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Phoenix ES Sensorless AC Vector Drive

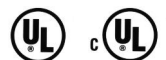


3 HP to 3500 HP

Standard Features:

- * OPEN LOOP AC VECTOR CONTROL
 - 100 TO 1 SPEED RANGE, 0.1% SPEED REGULATION - OPEN LOOP CONTROL (STANDARD)
- * CLOSED LOOP AC VECTOR CONTROL
 - 1000 TO 1 SPEED RANGE, 0.01% SPEED REGULATION - CLOSED LOOP CONTROL (WITH ENCODER FEEDBACK CARD)
 - SPEED CONTROL, TORQUE CONTROL, SPEED CONTROL WITH TORQUE LIMIT, TORQUE CONTROL WITH SPEED LIMIT
 - FULL TORQUE AT ZERO SPEED – HOLD POSITION / HOLD ZERO SPEED
 - RIGID AND NON-RIGID POSITION CONTROL INCLUDING ORIENTATION
 - PERMANENT MAGNET MOTOR CONTROL
- * NO NEED TO PERFORM AUTO-TUNE ROUTINE OR DISCONNECT THE MOTOR FROM THE LOAD OR DURING DRIVE START-UP
- * OPERATOR KEYPAD WITH ENGLISH LANGUAGE DISPLAY – 2 LINE, 32 CHARACTER. EASILY DISPLAY ANY PARAMETER INCLUDING MOTOR SPEED, MOTOR CURRENT, MOTOR VOLTAGE, KW, AND KWH. USER PROGRAMMABLE PARAMETER SCALING AND FORMATTING – DISPLAY "REAL WORLD" VALUES – GPM, CFM, PSI
- * OPERATOR KEYPAD INCLUDES SPEED INCREASE/DECREASE KEYS, START/STOP, FORWARD/REVERSE, AND FAULT RESET KEYS ALSO LED'S FOR "CURRENT LIMIT", "FWD/REV", "RUN", AND "FAULT."
- * 50°C AMBIENT TEMPERATURE RATING (NEMA 1 ENCLOSED DRIVES)
- * TOLERATES HIGH INPUT AC LINE VOLTAGES – 250/500/600 VAC +10% (240/480/575 VAC INPUT)
- * GROUND FAULT AND LINE TO LINE SHORT CIRCUIT PROTECTION
- * PROGRAMMABLE SPEED SENSITIVE MOTOR OVERLOAD PROTECTION TO COMPLY WITH UL 508C SECTIONS 43.3, 43.4 AND 43.5
- * SPEED INCREASE / DECREASE (MOP) FUNCTION
- * S CURVE ACCEL/DECEL CONTROL
- * USER PROGRAMMABLE AUTO-RESTART FUNCTION
- * BI-DIRECTIONAL FLYCATCHER (START INTO A ROTATING MOTOR) – NO INERTIA LIMITS
- * BUILT IN KW / KWH METERING AND TOTAL COST OF POWER CALCULATOR
- * PROGRAMMABLE TIME BASED FUNCTION GENERATOR AND PROGRAMMABLE THRESHOLD DETECTORS
- * PROGRAMMABLE TIME DELAY AND LOGIC FUNCTIONS (AND, OR, NOR) OF BIT PARAMETERS, DIGITAL INPUTS AND OUTPUTS
- * ADDING, SUBTRACTING, MULTIPLYING, DIVIDING, RAMPING, LIMITING, AND/OR FILTERING FUNCTIONS OF PARAMETERS AND ANALOG INPUTS AND OUTPUTS
- * RUN TIME AND POWER ON TIME COUNTDOWN TIMERS WITH ALARMS PLUS RUN TIME AND POWER ON TIME TOTALIZERS
- * CRITICAL SPEED REJECTION, 3 BANDS – INDIVIDUALLY PROGRAMMABLE BANDWIDTH
- * AUTO LOGGING FAULT HISTORY - LAST 10 FAULTS SAVED IN ORDER OF OCCURRENCE
- * 8 DIGITAL INPUTS, 24 VDC (7 PROGRAMMABLE INPUTS AND 1 FIXED STOP/ENABLE INPUT)
- * 2 PROGRAMMABLE DIGITAL OUTPUTS – TWO FORM C DRY CONTACTS RATED 5 AMPS AT 115VAC
- * 2 PROGRAMMABLE ANALOG INPUT SIGNALS, -10 VDC TO +10 VDC OR 4 TO 20 MA
- * 2 PROGRAMMABLE ANALOG OUTPUT SIGNALS, -10 VDC TO +10 VDC
- * DC BRAKING
- * FIXED OR VARIABLE CARRIER FREQUENCY
- * MUCH, MUCH, MORE..

