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2015 HVAC Catalog

ADJUSTABLE SPEED DRIVES



Toshiba International Corporation

Industrial Division

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GENERAL INFORMATION

PRICING INFORMATION

- List pricing is subject to change at any time.
- All dimensions and weights are approximate and subject to change without notice.
- For availability of units, contact customer service at 855-803-7091.
- For pricing on non-listed options or special features, contact the ASD Department at 855-803-7089.
- Ensure that the product's amp rating is equal to or larger than the applied motor amp rating.
- All options may not work in conjunction with one another. Contact the appropriate department for compatibility.
- Unless otherwise specified, all ASDs are three-phase input and three-phase output.
- See each device's Part Numbering Convention section for the required ordering information.
- Please see Toshiba's Terms and Conditions at https://www.toshiba.com/tic/cms_files/TCofSale.pdf.

DRAWING REQUESTS

APPROVAL DRAWINGS

Please include a part number of DWG-APP to request approval drawings on any purchase order to Toshiba. For non-standard parts, a set of drawings will be provided for your approval three to four weeks after acceptance of the purchase order. Standard product drawings will be available immediately for approval. Not all products in this price book are standard.

We will expect, in writing, a release for manufacture as submitted, revise and release as noted, or revise and resubmit for approval.

REFERENCE DRAWINGS

Please include a part number of DWG-REF to request approval drawings on any purchase order to Toshiba. For non-standard parts, a set of drawings will be provided for your reference three to four weeks after receipt of the purchase order. Standard product drawings will be available immediately for approval. Not all products in this price book are standard.

Any changes made to reference drawings are considered a change request and subject to change fees and scrap charges.

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Q9 PLUS ASD

The Q9 Plus is designed for commercial HVAC applications such as fans and pumps for VAV systems and cooling towers. It features a plain-english LCD keypad that provides the programming, monitoring, and, operation interfaces. The robust construction of the Q9 Plus makes it suitable for a wide variety of demanding applications.



SPECIFICATIONS

CONTROL

- **PWM Control** — Carrier Frequency may be set from 1.0 to 16 kHz or 8.0 kHz, Depending on ASD Rating.
- **Input Signal Control** — Local Operation (EOI), Remote Potentiometer (1 to 10 k Ω), 0 to 10 VDC (Internal Impedance: 30 k Ω), Isolated 4 to 20 mA (Internal Impedance: 250 Ω), ± 10 VDC (Internal Impedance: 30 k Ω), 15 Preset Speeds Via Contact Closure, Communication Protocol, or MOP Control.
- **Output Frequency Precision** — Analog Input $\pm 0.5\%$ of Maximum Output Frequency, Discrete Input $\pm 0.01\%$ of Maximum Output Frequency.
- **Output Frequency Range** — 0.1 to 299 Hz.
- **Output Voltage/Frequency Control Method** — Constant Torque, Variable Torque, Auto-Torque Boost, Sensorless Vector Control, Permanent Magnet Motor Control, V/F Five-Point Setting, PG Feedback Vector Control, Auto & Dynamic Power Save Modes.
- **Overload Rating** — ASD Output 100% Continuous Current & 110% Current for 60 Seconds.
- **Braking** — DC Injection & Dynamic Braking are Available. DC Injection Braking Frequency may be set from 0 to Maximum Frequency. Amperage may be set from 0 to 100% of the ASD Output. Braking Time may be set from 0 to 20 Seconds, & Motor Shaft Stationary Control is Available. Dynamic Braking Circuit Built-In for 250 HP & Below (Optional External Braking Resistor Required).

OPERATION

- **Voltage/Frequency** — Three-Phase 200 to 240 VAC or 380 to 480 VAC, 50/60 Hz. Adjustable Within 100 to 120% of Corrected Supply Voltage.
- **Input Voltage Tolerance** — Voltage $\pm 10\%$ Continuous. Frequency ± 2 Hz.
- **Frequency Adjustability** — EOI: 0.01 Hz. Analog Input: 0.1 Hz.
- **Frequency Control** — EOI (Rotary Encoder), Two 0 to 10 VDC, ± 10 VDC, Isolated 4 to 20 mA, or Communication Protocol.
- **Acceleration/Deceleration** — 0.01 to 6000 Seconds. Switchable Between Times 1, 2 or, Automatic. Selectable Patterns are Linear, S-Pattern 1 or, 2.
- **Jump Frequencies** — Three User-Selected Frequencies & Associated Bandwidths.

- **Input Terminal Functions** — Eight Discrete Input Terminals Selectable as Sink or Source Logic. Programmable to 42 Different Functions.
- **Output Terminal Functions** — Three Output Relays Programmable to 95 Different Functions.
- **Output Meter** — Two Analog Outputs, One 4 to 20 mA or 0 to 10 VDC, & One 0 to 10 VDC Programmable to 45 Different Values.
- **Retry Operation** — Auto-Reset of User-Selected Faults After a Main Circuit Check. Programmable up to 10 Retry Attempts.
- **Regenerative Power Ride-Through Control** — Possible to Keep Logic Circuit Active in Case of Momentary Loss of Power Using Regenerative Energy from Motor.
- **Auto-Restart/Catch a Spinning Motor** — In the Event of a Momentary Loss of Power, Drive Will Read Speed & Direction of Rotating Motor & Seamlessly Start at Appropriate Speed.
- **Protective Functions** — Stall Protection, Current Limit, Overcurrent, Output Short Circuit, Overvoltage, Overvoltage Limit, Undervoltage, Ground Fault, Input & Output Single-Phase, Overload, Overtorque, & Overheat.
- **Motor Protection** — Electronic Thermal Overload Protection, Adjustable from 10 to 100%.

DISPLAY

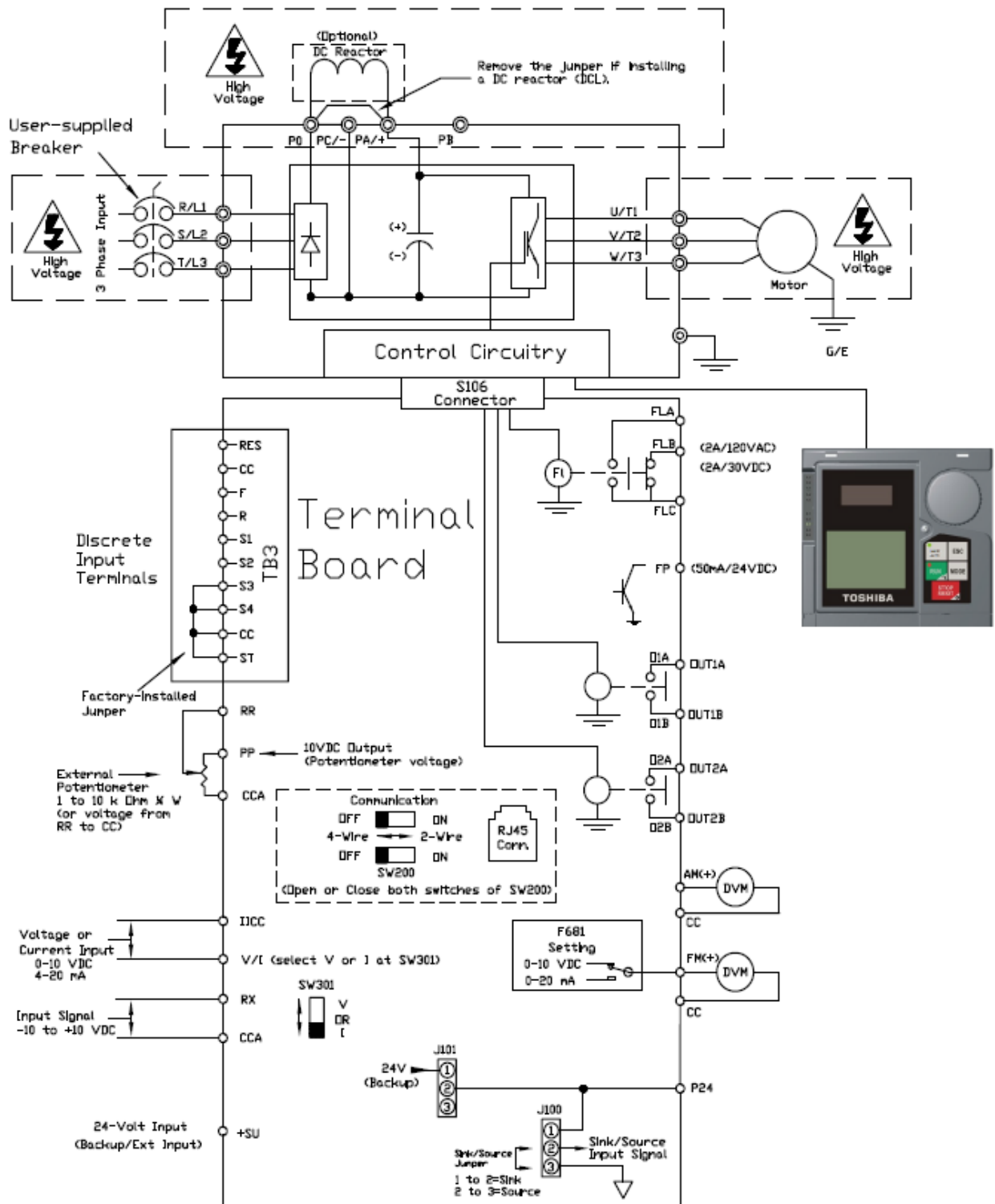
- **EOI** — Backlit Full-English LCD Display.
- **Status Monitoring** — Output Frequency, Frequency Command, Output Current, Output Voltage, DC Bus Voltage, Torque Current, Input Terminal Status.
- **Past Trip Monitoring** — Stores Last Four Faults & Useful Drive Information at Time of Trip. No RTC.

