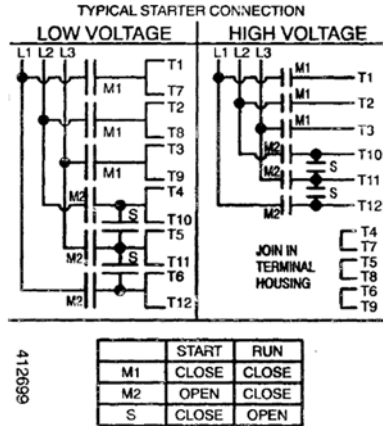


WYE / DELTA STARTING

12 LEADS MOTORS FROM 213T -286T



MAINTENANCE

Elektrim NEMA standard motors are designed and built for maximum reliability and low maintenance requirements. Following these recommendations will assure you of full service life from your motor and minimize downtime:

1. Keep the motor clean and provide adequate ventilation.
2. Make sure all screens, covers and safety guards are in place.
3. Shut off power and discharge capacitors (except as indicated) before working or performing maintenance on the motor.

ASSEMBLY OF THE MOTOR

The permissible value of the screw-down torque for motor fixing screws.

140	30 ft. lbs.	250	45 ft. lbs.
180	40 ft. lbs.	280	45 ft. lbs.
210	40 ft. lbs.		

Please report any conclusions arising from use of the motors to Elektrim where they will be considered in order to better the quality and utility advantages of the motors.

ELEKTRIM MOTORS

2015 S. Mitchell Blvd., Schaumburg, IL 60193

855-Go-Elektrim or 847-524-1074 | Fax 847-524-9996

www.elektrimmotors.com | support@elektrimmotors.com

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Elektrim[®] Motors



NEMA 140 up to 280 Frame INSTALLATION AND MAINTENANCE INSTRUCTIONS

INTRODUCTION

The purpose of this booklet is to help you install, operate and maintain ELEKTRIM Motors to assure that you will get full advantage of their built-in efficiency and reliability. Following the recommended installation and maintenance procedures will extend the service life of the motor and minimize downtime.

UPON DELIVERY

Upon receipt of your ELEKTRIM motor, visually inspect it for damage that may have occurred in shipment or storage. Turn the shaft manually to be sure that it runs freely, and check the nameplate data to be sure that specifications are in accordance with your order. Before installing the motor, inspect the windings for moisture.

Insulation resistance lower than 20 MOHMS - for 143T through 184T frame motors, and 2 MOHMS - for 213T through 286T (S) frame motors as measured with a 500V magneto - resistance control device between each phase and frame indicates excess moisture requiring that the windings be dried before installation.

MOUNTING

ELEKTRIM motors may be mounted horizontally or vertically provided that there is free movement of air for cooling. Ambient temperatures must not exceed 104°F (40°C). The motors are designed for NEMA F-1, W-2, W-3, W-6, W-8, and C-2 mounting assemblies. F1 assembly is standard. Motors should be mounted on a firm, flat base using the largest bolts that will fit the bracket holes. ELEKTRIM motors may be used with any type of drive provided that the motor is accurately aligned and within capacity parameters. Tighten belt sufficiently to prevent slippage, but avoid over-tightening which can lead to bearing damage. When mounting the motor make sure drain plugs are removed and drain holes are positioned to allow condensed moisture to drain off.

TO REDUCE MAINTENANCE REQUIREMENTS

To reduce maintenance requirements and extend motor life, protect your Elektrim motor from:

- Excessive moisture,
- Excessive dirt which can reduce cooling effectiveness,
- Overheating due to ambient temperature in excess of 104°C, blocked ventilation, and frequent or prolonged starting,
- Inaccessible position that makes regular maintenance difficult.

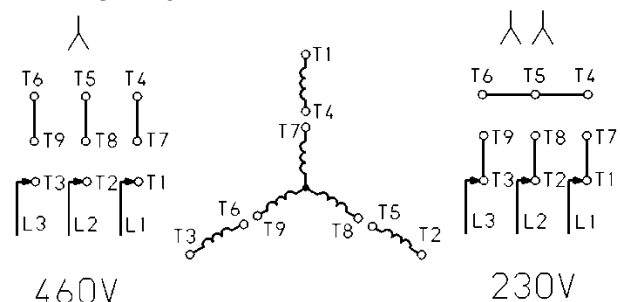
POWER SUPPLY AND CONNECTIONS

Power supply voltage should not vary more than $\pm 10\%$ from the nominal voltage on the nameplate.

Starting controls and overload protection relays must be sized according to the motor ratings, National Technical Code, and recommendations of the control manufacturer.

