



IRONHORSE™

General Purpose AC Motors

Manual Number: IH-USER-M-WO



THIS PAGE
INTENTIONALLY
LEFT BLANK

WARNING

Thank you for purchasing automation equipment from Automationdirect.com™, doing business as AutomationDirect. We want your new automation equipment to operate safely. Anyone who installs or uses this equipment should read this publication (and any other relevant publications) before installing or operating the equipment.

To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and usually change with time. It is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation is in compliance with the latest revision of these codes.

At a minimum, you should follow all applicable sections of the National Fire Code, National Electrical Code, and the codes of the National Electrical Manufacturer's Association (NEMA). There may be local regulatory or government offices that can also help determine which codes and standards are necessary for safe installation and operation.

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.

Our products are not fault-tolerant and are not designed, manufactured or intended for use or resale as on-line control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines, or weapons systems, in which the failure of the product could lead directly to death, personal injury, or severe physical or environmental damage ("High Risk Activities"). AutomationDirect specifically disclaims any expressed or implied warranty of fitness for High Risk Activities.

For additional warranty and safety information, see the Terms and Conditions section of our catalog. If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call us at 770-844-4200.

This publication is based on information that was available at the time it was printed. At AutomationDirect we constantly strive to improve our products and services, so we reserve the right to make changes to the products and/or publications at any time without notice and without any obligation. This publication may also discuss features that may not be available in certain revisions of the product.

Trademarks

This publication may contain references to products produced and/or offered by other companies. The product and company names may be trademarked and are the sole property of their respective owners. AutomationDirect disclaims any proprietary interest in the marks and names of others.

**Copyright 2007, 2008, 2009 Automationdirect.com™ Incorporated
All Rights Reserved**

No part of this manual shall be copied, reproduced, or transmitted in any way without the prior, written consent of Automationdirect.com™ Incorporated. AutomationDirect retains the exclusive rights to all information included in this document.

AVERTISSEMENT

Nous vous remercions d'avoir acheté l'équipement d'automatisation de Automationdirect.com™, en faisant des affaires comme AutomationDirect. Nous tenons à ce que votre nouvel équipement d'automatisation fonctionne en toute sécurité. Toute personne qui installe ou utilise cet équipement doit lire la présente publication (et toutes les autres publications pertinentes) avant de l'installer ou de l'utiliser.

Afin de réduire au minimum le risque d'éventuels problèmes de sécurité, vous devez respecter tous les codes locaux et nationaux applicables régissant l'installation et le fonctionnement de votre équipement. Ces codes diffèrent d'une région à l'autre et, habituellement, évoluent au fil du temps. Il vous incombe de déterminer les codes à respecter et de vous assurer que l'équipement, l'installation et le fonctionnement sont conformes aux exigences de la version la plus récente de ces codes.

Vous devez, à tout le moins, respecter toutes les sections applicables du Code national de prévention des incendies, du Code national de l'électricité et des codes de la National Electrical Manufacturer's Association (NEMA). Des organismes de réglementation ou des services gouvernementaux locaux peuvent également vous aider à déterminer les codes ainsi que les normes à respecter pour assurer une installation et un fonctionnement sûrs.

L'omission de respecter la totalité des codes et des normes applicables peut entraîner des dommages à l'équipement ou causer de graves blessures au personnel. Nous ne garantissons pas que les produits décrits dans cette publication conviennent à votre application particulière et nous n'assumons aucune responsabilité à l'égard de la conception, de l'installation ou du fonctionnement de votre produit.

Nos produits ne sont pas insensibles aux défaillances et ne sont ni conçus ni fabriqués pour l'utilisation ou la revente en tant qu'équipement de commande en ligne dans des environnements dangereux nécessitant une sécurité absolue, par exemple, l'exploitation d'installations nucléaires, les systèmes de navigation aérienne ou de communication, le contrôle de la circulation aérienne, les équipements de survie ou les systèmes d'armes, pour lesquels la défaillance du produit peut provoquer la mort, des blessures corporelles ou de graves dommages matériels ou environnementaux («activités à risque élevé»). La société AutomationDirect nie toute garantie expresse ou implicite d'aptitude à l'emploi en ce qui a trait aux activités à risque élevé.

Pour des renseignements additionnels touchant la garantie et la sécurité, veuillez consulter la section Modalités et conditions de notre documentation. Si vous avez des questions au sujet de l'installation ou du fonctionnement de cet équipement, ou encore si vous avez besoin de renseignements supplémentaires, n'hésitez pas à nous téléphoner au 770-844-4200.

Cette publication s'appuie sur l'information qui était disponible au moment de l'impression. À la société AutomationDirect, nous nous efforçons constamment d'améliorer nos produits et services. C'est pourquoi nous nous réservons le droit d'apporter des modifications aux produits ou aux publications en tout temps, sans préavis ni quelque obligation que ce soit. La présente publication peut aussi porter sur des caractéristiques susceptibles de ne pas être offertes dans certaines versions révisées du produit.

Marques de commerce

La présente publication peut contenir des références à des produits fabriqués ou offerts par d'autres entreprises. Les désignations des produits et des entreprises peuvent être des marques de commerce et appartiennent exclusivement à leurs propriétaires respectifs. AutomationDirect nie tout intérêt dans les autres marques et désignations.

**Copyright 2007, 2008, 2009 Automationdirect.com™ Incorporated
Tous droits réservés**

Nulle partie de ce manuel ne doit être copiée, reproduite ou transmise de quelque façon que ce soit sans le consentement préalable écrit de la société Automationdirect.com™ Incorporated. AutomationDirect conserve les droits exclusifs à l'égard de tous les renseignements contenus dans le présent document.



IRONHORSE GENERAL PURPOSE AC MOTORS USER MANUAL

Please include the Manual Number and the Manual Issue, both shown below, when communicating with Technical Support regarding this publication.

Manual Number: IH-USER-M-WO

Issue: Third Edition

Issue Date: 06/2009

Publication History		
Issue	Date	Description of Changes
First Edition	09/2007	Original Issue
1st Ed., Rev. A	11/2007	Chapter 2 wiring diagrams
Second Edition	12/2008	User manual name change (previously "IH-USER-M") Deleted obsolete motor MTR-002-1AB18 Added MTC-xxx-xxxxxCK cast iron TC-frame motors Revised specs for existing MTC-xxx-xxxxx cast iron T-frame motors
Third Edition	06/2009	Added 1200 and 3600 rpm motors

THIS PAGE
INTENTIONALLY
LEFT BLANK



TABLE OF CONTENTS

Chapter 1: Getting Started	1-1
Manual Overview	1-2
Overview of this Publication	1-2
Who Should Read This Manual	1-2
Technical Support	1-2
Special Symbols	1-2
Available Models	1-3
Single-Phase Motors Features and Specifications	1-3
Three-Phase Motors Features and Specifications	1-4
Receiving and Inspection	1-15
Unpacking	1-15
IronHorse Part Number Information	1-15
Reshipping	1-16
Long Term Storage	1-16
Warranty	1-16

Table of Contents

Chapter 2: Mounting & Initial Startup	2-1
Safety Information	2-2
Motor Dimensions	2-3
56C-Frame Single-phase Motor Dimensions	2-3
56C-Frame Three-phase Motor Dimensions	2-3
T-Frame Three-phase Motor Dimensions	2-4
TC-Frame Three-phase Motor & C-Flange Dimensions	2-8
Terminal Diagrams	2-9
Motor Mounting	2-10
STABLE™ Slide Bases	2-10
Proper Installation Conditions	2-11
Coupling Alignment	2-11
Motor Nameplate & Starter Information	2-12
Typical IronHorse Motor Nameplate	2-12
Motor Starter Information	2-12
Locked Rotor Amps	2-13
Inspection Before Startup	2-14
Initial Startup Inspection	2-14
Chapter 3: Preventative Ongoing Maintenance	3-1
Routine Maintenance	3-2
Bearing Size Information	3-3
Chapter 4: Accessories	4-1
Capacitors and Centrifugal Switches	4-2
C-Flange Kits	4-3
STABLE Slide Bases	4-4

Chapter 5: Reference5-1
Using IronHorse Motors with AC Drives5-2
Voltage Spike Considerations for AC Drive Control5-2
Double Punched Motors5-3
F1 and F2 Mounting5-4
Junction Box Dimensions5-5
Minimum Sheave Diameters5-6
Decibel Levels5-7
Shipping Crate Dimensions5-8

THIS PAGE
INTENTIONALLY
LEFT BLANK



GETTING STARTED

CHAPTER 1

In This Chapter...

Manual Overview	1-2
Overview of this Publication	1-2
Who Should Read This Manual	1-2
Technical Support	1-2
Special Symbols	1-2
Available Models	1-3
Single-Phase Motors Features and Specifications	1-3
Three-Phase Motors Features and Specifications	1-4
Receiving and Inspection	1-15
Unpacking	1-15
IronHorse Part Number Information	1-15
Reshipping	1-16
Long Term Storage	1-16
Warranty	1-16

Manual Overview

Overview of this Publication

The IronHorse General Purpose AC Motor User Manual describes the installation, maintenance and use of all IronHorse General Purpose Motors.

Who Should Read This Manual

This manual contains important information for those who will install, maintain, use and/or resell any of the IronHorse motors.

Technical Support

By Telephone: 770-844-4200

(Mon.-Fri., 9:00 a.m.-6:00 p.m. E.T.)

On the Web: support.automationdirect.com

Our technical support group is glad to work with you in answering your questions. If you cannot find the solution to your particular application, or, if for any reason you need additional technical assistance, please call technical support at **770-844-4200**. We are available weekdays from 9:00 a.m. to 6:00 p.m. Eastern Time.

We also encourage you to visit our web site where you can find technical and non-technical information about our products and our company. Visit us at www.automationdirect.com.

Special Symbols



When you see the "notepad" icon in the left-hand margin, the paragraph to its immediate right will be a special note.



When you see the "exclamation mark" icon in the left-hand margin, the paragraph to its immediate right will be a WARNING. This information could prevent injury, loss of property, or even death (in extreme cases).

Available Models

Single-Phase Motors Features and Specifications

Rolled Steel 56C Frame Single-Phase Motors



IronHorse single-phase 56C frame motors are available from 1/3 hp to 1-1/2 hp. All models have a TEFC rolled steel frame, cast aluminum end bell and removable mounting bases. All motors are NEMA B design.

1800 rpm Motor Specifications & Performance Data

Motor Specifications – Single-Phase 56C Frame Motors – 1800 rpm							
Part Number	HP	Base RPM	Voltage	NEMA Frame	Service Factor	F.L. Amps @ 115V/230V	Approx Weight (lb)
MTR-P33-1AB18	1/3	1800	115/208-230	56C flange mount	1.15	6.6 / 3.3	26
MTR-P50-1AB18	1/2					8.8 / 4.4	28
MTR-P75-1AB18	3/4					11.0 / 5.5	32
MTR-001-1AB18	1					13.6 / 6.8	38
MTR-1P5-1AB18	1-1/2					15.2 / 7.6	45

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

Performance Data – Single-Phase 56C Frame Motors – 1800 rpm (230V data except as indicated)											
Part Number	HP	F.L. RPM	Current @ 115V/230V (Amps)		Torque (lb·ft)			F.L. Efficiency (%)	F.L. Power Factor	Rotor Inertia (lb·ft ²)	
			230V No Load	Full Load	Locked Rotor	Full Load	Locked Rotor				
MTR-P33-1AB18	1/3	1725	2.2	6.6 / 3.3	31 / 18	1.02	3.06	2.81	56.0	0.62	0.075
MTR-P50-1AB18	1/2		2.93	8.8 / 4.4	37 / 21	1.52	4.56	4.18	57.0	0.63	0.080
MTR-P75-1AB18	3/4		3.67	11.0 / 5.5	55 / 32	2.29	6.30	5.73	65.0	0.65	0.095
MTR-001-1AB18	1		4.53	13.6 / 6.8	75 / 43	3.04	8.36	7.60	68.0	0.66	0.120
MTR-1P5-1AB18	1-1/2		5.07	15.2 / 7.6	120 / 65	4.57	11.43	10.28	71.0	0.75	0.142

Three-Phase Motors Features and Specifications

Rolled Steel 56C Frame Three-Phase Motors



IronHorse 56C rolled steel frame three-phase motors are available from 1/3 hp to 2 hp. All models have a TEFC frame, cast aluminum end bell and removable mounting bases.

