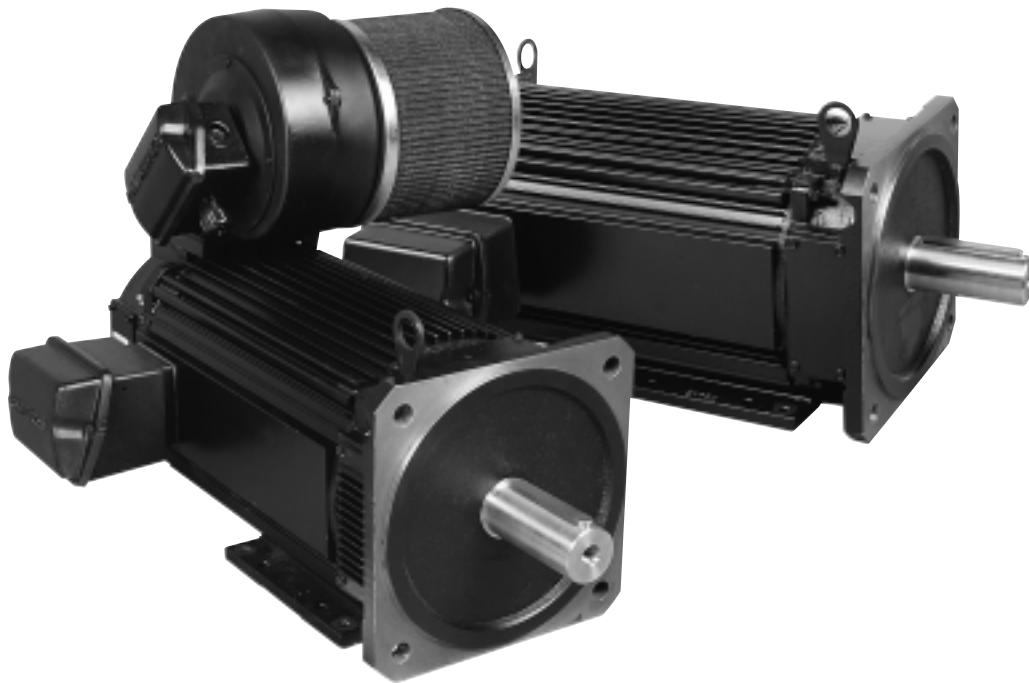
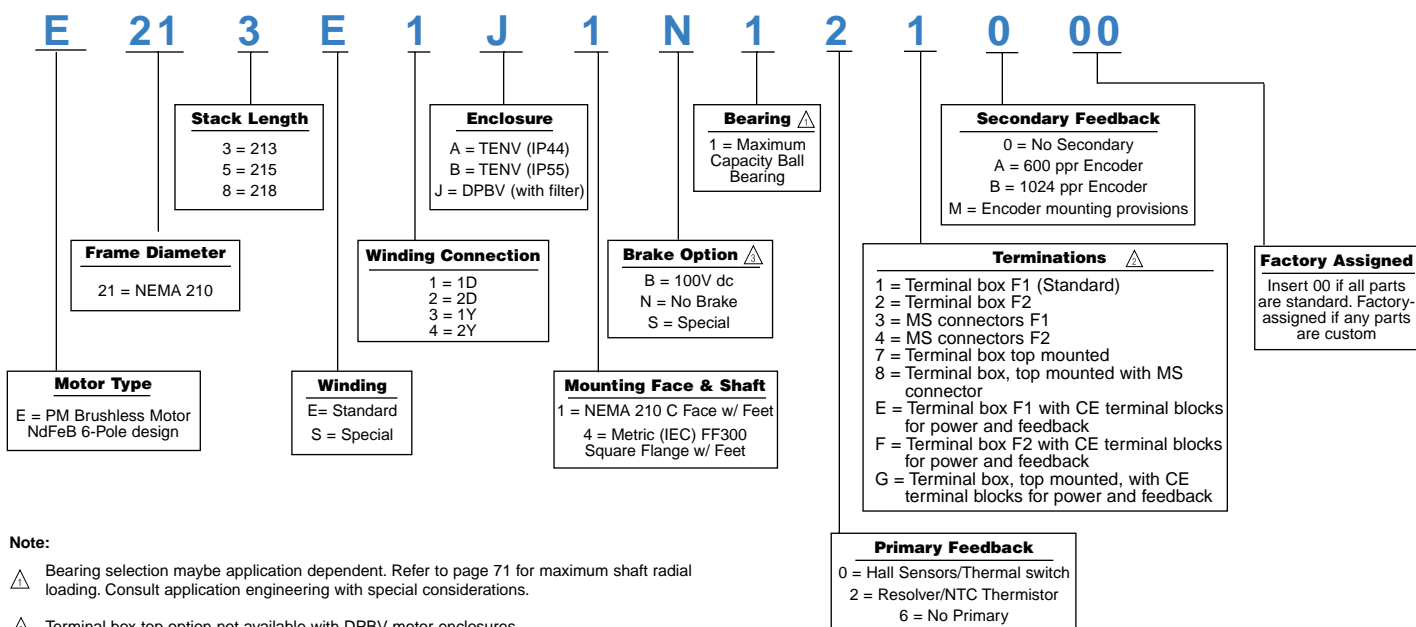


# E210 DIAMETER FRAMES



## MODEL NUMBER CODE...E210 FRAME

To construct a motor listing, select the combination of features required, and put all the coded information in the proper sequence. Please account for all the entries. The model number shown is an example of a properly specified motor.



# E210 DIAMETER FRAMES



## RATINGS AND CHARACTERISTICS

Motor parameters and winding data

### ENGLISH

### METRIC

Parameters, DPBV & TENV	Symbol	Units	E213	E215	E218	Symbol	Units	E213	E215	E218
Continuous stall torque $\Delta \Delta$	$T_{CS}$	lb-ft	128 (64)	160 (81)	190 (100)	$T_{CS}$	Nm	192 (87)	217 (110)	258 (136)
Peak Torque (theoretical) $\Delta \Delta$	$T_{PK}$	lb-ft	420	554	720	$T_{PK}$	Nm	569	751	976
Inertia (motor only)	$J_M$	lb-ft-sec <sup>2</sup>	.0256	.0298	.0356	$J_M$	kgm <sup>2</sup> x 10 <sup>-3</sup>	34,7	40,4	48,3
Static friction (max.)	$T_f$	lb-ft	.44	.58	.71	$T_f$	Nm	.60	.79	.96
Viscous Damping coefficient $\Delta$	$K_{DV}$	lb-ft/Krpm	1.08	1.45	1.93	$K_{DV}$	Nm/Krpm	1,46	1,97	2,62
Thermal resistance $\Delta$	$R_{TH}$	°C/Watt	.035 (.148)	.031 (.130)	.029 (.110)	$R_{TH}$	°C/Watt	.035 (.148)	.031 (.130)	.029 (.110)
Thermal time constant $\Delta$	$\tau_{TH}$	min.	30 (130)	32 (130)	36 (140)	$\tau_{TH}$	min.	30 (130)	32 (130)	36 (140)
Weight $\Delta$	$W$	lbs.	175 (164)	211 (200)	261 (250)	$M$ (mass)	kg	79,6 (75)	95,9 (90,9)	118,6 (113,6)

