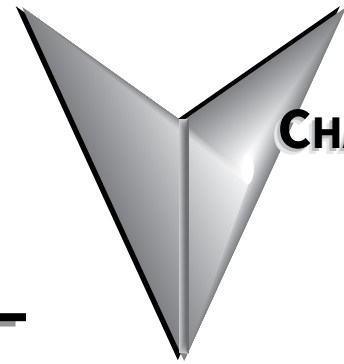


# MOUNTING AND INITIAL STARTUP

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## CHAPTER 2

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## Safety Information

### Danger!



**HAZARDOUS VOLTAGE!** BEFORE MAKING ANY CONNECTION TO THE MOTOR, DISCONNECT ALL POWER TO THE MOTOR.



**WARNING:** ANY ELECTRICAL OR MECHANICAL MODIFICATION TO THIS EQUIPMENT WITHOUT PRIOR WRITTEN CONSENT OF AUTOMATIONDIRECT.COM, INC. WILL VOID ALL WARRANTIES, MAY RESULT IN A SAFETY HAZARD, AND MAY VOID THE cCSA<sub>US</sub> OR cUR<sub>US</sub> LISTING.



**WARNING:** TO AVOID PHYSICAL INJURY, KEEP YOUR HANDS AND CLOTHING AWAY FROM ALL MOVING PARTS.

#### **WIRING NOTES: PLEASE READ PRIOR TO INSTALLATION.**

- 1) During installation, follow all local electrical, construction, and safety codes for the country in which the motor is to be installed.
- 2) Make sure the appropriate protective devices (circuit breaker or fuses) are connected between the power source and motor controller.
- 3) Make sure that the leads are connected correctly and the motor is properly grounded. (Ground resistance should not exceed 0.1Ω.)
- 4) Use ground leads that comply with AWG/MCM standards and keep them as short as possible.
- 5) Make sure that the power source is capable of supplying the correct voltage and required current to the motor.
- 6) Do not attach or remove wiring when power is applied to the motor.

#### **APPLICABLE CODES**

Most IronHorse® motors are cCSA<sub>US</sub> listed, and therefore comply with the requirements of the National Electrical Code (NEC) and the Canadian Electrical Code (CEC).

IronHorse MTDP, open drip proof and MTF2, farm duty motors are cUR<sub>US</sub> recognized and comply with the requirements of the National Electrical Code (NEC) and the Canadian Electrical Code (CEC).

Because IronHorse, MTDP and MTF2 motors are UL recognized, it is the responsibility of the user to insure that the installation complies with the conditions of acceptability as specified in the UR file.

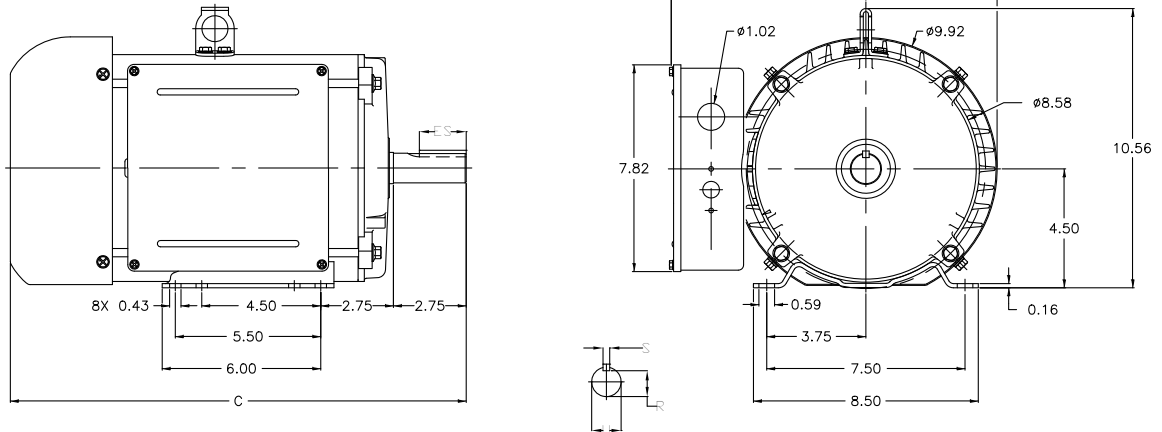
Installation intended to meet the cCSA<sub>US</sub> requirements must follow the instructions provided in the “Wiring Notes” as a minimum standard. Follow all local codes that exceed cCSA<sub>US</sub> requirements. Refer to the technical data on the motor nameplate for electrical and performance data.

## Motor Dimensions

(Dimensions = inches)

### MTF2 T-FRAME SINGLE-PHASE FARM-DUTY MOTOR DIMENSIONS

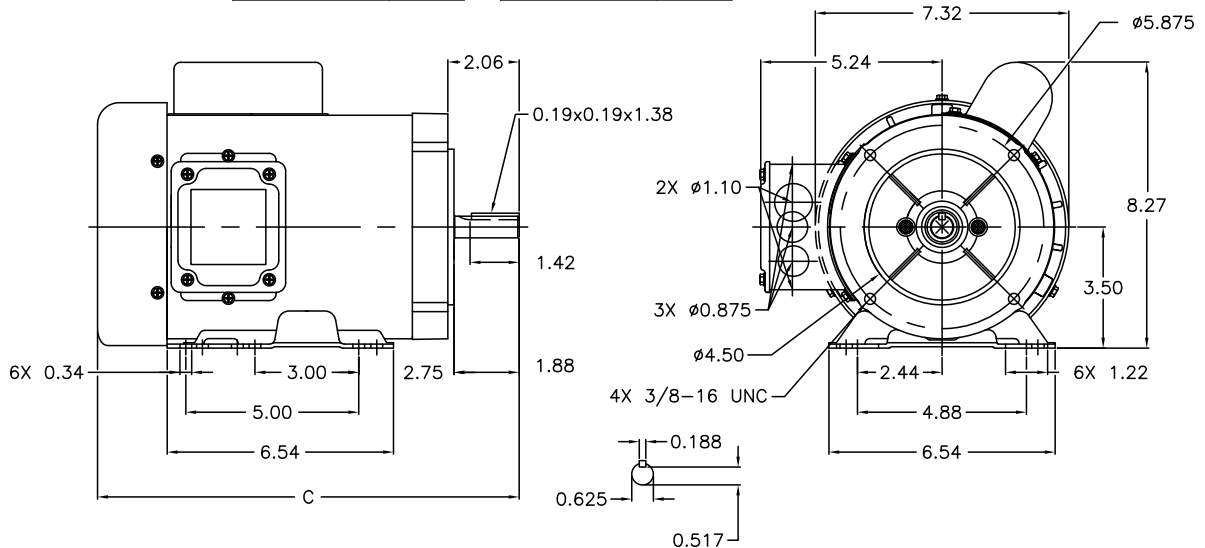
PART NUMBER	DIM. C	U	R	S	ES
MTF2-002-1B18-182	18.6	1.125	0.986	0.25	1.78
MTF2-003-1B18	18.6	1.125	0.986	0.25	1.78
MTF2-005-1B18	18.6	1.125	0.986	0.25	1.78
MTF2-7P5-1B18-215	20.46	1.375	1.201	0.312	2.41
MTF2-010-1B18	20.46	1.375	1.201	0.312	2.41



### MTR2 56(H)C-FRAME SINGLE-PHASE ROLLED-STEEL MOTOR DIMENSIONS

#### MTR2 56C-FRAME SINGLE-PHASE MOTOR DIMENSIONS, 1/3 – 1 HP

PART NUMBER	DIM. C	PART NUMBER	DIM. C
MTR2-P33-1AB18	11.90	MTR2-P75-1AB18	12.40
MTR2-P33-1AB36	11.90	MTR2-P75-1AB36	11.90
MTR2-P50-1AB18	11.90	MTR2-001-1AB18	12.90
MTR2-P50-1AB36	11.90	MTR2-001-1AB36	12.40