ENVIRONMENT

- **Installation** — Indoor, Maximum Altitude 3300 Feet, Not in Direct Sunlight, Protect from Corrosive &/or Explosive Gases, & Vibrations in Excess of 0.6 G.
- **Ambient Temperature** — 14 to 104 $^{\circ}$ F (-10 to 40 $^{\circ}$ C).
- **Humidity** — 95% Non-Condensing.



Q9 PLUS PLUS POWER UNIT CONNECTION DIAGRAM



Q9 PLUS POWER UNIT PART NUMBERING CONVENTION

Example Part Number:	VT130Q9+	2	035	RD
Series: VT130Q9+ — Q9 Plus ASD				
Voltage: 2 — 230 4 — 460				
Capacity Rating: 015 — 1 HP 025 — 2 HP 035 — 3 HP 055 — 5 HP 080 — 7.5 HP 110 — 10 HP 160 — 15 HP 220 — 20 HP 270 — 25 HP 330 — 30 HP 400 — 40 HP 500 — 50 HP 600 — 60 HP 750 — 75 HP 10K — 100 HP 12K — 125 HP 15K — 150 HP 20K — 200 HP 25K — 250 HP 30K — 300 HP 35K — 350 HP 40K — 400 HP				
Additional Options: RD — DC Link Reactor				

Q9 PLUS POWER UNIT PRICING & DIMENSIONS

Q9 PLUS POWER UNIT — 230 V									
VAC	HP	FLA	Model Number	List Price	Frame	Dimensions (in.)			Shipping Weight (lbs.)
						H	W	D	
230	1	4.8	VT130Q9+2015	\$1,156	2	10.0	5.1	6.0	9
	2	7.8	VT130Q9+2025	\$1,178					
	3	11.0	VT130Q9+2035	\$1,271	3	11.1	6.1	6.5	11
	5	17.5	VT130Q9+2055	\$1,315					
	7.5	25.3	VT130Q9+2080	\$1,582	4	12.6	6.9	7.6	15
	10	32.2	VT130Q9+2110	\$1,740	5A		8.3		20
	15	48.3	VT130Q9+2160	\$2,200	5B	16.7	9.1	7.5	35
	20	62.1	VT130Q9+2220	\$2,403					
	25	78.2	VT130Q9+2270	\$3,111	6	16.5	9.4	8.3	51
	30	92.0	VT130Q9+2330	\$3,244					
	40	120	VT130Q9+2400	\$4,318	7B	21.7	12.6	9.5	110
	50	150	VT130Q9+2500	\$4,889					
	60	177	VT130Q9+2600	\$5,333					126
	75	221	VT130Q9+2750	\$6,840	9	26.8	12.2	14.8	220
	100	285	VT130Q9+210K	\$7,674					269
	125	359	VT130Q9+212K	\$9,381	10	30.8	13.8		

Notes:

- Dimensions and weights are for estimating purposes only.
- 230 V power units ranging from 15 to 60 HP include a DC link reactor.
- 230 V power units ranging from 75 to 125 HP require a DC link reactor or a 3% line reactor.



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Q9 PLUS POWER UNIT — 460 V									
VAC	HP	FLA	Model Number	List Price	Frame	Dimensions (in.)			Shipping Weight (lbs.)
						H	W	D	
460	1	2.1	VT130Q9+4015	\$1,130	2	10.0	5.1	6.0	9
	2	3.4	VT130Q9+4025	\$1,138					
	3	4.8	VT130Q9+4035	\$1,155					
	5	7.6	VT130Q9+4055	\$1,292	3	11.1	6.1	6.5	11
	7.5	11.0	VT130Q9+4080	\$1,342					
	10	14.0	VT130Q9+4110	\$1,543	4	12.6	6.9	7.6	15
	15	21.0	VT130Q9+4160	\$1,667	5A		8.3		20
	20	27.0	VT130Q9+4220	\$1,778					
	25	34.0	VT130Q9+4270	\$2,264	5B	16.7	9.1	7.5	33
	30	40.0	VT130Q9+4330	\$2,471					37
	40	52.0	VT130Q9+4400	\$2,984	6	16.5	9.4	8.3	51
	50	65.0	VT130Q9+4500	\$3,567	7A	21.7		9.5	88
	60	77.0	VT130Q9+4600	\$3,702					
	75	96.0	VT130Q9+4750	\$4,629	8	24.8	12.6	11.4	125
	100	124	VT130Q9+410K	\$4,740					127
	125	156	VT130Q9+412K	\$5,556					
	150	180	VT130Q9+415K	\$8,667	9	26.8	12.2	14.6	168
	200	240	VT130Q9+420K	\$10,556	10	30.8			380
	250	302	VT130Q9+425K	\$11,671	11	37.4	13.8		463
	300	361	VT130Q9+430K	\$15,753	12		16.9		507
	350	414	VT130Q9+435K	\$16,593					
	400	477	VT130Q9+440K	\$19,348	13		23.0		665

Notes:

- Dimensions and weights are for estimating purposes only.
- 460 V power units ranging from 30 to 125 HP include a DC link reactor.
- 460 V power units ranging from 150 to 400 HP require a DC link reactor or a 3% line reactor.

Q9 PLUS POWER UNIT WITH DC LINK REACTOR INCLUDED									
VAC	HP	FLA	Model Number	List Price	Frame	Dimensions (in.)			Shipping Weight (lbs.)
						H	W	D	
230	75	221	VT130Q9+2750RD	\$8,245	9	36.5	12.2	14.8	265
	100	285	VT130Q9+210KRD	\$8,549					269
	125	359	VT130Q9+212KRD	\$10,944	10	40.5	13.8		
460	150	180	VT130Q9+415KRD	\$9,524	9	36.5	13.8	14.6	261
	200	240	VT130Q9+420KRD	\$11,600	10	40.5	16.9		466
	250	302	VT130Q9+425KRD	\$12,825	11	46.0	23.0		463
	300	361	VT130Q9+430KRD	\$16,143	12				507
	350	414	VT130Q9+435KRD	\$16,659					493
	400	477	VT130Q9+440KRD	\$20,534	13				665

Note: Dimensions and weight are for estimating purposes only.



Q9 PLUS CONDUIT ADAPTERS

Q9 PLUS CONDUIT ADAPTERS						
230 V Drive Model Number	HP Range	460 V Drive Model Number	HP Range	Conduit Adapter Model Number	Height Adder (in.)	List Price
VT130Q9+2015 VT130Q9+2025	1 to 2	VT130Q9+4015 VT130Q9+4025 VT130Q9+4035	1 to 3	NEM1101Z	1.3	\$140
VT130Q9+2035 VT130Q9+2055	3 to 5	VT130Q9+4055 VT130Q9+4080	5 to 7.5	NEM1102Z		
VT130Q9+2080	7.5	VT130Q9+4110	10	NEM1103Z		\$150
VT130Q9+2110	10	VT130Q9+4160 VT130Q9+4220	15 to 20	NEM1104Z	1.4	
VT130Q9+2160 VT130Q9+2220	15 to 20	VT130Q9+4270 VT130Q9+4330	25 to 30	NEM1105Z	1.5	\$155
VT130Q9+2270 VT130Q9+2330	25 to 30	VT130Q9+4400	40	NEM1106Z	3.0	
N/A		VT130Q9+4500 VT130Q9+4600	50 to 60	NEM1107Z		\$160
VT130Q9+2400 VT130Q9+2500 VT130Q9+2600	40 to 60	N/A		NEM1117Z	7.0	\$350
N/A		VT130Q9+4750 VT130Q9+410K VT130Q9+412K	75 to 125	NEM1108Z	6.4	\$185
VT130Q9+2750 VT130Q9+210K VT130Q9+2750RD VT130Q9+210KRD	75 to 100	VT130Q9+415K VT130Q9+415KRD	150	NEM1109Z	9.7	\$850
VT130Q9+212K VT130Q9+212KRD	125	VT130Q9+420K VT130Q9+420KRD	200	NEM1110Z	13.2	\$1,000
N/A		VT130Q9+425K VT130Q9+425KRD	250	NEM1111Z		\$1,300
		VT130Q9+430K VT130Q9+435K VT130Q9+430KRD VT130Q9+435KRD	300 to 350	NEM1112Z		
		VT130Q9+440K VT130Q9+440KRD	400	NEM1113Z		

Notes:

- Dimensions are for estimating purposes only.
- Q9 Plus power units are rated either IP20 or IP00. This means the bottom cover does not accept conduit connections or the drive does not include a bottom cover. As a result, all standalone Q9 Plus power units do not comply with NEMA 1 standards. The conduit adapters listed above will bring the drive into NEMA 1 compliance.



