



IRONHORSE™

General Purpose AC Motors

Manual Number: IH-USER-M



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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
Issue: First Edition, Revision A
Issue Date: 11/2007

Publication History		
Issue	Date	Description of Changes
First Edition	09/2007	Original Issue
1st Ed., Rev. A	11/2007	Chapter 2 wiring diagrams

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GETTING STARTED



In This Chapter...

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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

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



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Available Models

Single Phase Motors Features and Specifications

Rolled Steel 56C Frame



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

Motor Specifications – Single Phase 56C Frame Motors							
Part Number	HP	Base RPM	Voltage	NEMA Frame	Service Factor	F.L. Amps @ 115V/230V	Approx Weight (lbs.)
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
MTR-002-1AB18	2					20.0 / 10.0	51

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

Performance Data – Single Phase 56C Frame Motors (230V data except as indicated)											
Part Number	HP	FL RPM	Current @ 115V/230V (Amps)			Torque (lb-ft)			FL Efficiency (%)	FL Power Factor	Rotor Inertia (lb-ft ²)
			230V No Load	Full Load	Locked Rotor	Full Load	Locked Rotor	Break-down			
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
MTR-002-1AB18	2		6.67	20.0 / 10.0	150 / 86	6.09	15.23	13.70	73.0	0.77	0.182

Three Phase Motors Features and Specifications

Rolled Steel 56C Frame



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.

Motor Specifications – Three Phase 56C Frame Motors									
Part Number	HP	Base RPM	Phase	Voltage	Housing	NEMA Frame	Service Factor	F.L. Amps @ 230V/460V	Approx Weight (lbs.)
MTR-P33-3BD18	1/3	1800	3	208-230/460	TEFC rolled steel frame w / cast aluminum end bell	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

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Performance Data – Three Phase 56C Frame Motors (460V data except as indicated)								
Part Number	HP	NEMA Design	FL RPM	Minimum Speed (rpm)		Current @ 230V/460V (Amps)		
				CT	VT	No Load	Full Load	Locked Rotor
MTR-P33-3BD18	1/3	B	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

Performance Data – Three Phase 56C Frame Motors (cont) (460V data except as indicated)									
Part Number	HP	Torque (lb-ft)			Maximum Speed (rpm)		FL Efficiency (%)	FL 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.*

Cast Iron T-Frame



IronHorse 1800 RPM industrial duty cast iron frame motors are available from 1 hp to 300 hp with. All models have a TEFC frame and full length mounting foot.

Motor Specifications – T Frame Three Phase Motors									
Part Number	HP	Voltage	NEMA Frame	Mounting	Holes in Foot	Service Factor	F.L. Amps @230V/460V	Approx Shipping Weight (lb)	Shaft Material
MTC-001-3BD18	1	208-230/460	143T	F1/F2	2	1.15	3.0 / 1.5	58	1045 CS
MTC-1P5-3BD18	1.5		145T	F1/F2	4		4.2 / 2.1	64	
MTC-002-3BD18	2		145T	F1/F2	4		5.4 / 2.7	68	
MTC-003-3BD18	3		182T	F1/F2	2		7.72 / 3.86	100	
MTC-005-3BD18 ¹⁾	5		184T	F1/F2	4		11.8 / 5.9	122 ¹⁾	
MTC-7P5-3BD18 ¹⁾	7.5		213T	F1/F2	2		18.6 / 9.3	170 ¹⁾	
MTC-010-3BD18 ¹⁾	10		215T	F1/F2	4		24.8 / 12.4	194 ¹⁾	
MTC-015-3BD18 ¹⁾	15		254T	F1/F2	2		35.4 / 17.7	298 ¹⁾	
MTC-020-3BD18 ¹⁾	20		256T	F1/F2	4		47.6 / 23.8	342 ¹⁾	
MTC-025-3BD18 ¹⁾	25		284T	F1	2		56.4 / 28.2	428 ¹⁾	
MTC-030-3BD18 ¹⁾	30		286T	F1	3		67.2 / 33.6	468 ¹⁾	
MTC-040-3BD18 ¹⁾	40		324T	F1	2		93.0 / 46.5	588 ¹⁾	
MTC-050-3BD18 ¹⁾²⁾	50 ²⁾		326T	F1	3		114.6 / 57.3	624 ¹⁾	
MTC-060-3BD18 ¹⁾²⁾	60 ²⁾		364T	F1	2		139.4 / 69.7	760 ¹⁾	
MTC-075-3BD18 ¹⁾²⁾	75 ²⁾		365T	F1	3		172.8 / 86.4	818 ¹⁾	
MTC-100-3BD18 ¹⁾²⁾	100 ²⁾		405T	F1	3		230 / 115	1248 ¹⁾	
MTC-125-3BD18 ¹⁾²⁾	125 ²⁾		444T	F1/F2	2		274 / 137	1570 ¹⁾	
MTC-150-3BD18 ¹⁾²⁾	150 ²⁾	445T	F1/F2	4	326 / 163	1752 ¹⁾			
MTC-200-3BD18 ¹⁾²⁾	200 ²⁾	445/7T	F1	3	446 / 223	2164 ¹⁾			
MTC-250-3D18 ¹⁾²⁾	250 ²⁾	460	449T	F1	2	- / 282	2754 ¹⁾	4140 CS	
MTC-300-3D18 ¹⁾²⁾	300 ²⁾		449T	F1	2	- / 334	2966 ¹⁾		

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

1) 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.

2) 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.