1800 & 3600 rpm Motor Specifications

Motor Specifications – Three-Phase 56C Frame Motors – 1800 & 3600 rpm									
Part Number	HP	Base RPM	Phase	Voltage	Housing	NEMA Frame	Service Factor	F.L. Amps @ 230V/460V	Approx Weight (lb)
1800 RPM									
MTR-P33-3BD18	1/3	1800	3	208-230/460	TEFC rolled steel frame cast aluminum end bell F1 conduit box location	56C flange mount	1.15	1.6 / 0.8	23
MTR-P50-3BD18	1/2							2.0 / 1.0	24
MTR-P75-3BD18	3/4							2.8 / 1.4	26
MTR-001-3BD18	1							3.6 / 1.8	29
MTR-1P5-3BD18	1-1/2							4.8 / 2.4	33
MTR-002-3BD18	2							6.0 / 3.0	42
3600 RPM									
MTR-P33-3BD36	1/3	3600	3	208-230/460	TEFC rolled steel frame cast aluminum end bell F1 conduit box location	56C flange mount	1.15	1.6 / 0.8	23
MTR-P50-3BD36	1/2							2.2 / 1.1	24
MTR-P75-3BD36	3/4							2.9 / 1.5	26
MTR-001-3BD36	1							3.6 / 1.8	28
MTR-1P5-3BD36	1-1/2							4.6 / 2.3	34
MTR-002-3BD36	2							6.0 / 3.0	43

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

Three-Phase Motors Features and Specifications (continued)

Rolled Steel 56C Frame Three-Phase Motors

1800 rpm Motor Performance Data

Performance Data – Three-Phase 56C Frame Motors – 1800 rpm (460V data except as indicated)									
Part Number	HP	NEMA Design	n/a	F.L. RPM	Minimum Speed (rpm)		Current @ 230V/460V (Amps)		
					CT	VT	No Load	Full Load	Locked Rotor
MTR-P33-3BD18	1/3	B	n/a	1725	900	360	0.53 / 0.27	1.6 / 0.8	8 / 4
MTR-P50-3BD18	1/2						0.67 / 0.33	2.0 / 1.0	12 / 6
MTR-P75-3BD18	3/4						0.93 / 0.47	2.8 / 1.4	18 / 9
MTR-001-3BD18	1						1.2 / 0.6	3.6 / 1.8	24 / 12
MTR-1P5-3BD18	1-1/2						1.53 / 0.77	4.8 / 2.4	36 / 18
MTR-002-3BD18	2						2.0 / 1.0	6.0 / 3.0	48 / 24
Part Number	HP	Torque (lb·ft)			Maximum Speed (rpm)		F.L. Efficiency (%)	F.L. Power Factor	Rotor Inertia (lb·ft ²)
		Full Load	Locked Rotor	Break-down	CHP*	Safe			
MTR-P33-3BD18	1/3	1.02	2.55	2.81	2700	5400	67.0	0.70	0.058
MTR-P50-3BD18	1/2	1.52	3.80	4.18			69.0	0.72	0.068
MTR-P75-3BD18	3/4	2.29	5.73	6.30			71.0	0.74	0.075
MTR-001-3BD18	1	3.02	7.55	8.31			73.0	0.76	0.086
MTR-1P5-3BD18	1-1/2	4.57	10.28	11.43			75.0	0.78	0.108
MTR-002-3BD18	2	6.09	13.70	15.23			77.0	0.80	0.143

* Maximum Constant HP RPM is for direct coupled loads.

Three-Phase Motors Features and Specifications (continued)

Rolled Steel 56C Frame Three-Phase Motors

3600 rpm Motor Performance Data

Performance Data – Three-Phase 56C Frame Motors – 3600 rpm (460V data except as indicated)									
Part Number	HP	NEMA Design	n/a	F.L. RPM	Minimum Speed (rpm)		Current @ 230V/460V (Amps)		
					CT	VT	No Load	Full Load	Locked Rotor
MTR-P33-3BD36	1/3	B	n/a	3450	1725	690	1.2 / 0.59	1.6 / 0.8	9 / 5
MTR-P50-3BD36	1/2						1.4 / 0.7	2.2 / 1.1	14 / 7
MTR-P75-3BD36	3/4						1.5 / 0.75	2.9 / 1.5	17 / 8.9
MTR-001-3BD36	1						1.7 / 0.85	3.6 / 1.8	25 / 13
MTR-1P5-3BD36	1-1/2						1.8 / 0.9	4.6 / 2.3	29 / 17
MTR-002-3BD36	2						3.4 / 1.7	6.0 / 3.0	57 / 30
Part Number	HP	Torque (lb·ft)			Maximum Speed (rpm)		F.L. Efficiency (%)	F.L. Power Factor	Rotor Inertia (lb·ft ²)
		Full Load	Locked Rotor	Break-down	CHP*	Safe			
MTR-P33-3BD36	1/3	0.50	3.0	3.0	5400	5400	57.0	0.71	0.084
MTR-P50-3BD36	1/2	0.75	4.4	4.5			62.0	0.71	0.095
MTR-P75-3BD36	3/4	1.13	6.0	5.8			67.0	0.78	0.107
MTR-001-3BD36	1	1.50	7.9	7.1			69.0	0.82	0.122
MTR-1P5-3BD36	1-1/2	2.25	11.2	8.4			72.0	0.85	0.143
MTR-002-3BD36	2	3.00	21.5	13.9			75.0	0.78	0.188

* Maximum Constant HP RPM is for direct coupled loads.

Three-Phase Motors Features and Specifications (continued)

Cast Iron T-Frame



Cast Iron TC-Frame



IronHorse 1800 rpm T-frame cast iron industrial duty motors are available from 1–300 hp, and TC-frame motors are available from 1–100 hp. Optional C-face kits are available for all IronHorse T-frame motors. All models have a TEFC frame and full length mounting feet.

1800 rpm Motor Specifications

Motor Specifications – T & TC ⁽¹⁾ Frame Three-Phase Motors – 1800 rpm											
Part Number	HP	NEMA Frame	Voltage	Housing	Shaft Material	Conduit Box Location ⁽²⁾	Holes/Foot	Service Factor	F.L. Amps @ 230V/460V	Approx Ship Weight (lb)	
MTC-001-3BD18	1	143T	208-230/460	TEFC cast iron	1045 CS	F1(F2)	2	1.15	3.0 / 1.5	55	
MTC-001-3BD18CK ⁽¹⁾		143TC								61	
MTC-1P5-3BD18	1.5	145T	208-230/460	TEFC cast iron	1045 CS	F1(F2)	3		4.2 / 2.1	55	
MTC-1P5-3BD18CK ⁽¹⁾		145TC								67	
MTC-002-3BD18	2	145T	208-230/460	TEFC cast iron	1045 CS	F1(F2)	3		5.4 / 2.7	60	
MTC-002-3BD18CK ⁽¹⁾		145TC								69	
MTC-003-3BD18	3	182T	208-230/460	TEFC cast iron	1045 CS	F1(F2)	2		7.72 / 3.86	90	
MTC-003-3BD18CK ⁽¹⁾⁽³⁾		182TC								112 ⁽³⁾	
MTC-005-3BD18 ⁽³⁾	5	184T	208-230/460	TEFC cast iron	1045 CS	F1(F2)	3		11.8 / 5.9	110 ⁽³⁾	
MTC-005-3BD18CK ⁽¹⁾⁽³⁾		184TC								125 ⁽³⁾	
MTC-7P5-3BD18 ⁽³⁾	7.5	213T	208-230/460	TEFC cast iron	1045 CS	F1(F2)	2		18.6 / 9.3	150 ⁽³⁾	
MTC-7P5-3BD18CK ⁽¹⁾⁽³⁾		213TC								170 ⁽³⁾	

- 1) TC-frame motors are T-frame motors with applicable C-face accessory kits installed.
 2) F1(F2) indicates F1 conduit box mounting location, field convertible to F2.
 (Refer to "Chapter 5: Reference" for further information regarding F1 and F2 mounting.)

NOTES 3 & 4: Please review the AutomationDirect Terms & Conditions for warranty and service on this product.

- 3) For motors weighing over 100 lbs: A) LTL shipment required. B) Order before 4:00 p.m. EST for same day shipment. C) You must have a receiving loading dock. D) Not available in Hawaii or Puerto Rico.
 4) For warranty on motors 50 hp and above, motors must be inspected by an EASA motor repair or service center. See AutomationDirect Terms & Conditions for details.

*** TABLE CONTINUED ON NEXT PAGE ***

*** TABLE CONTINUED FROM PREVIOUS PAGE ***										
Motor Specifications – T & TC ⁽¹⁾ Frame Three-Phase Motors – 1800 rpm										
Part Number	HP	NEMA Frame	Voltage	Housing	Shaft Material	Conduit Box Location ⁽²⁾	Holes/Foot	Service Factor	F.L. Amps @ 230V/460V	Approx Ship Weight (lb)
MTC-010-3BD18 ⁽³⁾	10	215T	208-230/460	TEFC cast iron	1045 CS	F1(F2)	3	1.15	24.8 / 12.4	179 ⁽³⁾
MTC-010-3BD18CK ⁽¹⁾⁽³⁾		215TC								198 ⁽³⁾
MTC-015-3BD18 ⁽³⁾	15	254T	208-230/460	TEFC cast iron	1045 CS	F1(F2)	2	1.15	35.4 / 17.7	290 ⁽³⁾
MTC-015-3BD18CK ⁽¹⁾⁽³⁾		254TC								310 ⁽³⁾
MTC-020-3BD18 ⁽³⁾	20	256T	208-230/460	TEFC cast iron	1045 CS	F1(F2)	3	1.15	47.6 / 23.8	326 ⁽³⁾
MTC-020-3BD18CK ⁽¹⁾⁽³⁾		256TC								360 ⁽³⁾
MTC-025-3BD18 ⁽³⁾	25	284T	208-230/460	TEFC cast iron	1045 CS	F1	2	1.15	56.4 / 28.2	400 ⁽³⁾
MTC-025-3BD18CK ⁽¹⁾⁽³⁾		284TC								440 ⁽³⁾
MTC-030-3BD18 ⁽³⁾	30	286T	208-230/460	TEFC cast iron	1045 CS	F1	3	1.15	67.2 / 33.6	451 ⁽³⁾
MTC-030-3BD18CK ⁽¹⁾⁽³⁾		286TC								470 ⁽³⁾
MTC-040-3BD18 ⁽³⁾	40	324T	208-230/460	TEFC cast iron	1045 CS	F1	2	1.15	93.0 / 46.5	589 ⁽³⁾
MTC-040-3BD18CK ⁽¹⁾⁽³⁾		324TC								608 ⁽³⁾
MTC-050-3BD18 ⁽³⁾⁽⁴⁾	50 ⁽⁴⁾	326T	208-230/460	TEFC cast iron	1045 CS	F1	3	1.15	114.6 / 57.3	640 ⁽³⁾
MTC-050-3BD18CK ⁽¹⁾⁽³⁾⁽⁴⁾		326TC								652 ⁽³⁾
MTC-060-3BD18 ⁽³⁾⁽⁴⁾	60 ⁽⁴⁾	364T	208-230/460	TEFC cast iron	1045 CS	F1	2	1.15	139.4 / 69.7	760 ⁽³⁾
MTC-060-3BD18CK ⁽¹⁾⁽³⁾⁽⁴⁾		364TC								777 ⁽³⁾
MTC-075-3BD18 ⁽³⁾⁽⁴⁾	75 ⁽⁴⁾	365T	208-230/460	TEFC cast iron	1045 CS	F1	3	1.15	172.8 / 86.4	803 ⁽³⁾
MTC-075-3BD18CK ⁽¹⁾⁽³⁾⁽⁴⁾		365TC								837 ⁽³⁾
MTC-100-3BD18 ⁽³⁾⁽⁴⁾	100 ⁽⁴⁾	405T	208-230/460	TEFC cast iron	1045 CS	F1	3	1.15	230 / 115	1300 ⁽³⁾
MTC-100-3BD18CK ⁽¹⁾⁽³⁾⁽⁴⁾		405TC								1335 ⁽³⁾
MTC-125-3BD18 ⁽³⁾⁽⁴⁾	125 ⁽⁴⁾	444T	460	4140 CS	F1(F2)	2	1.15	1.15	274 / 137	1433 ⁽³⁾
MTC-150-3BD18 ⁽³⁾⁽⁴⁾	150 ⁽⁴⁾	445T								326 / 163
MTC-200-3BD18 ⁽³⁾⁽⁴⁾	200 ⁽⁴⁾	445/7T	460	4140 CS	F1(F2)	3	1.15	1.15	446 / 223	1575 ⁽³⁾
MTC-250-3D18 ⁽³⁾⁽⁴⁾	250 ⁽⁴⁾	449T								1858 ⁽³⁾
MTC-300-3D18 ⁽³⁾⁽⁴⁾	300 ⁽⁴⁾	449T							- / 282	2508 ⁽³⁾
									- / 334	2728 ⁽³⁾

1) TC-frame motors are T-frame motors with applicable C-face accessory kits installed.

2) F1(F2) indicates F1 conduit box mounting location, field convertible to F2 (ref dimen diag).

NOTES 3 & 4: Please review the AutomationDirect Terms & Conditions for warranty and service on this product.

3) For motors weighing over 100 lbs: A) LTL shipment required. B) Order before 4:00 p.m. EST for same day shipment. C) You must have a receiving loading dock. D) Not available in Hawaii or Puerto Rico.

4) For warranty on motors 50 hp and above, motors must be inspected by an EASA motor repair or service center. See AutomationDirect Terms & Conditions for details.