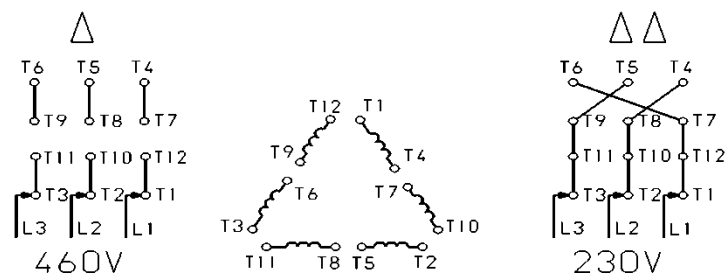
CONNECTING DATA AND METHODS OF STARTING

SIZE 143T - 184T ACROSS THE LINE STARTING



TO REVERSE ROTATION INTERCHANGE ANY TWO LINES

SIZE 213T - 286T (S) ACROSS THE LINE STARTING



WYE - DELTA Starting CONNECT AS BELOW

Voltage	Connect to Starter	Link Together
460V	T1, T2, T3, T10, T11, T12	T4-T7; T5-T8; T6-T9
230V	T1, T2, T3, T10, T11, T12	T1-T7; T2-T8; T3-T9 T10-T4; T11-T5; T12-T6

Worm Gear Reducers Installation, Lubrication and Maintenance Instructions

Selection Information

Read ALL instructions prior to operating reducer. Injury to personnel or reducer failure may be caused by improper installation, maintenance or operation.

Written authorization from GROVE GEAR / ELECTRA-GEAR is required to operate or use reducers in man lift or people moving devices.

Check to make certain application does not exceed the allowable load capacities published in the current catalog.

Buyer shall be solely responsible for determining the adequacy of the product for any and all uses to which Buyer shall apply the product. The application by Buyer shall not be subject to any implied warranty of fitness for a particular purpose.

Safety Alert



- For safety, Buyer or User should provide protective guards over all shaft extensions and any moving apparatus mounted thereon. The User is responsible for checking all applicable safety codes in his area and providing suitable guards. Failure to do so may result in bodily injury and/or damage to equipment.
- Hot oil and reducers can cause severe burns. Use extreme care when removing lubrication plugs and vents.
- Make certain that the power supply is disconnected before attempting to service or remove any components. Lock out the power supply and tag it to prevent unexpected application of power.
- Reducers are not to be considered fail safe or self-locking devices. If these features are required, a properly sized, independent holding device should be utilized. **Reducers should not be used as a brake.**
- Any brakes that are used in conjunction with a reducer must be sized or positioned in such a way so as to not subject the reducer to loads beyond the catalog rating.
- Lifting supports including eyebolts are to be used for vertically lifting the gearbox only, with no other associated attachments or motors.
- Use of an oil with an EP additive on units with backstops may prevent proper operation of the backstop. Injury to personnel, damage to the reducer or other equipment may result.
- Overhung loads subject shaft bearings and shafts to stress which may cause premature bearing failure and/or shaft breakage from bending fatigue, if not sized properly.



- Test run unit to verify operation. If the unit tested is a prototype, that unit must be of current production.
- If the speed reducer cannot be located in a clear and dry area with access to adequate cooling air supply, then precautions must be taken to avoid the ingestion of contaminants such as water and the reduction in cooling ability due to exterior contaminants.
- Mounting bolts should be routinely checked to ensure that the unit is firmly anchored for proper operation.

Important Information

In the event of the resale of any of the goods, in whatever form, Resellers/Buyers will include the following language in a conspicuous place and in a conspicuous manner in a written agreement covering such sale:

The manufacturer makes no warranties or representations, express or implied, by operation of law or otherwise, as to the merchantability or fitness for a particular purpose of the goods sold hereunder. Buyer acknowledges that it alone has determined that the goods purchased hereunder will suitably meet the requirements of their intended use. In no event will the manufacturer be liable for consequential, incidental or other damages. Even if the repair or replacement remedy shall be deemed to have failed of its essential purpose under Section 2-719 of the Uniform Commercial Code, the manufacturer shall have no liability to Buyer for consequential damages.

Resellers/Buyers agree to also include this entire document including the warnings above in a conspicuous place and in a conspicuous manner in writing to instruct users on the safe usage of the product.

This instructions manual should be read together with all other printed information such as catalogs, supplied by Grove Gear / Electra-Gear.

