

TECO Westinghouse

ISSUED

TYPE

8/28/2014

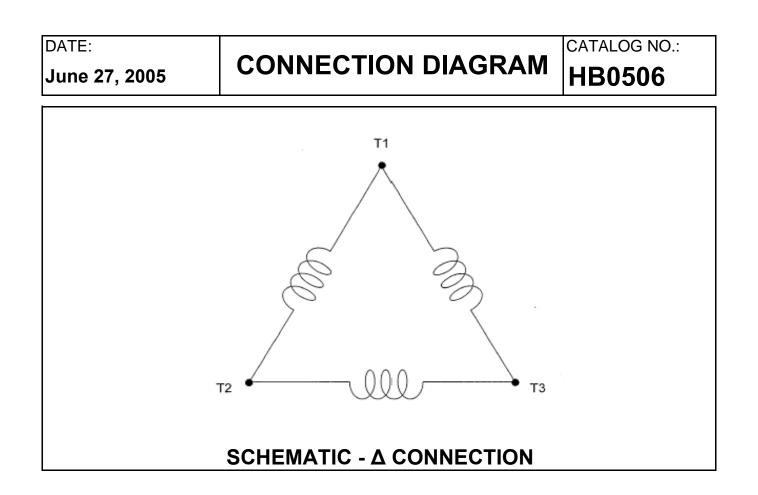
AEHH8B

PERFORMANCE DATA 3-PHASE INDUCTION MOTOR

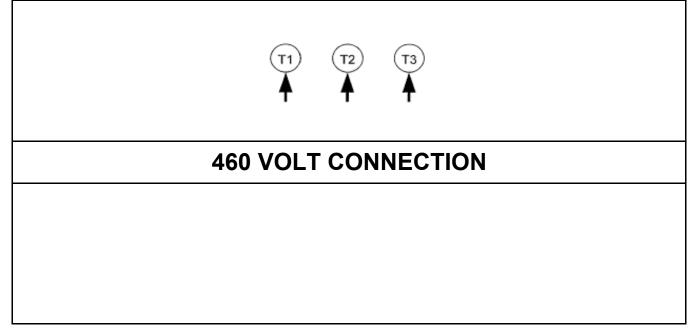
ENCLOSURE TEFC CATALOG#

HB0506

3-60 0.0063-50 60-1200 0.551-222.5 0.0502 0.1436 0.3901 0.6604 12.3 CONSTANT TORQUE CONSTANT HORSEPOWER HZ HP RPM TORQUE (lb-ft) HZ HP RPM TORQUE (lb-ft) 6-60 5-50 120-1200 222.5 60-90 50 1200-1800 222.5-148.3 TYPICAL PERFORMANCE FULL LOAD FULL LOAD 3/4 LOAD 1/2 LOAD SOUND PRESSURE LEVEL @ 3 F MIN.% NOM.% % % % 1/2 LOAD 3/4 LOAD 1/2 LOAD PRESSURE LEVEL @ 3 F MIN.% NOM.% % 93.6 86 83 75.5 75 CURRENTS SAFE STAL TIME IN SECONDS AT AT AT AT CODE 460 460 460 CODE COLD HC VOLT VOLT VOLT VOLT VOLT CODE COLD ALLOWABLE SAFE STAL <tr< th=""><th></th><th></th><th>-1.11.15</th><th>00</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>110000</th><th>0</th></tr<>			-1.11.15	00												110000	0
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222.50 225 170 240 21.39 620 1385 5.22 11.44 2 1	LOAD	R	OTOR	ε L	JP	DOWN	WR ²	LOA WK	D AL	LOWABI WK ²	LE L	OAD NK ²	ALLO	owabl WK ²	.E	COLD	НОТ
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ACROSS THE LINE CONNECTION





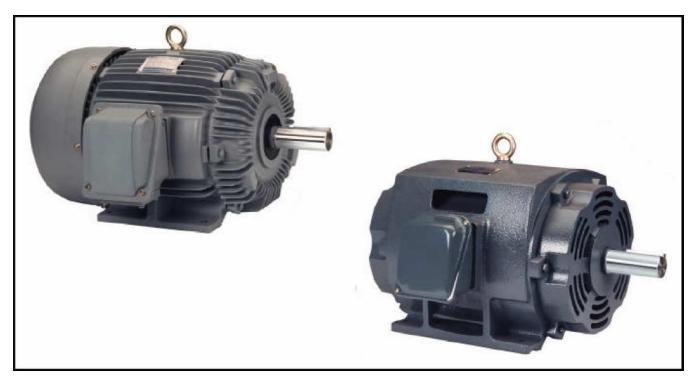
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DAC-1547-4

