TOSHIBA

ADJUSTABLE SPEED DRIVES

Q9 Series

Reliability *in motion*®

Reliable & Configurable

Reliable

Toshiba has manufactured pulse-width modulated drives since 1981 and is one of the few companies that manufactures both motors and drives in the same facility. Because of this, Toshiba has the knowledge to develop and manufacture the most powerful, efficient, and motor-friendly adjustable speed drives available.

Toshiba produces one of the most reliable and rugged adjustable speed drives in the industry. Users can rely on Toshiba drives working for years beyond their warranty.

The Q9 is no exception — it is built to last. Toshiba uses oversized transistors and heavy-duty DC bus capacitors to extend the drive's life. The Q9 is listed at 100,000 AIC interrupting capacity. The drive is also designed to operate in environments from -10˚ to 40˚C at elevations up to 3,300 feet.

Integrated Enclosure

Configurable

The Q9 is not only a monster in durability and dependability, but also simple to use. The electronic operator interface (EOI), with its LCD display and simple keypad layout, allows for quick and easy menu and parameter navigation. Toshiba even provides optional Windows®-based software to help with Q9 programming and monitoring.

With eight digital inputs, three digital outputs, three analog inputs, two analog outputs, EOI, and various communication protocol options, the Q9 allows for flexibility in controlling and monitoring the drive.

My Function is a Q9 feature that allows the user to access built-in PLC-type logic. *My Function* provides basic logic programming without the need for an external PLC.

HVAC-Minded

Designed for HVAC Systems

The Q9 ASD is designed for HVAC systems offering many popular features needed in the industry. It comes equipped with a fire-speed circuit that forces the drive to run at a preset speed during a smoke purge. The Q9 also provides a damper-permissive function that can be used to protect from over-pressuring ductwork.

A user can set a low-output disable time to force the drive to zero-speed if the drive runs at the lower limit frequency for a specified time. This option helps reduce energy costs.

PID Control

A built-in proportional/integral/derivative (PID) controller, used to regulate a process without the need for external control devices, comes standard with the Q9. In addition, the wire-break function trips the drive if the feedback signal drops below specified levels. This prevents the drive from accelerating to maximum speed and helps protect the system.

Internal Communication Option Cards

Communications

The Q9 supports many common protocols used in HVAC applications including:

- BACnet (MS/TP)®
- LonWorks®
- Metasys N2®
- Modbus RTU®
- APOGEE FLN®

System-Friendly

The Q9 includes multiple features in its standard design that protects the drive, your equipment, and your systems.

Alarms & Faults

The Q9 provides various alarms and fault-notifications that serve to alert the user when poor operating conditions are present. This capability not only protects your drive but also protects the motor that is connected to it.

Equipment Friendly

The Q9's speed search function can detect the speed and direction of a spinning motor and start smoothly without tripping. This drive feature proves especially useful when trying to start a motor after a momentary power outage or in the case of a free-wheeling fan.

Adjustable acceleration/deceleration times and stall capabilities allow for minimal stress on fans, pumps, belts, and pulleys.

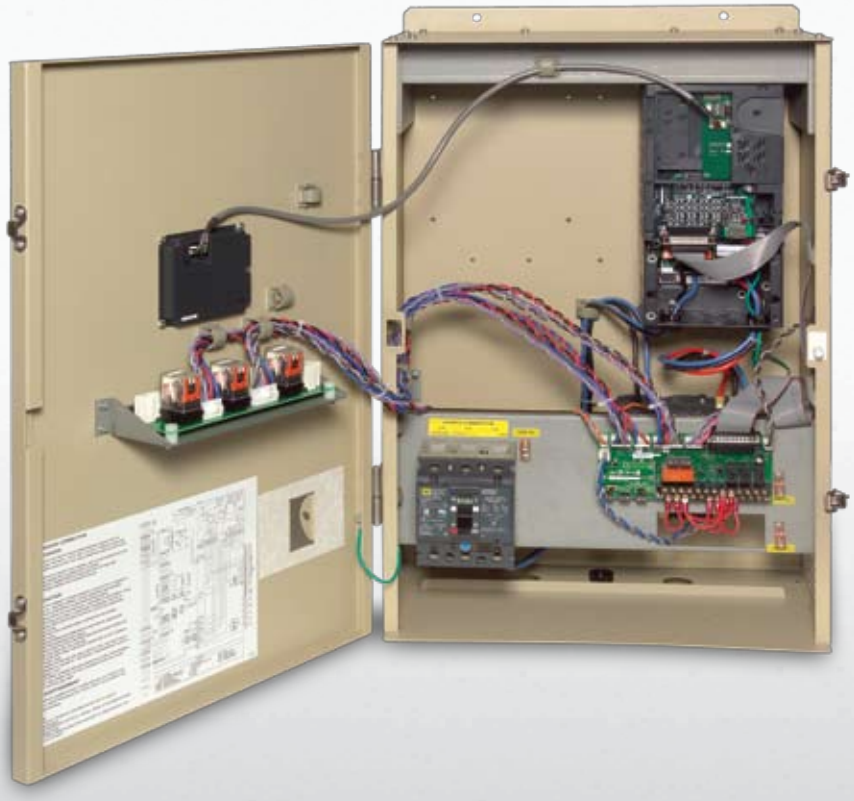
The Q9 is capable of programming up to three different skip frequencies. User-selected frequencies may be "skipped" to avoid the negative effects of mechanical resonance.