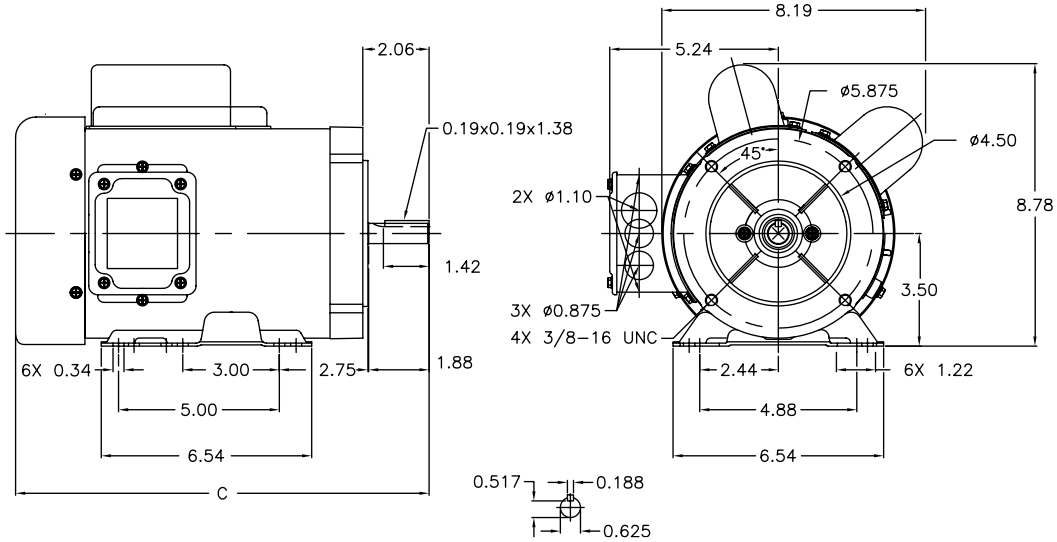


**MTR2 56(H)C-FRAME SINGLE-PHASE ROLLED-STEEL MOTOR DIMENSIONS (CONTINUED)**

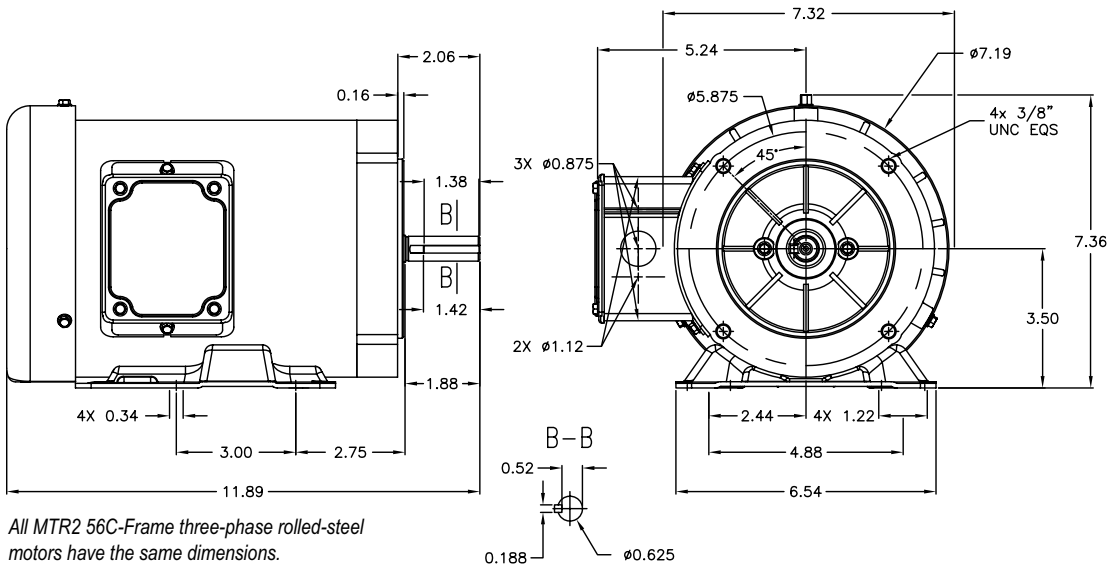
**(DIMENSIONS = INCHES)**

**MTR2 56(H)C-FRAME SINGLE-PHASE MOTOR DIMENSIONS, 1-1/2 – 2 HP**

PART NUMBER	DIM. C
MTR2-1P5-1AB18	12.90
MTR2-002-1AB18	13.90
MTR2-1P5-1AB36	12.40
MTR2-002-1AB36	12.90



**MTR2 56C-FRAME THREE-PHASE ROLLED-STEEL MOTOR DIMENSIONS**

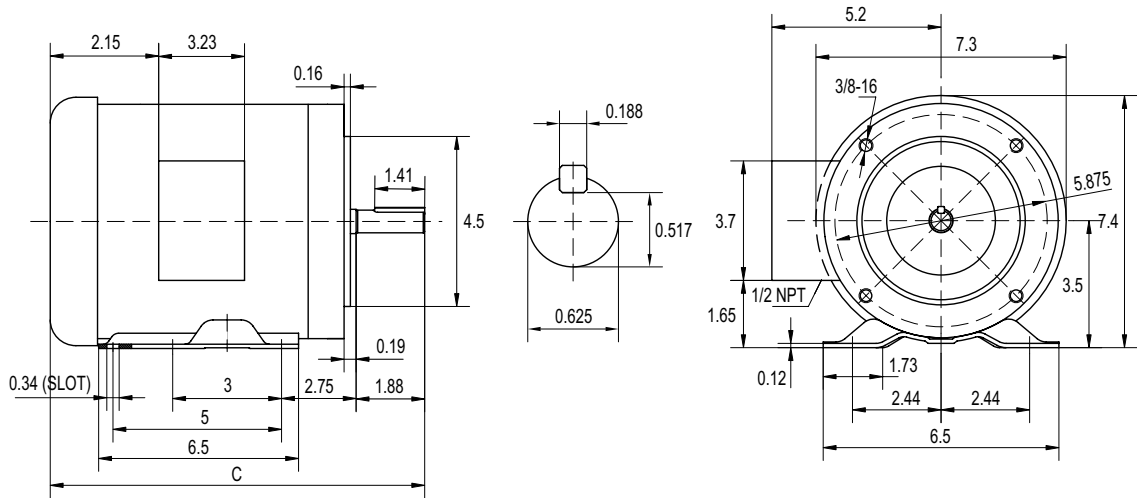


All MTR2 56C-Frame three-phase rolled-steel motors have the same dimensions.

**MOTOR DIMENSIONS (CONTINUED)**

**(DIMENSIONS = INCHES)**

**MTRP 56HC-FRAME THREE-PHASE ROLLED-STEEL MOTOR DIMENSIONS**

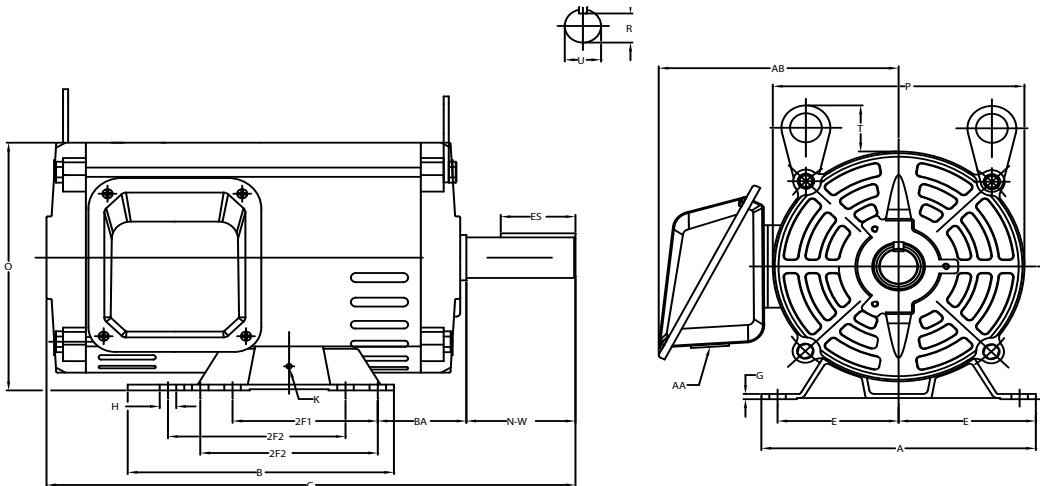


- C = 12.4 in; 1.0hp MTRP-001-3BD18
- C = 13.4 in; 1.5hp MTRP-1P5-3BD18
- C = 13.9 in; 2hp MTRP-002-3BD18
- C = 11.9 in; 1 to 2 hp MTRP-xxx-3BD36
- C = 12.9 in; 3hp MTRP-003-3BD36

**UNITS = INCHES**

MTRP-xxx-3BDxx IronHorse Motors  
(3-phase rolled steel)