TECO Westinghouse

INSTALLATION AND MAINTENANCE INSTRUCTIONS FOR THREE PHASE INDUCTION MOTORS

Frames 143T - 449TZ



5100 North IH 35 Round Rock, Texas 78681

RECEIVING

- 1. Check nameplate data.
- 2. Check whether any damage has occurred during transportation.
- 3. After removal of shaft clamp, turn shaft by hand to check that it turns freely.
- 4. If motor is to be reshipped (alone or installed to another piece of equipment) the shaft must again be clamped to prevent axial movement.

Note: Remove the bearing clamp before turning the shaft on 284T-449TZ frame motors.

WARNING

THE FOLLOWING SAFETY PRECAUTIONS MUST BE OBSERVED:

- 1. Electric rotating machinery and high voltage can cause serious or fatal injury if improperly installed, operated or maintained. Responsible personnel should be familiarized with NEMA MG-1; Safety Standards for Construction and Guide Selection. Installation and Use of Electric Motors and Generators; National Electric Code and all local safety requirements.
- 2. When servicing, all power sources to the motor and to the accessory devices should be de-energized and disconnected and all rotating parts should be at standstill.
- 3. Lifting means, when supplied, are intended for lifting the motor only. When two lifting devices are supplied with the motor a dual chain must be used.
- 4. Suitable protection must be used when working near machinery with high noise levels.
- 5. Safeguard or protective devices must not be by-passed or rendered inoperative.
- 6. The frame of this machine must be grounded in accordance with the National Electric Code and applicable local codes.
- 7. A suitable enclosure should be provided to prevent access to the motor by other than authorized personnel. Extra caution should be observed around motors that are automatically or have automatic re-setting relays as they may restart unexpectedly.
- 8. Shaft key must be fully captive or removed before motor is started.
- 9. Provide proper safeguards for personnel against possible failure of motor-mounted brake, particularly on applications involving overhauling loads.
- 10. Explosion proof motors are constructed to comply with the label service procedure manual, repair of these motors must be made by TECO-Westinghouse Motor Company or U/L listed service center in order to maintain U/L listing.

LOCATION

- 1. Drip-proof motors are intended for use where atmosphere is relatively clean, dry, well ventilated and non-corrosive.
- 2. Totally enclosed motors may be installed where dirt, moisture, or dust are present and in outdoor locations.
- 3. Explosion-proof motors are built for use in hazardous locations as indicated by Underwriters' label on the motor.
- 4. Chemical duty enclosed motors are designed for installation in high corrosion or excessive moisture locations.

Note: in all cases, no surrounding structure should obstruct normal flow or ventilating air through or over the motor.

MOUNTING

- 1. Mount motor securely on a firm, flat base. All ball bearing normal thrust motors up to and including 256T frame size may be side-wall or ceiling mounted; all others check nearest TECO-Westinghouse office for mounting recommendations.
- 2. Align motor accurately, using a flexible coupling if possible. For drive recommendations, consult with drive or equipment manufacturer, or TECO-Westinghouse.
- 3. Mounting bolts must be carefully tightened to prevent changes in alignment and possible damage to the equipment. The recommended tightening torque's for medium carbon steel bolts, identified by three radial lines at 120 degrees on the head, are:

Bolt Size	Recommended Torque (Ft-lb.)				
Bolt Size	Minimum	Maximum			
2/8	25	37			
1/2	60	90			
5/8	120	180			
3/4	210	320			

- 4. V-belts Sheave Pitch Diameters should not be less than those shown in Table 1 (NEMA recommended values)
- 5. Tighten belts only enough to prevent slippage. Belt speed should not exceed 5000 ft. per min.