General Operation

1. Run the motor which drives the reducer and check the direction of reducer output rotation. Consult motor nameplate for instructions to reverse the direction of rotation.
2. Attaching the load: On direct coupled installations, check shaft and coupling alignment between speed reducer and loading mechanism. On chain/sprocket and belt/pulley installation, locate the sprocket or pulley as close to the oil seal as possible to minimize overhung load. Check to verify that the overhung load does not exceed specifications published in the catalog.
3. High momentum loads: If coasting to a stop is undesirable, a braking mechanism should be provided to the speed reducer output shaft or the driven mechanism.



The system of connected rotating parts must be free from critical speed, torsional or other type vibration, no matter how induced. The responsibility for this system analysis lies with the purchaser of the speed reducer.

Installation

1. Mount the unit to a rigid flat surface using grade 5 or higher fasteners. The mounting fasteners should be the largest standard size that will fit in the base mounting hole. Shim as required under flange or base feet which do not lie flat against the mounting surface.
2. For shipment, pipe plugs are installed in the unit and a vent plug is packed separately. After mounting the unit in position, remove the appropriate pipe plug and install the vent plug in the location shown on page 5. On double reduction units both the primary and the secondary must be vented. Failure to vent the unit can cause premature seal wear or loss of seal and oil. These conditions are not covered by warranty. Check for correct oil level. Contact the Factory for level and vent recommendations on non-standard mounting positions.
3. Connect motor to speed reducer.

Depending upon gear geometry and operating conditions worm gear reducers may or may not back-drive. Use of a brake or external holding device is required if any evidence of backdriving is not desired.

Special consideration should be given to high inertia loads connected to the output shaft. Consult the factory for further details.



DO NOT CHANGE MOUNTING POSITIONS WITHOUT CONTACTING FACTORY. Altering the mounting position may require special lubrication provisions which must be factory installed.



Do not operate the reducer without making sure it contains the correct amount of oil. Do not overfill or underfill with oil, or injury to personnel, reducer or other equipment may result.



A unit cannot be used as an integral part of a machine superstructure which would impose additional loads on the unit other than those imposed by the torque being transmitted either through a shaft-mounted arrangement, and any shaft mounted power transmitting device. (*e.g., sprockets, pulleys, couplings*)



For safe operation and to maintain the unit warranty, when changing a factory installed fastener for any reason, it becomes the responsibility of the person making the change to properly account for fastener grade, thread engagement, load, tightening torque and the means of torque retention.

Lubrication - Standard and WASHGUARD® / Platinum Units

All standard reducers ordered from Factory are filled with Mobil Glygoyle 460 polyglycol (**PAG**) lubricant or equivalent suitable for continuous option within a -10° F to 120° F ambient temperature range. Double and triple reduction units have separate oil sumps and must be filled/checked independently. Prior to startup, verify that the oil is at the level shown on page 6. Lubricant type is stamped on all nameplates.

Change Intervals: Standard compounded lubricants (non-synthetic) should be changed every six months or 2500 operating hours, whichever comes first. Factory installed synthetic lubricants should be changed only when performing maintenance that requires gearbox disassembly.

CAUTION Oil should be changed more often if reducer is used in a severe environment (i.e. dusty, humid).

CAUTION In the Food and Drug Industry (including animal food), consult the lubrication supplier for recommendation of lubricants which are acceptable to the Food and Drug Administration and/or other authoritative bodies having jurisdiction. Factory supplied **PAG** oil is acceptable for incidental food contact (NSF H1) for use in and around food processing areas.

CAUTION Do not mix different oils in the reducer. Grove Gear / Electra-Gear reducers are shipped standard with **PAG** lubricant – this lubricant is not compatible with conventional mineral or PAO synthetic oils.

Special Lubrication Requirements - Size 818 and Larger

Units shipped from Factory are assembled to properly lubricate all internal components based on a specific assumed mounting orientation. If a size 818 or larger unit will be mounted in an orientation different from its original intension, as shown in product catalog, or run with sustained input speeds less than 1200 RPM, it should be specified with the order. The unit can then be modified to assure proper lubrication.

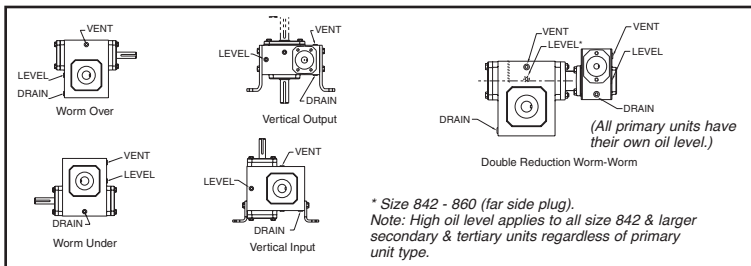
The precision-made gears and bearings in Grove Gear / Electra-Gear Speed Reducers require high-grade lubricants of the proper viscosity to maintain trouble-free performance. All standard reducers ordered from the factory are filled with ISO viscosity grade 460 polyglycol (**PAG**) lubricant. If oil needs to be added or changed, ONLY compatible polyglycol lubricants should be used. Contact the factory for more information.