**MTDP OPEN DRIP-PROOF THREE-PHASE ROLLED-STEEL MOTOR DIMENSIONS**

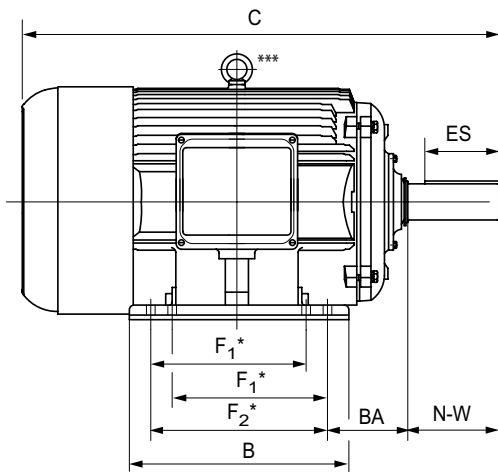


PART #	FRAME #	"E"	"2F1"	"2F2"	"H"	"BA"	"A"	"B"	"C"	"D"	"G"	"K"
MTDP-001-3BD18	143T	2.75	4.00	5.00	0.34	2.25	6.50	6.50	11.97	3.50	0.12	M5
MTDP-1P5-3BD18	145T	2.75	4.00	5.00	0.34	2.25	6.50	6.50	11.97	3.50	0.12	M5
MTDP-002-3BD18	145T	2.75	4.00	5.00	0.34	2.25	6.50	6.50	11.97	3.50	0.12	M5
MTDP-003-3BD36	145T	2.75	4.00	5.00	0.34	2.25	6.50	6.50	11.97	3.50	0.12	M5
MTDP-003-3BD18	182T	3.75	4.50	5.50	0.41	2.75	8.50	6.50	16.40	4.50	0.41	M5
MTDP-005-3BD36	182T	3.75	4.50	5.50	0.41	2.75	8.50	6.50	16.40	4.50	0.41	M5
MTDP-005-3BD18	184T	3.75	4.50	5.50	0.41	2.75	8.50	6.50	16.40	4.50	0.41	M5
MTDP-7P5-3BD36	184T	3.75	4.50	5.50	0.41	2.75	8.50	6.50	16.40	4.50	0.41	M5
MTDP-7P5-3BD18	213T	4.25	5.50	7.00	0.43	3.50	9.69	8.18	17.80	5.25	0.18	M5
MTDP-010-3BD18	215T	4.25	5.50	7.00	0.43	3.50	9.69	8.18	17.80	5.25	0.18	M5
MTDP-015-3BD18	254T	5.00	8.25	10.00	0.53	4.25	12.05	11.57	22.30	6.25	0.24	M6
MTDP-020-3BD18	256T	5.00	8.25	10.00	0.53	4.25	12.05	11.57	22.30	6.25	0.24	M6
MTDP-025-3BD18	284T	5.50	9.50	11.00	0.53	4.75	12.80	12.80	25.00	7.00	0.24	M6
MTDP-030-3BD18	286T	5.50	9.50	11.00	0.53	4.75	12.80	12.80	25.00	7.00	0.24	M6
MTDP-040-3BD18	324T	6.25	10.50	12.00	0.66	5.25	15.08	14.00	27.80	8.00	0.28	M8
MTDP-050-3BD18	326T	6.25	10.50	12.00	0.66	5.25	15.08	14.00	27.80	8.00	0.28	M8
PART #	FRAME #	"R"	"ES"	"S"	"U"	"N-W"	"P"	"AB"	"AA"	"O"	"T"	
MTDP-001-3BD18	143T	0.771	1.41	0.188	0.875	2.25	6.40	5.38	1.09	6.70	--	
MTDP-1P5-3BD18	145T	0.771	1.41	0.188	0.875	2.25	6.40	5.38	1.09	6.70	--	
MTDP-002-3BD18	145T	0.771	1.41	0.188	0.875	2.25	6.40	5.38	1.09	6.70	--	
MTDP-003-3BD36	145T	0.771	1.41	0.188	0.875	2.25	6.40	5.38	1.09	6.70	--	
MTDP-003-3BD18	182T	0.986	1.78	0.250	1.125	2.75	7.72	7.55	1.09	8.40	1.60	
MTDP-005-3BD36	182T	0.986	1.78	0.250	1.125	2.75	7.72	7.55	1.09	8.40	1.60	
MTDP-005-3BD18	184T	0.986	1.78	0.250	1.125	2.75	7.72	7.55	1.09	8.40	1.60	
MTDP-7P5-3BD36	184T	0.986	1.78	0.250	1.125	2.75	7.72	7.55	1.09	8.40	1.60	
MTDP-7P5-3BD18	213T	1.201	2.41	0.312	1.375	3.38	8.98	8.16	1.38	9.74	1.50	
MTDP-010-3BD18	215T	1.201	2.41	0.312	1.375	3.38	8.98	8.16	1.38	9.74	1.50	
MTDP-015-3BD18	254T	1.416	2.91	0.375	1.625	4.00	10.63	9.70	1.38	11.60	2.48	
MTDP-020-3BD18	256T	1.416	2.91	0.375	1.625	4.00	10.63	9.70	1.38	11.60	2.36	
MTDP-025-3BD18	284T	1.591	3.28	0.500	1.875	4.62	12.20	11.10	2.00	13.10	2.36	
MTDP-030-3BD18	286T	1.591	3.28	0.500	1.875	4.62	12.20	11.10	2.00	13.10	2.36	
MTDP-040-3BD18	324T	1.845	3.88	0.500	2.125	5.25	14.00	13.10	2.50	15.00	2.36	
MTDP-050-3BD18	326T	1.845	3.88	0.500	2.125	5.25	14.00	13.10	2.50	15.00	2.36	

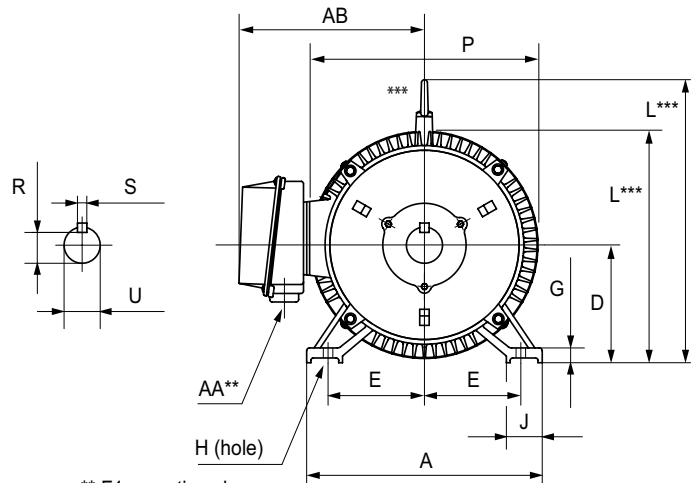
**MOTOR DIMENSIONS (CONTINUED)**

**(DIMENSIONS = INCHES)**

**MTCP2 PREMIUM-EFFICIENCY T-FRAME THREE-PHASE MOTOR DIMENSIONS**



\* Various frame sizes have 2 or 4 mounting holes per mounting foot (one mounting foot per side).



\*\* F1 mounting shown.  
 \*\* Some frame sizes are F1/F2 convertible.  
 \*\*\* Frames 143T & 145T have no lifting eyelet.

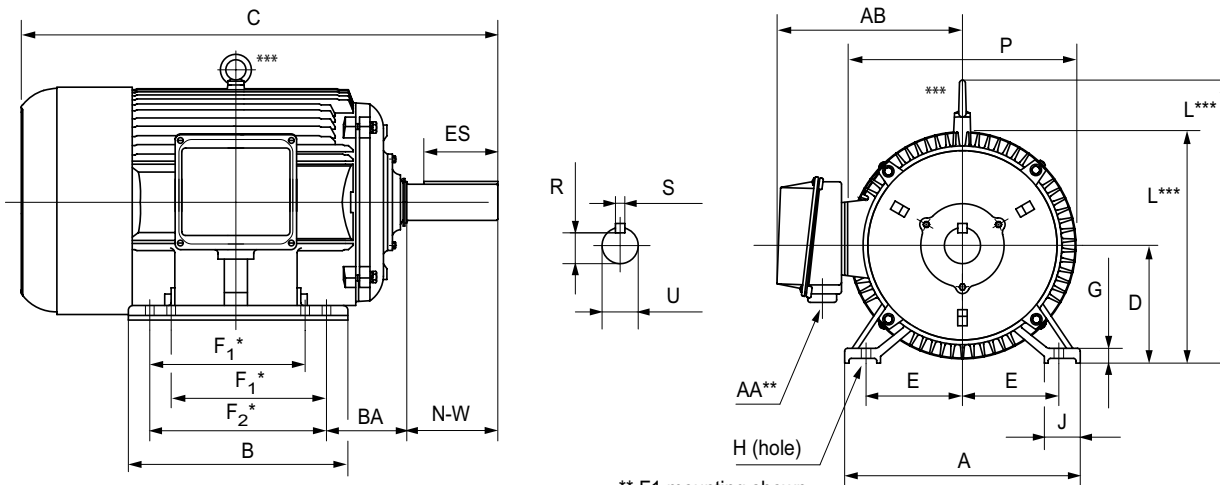
Dimensions [inches, except as noted] Premium-Efficiency Three-Phase T-Frame Motors – 1800 rpm											
Part Number	HP	NEMA Frame	A	AA**	AB	B	BA	C	D	E	ES
MTCP2-001-3BD18	1	143T	7	3/4" NPT	6.7	5.6	2.25	12.47	3.5	2.75	1.41
MTCP2-1P5-3BD18	1-1/2	145T	7	3/4" NPT	6.7	6.6	2.25	13.47	3.5	2.75	1.41
MTCP2-002-3BD18	2		7	3/4" NPT	6.7	6.6	2.25	13.47	3.5	2.75	1.41
MTCP2-003-3BD18	3	182T	9	1" NPT	7.2	6	2.75	15	4.5	3.75	1.78
MTCP2-005-3BD18	5	184T	9	1" NPT	8.2	7	2.75	16	4.5	3.75	1.78
MTCP2-7P5-3BD18	7-1/2	213T	10.5	1" NPT	8.5	7.5	3.5	19.5	5.25	4.25	2.41
MTCP2-010-3BD18	10	215T	10.5	1" NPT	8.5	9	3.5	21	5.25	4.25	2.41
MTCP2-015-3BD18	15	254T	12.5	1.5" NPT	10.5	10.3	4.25	23.3	6.25	5	2.91
MTCP2-020-3BD18	20	256T	12.5	1.5" NPT	10.5	12	4.25	25.3	6.25	5	2.91
MTCP2-025-3BD18	25	284T	14	1.5" NPT	11.5	12.4	4.75	26.63	7	5.5	3.28
MTCP2-030-3BD18	30	286T	14	1.5" NPT	11.5	13.9	4.75	28.1	7	5.5	3.28
MTCP2-040-3BD18	40	324T	16	2" NPT	14.5	13.5	5.25	29.6	8	6.25	3.91
MTCP2-050-3BD18	50	326T	16	2" NPT	14.5	15	5.25	31.2	8	6.25	3.91
MTCP2-060-3BD18	60	364T	17	3" NPT	16.5	15	5.88	32.58	9	7	4.28
MTCP2-075-3BD18	75	365T	17	3" NPT	16.5	16	5.88	33.6	9	7	4.28
MTCP2-100-3BD18	100	405T	20	3" NPT	19	17	6.62	38.1	10	8	5.65
MTCP2-125-3BD18	125	444T	22	2x3" NPT	20	18.5	7.5	41.9	11	9	6.91
MTCP2-150-3BD18	150	445T	22	2x3" NPT	20	20.5	7.5	44	11	9	6.91
MTCP2-200-3BD18	200	445/7T	22	2x3" NPT	20	24	7.5	47.4	11	9	6.91
MTCP2-250-3D18	250	449T	22	2x3" NPT	19.5	31	7.5	58	11	9	6.91
MTCP2-300-3D18	300	449T	22	2x3" NPT	19.5	31	7.5	58	11	9	6.91

\* Various frame sizes have 2 or 4 mounting holes per mounting foot.  
 \*\* AA dimension is conduit fitting size. F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T-frame "Motor Specifications" table.  
 (F2 mounting = conduit entrance on right side facing shaft.)  
 \*\*\* Frame sizes 143T(C) and 145T(C) have no lifting eyelet.

\*\*\*\* TABLE CONTINUED NEXT PAGE (for dimensions F1-U) \*\*\*\*

**MTCP2 PREMIUM-EFFICIENCY T-FRAME THREE-PHASE MOTOR DIMENSIONS (CONTINUED)**

**(DIMENSIONS = INCHES)**



\* Various frame sizes have 2 or 4 mounting holes per mounting foot (one mounting foot per side).

\*\* F1 mounting shown.  
 \*\* Some frame sizes are F1/F2 convertible.  
 \*\*\* Frames 143T & 145T have no lifting eyelet.