TABLE 1. V-Belt Sheave Pitch Diameters (MG1-14.42)

						V-Belt	Sheave	
						ntional D AND E		rrow AND 8V
Frame Number	3600		power at s Speed, RPN 1200	И 900	Minimum Pitch Diameter Inches	*Maximum Width Inches	Minimum Outside Diameter Inches	**Maximum Width Inches
143T	1.5	1	.75	.5	2.2	4.25	2.2	2.25
145T	2-3	1.5-2	1	.75	2.4	4.25	2.4	2.25
182T	3	3	1.5	1	2.4	5.25	2.4	2.75
182T	5				2.6	5.25	2.4	2.75
184T			2	1.5	2.4	5.25	2.4	2.75
184T	5				2.6	5.25	2.4	2.75
184T	7.5	5			3.0	5.25	3.0	2.75
213T	7.5-10	7.5	3	2	3.0	6.5	3.0	3.375
215T	10		5	3	3.0	6.5	3.0	3.375
215T	15	10			3.8	6.5	3.8	3.375
254T	15		7.5	5	3.8	7.75	3.8	4
254T	20	15			4.4	7.75	4.4	4
256T	20-25		10	7.5	4.4	7.75	4.4	4
256T		20			4.6	7.75	4.4	4
284T			15	10	4.6	9	4.4	4.625
284T		25			5.0	9	4.4	4.625
286T		30	20	15	5.4	9	5.2	4.625

					V-Belt Sheave					
						ntional D AND E		rrow AND 8V		
Frame Number	3600		power at s Speed, RPM 1200	1900	Minimum Pitch Diameter Inches	*Maximum Width Inches	Minimum Outside Diameter Inches	**Maximum Width Inches		
324T		40	25	20	6.0	10.25	6.0	5.25		
326T		50	30	25	6.8	10.25	6.8	5.25		
364T			40	30	6.8	11.5	6.8	5		
364T		60			7.4	11.5	7.4	5.785		
365T			50	40	8.2	11.5	8.2	5.785		
365T		75			9.0	11.5	8.6	5.785		
404T			60		9.0	14.25	8.0	7.25		
404T				50	9.0	14.25	8.4	7.25		
404T		100			10.0	14.25	8.6	7.25		
405T			75	60	10.0	14.25	10.0	7.25		
405T		100			10.0	14.25	8.6	7.25		
405T		125			11.5	14.25	10.5	7.25		
444T			100		11.0	16.75	10.0	8.5		
444T				75	10.5	16.75	9.5	8.5		
444T		125			11.0	16.75	9.5	8.5		
444T		150				16.75	10.5	8.5		
445T			125		12.5	16.75	12.0	8.5		
445T				100	12.5	16.75	12.0	8.5		
445T		150				16.75	10.5	8.5		

TABLE 1. V-Belt Sheave Pitch Diameters (MG1-14.42)

*Max. Sheave width = 2(N-W) - .25

**Max Sheave width = N-W

***Sheave ratios grater than 5:1 and center-to-center distance less than the diameter of the large sheave should be referred to TECO-Westinghouse.

POWER SUPPLY & CONNECTIONS

- 1. Wiring of motor and control, overload protection and grounding should be in accordance with National Electrical Code and all local safety requirements.
- Nameplate voltage and frequency should agree with power supply. Motor will operate satisfactorily on line voltage within ±10% of nameplate voltage; or frequency with ±5% and with a combined variation not to exceed ±10%. 230-volt motors can be used on 208-volt network systems, but with slightly modified performance characteristics as shown on the nameplate.
- 3. Dual voltage and single voltage motors can be connected for the desired voltage by following connection diagram shown on the nameplate or inside of the conduit box.
- 4. All Explosion Proof motors have Temperature Limiting Devices in the motor enclosure to prevent excessive external surface temperature of the motor in accordance with U/L standards. Terminals of thermal protectors (P1 & P2) should be connected to the motor control equipment, according to the connection diagram inside of the conduit box.
- 5. Standard connection diagram for three phase, not thermally protected, dual rotation motors are shown in diagrams A through E. (Note: To change rotation, Interchange any two line leads)

A. 3 Lead, Single Voltage



B. 6 Lead, Dual Voltage & Voltage Ration 1 to 3

B-1 Across the Line Start & Run





C. 9 Leads; Dual Voltage & Voltage Ratio 1 to 2, Wye Connected

C-1 Across the Line Start & Run

Low Williage	High Voltage			
L1 L2 L3	L1 L2 I3			
11 e T2 e T3 e	т1 е т2 е т3 е			
17 • 18 • 19 •	17 T8 T9			
T4 T5 T6	T4 . IS . T6.4			