Q9 PLUS INTEGRATED ENCLOSURE

The Q9 Plus Integrated Enclosure is an easy-to-install turn key package that combines the Q9 Plus power unit with commonly-used options, including:

- Input Disconnect
- Two or Three Contactor Bypass
 - Includes IEC Rated, Class 20 Overload Relay
- Class J Input Fuses
 - Only Available in 460 VAC Models
- Fused 120 VAC CPT
- Damper Permissive Circuit
- Firespeed Input
- Grounding Lug
- Door-Mounted Electronic Operator Interface
- Terminal Block for Customer Controls
- Optional DC link or AC Line Reactors



SPECIFICATIONS

DESIGN

- **Input Power** — Three-Phase 200 to 240 VAC or 380 to 480 VAC, 50/60 Hz. Adjustable Within 100 to 120% of Corrected Supply Voltage.
- **Input Voltage Tolerance** — Voltage $\pm 10\%$ Continuous. Frequency ± 2 Hz.
- **Short Circuit Current Rating** — RMS Symmetrical Current Capacity is 100 kA SCCR.
- **MCP** — Adjustable Instantaneous-Trip Magnetic-Only Circuit Breaker with Shunt Trip Door Switch.
- **Customer Control Terminal Strip** — Standard Control Terminal Board Contains the Following Features:
 - Eight Programmable Discrete Inputs, Activated Using Sink Logic Only
 - Three Programmable Output Relays
 - One Form C, Rated for 2 Amps at 250 VAC
 - Two Form A, Rated for 2 Amps at 250 VAC
 - Three Analog Inputs with Adjustable Gain & Bias
 - 0 to 10 VDC
 - Non-Isolated 0(4) to 20 mA
 - ± 10 VDC Differential Input
 - Two Analog Outputs with Adjustable Gain & Bias
 - 0 to 1 mA/VDC & 4 to 20 mA or 2 to 10 VDC
 - One Pulse Train Output
 - Customer Interlock Terminals
 - Enables/Disables Drive Operation in Both ASD & Bypass Mode
 - Damper Permissive Terminals
 - In ASD or Bypass Mode the Drive Will Not Operate Unless the Damper is Fully Open
 - An Internal Relay is Used to Command the Damper to Open
 - Damper Feedback Terminals to be Connected to the Damper's End Switch
 - 24 VDC Power Supply Rated for 200 mA
 - 10 VDC Power Supply Rated for 10 mA
- **CPT** — 120 VAC Secondary Voltage with Fused Primary & Secondary. 100 VA for 1 to 20 HP at 460 VAC & 150 VA for All Other Ratings.
- **Contactors** — All Contactors are IEC Rated with a 120 VAC Coil & Include One Set of N.O. & N.C. Auxiliary Contacts.

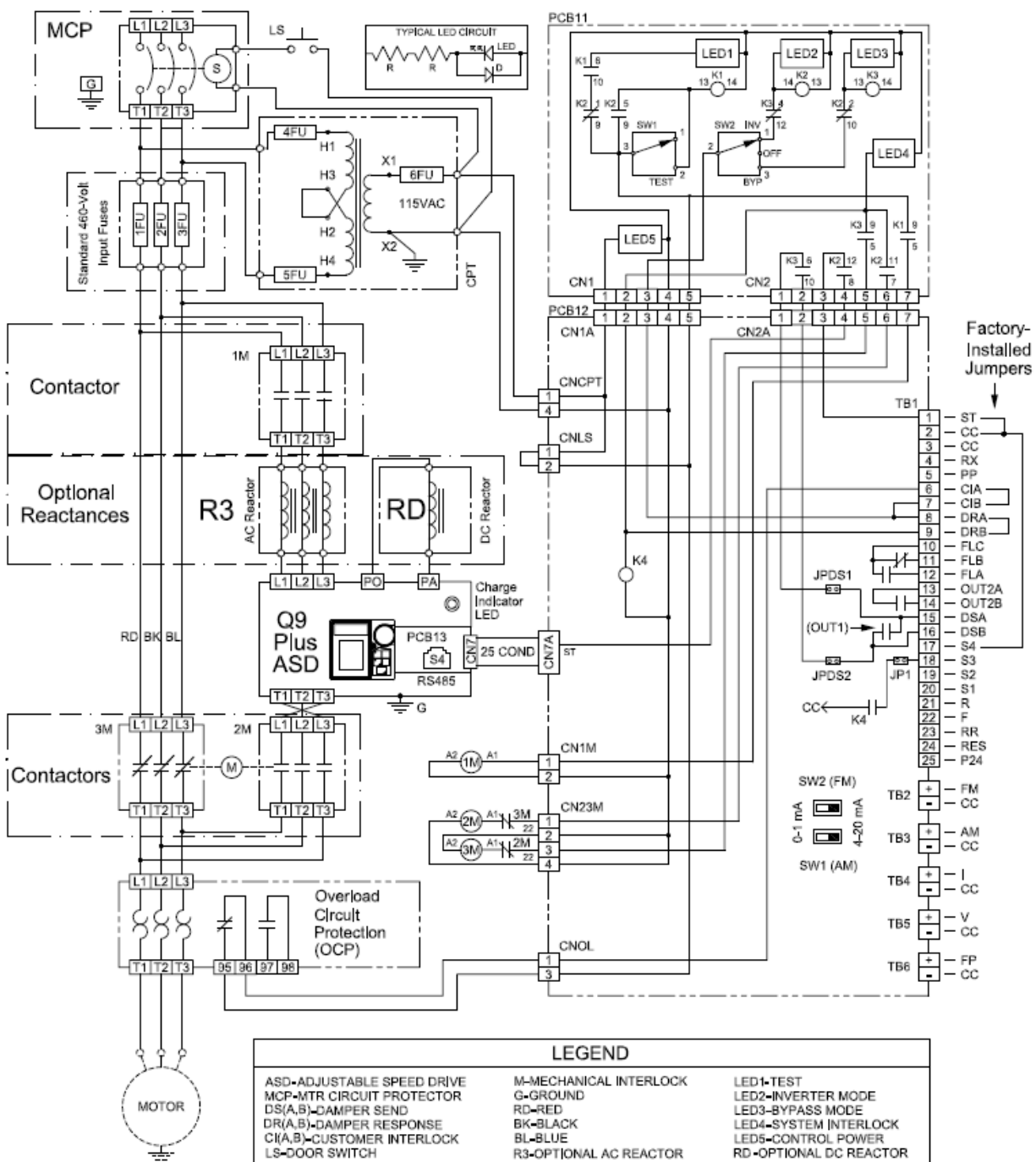
- **Control Panel** — Only Installed in Two or Three Contactor Bypass Styles. Control Power LED, System Interlock LED, Inverter Mode LED, Bypass Mode LED, Inverter-Off-Bypass Switch. Three-Contactor Bypass Also Includes Test On-Off Switch & Test LED.
- **Reactor Options** — Smaller HP Ratings have a DC Link Reactor Option & Larger Ratings have Them Included. All HP Ratings have an Option for a 3% or 5% Input AC Line Reactor.
- **Motor Overload Relay** — IEC Rated, Class 20 Overload Relay with Adjustable Trip Current & One Set of N.O. & N.C. Auxiliary Contacts. Provides Overload Protection in Both ASD & Bypass Mode.
- **Enclosure** — UL Listed with NEMA 1 Rating Constructed of 16-Gauge Steel.

ENVIRONMENT

- **Installation** — Indoor, Maximum Altitude 3300 Feet (1000 Meters), Not in Direct Sunlight, Protect from Corrosive &/or Explosive Gases, & Vibrations in Excess of 0.6 G.
- **Ambient Temperature** — 14 to 104 °F (-10 to 40 °C).
- **Humidity** — 95% Non-Condensing.



Q9 PLUS INTEGRATED ENCLOSURE CONNECTION DIAGRAM



DO NOT CONNECT CC TO EARTH GROUND

Q9 PLUS INTEGRATED ENCLOSURE PART NUMBERING CONVENTION

Example Part Number:	Q9+	2	035	IA	R3
Series: Q9+ — Q9 Plus ASD					
Voltage: 2 — 230 4 — 460					
Capacity Rating: 015 — 1 HP 025 — 2 HP 035 — 3 HP 055 — 5 HP 080 — 7.5 HP 110 — 10 HP 160 — 15 HP 220 — 20 HP 270 — 25 HP 330 — 30 HP 400 — 40 HP					
Configuration: IA — Input Circuit Breaker IC — Input Circuit Breaker, Bypass, Overload IE — Input Circuit Breaker, Isolated Bypass, Overload					
Additional Options: R3 — 3% AC Line Reactor R5 — 5% AC Line Reactor RD — DC Link Reactor					



Q9 PLUS INTEGRATED ENCLOSURE LIST PRICING & DIMENSIONS

Q9 PLUS NEMA 1 INTEGRATED ENCLOSURE									
VAC	HP	FLA	Model Number	List Price			Dimensions (in.)		
				IA	IC	IE	H	W	D
230	1	4.8	Q9+2015	\$2,300	\$2,525	\$2,542	28.5	16.1	10.6
	2	7.8	Q9+2025	\$2,325	\$2,551	\$2,568			
	3	11.0	Q9+2035	\$2,386	\$2,633	\$2,687			
	5	17.5	Q9+2055	\$2,401	\$2,667	\$2,756			
	7.5	25.3	Q9+2080	\$2,700	\$2,927	\$3,000			
	10	32.2	Q9+2110	\$2,991	\$3,322	\$3,382	45.5		13.9
	15	48.3	Q9+2160	\$3,460	\$3,778	\$3,889			
	20	62.1	Q9+2220	\$3,653	\$4,047	\$4,136			
	25	78.2	Q9+2270	\$4,322	\$4,749	\$4,851			
460	1	2.1	Q9+4015	\$2,205	\$2,412	\$2,428	28.5	16.1	10.6
	2	3.4	Q9+4025	\$2,218	\$2,426	\$2,443			
	3	4.8	Q9+4035	\$2,248	\$2,447	\$2,493			
	5	7.6	Q9+4055	\$2,353	\$2,516	\$2,562			
	7.5	11.0	Q9+4080	\$2,444	\$2,529	\$2,580			
	10	14.0	Q9+4110	\$2,547	\$2,742	\$2,804			
	15	21.0	Q9+4160I_RD*	\$2,689	\$2,882	\$2,949			
	20	27.0	Q9+4220	\$2,913	\$3,131	\$3,204	45.5		13.9
	25	34.0	Q9+4270	\$3,373	\$3,704	\$3,784			
	30	40.0	Q9+4330	\$3,700	\$3,956	\$3,982			
	40	52.0	Q9+4400	\$4,304	\$4,509	\$4,604			

*Only available with a DC link, 3%, or 5% reactor; e.g. Q9+4160IERD, Q9+4160IER3, or Q9+4160IER5.