\*\*\*\* TABLE CONTINUED FROM PREVIOUS PAGE (for dimensions A–ES) \*\*\*\*

Dimensions [inches, except as noted]													
Premium-Efficiency Three-Phase T-Frame Motors – 1800 rpm													
Part Number	HP	Frame	F <sub>1</sub> *	F <sub>2</sub> *	G	H	J	N-W	L	P	R	S	U
MTCP2-001-3BD18	1	143T	n/a	4	0.47	0.34	1.45	2.25	7.6	7.8	0.771	0.188	0.8759
MTCP2-1P5-3BD18	1-1/2	145T	4	5	0.47	0.34	1.45	2.25	7.8	8	0.771	0.188	0.8759
MTCP2-002-3BD18	2		4	5	0.43	0.34	1	2.25	7.8	8	0.771	0.188	0.8759
MTCP2-003-3BD18	3	182T	n/a	4.5	0.6	0.41	2	2.75	9.5	9.7	0.986	0.25	1.125
MTCP2-005-3BD18	5	184T	4.5	5.5	0.6	0.41	2	2.75	9.5	9.7	0.986	0.25	1.125
MTCP2-7P5-3BD18	7-1/2	213T	n/a	5.5	0.71	0.41	2.4	3.38	10.6	10.6	1.201	0.312	1.375
MTCP2-010-3BD18	10	215T	5.5	7	0.71	0.41	2.4	3.38	10.6	10.4	1.201	0.312	1.375
MTCP2-015-3BD18	15	254T	n/a	8.25	0.79	0.53	2.40	4	12.9	12.6	1.416	0.375	1.625
MTCP2-020-3BD18	20	256T	8.25	10	0.79	0.53	2.40	4	12.9	12.6	1.416	0.375	1.625
MTCP2-025-3BD18	25	284T	n/a	9.5	0.87	0.53	2.8	4.62	14.3	14	1.591	0.5	1.875
MTCP2-030-3BD18	30	286T	9.5	11	0.87	0.53	2.8	4.62	14.3	14	1.591	0.5	1.875
MTCP2-040-3BD18	40	324T	n/a	10.5	0.99	0.66	2.8	5.25	16	15.7	1.845	0.5	2.125
MTCP2-050-3BD18	50	326T	10.5	12	0.99	0.66	2.8	5.25	16	15.7	1.845	0.5	2.125
MTCP2-060-3BD18	60	364T	n/a	11.25	1.18	0.66	3	5.88	18.8	19.1	2.021	0.625	2.375
MTCP2-075-3BD18	75	365T	11.25	12.25	1.18	0.66	3	5.88	18.8	19.1	2.021	0.625	2.375
MTCP2-100-3BD18	100	405T	12.25	13.75	1.18	0.81	3.2	7.25	21.1	21.6	2.45	0.75	2.875
MTCP2-125-3BD18	125	444T	n/a	14.5	1.38	0.81	3.35	8.5	23	23.5	2.88	0.875	3.375
MTCP2-150-3BD18	150	445T	14.5	16.5	1.38	0.81	3.35	8.5	23	23.5	2.88	0.875	3.375
MTCP2-200-3BD18	200	445/7T	16.5	20	1.38	0.81	3.35	8.5	23	23.5	2.88	0.875	3.375
MTCP2-250-3D18	250	449T	n/a	25	1.58	0.81	3.4	8.500	23	24	2.88	0.875	3.375
MTCP2-300-3D18	300	449T	n/a	25	1.58	0.81	3.4	8.500	23	24	2.88	0.875	3.375

\* Various frame sizes have 2 or 4 mounting holes per mounting foot.

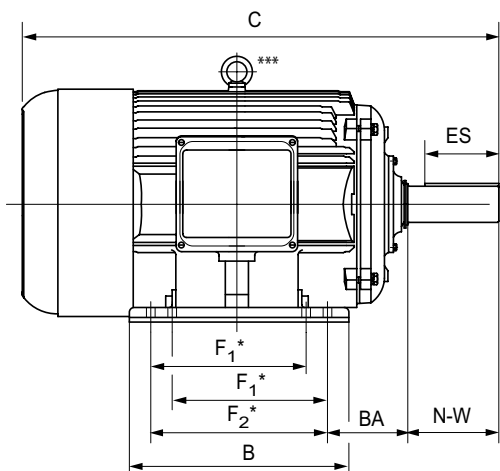
\*\* AA dimension is conduit fitting size. F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T-frame "Motor Specifications" table.  
 (F2 mounting = conduit entrance on right side facing shaft.)

\*\*\* Frame sizes 143T(C) and 145T(C) have no lifting eyelet.

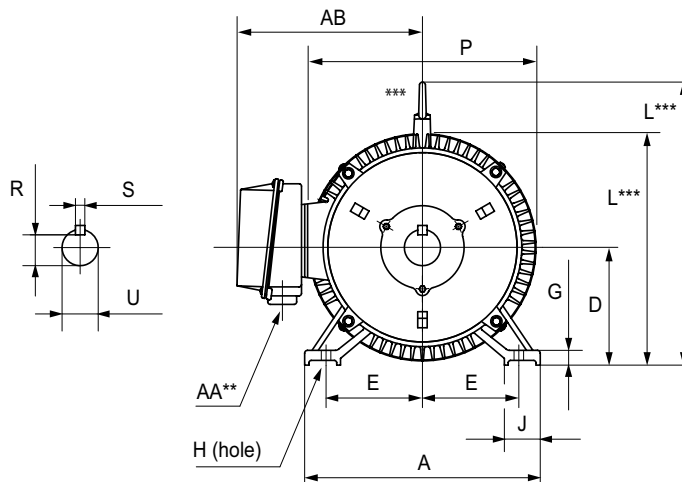


**MTCP2 PREMIUM-EFFICIENCY T-FRAME THREE-PHASE MOTOR DIMENSIONS (CONTINUED)**

**(DIMENSIONS = INCHES)**



\* Various frame sizes have 2 or 4 mounting holes per mounting foot (one mounting foot per side).

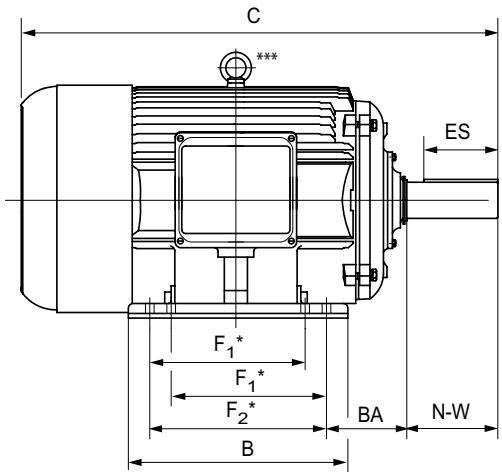


\*\* F1 mounting shown.  
 \*\* Some frame sizes are F1/F2 convertible.  
 \*\*\* Frames 143T & 145T have no lifting eyelet.

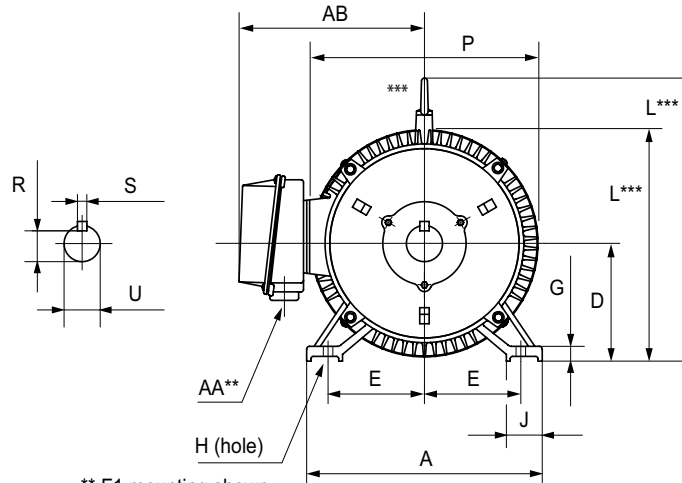
Dimensions [inches, except as noted]											
Premium-Efficiency Three-Phase T-Frame Motors – 1200 & 3600 rpm											
Part Number	HP	NEMA Frame	A	AA**	AB	B	BA	C	D	E	ES
<b>1200 rpm Motors</b>											
MTCP2-001-3BD12	1	145T	7	3/4" NPT	6.7	6.6	2.25	13.47	3.5	2.75	1.41
MTCP2-1P5-3BD12	1-1/2	182T	9	1" NPT	7.2	6	2.75	15	4.5	3.75	1.78
MTCP2-002-3BD12	2	184T	9	1" NPT	8.2	7	2.75	16	4.5	3.75	1.78
MTCP2-003-3BD12	3	213T	10.5	1" NPT	8.5	7.5	3.5	19.5	5.25	4.25	2.41
MTCP2-005-3BD12	5	215T	10.5	1" NPT	8.5	9	3.5	21	5.25	4.25	2.41
MTCP2-7P5-3BD12	7-1/2	254T	12.5	1.5" NPT	10.5	10.3	4.25	23.3	6.25	5	2.91
MTCP2-010-3BD12	10	256T	12.5	1.5" NPT	10.5	12	4.25	25.3	6.25	5	2.91
MTCP2-015-3BD12	15	284T	14	1.5" NPT	11.5	12.4	4.75	26.63	7	5.5	3.28
MTCP2-020-3BD12	20	286T	14	1.5" NPT	11.5	13.9	4.75	28.1	7	5.5	3.28
<b>3600 rpm Motors</b>											
MTCP2-1P5-3BD36	1-1/2	143T	7	3/4" NPT	6.7	5.6	2.25	12.47	3.5	2.75	1.41
MTCP2-002-3BD36	2	145T	7	3/4" NPT	6.7	6.6	2.25	13.47	3.5	2.75	1.41
MTCP2-003-3BD36	3	182T	9	1" NPT	7.2	6	2.75	15	4.5	3.75	1.78
MTCP2-005-3BD36	5	184T	9	1" NPT	8.2	7	2.75	16	4.5	3.75	1.78
MTCP2-7P5-3BD36	7-1/2	213T	10.5	1" NPT	8.5	7.5	3.5	19.5	5.25	4.25	2.41
MTCP2-010-3BD36	10	215T	10.5	1" NPT	8.5	9	3.5	21	5.25	4.25	2.41
MTCP2-015-3BD36	15	254T	12.5	1.5" NPT	10.5	10.3	4.25	23.3	6.25	5	2.91
MTCP2-020-3BD36	20	256T	12.5	1.5" NPT	10.5	12	4.25	25.3	6.25	5	2.91
* Various frame sizes have 2 or 4 mounting holes per mounting foot.											
** AA dimension is conduit fitting size. F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T-frame "Motor Specifications" table. (F2 mounting = conduit entrance on right side facing shaft.)											
*** Frame sizes 143T(C) and 145T(C) have no lifting eyelet.											
**** TABLE CONTINUED NEXT PAGE (for dimensions F1-U) ****											

**MTCP2 PREMIUM-EFFICIENCY T-FRAME THREE-PHASE MOTOR DIMENSIONS (CONTINUED)**

**(DIMENSIONS = INCHES)**



\* Various frame sizes have 2 or 4 mounting holes per mounting foot (one mounting foot per side).