Three-Phase Motors Features and Specifications (continued)

Cast Iron T-Frame – 1200 & 3600 rpm Motor Specifications

Motor Specifications – T-Frame Three-Phase Motors – 1200 & 3600 rpm										
Part Number	HP	NEMA Frame	Voltage	Housing	Shaft Material	Conduit Box Location(2)	Holes/Foot	Service Factor	F.L. Amps @ 230V/460V	Approx Ship Weight (lb)
1200 rpm Base Speed										
MTC-001-3BD12	1	145T	208-230/460	TEFC cast iron	1045 carbon steel	F1(F2)	4	1.15	3.2 / 1.6	65
MTC-1P5-3BD12 (3)	1.5	182T					2		4.8 / 2.4	100 (3)
MTC-002-3BD12 (3)	2	184T					4		6.1 / 3.1	105 (3)
MTC-003-3BD12 (3)	3	213T					2		8.4 / 4.2	155 (3)
MTC-005-3BD12 (3)	5	215T					4		13.6 / 6.8	175 (3)
MTC-7P5-3BD12 (3)	7.5	254T					2		21.2 / 10.6	300 (3)
MTC-010-3BD12 (3)	10	256T					4		28.0 / 14.0	340 (3)
3600 rpm Base Speed										
MTC-1P5-3BD36	1.5	143T	208-230/460	TEFC cast iron	1045 carbon steel	F1(F2)	2	1.15	3.8 / 1.9	50
MTC-002-3BD36	2	145T					4		5.0 / 2.5	60
MTC-003-3BD36 (3)	3	182T					2		7.2 / 3.6	100 (3)
MTC-005-3BD36 (3)	5	184T					4		11.3 / 5.7	110 (3)
MTC-7P5-3BD36 (3)	7.5	213T					2		16.8 / 8.4	148 (3)
MTC-010-3BD36 (3)	10	215T					4		22.4 / 11.2	181 (3)

2) F1(F2) indicates F1 conduit box mounting location, field convertible to F2.
(Refer to "Chapter 5: Reference" for further information regarding F1 and F2 mounting.)

NOTE 3: Please review the AutomationDirect Terms & Conditions for warranty and service on this product.

3) For motors weighing over 100 lbs: A) LTL shipment required. B) Order before 4:00 p.m. EST for same day shipment. C) You must have a receiving loading dock. D) Not available in Hawaii or Puerto Rico.

Three-Phase Motors Features and Specifications (continued)

Cast Iron T-Frame – 1800 rpm Motor Performance Data

Performance Data – T & TC ⁽¹⁾ Frame Three-Phase Motors – 1800 rpm (460 Volt except as indicated)							
Part Number	HP	NEMA Design	F.L. RPM	Minimum Speed (rpm)		Current @230V/460V (Amps)	
				Constant Torque (CT)	Variable Torque (VT)	Full Load	No Load
MTC-001-3BD18(CK)	1	B	1760	900	360	3.0 / 1.5	1.9 / 0.95
MTC-1P5-3BD18(CK)	1.5		1755			4.2 / 2.1	2.44 / 1.22
MTC-002-3BD18(CK)	2		1750			5.4 / 2.7	2.76 / 1.38
MTC-003-3BD18(CK)	3		1750			7.72 / 3.86	3.74 / 1.87
MTC-005-3BD18(CK)	5		1750			11.8 / 5.9	5.1 / 2.55
MTC-7P5-3BD18(CK)	7.5		1760			18.6 / 9.3	8.98 / 4.49
MTC-010-3BD18(CK)	10	A	1760			24.8 / 12.4	13.0 / 6.5
MTC-015-3BD18(CK)	15		1770			35.4 / 17.7	15.6 / 7.8
MTC-020-3BD18(CK)	20		1770			47.6 / 23.8	19.0 / 9.5
MTC-025-3BD18(CK)	25		1775			56.4 / 28.2	24.0 / 12.0
MTC-030-3BD18(CK)	30		1775			67.2 / 33.6	27.0 / 13.5
MTC-040-3BD18(CK)	40		1775			93.0 / 46.5	35.0 / 17.5
MTC-050-3BD18(CK)	50		1775			114.6 / 57.3	38.6 / 19.3
MTC-060-3BD18(CK)	60	B	1785	360	900	139.4 / 69.7	48.0 / 24.0
MTC-075-3BD18(CK)	75		1785			172.8 / 86.4	59.2 / 29.6
MTC-100-3BD18(CK)	100		1785			230 / 115	72.0 / 36.0
MTC-125-3BD18	125		1785			274 / 137	82.0 / 41.0
MTC-150-3BD18	150		1785			326 / 163	97.6 / 48.8
MTC-200-3BD18	200		1785			446 / 223	140 / 70.0
MTC-250-3D18	250		1790			- / 282	- / 85.6
MTC-300-3D18	300		1790			- / 334	- / 96.6

1) TC-frame motors (MTC-xxx-xxxxCK) are T-frame motors with applicable C-face accessory kits installed.

*** TABLE CONTINUED ON NEXT PAGE ***

*** TABLE CONTINUED FROM PREVIOUS PAGE ***								
Performance Data – T & TC ⁽¹⁾ Frame 3-Phase Motors – 1800 rpm (continued) (460 Volt except as indicated)								
Part Number	HP	Torque (lb·ft)		Maximum Speed (rpm)		F.L. Efficiency (%)	F.L. Power Factor	Rotor Inertia (lb·ft ²)
		Full Load	Breakdown	CHP ⁽²⁾	Safe			
MTC-001-3BD18(CK)	1	3.00	10.50	2700	5400	82.5	0.71	0.068
MTC-1P5-3BD18(CK)	1.5	4.41	14.11		5400	84.0	0.74	0.083
MTC-002-3BD18(CK)	2	6.05	17.55		5400	84.0	0.77	0.09
MTC-003-3BD18(CK)	3	9.07	29.93		5400	87.5	0.81	0.22
MTC-005-3BD18(CK)	5	15.1	46.8		5400	87.5	0.84	0.285
MTC-7P5-3BD18(CK)	7.5	22.0	72.6		5400	89.5	0.81	0.602
MTC-010-3BD18(CK)	10	29.8	92.4		4200	89.5	0.83	0.742
MTC-015-3BD18(CK)	15	44.5	124.6		4200	91.0	0.83	1.71
MTC-020-3BD18(CK)	20	59.7	155.2		4200	91.0	0.84	2.18
MTC-025-3BD18(CK)	25	73.9	206.9		4200	92.4	0.87	3.3
MTC-030-3BD18(CK)	30	88.7	257.2		4200	92.4	0.86	3.76
MTC-040-3BD18(CK)	40	118.3	354.9		3600	93.0	0.86	5.84
MTC-050-3BD18(CK)	50	148	444		3600	93.0	0.86	6.34
MTC-060-3BD18(CK)	60	179	483		3600	93.6	0.85	11.4
MTC-075-3BD18(CK)	75	221	530		3600	94.1	0.84	12.7
MTC-100-3BD18(CK)	100	296	858		2800	94.5	0.87	28.5
MTC-125-3BD18	125	355	888		2800	94.5	0.86	38.9
MTC-150-3BD18	150	433	1083		2800	95.0	0.87	47.2
MTC-200-3BD18	200	590	1652		2800	95.0	0.87	62.3
MTC-250-3D18	250	728	2402		2800	95.9	0.87	86.0
MTC-300-3D18	300	864	2817		2800	95.7	0.88	105.0

1) TC-frame motors (MTC-xxx-xxxxCK) are T-frame motors with applicable C-face accessory kits installed.

2) Maximum Constant HP RPM is for direct coupled loads.

*** TABLE CONTINUED ON NEXT PAGE ***

*** TABLE CONTINUED FROM PREVIOUS PAGE ***							
Performance Data – T & TC ⁽¹⁾ Frame 3-Phase Motors – 1800 rpm (continued) – (460 Volt except as indicated)							
Part Number	HP	Temperature Rise @ Full Load	Locked Rotor Torque (%)	Locked Rotor Amps 230V/460V	Max Time Locked Rotor (Hot)	Slip (%)	
MTC-001-3BD18(CK)	1	80° C (176°F)	250	30.0 / 15.0	20 seconds	2.22	
MTC-1P5-3BD18(CK)	1.5		240	40.0 / 20.0		2.50	
MTC-002-3BD18(CK)	2		230	50.0 / 25.0			
MTC-003-3BD18(CK)	3		280	64.0 / 32.0		2.78	
MTC-005-3BD18(CK)	5		270	92.0 / 46.0			
MTC-7P5-3BD18(CK)	7.5		127 / 63.5		13 seconds	2.22	
MTC-010-3BD18(CK)	10		200 / 100			2.20	
MTC-015-3BD18(CK)	15		280 / 140		20 seconds	1.67	
MTC-020-3BD18(CK)	20		400 / 200				
MTC-025-3BD18(CK)	25		206	440 / 220	16 seconds	1.38	
MTC-030-3BD18(CK)	30		200	520 / 260			
MTC-040-3BD18(CK)	40		210	720 / 360	20 seconds	1.39	
MTC-050-3BD18(CK)	50			880 / 440			
MTC-060-3BD18(CK)	60		180	870 / 435	15 seconds	0.83	
MTC-075-3BD18(CK)	75			1086 / 543			
MTC-100-3BD18(CK)	100		200	1450 / 725			
MTC-125-3BD18	125		175	1815 / 908			
MTC-150-3BD18	150		180	2170 / 1085	20 seconds	0.54	
MTC-200-3BD18	200		200	2900 / 1450			
MTC-250-3D18	250	85° C (185°F)	228	- / 2017	20 seconds	0.54	
MTC-300-3D18	300		226	- / 2351		0.53	

1) TC-frame motors (MTC-xxx-xxxxCK) are T-frame motors with applicable C-face accessory kits installed.

Three-Phase Motors Features and Specifications (continued)

Cast Iron T-Frame – 1200 rpm Motor Performance Data

Performance Data – T-Frame Three-Phase Motors – 1200 rpm (460 Volt except as indicated)								
Part Number	HP	NEMA Design	F.L. RPM	Minimum Speed (rpm)		Maximum Speed (rpm)		
				Constant Torque (CT)	Variable Torque (VT)	CHP ⁽²⁾	Safe	
MTC-001-3BD12	1	B	1150	600	240	1800	3600	
MTC-1P5-3BD12	1.5		1170					
MTC-002-3BD12	2		1180					
MTC-003-3BD12	3							
MTC-005-3BD12	5							
MTC-7P5-3BD12	7.5							
MTC-010-3BD12	10	A						
Part Number	HP	Current @ 230V/460V (Amps)				Torque (lb·ft)		
		No Load	Full Load	Locked Rotor	Full Load	Locked Rotor	Break-down	
MTC-001-3BD12	1	3.2 / 1.6	3.2 / 1.6	25.0 / 12.5	4.59	11.47	14.69	
MTC-1P5-3BD12	1.5	3.5 / 1.8	4.8 / 2.4	40.0 / 20.0	6.60	18.5	24.4	
MTC-002-3BD12	2	4.0 / 2.0	6.1 / 3.1	50.0 / 25.0	9.02	24.4	30.7	
MTC-003-3BD12	3	4.7 / 2.4	8.4 / 4.2	64.0 / 32.0	13.4	22.8	37.5	
MTC-005-3BD12	5	7.3 / 3.7	13.6 / 6.8	92.0 / 46.0	22.2	37.7	53.3	
MTC-7P5-3BD12	7.5	12.6 / 6.3	21.2 / 10.6	127 / 63.5	32.9	75.7	98.7	
MTC-010-3BD12	10	7.6 / 3.8	28.0 / 14.0	168 / 84.0	44.8	98.6	139	
Part Number	HP	Temperature Rise @ Full Load	Max Time Locked Rotor (Hot)	Rotor Inertia (lb·ft ²)	Slip (%)	F.L. Efficiency (%)	F.L. Power Factor	
MTC-001-3BD12	1	80° C (176°F)	20 seconds	0.009	3.3	81.1	0.72	
MTC-1P5-3BD12	1.5			0.068	2.5	85.5	0.65	
MTC-002-3BD12	2			0.100	2.5	86.5	0.70	
MTC-003-3BD12	3			0.207	1.7	87.5	0.72	
MTC-005-3BD12	5			0.258	1.7	87.5	0.72	
MTC-7P5-3BD12	7.5			0.480	1.7	89.5	0.71	
MTC-010-3BD12	10			2.487	1.7	89.5	0.74	

2) Maximum Constant HP RPM is for direct coupled loads

Three-Phase Motors Features and Specifications (continued)

Cast Iron T-Frame – 3600 rpm Motor Performance Data

Performance Data – T-Frame Three-Phase Motors – 3600 rpm (460 Volt except as indicated)								
Part Number	HP	NEMA Design	F.L. RPM	Minimum Speed (rpm)		Maximum Speed (rpm)		
				Constant Torque (CT)	Variable Torque (VT)	CHP ⁽²⁾	Safe	
MTC-1P5-3BD36	1.5	B	3480	1800	720	5400	5400	
MTC-002-3BD36	2							
MTC-003-3BD36	3							
MTC-005-3BD36	5							
MTC-7P5-3BD36	7.5							
MTC-010-3BD36	10							
Part Number	HP	Current @ 230V/460V (Amps)				Torque (lb·ft)		
		No Load	Full Load	Locked Rotor		Full Load	Locked Rotor	Break-down
MTC-1P5-3BD36	1.5	1.4 / 0.7	3.8 / 1.9	40.0 / 20.0	2.23	4.01	5.58	
MTC-002-3BD36	2	1.5 / 0.8	5.0 / 2.5	50.0 / 25.0	3.03	6.06	8.18	
MTC-003-3BD36	3	2.8 / 1.4	7.2 / 3.6	64.0 / 32.0	4.50	10.4	16.2	
MTC-005-3BD36	5	4.0 / 2.0	11.3 / 5.7	92.0 / 46.0	7.46	15.7	26.5	
MTC-7P5-3BD36	7.5	5.0 / 2.5	16.8 / 8.4	127 / 63.5	11.0	22.0	36.3	
MTC-010-3BD36	10	5.7 / 2.8	22.4 / 11.2	162 / 81.0	15.0	33.0	49.5	
Part Number	HP	Temperature Rise @ Full Load	Max Time Locked Rotor (Hot)	Rotor Inertia (lb·ft ²)	Slip (%)	F.L. Efficiency (%)	F.L. Power Factor	
MTC-1P5-3BD36	1.5	80° C (176°F)	20 seconds	0.009	3.3	82.5	0.86	
MTC-002-3BD36	2			0.010	3.3	84.0	0.87	
MTC-003-3BD36	3			0.034	2.2	85.5	0.86	
MTC-005-3BD36	5			0.040	2.5	87.5	0.88	
MTC-7P5-3BD36	7.5			0.258	2.2	88.5	0.89	
MTC-010-3BD36	10			0.109	1.9	89.5	0.89	

