

# POWERTEC

INDUSTRIAL MOTORS, INC.

E340 Frame Series

*Hi-Torque Brushless Direct-Drive Servomotor*



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[www.powertecmotors.com](http://www.powertecmotors.com)

## Applications for POWERTEC HI\_TORQ motors:

Gearless uses where zero backlash is required
Machines where very high torque is needed in a small space
Where maintenance is a problem (built into machinery).
When extremely smooth low speed torque is needed
Where shaft mounting, low profile drive means is necessary

## Features and Benefits:

Low overall weight compared to motor/gear combinations
Extremely high accuracy with drives capable of using the sinusoidal encoder
Completely enclosed feedback devices
Conventional servo connectorized power and feedback wiring
Low compliance bolted shaft-mount provisions
Input shaft can be keyed if desired.
Hall effect commutation output plus sinusoidal encoder built in (resolver optional)

## Basic HI-TORQ Characteristics (TENV) (E342TVY Data Shown)

Rated Stall Torque (Cont) 264 lb-ft	Rated Stall Current (Cont) 28.7 amps
Continuous HP (rated at 220 rpm) 8.7 hp	Peak Torque accel rate: 11,950 rad/sec <sup>2</sup>
Continuous Torque , rated speed 207 lb-ft	Rated Current, Continuous 27.6 amps
Weight: 265 lbs	Inertia: 0.1757 lb-ft <sup>2</sup>

## TEAO Option:

Increases continuous torque output to 326 lb-ft (stall)
RMS continuous torque at rated speed increases to 307 lb-ft

**HI-TORQ BRUSHLESS AC SERVOMOTOR DATA SHEET**  
Inch Dimensions

Frame		Enclosure	Winding letter	Connection
E342TVY		TENV	A	1Y
PARAMETER	NOTES	SYMBOL	UNITS	VALUE
Continuous stall torque	1	Tcs	lb.ft.	264.7
Peak torque, theoretical		Tpk	lb.ft.	2685.0
Rotor inertia		Jm	lb.ft.sec. <sup>2</sup>	0.1757
Theoretical acceleration	2	a	radians/sec. <sup>2</sup>	11950
Static friction torque		Tf	lb.ft.	2.62
Viscous damping coefficient	4	Kdv	lb.ft./1000 rpm	46.60
Thermal resistance		Rth	°C/watt	0.092
Thermal time constant		tth	minutes	70.0
Motor constant	4	Km	lb.ft./√watt	10.68
Weight		W	lb.	265
Maximum safe speed		$\omega_{max}$	RPM	1000
Insulation class				H
Winding data:				
Rotor poles		P		32
Stator phases		∅		3
Voltage constant	3, 4	Kepeak	Vpk t-t/1000 RPM	1188.0
RMS voltage constant	4, 5	Kerms	Vrms t-t/1000 RPM	840.0
Torque constant	4, 6	Ktpeak	lb.ft./ampere pk	7.25
RMS torque constant	4, 6	Ktrms	lb.ft./ampere rms	10.25
Resistance	4, 5	Rtt	ohms	0.600
Inductance	5	Ltt	millihenries	11.949
Synchronous Inductance	5	Ltsync	millihenries	15.593
Electrical time constant	4, 5	te	milliseconds	19.9
Mechanical time constant	4	tm	milliseconds	1.14
Continuous stall current	1, 6	Ics	amperes rms	28.7
Current at peak torque	6, 7	Ipk	amperes rms	262.0
Rated base speed	8	$\omega_{rated}$	RPM	220
Power at base speed	8		HP	8.67

Thermal sensor: normally closed pilot duty  
Feedback specifications: halls plus 1200 ppr sinusoidal encoder

**Notes:**

- (1) 40°C ambient temperature (2) Angular acceleration at peak torque, motor only  
(3) Volts peak, terminal to terminal (4) 25°C ambient (5) Terminal to terminal  
(6) Based on RMS (sine wave) current (7) 140°C winding temperature (8) 320 VDC