\*\* F1 mounting shown.  
 \*\* Some frame sizes are F1/F2 convertible.  
 \*\*\* Frames 143T & 145T have no lifting eyelet.

\*\*\*\* TABLE CONTINUED FROM PREVIOUS PAGE (for dimensions A-ES) \*\*\*\*

Dimensions [inches, except as noted]

Premium-Efficiency Three-Phase T-Frame Motors – 1200 & 3600 rpm

Part Number	HP	Frame	F <sub>1</sub> *	F <sub>2</sub> *	G	H	J	N-W	L	P	R	S	U
<b>1200 rpm Motors</b>													
MTCP2-001-3BD12	1	145T	4	5	0.43	0.34	1	2.25	7.8	8	0.771	0.188	0.8759
MTCP2-1P5-3BD12	1-1/2	182T	n/a	4.5	0.6	0.41	2	2.75	9.5	9.7	0.986	0.25	1.125
MTCP2-002-3BD12	2	184T	4.5	5.5	0.6	0.41	2	2.75	9.5	9.7	0.986	0.25	1.125
MTCP2-003-3BD12	3	213T	n/a	5.5	0.71	0.41	2.4	3.38	10.6	10.6	1.201	0.312	1.375
MTCP2-005-3BD12	5	215T	5.5	7	0.71	0.41	2.4	3.38	10.6	10.4	1.201	0.312	1.375
MTCP2-7P5-3BD12	7-1/2	254T	n/a	8.25	0.79	0.53	2.40	4	12.9	12.6	1.416	0.375	1.625
MTCP2-010-3BD12	10	256T	8.25	10	0.79	0.53	2.40	4	12.9	12.6	1.416	0.375	1.625
MTCP2-015-3BD12	15	284T	n/a	9.5	0.87	0.53	2.8	4.62	14.3	14	1.591	0.5	1.875
MTCP2-020-3BD12	20	286T	9.5	11	0.87	0.53	2.8	4.62	14.3	14	1.591	0.5	1.875
<b>3600 rpm Motors</b>													
MTCP2-1P5-3BD36	1-1/2	143T	n/a	4	0.47	0.34	1	2.25	7.6	7.8	0.771	0.188	0.8759
MTCP2-002-3BD36	2	145T	4	5	0.43	0.34	1	2.25	7.8	8	0.771	0.188	0.8759
MTCP2-003-3BD36	3	182T	n/a	4.5	0.6	0.41	2	2.75	9.5	9.7	0.986	0.25	1.125
MTCP2-005-3BD36	5	184T	4.5	5.5	0.6	0.41	2	2.75	9.5	9.7	0.986	0.25	1.125
MTCP2-7P5-3BD36	7-1/2	213T	n/a	5.5	0.71	0.41	2.4	3.38	10.6	10.6	1.201	0.312	1.375
MTCP2-010-3BD36	10	215T	5.5	7	0.71	0.41	2.4	3.38	10.6	10.4	1.201	0.312	1.375
MTCP2-015-3BD36	15	254T	n/a	8.25	0.79	0.53	2.40	4	12.9	12.6	1.416	0.375	1.625
MTCP2-020-3BD36	20	256T	8.25	10	0.79	0.53	2.40	4	12.9	12.6	1.416	0.375	1.625

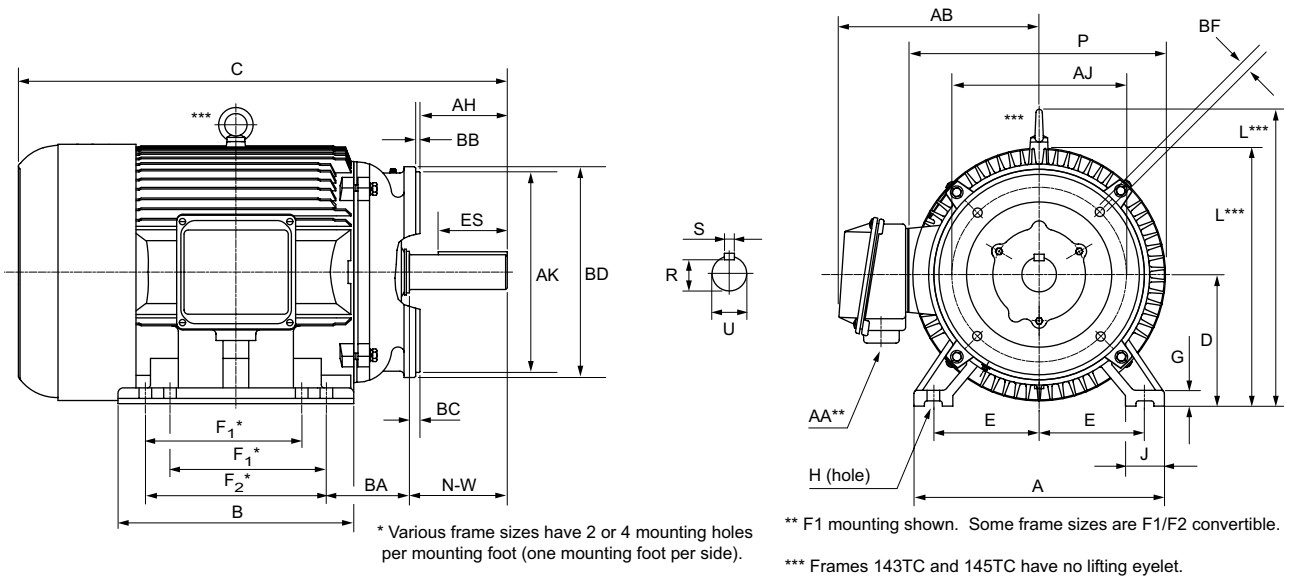
\* Various frame sizes have 2 or 4 mounting holes per mounting foot.

\*\* AA dimension is conduit fitting size. F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T-frame "Motor Specifications" table.  
 (F2 mounting = conduit entrance on right side facing shaft.)

\*\*\* Frame sizes 143T(C) and 145T(C) have no lifting eyelet.

**MTCP2 PREMIUM-EFFICIENCY TC-FRAME THREE-PHASE MOTOR DIMENSIONS**

**(DIMENSIONS = INCHES)**



Dimensions [inches, except as noted] Premium-Efficiency Three-Phase TC-Frame Motors – 1800 rpm															
Part # MTCP2- xxx- 3BD18C	HP	NEMA Frame	A	AA**	AB	AH	AJ	AK	B	BA	BB	BC	BD	BF	C
-001-	1	143TC	7	3/4"NPT	6.7	1.96	5.875	4.5	5.6	2.25	0.16	0.29	6.5	3/8-16	12.5
-1P5-	1-1/2	145TC	7	3/4"NPT	6.7	1.96	5.875	4.5	6.6	2.25	0.16	0.29	6.5	3/8-16	13.5
-002-	2		7		6.6										
-003-	3	182TC	9	1" NPT	7.2	2.37	7.25	8.5	6	2.75	0.25	0.38	9	1/2-13	15
-005-	5	184TC	9	1" NPT	8.2	2.37	7.25	8.5	7	2.75	0.25	0.38	9	1/2-13	16
-7P5-	7-1/2	213TC	10.5	1" NPT	8.5	2.87	7.25	8.5	7.5	3.5	0.25	0.51	9	1/2-13	20.3
-010-	10	215TC	10.5	1" NPT	8.5	2.87	7.25	8.5	9	3.5	0.25	0.51	9	1/2-13	21.8
-015-	15	254TC	12.5	1.5"NPT	10.5	3.75	7.25	8.5	10.3	4.25	0.25	0.25	10	1/2-13	23.3
-020-	20	256TC	12.5	1.5"NPT	10.5	3.75	7.25	8.5	12	4.25	0.25	0.25	10	1/2-13	25.3
-025-	25	284TC	14	1.5"NPT	11.5	4.38	9	10.5	12.4	4.75	0.25	0.25	11.25	1/2-13	26.6
-030-	30	286TC	14	1.5"NPT	11.5	4.38	9	10.5	13.9	4.75	0.25	0.24	11.25	1/2-13	28.1

\* Various frame sizes have 2 or 4 mounting holes per mounting foot.