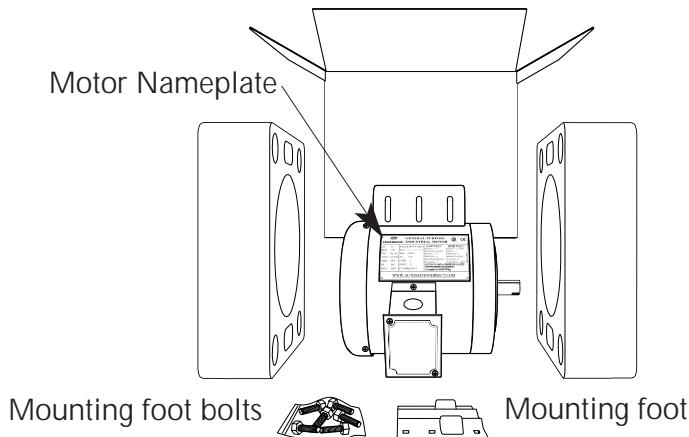
2) Maximum Constant HP RPM is for direct coupled loads

Receiving and Inspection

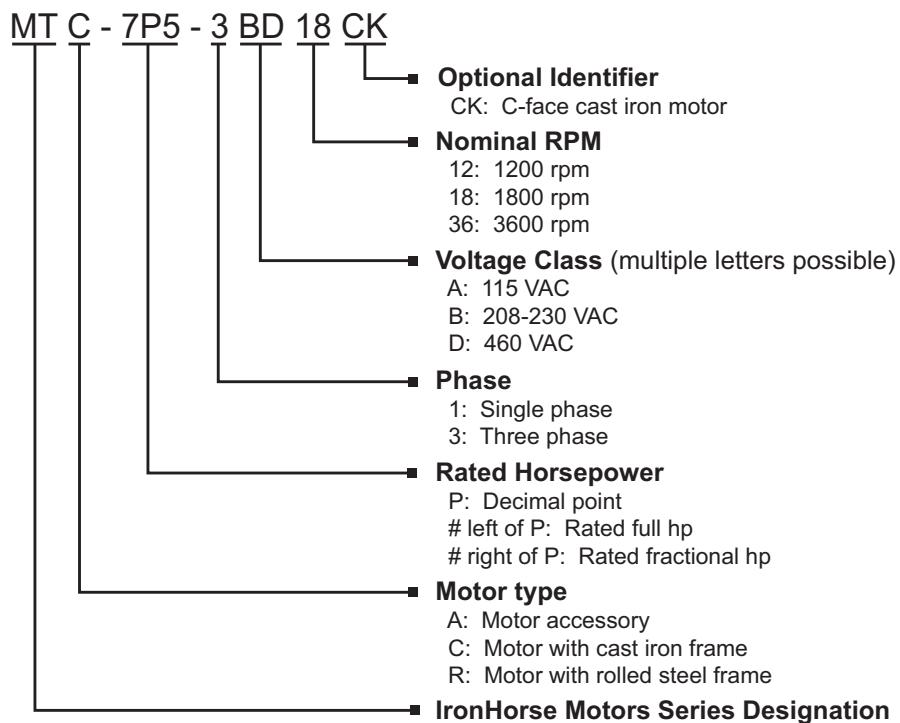
Unpacking

After receiving an IronHorse motor, please check for the following:

- Open the motor packaging and inspect for damage during shipment.
- Make sure the part number indicated on the motor nameplate corresponds with the part number on your order.
- For all 56C framed motors, make sure that the shipment contains the motor, the removable mounting foot and six mounting foot bolts.
- Read the enclosed Product Advisory.



IronHorse Part Number Information



Reshipping

If an IronHorse motor needs to be reshipped from the initial shipping point, the following procedures should be followed to protect the motor from damage.

1. If the original packaging is to be used for reshipment, inspect the packaging for previous shipping damage and repackage if necessary. Take care to protect the motor body, fan cover and shaft.
2. It is a good idea to bolt the motor to a platform that fits securely in the bottom of the shipping crate or box. This helps prevent the motor from shifting during transport and thus protects the bearings from damage.
3. A shaft lock device should be installed on motors from 100 to 300 hp prior to shipment. The shaft lock helps prevent bearing damage.
4. Motors should only be lifted by the the eyebolt(s) provided on the motor. When lifting motors with more than one eyebolt, use every bolt provided.

Long Term Storage

The following preventative measures should be taken when storing IronHorse motors for a long period of time.

1. Store motors in a controller temperature, dry atmosphere free of excess dirt, dust and airborne particles.
2. Rotate the motor shaft every sixty days to prevent hardening of the bearing grease.
3. Warehoused motors should have the bearing grease purged and replaced every six months. Use only Exxon POLYREX® EM Polyurea grease.

Warranty

IronHorse motors carry a two year warranty from the date of invoice. All warranty issues must first be evaluated by AutomationDirect technical support services. For motors 40 hp and smaller, valid warranty claims will be resolved by product replacement. Motors 50 hp and larger must be evaluated by an authorized Electrical Apparatus Service Association (EASA) service center. Valid warranty claims will be resolved by repair or replacement at the discretion of AutomationDirect. See AutomationDirect Terms and Conditions in our current catalog or online at <http://www.automationdirect.com/static/specs/adpolicy.pdf> for complete details.

Authorized EASA service centers are available nationwide. Visit the EASA website at www.easa.com to find the nearest authorized service center. These shops may also be able to assist with non-warranty service.

MOUNTING & INITIAL STARTUP

CHAPTER 2

In This Chapter...

Safety Information	2-2
Motor Dimensions	2-3
56C-Frame Single-phase Motor Dimensions	2-3
56C-Frame Three-phase Motor Dimensions	2-3
T-Frame Three-phase Motor Dimensions	2-4
TC-Frame Three-phase Motor & C-Flange Dimensions	2-8
Terminal Diagrams	2-9
Motor Mounting	2-10
STABLE™ Slide Bases	2-10
Proper Installation Conditions	2-11
Coupling Alignment	2-11
Motor Nameplate & Starter Information	2-12
Typical IronHorse Motor Nameplate	2-12
Motor Starter Information	2-12
Locked Rotor Amps	2-13
Inspection Before Startup	2-14
Initial Startup Inspection	2-14

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_{us} 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.

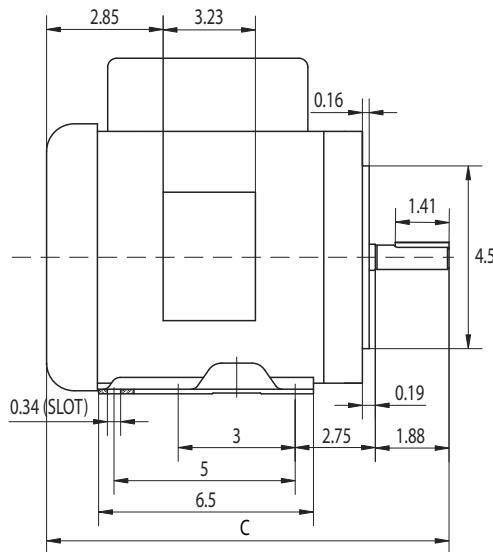
Applicable Codes

All IronHorse motors are _cCSA_{us} listed, and therefore comply with the requirements of the National Electrical Code (NEC) and the Canadian Electrical Code (CEC).

Installation intended to meet the _cCSA_{us} requirements must follow the instructions provided in the "Wiring Notes" as a minimum standard. Follow all local codes that exceed _cCSA_{us} requirements. Refer to the technical data on the motor nameplate for electrical and performance data.

Motor Dimensions

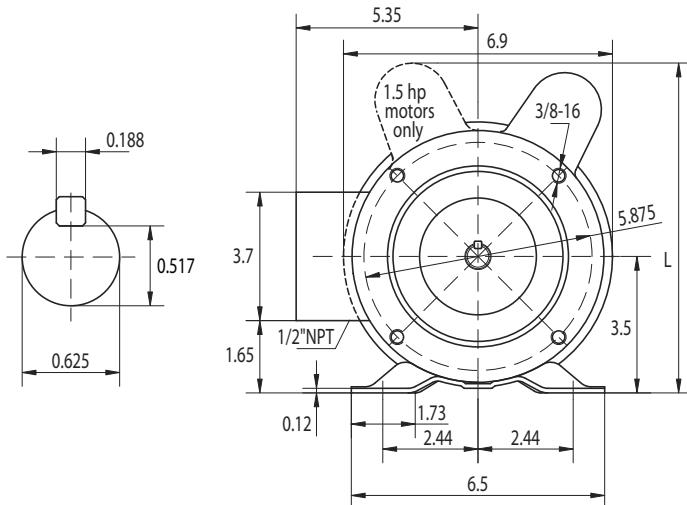
56C-Frame Single-phase Motor Dimensions



C = 12.4"; all except 1 & 1.5 hp motors

C = 13"; 1 hp MTR-001-1AB18

C = 13.8"; 1.5hp MTR-1P5-1AB18



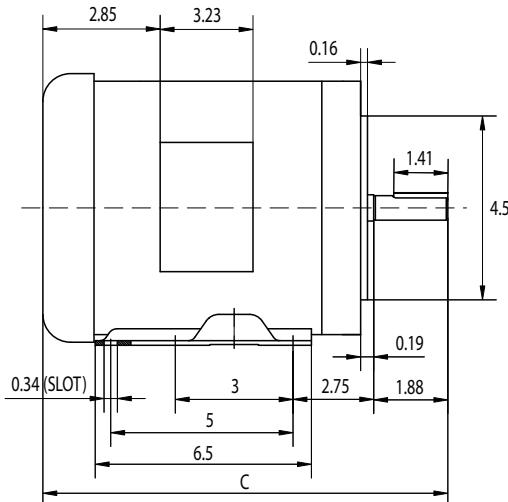
UNITS = INCHES

MTR-xxx-1AB18 IronHorse Motors
(single-phase rolled steel)

L = 8.19"; all except 1.5 hp motors

L = 8.5"; 1.5 hp motors

56C-Frame Three-phase Motor Dimensions



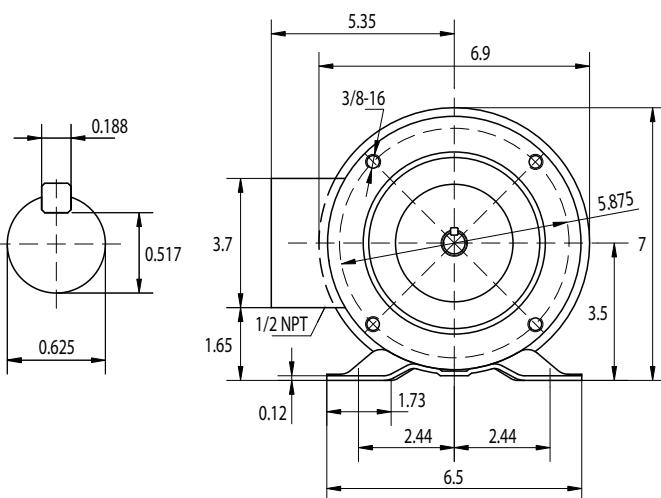
C = 12.2"; 0.33 to 1hp motors

C = 12.6"; 1.5hp MTR-1P5-3BD18

C = 12.2"; 1.5hp MTR-1P5-3BD36

C = 13.8"; 2hp MTR-002-3BD18

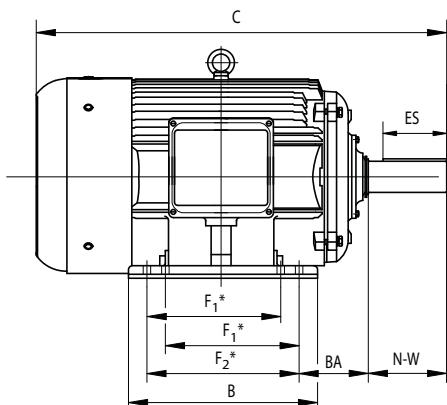
C = 12.4"; 2hp MTR-002-3BD36



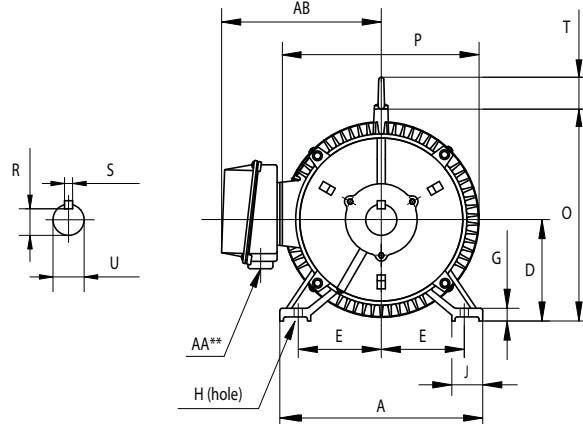
UNITS = INCHES

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

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.