ASD Pro Software

Toshiba offers downloadable software that can be used to interface with the Q9 at no additional cost. The software can be used to program and control the Q9, download parameter sets, and monitor real-time conditions.

Integrated Enclosure & Extender Box

Toshiba allows you to “build your own drive” by including many of the popular features requested by the HVAC market as choices for your own standard package. The configurations you can choose include line reactors for input power-conditioning and harmonic mitigation, as well as the choice between two or three-contactor bypasses to allow for across-the-line motor operation.



Integrated Enclosure

“Build your own drive” uses a standard NEMA 1 enclosure that is available with the following options:

- Input Circuit Breaker
- Two-Contactor Bypass
- Three-Contactor Bypass
- 3% AC Line Reactor
- 5% AC Line Reactor
- DC Link Reactor

Extender Box

The extender box includes the same options for line reactors and bypass configurations as the integrated enclosure. The extender box is connected to the bottom of the standard Q9 power unit, and the entire assembly is NEMA 1 rated.

Integrated Enclosure Dimensions		
	Without Reactor	
230 V	3 to 7.5 HP	10 to 25 HP
460 V	3 to 15 HP	20 to 40 HP
Height (in.)	28.5	45.5
Width (in.)	16.1	16.1
Depth (in.)	10.6	13.9

Bypass Box Dimensions					
	Without Reactor		With Reactor		
230 V	30 HP	40 HP	-	30 HP	40 HP
460 V	-	50 to 100 HP	50 to 60 HP	-	75 to 100 HP
Height (in.)*	35.5	36.3	36.3	40.5	41.3
Width (in.)	16.0	16.0	16.0	16.0	16.0
Depth (in.)	12.5	12.5	12.5	12.5	12.5

* Height does not include power unit dimension.

Layout & Enclosure

LCD Display
Displays Configuration Information, Performance Data, and Diagnostic Information

Option Card Status LEDs
Shows Stackable Option Card Status LEDs When Options are Installed

LOCAL/REMOTE Key
Toggles System to and from Local/Remote Modes; LOCAL/REMOTE Key Light Illuminates Green While in Local Mode

RUN Key
Issues Run Command While in Local Mode; RUN Key Light Illuminates Red While Running and Green While Stopped

Panel Door
Allows Easy Access to Control Terminal Strip

Rotary Encoder
Accesses the Q9 Menu Selections, Changes Parameter Values, and Performs Enter Function; Up and Down Functions Operated by Rotating Encoder

ESCAPE Key
Returns System to Previously Viewed Menu Item

MODE Key
Provides a Means to Access Five Root Menus

STOP/RESET Key
Issues Off Command While in Local Mode; Initiates Emergency-Off if Pressed Twice Quickly; Resets Active Faults and/or Alarms if Pressed Twice Quickly