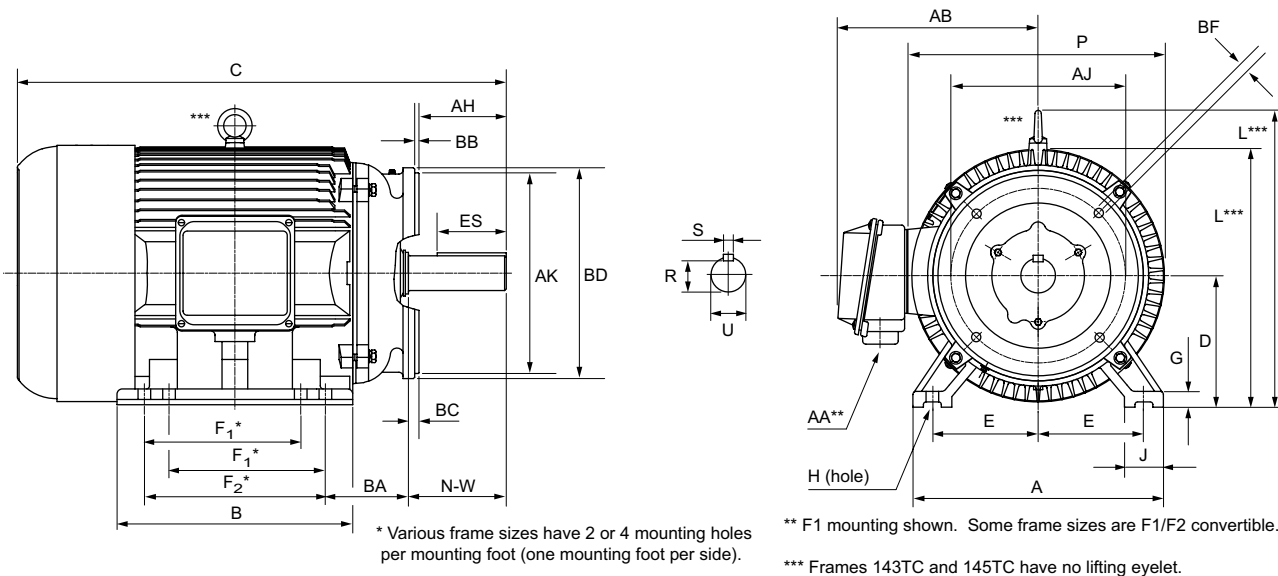
\*\* AA dimension is conduit fitting size. F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T-frame "Motor Specifications" table.  
(F2 mounting = conduit entrance on right side facing shaft.)

\*\*\* Frame sizes 143T(C) and 145T(C) have no lifting eyelet.

\*\*\*\* TABLE CONTINUED NEXT PAGE (for dimensions D-U) \*\*\*\*

**MTCP2 PREMIUM-EFFICIENCY TC-FRAME THREE-PHASE MOTOR DIMENSIONS (CONTINUED)**

**(DIMENSIONS = INCHES)**



\*\*\*\* TABLE CONTINUED FROM PREVIOUS PAGE (for dimensions A-C) \*\*\*\*

Dimensions [inches, except as noted]  
 Premium-Efficiency Three-Phase TC-Frame Motors – 1800 rpm

Part # MTCP2- xxx- 3BD18C	HP	NEMA Frame	D	E	ES	F1*	F2*	G	H	J	N-W	L	P	R	S	U
-001-	1	143TC	3.5	2.75	1.41	n/a	4	0.47	0.34	1	2.25	7.6	7.8	0.771	0.188	0.8759
-1P5-	1-1/2	145TC	3.5	2.75	1.41	4	5	0.43	0.34	1.2	2.25	7.8	8	0.771	0.188	0.8759
-002-	2				1.41			0.43								
-003-	3	182TC	4.5	3.75	1.78	n/a	4.5	0.6	0.41	2	2.75	9.5	9.7	0.986	0.25	1.125
-005-	5	184TC	4.5	3.75	1.78	4.5	5.5	0.6	0.41	2	2.75	9.5	9.7	0.986	0.25	1.125
-7P5-	7-1/2	213TC	5.25	4.25	2.41	n/a	5.5	0.71	0.41	2.4	3.38	10.6	10.4	1.201	0.312	1.375
-010-	10	215TC	5.25	4.25	2.41	5.5	7	0.71	0.41	2.4	3.38	10.6	10.4	1.201	0.312	1.375
-015-	15	254TC	6.25	5	2.91	n/a	8.25	0.79	0.53	2.40	4	12.9	12.6	1.416	0.375	1.625
-020-	20	256TC	6.25	5	2.91	8.25	10	0.79	0.53	2.40	4	12.9	12.6	1.416	0.375	1.625
-025-	25	284TC	7	5.5	3.28	n/a	9.5	0.87	0.53	2.8	4.62	14.3	14	1.591	0.5	1.875
-030-	30	286TC	7	5.5	3.28	9.5	11	0.87	0.53	2.8	4.62	14.3	14	1.591	0.5	1.875

\* Various frame sizes have 2 or 4 mounting holes per mounting foot.

\*\* AA dimension is conduit fitting size. F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T-frame "Motor Specifications" table.  
 (F2 mounting = conduit entrance on right side facing shaft.)

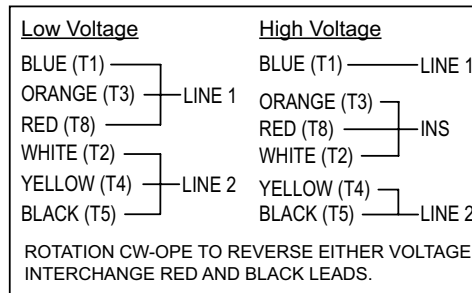
\*\*\* Frame sizes 143T(C) and 145T(C) have no lifting eyelet.

## Terminal and Wiring Diagrams

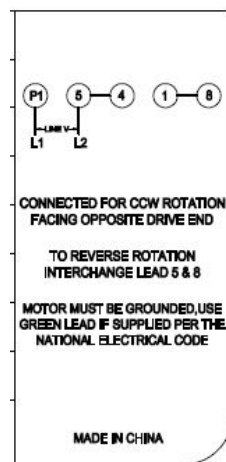
### IRONHORSE® SINGLE-PHASE MOTORS

#### MTR2 GENERAL-PURPOSE MOTORS

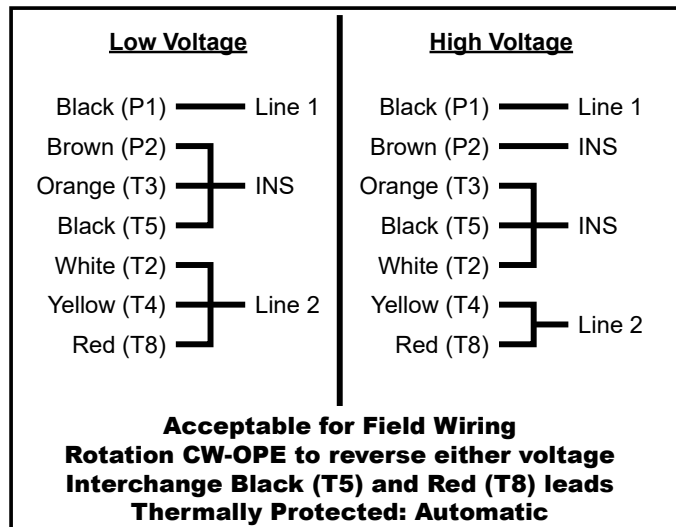
1/3 hp – 1.5hp 1Ø MTR2 models  
6-Lead, 115/208-230 VAC



#### MTF2 FARM-DUTY MOTORS



#### MTRJ JET PUMP MOTORS

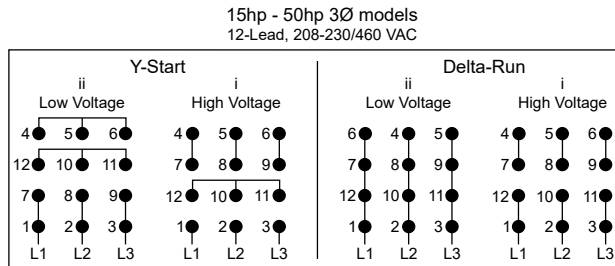
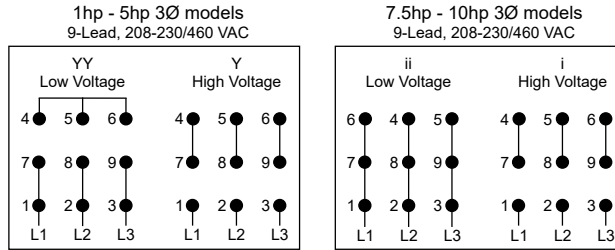


**IRONHORSE® THREE-PHASE MOTORS**

**MTDP OPEN DRIP PROOF MOTORS**

**MTDP 1-50 hp 3Ø models**

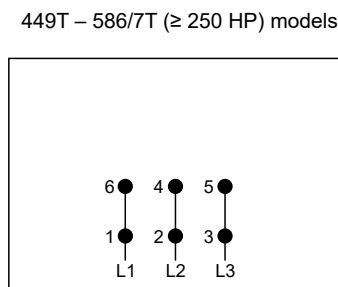
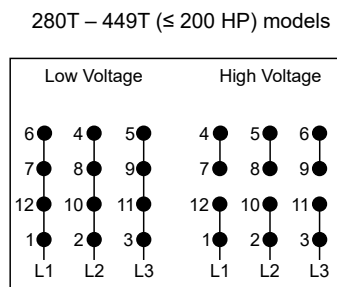
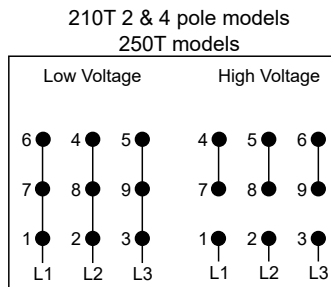
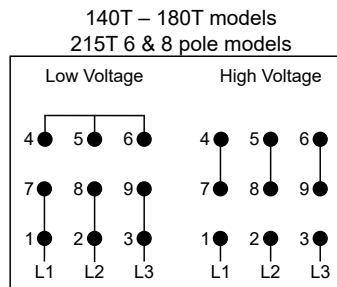
- T1 = Blue
- T2 = White
- T3 = Orange
- T4 = Yellow
- T5 = Black
- T6 = Purple
- T7 = Pink
- T8 = Red
- T9 = Grey