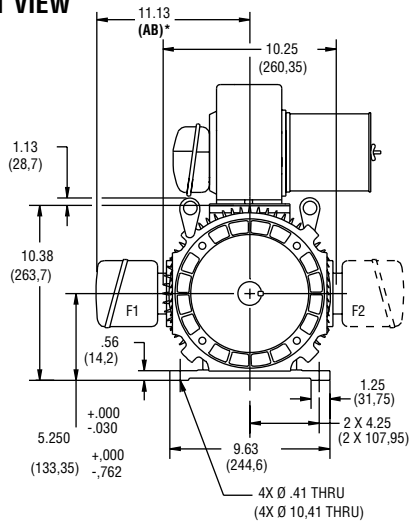
Winding data	Symbol	Units	E213				E215				E218			
			E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4
Torque Constant line-line $\Delta$	$K_T$ rms	lb-ft/A Nm/A	3.22	1.61	5.58	2.79	3.02	1.51	5.23	2.62	2.96	1.48	5.13	2.56
			4.37	2.18	7.56	3.78	4.09	2.05	7.09	3.55	4.01	2.01	6.95	3.48
Voltage Constant line-line $\Delta$	$K_E$ rms	V/Krpm V/rad/sec	264	132	457	229	248	124	429	215	243	122	421	210
			2.52	1.26	4.37	2.18	2.37	1.18	4.10	2.05	2.32	1.16	4.02	2.01
Continuous stall current $\Delta \Delta \Delta$	$I_{CS}$	A	44(22)	88(44)	28(13)	50(25)	58(29)	118(60)	34(17)	67(34)	71(37)	142(75)	42(22)	82(43)
Current at peak torque $\Delta \Delta \Delta$	$I_{PK}$	A	131	262	76	151	184	367	106	212	244	488	141	282
Hot Resistance line-line $\Delta$	$R_H$	Ohms	0.84	.021	2.51	0.63	0.54	0.14	1.61	0.40	0.37	0.093	1.12	0.28
Cold Resistance line-line $\Delta$	$R_C$	Ohms	0.58	0.14	1.73	0.43	0.37	0.093	1.11	0.28	0.26	0.064	0.77	0.19
Inductance line-line	$L$	mH	11.4	2.85	34.3	8.56	7.64	1.91	22.9	5.73	5.67	1.42	17	4.25
Electrical time constant $\Delta$	$\tau_e$	msec	19.8	19.8	19.8	19.8	20.5	20.5	20.5	20.5	22.2	22.2	22.2	22.2
Mechanical time constant $\Delta$	$\tau_m$	msec	1.57	1.57	1.57	1.57	1.32	1.32	1.32	1.32	1.14	1.14	1.14	1.14
Rated base speed $\Delta$	$\omega_r$	rpm	1750	3600	1000	2000	1750	3600	1000	2000	1750	3600	1000	2000
Rated current @ rated speed, RMS Amperes	$I_R$	A	43.3	77.2	26.0	49.3	54.7	94.0	33.0	62.0	63.6	100.0	38.8	72.0
			(17.4)	(N/A)	(11.9)	(18.5)	(20.9)	(N/A)	(15.2)	(21.4)	(23.0)	(N/A)	(18.1)	(21.7)
Power @ rated speed $\Delta$	$P_R$	HP, DPBV (TENV)	40.2	73.4	21.5	45.3	49.2	86.2	29.3	55.3	57.0	92.6	34.5	63.6
			(15.7)	(N/A)	(10.7)	(16.5)	(18.2)	(N/A)	(13.2)	(18.3)	(19.9)	(N/A)	(15.8)	(18.5)
Power @ rated speed $\Delta$	$P_R$	kW, DPBV (TENV)	30.0	54.8	16.0	33.8	36.7	64.3	21.9	41.3	42.5	69.1	25.7	47.4
			(11.7)	(N/A)	(8.0)	(12.3)	(13.6)	(N/A)	(9.8)	(13.7)	(14.8)	(N/A)	(11.8)	(13.8)

Note: All values at 40°C unless otherwise noted.

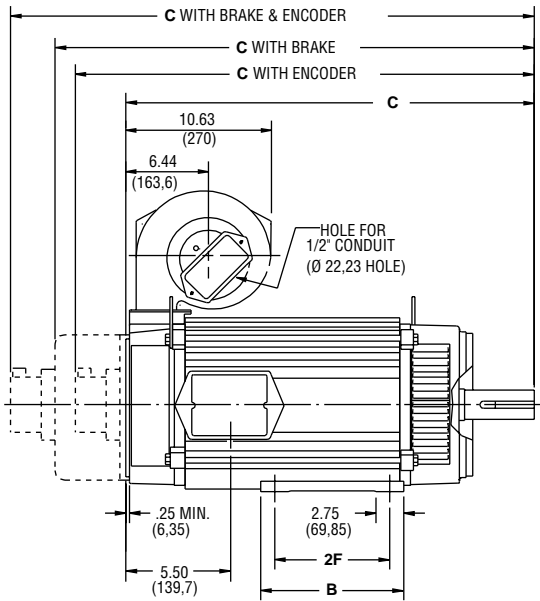
- $\Delta$  25°C ambient temperature
- $\Delta$  ( ) denotes TENV when dual ratings are shown. Single ratings apply to both
- $\Delta$  Based on RMS (sine wave) amps
- $\Delta$  140°C winding temperature
- $\Delta$  640V dc
- $\Delta$  Theoretical (cold) ratings at peak current,  $I_{PK}$ . For ratings at rated temperature, see Torque-Speed curves, pages 20-22
- $\Delta$  Demagnetization current for 150°C magnet temperature

# DIMENSIONS . . . 210 Diameter Frames; DPBV (Dripproof, Blower Ventilated)

## FRONT VIEW



## SIDE VIEW

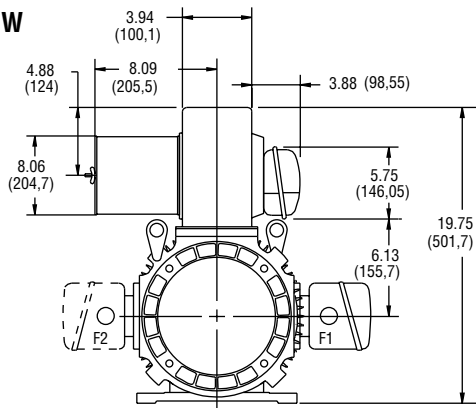


CALLOUT FOR "C" DIMENSION				
MODEL	MOTOR ONLY	WITH ENCODER	WITH BRAKE	WITH BRAKE & ENCODER
E213	22.25 (565,15)	25.04 (636)	26.14 (664)	28.10 (713,7)
E215	26.88 (682,75)	29.67 (753,6)	30.77 (781,6)	32.73 (831,3)
E218	29.25 (742,95)	32.04 (813,8)	33.14 (841,8)	35.10 (891,5)