**HI-TORQ BRUSHLESS AC SERVOMOTOR DATA SHEET**  
Metric Dimensions

<b>Frame</b>		<b>Enclosure</b>	<b>Winding letter</b>	<b>Connection</b>
E342TVY		TENV	A	1Y
<b>PARAMETER</b>	<b>NOTES</b>	<b>SYMBOL</b>	<b>UNITS</b>	<b>VALUE</b>
Continuous stall torque	1	Tcs	Nm	358.9
Peak torque, theoretical		Tpk	Nm	3640.7
Rotor inertia		Jm	kg m <sup>2</sup>	0.2382
Theoretical acceleration	2	a	radians/sec. <sup>2</sup>	11950
Static friction torque		Tf	Nm	3.55
Viscous damping coefficient	4	Kdv	Nm/1000 rpm	63.19
Thermal resistance		Rth	°C/watt	0.092
Thermal time constant		tth	minutes	70.0
Motor constant	4	Km	Nm/√watt	14.48
Weight		W	kg	120.45
Maximum safe speed		ωmax	RPM	1000
Insulation class				H
Winding data:				
Rotor poles		P		32
Stator phases		∅		3
Voltage constant	3, 4	Kepeak	Vpk t-t/1000 RPM	1188.0
RMS voltage constant	4, 5	Kerms	Vrms t-t/1000 RPM	840.0
Torque constant	4, 6	Ktpeak	Nm/ampere pk	9.82
RMS torque constant	4, 6	Ktrms	Nm/ampere rms	13.90
Resistance	4, 5	Rtt	ohms	0.600
Inductance	5	Ltt	millihenries	11.949
Synchronous Inductance	5	Ltsync	millihenries	15.593
Electrical time constant	4, 5	te	milliseconds	19.9
Mechanical time constant	4	tm	milliseconds	1.14
Continuous stall current	1, 6	Ics	amperes rms	28.7
Current at peak torque	6, 7	Ipk	amperes rms	262.0
Rated base speed	8	ωrated	RPM	220
Power at base speed	8		kW	6.5

Thermal sensor: normally closed pilot duty  
Feedback specifications: Halls plus 1200 ppr sinusoidal encoder

**Notes:**

- (1) 40°C ambient temperature (2) Angular acceleration at peak torque, motor only
- (3) Volts peak, terminal to terminal (4) 25°C ambient (5) Terminal to terminal
- (6) Based on RMS (sine wave) current (7) 140°C winding temperature (8) 320 VDC