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

Performance Data – T Frame Three Phase Motors (con't) (460 Volt except as indicated)								
Part Number	HP	Torque (lb-ft)		Maximum Speed (rpm)		FL Efficiency (%)	F.L. Power Factor	Rotor Inertia (lb-ft ²)
		Full Load	Breakdown	CHP*	Safe			
MTC-001-3BD18	1	3.00	10.50	2700	5400	82.5	0.71	0.015
MTC-1P5-3BD18	1.5	4.41	14.11		5400	84.0	0.74	0.015
MTC-002-3BD18	2	6.05	17.55		5400	84.0	0.77	0.020
MTC-003-3BD18	3	9.07	29.93		5400	87.5	0.81	0.020
MTC-005-3BD18	5	15.1	46.8		5400	87.5	0.84	0.069
MTC-7P5-3BD18	7.5	22.0	72.6		5400	89.5	0.81	0.155
MTC-010-3BD18	10	29.8	92.4		4200	89.5	0.83	0.4319
MTC-015-3BD18	15	44.5	124.6		4200	91.0	0.83	1.996
MTC-020-3BD18	20	59.7	155.2		4200	91.0	0.84	2.463
MTC-025-3BD18	25	73.9	206.9		4200	92.4	0.87	3.45
MTC-030-3BD18	30	88.7	257.2		4200	92.4	0.86	3.941
MTC-040-3BD18	40	118.3	354.9		3600	93.0	0.86	6.348
MTC-050-3BD18	50	148	444		3600	93.0	0.86	6.996
MTC-060-3BD18	60	179	483		3600	93.6	0.85	3.400
MTC-075-3BD18	75	221	530		3600	94.1	0.84	3.700
MTC-100-3BD18	100	296	858		2800	94.5	0.87	9.200
MTC-125-3BD18	125	355	888		2800	94.5	0.86	9.380
MTC-150-3BD18	150	433	1083		2800	95.0	0.87	11.220
MTC-200-3BD18	200	590	1652		2800	95.0	0.87	15.100
MTC-250-3D18	250	728	2402		2800	95.9	0.87	86.000
MTC-300-3D18	300	864	2817	2800	95.7	0.88	105.000	

* Maximum Constant HP RPM is for direct coupled loads.

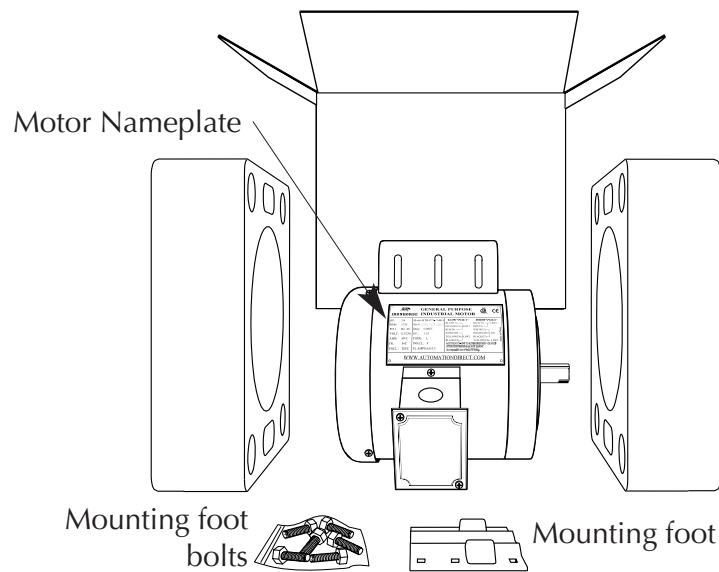
Performance Data – T Frame Three Phase Motors (cont) (460 Volt except as indicated)								
Part Number	HP	Temperature Rise @ Full Load	Locked Rotor Torque (%)	Locked Rotor Amps 230V/460V	Max Time Locked Rotor (Hot)	IL / IN	Slip (%)	
MTC-001-3BD18	1	80° C (176°F)	250	30.0 / 15.0	20 Seconds	10.0 / Code N	2.22	
MTC-1P5-3BD18	1.5		240	40.0 / 20.0		9.5 / Code M	2.50	
MTC-002-3BD18	2		230	50.0 / 25.0		20 Seconds	9.3 / Code L	2.78
MTC-003-3BD18	3		280	64.0 / 32.0			8.3 / Code K	
MTC-005-3BD18	5		270	92.0 / 46.0			7.8 / Code J	
MTC-7P5-3BD18	7.5		200	200		127 / 63.5	6.8 Code H	2.22
MTC-010-3BD18	10					200 / 100	13 Seconds	8.1 / Code J
MTC-015-3BD18	15		20 Seconds	200	280 / 140	7.9 / Code J	1.67	
MTC-020-3BD18	20				400 / 200	8.4 / Code J		
MTC-025-3BD18	25		206	440 / 220	16 Seconds	7.8 / Code H	1.38	
MTC-030-3BD18	30		200	520 / 260	20 Seconds	7.7 / Code H		
MTC-040-3BD18	40		210	720 / 360		7.7 / Code J	1.39	
MTC-050-3BD18	50			880 / 440		7.7 / Code H		
MTC-060-3BD18	60		180	870 / 435		20 Seconds	6.2 / Code G	0.83
MTC-075-3BD18	75			1086 / 543	6.3 / Code G			
MTC-100-3BD18	100		200	1450 / 725	15 Seconds	6.6 / Code G		
MTC-125-3BD18	125		175	1815 / 908		6.7 / Code G		
MTC-150-3BD18	150		180	2170 / 1085		6.5 / Code G		
MTC-200-3BD18	200		200	2900 / 1450		6.5 / Code G		
MTC-250-3D18	250		85° C (185°F)	228	- / 2017	20 Seconds	7.2 / Code H	0.54
MTC-300-3D18	300	226		- / 2351	Code G		0.53	

Receiving and Inspection

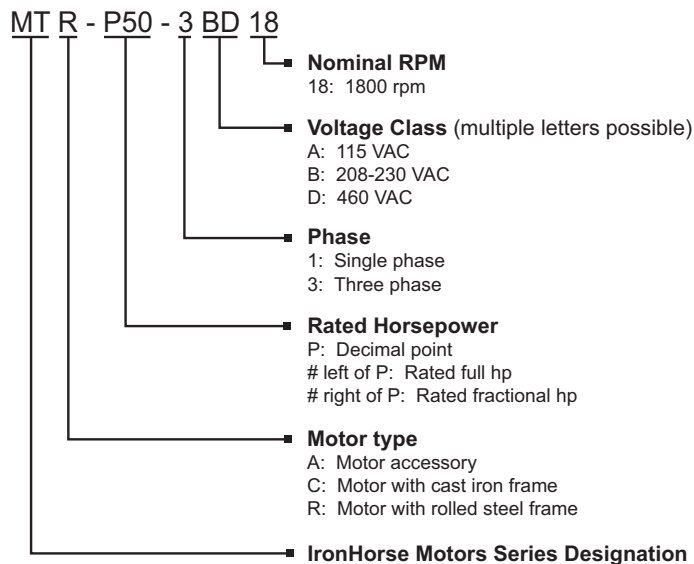
Unpacking

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



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Motor Dimensions2-3
Terminal Diagrams2-6
Motor Mounting2-7
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Coupling Alignment2-8
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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 $cCSA_{US}$ 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 0.1 Ω .)
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.
9. Do not attach or remove wiring when power is applied to the motor.

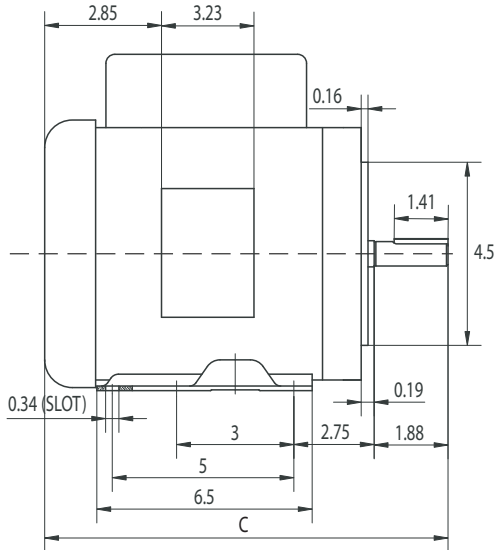
Applicable Codes

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).

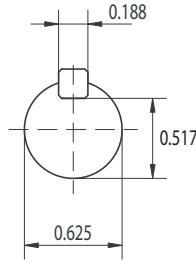
Installation intended to meet the $cCSA_{US}$ requirements must follow the instructions provided in the "Wiring Notes" as a minimum standard. Follow all local codes that exceed $cCSA_{US}$ requirements. Refer to the technical data on the motor nameplate for electrical and performance data.

Motor Dimensions

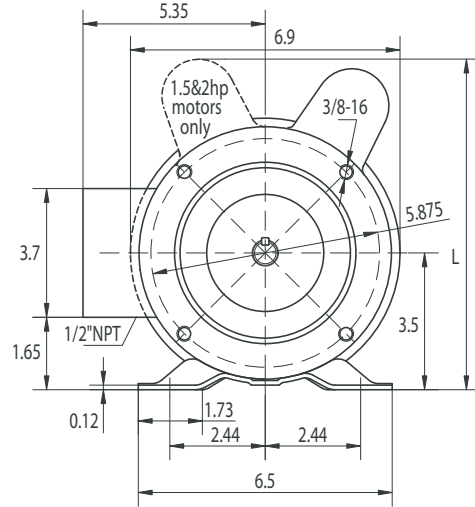
56C Frame Single Phase



C = 12.4"; all except 1, 1.5 & 2 hp motors
 C = 13"; 1 hp MTR-001-1AB18
 C = 13.8"; 1.5hp MTR-1P5-1AB18
 C = 14.6"; 2hp MTR-002-1AB18



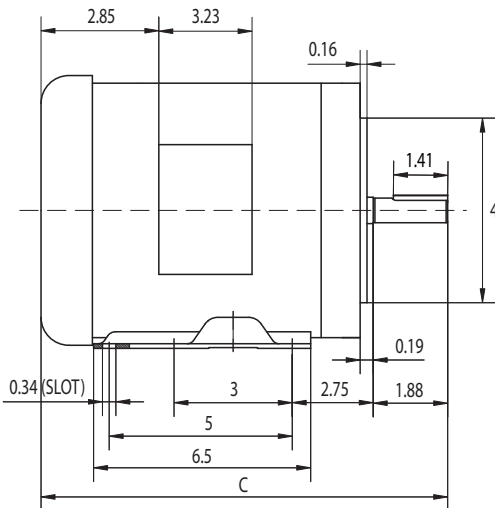
UNITS = INCHES



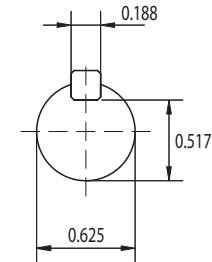
L = 8.19"; all except 1.5 & 2 hp motors
 L = 8.5"; 1.5 & 2 hp motors

MTR-xxx-1AB18 IronHorse Motors

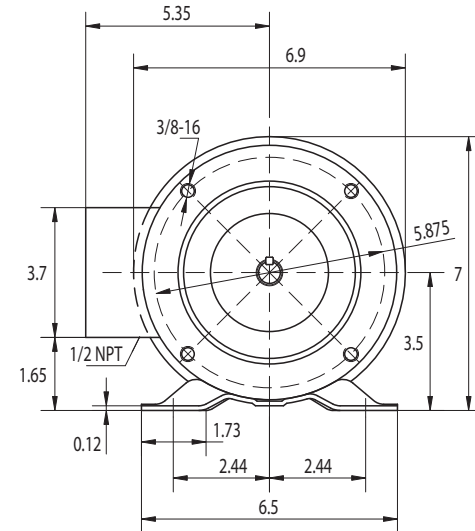
56C Frame Three Phase



C = 12.2"; all except 1.5 & 2 hp motors
 C = 12.6"; 1.5hp MTR-1P5-3BD18
 C = 13.8"; 2hp MTR-002-3BD18

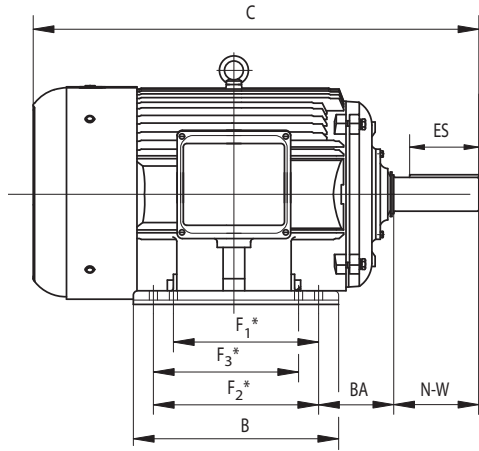


UNITS = INCHES

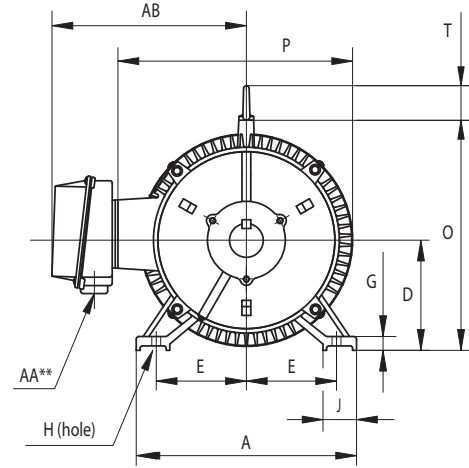
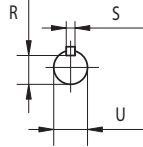


MTR-xxx-3BD18 IronHorse Motors

T Frame Three Phase Industrial Duty Motors



* Various frame sizes have 2, 3, or 4 mounting holes per mounting foot.



** F1 mounting shown.
** Some frame sizes are F1/F2 convertible.

Dimensions [inches, except as noted] - Three Phase T Frame Motors											
Part Number	HP	NEMA Frame	A	AA**	AB	B	BA	C	D	E	ES
MTC-001-3BD18	1	143T	7	3/4" NPT	6.89	5	2.25	12.47	3.5	2.75	1.41
MTC-1P5-3BD18	1-1/2	145T				6		13.58			
MTC-002-3BD18	2	182T	9	1" NPT	7.45	6.5	2.75	15.11	4.5	3.75	1.78
MTC-003-3BD18	3					7.5		16.11			
MTC-005-3BD18	5	184T	10.5	1" NPT	8.63	7.5	3.5	18.89	5.25	4.25	2.41
MTC-7P5-3BD18	7-1/2	213T				9		20.49			
MTC-010-3BD18	10	215T	12.5	1.5" NPT	11.2	10.8	4.25	23.29	6.25	5	2.91
MTC-015-3BD18	15	254T				12.5		25.06			
MTC-020-3BD18	20	256T	14	1.5" NPT	12	12.5	4.75	26.64	7	5.5	3.28
MTC-025-3BD18	25	284T				14		28.18			
MTC-030-3BD18	30	286T	16	2" NPT	13.4	14	5.25	29.95	8	6.25	3.91
MTC-040-3BD18	40	324T				15.5		31.24			
MTC-050-3BD18	50	326T	18	3" NPT	15.7	15.2	5.88	32.68	9	7	4.28
MTC-060-3BD18	60	364T				16.2		34.11			
MTC-075-3BD18	75	365T	20	3" NPT	18.31	17.8	6.62	38.35	10	8	5.65
MTC-100-3BD18	100	405T				18.5		42.52			
MTC-125-3BD18	125	444T	22	2x3" NPT	19.41	20.5	7.5	44.5	11	9	6.91
MTC-150-3BD18	150	445T				24		48.03			
MTC-200-3BD18	200	445/7T									
MTC-250-3D18	250	449T	21.3	2x3" NPT	19	30.5	7.5	55.27	11	9	6.91
MTC-300-3D18	300										

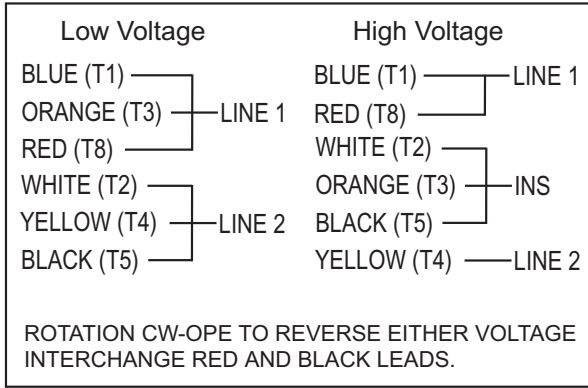
** AA dimension is conduit fitting size.

Dimensions [inches, except as noted] - Three Phase T Frame Motors (cont)													
Part Number	F1*	F2*	F3*	G	H	J	N-W	O	P	R	S	T	U
MTC-001-3BD18	n/a	4	n/a	0.512	0.34	1.45	2.25	7.08	7.16	0.771	0.188	n/a	0.875
MTC-1P5-3BD18	4	5	4										
MTC-002-3BD18													
MTC-003-3BD18	n/a	4.5	n/a	0.59	0.41	1.97	2.75	8.97	8.82	0.986	0.25	1.42	1.125
MTC-005-3BD18	4.5	5.5	4.5										
MTC-7P5-3BD18	n/a	5.5	n/a	0.709	0.41	2.36	3.38	10.53	10.4	1.201	0.312	1.73	1.375
MTC-010-3BD18	5.5	7	5.5										
MTC-015-3BD18	n/a	8.25	n/a	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	8.25										
MTC-025-3BD18	n/a	9.5	n/a	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	n/a										
MTC-040-3BD18	n/a	10.5	n/a	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	n/a										
MTC-060-3BD18	n/a	11.25	n/a	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	n/a										
MTC-100-3BD18	12.25	13.75	n/a	1.18	0.81	3.15	7.25	21.42	21.42	2.45	0.75	2.83	2.875
MTC-125-3BD18	n/a	14.5	n/a	1.38	0.81	3.35	8.5	22.97	23.43	2.88	0.875	3.46	3.375
MTC-150-3BD18	14.5	16.5	14.5										
MTC-200-3BD18	16.5	20	n/a										
MTC-250-3D18	n/a	25	n/a	1.575	0.827	3.35	8.5	23	23.62	2.88	0.875	4.25	3.375
MTC-300-3D18													

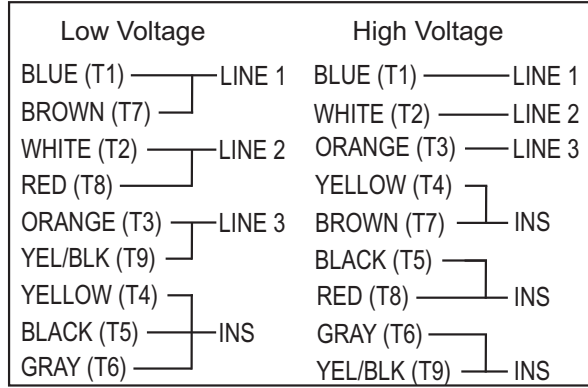
* Various frame sizes have 2, 3, or 4 mounting holes per mounting foot.
F1 mounting shown; some frame sizes are F1/F2 convertible; refer to T Frame "Motor Specifications" table. (F2 mounting = conduit entrance on right side facing shaft.)

Terminal Diagrams

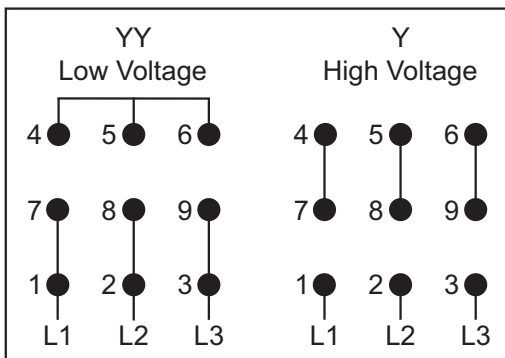
1/3 hp - 2hp 1Ø models
6-Lead, 115/208-230 VAC



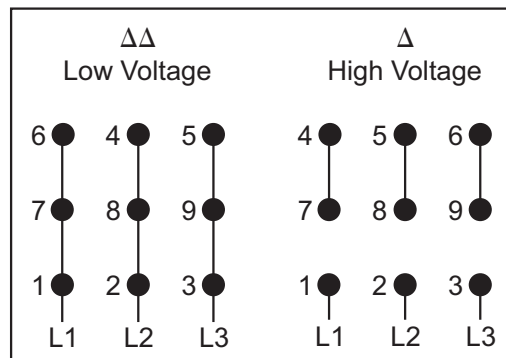
1/3 hp - 2hp 3Ø models
9-Lead, 208-230/460 VAC



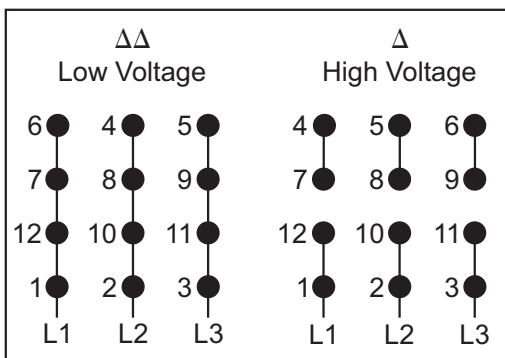
1hp - 5hp models
9-Lead, 208-230/460 VAC



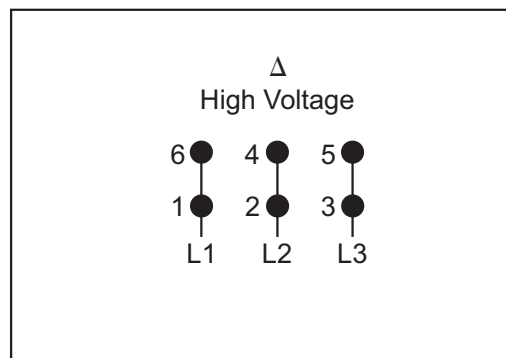
7.5 hp - 20 hp models
9-Lead, 208-230/460 VAC



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

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 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 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 : 100 hp @ 60 °C and 2000 Meters
 $100 / 0.64 = 156$ 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.

Motor Nameplate & Starter Information

Below is an example of the typical IronHorse motor nameplate.

GENERAL PURPOSE IRONHORSE INDUSTRIAL MOTOR		LOW VOLT	HIGH VOLT
HP: 3/4	Model: MTR-P75-1AB18	BLUE(T1) —	BLUE(T1) — LINE1
RPM: 1725	Ser.#: 0707121305	ORANGE(T3) — LINE1	RED(T8) —
PH: 1 Hz: 60	Duty: CONT.	RED(T8) —	WHITE(T2) —
VOLT: 115/230	S.F.: 1.15	WHITE(T2) —	ORANGE(T3) — INS
AMB: 40°C	CODE: L	YELLOW(T4) — LINE2	BLACK(T5) —
FR.: 56C	INS.CL.: F	BLACK(T5) —	YELLOW(T4) — LINE2
ENCL.: TEFC	FL AMPS: 6.6/3.3	ROTATION CW-OFF TO REVERSE EITHER VOLTAGE INTERCHANGE RED & BLACK LEADS. Acceptable for Field Wiring	
WWW.AUTOMATIONDIRECT.COM			

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. For more information about using AC drives with IronHorse motors see Chapter 5.

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"	115/208-230	N/A		
56C (3Ø)	9						
143T			9-1/2"		Wye		
145T							
182T							
184T							
213T							
215T						14 AWG	Delta
254T						12 AWG	
256T							
284T	12	10 AWG	10-5/8"	208-230/460		Wye / Delta	
286T							
324T		8 AWG	13"				
326T							
364T		6 AWG					
365T							
404T		4 AWG	13-3/4"				
405T							
444T		3 AWG					
445T							
447T	6	1 AWG	14"	460			
449T							

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 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: $230 \text{ VAC} \times 1.15 = 264.5 \text{ VAC}$.
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**



**CHAPTER
3**

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 and 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				
25	7500	0.64 oz		7500
30				
40	7000	0.75 oz	7500	0.64 oz
50				
60	6500	0.86 oz	7000	0.75 oz
75				
100	3000	1.22 oz	6500	0.86 oz
125	2500	1.47 oz	6500	
150				
200	2300	1.61 oz	2300	1.61 oz
250	2100	1.82 oz		
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	6205-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

ACCESSORIES



In This Chapter...

Capacitors and Centrifugal Switches4-2
C-Flange Kits4-3
STABLE Slide Bases4-5

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 need and is taken out of the circuit by a centrifugal switch. In addition to the start capacitor, 1-1/2 and 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	Applicable Motor Number	Motor HP	Motor Phase
MTA-CAP-01	start capacitor	200	125	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-05		200	165	MTR-002-1AB18	2	1
MTA-CAP-06	run capacitor	40	450	MTR-1P5-1AB18	1-1/2	1
MTA-CAP-07		40	450	MTR-002-1AB18	2	1
MTA-CSW-01	centrifugal switch	N/A	250	all IronHorse single Ø	all	1



C-Flange Kits

Any IronHorse T-frame cast iron motor 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.

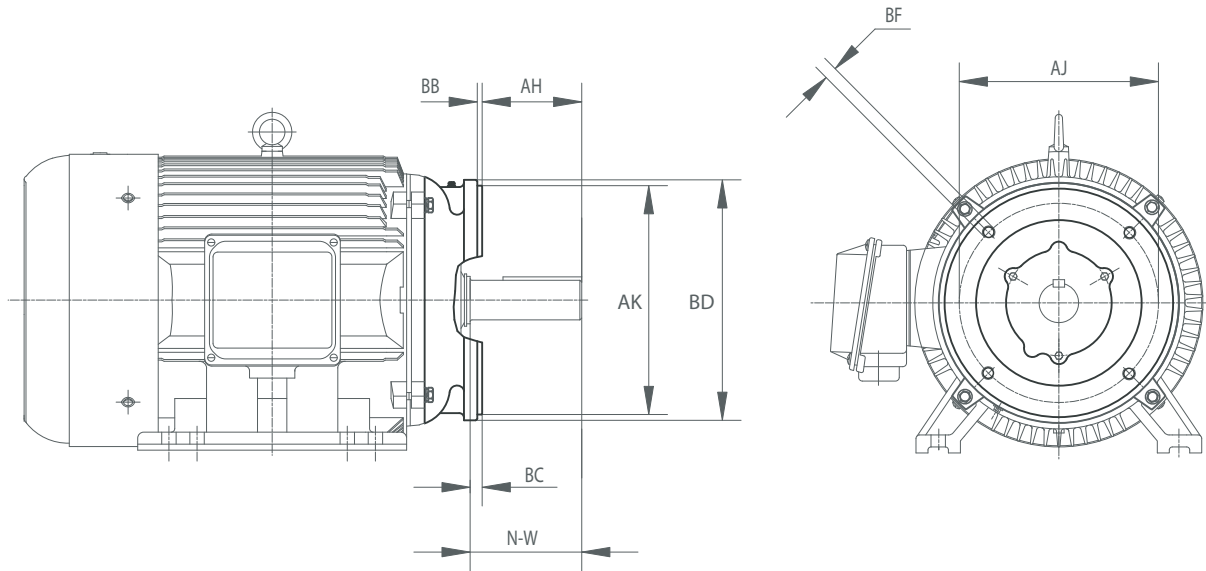
Three Phase T-Frame Motor C-Flange Kits				
Part Number	Fits Frame	Fits Motor Number	Motor HP	Shipping Weight (lb)
MTA-CFACE-140TC	143T	MTC-001-3BD18	1	6
	145T	MTC-1P5-3BD18	1-1/2	
	145T	MTC-002-3BD18	2	
MTA-CFACE-180TC	182T	MTC-003-3BD18	3	12
	184T	MTC-005-3BD18	5	
MTA-CFACE-210TC	213T	MTC-7P5-3BD18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



T-Frame C-Flange Kit



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.



Dimensions [inches] - T-Frame Motor C-Flange Kits									
Part Number	Frame Type	AH	AJ	AK	BB	BC	BD	BF	N-W
MTA-CFACE-140TC	143T / 145T	1.96	5.875	4.50	0.16	0.12	6.5	3/8-16	2.25
MTA-CFACE-180TC	182T / 184T	2.62	7.25	8.50	0.25	0.12	9	1/2-13	2.75
MTA-CFACE-210TC	213T / 215T	3.12	7.25	8.50	0.25	0.25	9	1/2-13	3.38
MTA-CFACE-250TC	254T / 256T	3.75	7.25	8.50	0.25	0.25	10	1/2-13	4
MTA-CFACE-280TC	284T / 286T	4.38	9	10.50	0.25	0.25	11.25	1/2-13	4.62
MTA-CFACE-320TC	324T / 326T	5	11	12.50	0.25	0.25	14	5/8-11	5.25
MTA-CFACE-360TC	364T / 365T	5.62	11	12.50	0.25	0.25	14	5/8-11	5.88
MTA-CFACE-400TC	405T	7	11	12.50	0.25	0.25	15.5	5/8-11	7.25
MTA-CFACE-444TC	444T / 445T	8.25	14	16.00	0.25	0.25	18	5/8-11	8.5
MTA-CFACE-447TC	445/7T	8.25	14	16.00	0.25	0.25	18	5/8-11	8.5
MTA-CFACE-449TC	449T	8.248	14	16.00	0.256	0.256	17.72	5/8-11	8.5

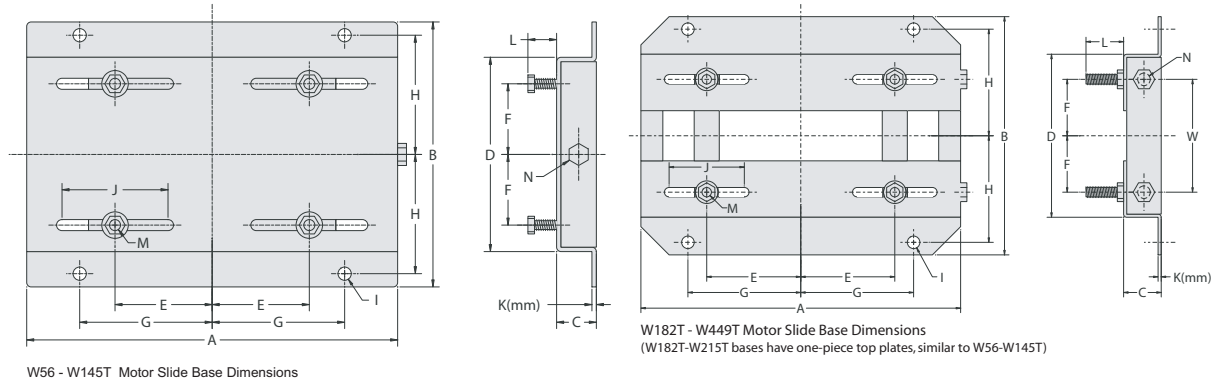
STABLE Slide Bases

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.



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
MTA-BASE-W143T	143T	5.0	MTC-001-3BD18
MTA-BASE-W145T	145T	5.6	MTC-1P5-3BD18 MTC-002-3BD18
MTA-BASE-W182T	182T	10	MTC-003-3BD18
MTA-BASE-W184T	184T	10	MTC-005-3BD18
MTA-BASE-W213T	213T	15	MTC-7P5-3BD18
MTA-BASE-W215T	215T	16	MTC-010-3BD18
MTA-BASE-W254T	254T	20	MTC-15-3BD18
MTA-BASE-W256T	256T	21	MTC-20-3BD18
MTA-BASE-W284T	284T	23	MTC-25-3BD18
MTA-BASE-W286T	286T	24	MTC-30-3BD18
MTA-BASE-W324T	324T	33	MTC-40-3BD18
MTA-BASE-W326T	326T	35	MTC-50-3BD18
MTA-BASE-W364T	364T	46	MTC-60-3BD18
MTA-BASE-W365T	365T	47	MTC-75-3BD18
MTA-BASE-W404T	404T	64	-
MTA-BASE-W405T	405T	65	MTC-100-3BD18
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

Chapter 4: Accessories



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

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

REFERENCE



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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 RPM. 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) - For IronHorse 1800 RPM general purpose motors, the CT minimum continuous speed is 900 RPM.
- Variable Torque (VT) applications - 5:1 (1/5 of the rated speed) - For IronHorse 1800 RPM general purpose motors, The VT minimum continuous speed is 360 RPM. 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 the above applications can withstand voltage stress per NEMA Part 30 having a value of:

- Base Voltage Rating \leq 600V
- Vpk = 1Kv
- Rise Time = 2 μ 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 drive 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.

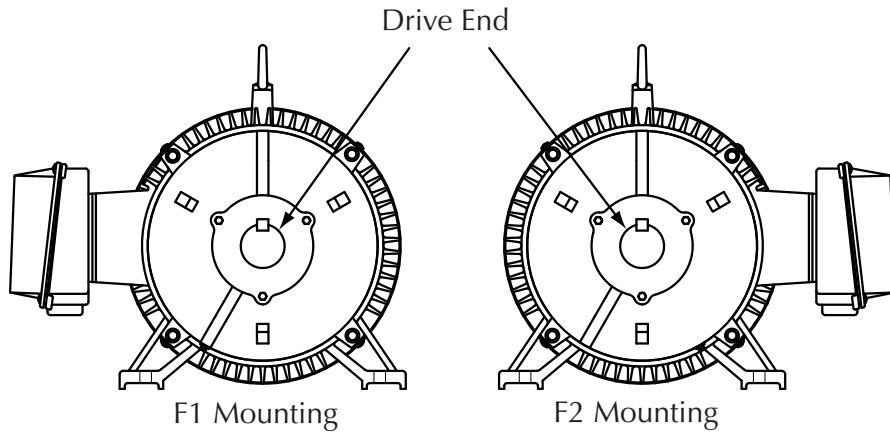
Double Punched Motors

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 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	

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.

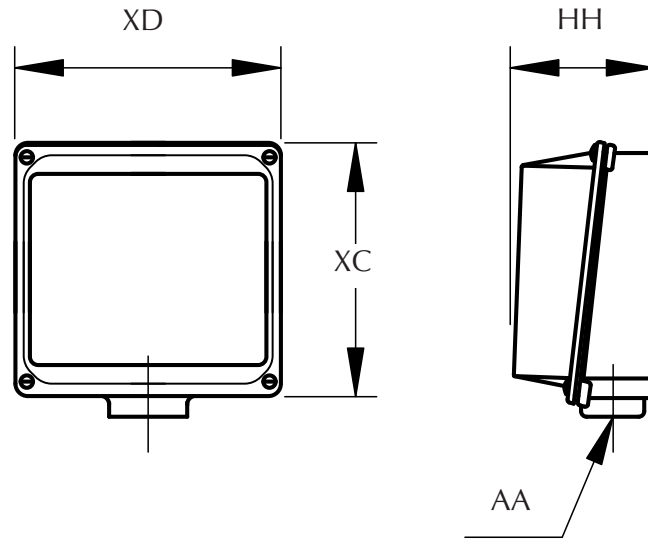


F1 to F2 Mounting Conversion	
Frame Size	Ability to be Converted
56	No
143T	Yes
145T	Yes
182T	Yes
184T	Yes
213T	Yes
215T	Yes
254T	Yes
256T	Yes
284T	No
286T	No
324T	No
326T	No
364T	No
365T	No
405T	No
444T	Yes
445T	Yes
445/7T	Yes
449T	No



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	4.1"	4.5"	2.3"	3/4"
145T				
182T	4.6"	5.0"	2.6"	1"
184T				
213T				
215T				
254T	6.3"	7.2"	3.3"	1-1/2"
256T				
284T				
286T				
324T	9"	10.6"	5.3"	2"
326T				
364T				
365T				
405T	9.8"	11.7"	7.1"	3"
444T	11.3"			3" (2 openings)
445T				
445/7T				
449T				

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	V-Belt Sheave ⁽¹⁾	
	Conventional A, B, C, D and E ⁽²⁾	Narrow 3V, 5V and 8V ⁽³⁾
	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"	4.4"
256T	4.6"	
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) 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.
- 2) 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.
- 3) 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

Shipping Crate Dimensions and Weights

Nominal Shipping Crate Dimensions and Weights			
Frame Size	HP	Weight (lbs.) ⁽¹⁾	Width x Depth x Height
56	1/3	26 / 23	15 x 11 x 10
	1/2	28 / 24	
	3/4	32 / 26	
	1	38 / 29	
	1-1/2	45 / 33	17 x 11 x 10
	2	51 / 42	
143T	1	58	14 x 11 x 17
145T	1-1/2	64	
	2	68	
182T	3	100	16 x 14 x 20
184T	5	122	
213T	7-1/2	170	18 x 16 x 25
215T	10	194	
254T	15	298	
256T	20	342	31 x 23 x 22
284T	25	428	
286T	30	468	33 x 24 x 24
324T	40	588	
326T	50	624	
364T	60	760	39 x 28 x 27
365T	75	818	
405T	100	1248	44 x 32 x 30
444T	125	1570	47 x 33 x 32
445T	150	1752	
445/7T	200	2164	
449T	250	2754	63 x 33 x 37
	300	2966	

Notes:
1) Single phase model / Three phase model.