Notes:

- 230 V integrated enclosures ranging from 15 to 25 HP include a DC link reactor.
- 460 V integrated enclosures ranging from 30 to 40 HP include a DC link reactor.
- Dimensions are for estimating purposes only.

Q9 PLUS INTEGRATED ENCLOSURE REACTORS

Q9 PLUS OPTIONAL REACTORS					
VAC	HP	Model Number	Price Adder		
			I_RD	I_R3	I_R5
230	1	Q9+2015	\$97	\$123	\$603
	2	Q9+2025			\$748
	3	Q9+2035	\$109	\$176	\$891
	5	Q9+2055		\$200	\$933
	7.5	Q9+2080			\$1,000
	10	Q9+2110	\$134	\$227	\$1,126
	15	Q9+2160	INCL		\$1,222
	20	Q9+2220		\$322	\$1,408
	25	Q9+2270			\$1,616
460	1	Q9+4015	\$102	\$109	\$514
	2	Q9+4025			\$669
	3	Q9+4035		\$143	\$796
	5	Q9+4055			\$819
	7.5	Q9+4080		\$187	\$873
	10	Q9+4110	\$129		\$932
	15	Q9+4160	N/A	\$94	\$854
	20	Q9+4220	\$129	\$265	\$1,087
	25	Q9+4270			\$1,277
	30	Q9+4330	INCL	\$329	\$1,407
	40	Q9+4400		\$400	\$1,652

Notes:

- 230 V integrated enclosures ranging from 15 to 25 HP include a DC link reactor.
- 460 V integrated enclosures ranging from 30 to 40 HP include a DC link reactor.

Q9 PLUS EXTENDED ENCLOSURE

The Q9 Plus Extended Enclosure is an easy-to-install turn key package that combines the Q9 Plus power unit with a bypass box for larger horsepower applications that include the following options:

- Pre-Mounted on DIN Rails
- Input Disconnect
- Two or Three Contactor Bypass
 - Includes IEC Rated, Class 20 Overload Relay
- Class J Input Fuses
- Fused 120 VAC CPT
- Damper Permissive Circuit
- Firespeed Input
- Grounding Lug
- Electronic Operator Interface
- Terminal Block for Customer Controls
- Optional AC Line Reactor, DC Link Reactor Included



SPECIFICATIONS

DESIGN

- **Input Power** — Three-Phase 200 to 240 VAC or 380 to 480 VAC, 50/60 Hz. Adjustable Within 100 to 120% of Corrected Supply Voltage.
- **Input Voltage Tolerance** — Voltage $\pm 10\%$ Continuous. Frequency ± 2 Hz.
- **Short Circuit Current Rating** — RMS Symmetrical Current Capacity is 100 kA SCCR.
- **MCP** — Adjustable Instantaneous-Trip Magnetic-Only Circuit Breaker with Shunt Trip Door Switch.
- **Customer Control Terminal Strip** — Standard Control Terminal Board Contains the Following Features:
 - Eight Programmable Discrete Inputs, Activated Using Sink Logic Only
 - Three Programmable Output Relays
 - One Form C, Rated for 2 Amps at 250 VAC
 - Two Form A, Rated for 2 Amps at 250 VAC
 - Three Analog Inputs with Adjustable Gain & Bias
 - 0 to 10 VDC
 - Non-Isolated 0(4) to 20 mA
 - ± 10 VDC Differential Input
 - Two Analog Outputs with Adjustable Gain & Bias
 - 0 to 1 mA/VDC & 4 to 20 mA or 2 to 10 VDC
 - One Pulse Train Output
 - Customer Interlock Terminals
 - Enables/Disables Drive Operation in Both ASD & Bypass Mode
 - Damper Permissive Terminals
 - In ASD or Bypass Mode the Drive Will Not Operate Unless the Damper is Fully Open
 - An Internal Relay is Used to Command the Damper to Open
 - Damper Feedback Terminals to be Connected to the Damper's End Switch
 - 24 VDC Power Supply Rated for 200 mA
 - 10 VDC Power Supply Rated for 10 mA
- **CPT** — 120 VAC Secondary Voltage with Fused Primary & Secondary. 150 VA for 50 to 60 HP at 460 VAC & 250 VA for All Other Ratings.
- **Contactors** — All Contactors are IEC Rated with a 120 VAC Coil & Include One Set of N.O. & N.C. Auxiliary Contacts.

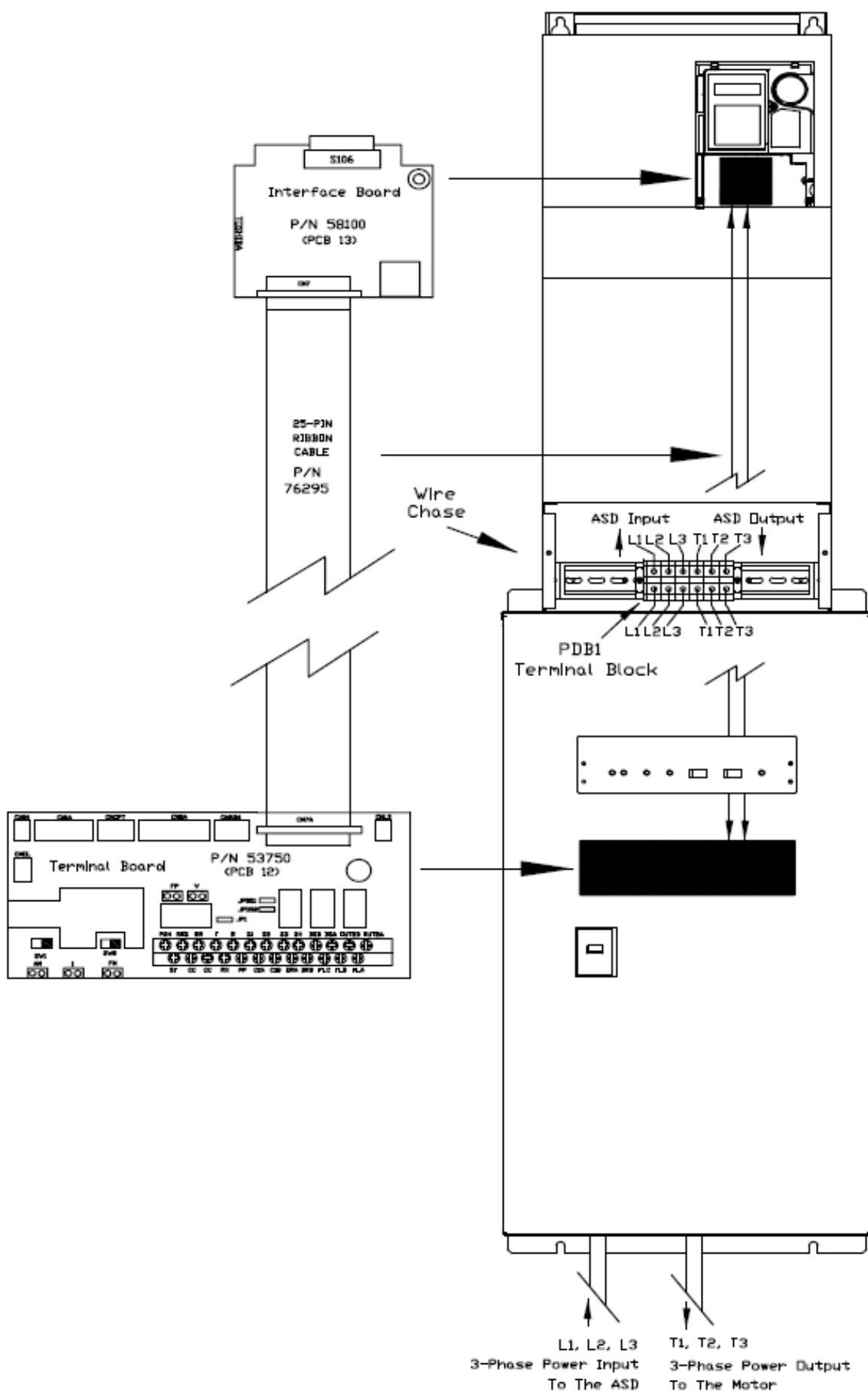
- **Control Panel** — Only Installed in Two or Three Contactor Bypass Styles. Control Power LED, System Interlock LED, Inverter Mode LED, Bypass Mode LED, Inverter-Off-Bypass Switch. Three Contactor Bypass Also Includes Test On-Off Switch & Test LED.
- **Reactor Options** — All HP Ratings have a DC Link Reactor Included. All HP Ratings have an Option for a 3% or 5% Input AC Line Reactor.
- **Motor Overload Relay** — IEC Rated, Class 20 Overload Relay with Adjustable Trip Current & One Set of N.O. & N.C. Auxiliary Contacts. Provides Overload Protection in Both ASD & Bypass Mode.
- **Enclosure** — UL Listed with NEMA 1 Rating Constructed of 16 Gauge Steel.

ENVIRONMENT

- **Installation** — Indoor, Maximum Altitude 3300 Feet (1000 Meters), Not in Direct Sunlight, Protect from Corrosive &/or Explosive Gases, & Vibrations in Excess of 0.6 G.
- **Ambient Temperature** — 14 to 104 °F (-10 to 40 °C).
- **Humidity** — 95% Non-Condensing.