Panel Locking Screw
Allows for Simple Front-Panel Locking and Unlocking

Meets or Exceeds Your Specifications

Q9 Standard Specifications

Input Voltage	230 V												
HP Rating	1	2	3	5	7.5	10	15	20	25	30	40	50	60
Current Rating	4.8	7.8	11	17.5	25.3	32.2	48.3	62.1	78.2	92	120	150	177
Input Voltage	460 V, 50/60 Hz, Three-Phase												
HP Rating	1	2	3	5	7.5	10	15	20	25	30	40	50	60
Current Rating	2.1	3.4	4.8	7.6	11	14	21	27	34	40	52	65	77
HP Rating	75	100	125	150	200	250	300	350	400				
Current Rating	96	124	156	180	240	302	361	414	477				
Power Requirements													
Input Voltage Range	200 to 240 V, 50/60 Hz, Three-Phase						380 to 480 V, 50/60 Hz, Three-Phase						
Power Terminals	Input (L1/R, L2/S, L3/T), Output (T1/U, T2/V, T3/W), DCL (PO, PA), DC Bus (PA, PC)												
Voltage Tolerance	±10%												
Frequency Tolerance	±2%												
Control Specifications													
Output Method	Sine Wave Pulse-Width Modulated System												
Output Frequency Range	0 to 299 Hz												
V/Hz Pattern	Constant Torque, Variable Torque, Automatic Torque Boost, Sensor-Less Vector Control (Speed), V/f Five-Point Setting, Permanent Magnet Control, Auto Power-Saver												
Overload Current Rating	100% Continuous; 110% for One Minute												
Frequency Control	Rotary Encoder Integrated Into EOI, 0 to 10 VDC, ±10 VDC, 4 to 20 mA, Binary Input, Motor Operated Potentiometer												
Frequency Accuracy	Analog Input: ±0.2% of Maximum Output Frequency; Digital Input: ±0.01% of ±0.022 Hz of Output Frequency												
Frequency Resolution	Operation Panel: 0.01 Hz												
Acceleration/Deceleration	0.1 to 6000 Seconds												
Analog Inputs	Three: One Isolated Input Selectable Between 0 to 10 VDC/4 to 20 mA, One 0 to 10 VDC, and One ±10 VDC												
Analog Outputs	Two Programmable to 57 Functions (One Switchable 0 to 10 VDC/0 to 20 mA, and One 0 to 1 mA)												
Discrete Inputs	Eight Programmable to 41 Functions												
Sink/Source Switching	Ability to Switch Between Sink Logic and Source Logic												
Discrete Outputs	Three Programmable to 83 Functions (Two Form-A and One Form-C); Outputs Rated at 2 A/120 VAC, 2 A/30 VDC												
PID (Set Point Control)	Adjustment of Proportional Gain, Integral Time, Differential Time, and Delay Filter												
Braking Control	DC Braking, Over-Flux Braking												
Communication Ports	Two-Wire/Four-Wire RS485												
Communication Protocol	BACNet®, LonWorks®, Metasys N2®, Modbus RTU®, APOGEE FLN®												
Protection													
Protective Functions	Overvoltage Stall, Overcurrent Stall, Critical (Skip) Frequencies, Ride-Through, Electronic Thermal Motor Protection												
Interrupting Current Rating	100,000 AIC												
Faults	Overcurrent, ASD Overheat, ASD Overload, Motor Overload, Overvoltage, Overtorque, Undercurrent, Ground Fault, Communication Time-Out, Analog-Input Terminal Overvoltage, Emergency Stop, Input/Output Phase Loss, RAM/ROM Error, Undervoltage												
Retry	Ability to Reset Certain Faults Automatically; Programmable Up to 10 Retries												
Restart	Ability to Detect Speed and Direction of Freewheeling Motor and Start into Motor Smoothly												
Interface													
EOI Display	Full-English Backlit LCD Display												
Keys	LOCAL/REMOTE, ESC, RUN, MODE, STOP/RESET												
Rotary Encoder	Encoder with Integrated Enter Key for Frequency and Parameter Adjustments												
Monitoring	Monitors 19 Drive Conditions												
Display Units	Programmed to Display Percentage or Volts/Amps												
Ambient Conditions													
Temperature	-10˚ to 40˚C												
Relative Humidity	Maximum 93% (Non-Condensing)												
Altitude	1000 Meters or Less												

Q9 Dimensions														
230 V	1 to 2 HP	3 to 5 HP	7.5 HP	10 HP	15 to 20 HP	25 to 30 HP	-	40 to 60 HP	-	100 HP	125 HP	-	-	-
460 V	1 to 3 HP	5 to 7.5 HP	10 HP	15 to 20 HP	25 to 30 HP	40 HP	50 to 60 HP	-	75 to 125 HP	150 HP	200 HP	250 HP	300 to 350 HP	400 HP
Frame	2	3	4	5A	5B	6	7A	7B	8	9B	10B	11B	12B	13A
Height (in.)	10.0	11.1	12.6	12.6	15.7	16.5	21.7	21.7	24.8	36.2	40.2	46.9	46.9	46.9
Width (in.)	5.1	6.1	6.9	8.3	9.1	9.4	9.4	12.6	12.6	12.2	13.8	13.0	16.9	23.0
Depth (in.)	6.0	6.5	6.5	7.5	7.5	8.3	8.3	9.5	11.4	14.6	14.6	14.6	14.6	14.6

TOSHIBA INTERNATIONAL CORPORATION

North America 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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