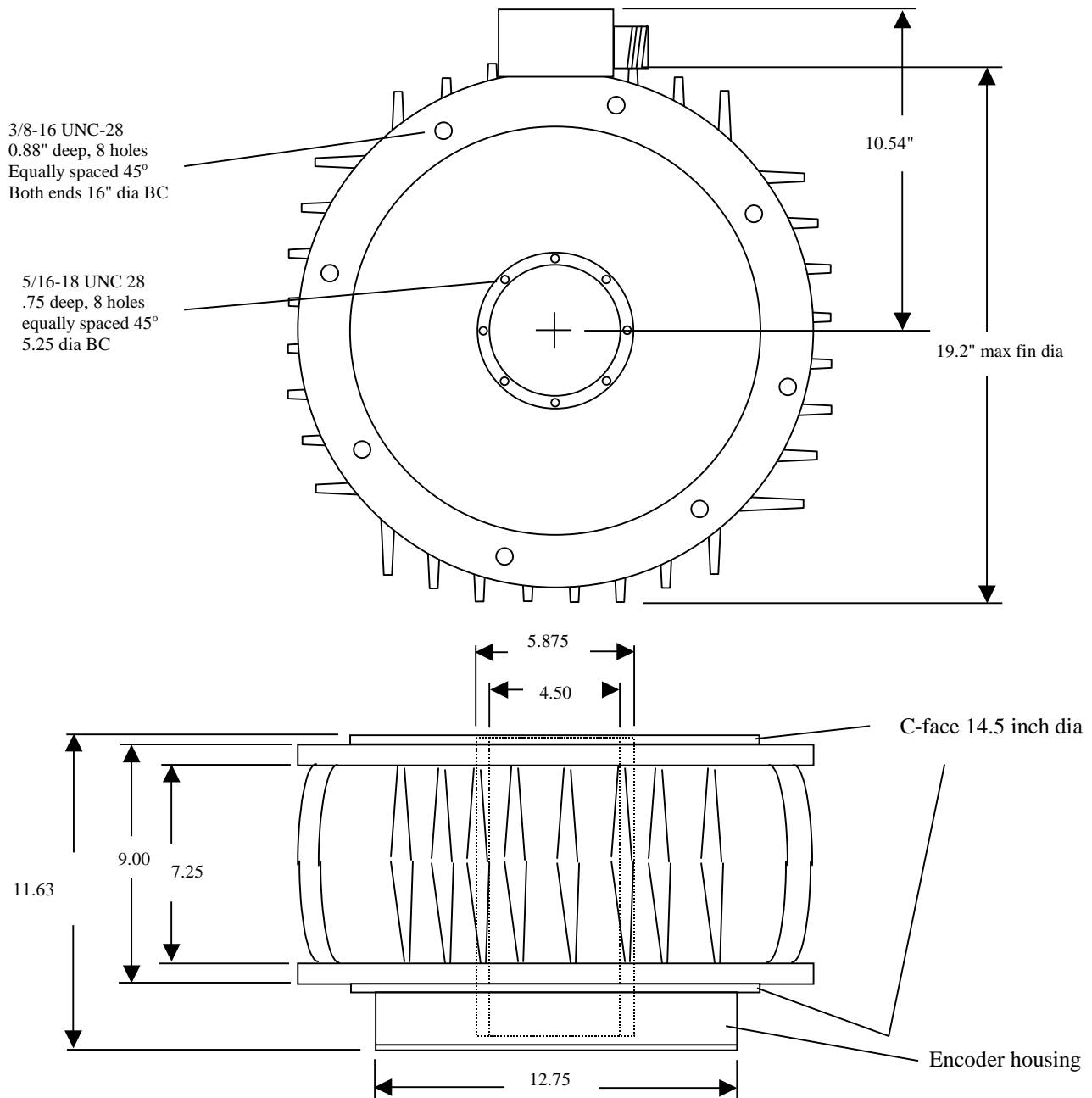
## Summary of Performance By Frame Size

Parameter	Frame Size		
	ES342	E342	EL342
Continuous Stall Torque, TENV	145 lb-ft	264 lb-ft	475 lb-ft
Continuous Stall Torque, TEAO	179 lb-ft	326 lb-ft	587 lb-ft
Continuous Torque @ 220 rpm, TENV	114 lb-ft	207 lb-ft	373 lb-ft
Continuous Torque @ 220 rpm, TEAO	169 lb-ft	307 lb-ft	553 lb-ft
Continuous Rated HP, TENV	4.8 hp	8.7 hp	15.7 hp
Continuous Rated HP, TEAO	5.9 hp	10.7 hp	19.3 hp
Peak Torque, TENV and TEAO	1342 lb-ft	2685 lb-ft	5370 lb-ft

Just the thing for:

- Direct Drive Rolls, just hang on the shaft
- Rotary Knives/Flying Shears, no backlash
- Direct Drive Extruders, no gearbox
- Direct Drive servos, no gears or compliance
- Metering pump drives, accurate low speed
- High torque, low speed dynamometers
- Wheel drives for blow molding machines
- Joint-mounted drives for robots

# OUTLINE DIMENSIONS E342 Series, TENV Shown



Size	ES324TVY	E324TVY	EL324TVY
Dimension A	9.63	11.63	15.88
Dimension B	7.00	9.00	13.25
Dimension C	5.25	7.25	12.00