Q9 PLUS EXTENDED ENCLOSURE CONNECTION DIAGRAM



Q9 PLUS EXTENDED ENCLOSURE PART NUMBERING CONVENTION

Example Part Number:	Q9+	4	600	EA	R3
Series: Q9+ — Q9 PLUS ASD					
Voltage: 2 — 230 4 — 460					
Capacity Rating: 330 — 30 HP 400 — 40 HP 500 — 50 HP 600 — 60 HP 750 — 75 HP 10K — 100 HP					
Configuration: EA — Input Circuit Breaker EC — Input Circuit Breaker, Bypass, Overload EE — Input Circuit Breaker, Isolated Bypass, Overload					
Additional Options: R3 — 3% AC Line Reactor R5 — 5% AC Line Reactor					



Q9 PLUS EXTENDED ENCLOSURE PRICING & DIMENSIONS

Q9 PLUS NEMA 1 EXTENDED ENCLOSURE										
VAC	HP	FLA	Model Number	List Price			Dimensions (in.)			
				EA	EC	EE	H		W	D
							E_	E_R_		
230	30	92.0	Q9+2330	\$6,563	\$7,551	\$7,734	54.4	59.8	16.0	14.6
	40	120	Q9+2400	\$8,149	\$9,378	\$9,569	59.8	64.9		
460	50	65.0	Q9+4500	\$7,081	\$7,688	\$7,826	59.8		16.0	14.6
	60	77.0	Q9+4600	\$7,568	\$8,183	\$8,330				
	75	96.0	Q9+4750	\$9,345	\$10,346	\$10,528	63.0	68.0		
	100	124	Q9+410K	\$9,542	\$10,677	\$10,962				

Notes:

- Dimensions are for estimating purposes only.
- All extended enclosures include a DC link reactor.

Q9 PLUS EXTENDED ENCLOSURE REACTORS

Q9 PLUS EXTENDED ENCLOSURE OPTIONAL REACTORS				
VAC	HP	Model Number	Price Adder	
			E_R3	E_R5
230	30	Q9+2330	\$723	\$1,740
	40	Q9+2400	\$868	\$2,086
460	50	Q9+4500	\$492	\$1,805
	60	Q9+4600	\$538	\$2,053
	75	Q9+4750	\$786	\$2,455
	100	Q9+410K	\$866	\$2,760

Note: All extended enclosures include a DC link reactor.

Q9 PLUS ASSEMBLY UNIT

The Q9 Plus Assembly Unit is an easy-to-install turn key package that houses the Q9 Plus power unit in a NEMA 3R enclosure with commonly-used options, including:

- NEMA 3R Pole Mounted Enclosure
 - Optional Leg Stand Kit Can Be Provided
- Input Disconnect
- Three Contactor Bypass
 - Includes IEC Rated, Class 20 Overload Relay
- Fused 120 VAC CPT
- Grounding Lug
- Door-Mounted Electronic Operator Interface
- Terminal Block for Customer Controls
- Optional DC Link or AC Line Reactors



SPECIFICATIONS

DESIGN

- **Input Power** — Three-Phase 200 to 240 VAC or 380 to 480 VAC, 50/60 Hz. Adjustable Within 100 to 120% of Corrected Supply Voltage.
- **Input Voltage Tolerance** — Voltage $\pm 10\%$ Continuous. Frequency ± 2 Hz.
- **MCP** — Adjustable Instantaneous-Trip Magnetic-Only Circuit Breaker with Shunt Trip Door Switch.
- **Customer Control Terminal Strip** — Standard Control Terminal Board Contains the Following Features:
 - Eight Programmable Discrete Inputs, Activated Using Sink Logic Only
 - Three Programmable Output Relays
 - One Form C, Rated for 2 Amps at 250 VAC
 - Two Form A, Rated for 2 Amps at 250 VAC
 - Three Analog Inputs with Adjustable Gain & Bias
 - 0 to 10 VDC
 - Non-Isolated 0(4) to 20 mA
 - ± 10 VDC Differential Input
 - Two Analog Outputs with Adjustable Gain & Bias
 - 0 to 1 mA/VDC & 4 to 20 mA or 2 to 10 VDC
 - One Pulse Train Output
 - Customer Interlock Terminals
 - Enables/Disables Drive Operation in Both ASD & Bypass Mode
 - Damper Permissive Terminals
 - In ASD or Bypass Mode the Drive Will Not Operate Unless the Damper is Fully Open
 - An Internal Relay is Used to Command the Damper to Open
 - Damper Feedback Terminals to be Connected to the Damper's End Switch
 - 24 VDC Power Supply Rated for 200 mA
 - 10 VDC Power Supply Rated for 10 mA
- **Contactors** — All Contactors are IEC Rated with a 120 VAC Coil & Include One Set of N.O. & N.C. Auxiliary Contacts.
- **Motor Overload Relay** — IEC Rated Class 20 Overload Relay with Adjustable Trip Current & One Set of N.O. & N.C. Auxiliary Contacts. Provides Overload Protection in Both ASD & Bypass Mode.

- **Control Panel** — Only Installed in Two or Three Contactor Bypass Styles. Control Power LED, System Interlock LED, Inverter Mode LED, Bypass Mode LED, Inverter-Off-Bypass Switch. 3-Contactor Bypass Also Includes Test On-Off Switch & Test LED.
- **CPT** — 120 VAC Secondary Voltage with Fused Primary & Secondary.
- **Reactor Options** — Smaller HP Ratings have a DC Link Reactor Option & Larger Ratings have Them Included. All HP Ratings have an Option for a 3% Input AC Line Reactor or have one Included, 5% Input AC Line Reactors are Available as an Option on All Ratings.
- **Enclosure** — NEMA 3R. Pole Mounted. Constructed of 16 Gauge Steel.

ENVIRONMENT

- **Installation** — Indoor/Outdoor, Maximum Altitude 3300 Feet (1000 Meters), Not in Direct Sunlight, Protect from Corrosive &/or Explosive Gases, & Vibrations in Excess of 0.6 G.
- **Ambient Temperature** — 14 to 104 °F (-10 to 40 °C).
- **Humidity** — 95% Non-Condensing.



Q9 PLUS ASSEMBLY UNIT PART NUMBERING CONVENTION

Example Part Number:	Q9+	4	025	AE	R3
Series: Q9+ — Q9 PLUS ASD					
Voltage: 2 — 230 4 — 460					
Capacity Rating: 015 — 1 HP 025 — 2 HP 035 — 3 HP 055 — 5 HP 080 — 7.5 HP 110 — 10 HP 160 — 15 HP 220 — 20 HP 270 — 25 HP 330 — 30 HP 400 — 40 HP 500 — 50 HP 600 — 60 HP 750 — 75 HP 10K — 100 HP 12K — 125 HP 15K — 150 HP 20K — 200 HP 25K — 250 HP 30K — 300 HP 35K — 350 HP 40K — 400 HP					
Configuration: AA — NEMA 3R Enclosure, Input Circuit Breaker AE — NEMA 3R Enclosure, Input Circuit Breaker, Isolated Bypass, Overload					
Additional Options: R3 — 3% AC Line Reactor R5 — 5% AC Line Reactor RD — DC Link Reactor					

Q9 PLUS ASSEMBLY UNIT PRICING & DIMENSIONS

Q9 PLUS NEMA 3R ASSEMBLY UNIT — 230 V											
VAC	HP	FLA	Model Number	List Price		Dimensions (in.)					
				AA	AE	AA			AE		
						H	W	D	H	W	D
230	1	4.8	Q9+2015	\$5,910	\$8,607	34.0 (70.0)	40.5	20.0	34.0 (70.0)	40.5	20.0
	2	7.8	Q9+2025	\$5,948	\$8,644						
	3	11.0	Q9+2035	\$6,297	\$8,814						
	5	17.5	Q9+2055	\$6,308	\$8,866						
	7.5	25.3	Q9+2080	\$6,761	\$9,268						
	10	32.2	Q9+2110	\$7,287	\$9,512						
	15	48.3	Q9+2160	\$7,814	\$10,681						
	20	62.1	Q9+2220	\$8,086	\$11,062	46.0 (70.0)	43.5	24.0			
	25	78.2	Q9+2270	\$8,350	\$11,197						
	30	92.0	Q9+2330	\$8,848	\$11,340						
	40	120	Q9+2400	\$10,498	\$14,783						
	50	150	Q9+2500	\$10,953	\$16,819						
	60	177	Q9+2600	\$11,671	\$18,706						

Notes:

- 230 V assembly units ranging from 15 to 60 HP include a DC link reactor.
- Dimensions are for estimating purposes only.
- Heights in parentheses include the optional leg stand kit.
- Five inches of rear clearance is required for air circulation.

