTER		
VT130H9U4015		
	INPUT	OUTPUT
U (V)	3PH 380/480	3PH 380/480
F (Hz)	50/60	0/500
I (A)	5.1	3.6 (CF 4 KHz)

2. Mounting

Only qualified personnel should install this equipment.

The installation of the equipment should conform to the 2008 National Electrical Code (NEC) Article 110, OSHA, as well as any other applicable national, regional, or industry codes and standards.

Installation practices shall conform to the latest revision of the NFPA 70E Electrical Safety Requirements for Employee Workplace.

It is the responsibility of the H9 ASD installer/maintenance personnel to ensure that the unit is installed in an enclosure that will protect personnel against electric shock.

Location

Select a mounting location that is easily accessible and has adequate working space. Proper illumination is required for making inspections, adjustments, and performing equipment maintenance.

DO NOT mount the H9 ASD in a location that would produce catastrophic results if it were to fall from its mounting location (equipment damage and/or injury to personnel).

Avoid installation in direct sunlight or in areas where vibration, heat, humidity, dust, fibers, metal particles, explosive/corrosive mists or gases, sources of electrical noise are present, or where it would be exposed to harmful liquids, solvents, or other fluids.

Temperature

The ambient operating temperature rating is 14° to 104° F (-10° to 40° C).

Ventilation

Install the unit in an upright position and in a well-ventilated area.

When installing adjacent ASDs horizontally, Toshiba recommends at least 5 cm of space between units. However, if the top cover is removed from each ASD then horizontally mounted ASDs may be installed side-by-side with no space in-between the adjacent ASDs.

For 230-volt ASDs, a minimum of 10 cm of space is required above and below adjacent ASDs and any obstruction. For 460-volt ASDs, a minimum of 30 cm of space is required.

Lead Length

The table below lists the recommended maximum lead lengths for the listed motor voltages. Lead lengths from the ASD to the motor in excess of those listed below may require filters to be added to the output of the ASD. Excessive lead lengths may adversely affect the performance of the motor. Exceeding the peak voltage rating or the allowable thermal rise time of the motor insulation will reduce the life expectancy of the motor.

Contact your Toshiba Sales Representative for application assistance when using lead lengths in excess of those listed.

Lead Length Specifications

Model	PWM Carrier Frequency	NEMA MG1 Part 31 Compliant Motors ²	NEMA MG1 Part 30 Compliant Motors ²
230-Volt	All	1000 feet	450 feet
460-Volt	≤ 5 kHz	600 feet	200 feet
	> 5 kHz	300 feet	100 feet

For enclosure dimensions, mounting hole dimensions, current/voltage specifications, and cable/terminal specifications consult the *H9 ASD Quick Start Guide*.

3. Connectivity



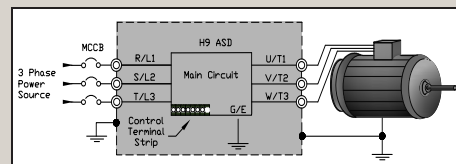
DANGER

Contact With Energized Wiring Will Cause Severe Injury Or Loss Of Life.

When using an ASD output disconnect, the ASD and the motor **MUST** be stopped before the disconnect is either opened or closed. Closing the output disconnect while the 3-phase output of the ASD is active may result in equipment damage or injury to personnel.

De-energize and lockout/tagout the main power, control power, and instrumentation connections before connecting or disconnecting the power wiring to the equipment or opening the enclosure door.

3-Phase Input/Output Connections



Connect the 3-phase input power to the ASD to terminals **R/L1**, **S/L2**, and **T/L3**. Connect the 3-phase output power from terminals **U/T1**, **V/T2**, and **W/T3** to the motor. Ensure that all wiring is performed in accordance with national, state, and local electrical codes.

Install a circuit disconnecting device and branch circuit protection in accordance with the fault current settings of the ASD and the 2008 NEC Article 430.

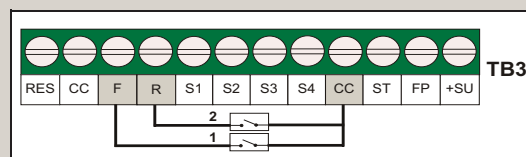
The default settings of the ASD require the use of a factory-installed jumper from the **CC** to **ST** terminals to enable the ASD.