MODEL	2F DIMENSION	B DIMENSION
E213	5.50 (139,7)	8.38 (212,85)
E215	7.00 (177,8)	8.38 (212,85)
E218	10.00 (254)	11.38 (289,1)

Dimensions in ( ) are mm, all others in inches

## REAR VIEW



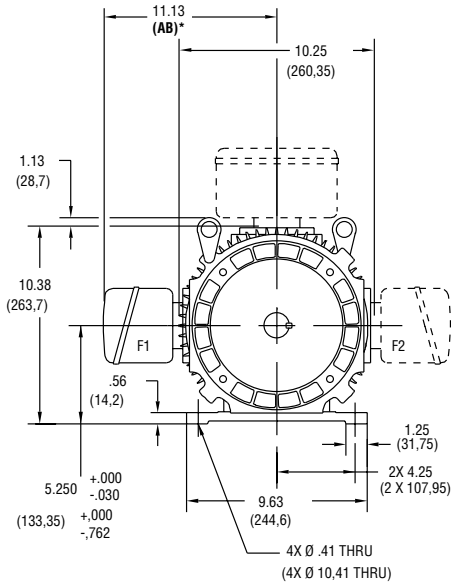
### NOTE:

- Reference pages 56, 57 for conduit box dimensions.
- Conduit box can be rotated in 90° steps on its own axis and can be mounted on opposite side or top when specified.
- Blower can be rotated 180° about its axis. Size #3 blower is used on E210 frames. See Page 67.

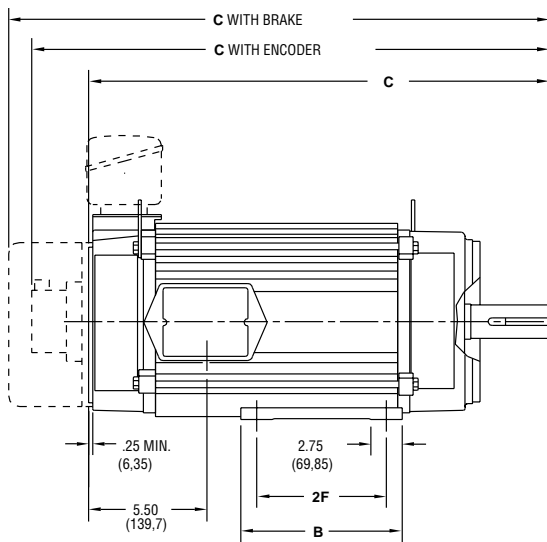
\* See terminations, page 56.

# DIMENSIONS . . . 210 Diameter Frames; TENV (Totally Enclosed, Non-Ventilated)

## FRONT VIEW



## SIDE VIEW

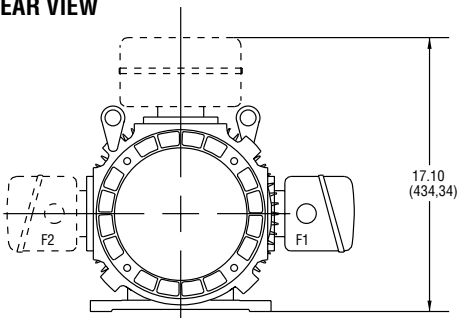


CALLOUT FOR "C" DIMENSION				
MODEL	MOTOR ONLY	WITH ENCODER	WITH BRAKE	WITH BRAKE & ENCODER
E213	$\frac{22.25}{(565,15)}$	$\frac{25.04}{(636)}$	$\frac{26.14}{(664)}$	$\frac{28.10}{(713,7)}$
E215	$\frac{26.88}{(682,75)}$	$\frac{29.67}{(753,6)}$	$\frac{30.77}{(781,6)}$	$\frac{32.73}{(831,3)}$
E218	$\frac{29.25}{(742,95)}$	$\frac{32.04}{(813,8)}$	$\frac{33.14}{(841,8)}$	$\frac{35.10}{(891,5)}$

MODEL	2F DIMENSION	B DIMENSION
E213	$\frac{5.50}{(139,7)}$	$\frac{8.38}{(212,85)}$
E215	$\frac{7.00}{(177,8)}$	$\frac{8.38}{(212,85)}$
E218	$\frac{10.00}{(254)}$	$\frac{11.38}{(289,1)}$

Dimensions in ( ) are mm, all others in inches

## REAR VIEW



### NOTE:

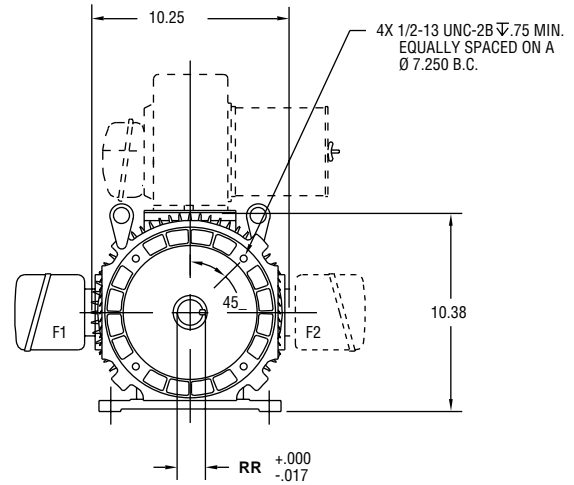
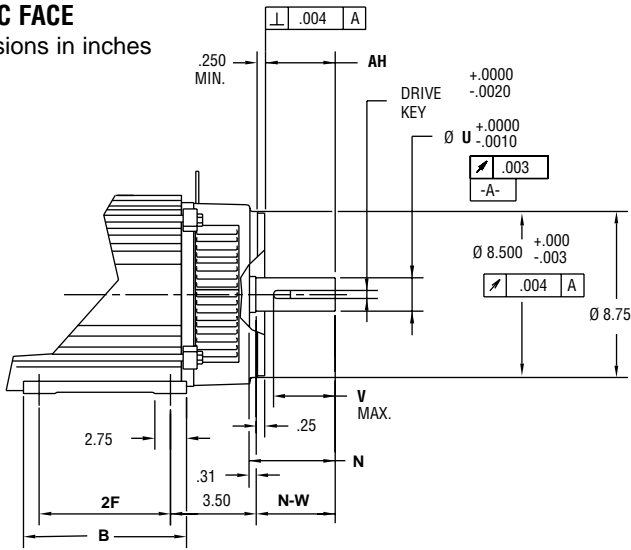
1. Reference pages 56, 57 for conduit box dimensions.
2. Conduit box can be rotated in 90° steps on its own axis and can be mounted on opposite side or top when specified.

\* See terminations, page 56.