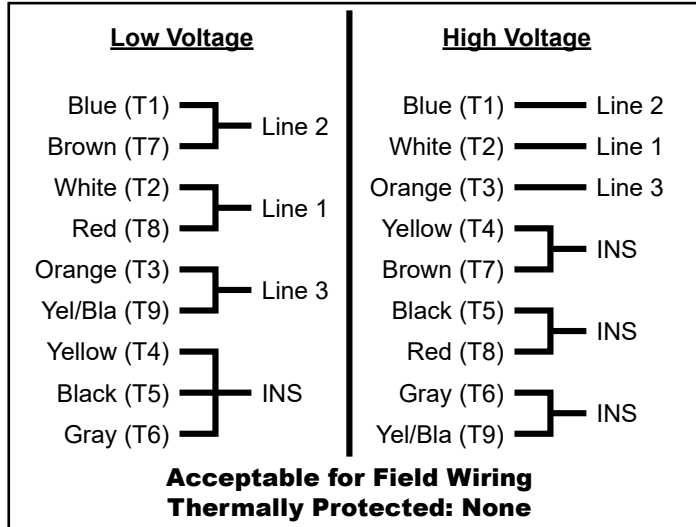
**Nameplate / Wiring Diagram abbreviations:**

- 1) "INS" = The wires are to be connected and then insulated.
- 2) "ODE" = Opposite Drive End.
- 3) "OPE" = Opposite Pulley End.

**MTCP2 MOTORS**



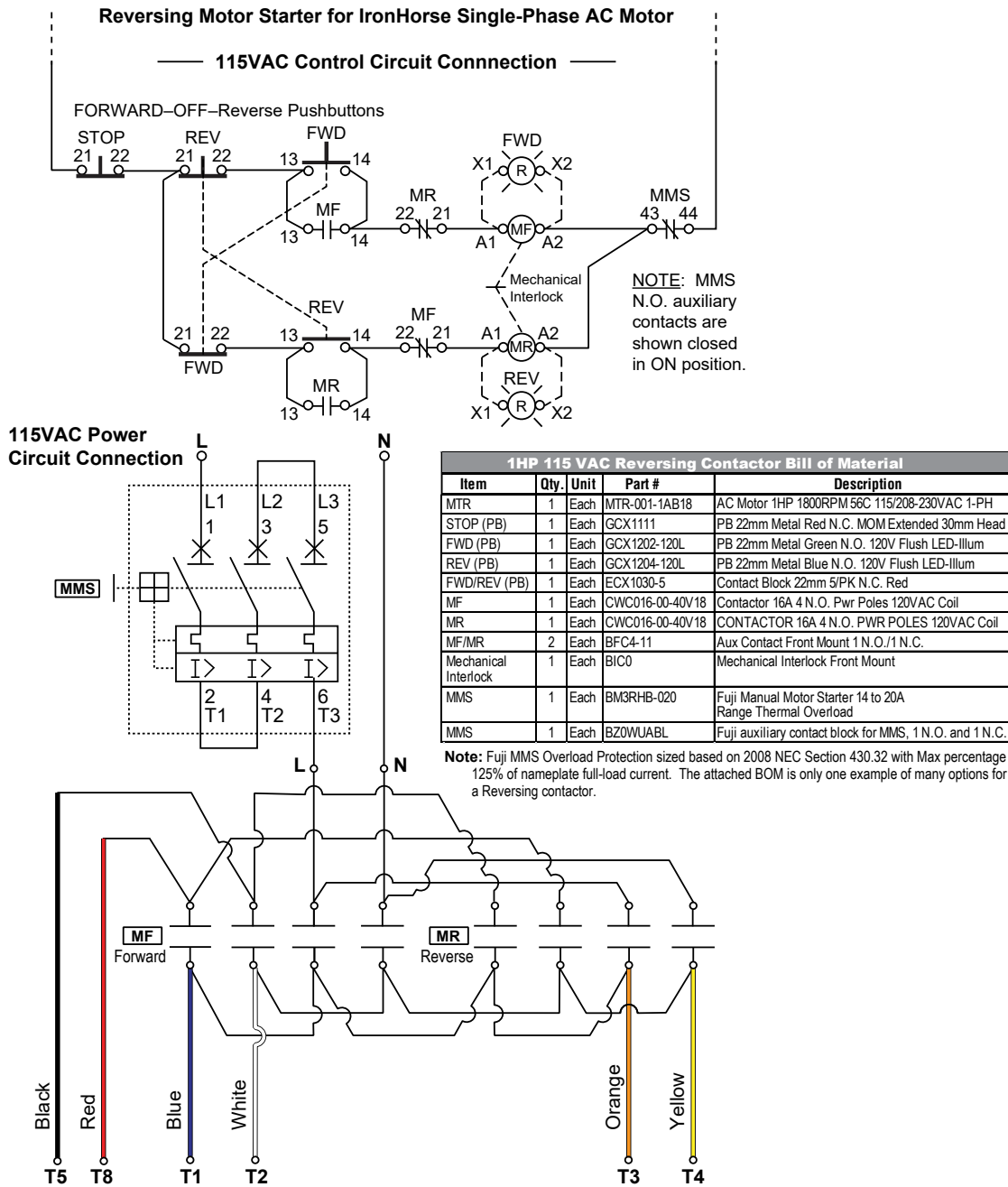
**MTRJ JET PUMP MOTORS**



TERMINAL AND WIRING DIAGRAMS (CONTINUED)

SINGLE-PHASE MOTORS REVERSING DIAGRAMS

FOR 115VAC POWER CIRCUIT (115VAC CONTROL CIRCUIT)



Note: To reverse motor direction the wiring of T5 Black and T8 Red should be swapped. Always check the motor manufacturer's wiring diagrams (or nameplate) for proper reversing of 1-phase motors.

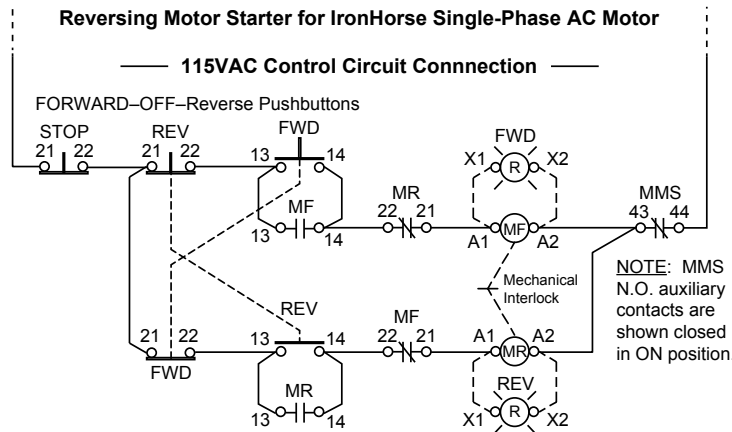


**WARNING: THIS WIRING DIAGRAM DOES NOT PREVENT PLUGGING OR INSTANT REVERSING OF THE MOTOR, WHICH IS VERY STRESSFUL TO THE MOTOR AND MAY TRIP ANY OVERCURRENT/OVERLOAD PROTECTION.**

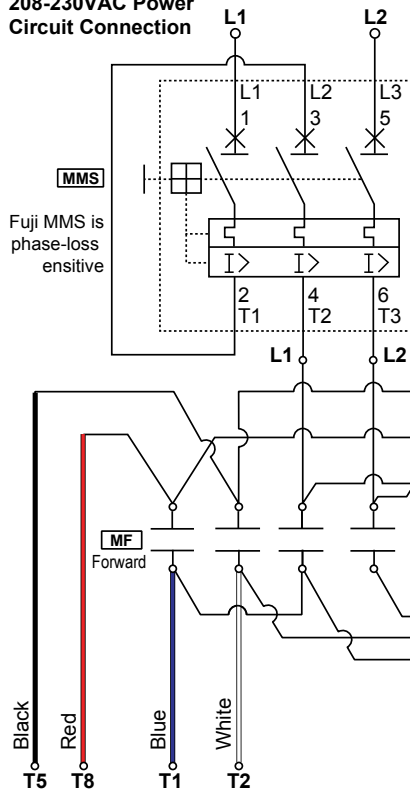


TERMINAL AND WIRING DIAGRAMS – SINGLE-PHASE MOTORS REVERSING DIAGRAMS (CONTINUED)

FOR 208-230VAC POWER CIRCUIT (115VAC CONTROL CIRCUIT)



208-230VAC Power Circuit Connection



1HP 208 VAC Reversing Contactor Bill of Material

Item	Qty.	Unit	Part #	Description
MTR	1	Each	MTR-001-1AB18	AC Motor 1HP 1800RPM 56C 115/208-230VAC 1-PH
STOP (PB)	1	Each	GCX1111	PB 22mm Metal Red N.C. MOM Extended 30mm Head
FWD (PB)	1	Each	GCX1202-120L	PB 22mm Metal Green N.O. 120V Flush LED-Illum
REV (PB)	1	Each	GCX1204-120L	PB 22mm Metal Blue N.O. 120V Flush LED-Illum
FWD/REV (PB)	1	Each	ECX1030-5	Contact Block 22mm 5/PK N.C. Red
MF	1	Each	CWC016-00-40V18	Contact 16A 4 N.O. Pwr Poles 120VAC Coil
MR	1	Each	CWC016-00-40V18	CONTACTOR 16A 4 N.O. PWR POLES 120VAC Coil
MF/MR	2	Each	BFC4-11	Aux Contact Front Mount 1 N.O./1 N.C.
Mechanical Interlock	1	Each	BIC0	Mechanical Interlock Front Mount
MMS	1	Each	BM3RHB-020	Fuji Manual Motor Starter 14 to 20A Range Thermal Overload
MMS	1	Each	BZ0WUABL	Fuji auxiliary contact block for MMS, 1 N.O. and 1 N.C.