D. 9 Leads; Dual Voltage & Voltage Ration 1 to 2, Delta Connected

D-1 Across the Line Start & Run

LOW VOLTAGE (24)	HIGH VOLTAGE (A)		
L1 L3 L2	11 13 L2		
T1 0 T3 0 T2 0	11 13 120		
T7 0 T5 0 T8 0	170 150 120		



E. 12 Leads, Dual Voltage

E-1 Across the Line	e Start & Run
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Low	Voltage	High Voltage				
L1	12 L3	L1 L2 L3				
TI 72	νп	ינד ינד יוד				
17 78	9 13 9	T12 T10 T11				
тб т4	., т 5 о	16° 14° 12°				
T12 T10		n n n				





E-2-2 Wye Start & Delta Run (High Voltage only)





*Important: For Part Winding Start, M2 contactor should be closed within two (2) seconds after M1 contactor is closed. Only 4 pole and above (e.g., 6P, 8P...) motors are satisfactory for Part Winding Start at low voltage.

START UP

- Disconnect load and start motor. Check direction of rotation. If rotation must be changed, ALLOW THE MOTOR TO STOP COMPLETLEY. Interchange any two leads of a three-phase motor.
- 2. Connect load. The motor should start quickly and run smoothly. If no, shut power off at once. Recheck the assembly including all connections before restarting.
- 3. If excessive vibration is noted, check for loose mounting bolts too flexible motor support structure or transmitted vibration from adjacent machinery. Periodic vibration checks should be made; foundations often settle.
- 4. Operate under load for short period of time and check operating current against nameplate.

TESTING

If the motor has been in storage for an extensive period or has been subjected to adverse moisture conditions, it is best to check the insulation resistance of the stator winding with a megometer. Depending on the length and conditions of storage it may be necessary to regrease or change rusted bearings.

If the resistance is lower than one megohm the windings should be dried in one of the following two ways:

- 1. Bake in oven at temperatures not exceeding 194°F until insulation resistance becomes constant.
- 2. With rotor locked, apply low voltage and gradually increase the current through windings until temperature measured with a thermometer reaches 194°F. Do not exceed this temperature.

MAINTENANCE

INSPECTION

Inspect motor at regular intervals. Keep motor clean and ventilation openings clear.

LUBRICATION

- 1. Frame 143T-256T: Double shielded and pre-lubricated ball-bearing motors without grease fittings and don't need re-lubrication, except on MAX-E1[®] and MAX-E2[®] products which have re-greasable features.
- Frames 280TS, 320-449TZ(TS): Motors having grease fittings and grease discharge devices at brackets. Motors are shipped with grease for initial running. It is necessary to re-lubricate anti-friction bearing motors periodically, depending on size and type of service. See Table 2 to provide maximum bearing life. Excessive or too frequent lubrication may damage the motor.

TABLE 2

Horsepower	Standard Conditions	Severe Conditions	Extreme Conditions
1 Thru 30 Hp, 1800 rpm and below	7 years	3 years	180 days
40 Thru 75 Hp, 1800 rpm and below	210 days	70 days	30 days
100 Thru 150 Hp, 1800 rpm and below	90 days	30 days	15 days
1 Thru 20 Hp, 3600 rpm 25 Thru 75 Hp, 3600 rpm	5 years 180 days	2 years 60 days	90 days 30 days
100 Thru 150 Hp, 3600 rpm	90 days	30 days	15 days

Note:

- A. Standard conditions: 8 hours operation per day, normal or light loading, clear and 40°C ambient conditions.
- B. Severe conditions: 24-hour operation per day or light shock loading, vibration or in dirty or dusty conditions.
- C. Extreme conditions: With heavy shock loading or vibration or dusty conditions.
- D. For double shielded bearings, above data (lubrication frequency) means that the bearing must be replaced.
- 3. Be sure fittings are clean and free from dirt. Using a low-pressure grease gun, pump in the recommended grease until new grease appears at grease discharge hole.
- 4. Use the POLYUREA grease unless special grease is specified on the nameplate.
- 5. If re-lubrication is to be performed with the motor running, stay clear of rotating parts. After re-greasing, allow the motor to run for ten to thirty minutes.

RENEWAL PARTS

- 1. Use only genuine TECO-Westinghouse renewal parts or as recommended by TECO-Westinghouse Motor Company.
- 2. When you order renewal parts please specify complete information to TECO-Westinghouse office/agent such as type, frame no., poles, horsepower, voltage, series no., quantity, etc.

FOR FURTHER INFORMATION PLEASE CONTACT TECO-WESTINGHOUSE MOTOR COMPANY

Round Rock, TX 800-873-8326