# DIMENSIONS ... 210 Diameter Frame Mounting; NEMA and Metric

## NEMA C FACE

Dimensions in inches

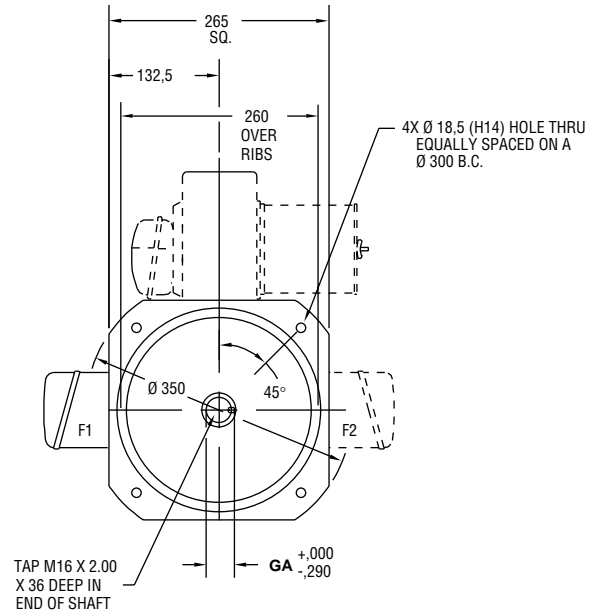
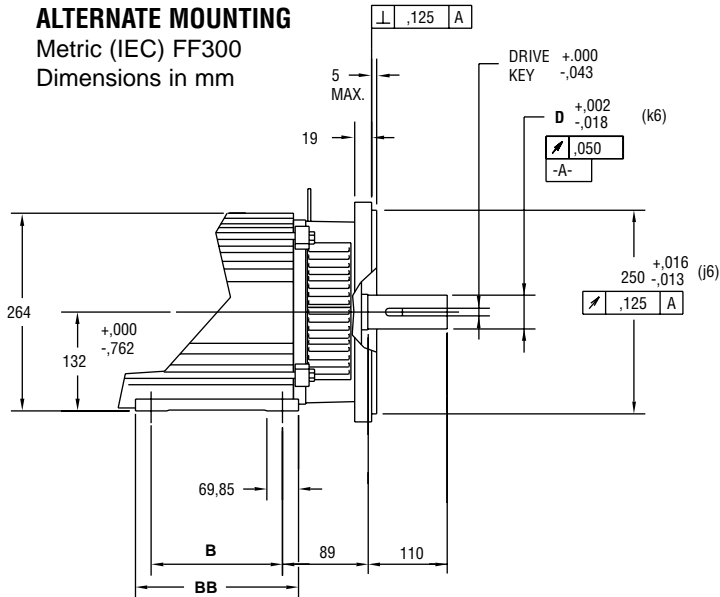


REFER TO DPBV, PAGE 17, FOR FRONT VIEW FEET DIMENSIONS

MODEL	2F	B	AH	N	N-W	U	V	RR	Drive Key
E213	5.50	8.38	3.75	4.31	4.00	1.625	3.5	1.791	.375
E215	7.00	8.38	5.00	5.56	5.25	2.125	4.75	2.345	.500
E218	10.00	11.38	5.00	5.56	5.25	2.125	4.75	2.345	.500

## ALTERNATE MOUNTING

Metric (IEC) FF300  
Dimensions in mm



EXCEPT FOR FOOT HEIGHT REFER TO DPBV, PAGE 17, FOR FRONT VIEW FEET DIMENSIONS

MODEL	D	B	BB	GA	Drive Key
E213	42	139,7	213	45	12
E215	48	177,8	213	51,5	14
E218	48	254	289	51,5	14

# PERFORMANCE CURVES

## 210 FRAME E213

### Test Conditions

- Motor operated in ambient temperature of 40° C maximum that results in a maximum motor stator winding temperature of 140° C
- 640V dc bus applied
- Sinusoidal drive output

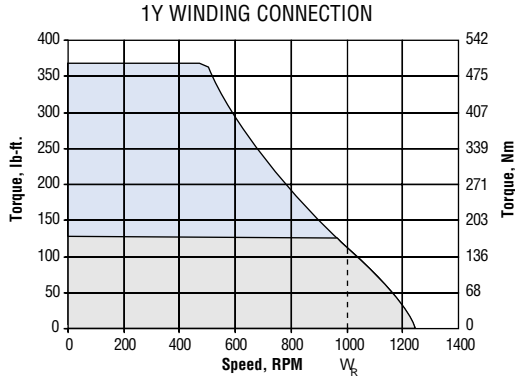
- Intermittent duty
- Continuous duty

### DPBV DRIPPROOF BLOWER VENTILATED

### TENV TOTALLY ENCLOSED NON-VENTILATED

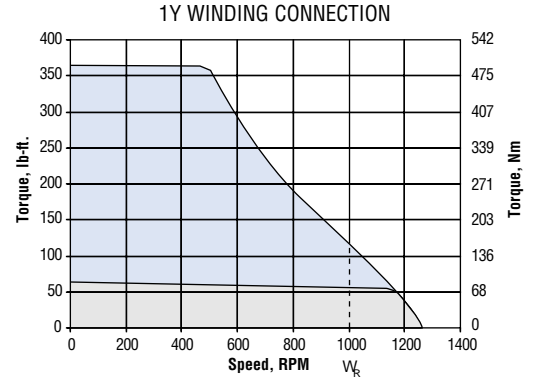
#### E213E3 MOTOR

Reference Points	
$T_{PK}$	368
$T_{CS}$	128
$T_{CR}$	113
$W_R$	1,000
$I_{CS}$	28.0
$I_{CR}$	26.0



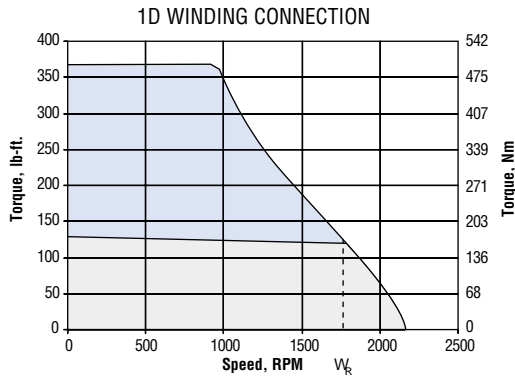
#### E213E3 MOTOR

Reference Points	
$T_{PK}$	368
$T_{CS}$	64
$T_{CR}$	56
$W_R$	1,000
$I_{CS}$	13.0
$I_{CR}$	11.9



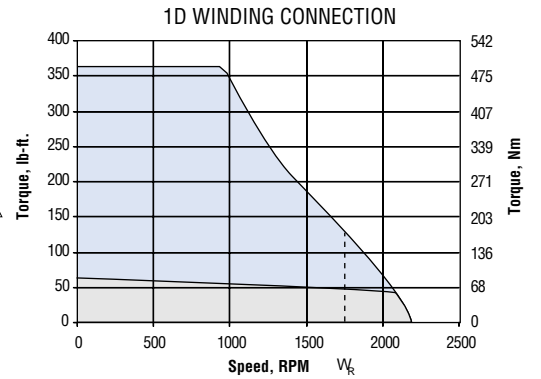
#### E213E1 MOTOR

Reference Points	
$T_{PK}$	368
$T_{CS}$	128
$T_{CR}$	120
$W_R$	1,750
$I_{CS}$	44.0
$I_{CR}$	43.4