Q9 PLUS NEMA 3R ASSEMBLY UNIT — 460 V													
VAC	HP	FLA	Model Number	List Price		Dimensions (in.)							
				AA	AE	AA			AE				
						H	W	D	H	W	D		
460	1	2.1	Q9+4015	\$5,875	\$8,569	34.0 (70.0)	40.5	20.0	34.0 (70.0)	40.5	20.0		
	2	3.4	Q9+4025	\$5,902	\$8,571								
	3	4.8	Q9+4035	\$5,917	\$8,613								
	5	7.6	Q9+4055	\$6,343	\$8,836								
	7.5	11.0	Q9+4080	\$6,507	\$8,860								
	10	14.0	Q9+4110	\$6,682	\$9,166				46.0 (70.0)	43.5	24.0		
	15	21.0	Q9+4160	\$7,295	\$9,491								
	20	27.0	Q9+4220	\$7,372	\$9,520								
	25	34.0	Q9+4270	\$7,957	\$10,811								
	30	40.0	Q9+4330	\$8,101	\$10,955								
	40	52.0	Q9+4400	\$8,947	\$11,743	46.0 (70.0)	43.5	22.0	52.0 (70.0)	47.5	26.0		
	50	65.0	Q9+4500	\$9,704	\$12,598								
	60	77.0	Q9+4600	\$10,330	\$14,394				62.0 (72.0)				
	75	96.0	Q9+4750	\$12,145	\$16,713								
	100	124	Q9+410K	\$13,572	\$17,009								
	125	156	Q9+412K	\$14,939	\$19,757								
	150	180	Q9+415K	\$17,753	\$23,379	62.0 (72.0)	51.5	26.0	78.0 (88.0)	51.5	26.0		
	200	240	Q9+420K	\$23,107	\$30,566								
	250	302	Q9+425K	\$27,667	\$35,107				90.0	69.5	30.0		
	300	361	Q9+430K	\$31,167	\$41,953								
	350	414	Q9+435K	\$36,411	\$47,206								
	400	477	Q9+440K	\$42,547	\$52,240	90.0	57.5	34.3		93.5			

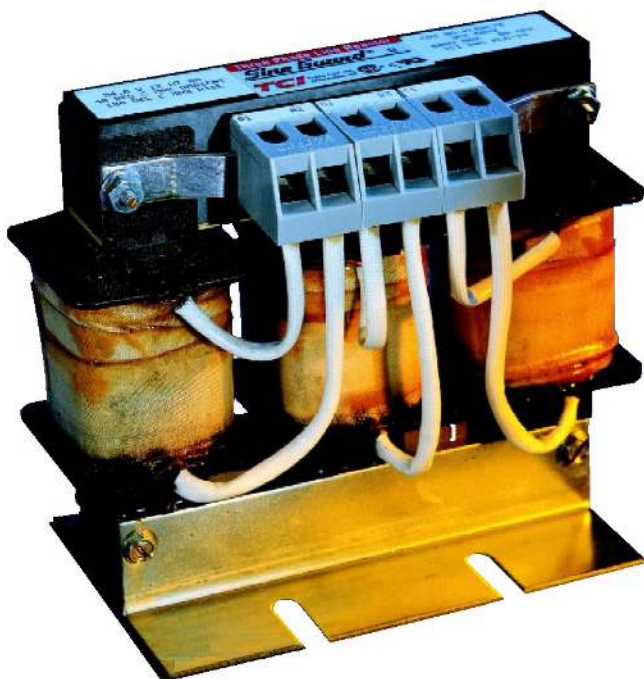
Notes:

- 460 V assembly units ranging from 30 to 125 HP include a DC link reactor.
- 460 V assembly units ranging from 150 to 400 HP include a 3% AC line reactor.
- Dimensions are for estimating purposes only.
- Heights in parentheses include the optional leg stand kit.
- Five inches of rear clearance is required for air circulation

Q9 PLUS ASSEMBLY UNIT REACTORS

Q9 PLUS NEMA 3R ASSEMBLY UNIT OPTIONAL REACTORS — 230 V					
VAC	HP	460V	Price Adder		
			A_RD	A_R3	A_R5
230	1	Q9+2015	\$97	\$123	\$603
	2	Q9+2025			\$748
	3	Q9+2035	\$109	\$176	\$891
	5	Q9+2055		\$200	\$933
	7.5	Q9+2080			\$1,000
	10	Q9+2110	\$134	\$227	\$1,126
	15	Q9+2160	INCL		\$1,222
	20	Q9+2220		\$1,408	
	25	Q9+2270		\$1,616	
	30	Q9+2330		\$723	\$1,740
	40	Q9+2400		\$868	\$2,086
	50	Q9+2500		\$1,019	\$2,430
	60	Q9+2600		\$1,190	\$2,996

Note: 230 V assembly units ranging from 15 to 60 HP include a DC link reactor.



Q9 PLUS NEMA 3R ASSEMBLY UNIT OPTIONAL REACTORS — 460 V

VAC	HP	460V	Price Adder		
			A_RD	A_R3	A_R5
460	1	Q9+4015	\$102	\$109	\$514
	2	Q9+4025			\$669
	3	Q9+4035		\$143	\$796
	5	Q9+4055			\$819
	7.5	Q9+4080		\$187	\$873
	10	Q9+4110	\$129		\$932
	15	Q9+4160	N/A	\$94	\$854
	20	Q9+4220	\$129	\$265	\$1,087
	25	Q9+4270			\$1,277
	30	Q9+4330	INCL	\$329	\$1,407
	40	Q9+4400		\$400	\$1,652
	50	Q9+4500		\$492	\$1,805
	60	Q9+4600		\$538	\$2,053
	75	Q9+4750		\$786	\$2,455
	100	Q9+410K		\$866	\$2,760
	125	Q9+412K		\$1,058	\$3,370
	150	Q9+415K	N/A	INCL	\$1,791
	200	Q9+420K			\$1,954
	250	Q9+425K			\$1,968
	300	Q9+430K			\$2,243
	350	Q9+435K			\$2,969
	400	Q9+440K			\$3,095

Notes:

- 460 V assembly units ranging from 30 to 125 HP include a DC link reactor.
- 460 V assembly units ranging from 150 to 400 HP include a 3% AC line reactor.

Q9 PLUS ASSEMBLY UNIT INSTALLED OPTIONS

INSTALLED THERMAL-OVERLOAD RELAYS		
Option Code	Description	List Price
LA	• 0.25 HP Overload Relay	\$150
LB	• 0.33 HP Overload Relay	
LC	• 0.5 HP Overload Relay	
LD	• 0.75 HP Overload Relay	
LE	• 1 HP Overload Relay	
LF	• 1.5 HP Overload Relay	
LG	• 2 HP Overload Relay	
LH	• 3 HP Overload Relay	
LJ	• 5 HP Overload Relay	\$200
LK	• 7.5 HP Overload Relay	
LL	• 10 HP Overload Relay	
LM	• 15 HP Overload Relay	
LN	• 20 HP Overload Relay	
LP	• 25 HP Overload Relay	\$250
LQ	• 30 HP Overload Relay	
LR	• 40 HP Overload Relay	
LS	• 50 HP Overload Relay	\$450
LT	• 60 HP Overload Relay	
LU	• 75 HP Overload Relay	
LW	• 100 HP Overload Relay	
LY	• 125 HP Overload Relay	
LZ	• 150 HP Overload Relay	\$500
L1	• 200 HP Overload Relay	
L2	• 250 HP Overload Relay	
L3	• 300 HP Overload Relay	
L4	• 350 HP Overload Relay	\$550
L5	• 400 HP Overload Relay	

Note: The above option codes are used to specify sizes for multiple overload relays or to add an overload relay to assembly unit style that does not include an overload.

INSTALLED PILOT LIGHTS		
Option Code	Description	List Price
PA	• Pilot light for ASD Mode indicator	\$300
PB	• Pilot light for Bypass Mode indicator	
PF	• Pilot light for Fault indicator (amber)	
PG	• Pilot light for Stop indicator (green)	
PP	• Pilot light for Power On indicator (white)	
PR	• Pilot light for Run indicator (red)	

Notes:

- For NEMA-rated devices, consult factory for pricing.
- Discrete outputs OUT1, OUT2, and FLA/B/C are used to activate the pilot lights.
- For more than three active indicators, consult factory for pricing and availability of additional required hardware.

INSTALLED SPACE HEATERS		
Option Code	Description	List Price
HM*	• Motor space heater	\$400
HS	• Cabinet anti-condensation space heater powered by incoming power • Active when ASD not running	\$500
HT	• Cabinet space heater powered by incoming power • Thermostat controlled	\$600
T2*	• 200 VA 120 V CPT for motor space heater power	\$300

*Voltage and wattage ratings required when specifying HM option.

Notes:

- Motor Space Heater will be remotely powered by customer's power supply unless T2 option is also specified.
- Some motors may require a CPT larger than 200 VA.

INSTALLED METERS		
Option Code	Description	List Price
M1	• Output voltage and current meter package	\$350
MA	• Output current meter	\$200
ME	• Elapsed time meter	
MF	• Output frequency meter	
MV	• Output voltage meter	
RT	• RTD monitor/relay • 14 RTD inputs • Door-mount display • Accepts only PT100 RTDs	\$4,400



Notes:

- AM and FM analog outputs are used for meter display.
- Please consult factory for availability and pricing if more than two meters are needed, as additional transformers may be required.

Q9 PLUS ADDITIONAL OPTIONS

COMMUNICATION CARDS, KEYPADS, CABLES		
Model Number	Description	List Price
APG001Z	<ul style="list-style-type: none"> Apogee FLN communication option module Snaps directly onto the drive, mounting behind the drive keypad control panel 	\$250
BCN001Z	<ul style="list-style-type: none"> BACnet communication option module Snaps directly onto the drive, mounting behind the drive keypad control panel 	
LIU006Z	<ul style="list-style-type: none"> LonWorks communication option module Snaps directly onto the drive, mounting behind the drive keypad control panel 	\$550
MTS001Z	<ul style="list-style-type: none"> Metasys N2 communication option module Snaps directly onto the drive, mounting behind the drive keypad control panel 	\$250
ASD-G9ETH	<ul style="list-style-type: none"> Ethernet IP communication option module Snaps directly onto the drive, mounting behind the drive keypad control panel Supports the following protocols: <ul style="list-style-type: none"> - Modbus/TCP - BACnet/IP - EtherNet/IP - Allen Bradley CSP (PCCC or AB Ethernet) - PROFINET IO 	\$900
DNET-1000	<ul style="list-style-type: none"> Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - DeviceNet - Modbus RTU - BACnet MS/TP - Metasys N2 - Siemens FLN 	\$1,350
ECAT-1000	<ul style="list-style-type: none"> Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - EtherCAT - Modbus RTU - BACnet MS/TP - Metasys N2 - Siemens FLN 	