For **2-Wire Control** and **3-Wire Control** open the enclosure door to gain access to the **Terminal Board** and continue below.

2-Wire Control

Install a switch as described below from the **F** and/or **R** terminals to the **CC** terminals. Close or reattach the enclosure door.

2-Wire Start/Stop Control Connections

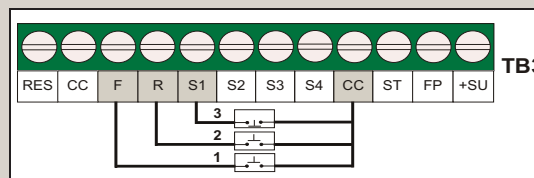


- 1 — Normally open switch that will be used to provide the forward run command (Set to Forward).
- 2 — Normally open switch that will be used to provide the reverse run command (Set to Reverse).

3-Wire Control

Install momentary push buttons as described below from the **F** and/or **R** terminals to the **CC** terminal. Close or reattach the enclosure door.

3-Wire Start/Stop Control Connections



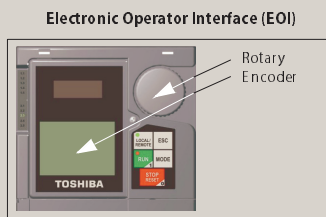
- 1 — Normally open momentary push button that will be used to provide the forward run command (Set to Forward).
- 2 — Normally open momentary push button that will be used to provide the reverse run command (Set to Reverse).
- 3 — Normally closed momentary push button that will be used to hold the output frequency upon termination of the run command (Set to Hold: **F115** = 50 (Hold, N.O.).

Before tuning on the ASD ensure that:

The enclosure door is closed or reattached, and secure. Terminals **R/L1**, **S/L2**, and **T/L3** are connected to the input power and terminals **U/T1**, **V/T2**, and **W/T3** are connected to the motor. The 3-phase input voltage is as specified and there are no shorts and all grounds are secure.

4. Programming

The operating parameters displayed on the LCD screen may be selected, viewed, or changed using the **Electronic Operator Interface (EOI)**. To change a setting turn the **Rotary Encoder** to highlight the desired **Primary Menu** item (repeat for **Sub Menu** items as required). Select the item to be changed and press the **Rotary Encoder** to enter the **Edit** mode — the encoder acts as the enter key. Set the parameter to the new value. To exit the setting without saving a change press the **ESC** key while the parameter is in the reverse video mode (dark background/light text). Press the **Rotary Encoder** to accept the change.



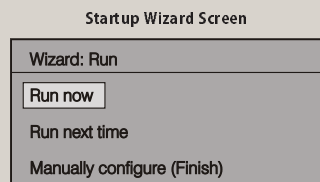
Startup Wizard

Upon initial power up or factory reset the **Startup Wizard** will start automatically.

The **Startup Wizard** will query the user to select one of the following items: **Run Now**, **Run Next Time**, or **Manually Configure**.

Click **Run Next Time** or **Manually Configure** to skip setup. The ASD may also be setup at a later time by directly accessing each of the startup parameters via the **Program Menu**, the associated **Direct Access Number**, or by running the **Startup Wizard** from the programming menu.

Click **Run Now** to setup the ASD now. The **Startup Wizard** will take the user through the parameters listed below.



Startup Wizard Parameters

Direct Access Number	Startup Wizard Parameter	Description
F405	Voltage/Frequency Rating of Motor	Used to input the nameplated voltage and frequency of the motor being used.
F012	Upper Limit Frequency	Sets the highest frequency that the ASD will accept as a frequency command or frequency setpoint.
F013	Lower Limit Frequency	Sets the lowest frequency that the ASD will accept as a frequency command or frequency setpoint.
F000	Automatic Acceleration/Deceleration Setting	Adjusts the acceleration and deceleration rates according to the applied load.
F009	Acceleration Time	Specifies the time in seconds for the output of the ASD to go from 0.0 Hz to the Maximum Frequency.
F010	Deceleration Time	Specifies the time in seconds for the output of the ASD to go from the Maximum Frequency to 0.0 Hz.
F015	Volts per Hertz Setting	Establishes the relationship between the output frequency and the output voltage of the ASD.
F406	Motor Current Rating	Allows the user to input the Full-Load Amperage (FLA) of the motor. Used to determine the Thermal Overload Protection setting for the motor.
F407	Motor RPM	Used to input the nameplated rated speed (RPM) of the motor being used.
F003	Command Source	Establishes the source of input commands (i.e., Run, Stop, Jog, etc.).
F004	Frequency Source	Establishes the source of the primary frequency reference.
F701	Display Unit	Sets the unit of measure for current and voltage values displayed on the EOI.