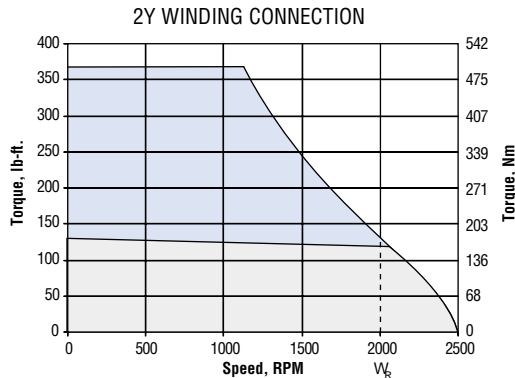
#### E213E1 MOTOR

Reference Points	
$T_{PK}$	368
$T_{CS}$	64
$T_{CR}$	47
$W_R$	1,750
$I_{CS}$	22.0
$I_{CR}$	17.4



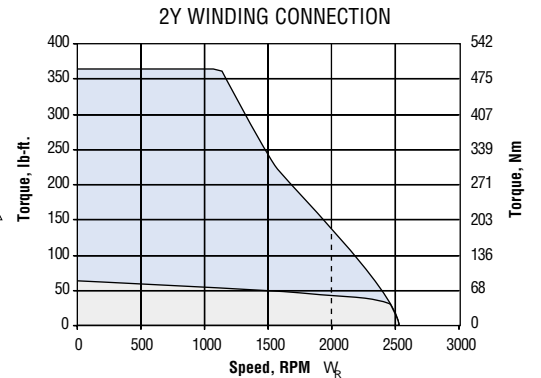
#### E213E4 MOTOR

Reference Points	
$T_{PK}$	368
$T_{CS}$	128
$T_{CR}$	118
$W_R$	2,000
$I_{CS}$	50.0
$I_{CR}$	49.3



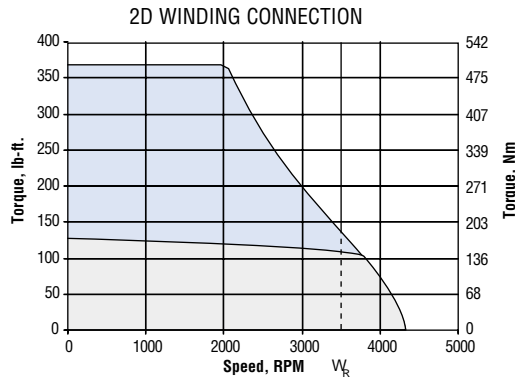
#### E213E4 MOTOR

Reference Points	
$T_{PK}$	368
$T_{CS}$	64
$T_{CR}$	43
$W_R$	2,000
$I_{CS}$	25.0
$I_{CR}$	18.5



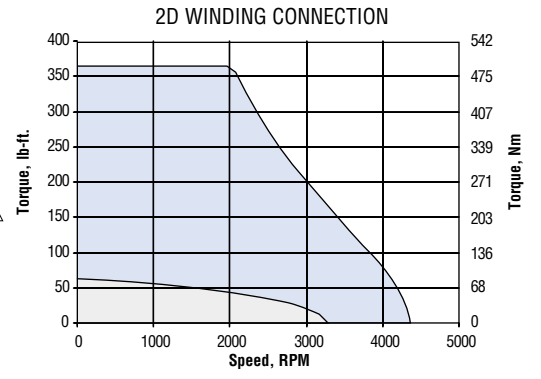
#### E213E2 MOTOR

Reference Points	
$T_{PK}$	368
$T_{CS}$	128
$T_{CR}$	107
$W_R$	3,600
$I_{CS}$	88.0
$I_{CR}$	77.2



#### E213E2 MOTOR

Reference Points	
$T_{PK}$	368
$T_{CS}$	64
$T_{CR}$	-
$W_R$	-
$I_{CS}$	44
$I_{CR}$	-



- See model number code, page 15.
- This is also the demagnetization limit. User should apply appropriate safety margins in its use.

- Notes:
1. See Motor Performance Curves, page 76.
  2. See Thermal Protection, page 69.
  3. See Power Curves, page 23.
  4. See Efficiency Curves, page 24.

# PERFORMANCE CURVES

## 210 FRAME E215

### Test Conditions

- Motor operated in ambient temperature of 40° C maximum that results in a maximum motor stator winding temperature of 140° C
- 640V dc bus applied
- Sinusoidal drive output

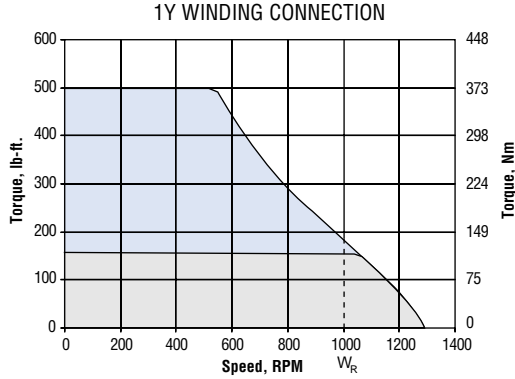
- Intermittent duty
- Continuous duty

### DPBV DRIPPROOF BLOWER VENTILATED

### TENV TOTALLY ENCLOSED NON-VENTILATED

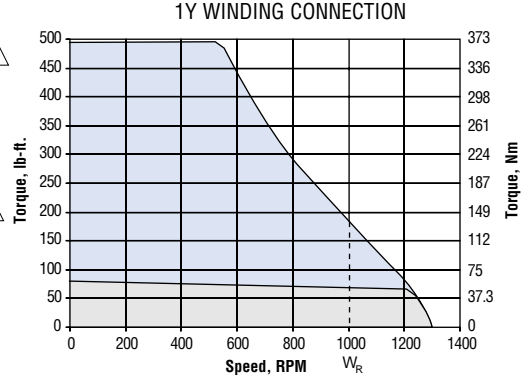
#### E215E3 MOTOR

Reference Points	
$T_{PK}$	500
$T_{CS}$	160
$T_{CR}$	154
$W_R$	1,000
$I_{CS}$	34.0
$I_{CR}$	33.0



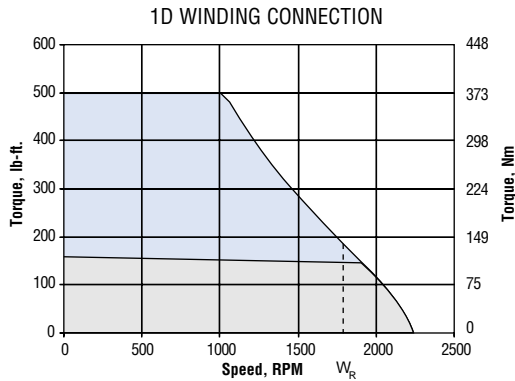
#### E215E3 MOTOR

Reference Points	
$T_{PK}$	500
$T_{CS}$	81
$T_{CR}$	69
$W_R$	1,000
$I_{CS}$	17.0
$I_{CR}$	15.2



