



US Drives Inc.
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Phoenix DS / ES Sensorless AC Vector Drive



“Size 0” - 3 HP to 40 HP

Standard Features:

* OPEN LOOP AC VECTOR CONTROL (DS)

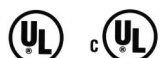
- 100 TO 1 SPEED RANGE, 0.1% SPEED REGULATION - OPEN LOOP CONTROL (STANDARD)
- SENSORLESS AC VECTOR CONTROL FOR PRECISE CONTROL OF MOTOR SPEED AND TORQUE
- HIGHEST STARTING TORQUE - SMART POWER START MAXIMIZES MOTOR TORQUE PER AMPERE
- CONTINUOUS AUTOMATIC TUNING – PROVIDES OPTIMAL PERFORMANCE UNDER ALL CONDITIONS
- POWER LOSS RIDE THROUGH
- HIGH PERFORMANCE PID CONTROL LOOP (FULL SETPOINT CONTROL OR TRIM CONTROL)
- SLEEP MODE PID
- PUMP UNDERLOAD AND OVERLOAD PROTECTION AND LOAD RECOVERY
- PUMP BACKSPIN CONTROL
- BI-DIRECTIONAL FLYCATCHER (START INTO A ROTATING MOTOR) – NO INERTIA LIMITS

* CLOSED LOOP AC VECTOR CONTROL (ES)

- 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
- * 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

Control Method: Sine coded PWM with programmable carrier.
 Space Vector control.

Output Voltage: 0 to rated 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 3200 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: Approximately 20%.

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

Noise Immunity: Showering Arc - 2000V Peak
 EN50082 - 1, 2

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

PHYSICAL ATTRIBUTES

Mounting: Free Standing Enclosure

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

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

Phoenix DS Product Data

Input Voltage	Part Number	Motor HP		Output Current		Input Current		Approximate Dimensions	Approximate Weight
		High Overload Capacity (CT)	Normal Overload Capacity (VT)	High Overload Capacity (CT)	Normal Overload Capacity (VT)	High Overload Capacity (CT)	Normal Overload Capacity (VT)		
200 - 250 VAC (208/230/240)	D2-0005-N1	3	5	10	16	12	19	13.05" x 9.0" x 10.9"	30 Lbs.
	D2-0007-N1	5	7.5	16	22	19	26	13.05" x 9.0" x 10.9"	30 Lbs.
	D2-0010-N1	7.5	10	22	28	26	33	13.05" x 9.0" x 10.9"	30 Lbs.
	D2-0015-N1	10	15	28	42	33	50	13.05" x 9.0" x 10.9"	30 Lbs.
	D2-0020-N1	15	20	42	54	50	64	13.05" x 9.0" x 10.9"	30 Lbs.
	D2-0020CT-N1	20	-	54	-	64	-	13.05" x 9.0" x 10.9"	30 Lbs.
380 - 500 VAC (380/400/415/480)	D4-0007-N1	5	7.5	8	11	10	13	13.05" x 9.0" x 10.9"	30 Lbs.
	D4-0010-N1	7.5	10	11	14	13	17	13.05" x 9.0" x 10.9"	30 Lbs.
	D4-0015-N1	10	15	14	21	17	26	13.05" x 9.0" x 10.9"	30 Lbs.
	D4-0020-N1	15	20	21	27	26	33	13.05" x 9.0" x 10.9"	30 Lbs.
	D4-0025-N1	20	25	27	34	33	40	13.05" x 9.0" x 10.9"	30 Lbs.
	D4-0030-N1	20	30	34	43	40	46	13.05" x 9.0" x 10.9"	30 Lbs.
	D4-0040-N1	30	40	40	52	43	58	13.05" x 9.0" x 10.9"	30 Lbs.
	D4-0040CT-N1	40	-	52	-	58	-	13.05" x 9.0" x 10.9"	30 Lbs.
500 - 600 VAC (525/575/600)	D5-0007-N1	5	7.5	7	9	9	11	13.05" x 9.0" x 10.9"	30 Lbs.
	D5-0010-N1	7.5	10	9	12	11	13	13.05" x 9.0" x 10.9"	30 Lbs.
	D5-0015-N1	10	15	11	17	13	20	13.05" x 9.0" x 10.9"	30 Lbs.
	D5-0020-N1	15	20	17	22	20	26	13.05" x 9.0" x 10.9"	30 Lbs.
	D5-0025-N1	20	25	22	28	26	34	13.05" x 9.0" x 10.9"	30 Lbs.
	D5-0030-N1	20	30	27	34	33	41	13.05" x 9.0" x 10.9"	30 Lbs.
	D5-0040-N1	30	40	32	41	39	49	13.05" x 9.0" x 10.9"	30 Lbs.
	D5-0040CT-N1	40	-	41	-	49	-	13.05" x 9.0" x 10.9"	30 Lbs.

(1) All Dimensions in Inches (HxWxD)

(2) High Overload Capacity Drives produce 150% of Rated Drive Output Current for 1 minutes.

(3) Normal Overload Capacity Drives produce 120% of Rated Drive Output Current for 1 minutes.