Oil Capacities (ounces) - Standard Units

OIL CAPACITIES - (OUNCES) STANDARD UNITS														
Mounting Position	UNIT SIZE													
	813	815	818	821	824	826	830	832	842	852	860	870*	880*	8100*
Worm Over	4	12	12	20	24	40	56	72	112	188	312	560	768	1152
Worm Under	8	16	20	28	40	60	84	108	152	304	328	524	820	1280
Vertical Output	4	16	16	28	32	48	68	88	128	248	320	332	460	640
Vertical Input	4	16	16	24	32	48	72	92	128	248	325	584	800	1200
Extended Bearing	N/A	N/A	N/A	N/A	N/A	N/A	N/A	128	192	272	432	640	1008	1632
Worm Over on Secondary Unit of Double Reduction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	192	308	320	485	805	1144	1716
White Washguard - All Mounting Positions	6	14	18	26	32	50	78	98	N/A	N/A	N/A	N/A	N/A	N/A
Unified Stainless Steel - All Mounting Positions	7	15	15	19	28	44	N/A	76	N/A	N/A	N/A	N/A	N/A	N/A
CAUTION	Always check for proper oil level after filling. Oil should rise to the bottom edge of level hole on Standard Units. DO NOT OVER FILL													
* Shipped Dry														

As of 12/26/2013

Standard Gear Reducer Mounting Positions & Vent Plug, Level and Drain Locations ▲



▲ Does not apply to Stainless Steel, WASHGUARD® or units with Enviroseal option.

Maintenance - Standard Units

Your Grove Gear / Electra-Gear reducer has been tested and adjusted at Factory. Dismantling or replacement of components must be done by Grove Gear / Electra-Gear to maintain the warranty.

1. Frequently check the oil level of the reducer. If oil level is low, (refer to reducer vent and level position chart) add proper lubrication through the filler plug until it comes out the oil level plug.
2. Inspect vent plug often to insure it is clean and operating.
3. Always check for proper oil level after filling. Do not overfill or underfill with oil, or injury to personnel, reducer, or other equipment may result.
4. Do not mix different oils in the reducer.

Seals: The Grove Gear / Electra-Gear line of speed reducers utilizes premium quality seals which are the state-of-the-art in sealing technology. Seals are, however, a wear item and eventually need to be replaced. Replacement can be easily accomplished by following the steps below:

1. Remove the worn seal without damaging the shaft surface or the seal bore. This can be done by drilling a .062 diameter hole in the seal casing (being careful not to drill into the bearing behind the seal). Install a #10 sheet metal screw into the hole and pry out the seal.
2. Clean the seal bore of sealant.
3. Before installing the new seal, use electrical tape to cover any keyways on the shaft to prevent seal lip damage.
4. Grease the seal lips with bearing grease and apply a sealant to the seal bore.
5. Slide the seal into the shaft being careful not to fold the inner lip over on any shaft steps.
6. Press the seal into its bore with a sleeve that presses on the seal casing, being careful to keep the seal square in its bore.

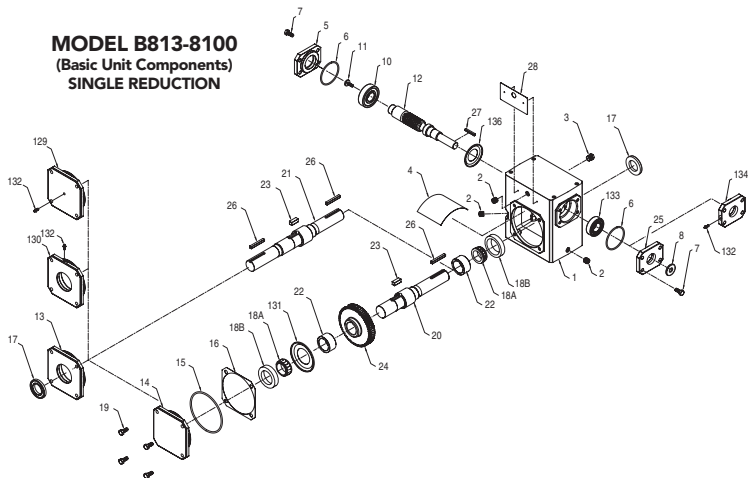
Class of Service

Load conditions must be within cataloged ratings published in the current Grove Gear / Electra-Gear Catalog (available upon request).