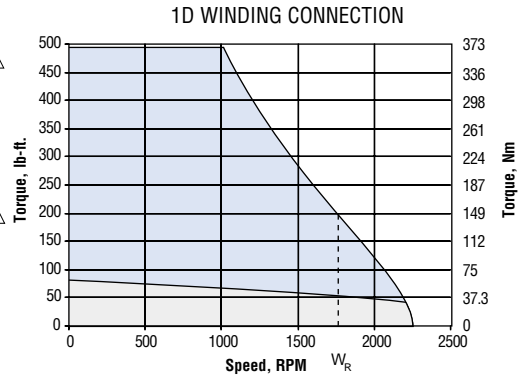
#### E215E1 MOTOR

Reference Points	
$T_{PK}$	500
$T_{CS}$	160
$T_{CR}$	147
$W_R$	1,750
$I_{CS}$	58.0
$I_{CR}$	54.7



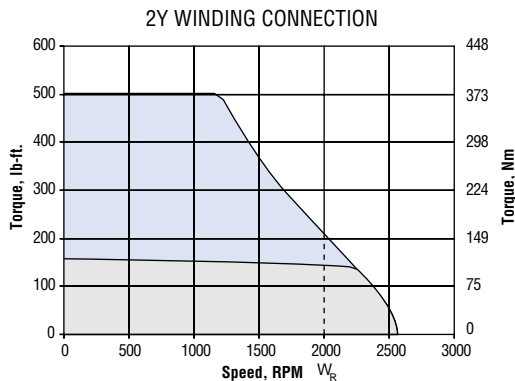
#### E215E1 MOTOR

Reference Points	
$T_{PK}$	500
$T_{CS}$	81
$T_{CR}$	54
$W_R$	1,750
$I_{CS}$	29.0
$I_{CR}$	20.9



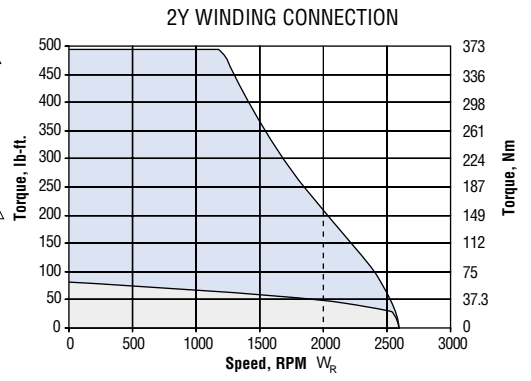
#### E215E4 MOTOR

Reference Points	
$T_{PK}$	500
$T_{CS}$	160
$T_{CR}$	145
$W_R$	2,000
$I_{CS}$	67.0
$I_{CR}$	62.0



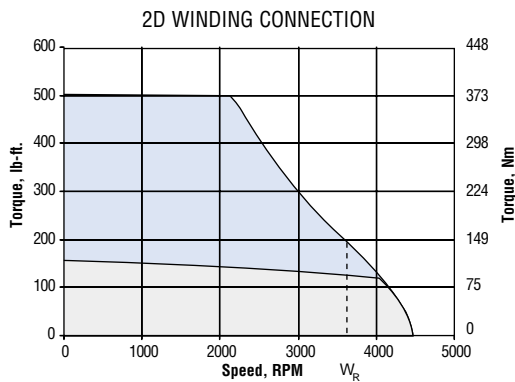
#### E215E4 MOTOR

Reference Points	
$T_{PK}$	500
$T_{CS}$	81
$T_{CR}$	48
$W_R$	2,000
$I_{CS}$	34.0
$I_{CR}$	21.4



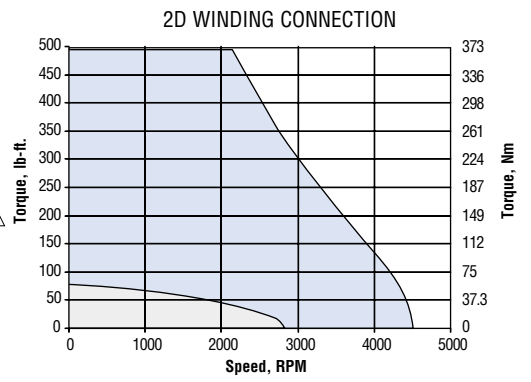
#### E215E2 MOTOR

Reference Points	
$T_{PK}$	500
$T_{CS}$	160
$T_{CR}$	125
$W_R$	3,600
$I_{CS}$	118.0
$I_{CR}$	94.0



#### E215E2 MOTOR

Reference Points	
$T_{PK}$	500
$T_{CS}$	81
$T_{CR}$	-
$W_R$	-
$I_{CS}$	60.0
$I_{CR}$	-



- △ See model number code, page 15.
- △ This is also the demagnetization limit. User should apply appropriate safety margins in its use.

- Notes:
1. See Motor Performance Curves, page 76.
  2. See Thermal Protection, page 69.
  3. See Power Curves, page 23.
  4. See Efficiency Curves, page 24.

# PERFORMANCE CURVES

## 210 FRAME E218

### Test Conditions

- Motor operated in ambient temperature of 40° C maximum that results in a maximum motor stator winding temperature of 140° C
- 640V dc bus applied
- Sinusoidal drive output

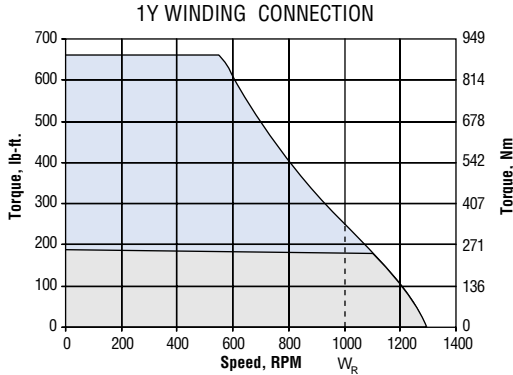
- Intermittent duty
- Continuous duty

**DPBV**  
**DRIPPROOF**  
**BLOWER VENTILATED**

**TENV**  
**TOTALLY ENCLOSED**  
**NON-VENTILATED**

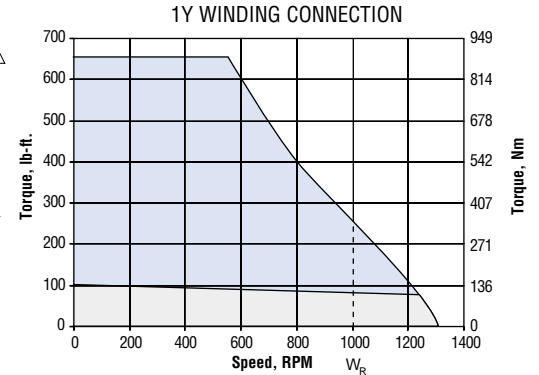
### E218E3 MOTOR

Reference Points	
$T_{PK}$	660
$T_{CS}$	190
$T_{CR}$	181
$W_R$	1,000
$I_{CS}$	42.0
$I_{CR}$	38.8



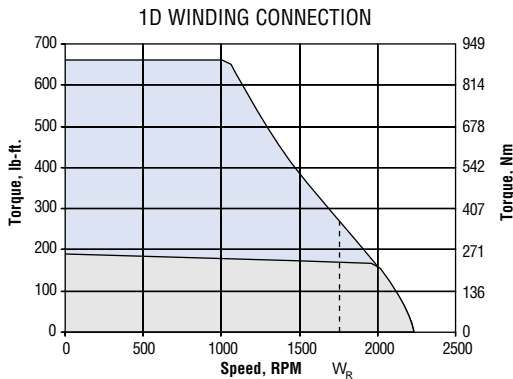
### E218E3 MOTOR

Reference Points	
$T_{PK}$	660
$T_{CS}$	100
$T_{CR}$	82.8
$W_R$	1,000
$I_{CS}$	22.0
$I_{CR}$	18.2



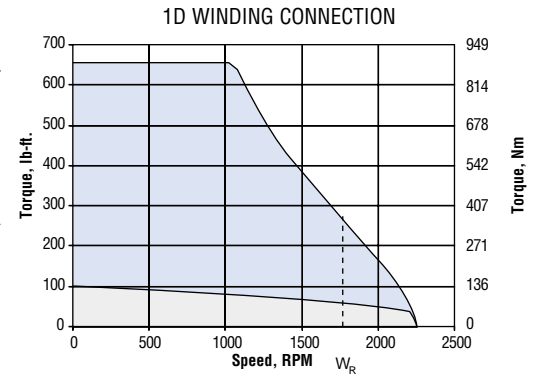
### E218E1 MOTOR

Reference Points	
$T_{PK}$	660
$T_{CS}$	190
$T_{CR}$	171
$W_R$	1,750
$I_{CS}$	71.0
$I_{CR}$	63.6



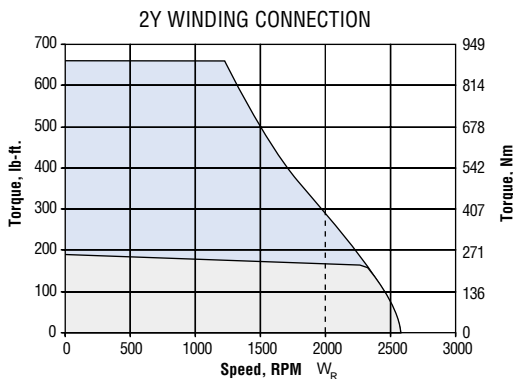
### E218E1 MOTOR

Reference Points	
$T_{PK}$	660
$T_{CS}$	100
$T_{CR}$	59.6
$W_R$	1,750
$I_{CS}$	37.0
$I_{CR}$	23.0



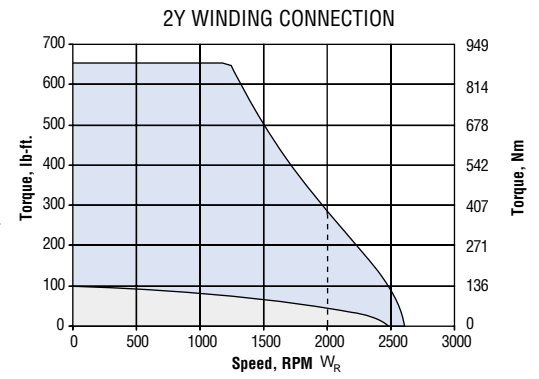
### E218E4 MOTOR

Reference Points	
$T_{PK}$	660
$T_{CS}$	190
$T_{CR}$	167
$W_R$	2,000
$I_{CS}$	82.0
$I_{CR}$	72.0



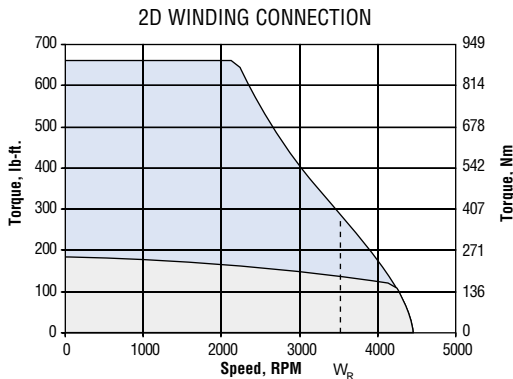
### E218E4 MOTOR

Reference Points	
$T_{PK}$	660
$T_{CS}$	100
$T_{CR}$	48.4
$W_R$	2,000
$I_{CS}$	43.0
$I_{CR}$	21.7



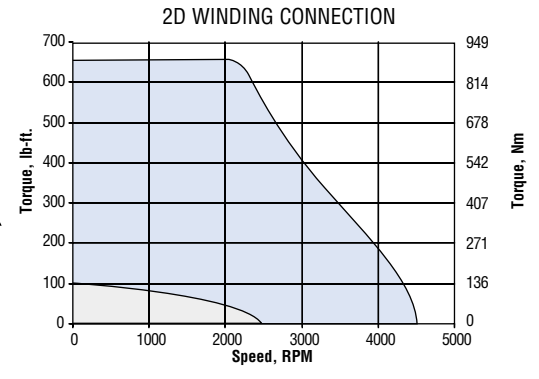
### E218E2 MOTOR

Reference Points	
$T_{PK}$	660
$T_{CS}$	190
$T_{CR}$	135
$W_R$	3,600
$I_{CS}$	142.0
$I_{CR}$	100.0



### E218E2 MOTOR

Reference Points	
$T_{PK}$	660
$T_{CS}$	100
$T_{CR}$	-
$W_R$	-
$I_{CS}$	75.0
$I_{CR}$	-



- See model number code, page 15.
- This is also the demagnetization limit. User should apply appropriate safety margins in its use.

- Notes:
1. See Motor Performance Curves, page 76.
  2. See Thermal Protection, page 69.
  3. See Power Curves, page 23.
  4. See Efficiency Curves, page 24.