Note: Use the **Motor Information** outline provided in this guide to record and retain information about the motor for future use.

At any point, the user may click **Next** to skip a parameter or click **Finish** to close the **Startup Wizard**.

Click **Finish** when complete.

Programming Options:

Direct Access to Parameters

Each parameter may be viewed or changed by entering the parameter number of the setting at the **Direct Access Menu** via Program ⇒ Direct Access ⇒ **Applicable Parameter Number**.

Changed From Default

A listing of all the parameters that have been changed from the default setting may be viewed sequentially by accessing the **Changed From Default** screen via Program ⇒ Utilities ⇒ **Changed From Default**.

Press the **Rotary Encoder** while stopped at a changed parameter to display the settings of the changed parameter. Press the **Rotary Encoder** to enter the **Edit** mode. Turn the **Rotary Encoder** to change the parameter setting.

Press the **ESC** key while the system is performing a **Changed From Default** search to terminate the search.

When finished searching, press the **ESC** key to take the menu back one level.

RR Analog Input

Frequency Mode 1 (F004)

establishes the user-selected source of the frequency-control input for the ASD. By default it is set to the RR terminal.

This input terminal may be programmed to control the speed or torque of the motor.

The **Scaling**, **Gain**, and **Bias** of this terminal may be adjusted for application-specific suitability (see **F210 – F215**).

V/I Analog Input

Frequency Mode 1 (F004) establishes the user-selected source of the frequency-control input for the ASD.

This is an isolated input terminal. This terminal may be programmed to control the speed or torque of the motor and must be set to receive either current (**SW301** set to I) or voltage (**SW301** set to V).

The **Scaling**, **Gain**, and **Bias** of this terminal may be adjusted for application-specific suitability (see **F201 – F206**).

FM Analog Output

By default, the **FM** analog output terminal produces an output current or voltage that is proportional to the output frequency of the ASD or of the magnitude of the function assigned to this terminal (select current or voltage at **F681**). The programmable functions for this output terminal are listed in the *H9 ASD Installation and Operation Manual*.

FM Terminal Setup Parameters:

- F005** — Set Function
- F006** — Calibrate Terminal Selection
- F681** — Voltage/Current Switching Selection
- F682** — Response Polarity Selection
- F683** — Bias Adjustment

AM Analog Output

By default, the **AM** analog output terminal produces an 0-20 mA current that is proportional to the output current of the ASD or of the magnitude of the function assigned to the terminal. The programmable functions for this output terminal are listed in the *H9 ASD Installation and Operation Manual*.

AM Terminal Setup Parameters:

- F670** — Set Function
- F671** — Calibrate Terminal Selection
- F685** — Response Polarity Selection
- F686** — Bias Adjustment

For a complete listing of the discrete and analog inputs and outputs see the *H9 ASD Quick Start Guide*.

Direct Access Number	Terminal	Default (Where Programmable)
F114	RES	Reset
F111	F	Forward Run
F112	R	Reverse Run
F115	S1	Preset Speed 1
F116	S2	Preset Speed 2
F117	S3	Preset Speed 3
F118	S4	Preset Speed 4
F113	ST	Standby
—	FP	Frequency Pulse
—	+SU	References CC
—	CC	Control Common

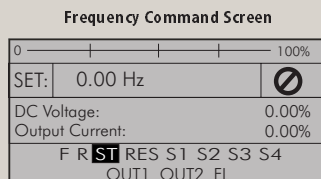
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5. Run

The **Local** mode allows the **Command** and **Frequency** control functions to be carried out via the **EOI**.