THREE YEAR WARRANTY



MADE IN USA



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ENGINEERING SPECIFICATIONS

CONTROL

Speed Range: Open Loop: 100:1
 Closed Loop: 1000:1

Control Modes: Speed Control
 Torque Control
 Speed Control with Torque Limit
 Torque Control with Speed Limit

Control Method: Sine coded PWM with programmable carrier.
 Open Loop/Closed Loop Vector Control.

Output Voltage: 0 to input voltage

Output Frequency Range: 0 to 600 Hz.

Frequency accuracy: Analog reference: 0.1% of max frequency.
 Digital reference: 0.01% of max frequency.

Frequency resolution: Analog reference: 0.06Hz at 60Hz.
 Digital reference: 0.001Hz at 60Hz.

Accel / Decel: Adjustable 0.1 to 3276 sec.

Drive Overload: High Overload Capacity Drives:
 150% of drive rated output for one (1) minute.
 Normal Overload Capacity Drives:
 120% of drive rated output for one (1) minute.

Inverse Time Overload: Programmable for class 10, 20 and 30 protection with speed sensitive protection to comply with N.E.C. Article 430.

Current limit: Proactive current limit programmable in % of motor rated current.

Braking torque: 5 to 20% without modification. Braking modules available for added braking to 150%

ELECTRICAL

Rated Input Voltage: 200-250Vac, 380-500Vac, 500-600Vac
 -10% of minimum, +10% of maximum.

Rated Input Frequency: 48 to 63Hz

Number of Phases: 3

Displacement Power Factor: .95 or greater

Efficiency: 97% or greater at rated current

ENVIRONMENTAL

Ambient Temperature: -10°C to 50°C (14°F to 122°F) without derating.

Storage Temperature: -40°C to 70°C (-40°F to 158°F)

Altitude: Sea level to 3300 Feet [1000m] without derating.

Humidity: 95% relative humidity non-condensing.

Vibration: 9.8m/sec2 (1.0G) peak.

Surge Protection: Line Transients to 6000V
 IEEE C62.41-1991 Category B
 Showering Arc - 2000V Peak
 EN50082 - 1, 2

Noise Immunity: Standard on all models.

Input R.F.I Filter: Standard on all models.

PHYSICAL ATTRIBUTES

Mounting: Wall Mount: Through hole or panel mount.

Nema Rating: Type 1 (IP20) as Standard
 Type 12 (IP54) Optional
 Type 4 (IP65) Optional

Construction: Steel Enclosure (Reduces E.M.I.)

AVAILABLE OPTIONS

- Encoder Feedback Card
- Signal Conditioners/Isolators
- Communications Cards: RS-232/422/485, Modbus RTU
- Analog Signal Conditioner/Isolation Cards
- Digital Input/Output Expansion/Conditioning Cards
- Hand/Off Auto, Local/Remote, Auto/Manual Selection
- Many Additional Modifications Available

Phoenix ES AC Drive Dimensions¹

Input Voltage	Motor HP ²		Nema 1 VFD Only	Nema 12 VFD Only	Nema 1 w Disconnect & Fuses	Nema 12 w Disconnect & Fuses	Nema 1 with Bypass	Nema 12 with Bypass
	High Overload Capacity ³ (HT)	Normal Overload Capacity ⁴ (NT)						
200 - 250 VAC (208/230/240)	3 - 7.5	5 - 10	13.05"x9.0"x10.9"	13.05"x9.0"x10.9"	20.74"x9.0"x10.9"	20.74"x9.0"x10.9"	34.02"x9.0"x10.9"	34.02"x9.0"x10.9"
	10 - 20	15 - 20	13.05"x9.0"x10.9"	13.05"x9.0"x10.9"	20.74"x9.0"x10.9"	20.74"x9.0"x10.9"	34.02"x9.0"x10.9"	34.02"x9.0"x10.9"
	25 - 30	25 - 30	25"x11.6"x11.1"	25"x11.6"x11.1"	25"x11.6"x11.1"	25"x11.6"x11.1"	38.4"x11.6"x11.1"	38.4"x11.6"x11.1"
	40 - 100	40 - 100	32.5"x20.1"x13.5"	32.5"x20.1"x13.5"	32.5"x20.1"x13.5"	32.5"x20.1"x13.5"	65"x20.1"x13.5"	60"x36"x16"
	125 - 250	125 - 250	44.2"x31.1"x16.8"	44.2"x31.1"x16.8"	72"x36"x23.5"	72"x36"x23.5"	72"x72"x23.5"	72"x72"x23.5"
380 - 500 VAC (380/400/415/480)	5 - 15	7.5 - 20	13.05"x9.0"x10.9"	13.05"x9.0"x10.9"	20.74"x9.0"x10.9"	20.74"x9.0"x10.9"	34.02"x9.0"x10.9"	34.02"x9.0"x10.9"
	20 - 40	25 - 40	13.05"x9.0"x10.9"	13.05"x9.0"x10.9"	20.74"x9.0"x10.9"	20.74"x9.0"x10.9"	34.02"x9.0"x10.9"	34.02"x9.0"x10.9"
	50 - 60	50 - 60	25"x11.6"x11.1"	25"x11.6"x11.1"	25"x11.6"x11.1"	25"x11.6"x11.1"	38.4"x11.6"x11.1"	38.4"x11.6"x11.1"
	75 - 200	75 - 200	32.5"x20.1"x13.5"	32.5"x20.1"x13.5"	32.5"x20.1"x13.5"	32.5"x20.1"x13.5"	65"x20.1"x13.5"	60"x36"x16"
	250 - 500	250 - 500	44.2"x31.1"x16.8"	44.2"x31.1"x16.8"	72"x36"x23.5"	72"x36"x23.5"	72"x72"x23.5"	72"x72"x23.5"
525 - 600 VAC (525/575/600)	5 - 15	7.5 - 20	13.05"x9.0"x10.9"	13.05"x9.0"x10.9"	20.74"x9.0"x10.9"	20.74"x9.0"x10.9"	24"x24"x14.2"	24"x24"x14.2"
	20 - 40	25 - 40	13.05"x9.0"x10.9"	13.05"x9.0"x10.9"	20.74"x9.0"x10.9"	20.74"x9.0"x10.9"	24"x30"x14.2"	24"x30"x14.2"
	50 - 75	50 - 75	25"x11.6"x11.1"	25"x11.6"x11.1"	25"x11.6"x11.1"	25"x11.6"x11.1"	38.4"x11.6"x11.1"	38.4"x11.6"x11.1"
	100 - 200	100 - 200	32.5"x20.1"x13.5"	32.5"x20.1"x13.5"	32.5"x20.1"x13.5"	32.5"x20.1"x13.5"	65"x20.1"x13.5"	60"x36"x16"
	250 - 600	250 - 600	44.2"x31.1"x16.8"	44.2"x31.1"x16.8"	72"x36"x23.5"	72"x36"x23.5"	72"x72"x23.5"	72"x72"x23.5"

(1) All Dimensions in Inches (HxWxD)
 (2) Horsepower Rating based on 230, 460, and 575VAC Motors
 (3) High Overload Capacity Drives produce 150% of Rated Drive Output Current for 1 minutes
 (4) Normal Overload Capacity Drives produce 120% of Rated Drive Output Current for 1 minutes
 (5) Consult Factory for Higher HP Drive Dimensions