COMMUNICATION CARDS, KEYPADS, CABLES		
Model Number	Description	List Price
ETH-1000	<ul style="list-style-type: none"> Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - Allen Bradley CSP (PCCC or AB Ethernet) - BACnet/IP - EtherNet/IP - Modbus/TCP - PROFINET IO - Modbus RTU - BACnet MS/TP - Metasys N2 - Siemens FLN 	\$1,250
PBDP-1000	<ul style="list-style-type: none"> Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - Profibus DP-V1 - Modbus RTU - BACnet MS/TP - Metasys N2 - Siemens FLN 	\$1,350
XLTR-1000	<ul style="list-style-type: none"> Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - Modbus RTU - BACnet MS/TP - Metasys N2 - Siemens FLN 	\$800
ETB003Z	<ul style="list-style-type: none"> I/O terminal block that can be added to enhance your system for extra compatibility with a wide range of systems <ul style="list-style-type: none"> - Four Discrete Inputs - Two Open-Collector Outputs - One Thermal-Trip Input - One Form-C Relay Only one ETB003Z card can be used per drive 	\$175
ETB004Z	<ul style="list-style-type: none"> I/O terminal block that can be added to enhance your system for extra compatibility with a wide range of systems <ul style="list-style-type: none"> - Four Discrete Inputs - Two Open-Collector Outputs - One Thermal-Trip Input - One Form-C Relay - Two Analog Inputs - Two Analog Outputs - One Pulse Train Input Only one ETB004Z card can be used per drive 	\$300
ASD-MTG-KIT9	<ul style="list-style-type: none"> Remote mounting kit for the Q9 Plus keypad Required extender cable ASD-CABxF is not included 	\$300
ASD-CAB7F	<ul style="list-style-type: none"> Seven-foot remote-mount cable with ferrite cores for the Q9 Plus keypad 	\$45
ASD-CAB10F	<ul style="list-style-type: none"> Ten-foot remote-mount cable with ferrite cores for the Q9 Plus keypad 	\$65
ASD-CAB15F	<ul style="list-style-type: none"> Fifteen-foot remote-mount cable with ferrite cores for the Q9 Plus keypad 	\$75

COMMUNICATION CARDS, KEYPADS, CABLES		
Model Number	Description	List Price
USB-485-2W	<ul style="list-style-type: none"> USB to 2-Wire RS485 cable for PC to ASD communication Can communicate with the Q9 Plus, Q9, G9, P9, H9, AS1, G7, H7, Q7 and S15 	\$150
ASD-TB1-SIM9	<ul style="list-style-type: none"> Simulation terminal board Replaces the standard terminal strip Emulates input and output control signals using switches, potentiometers, and indication lights 	\$300

NOTES:

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NOTES:

QX7 18-PULSE ASD

The QX7 adjustable speed drives are advanced AC drives featuring a patented 18-pulse auto transformer input for harmonic cancellation. The QX7 includes a backlit graphical LCD screen, RS232/RS485 ports, and a programming/speed control encoder knob. Standard features include input fuses, ground lug, customer terminal block, door-mounted electronic operator interface, *Power On* pilot light (white), *Run* pilot light (red), *Fault* pilot light (amber), *Hand/Off/Auto* selector switch, emergency-stop push-button, built-in real-time clock, and analog isolator (two isolated outputs and one isolated input).



SPECIFICATIONS

CONTROL

- **PWM Control** — Carrier Frequency may be set from 0.5 to 15 kHz or 5 kHz, Depending on ASD Rating.
- **Input Signal Control** — Local Operation (EOI), Remote Potentiometer (1 to 10 k Ω), 0 to 10 VDC (Internal Impedance: 30 k Ω), Isolated 4 to 20 mA (Internal Impedance: 250 Ω), ± 10 VDC (Internal Impedance: 30 k Ω), 15 Preset Speeds via Contact Closure, Communication Protocol, or MOP Control.
- **Output Frequency Precision** — Analog Input $\pm 0.2\%$ of Maximum Output Frequency, Discrete Input $\pm 0.01\%$ of Maximum Output Frequency.
- **Output Frequency Range** — 0.01 to 299 Hz.
- **Output Voltage/Frequency Control Method** — Constant Torque, Variable Torque, Auto-Torque Boost, Sensorless Vector Control, V/F Five-Point Setting, PG Feedback Vector Control, Auto & Dynamic Power Save Modes.
- **Overload Rating** — ASD Output 100% Continuous Current & 120% Current for 120 Seconds.

OPERATION

- **Voltage/Frequency** — Three-Phase 460 to 480 VAC, 50/60 Hz.
- **Input Voltage Tolerance** — Voltage $\pm 10\%$ Continuous; Frequency ± 5 Hz.
- **Frequency Adjustability** — EOI: 0.01 Hz. Analog Input: 0.1 Hz.
- **Frequency Control** — EOI (Rotary Encoder), Two 0 to 10 VDC, ± 10 VDC, Isolated 4 to 20 mA, or Communication Protocol.
- **Jump Frequencies** — Three User-Selected Frequencies & Associated Bandwidths.
- **Acceleration/Deceleration** — 0.01 to 6000 Seconds. Switchable Between 4 Different Times or Automatic. Selectable Patterns are Linear, S-Pattern, or C-Pattern.
- **Input Terminal Functions** — Eight Discrete Input Terminals Selectable as Sink or Source Logic, Programmable to 61 Different Functions.
- **Output Terminal Functions** — Three Output Relays Programmable to 62 Different Functions.
- **Output Meter** — Two Analog Outputs, One 4 to 20 mA or 0 to 10 VDC & One 0 to 10 VDC Programmable to 31 Different Values.

- **Retry Operation** — Auto-Reset of User-Selected Faults After a Main Circuit Check. Programmable up to 10 Retry Attempts.
- **Stall/Limit** — Auto-Load/Torque Reduction Control During Overload (Default Setting: OFF).
- **Regenerative Power Ride-Through Control** — Possible to Keep Logic Circuit Active in Case of Momentary Loss of Power Using Regenerative Energy from Motor.
- **Auto-Restart/Catch a Spinning Motor** — In the Event of a Momentary Loss of Power, Drive Will Read Speed & Direction of Rotating Motor & Seamlessly Start at Appropriate Speed.
- **Protective Functions** — Stall Protection, Current Limit, Overcurrent, Output Short Circuit, Overvoltage, Overvoltage Limit, Undervoltage, Ground Fault, Input & Output Single-Phase, Overload, Overtorque, & Overheat.
- **Motor Protection** — Electronic Thermal Overload Protection, Adjustable from 10 to 100%.

DISPLAY

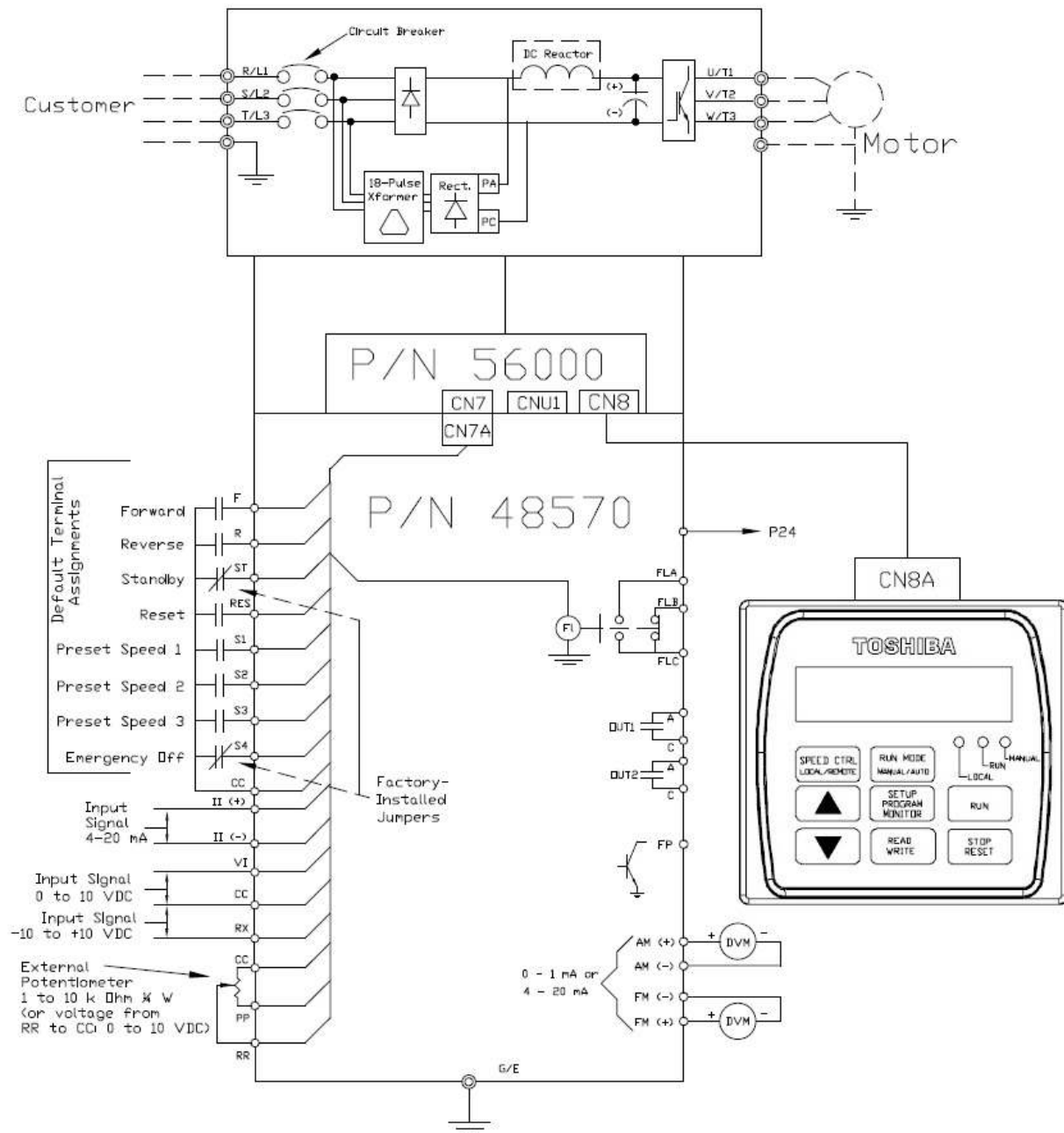
- **EOI** — Backlit Full-English LCD Display.
- **Status Monitoring** — Output Frequency, Frequency Command, Output Current, Output Voltage, DC Bus Voltage, Torque Current, Input Terminal Status.
- **Past Trip Monitoring** — Included RTC Stores Last 100 Faults & Useful Drive Information at Time of Trip.
- **Indicator LEDs** — Fault, Run, & Power.