Dimensions [inches, except as noted] Three-phase T Frame Motors – 1200, 1800, 3600 rpm												
Part Number	HP	NEMA Frame	A	AA**	AB	B	BA	C	D	E	ES	
MTC-001-3BD12	1	145T	7	3/4"npt	6.89	6	2.25	13.58	3.5	2.75	1.41	
MTC-001-3BD18		143T				5		12.57				
MTC-1P5-3BD12	1-1/2	182T	9	1" NPT	7.45	6.5	2.75	15.11	4.5	3.75	1.78	
MTC-1P5-3BD18		145T				6	2.25	13.58				
MTC-1P5-3BD36						5		12.57	3.5	2.75	1.41	
MTC-002-3BD12	2	184T	9	1" NPT	7.45	7.5	2.75	16.11	4.5	3.75	1.78	
MTC-002-3BD18		145T				6.89	6	2.25	13.58	3.5	2.75	1.41
MTC-002-3BD36	3	213T	10.5	1" NPT	8.63	7.5	3.5	18.89	5.25	4.25	2.41	
MTC-003-3BD18		182T				7.45	6.5	2.75	15.11	4.5	3.75	1.78
MTC-003-3BD36	5	215T	10.5	1" NPT	8.63	9	3.5	20.49	5.25	4.25	2.41	
MTC-005-3BD18		184T				7.45	7.5	2.75	16.11	4.5	3.75	1.78
MTC-005-3BD36	7-1/2	254T	12.5	1.5" NPT	11.2	10.8	4.25	23.29	6.25	5	2.91	
MTC-7P5-3BD18		213T				8.63	7.5	3.5	18.89	5.25	4.25	2.41
MTC-7P5-3BD36	10	256T	12.5	1.5" NPT	11.2	12.5	4.25	25.06	6.25	5	2.91	
MTC-010-3BD18		215T				8.63	9	3.5	20.49	5.25	4.25	2.41
MTC-010-3BD36												

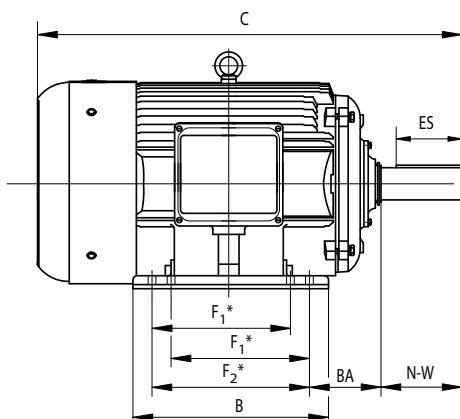
* Various frame sizes have 2 or 4 mounting holes per mounting foot.

** AA dimension is conduit fitting size.

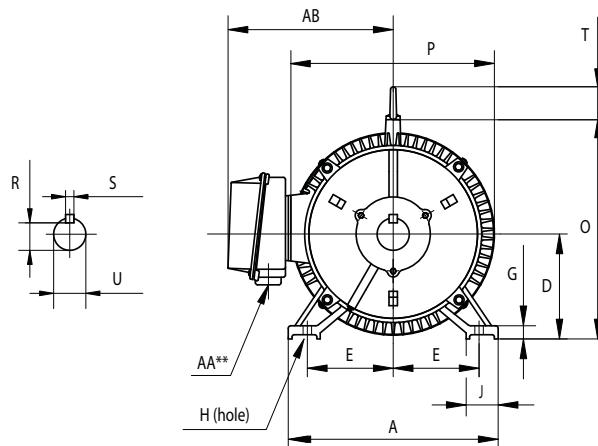
F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T Frame "Motor Specifications" table. (F2 mounting = conduit entrance on right side facing shaft.)

**** Table Continued Next Page for 1-10 hp T-frame Motors; 1200, 1800, 3600 rpm ****

T-Frame Three-phase Motor Dimensions (continued)



* 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.

Dimensions [inches, except as noted] (continued)
Three-phase T Frame Motors – 1200, 1800, 3600 rpm

Part Number	F1*	F2*	G	H	J	N-W	O	P	R	S	T	U
MTC-001-3BD12	4	5	0.512	0.34	1.45	2.25	7.08	7.16	0.771	0.188	0.88	0.875
MTC-001-3BD18	n/a	4		0.34	1.45	2.25	7.08	7.16	0.771	0.188	n/a	
MTC-1P5-3BD12	n/a	4.5	0.59	0.41	1.97	2.75	8.97	8.82	0.986	0.25	1.42	1.125
MTC-1P5-3BD18	4	5	0.512	0.34	1.45	2.25	7.08	7.16	0.771	0.188	n/a	0.875
MTC-1P5-3BD36	n/a	4		0.34	1.45	2.25	7.08	7.16	0.771	0.188	n/a	0.875
MTC-002-3BD12	4.5	5.5	0.59	0.41	1.97	2.75	8.97	8.82	0.986	0.25	1.42	1.125
MTC-002-3BD18	4	5	0.512	0.34	1.45	2.25	7.08	7.16	0.771	0.188	n/a	0.875
MTC-002-3BD36		4		0.34	1.45	2.25	7.08	7.16	0.771	0.188	0.88	
MTC-003-3BD12	n/a	5.5	0.709	0.41	2.36	3.38	10.53	10.4	1.201	0.312	1.73	1.375
MTC-003-3BD18	n/a	4.5	0.59	0.41	1.97	2.75	8.97	8.82	0.986	0.25	1.42	1.125
MTC-003-3BD36	n/a	4.5	0.59	0.41	1.97	2.75	8.97	8.82	0.986	0.25	1.42	1.125
MTC-005-3BD12	5.5	7	0.709	0.41	2.36	3.38	10.53	10.4	1.201	0.312	1.73	1.375
MTC-005-3BD18	4.5	5.5	0.59	0.41	1.97	2.75	8.97	8.82	0.986	0.25	1.42	1.125
MTC-005-3BD36		4.5		0.41	1.97	2.75	8.97	8.82	0.986	0.25	1.42	1.125
MTC-7P5-3BD12	n/a	8.25	0.787	0.53	2.76	4	12.89	12.6	1.416	0.375	2.05	1.625
MTC-7P5-3BD18	n/a	5.5	0.709	0.41	2.36	3.38	10.53	10.4	1.201	0.312	1.73	1.375
MTC-7P5-3BD36	n/a	5.5	0.709	0.41	2.36	3.38	10.53	10.4	1.201	0.312	1.73	1.375
MTC-010-3BD12	8.25	10	0.787	0.53	2.76	4	12.89	12.6	1.416	0.375	2.05	1.625
MTC-010-3BD18	5.5	7	0.709	0.41	2.36	3.38	10.53	10.4	1.201	0.312	1.73	1.375
MTC-010-3BD36		5.5		0.41	2.36	3.38	10.53	10.4	1.201	0.312	1.73	1.375

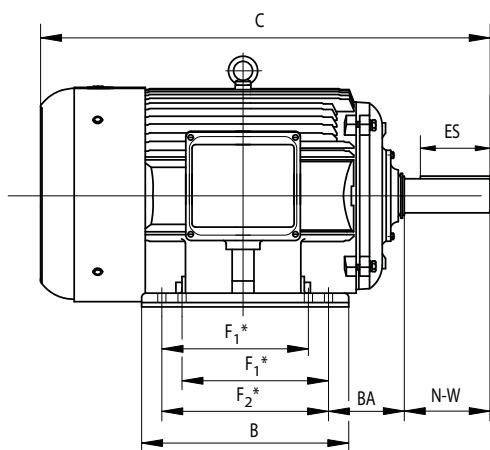
* Various frame sizes have 2 or 4 mounting holes per mounting foot.

** AA dimension is conduit fitting size.

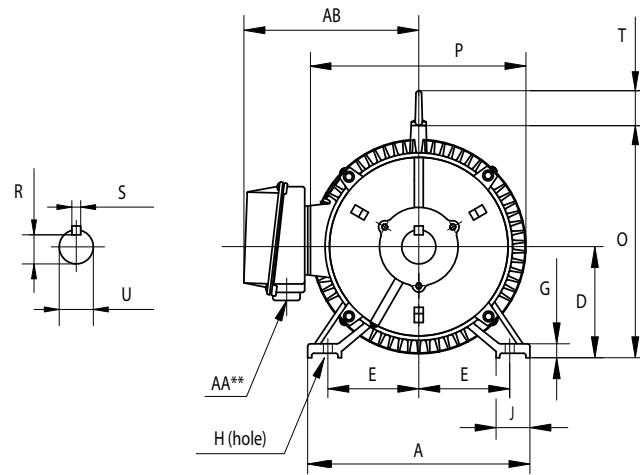
F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T Frame "Motor Specifications" table. (F2 mounting = conduit entrance on right side facing shaft.)

**** Table Continued Next Page for 15–300 hp T-frame Motors; 1800 rpm ****

T-Frame Three-phase Motor Dimensions (continued)



*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.

Dimensions [inches, except as noted] (continued)
Three-phase T Frame Motors – 1800 rpm

Part Number	HP	NEMA Frame	A	AA**	AB	B	BA	C	D	E	ES
MTC-015-3BD18	15	254T	12.5	1.5" NPT	11.2	10.8	4.25	23.29	6.25	5	2.91
MTC-020-3BD18	20	256T				12.5		25.06			
MTC-025-3BD18	25	284T	14	1.5" NPT	12	12.5	4.75	26.64	7	5.5	3.28
MTC-030-3BD18	30	286T				14		28.18			
MTC-040-3BD18	40	324T	16	2" NPT	13.4	14	5.25	29.95	8	6.25	3.91
MTC-050-3BD18	50	326T				15.5		31.24			
MTC-060-3BD18	60	364T	18	3" NPT	15.7	15.2	5.88	32.68	9	7	4.28
MTC-075-3BD18	75	365T				16.2		34.11			
MTC-100-3BD18	100	405T	20	3" NPT	18.31	17.8	6.62	38.35	10	8	5.65
MTC-125-3BD18	125	444T	22	2x3" NPT	19.41	18.5	7.5	42.52	11	9	6.91
MTC-150-3BD18	150	445T				20.5		44.5			
MTC-200-3BD18	200	445/7T				24		48.03			
MTC-250-3D18	250		449T	22	2x3" NPT	19.07	31	7.5	55.51	11	9
MTC-300-3D18	300										7.01

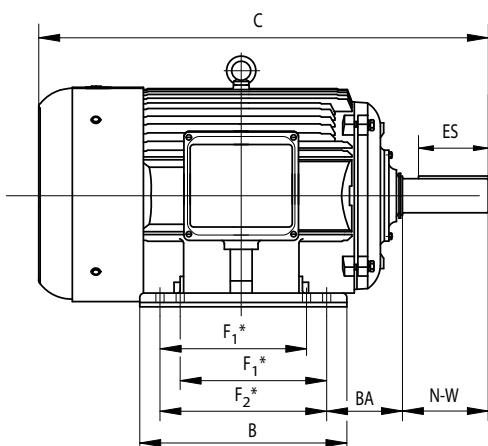
* Various frame sizes have 2 or 4 mounting holes per mounting foot.

** AA dimension is conduit fitting size.

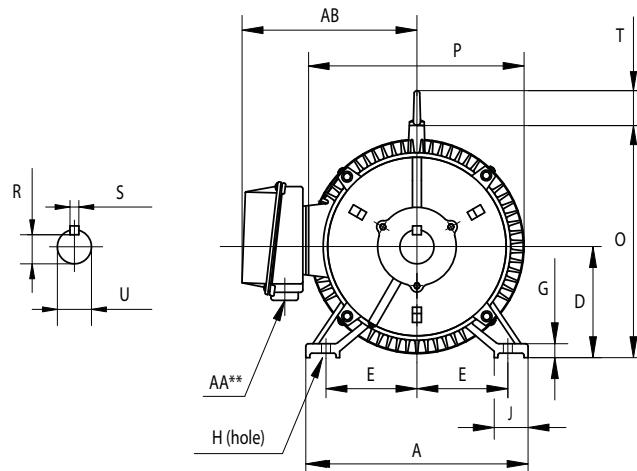
F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T Frame "Motor Specifications" table. (F2 mounting = conduit entrance on right side facing shaft.)

**** Table Continued Next Page for 15-300 hp T-frame Motors; 1800 rpm ****

T-Frame Three-phase Motor Dimensions (continued)



* 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.