To run the motor perform the following:

1. Press the **Mode** key until the **Frequency Command** screen is displayed.
2. Press the **Local/Remote** key to enter the **Local** mode (green LED illuminates).
3. Turn the **Rotary Encoder** until the desired **Frequency Command** value is displayed in the **SET** field on the **LCD** screen.
4. Press the **Run** key and the motor will run at the **Frequency Command** value. (While running the **Run** LED will illuminate red). Press the **Stop/Reset** key to stop the motor.



Remote

The **Remote** mode allows control of the ASD via the **Command** mode (F003) and the **Frequency** mode (F004).

The **Terminal Board** is used in the following example to demonstrate **Remote** mode operation:

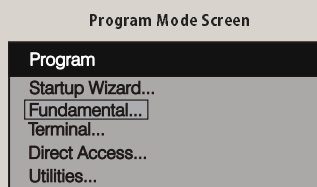
To run the motor perform the following.

1. Press the **Mode** key until the **Program** screen is displayed.
2. Select Program ⇒ Fundamental ⇒ Standard Mode Selection ⇒ Command Mode Selection ⇒ **Terminal Block**.
3. Select Program ⇒ Fundamental ⇒ Standard Mode Selection ⇒ Frequency Mode 1 ⇒ **RR**.
4. Select Program ⇒ Terminal ⇒ **Input Terminals** to verify the following discrete terminal assignments:

- F111** — F (Forward Run)
- F112** — R (Reverse Run)
- F113** — ST (Standby)
- F114** — RES (Reset)

5. Activate the **ST** terminal and provide an **Run** command.
6. Apply a positive voltage across **RR** and **CC**.

For complete instructions on the **Command** and **Frequency** control functions see the *H9 ASD Installation and Operation Manual*.



6. Braking

The motor may continue to rotate and coast to a stop after being shut off due to the inertia of the load. If an immediate stop is required, one of the following braking systems should be used.

DC Injection Braking

The **DC Injection Braking** function may be setup and enabled by providing the proper information at the parameters listed below.

- F250** — Braking Start Frequency
- F251** — Braking Current
- F252** — Braking Time
- F253** — Forward/Reverse Braking Priority
- F254** — Motor Shaft Fixing Control

Dynamic Braking

The **Dynamic Braking** function may be setup and enabled by connecting a braking resistor from terminal **PA** to **PB** of the ASD and providing the proper information at the parameters listed below.

- F304** — Braking Enable/Disable
- F308** — Braking Resistance
- F309** — Braking Capacity
- F639** — Braking Resistance Overload Time (10x Rated Torque)

Dynamic Braking uses the transistor **IGBT7** to dissipate the bus voltage when required.

IGBT7 is standard item on the 25 HP and below H9 ASD 230-volt systems and is standard on the 400 HP and below for the 460-volt systems. **IGBT7** is optional for all remaining systems.

Mount the resistor pack above or to the side of the ASD — never below. The DBR generates heat that will affect the cooling capacity of the heat sink so it is important to maintain a minimum of six inches between the resistor pack and the ASD.

For light-duty DBRs, use one wire size smaller (AWG or kcmil) than the motor leads. For heavy-duty DBRs, use the same gauge wire as the motor leads — the total wire length from the ASD to the DBR should not exceed 10 feet. Twist the wire approximately two times per foot throughout the length of the wire.

For additional information about braking, see the *H9 ASD Installation and Operation Manual*.

Additional Information

Factory Default

Parameter settings may be returned to factory default values via the **Type Reset** menu, Program ⇒ Utilities ⇒ Type Reset ⇒ **Reset to Factory Defaults**.

Save User Settings

A profile of an existing setup may be saved and re-applied when required by using the **Save User Settings** feature. This function is carried out via Program ⇒ Utilities ⇒ Type Reset ⇒ **Save User Settings**. With the initial setup saved, troubleshooting and diagnostics may be performed and the starting setup may be re-applied when finished, via Program ⇒ Utilities ⇒ Type Reset ⇒ **Restore User Settings**.

A profile of an existing setup may be saved to the **EOI** via Program ⇒ Utilities ⇒ Type Reset ⇒ **Save User Settings to EOI**. The initial setup may be restored from the **EOI** via Program ⇒ Utilities ⇒ Type Reset ⇒ **Restore User Settings from EOI**.

Motor Information Outline

Voltage/Frequency:

Current Rating:

RPM:
