

AC Motor Selection – Three-phase Motors

(Single-phase motors are shown on page 15-13)

3-Phase Characteristic	IronHorse™ 56C Frame 3-Phase	IronHorse™ T & TC Frames	Marathon microMAX™	Marathon Black Max®	Marathon Blue Max®	Marathon NEMA Premium® XRI®	Marathon Blue Chip XRI®
Electrical Characteristics							
Horsepower range	1/3 - 2	1 - 300 (T); 1 - 100 (TC)	1/4 - 10	1/4 - 30	40 - 100	1 - 10	15 - 100
Base speed (# Poles)	1800 (4), 3600 (2)	1200(6), 1800 (4), 3600(2)	1800 (4)	1800 (4) and 1200 (6)	1800 (4)	1200(6),1800(4),3600(2)	1800 (4)
Standard Voltage	208-230/460	208-230/460 (250 & 300 hp 460V only)	230/460 (1/4 hp is 230V only)	230/460 and 575	230/460	208-230/460	230/460 and 575
Insulation Class	F	F	H	F	H	F	F
Insulation System	dip & bake	double dip & bake	CR200 magnet wire	MAX GUARD®		CR200 magnet wire	
Service Factor	1.15 (line) 1.0 (drive)	1.15 (line) 1.0 (drive)	1.0	1.0	1.0	1.15 (line) 1.0 (drive)	1.15
Phase/Base Frequency	3/60						
Design Code (NEMA)	B	A: 10-50 hp 4&6 pole B: all other sizes	A and B for 1/4 - 2 hp	A	A	B	B
Duty Cycle	Continuous						
Thermal protection	None			Class F thermostats		None	
Mechanical Characteristics							
Frame size (mounting)	56C	143T/TC - 405TC/449T	56C - 215TC	56C - 286TC	324T(C)-405T(C)	56C - 215TC	254T - 405T
Enclosure	TEFC	TEFC	TENV and TEFC	TENV	TEFC and TEBC	TEFC	TEFC
Frame material	Rolled Steel frame; Aluminum end bell	Cast Iron	Rolled Steel	Rolled Steel w Al face; Cast Iron	Cast Iron	Rolled Steel	Cast Iron
End bracket material	Aluminum	Cast Iron	Aluminum	Aluminum, Cast Iron	Cast Iron	Aluminum	Cast Iron
Conduit box material	Steel	Cast Iron	Steel	Steel	Cast Iron	Steel	Steel (<326T) Cast Iron (>324T)
Fan guard material	Steel	Steel	Polypropylene	None (all ratings TENV)	Cast Iron	Plastic	Polyprop. (<286T) Cast Iron (>324T)
Fan material	Plastic	Plastic (143T/TC - 445/7T) Aluminum (449T)	Polypropylene	None (all ratings TENV)	Polypropylene	Plastic	Polypropylene
Lead termination	Conduit box	Conduit box	Conduit box except Terminal block - 1/4 hp	Conduit box	Conduit box	Conduit box	Conduit box
Standard mounting	C-Face with Removable Rigid Base	Rigid Base (C-Flange kit available) C-Face with Rigid Base (1-100 hp)	C-Face with Rigid Base & C-Face Round Body	C-Face with Rigid Base	C-Face with Rigid Base	C-Face with Rigid Base	Rigid Base
Drive end shaft slinger	Yes	Yes	No	No	Yes	Yes	Yes
Paint	Black	Epoxy primer / Synthetic alkyd enamel	Black powder-coat	Black enamel	Blue enamel	Blue enamel	epoxy paint
Bearings	Ball	1-75 hp: Ball 100-300 hp: Roller	Ball (C3 fit)	Ball (C3 fit)	Ball (C3 fit)	Ball	Ball (C3 fit)
Grease	Exxon Polyrex EM						
Standard conduit box assembly position	F1	F1 some sizes reversible to F2	F3	F1, reversible to F2	F1, reversible to F2	F3	F1
Performance Characteristics							
Constant Torque speed range	2:1	2:1	20:1 (TEFC) 1000:1 (TENV)	1000:1 (TENV)	2000:1 (all enclosures)	10:1	20:1
Variable Torque speed range	5:1	5:1	-	-	-	10:1	-
Constant Horsepower speed range	1.5:1	1.5:1	2:1	2:1 (90-120Hz intermit- tent @50% duty cycle)	2:1	2:1	2:1
Temperature rise	B	B	B	F	F (TEFC) and B (TEBC)	F	B
Encoder provisions	No	No	No	Yes	Yes	No	No
Other Characteristics							
Agency listings	cCSA _{US}	CE, cCSA _{US} , EPACK	UL Recognized and CSA Certified				
Warranty*	2 years			3 years (through Marathon Electric)			

*See Terms and Conditions for motor warranty explanation.

1) For warranty on IronHorse motors below 50 hp, warranty service can be arranged through AutomationDirect.

2) For warranty on IronHorse motors 50 hp and above, motors must be inspected by a local EASA motor repair or service center; see AutomationDirect Terms & Conditions.

3) Marathon warranty service can be arranged through Marathon Electric service centers. See list of service centers on our web site at www.automationdirect.com.

NEMA Premium[®] Efficiency XRI[®] Series Inverter Duty Motors



Features

- Meets or exceeds NEMA Premium efficiencies
- Inverter duty
- 10:1 variable torque and constant torque on VFD with 1.0 service factor
- 1.15 service factor on sinewave; 1.0 service factor on IGBT power
- Class F insulation
- Continuous duty at 40° C ambient
- Rolled steel construction with C-face rigid base mounting
- F3 conduit box location
- Utilizes ball bearings
- Electrically reversible
- UL recognized and CSA certified
- Three year warranty (through Marathon Electric)

Applications

Typical uses include gear reducers, pumps, machine tools, and other direct-coupled equipment installed in damp, dusty, or dirty environments where long life and ultra-high efficiency is desired.

Motor Shipping Schedule

Same or one day *

* For same-day shipping of stock motors requiring LTL shipment, order before 5 p.m. EST.

208–230/460V Motor Specifications

Part Number	HP	Base RPM	Volts	Enclosure	NEMA Frame	Model No.	N.P. F.L. Amps	Weight (lb)
E2000	1	3600	208–230/460	TEFC	56C	056T34F5940	3.0–2.8/1.4	28
E2001	1	1800			143TC	143TTFR5642	3.2–3.2/1.6	32
E2002	1	1200			145TC	145TTFR6078	3.8–3.8/1.9	42
E2003	1.5	3600			143TC	143TTFR5582	4.4–4.0/2.0	39
E2004	1.5	1800			145TC	145TTFR6033	5.2–4.8/2.4	34
E2005	1.5	1200			182TC	182TTFR6076	4.8–4.4/2.2	82
E2006	2	3600			145TC	145TTFR3002	5.2–4.8/2.4	48
E2007	2	1800			145TC	145TTFR6035	6–5.8/2.9	50
E2008	2	1200			184TC	184TTFR6076	6.4–6.0/3.0	94
E2009	3	3600			182TC	182TTFR6001	8.0–7.6/3.8	83
E2010	3	1800			182TC	182TTFW6026	8.4–7.8/3.9	87
E2011*	3	1200			213TC	213TTFW6076	9.2–8.8/4.4	125
E2012	5	3600			184TC	184TTFW6001	13.2–12.0/6.0	86
E2013	5	1800			184TC	184TTFW6026	13.7–12.6/6.3	87
E2014*	5	1200			215TC	215TTFW6076	15.0–14.0/7.0	160
E2015*	7.5	3600			213TC	213TTFW6001	19.6–17.8/8.9	116
E2016*	7.5	1800			213TC	213TTFW6026	21.0–19.4/9.7	143
E2018*	10	3600			215TC	215TTFW6001	26.4–23.6/11.8	230
E2019*	10	1800			215TC	215TTFW6026	28.0–25.6/12.8	164

Note: Please review the AutomationDirect Terms & Conditions for warranty and service on this product.

Warranty service can be arranged through numerous Marathon Electric service centers.

See list of service centers on our Web site at www.automationdirect.com.

NEMA Premium® Efficiency XRI® Series Inverter Duty Motors

Motor Performance Data

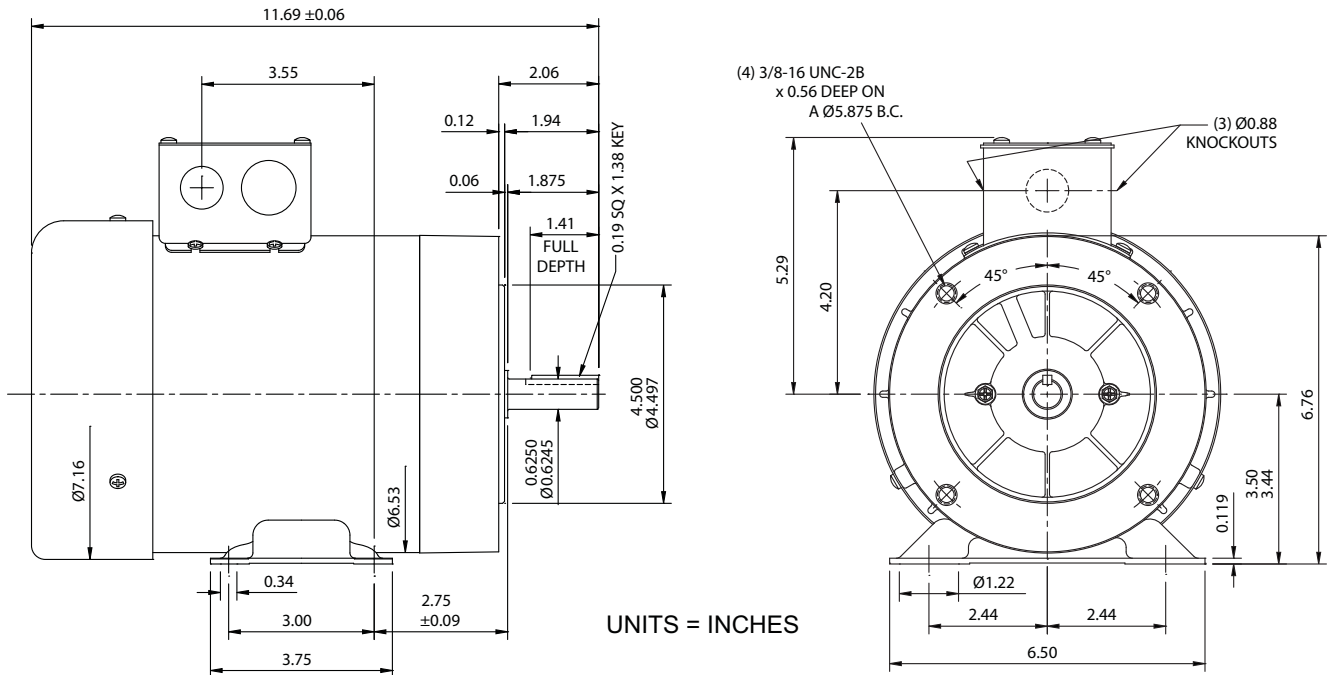
Performance Data (460 Volt)															
Part Number	HP	NEMA Design	F.L. RPM	Min RPM	Current (Amps)			Torque (lb-ft)			Max CHP RPM*	Max Safe RPM	F.L. Effic. (%)	F.L. Power Factor	Rotor Inertia (lb-ft ²)
					No Load	Full Load	Locked Rotor	Full Load	Locked Rotor	Break-down					
E2000	1	B	3490	349	0.7	1.4	10	1.5	3.6	5.1	5235	7200	80	84	0.04
E2001	1		1760	176	1.0	1.6	14	3.0	12.0	15.8	2640	5400	85.5	68.5	0.12
E2002	1		1170	117	1.3	1.9	10	4.5	13.5	15.8	1755	5400	82.5	60	0.14
E2003	1.5		3490	349	1.0	2.0	21	2.3	8.5	11.2	5235	7200	84.0	82	0.06
E2004	1.5		1750	175	1.2	2.4	18	4.5	14.8	19.8	2625	5400	86.5	67.7	0.14
E2005	1.5		1175	118	1.3	2.2	17	6.8	13.4	24.4	1762.5	5400	87.5	71.5	0.38
E2006	2		3490	349	1.0	2.4	26	3.0	10.8	13.0	5235	7200	85.5	88	0.08
E2007	2		1745	175	1.7	2.9	27	6.0	24.6	28.8	2617.5	5400	86.5	75.6	0.16
E2008	2		1170	117	1.9	3.0	22	9.0	17.5	32.0	1755	5400	88.5	70	0.46
E2009	3		3525	353	1.7	3.8	29	4.5	9.0	16.0	5250	7200	87.5	85.0	0.23
E2010	3		1760	176	1.9	3.9	34	8.9	22.5	36.0	2640	5400	89.5	80.5	0.38
E2011	3		1170	117	2.5	4.4	32	13.5	34.0	47.5	1755	4200	89.5	70	0.80
E2012	5		3495	350	1.7	6.0	46	7.5	16.0	26.0	5242.5	7200	88.5	89.5	0.30
E2013	5		1760	176	2.4	6.3	49	15.0	30.1	50	2640	5400	89.5	83.1	0.49
E2014	5		1170	117	3.7	7.0	46	22.5	47.0	79	1755	4200	90.2	75	1.0
E2015	7.5		3540	354	3.0	8.9	64	11.1	24.0	38.0	5310	5400	90.2	87	0.55
E2016	7.5		1765	177	4.7	9.7	64	22.0	52	72	2647.5	4200	91.7	80	0.85
E2018	10		3535	354	3.5	11.8	80	14.9	30.0	46.0	5302.5	5400	91.7	87	0.65
E2019	10		1760	176	5.5	12.8	80	29.8	65	90	2640	4200	91.7	80	1.1

* Maximum Constant HP RPM is for direct coupled loads.

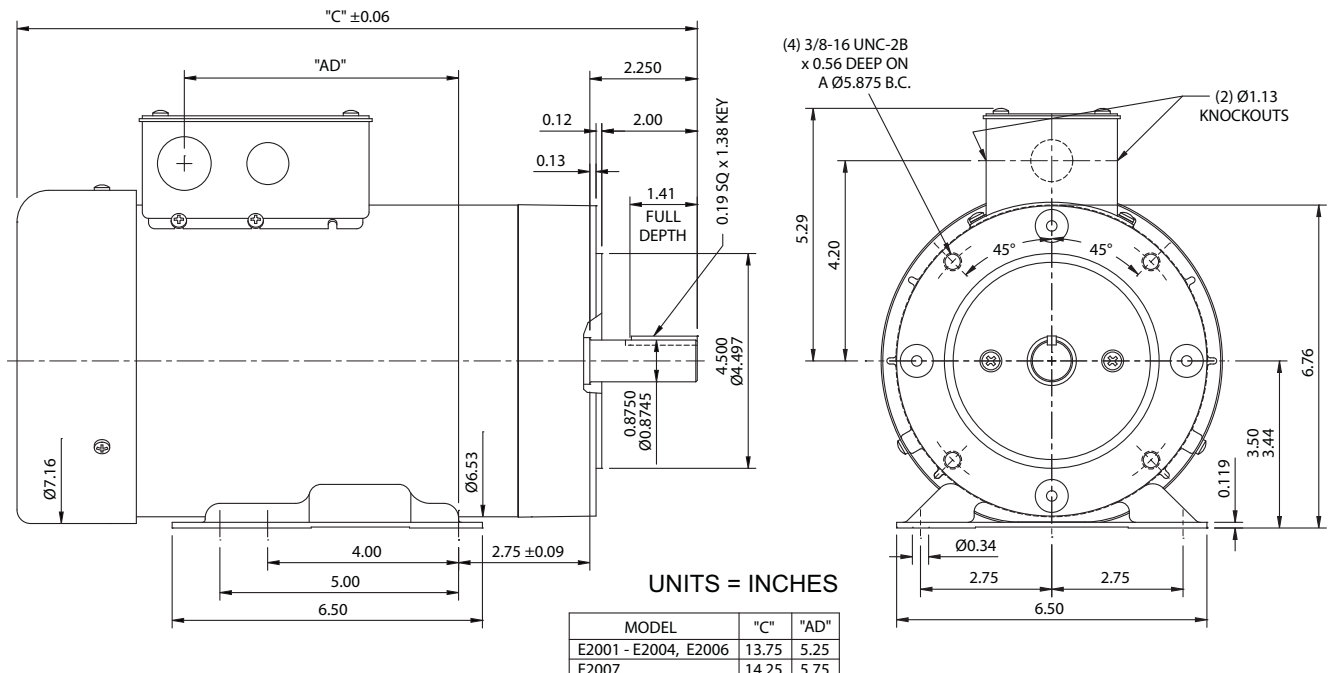
NEMA Premium[®] Efficiency XRI[®] Series Inverter Duty Motors

Motor Dimensions

Frame 56C – Part #: E2000



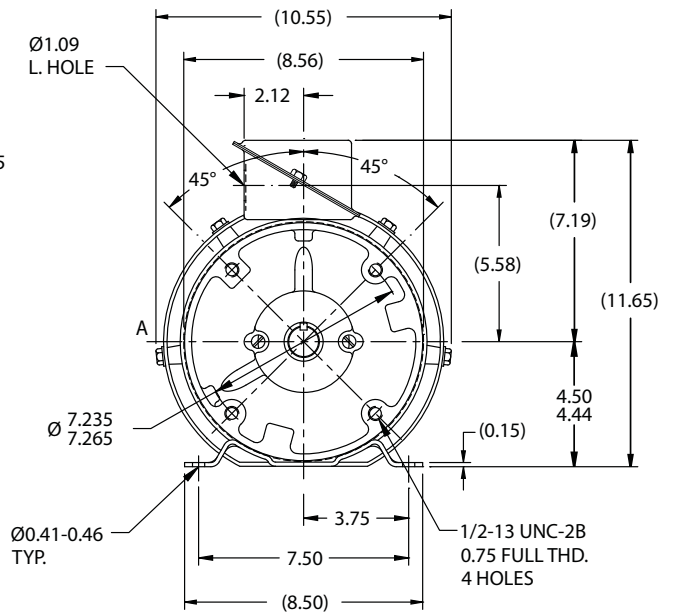
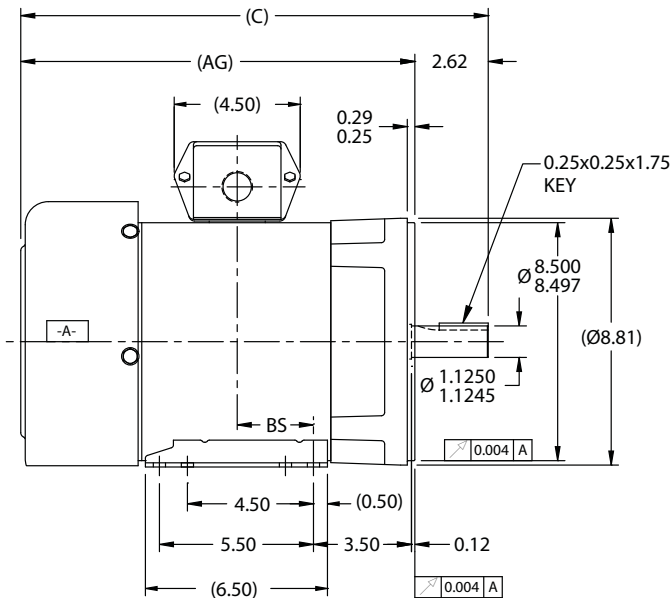
Frame 143/5TC – Part #: E2001, E2002, E2003, E2004, E2006, E2007



NEMA Premium® Efficiency XRI® Series Inverter Duty Motors

Motor Dimensions

Frame 182/4TC – Part #: E2005, E2008, E2009

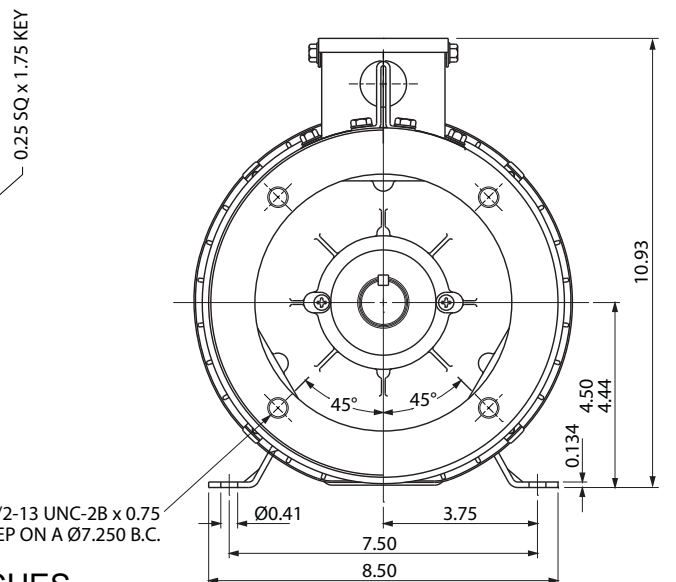
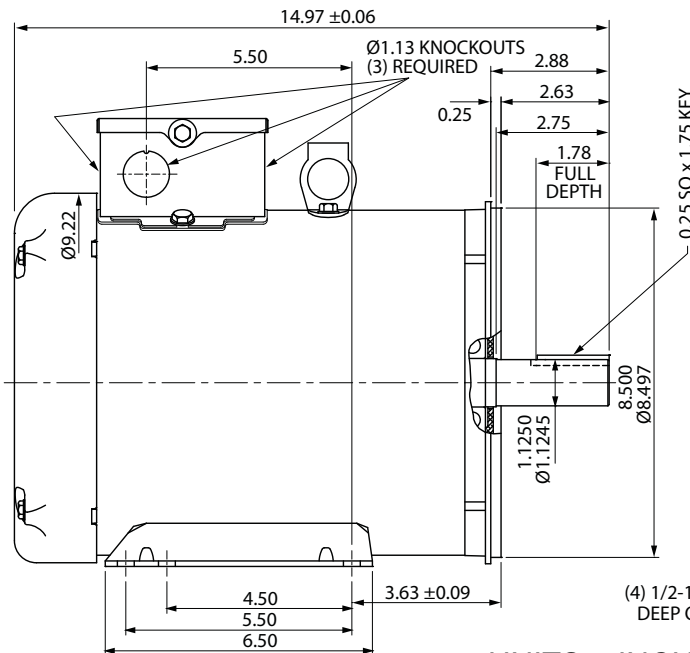


MODEL	C	BS	AG
E2005	16.19	2.50	13.57
E2008	17.19	3.00	14.57
E2009	15.69	2.25	13.07

UNITS = INCHES

- NOTES:
1. BOX CAN BE ROTATED IN 90° STEPS.
2. NAMEPLATE READ FROM LOCATION 'A'.

Frame 184TC – Part #: E2012

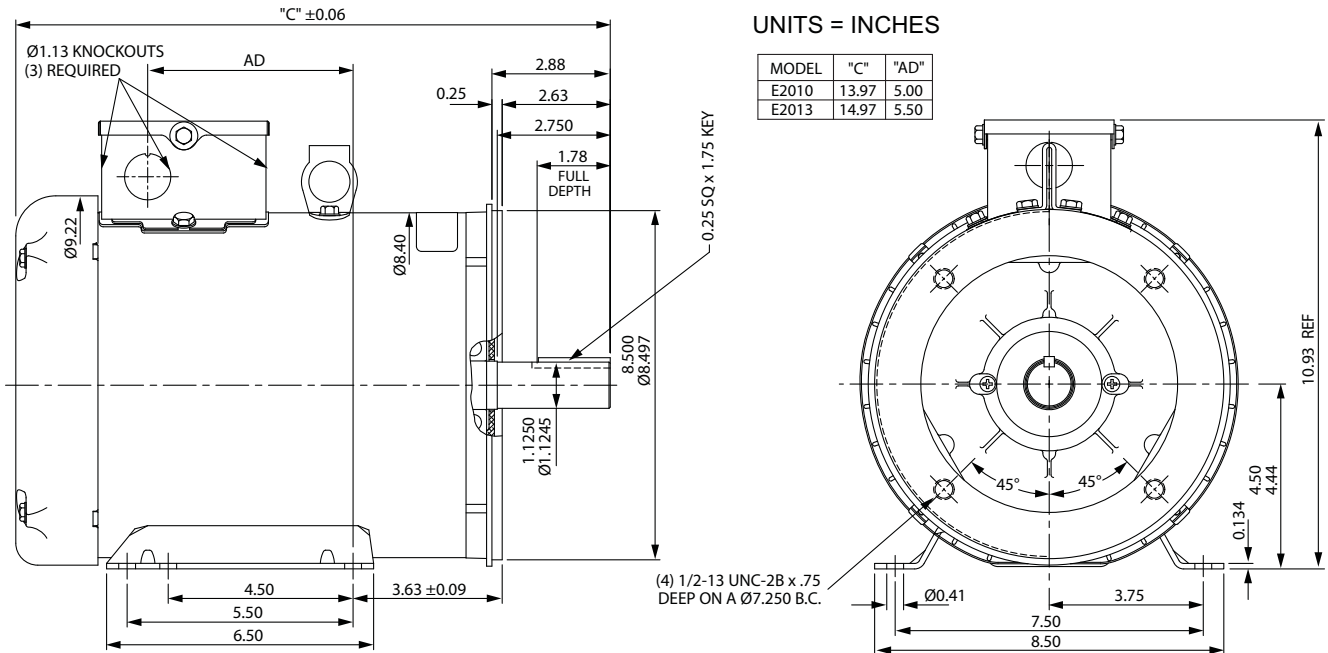


UNITS = INCHES

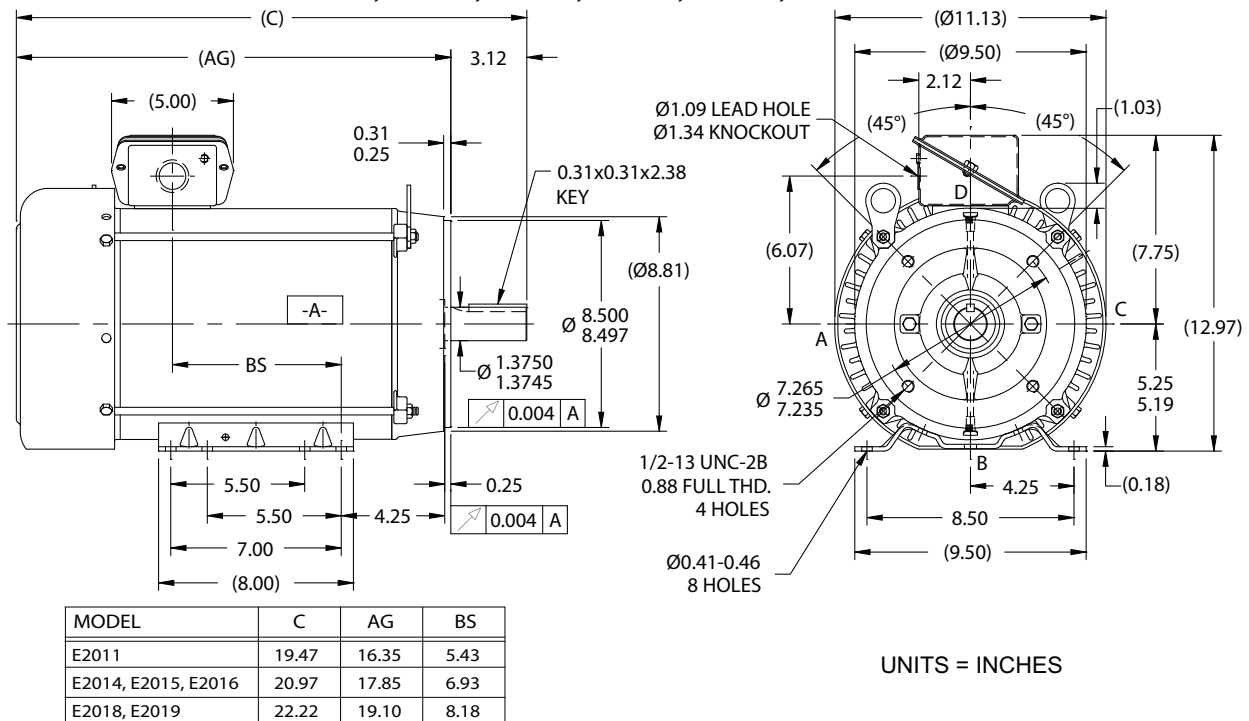
NEMA Premium® Efficiency XRI® Series Inverter Duty Motors

Motor Dimensions

Frame 182/4TC – Part #: E2010, E2013



Frame 213/5TC – Part #: E2011, E2014, E2015, E2016, E2018, E2019



STABLE™ Motor Slide Bases

Mounting Slide Bases for 56 to 449T NEMA Motors

Features

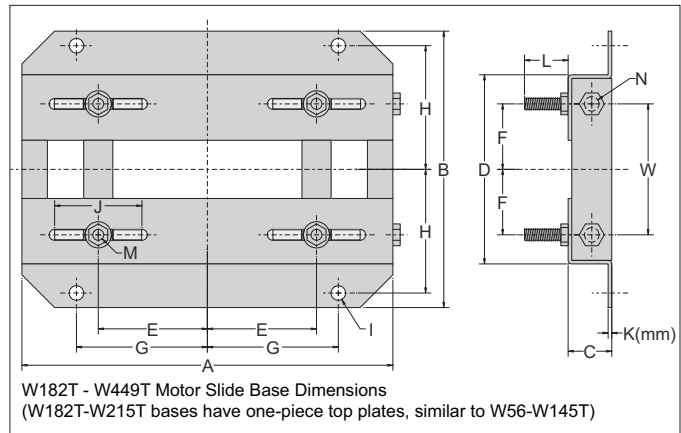
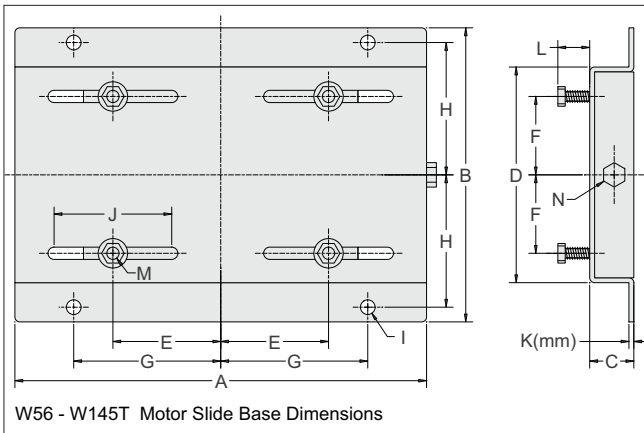
- Allows adjustment of motor mounting position
- Double adjusting screws for frames 182T - 449T
- Manufactured to precise dimensional standards
- Dimensionally interchangeable with existing major makes
- Heavy-duty steel construction
- Painted with oven-baked primer for better adhesion of customer's paint
- All "D" bolts (motor mounting bolts) are fixed to the exact motor foot pattern
- All "D" bolts are welded into position to prevent spinning and dropping from slots
- Bases are provided with washers



Motor Slide Bases											
Part Number	Fits Frame Type	Shipping Weight (lb)	Fits Motor								
			IronHorse	Marathon micro-MAX	Marathon Black Max 230/460V	Marathon Black Max 575V	Marathon Blue Max	Marathon NEMA Premium XRI	Marathon Blue Chip XRI 230/460V	Marathon Blue Chip XRI 575V	
MTA-BASE-W56		3.5	MTR-xxx-xxxx MTPM-xxx-xxxx	Y500 Y360 Y364	Y592(-A772) Y534(-A772) Y535(-A772)	Y555(-A772) Y556(-A772)	-	E2000	-	-	
MTA-BASE-W143T	T/TC	5.0	MTC-001-3BD18(CK) MTC-1P5-3BD36	-	Y536(-A772)	-	-	E2001 E2003	-	-	
MTA-BASE-W145T	145T/TC	5.6	MTC-001-3BD12 MTC-1P5-3BD18(CK) MTC-002-3BD18(CK) MTC-002-3BD36	Y368	Y537(-A772) Y538(-A772) Y551(-A772)	Y557(-A772)	-	E2002 E2004 E2006 E2007	-	-	
MTA-BASE-W182T	2T/TC	10	MTC-1P5-3BD12 MTC-003-3BD18(CK) MTC-003-3BD36	Y999	Y541(-A772)	Y558(-A772)	-	E2005 E2009 E2010	-	-	
MTA-BASE-W184T	184T/TC	10	MTC-002-3BD12 MTC-005-3BD18(CK) MTC-005-3BD36	Y372	Y540(-A772) Y543(-A772)	Y559(-A772)	-	E2008 E2012 E2013	-	-	
MTA-BASE-W213T		15	MTC-003-3BD12 MTC-7P5-3BD18(CK) MTC-7P5-3BD36	Y994	Y542(-A772) Y545(-A772)	Y560(-A772)	-	E2011 E2015 E2016	-	-	
MTA-BASE-W215T	215T/TC	16	MTC-005-3BD12 MTC-010-3BD18(CK) MTC-010-3BD36	Y996	Y544(-A772) Y547(-A772)	Y561(-A772)	-	E2014 E2018 E2019	-	-	
MTA-BASE-W254T	254T/TC	20	MTC-7P5-3BD12 MTC-015-3BD18(CK)	-	Y546(-A772) Y549(-A772)	Y562(-A772)	-	-	E205	E307	
MTA-BASE-W256T	56T/TC	21	MTC-010-3BD12 MTC-020-3BD18(CK)	-	Y548(-A772) Y552(-A772)	Y563(-A772)	-	-	E206	E308	
MTA-BASE-W284T	284T/TC	23	MTC-025-3BD18(CK)	-	Y553(-A772)	Y567(-A772)	-	-	E207	E309	
MTA-BASE-W286T	86T/TC	24	MTC-030-3BD18(CK)	-	Y393(-A772)	Y394(-A772)	-	-	E208	E310	
MTA-BASE-W324T	324T/TC	33	MTC-040-3BD18(CK)	-	-	-	Y571(-A774) Y513(-A775)	-	E209	E311	
MTA-BASE-W326T	326T/TC	35	MTC-050-3BD18(CK)	-	-	-	Y572(-A774) Y514(-A775)	-	E210	E312	
MTA-BASE-W364T	364T/TC	46	MTC-060-3BD18(CK)	-	-	-	Y573(-A774) Y515(-A775)	-	E211	E313	
MTA-BASE-W365T	365T/TC	47	MTC-075-3BD18(CK)	-	-	-	Y574(-A774) Y516(-A775)	-	E212	E315	
MTA-BASE-W404T	404T/TC	64	-	-	-	-	-	-	-	-	
MTA-BASE-W405T	405T/TC	65	MTC-100-3BD18(CK)	-	-	-	Y575(-A774) Y517(-A775)	-	E213	E314	
MTA-BASE-W444T	444T	69	MTC-125-3BD18	-	-	-	-	-	-	-	
MTA-BASE-W445T	445T	70	MTC-150-3BD18	-	-	-	-	-	-	-	
MTA-BASE-W447T	445/7T 447T	92	MTC-200-3BD18	-	-	-	-	-	-	-	
MTA-BASE-W449T	449T	98	MTC-250-3D18 MTC-300-3D18	-	-	-	-	-	-	-	