Note: Fuji MMS Overload Protection sized based on 2008 NEC Section 430.32 with Max percentage 125% of nameplate full-load current. The attached BOM is only one example of many options for a Reversing contactor.



Note: In applications involving Direct coupling of the motor, drive end, bearing life, may be increased by replacing roller bearings with equivalent ball bearings. Consult your EASA authorized motor shop for details. Reminder: To maintain motor warranty, any motor work must be accomplished by your local EASA authorized shop.



Note: To reverse motor direction, the wiring of T5 Black and T8 Red should be swapped. Always check the motor manufacturer's wiring diagrams (or nameplate) for proper reversing of 1-phase motors.



WARNING: THIS WIRING DIAGRAM DOES NOT PREVENT PLUGGING OR INSTANT REVERSING OF THE MOTOR, WHICH IS VERY STRESSFUL TO THE MOTOR AND MAY TRIP ANY OVERCURRENT/OVERLOAD PROTECTION.

## Motor Mounting

### GENERAL MOUNTING INFORMATION

IronHorse® motors should be properly mounted to prevent premature motor and/or bearing failure. When necessary, use motor shims to level the motor at all mounting bolt holes. Use proper diameter bolts of the highest grade material available for the application. Use the chart below to select the correct size bolt for each frame size.

A mounted motor must operate vibration free. Each motor installation should be checked for potential vibration situations. On motors 100hp and up, we recommend that foundation studs be used to secure the motor or slide base. Base shims should also be used when necessary for level mounting.

Motor Mounting Bolt Sizes				
Frame Size	Bolt Diameter	Minimum Useable Thread Length (A)	Minimum Exposed Anchor Length (B)	
<b>56</b>				
<b>143T</b>	5/16 in	0.45 in	0.88 in	
<b>145T</b>				
<b>182T</b>				
<b>184T</b>	3/8 in	0.53 in	1.50 in	
<b>213T</b>				
<b>215T</b>				
<b>254T</b>			1.44 in	
<b>256T</b>	1/2 in	0.69 in	1.69 in	
<b>284T</b>				
<b>286T</b>				
<b>324T</b>			2.19 in	
<b>326T</b>	5/8 in	0.85 in	2.06 in	
<b>364T</b>				
<b>365T</b>				
<b>404T</b>			2.50 in	
<b>405T</b>	3/4 in	0.95 in	3.00 in	
<b>444T</b>				
<b>445T</b>				
<b>447T</b>				
<b>449T</b>				

### MOTOR MOUNTING ORIENTATION

#### MTF MOTORS

MTF motors can be mounted *only* in a horizontal orientation.

#### MTF2, MTR2, MTRP AND MTDP MOTORS

MTF2, MTR2, MTRP and MTDP motors can be mounted in any horizontal or vertical orientation.

#### MTCP2 MOTORS

MTCP2 motors can be mounted in horizontal or vertical, shaft-down orientations.

**PROPER INSTALLATION CONDITIONS**

Care should be taken to make sure that an IronHorse® motor is mounted at least thirty inches from a wall or structure that would prevent proper ventilation of the motor. The installation area should be free of dust and smoke particles. Any air contaminate could inhibit proper operation of the motor fan.

If an IronHorse motor is to be installed in a high altitude or in a low temperature location, use the Altitude / Ambient Temperature Derating chart below for proper motor sizing.

		Altitude / Ambient Temperature Derating Chart						
		Altitude - Meters (Feet) Above Sea Level						
		1000 (3281)	1500 (4921)	2000 (6562)	2500 (8202)	3000 (9842)	3500 (11,483)	4000 (13,123)
Temperature - °C (°F)	10°C (50°F)	-	-	-	-	-	-	1.50
	15°C (59°F)	-	-	-	-	-	1.05	0.99
	20°C (68°F)	-	-	-	-	1.05	0.99	0.93
	25°C (77°F)	-	-	-	1.05	0.98	0.93	0.88
	30°C (86°F)	-	-	1.05	0.97	0.92	0.87	0.82
	40°C (104°F)	1.00	0.94	0.89	0.85	0.80	0.76	0.72
	50°C (122°F)	0.85	0.8	0.76	0.72	0.68	0.65	0.62
	60°C (140°F)	0.71	0.67	0.64	0.60	0.57	0.55	0.52

Example: 100hp @ 60°C and 2000 Meters  
 100 / 0.64 = 156hp  
 The motor should be a 200hp motor.

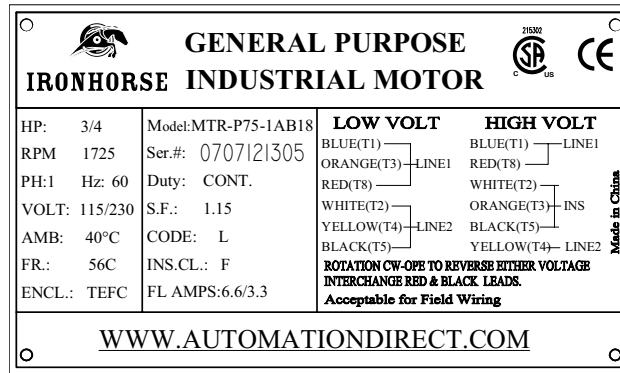
**COUPLING ALIGNMENT**

Correct coupling alignment is very important to the life of the motor. Coupling misalignment is the major cause of motor bearing failure. In belt driven applications, pulleys should be installed correctly. Belt tension, alignment, and wear should be checked at installation and at regular maintenance intervals. Install motor couplings per the manufacturers instructions. Whenever possible, direct couple or flange mount IronHorse motors in their application. Doing so can extend the bearing life greatly.

AutomationDirect offers C-face mounting kits for all PE and EAct T-frame IronHorse motors. For a complete list of mounting kits, see Chapter 4 (Accessories).

## Motor Nameplate & Starter Information

### TYPICAL IRONHORSE® MOTOR NAMEPLATE



### MOTOR STARTER INFORMATION

IronHorse® general purpose motors can be controlled by across-the-line starters such as contactors and manual motor starters. Under certain circumstances, three phase IronHorse motors can also be controlled by AC drives. Refer to Chapter 5 (Reference) for more information about using AC drives with IronHorse motors.

**Use the following chart to help determine the appropriate across-the-line starter.**

Starting System Information					
Frame Size *	Number of Internal Leads	Internal Lead Size	Internal Lead Length	Voltage	Winding Type
56C (1Ø)	6	16 AWG	6 in	115/208-230	N/A
56C (3Ø)	9		9-1/2 in		208-230/460
143T – 145T				Delta	
182T – 184T					
213T					
215T	12	14 AWG	10-5/8 in	Wye / Delta	
254T – 256T		12 AWG			
284T – 286T		10 AWG	13 in		
324T – 326T		8 AWG			
364T – 365T		6 AWG			
404T – 405T		4 AWG	13-3/4 in		
444T – 445T		3 AWG			
447T					
449T	6	1 AWG	14 in	460	

\* TC-frame motors have the same starting system characteristics as the comparable T-frame motors.

### LOCKED ROTOR AMPS

All electrical components used in an IronHorse motor installation must be able to handle the maximum current draw of the motor. When using a typical across-the-line starter, current is highest when power is first applied to the motor. This is commonly referred to as locked rotor amps. Every IronHorse motor has a locked rotor amperage code letter stamped on the motor nameplate either as “CODE” or “kVA Code”. This letter applies to the locked rotor amp range value. See the motor “Performance Data” tables in Chapter 1 (Getting Started) for specific locked rotor amperage information.

## Inspection Before Startup

- 1) Remove the shaft lock device if the motor was supplied with one.
- 2) Turn the shaft by hand and make sure the shaft turns freely. Listen for any unusual noises and feel for any interruption in the shaft as it turns.
- 3) In all motors with serviceable bearings, check the grease level on both drive end and opposite drive end bearings. Make sure the bearing cavities are filled with Mobil POLYREX® EM Polyurea grease. MTCP2 motors should be greased using SKF, LGHP2 grease. Motors of frame size 250 and above have grease fittings at the 12:00 o'clock position and relief ports at the 7:00 o'clock position. For these motors, remove the plugs from the relief ports, and pump 12 to 13 pumps of grease into the grease fittings. Some grease may come out of the relief port; this is normal. Reinstall the plug in the relief port.



***When replacing a T-frame end bell with a C-face end bell, transfer the grease fitting and plug from the original to the new end bell.***

- 4) Perform a final check on the installation of all parts in the assembly. Check the motor mounting bolts, coupling, belt drive, C-face mount, alignment, etc.
- 5) Verify all electrical connections for the motor and starter. Refer to the motor diagram on the motor nameplate. Make sure all terminal screws are tightened properly.
- 6) Make sure that all electrical components used in the installation are rated for the locked rotor amperage.
- 7) Make sure the motor is properly grounded. Use the grounding lug provided in the motor terminal box or on the mounting foot.

## Initial Startup Inspection

- 1) At initial startup monitor the start-up voltage and the running voltage of the motor. The full load voltage should never exceed the line voltage on the motor nameplate multiplied by the service factor of the motor.  
Example: 230 VAC x 1.15 = 264.5 VAC.
- 2) Check the full load running amperage (FLA) of the motor. The full load running amperage should not be more than the amount indicated on the motor nameplate
- 3) Listen for any unusual noises at motor start-up and in the first hour of operation. Listen for any unusual bearing noise in the drive end and opposite drive end of the motor. Abnormal bearing noise can be an indication of a defective bearing or the motor grease could be low. If there is abnormal noise in motors with serviceable bearings, shut down the motor and check the grease level on both the drive end and opposite drive end.



***DO NOT OVER GREASE THE BEARINGS. OVER GREASING MOTOR BEARINGS IS A COMMON CAUSE OF MOTOR FAILURE.***



***Large horsepower motors with roller bearings will typically be noisier than ball bearing motors at initial motor start-up and in normal operation.***