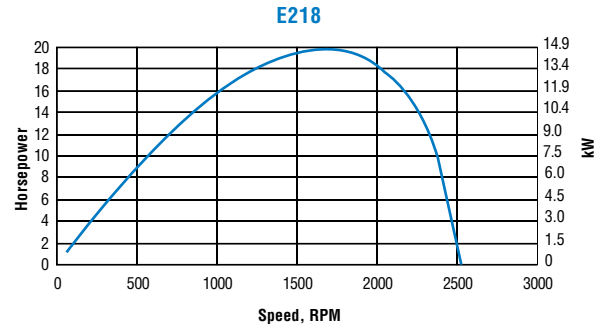
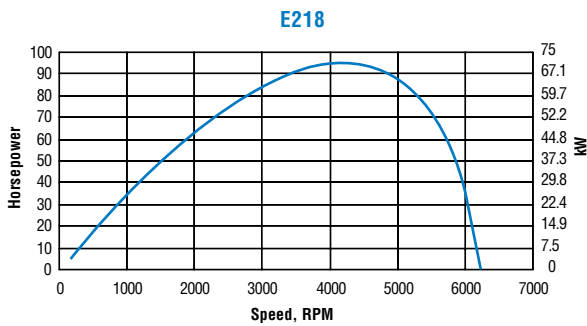
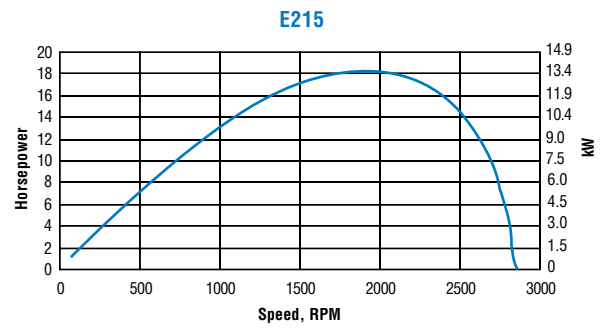
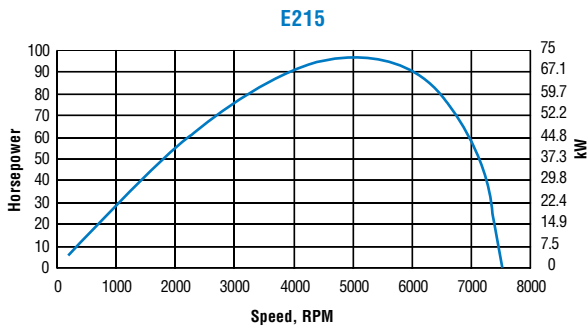
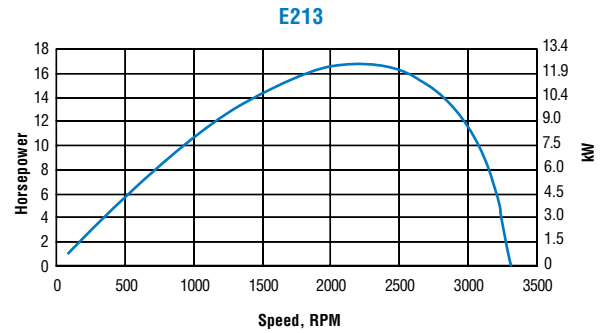
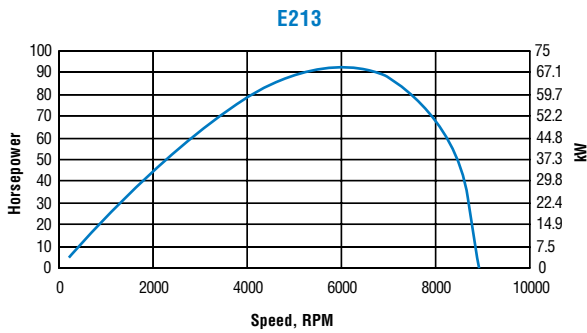
# CONTINUOUS POWER CURVES E210 DIAMETER FRAMES

Standard E210 frame motors are limited (mechanical design) to 4500 RPM. Special designs are available that allow operation to speeds indicated in the individual curves.

One power curve is shown for each stack length in both the DPBV and TENV enclosures. Four different winding connections are offered for each stack length, but the power curve is the same for all connections. Therefore, only one power curve is necessary for each stack length and enclosure.

## DPBV DRIPPROOF BLOWER VENTILATED

## TENV TOTALLY ENCLOSED NON-VENTILATED

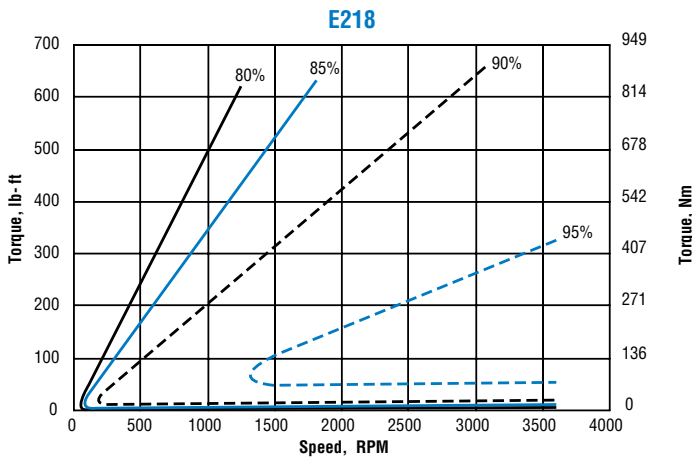
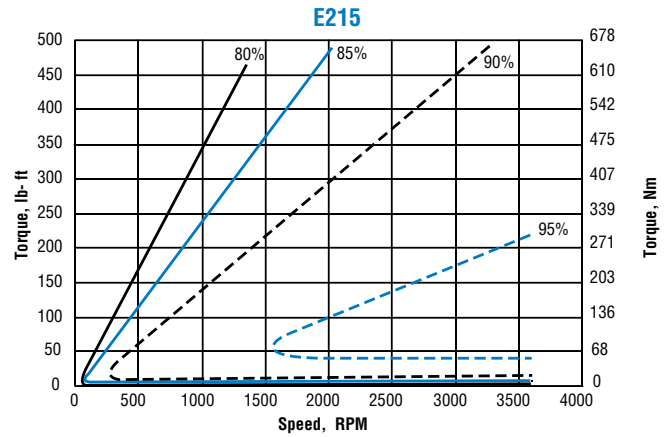
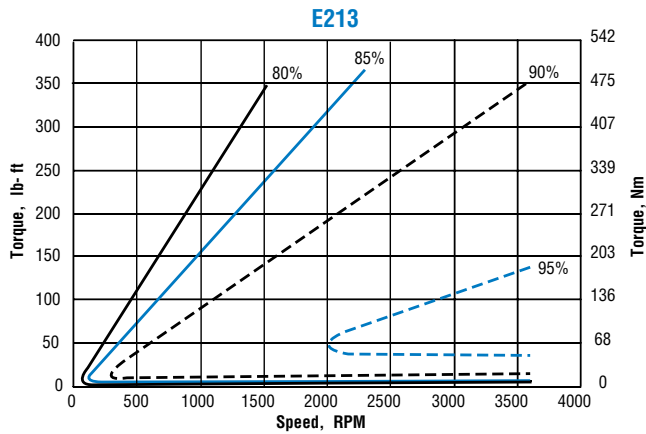


Note: see Motor Performance Curves, page 76.

# EFFICIENCY CURVES

## E210 DIAMETER FRAMES

One efficiency curve is shown for each stack length. Efficiencies for the DPBV and TENV enclosures are approximately the same, so a single curve represents both. In addition, although four different winding connections are offered for each stack length, the efficiency is the same for all connections.



Note: see Motor Performance Curves, page 76.