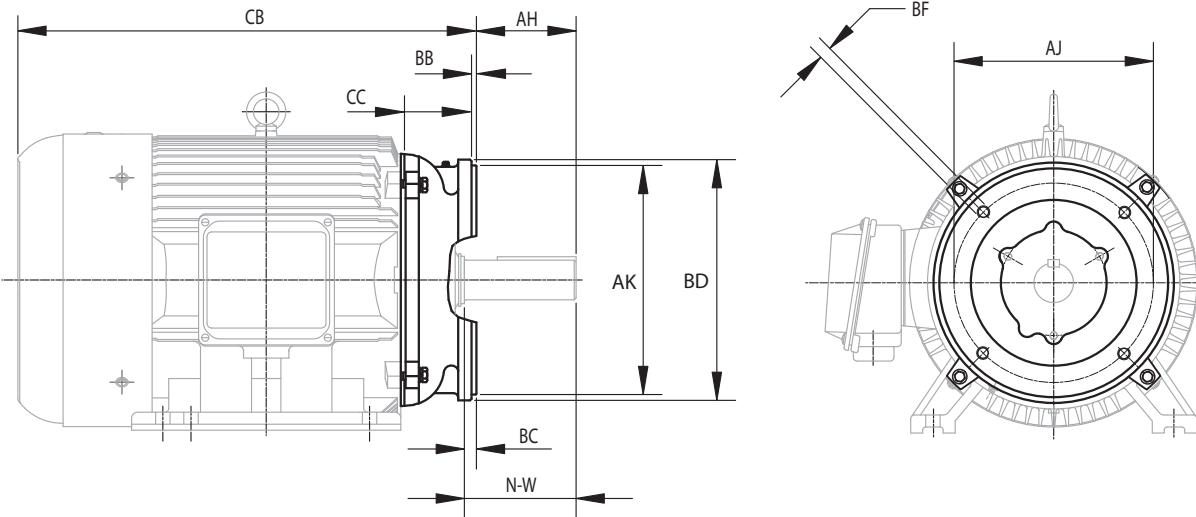
Dimensions [inches, except as noted] (continued)														
Three-phase T Frame Motors – 1800 rpm														
Part Number	F1*	F2*	G	H	J	N-W	O	P	R	S	T	U		
MTC-015-3BD18	n/a	8.25	0.787	0.53	2.76	4	12.89	12.6	1.416	0.375	2.05	1.625		
MTC-020-3BD18	8.25	10												
MTC-025-3BD18	n/a	9.5	0.866	0.53	2.76	4.62	14.28	14.17	1.591	0.5	2.05	1.875		
MTC-030-3BD18	9.5	11												
MTC-040-3BD18	n/a	10.5	0.984	0.66	2.76	5.25	15.91	15.75	1.845	0.5	2.44	2.125		
MTC-050-3BD18	10.5	12												
MTC-060-3BD18	n/a	11.25	1.102	0.66	2.95	5.88	18.13	17.7	2.021	0.625	2.44	2.375		
MTC-075-3BD18	11.25	12.25												
MTC-100-3BD18	12.25	13.75	1.18	0.81	3.15	7.25	21.02	21.42	2.45	0.75	2.83	2.875		
MTC-125-3BD18	n/a	14.5												
MTC-150-3BD18	14.5	16.5	1.38	0.81	3.35	8.5	22.97	23.43	2.88	0.875	3.46	3.375		
MTC-200-3BD18	16.5	20												
MTC-250-3D18	n/a	25	1.575	0.81	3.35	8.5	23	24	2.88	0.875	4.25	3.375		
MTC-300-3D18														

* 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.)

TC-Frame Three-phase Motor & C-Flange Dimensions



*TC-frame motors are T-frame motors with C-flange accessory kits installed.
For more information about the C-flange accessory kits, refer to Chapter 4: Accessories.*

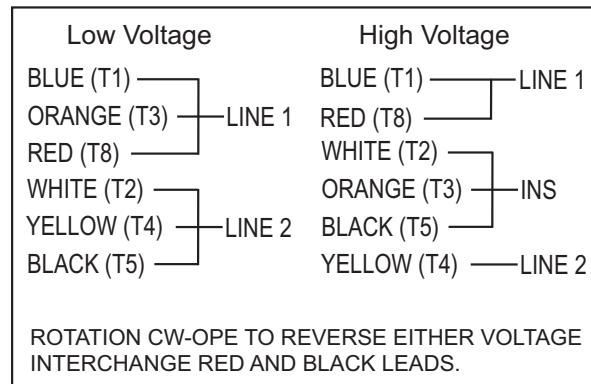
Dimensions (inches) - T-Frame Motor C-Flange Kits											
Part Number	Frame	AH ⁽²⁾	AJ	AK	BB	BC ⁽²⁾	BD	BF	CB ⁽²⁾	CC	N-W ⁽²⁾
MTA-CFACE-140TC ⁽¹⁾	143T	1.96	5.875 ⁽¹⁾	4.5 ⁽¹⁾	0.16	0.12	6.5	3/8-16	10.51	1.43	2.25
	145T								11.62		
MTA-CFACE-180TC	182T	2.62	7.25	8.5	0.25	0.12	9	1/2-13	12.49	1.17	2.75
	184T								13.49		
MTA-CFACE-210TC	213T	3.12	7.25	8.5	0.25	0.25	9	1/2-13	15.77	1.45	3.38
	215T								17.37		
MTA-CFACE-250TC	254T	3.75	7.25	8.5	0.25	0.25	10	1/2-13	19.54	2.89	4
	256T								21.31		
MTA-CFACE-280TC	284T	4.38	9	10.5	0.25	0.25	11.25	1/2-13	22.26	3.26	4.62
	286T								23.80		
MTA-CFACE-320TC	324T	5	11	12.5	0.25	0.25	14	5/8-11	24.95	3.67	5.25
	326T								26.24		
MTA-CFACE-360TC	364T	5.62	11	12.5	0.25	0.25	14	5/8-11	27.06	4.06	5.88
	365T								28.49		
MTA-CFACE-400TC	405T	7	11	12.5	0.25	0.25	15.5	5/8-11	31.35	4.33	7.25
MTA-CFACE-444TC	444T	8.25	14	16	0.25	0.25	18	5/8-11	34.27	4.11	8.5
	445T								36.25		
MTA-CFACE-447TC	445/7T	8.25	14	16	0.25	0.25	18	5/8-11	39.78	4.11	8.5
MTA-CFACE-449TC	449T	8.248	14	16	0.26	0.26	17.72	5/8-11	47.26	4.35	8.5

1) Mounting bolt holes for MTA-CFACE-140TC are located outside of the highest C-face flange surface (dimension AJ > AK).

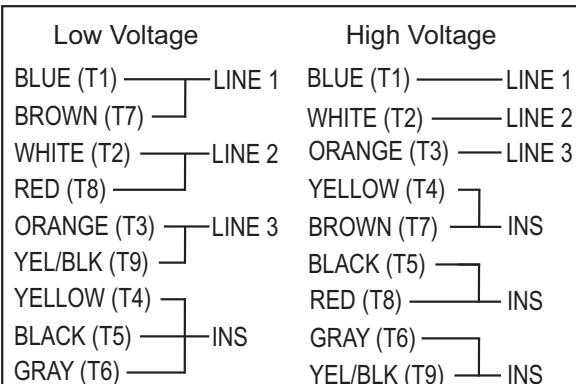
2) Motor dependent dimensions apply only to IronHorse MTC-xxx-xxxxx(CK) motors.

Terminal Diagrams

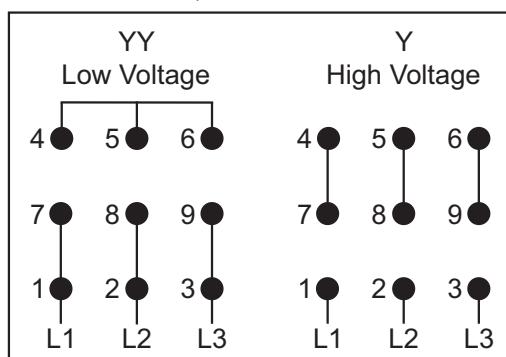
1/3 hp - 1.5hp 1Ø models
6-Lead, 115/208-230 VAC



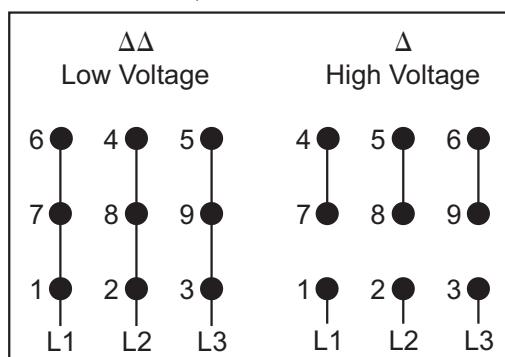
1/3 hp - 2hp 3Ø models
9-Lead, 208-230/460 VAC



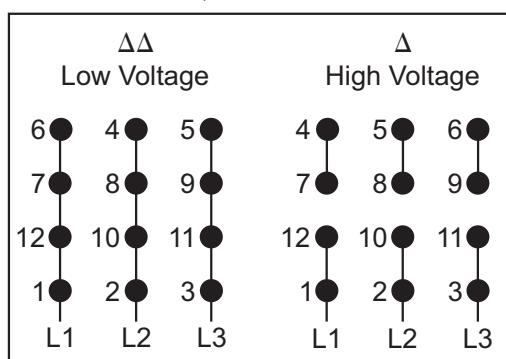
1hp - 5hp models
9-Lead, 208-230/460 VAC



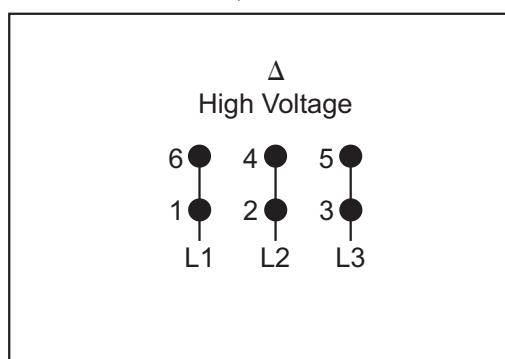
7.5 hp - 20 hp models
9-Lead, 208-230/460 VAC



25 hp - 200 hp models
12-Lead, 208-230/460 VAC



250 hp - 300 hp models
6-Lead, 460 VAC

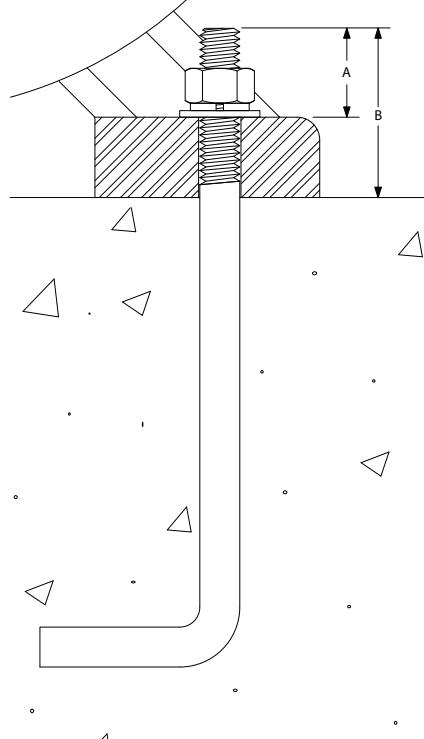


Motor Mounting

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 100 hp 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)	
56				
143T	5/16"	.45"	.88"	
145T				
182T				
184T	3/8"	.53"	1.50"	
213T				
215T				
254T				
256T	1/2"	.69""	1.44"	
284T			1.69"	
286T				
324T				
326T	5/8"	.85"	2.19"	
364T			2.06"	
365T				
404T				
405T				
444T	3/4"	.95"	2.50"	
445T				
447T				
449T			3.00"	



STABLE™ Slide Bases

AutomationDirect offers STABLE slide bases for simple mounting of any NEMA standard frame motor. STABLE slide bases are manufactured from heavy-duty steel and allow motor position adjustment when mounting any NEMA framed motor. See Chapter 4 (Accessories) for complete details.

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 contaminant 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					
Temperature - °C (°F)	1000 (3281)	1500 (4921)	2000 (6562)	2500 (8202)	3000 (9842)	3500 (11,483)	4000 (13,123)
	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
	50 °C (122 °F)	0.85	0.8	0.76	0.72	0.68	0.65
	60 °C (140 °F)	0.71	0.67	0.64	0.60	0.57	0.55

Example : 100 hp @ 60 °C and 2000 Meters

$$100 / 0.64 = 156 \text{ hp}$$

The motor should be a 200 hp motor.

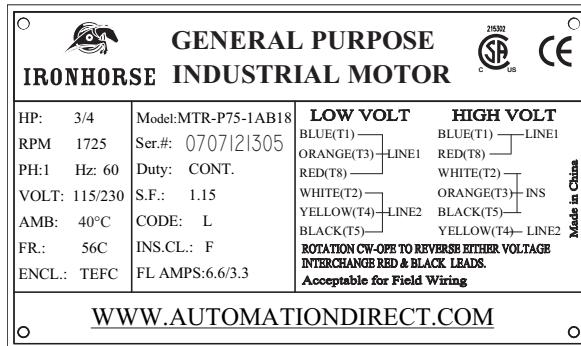
Coupling Alignment

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 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)				208-230/460	Wye	
143T – 145T			9-1/2 in			
182T – 184T			Delta			
213T						
215T		14 AWG	13 in	Wye / Delta	Wye / Delta	
254T – 256T						
284T – 286T	12	10 AWG	10-5/8 in			
324T – 326T		8 AWG				
364T – 365T		6 AWG				
404T – 405T		4 AWG				
444T – 445T		3 AWG				
447T		1 AWG	13-3/4 in			
449T			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 T-frame motor "Performance Data" table 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 drive end and opposite drive end bearings. Make sure the bearing cavities are filled with Exxon POLYREX® EM Polyurea grease to the proper running level.
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 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.

PREVENTATIVE ONGOING MAINTENANCE



In This Chapter...

Routine Maintenance	3-2
Bearing Size Information	3-3

Routine Maintenance

A routine maintenance schedule should be developed for every IronHorse motor installation based on the individual application. Motors installed in a harsh running environment should be serviced more frequently than those installed in a clean, climate controlled area. The following list should be used as a basis for creating the routine maintenance schedule.