STABLE Motor Slide Bases

Dimensions – Mounting Slide Bases for NEMA Motors



Dimensions [inches, except as noted] - STABLE Motor Slide Bases															
MTA-BASE-Wxxxx	A	B	C	D	E	F	G	H	I	J	K(mm)	L	M	N	W
56	10-5/8	6-1/2	1-1/8	4-1/2	2-7/16	1-1/2	3-13/16	2-7/8	3/8	3	2 mm	7/8	5/16 x 1	3/8 x 4	n/a
143T	10-1/2	7-1/2	1-1/8	5-1/2	2-3/4	2	3-3/4	3-3/8	3/8	3	3 mm	13/16	5/16 x 1	3/8 x 4	n/a
145T	10-1/2	8-1/2	1-1/8	6-1/2	2-3/4	2-1/2	3-3/4	3-7/8	3/8	3	3 mm	13/16	5/16 x 1	3/8 x 4	n/a
182T	12-3/4	9-1/2	1-1/2	6-1/2	3-3/4	2-1/4	4-1/2	4-1/4	1/2	3	3.5 mm	1-1/2	3/8 x 1-3/4	1/2 x 6	4-1/2
184T	12-3/4	10-1/2	1-1/2	7-1/2	3-3/4	2-3/4	4-1/2	4-3/4	1/2	3	3.5 mm	1-1/2	3/8 x 1-3/4	1/2 x 6	5-1/2
213T	15	11	1-3/4	7-1/2	4-1/4	2-3/4	5-1/4	4-3/4	1/2	3-1/2	3.8 mm	1-1/2	3/8 x 1-3/4	1/2 x 6	5-1/2
215T	15	12-1/2	1-3/4	9	4-1/4	3-1/2	5-1/4	5-1/2	1/2	3-1/2	3.8 mm	1-1/2	3/8 x 1-3/4	1/2 x 6	7
254T	17-3/4	15-1/8	2	10-3/4	5	4-1/8	6-1/4	6-5/8	5/8	4	4.6 mm	1-7/16	1/2 x 1-3/4	5/8 x 6	5-5/16
256T	17-3/4	16-7/8	2	12-1/2	5	5	6-1/4	7-1/2	5/8	4	4.6 mm	1-7/16	1/2 x 1-3/4	5/8 x 6	7
284T	19-3/4	16-7/8	2	12-1/2	5-1/2	4-3/4	7	7-1/2	5/8	4-1/2	4.6 mm	1-11/16	1/2 x 2	5/8 x 6	7
286T	19-3/4	18-3/8	2	14	5-1/2	5-1/2	7	8-1/4	5/8	4-1/2	4.6 mm	1-11/16	1/2 x 2	5/8 x 6	8
324T	22-3/4	19-1/4	2-1/2	14	6-1/4	5-1/4	8	8-1/2	3/4	5-1/4	4.6 mm	2-3/16	5/8 x 2-1/2	3/4 x 9	7
326T	22-3/4	20-3/4	2-1/2	15-1/2	6-1/4	6	8	9-1/4	3/4	5-1/4	4.6 mm	2-3/16	5/8 x 2-1/2	3/4 x 9	8-1/2
364T	25-1/2	20-1/2	2-1/2	15-1/2	7	5-5/8	9	9-1/8	3/4	6	5.8 mm	2-1/16	5/8 x 2-1/2	3/4 x 9	7-3/4
365T	25-1/2	21-1/2	2-1/2	16-1/2	7	6-1/8	9	9-5/8	3/4	6	5.8 mm	2-1/16	5/8 x 2-1/2	3/4 x 9	8-3/4
404T	28-3/4	22-3/8	3	16-1/2	8	6-1/8	10	9-7/8	7/8	7	5.8 mm	2-1/2	3/4 x 3	3/4 x 11	8-3/4
405T	28-3/4	23-7/8	3	18	8	6-7/8	10	10-5/8	7/8	7	5.8 mm	2-1/2	3/4 x 3	3/4 x 11	10-1/4
444T	31-1/4	24-5/8	3	19-1/4	9	7-1/4	11	11	7/8	7-1/2	5.8 mm	2-1/2	3/4 x 3	3/4 x 11	11
445T	31-1/4	26-5/8	3	21-1/4	9	8-1/4	11	12	7/8	7-1/2	5.8 mm	2-1/2	3/4 x 3	3/4 x 11	13
447T	31-1/4	30-1/8	3	24-3/4	9	10	11	13-3/4	7/8	7-1/2	8 mm	3	3/4 x 3-1/2	3/4 x 11	16-1/2
449T	31-1/4	35-1/8	3	29-3/4	9	12-1/2	11	16-1/4	7/8	7-1/2	8 mm	3	3/4 x 3-1/2	3/4 x 11	21-1/2