Published ratings assume lubrication with ISO 460 viscosity grade polyglycol (**PAG**) oil. Contact Factory for ratings when an alternate lubricant is used.

Warranty From Grove Gear / Electra-Gear - See 8050 catalog for warranty terms and conditions.

PARTS LIST

MODEL B813-8100
(Basic Unit Components)
SINGLE REDUCTION

BASIC SINGLE REDUCTION UNIT
(B-STYLE)

ITEM # DESCRIPTION

- 1 HOUSING
 2 PIPE PLUG
 3 VENT PLUG
 4 SPLASH GUARD
 5 INPUT CAP
 6 O-RING
 7 HEX HEAD CAP SCREW
 8 INPUT OIL SEAL
 9 INPUT BEARING (cup and cone for 842 and larger units)
 10 INPUT BEARING (cup and cone for 842 and larger units)
 *11 RETAINING SCREW
 12 INPUT WORM SHAFT
 13 OUTPUT COVER - OPEN
 14 OUTPUT COVER - CLOSED
 15 O-RING

- 16 OUTPUT COVER SHIM (as required)
 17 OUTPUT OIL SEAL
 18 OUTPUT BEARING (18A. CONE, 18B. CUP)
 19 HEX HEAD CAP SCREW
 *20 OUTPUT SHAFT - SINGLE
 *21 OUTPUT SHAFT - DOUBLE
 22 GEAR SPACER
 23 GEAR KEY (only used on size 826 and larger units)
 *24 OUTPUT GEAR
 *25 INPUT COVER
 26 KEY - OUTPUT EXTENSION
 27 KEY - INPUT EXTENSION
 28 NAMEPLATE

(supplied only when mounting position involves a vertical shaft)

- *129 OUTPUT COVER - CLOSED
 *130 OUTPUT COVER - OPEN
 *131 OUTPUT BEARING GREASE RETAINER
 132 GREASE FITTING
 133 SEALED BALL BEARING (only used on size 818 thru 826 units)
 ♦134 INPUT COVER
 ♦136 INPUT BEARING GREASE RETAINER
 * ONLY USED ON SIZE 842 AND LARGER UNITS
 ♦ ONLY USED ON SIZE 830 AND LARGER UNITS
 * SUPPLIED ONLY AS OUTPUT ASSEMBLY ON 813 THROUGH 824 UNITS

VERTICAL SHAFT REQUIRED PARTS

 Complete information is available online at www.grovegear.com

Continued on next page

PARTS LIST (cont'd)

QUILL MOTOR FLANGE UNIT
(BMQ-STYLE)

- 40 QUILL MOTOR FLANGE
41 INPUT OIL SEAL
42 HEX HEAD CAP SCREW (flange to housing)
43 RETAINING RING - SHAFT
*44 RETAINING RING - HOUSING
45 QUILL INPUT SHAFT
46 KEY - INPUT
47 HEX HEAD CAP SCREW (motor to flange)

- 51 OUTPUT COVER
52 OUTPUT OIL SEAL
53 OUTPUT BEARING (53A. CONE, 53B. CUP)
54 GEAR SPACER
*55 OUTPUT SHAFT
56 SETSCREW
57 GEAR KEY (only used on size 826 and larger units)
*58 OUTPUT GEAR
59 OUTPUT KEY

- 111 HEX HEAD CAP SCREW (flange to housing)
112 COUPLING KEY - REDUCER SHAFT
113 SETSCREW - REDUCER SHAFT
114 COUPLING GEAR - REDUCER SHAFT
115 COUPLING SLEEVE
116 SETSCREW - MOTOR SHAFT
117 COUPLING GEAR - MOTOR SHAFT
118 COUPLING KEY - MOTOR SHAFT
119 HEX HEAD CAP SCREW (motor to flange)
120 PLASTIC PLUG

HOLLOW OUTPUT SHAFT UNIT
(H-STYLE)LONG MOTOR FLANGE AND
COUPLING KIT (BM-STYLE)

- 110 "C" FACE MOTOR FLANGE

MODEL BM813-8100
(Refer to Single Reduction
Basic Unit Components)

MODEL BMQ813-8100
(Refer to Single Reduction Basic Unit
Components)

For the full Worm Gear
Reducer Installation,
Lubrication and
Maintenance instructions,
visit: www.grovetgear.com

HOLLOW SHAFT MODELS

H, HM, HMQ
(Refer to Single Reduction
Basic Unit Components)

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Rev2, 01-13 7471G/01-13/BH/PDF ONLY

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