1. Clean the motor housing using a brush, soft cloth or compressed air. Pay special attention to the cooling ribs on cast iron motors. Remove any dirt and dust from the fan and fan cover vents.
2. Frequently monitor the bearing temperature on the motor. It should not exceed 60°C (140°F).
2. Lubricate the bearings using the schedule shown below.
3. Have the insulation checked periodically by an authorized motor specialist.
4. Purge the bearing grease at least every six months on all motors with serviceable bearings. Replace both the drive end and opposite drive end bearings at the end of their recommended running hour life. Motors used in belt drive applications have a bearing life expectancy of 50,000 hours. Direct coupled application motors have a bearing life expectancy of 100,000 hours.

Bearing Lubrication Schedule				
HP ⁽¹⁾	Drive End Bearing Lubrication ⁽²⁾	Grease Amount ⁽³⁾	Opposite Drive End Bearing Lubrication ⁽²⁾	Grease Amount ⁽³⁾
15	9000	0.46 oz	9000	0.29 oz
20				0.46 oz
25	7500	0.64 oz	7500	0.64 oz
30				0.75 oz
40	7000	0.75 oz	7000	0.75 oz
50				0.86 oz
60	6500	0.86 oz	6500	0.86 oz
75				1.22 oz
100	3000	1.22 oz	6500	1.61 oz
125	2500	1.47 oz		
150	2300	1.61 oz	2300	1.82 oz
200	2100	1.82 oz		
250				
300				

Notes:

1) Motors from 1/3 hp to 10 hp have sealed bearings.
 2) Running time in hours.
 3) Use only Exxon POLYREX® EM Polyurea grease.

Bearing Size Information

All IronHorse motors use premium SKF brand bearings. Below is a bearing size chart listing the type of SKF bearings used in each frame size of IronHorse motors. The bearing types are also listed on the motor nameplate.

Bearing Size Chart			
Frame Size *	Drive End Bearing SKF Type	Opposite Drive End Bearing SKF Type	
56C	203	203	
143T	6205-ZZ	6205-ZZ	
145T			
182T	6306-ZZ	6206-ZZ	
184T			
213T	6308-ZZ	6308-ZZ	
215T			
254T	6309	6209	
256T			
284T	6311	6309	
286T			
324T	6312	6311	
326T			
364T	6313	6312	
365T			
404T	NU316	6313	
405T			
444T	NU318		
445T			
445/7T	NU319		
449T	NU320	6320	
<i>* TC-frame motors have the same bearings as the comparable T-frame motors.</i>			

THIS PAGE
INTENTIONALLY
LEFT BLANK

ACCESSORIES



CHAPTER **4**

In This Chapter...

Capacitors and Centrifugal Switches	4-2
C-Flange Kits	4-3
STABLE Slide Bases	4-4

Capacitors and Centrifugal Switches

Single phase motors use capacitors to provide starting torque when power is first applied to the motor. When the motor begins to turn, the start capacitor is no longer needed and is taken out of the circuit by a centrifugal switch. In addition to the start capacitor, 1-1/2 hp IronHorse motors have run capacitors to allow the motor to develop higher running torque and greater efficiency. Run capacitors also help improve the motor power factor.

Single Phase Motor Accessories							
Part Number	Accessory Type	Capacitance (μF)	Rated Voltage	Dimension Height x Ø (in[mm])	Applicable Motor Number	Motor HP	Motor Phase
MTA-CAP-01	start capacitor	200	125	3.15 x 1.65 [80.0 x 41.9]	MTR-P33-1AB18	1/3	1
MTA-CAP-02		250	125		MTR-P50-1AB18 MTR-P75-1AB18	1/2 3/4	1
MTA-CAP-03		300	125		MTR-001-1AB18	1	1
MTA-CAP-04		250	165		MTR-1P5-1AB18	1-1/2	1
MTA-CAP-06	run capacitor	40	450	4.02 x 1.75 [102.1 x 44.5]	MTR-1P5-1AB18	1-1/2	1
MTA-CSW-01	centrifugal switch	n/a	250	n/a	all IronHorse single phase	all	1



C-Flange Kits

Any IronHorse T-frame cast iron motor from 1–300hp can be converted to C-face mount by using a cast iron C-flange kit. These kits are field installable and include the C-faces and mounting bolts. (TC-frame C-face motors are available from 1–100hp with the C-flange kits already installed.)

Three Phase T-Frame Motor C-Flange Kits				
Part Number	Fits Frame	Fits Motor Number	Motor HP	Shipping Weight (lb)
MTA-CFACE-140TC	143T & 145T	MTC-001-3BD12	1	6
		MTC-001-3BD18	1	
		MTC-1P5-3BD18	1-1/2	
		MTC-1P5-3BD36	1-1/2	
		MTC-002-3BD18	2	
		MTC-002-3BD36	2	
MTA-CFACE-180TC	182T & 184T	MTC-1P5-3BD12	1-1/2	12
		MTC-002-3BD12	2	
		MTC-003-3BD18	3	
		MTC-003-3BD36	3	
		MTC-003-3BD36	5	
		MTC-005-3BD36	5	
MTA-CFACE-210TC	213T & 215T	MTC-003-3BD12	3	12
		MTC-005-3BD12	5	
		MTC-7P5-3BD18	7-1/2	
		MTC-7P5-3BD36	7-1/2	
		MTC-010-3BD18	10	
		MTC-010-3BD36	10	
MTA-CFACE-250TC	254T & 256T	MTC-7P5-3BD12	7-1/2	32
		MTC-010-3BD12	10	
		MTC-015-3BD18	15	
		MTC-020-3BD18	20	
MTA-CFACE-280TC	284T & 286T	MTC-25-3BD18	25	38
MTA-CFACE-320TC	324T & 326T	MTC-30-3BD18	30	60
MTA-CFACE-360TC	364T & 365T	MTC-40-3BD18	40	62
MTA-CFACE-400TC	405T	MTC-50-3BD18	50	
MTA-CFACE-444TC	444T & 445T	MTC-60-3BD18	60	
MTA-CFACE-447TC	445/7T	MTC-75-3BD18	75	
MTA-CFACE-449TC	449T	MTC-100-3BD18	100	144
		MTC-125-3BD18	125	
		MTC-150-3BD18	150	156
		MTC-200-3BD18	200	154
		MTC-250-3D18	250	
		MTC-300-3D18	300	168



Authorized EASA service centers are equipped with the necessary equipment to quickly and inexpensively install C-Face kits. Visit the EASA website at www.easa.com to find the nearest authorized service center.

C-Flange Kits (continued)

C-Flange Dimensions

C-flange dimensions are shown in Chapter 2 (Mounting & Initial Startup) along with TC-frame motor dimensions.



T-Frame C-Flange Kit

STABLE Slide Bases

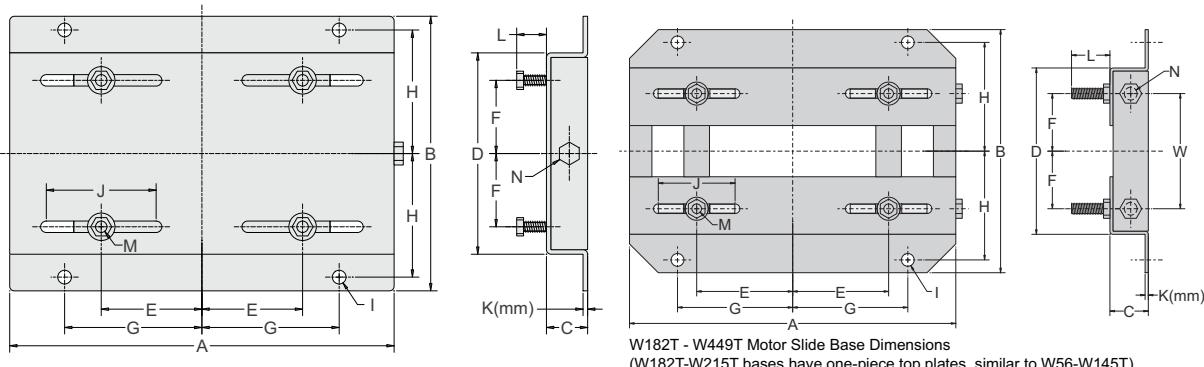
AutomationDirect offers STABLE AC motor slide bases for mounting most AC motor brands with frame sizes from 56 to 449. These heavy duty steel bases are primed with an oven-baked primer ready for painting. The motor mounting bolts are welded to the exact motor foot pattern to prevent the bolts from spinning.



Slide Base Selection

Motor Slide Bases			
Part Number	Fits Frame Type	Shipping Weight (lb)	IronHorse Model
MTA-BASE-W56	56	3.5	MTR-xxx-1AB18 MTR-xxx-3BD18 MTR-xxx-3BD36
MTA-BASE-W143T	143T/TC	5.0	MTC-001-3BD18(CK) MTC-1P5-3BD36
MTA-BASE-W145T	145T/TC	5.6	MTC-001-3BD12 MTC-1P5-3BD18(CK) MTC-002-3BD18(CK) MTC-002-3BD36
MTA-BASE-W182T	182T/TC	10	MTC-1P5-3BD12 MTC-003-3BD18(CK) MTC-003-3BD36
MTA-BASE-W184T	184T/TC	10	MTC-002-3BD12 MTC-005-3BD18(CK) MTC-005-3BD36
MTA-BASE-W213T	213T/TC	15	MTC-003-3BD12 MTC-7P5-3BD18(CK) MTC-7P5-3BD36
MTA-BASE-W215T	215T/TC	16	MTC-005-3BD12 MTC-010-3BD18(CK) MTC-010-3BD36
MTA-BASE-W254T	254T/TC	20	MTC-7P5-3BD12 MTC-015-3BD18(CK)
MTA-BASE-W256T	256T/TC	21	MTC-010-3BD12 MTC-020-3BD18(CK)
MTA-BASE-W284T	284T/TC	23	MTC-025-3BD18(CK)
MTA-BASE-W286T	286T/TC	24	MTC-030-3BD18(CK)
MTA-BASE-W324T	324T/TC	33	MTC-040-3BD18(CK)
MTA-BASE-W326T	326T/TC	35	MTC-050-3BD18(CK)
MTA-BASE-W364T	364T/TC	46	MTC-060-3BD18(CK)
MTA-BASE-W365T	365T/TC	47	MTC-075-3BD18(CK)
MTA-BASE-W404T	404T/TC	64	-
MTA-BASE-W405T	405T/TC	65	MTC-100-3BD18(CK)
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

Slide Base Dimensions

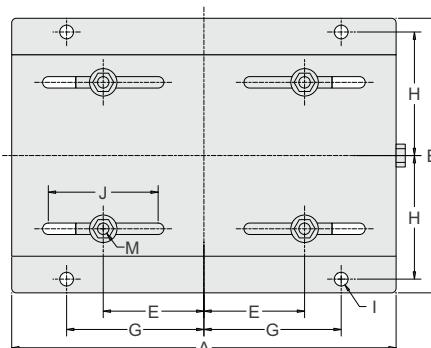


Dimensions [inches, except as noted] - STABLE Motor Slide Bases

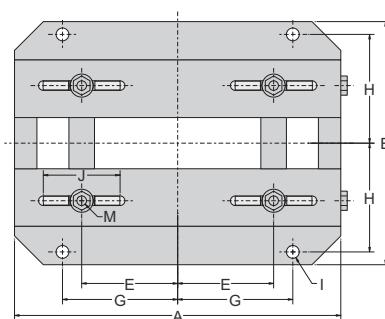
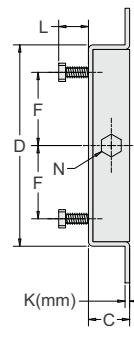
MTA-BASE-Wxxxx	A	B	C	D	E	F	G
56	10-5/8	6-1/2	1-1/8	4-1/2	2-7/16	1-1/2	3-13/16
143T	10-1/2	7-1/2	1-1/8	5-1/2	2-3/4	2	3-3/4
145T	10-1/2	8-1/2	1-1/8	6-1/2	2-3/4	2-1/2	3-3/4
182T	12-3/4	9-1/2	1-1/2	6-1/2	3-3/4	2-1/4	4-1/2
184T	12-3/4	10-1/2	1-1/2	7-1/2	3-3/4	2-3/4	4-1/2
213T	15	11	1-3/4	7-1/2	4-1/4	2-3/4	5-1/4
215T	15	12-1/2	1-3/4	9	4-1/4	3-1/2	5-1/4
254T	17-3/4	15-1/8	2	10-3/4	5	4-1/8	6-1/4
256T	17-3/4	16-7/8	2	12-1/2	5	5	6-1/4
284T	19-3/4	16-7/8	2	12-1/2	5-1/2	4-3/4	7
286T	19-3/4	18-3/8	2	14	5-1/2	5-1/2	7
324T	22-3/4	19-1/4	2-1/2	14	6-1/4	5-1/4	8
326T	22-3/4	20-3/4	2-1/2	15-1/2	6-1/4	6	8
364T	25-1/2	20-1/2	2-1/2	15-1/2	7	5-5/8	9
365T	25-1/2	21-1/2	2-1/2	16-1/2	7	6-1/8	9
404T	28-3/4	22-3/8	3	16-1/2	8	6-1/8	10
405T	28-3/4	23-7/8	3	18	8	6-7/8	10
444T	31-1/4	24-5/8	3	19-1/4	9	7-1/4	11
445T	31-1/4	26-5/8	3	21-1/4	9	8-1/4	11
447T	31-1/4	30-1/8	3	24-3/4	9	10	11
449T	31-1/4	35-1/8	3	29-3/4	9	12-1/2	11

**** Table Continued Next Page for Dimensions H-W ****

Slide Base Dimensions (continued)



W56 - W145T Motor Slide Base Dimensions

W182T - W449T Motor Slide Base Dimensions
(W182T-W215T bases have one-piece top plates, similar to W56-W145T)

**** Table Continued from Previous Page for Dimensions A-G ****

Dimensions [inches, except as noted] - STABLE Motor Slide Bases (continued)

MTA-BASE-Wxxxx	H	I	J	K(mm)	L	M	N	W
56	2-7/8	3/8	3	2 mm	7/8	5/16 x 1	3/8 x 4	n/a
143T	3-3/8	3/8	3	3 mm	13/16	5/16 x 1	3/8 x 4	n/a
145T	3-7/8	3/8	3	3 mm	13/16	5/16 x 1	3/8 x 4	n/a
182T	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	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	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	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	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	7-1/2	5/8	4	4.6 mm	1-7/16	1/2 x 1-3/4	5/8 x 6	7
284T	7-1/2	5/8	4-1/2	4.6 mm	1-11/16	1/2 x 2	5/8 x 6	7
286T	8-1/4	5/8	4-1/2	4.6 mm	1-11/16	1/2 x 2	5/8 x 6	8
324T	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	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	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	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	9-7/8	7/8	7	5.8 mm	2-1/2	3/4 x 3	3/4 x 11	8-3/4
405T	10-5/8	7/8	7	5.8 mm	2-1/2	3/4 x 3	3/4 x 11	10-1/4
444T	11	7/8	7-1/2	5.8 mm	2-1/2	3/4 x 3	3/4 x 11	11
445T	12	7/8	7-1/2	5.8 mm	2-1/2	3/4 x 3	3/4 x 11	13
447T	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	16-1/4	7/8	7-1/2	8 mm	3	3/4 x 3-1/2	3/4 x 11	21-1/2

THIS PAGE
INTENTIONALLY
LEFT BLANK

REFERENCE



In This Chapter...

Using IronHorse Motors with AC Drives	5-2
Voltage Spike Considerations for AC Drive Control	5-2
Double Punched Motors	5-3
F1 and F2 Mounting	5-4
Junction Box Dimensions	5-5
Minimum Sheave Diameters	5-6
Decibel Levels	5-7
Shipping Crate Dimensions	5-8

Using IronHorse Motors with AC Drives

IronHorse general purpose motors can be controlled by across-the-line starters such as contactors and manual motor starters. Under certain circumstances, it can be more desirable to control a three-phase IronHorse motor with an AC drive.



Single phase AC motors cannot be controlled by typical AC drives

The advantages of using an AC drive include:

- Lower inrush current at motor startup.
- Ability to change motor speed at any time.
- Greater efficiency in some applications. Fan and Pump applications can use an AC drive to provide motor flow control by varying the motor speed.
- Solid state power delivery meaning minimum maintenance.

There are a few considerations to take into account when an AC drive is chosen for motor control. Fan cooled motors are designed to provide sufficient insulation cooling when the motor is running at the rated speed. The cooling ability of the fan is reduced when motors run at lower speeds. Therefore, there are limitations on how slowly general purpose motors can be continuously run without prematurely causing insulation failure.

- Constant torque (CT) applications – 2:1 (1/2 of the rated speed) – The CT minimum continuous speed for an IronHorse general purpose motor is half of its rated speed, as shown in the motor Performance Data tables. (Constant torque loads require the same amount of torque from the motor regardless of speed; e.g., conveyors, cranes, machine tools.)
- Variable Torque (VT) applications – 5:1 (1/5 of the rated speed) – The VT minimum continuous speed for an IronHorse general purpose motor is one fifth of its rated speed, as shown in the motor Performance Data tables. (Variable torque loads require less torque at lower speeds, resulting in less heat generated by the motor; e.g., fans, centrifugal pumps.)

The insulation of IronHorse motors in both of the above applications can withstand voltage stress per NEMA Part 30 having a value of:

- Base Voltage Rating \leq 600V
- V_{pk} = 1kV
- Rise Time = $2\mu s$



AutomationDirect offers a line of AC Drives that are suitable for operating IronHorse motors per the above specs and NEMA part 30.

Voltage Spike Considerations for AC Drive Control

All AC drives can cause voltage spikes between the drive and the motor. Long cable lengths can increase these spikes. Therefore, there are maximum cable lengths that can be run between the drive and the motor. Line (load) reactors can also be installed near the drive output to reduce the voltage spikes.

- 230V & 460V without reactor – 125 ft maximum cable length between the drive and motor.
- 230V & 460V with reactor – 250 ft maximum cable length between the drive and motor.



To avoid overheating, the AC Drive carrier frequency must be set at or below 6kHz.

Double Punched Motors

Several IronHorse motor models have mounting feet that are double punched so that larger frame motors can be mounted using the same dimensions of different size frame motors. This can be helpful when replacing a motor with a different frame size. See Chapter 2: Mounting and Initial Startup for complete motor dimensions.

Motor Mounting Bolt Sizes		
Frame Size *	Double Punched	Punched for Additional Frame Size
56	Yes	143T
143T	No	
145T	Yes	143T
182T	No	
184T	Yes	182T
213T	No	
215T	Yes	213T
254T	No	
256T	Yes	254T
284T	No	
286T	Yes	284T
324T	No	
326T	Yes	324T
364T	No	
365T	Yes	364T
405T	Yes	404T
444T	No	
445T	Yes	444T
445/7T	Yes	445T
449T	No	

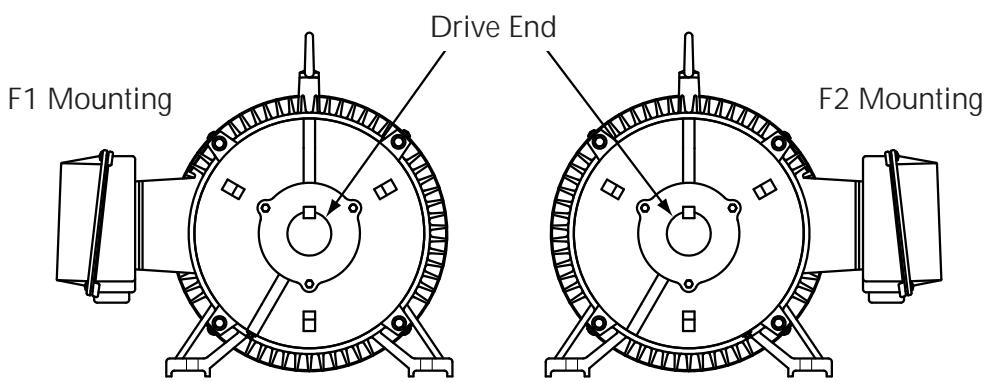
* TC-frame motors have the same mounting foot punching as the comparable T-frame motors.

F1 and F2 Mounting

F1 and F2 mounting refers to the location of the junction box on an AC motor. Several models of IronHorse motors can be converted from F1 to F2 mounting.

F1 to F2 Mounting Convertibility	
Frame Size *	Ability to be Converted
56	No (F1 only)
143T	
145T	
182T	
184T	
213T	Yes (F1, convertible to F2)
215T	
254T	
256T	
284T	
286T	
324T	
326T	No (F1 only)
364T	
365T	
405T	
444T	
445T	Yes (F1, convertible to F2)
445/7T	
449T	No (F1 only)

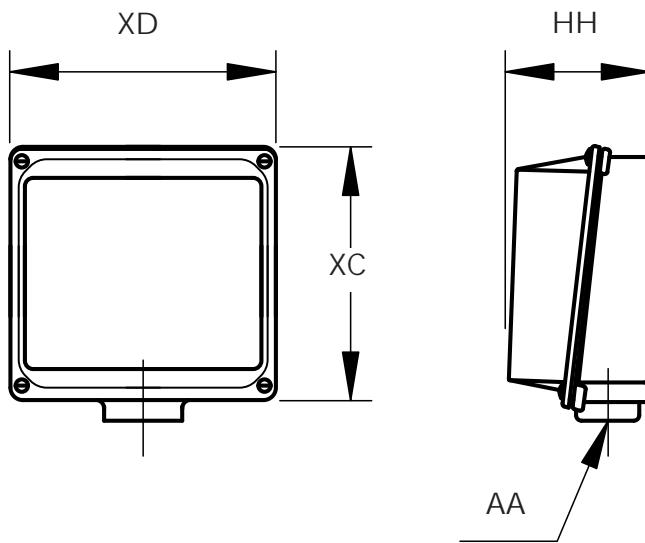
* TC-frame motors have the same convertibility as the comparable T-frame motors.



To minimize the potential of damage to any internal component, use caution when pulling the rotor from the frame when converting an IronHorse motor from F1 to F2 mounting. Authorized EASA service centers are equipped with the necessary equipment to quickly and inexpensively convert motor mounting. Visit the EASA website at www.easa.com to find the nearest authorized service center.



Junction Box Dimensions



Junction Box Dimensions				
Frame Size *	XD Width	XC Height	HH Depth	AA Conduit Hole (NPT)
56	3.23"	3.7"	1.55"	1/2"
143T				
145T	4.1"	4.5"	2.3"	3/4"
182T				
184T				
213T	4.6"	5.0"	2.6"	1"
215T				
254T				
256T				
284T	6.3"	7.2"	3.3"	1-1/2"
286T				
324T				
326T				
364T	9"	10.6"	5.3"	2"
365T				
405T	9.8"			3"
444T				
445T			7.1"	
445/7T	11.3"	11.7"		3" (2 openings)
449T				

* TC-frame motors have the same junction boxes as the comparable T-frame motors.

Minimum Sheave Diameters

The table below illustrates the minimum practical V-belt sheave diameter that can be used with each frame size IronHorse motor.

Minimum Sheave Diameters			
Frame Size (1)	V-Belt Sheave (2)		
	Conventional A, B, C, D and E (3)	Narrow 3V, 5V and 8V (4)	
	Minimum Pitch Diameter	Minimum Outside Diameter	
143T	2.2"	2.2"	
145T	2.4"	2.4"	
182T			
184T	3.0"	3.0"	
213T			
215T	3.8"	3.8"	
254T	4.4"		
256T	4.6"	4.4"	
284T	5.0"		
286T	5.4"	5.2"	
324T	6.0"	6.0"	
326T	6.8"	6.8"	
364T	7.4"	7.4"	
365T	9.0"	8.6"	
405T	10.0"		
444T	11.0"	9.5"	
445T	N/A	10.5"	
449T		13.2"	

Notes:

- 1) TC-frame motors have the same minimum sheave diameters as the comparable T-frame motors.
- 2) Sheave dimensions are based on the following:
 - a) Motor nameplate horsepower and speed.
 - b) Belt service factor of 1.6 with belts tightened to the belt manufacturers recommendations.
 - c) Speed reduction of 5:1.
 - d) Mounting of sheave on motor according to sheave manufacturers instructions.
 - e) Center-to-center distance between sheaves approximately equal to the diameter of the larger sheave.
 - f) Calculations covered by the standards listed in notes 2 & 3 below.
- 3) As covered by IP-20; Specifications for Drives Using Classical V-Belts and Sheaves. Go to www.mpta.org and www.rma.org for details.
- 4) As covered by IP-22; Specifications for Drives Using Narrow V-Belts and Sheaves. Go to www.mpta.org and www.rma.org for details.

Decibel Levels

The decibel (sound) level of an IronHorse motor should be measured after initial startup, after 30 days, and after six months of use. Decibel levels should remain fairly consistent and can be an indication of misalignment and premature bearing wear. If the measured decibel level for your IronHorse model exceeds the value listed below by more than 10%, contact AutomationDirect or a local motor service technician found at www.easa.com.

Average T-frame Decibel Levels		
Frame Size *	HP	Noise Level: Lw dB(A)
143T	1	64.0
145T	1-1/2	68.0
	2	68.8
182T	3	74.0
184T	5	73.0
213T	7-1/2	78.4
215T	10	74.3
254T	15	74.6
256T	20	74.0
284T	25	75.0
286T	30	76.1
324T	40	76.4
326T	50	77.0
364T	60	77.1
365T	75	78.0
405T	100	78.1
444T	125	78.3
445T	150	79.4
445/7T	200	79.4
449T	250	81.0
	300	81.4

* TC-frame motors have the same sound ratings as the comparable T-frame motors.

Shipping Crate Dimensions

Nominal Shipping Crate Dimensions			
Frame Size *	HP	Width x Depth x Height (in)	
56C	1/3	15 x 11 x 10	
	1/2		
	3/4		
	1	17 x 11 x 10	
	1-1/2		
	2		
143T	1	14 x 11 x 17	
145T	1-1/2		
145T	2		
182T	3	16 x 14 x 20	
184T	5		
213T	7-1/2	18 x 16 x 25	
215T	10		
254T	15	31 x 23 x 22	
256T	20		
284T	25	33 x 24 x 24	
286T	30		
324T	40	36 x 26 x 25	
326T	50		
364T	60	39 x 28 x 27	
365T	75		
405T	100	44 x 32 x 30	
444T	125	47 x 33 x 32	
445T	150		
445/7T	200		
449T	250	63 x 33 x 37	
	300		
* TC-frame motors ship in the same crates as the comparable T-frame motors.			
Shipping weights are listed in the Motor Specifications tables in "Chapter 1: Getting Started."			

THIS PAGE
INTENTIONALLY
LEFT BLANK