ENVIRONMENT

- **Installation** — Indoor, Maximum Altitude 3300 Feet (1000 Meters), Not in Direct Sunlight, Protect from Corrosive &/or Explosive Gases, & Vibrations in Excess of 0.6 G.
- **Ambient Temperature** — 14 to 104 $^{\circ}$ F (-10 to 40 $^{\circ}$ C).
- **Humidity** — 95% Non-Condensing.



QX7 CONNECTION DIAGRAM



DO NOT CONNECT CC TO EARTH GROUND.

QX7 PART NUMBERING CONVENTION

Example Part Number:	QX7B	4	10K	AE	DW	NC
Series: QX7B — QX7 ASD						
Voltage: 4 — 460						
Capacity Rating: 220 — 20 HP 330 — 30 HP 400 — 40 HP 500 — 50 HP 600 — 60 HP 750 — 75 HP 10K — 100 HP 12K — 125 HP 15K — 150 HP 20K — 200 HP 25K — 250 HP 30K — 300 HP 35K — 350 HP 40K — 400 HP 50K — 500 HP 60K — 600 HP 70K — 700 HP 80K — 800 HP						
Configuration: AA — Circuit Breaker AE — Circuit Breaker, Isolated Bypass, Overload AS — Circuit Breaker, Isolated Solid State Bypass, Overload						
Input Transformer DW — 18-Pulse Auto-Transformer						
Enclosure: NC — NEMA 12 Enclosure						












QX7 PRICING & DIMENSIONS

QX7 NEMA 1 ENCLOSURE — 460 V											
VAC	HP	FLA	Model Number	List Price			Dimensions (in.)				
				AADW	AEDW	ASDW	H	W			D
								AA	AE	AS	
460	20	27	QX7B4220	\$32,900	\$34,900	\$40,000	84	30	54	24	
	25	34	QX7B4270	\$33,400	\$35,400	\$40,500					
	30	42	QX7B4330	\$34,000	\$37,000	\$42,100					
	40	52	QX7B4400	\$34,540	\$37,540	\$43,070					
	50	65	QX7B4500	\$35,000	\$39,000	\$44,530					
	60	77	QX7B4600	\$37,000	\$42,000	\$48,400					
	75	96	QX7B4750	\$39,000	\$44,000	\$51,250	100				
	100	124	QX7B410K	\$42,000	\$47,000	\$55,400					
	125	156	QX7B412K	\$46,000	\$52,000	\$60,830					
	150	190	QX7B415K	\$49,000	\$55,000	\$64,250					
	200	240	QX7B420K	\$57,000	\$64,000	\$74,960					
	250	302	QX7B425K	\$64,000	\$74,000	\$86,000					
	300	370	QX7B430K	\$70,000	\$86,000	\$98,700					
	350	450	QX7B435K	\$80,000	\$96,000	\$111,300					
	400	480	QX7B440K	\$85,000	\$103,000	\$118,900					
							42	66	84		

Note: Dimensions are for estimating purposes only.

QX7 ADDITIONAL OPTIONS






COMMUNICATION CARDS		
Model Number	Description	List Price
ASD-NANOCOM	<ul style="list-style-type: none"> Multi-protocol RS485 interface that supports: <ul style="list-style-type: none"> - Modbus RTU - Metasys N2 - Siemens FLN Plugs directly into B-version of 7-series ASDs 	\$350
DNET-100	<ul style="list-style-type: none"> Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - DeviceNet - Modbus RTU One gateway will connect up to three drives Requires one CAB00xx-0A cable per drive 	\$1,050
ETH-200	<ul style="list-style-type: none"> Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - Modbus RTU - Modbus TCP - EtherNet/IP One gateway will connect up to three drives Requires one CAB00xx-0A cable per drive 	\$1,100
EXT-MODBUS+	<ul style="list-style-type: none"> Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - Modbus Plus - Modbus RTU One gateway will connect up to three drives Requires one CAB00xx-0A cable per drive 	\$1,450
EXT-PROFIBUS	<ul style="list-style-type: none"> ProfibusDP network gateway One gateway will connect up to two drives Requires one CAB00xx-0A cable per drive 	\$1,150
XLTR-200	<ul style="list-style-type: none"> Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - Modbus RTU - Siemens FLN - Metasys N2 - BACnet MS/TP One gateway will connect up to three drives Requires one CAB00xx-0A cable per drive 	\$800
10456	<ul style="list-style-type: none"> Standard 120 VAC to 9 VDC power supply Compatible with the above ICC Designs network gateways 	\$95
CAB0011-0A	<ul style="list-style-type: none"> Three-foot communication cable 	\$40
CAB0012-0A	<ul style="list-style-type: none"> Seven-foot communication cable 	\$50
CAB0015-0A	<ul style="list-style-type: none"> 15-foot communication cable 	\$60

MISCELLANEOUS		
Model Number	Description	List Price
ASD-TB1-ACI	<ul style="list-style-type: none"> 120 V Logic Input Board Replaces standard terminal strip 	\$450
USB-485-2W	<ul style="list-style-type: none"> RS485 2-Wire to USB cable for PC to ASD communication Can communicate with the Q9, G9, H9, AS1, G7, H7, Q7 and S15 	\$150

NOTES:

[illegible]

QX7 INSTALLED OPTIONS

INSTALLED COMMUNICATION CARDS		
Model Number	Description	List Price
CD	<ul style="list-style-type: none"> Installed DNET-100 Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - DeviceNet - Modbus RTU One gateway will connect up to three drives Requires one CAB00xx-0A cable per drive 	\$1,550
CQ	<ul style="list-style-type: none"> Installed ETH-200 Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - Modbus RTU - Modbus TCP - EtherNet/IP One gateway will connect up to three drives Requires one CAB00xx-0A cable per drive 	\$1,600
CH	<ul style="list-style-type: none"> Installed EXT-MODBUS+ Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - Modbus Plus - Modbus RTU One gateway will connect up to three drives Requires one CAB00xx-0A cable per drive 	\$1,950
CF	<ul style="list-style-type: none"> Installed EXT-PROFIBUS ProfibusDP network gateway One gateway will connect up to two drives Requires one CAB00xx-0A cable per drive 	\$1,650
CG	<ul style="list-style-type: none"> Installed XLTR-200 Multi-protocol network gateway with support for: <ul style="list-style-type: none"> - Modbus RTU - Siemens FLN - Metasys N2 - BACnet MS/TP One gateway will connect up to three drives Requires one CAB00xx-0A cable per drive 	\$1,300

INSTALLED METERS		
Model Number	Description	List Price
M1	Output voltage and current meter package	\$350
MA	Output current meter	\$200
ME	Elapsed time meter	
MF	Output frequency meter	
MV	Output voltage meter	
RT	<ul style="list-style-type: none"> RTD monitor/relay 14 RTD inputs Door-mount display Accepts only PT100 RTDs 	\$4,400

NOTES:

EXTENDED WARRANTY

Toshiba's standard warranty is 18 months from the date of shipment or one year from date of startup — whichever occurs first. This is a full parts and labor warranty. Please refer to Toshiba's Standard Terms and Conditions of Sale at https://www.toshiba.com/tic/cms_files/TCofSale.pdf for more details.

Extended warranties are also available on TIC motor-drive packages for the Q9. When a purchase order is submitted for a motor-drive package to TIC, the ASD warranty will be extended to match the motor warranty for up to three years on parts and labor when the **Motor-Drive Package Extended Warranty Request Form** is included. For motor-drive packages shipped from distributor stock, the distributor must submit this request form to the ASD department.

Factory-authorized startups extend the warranty of all drives by one year. The startup technician must be Toshiba-authorized and the corresponding startup form must be completed.

Extended warranties are also available from Toshiba as adders. The extended warranty must be on the same purchase order with the covered equipment. The adders are listed below:

Two-Year Warranty		Three-Year Warranty		Four-Year Warranty	
Parts Only	1.5%	Parts Only	4.0%	Parts Only	7.5%
Parts and Labor	3.0%	Parts and Labor	8.0%	Parts and Labor	15.0%

Example: If total equipment cost is \$30,000 and a four-year parts and labor warranty is required, multiply \$30,000 by 0.15, which equals \$4,500. Added to the original amount, the total order would equal \$34,500.

DELIVERY

TIC makes some of the best adjustable speed drives and value-added products in the market today — the right product, at the right price, delivered at the right time.

We offer engineered products and options that can be ordered in a variety of configurations. The combination and compatibility between different options can further impact delivery lead times.

Included in this price book are delivery guidelines that can be used to assist in determining the typical delivery of a standard or engineered product. Any item in stock is subject to prior sale. Please check with customer service for availability and delivery schedules.



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