



WORLDWIDE
ELECTRIC CORPORATION

Gear
Reducers

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Aluminum Worm Gear Speed Reducers

This Manual Covers for the following WorldWide Electric Gear Reducers



CALM Series

Installation and Maintenance **Product Manual**

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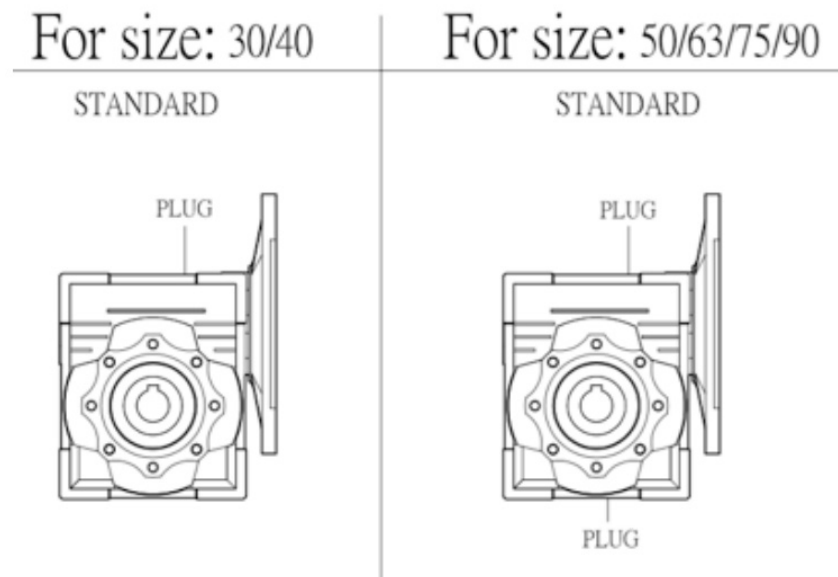
Thank you for choosing WorldWide Electric Corporation's CALM-style aluminum series worm gear speed reducer! These speed reducers, made of high-quality aluminum alloy, light in weight, non-rusting, low in noise, suitable for omni-bearing installation, are widely used in many industries. With more than 15 years of experience in the power transmission arena, we offer high quality, low maintenance speed reduction solutions for your toughest applications. Before using this product, please read this entire installation and maintenance manual through completely. We sincerely hope you enjoy and receive years of trouble-free service from this purchase. If you have any questions whatsoever, please do not hesitate to contact WorldWide Electric Corporation at the numbers shown on the bottom of this page.

Installation Notes

During the installation of the CALM aluminum worm gear speed reduction unit, please note the following recommendations:

1. Check the correct direction of rotation of the reduction unit output shaft before fitting the unit to the machine.
2. Before mounting the prime mover device, please check the reducer's axial diameter, aperture, key and key slot, to be sure their dimensions are in alignment and have not been damaged in shipment. Avoid assembling the reducer to the prime mover in a manner that is either too tight or too loose.
3. The mounting on the machine must be stable and secure to avoid any vibration. Excessive vibration will damage the reducer. Self-locking adhesives should be used on the bolts and joining surfaces of the machine frame to prevent the gearbox from working loose.
4. Drives such as sprocket wheels and gears must be fitted close to bearing in order to reduce bending stress of the hanging shaft. Maximum overhung load, shown in pounds, are listed for each size reducer in the catalog.
5. Before mounting, clean and lubricate all mating surfaces. While assembling motor to the reducer, it is recommended that a light coat of grease be added to the worm shaft input hole and key-way, to ease shaft installation and removal, and to avoid rusting when the unit is used for a long period of time between servicing.

6. The speed reducer must be structurally supported when the reducer is directly coupled to a motor whose weight is larger than the recommended motor frame size for the reducer.
7. The CALM series aluminum worm gear boxes do not require the oil to be changed unless a defective condition is noticed during the operation. If during normal operation, heat is noticed that exceeds 80°C or any abnormal noise is detected, the user should shut down the machine and resolve the problem. Once the problem is solved, it is recommended that the oil be replaced with new oil before returning the gearbox to service.
8. CALM reducers are considered maintenance free units and do not require the installation of the provided breather. If the breather is desired to be installed by the user, please note the breather should only be used in mounting position M1 for all box sizes and M4 for box size 50/63/75/90.



Operational Notes

1. Before using, please check carefully whether the reducer model, distance size, ratio, input connecting method, output shaft structure, input and output shaft direction and revolving direction are properly fitted and sized correctly for the application. Ensure the unit is properly aligned with the driven device and all bolts are properly tightened. If using a drive to over speed the motor, the input speed of the worm shaft should not exceed 1800 revolutions per minute (RPM).
2. Before starting up the machine, please check the reducer for the correct level of the lubricant by opening the plug and checking the fill level.
3. Avoid shock loading the reducer unit. The load should be added step by step when using the machine to improve reducer life. Reducer units will last longer if sized to run below full load capacity. Running a reducer at its full load capacity may reduce useful product life.

4. Whenever possible, protect the speed reducer against outdoor weather conditions (i.e. solar heat) and inclement weather by using guards or shields. Ensure the connected motor cools correctly by assuring good passage of air from the fan side across the motor.
5. In the case of ambient temperatures $<-5^{\circ}\text{C}$ or $>+40^{\circ}\text{C}$, please consult WWE engineering for required de-rating factors or other available factory installed product enhancements.
6. WorldWide Electric CALM style aluminum worm gear boxes are sized for a 1.0 mechanical service factor when operated at 1750 RPM. Consult the WWE catalog for a complete listing of mechanical ratings and available output torque ratings.

Operating Temperature

1. The operating temperature depends on a number of factors such as the type of power transmission, the type and quantity of lubricant, the characteristics and structure of the gearbox, the speed and power applied to the gearbox and the environment in which the gearbox is operating.
2. With worm gearboxes, the acceptable operating temperature range can be up to 50 degrees Celsius more than the ambient temperature because of the compactness and lower quantity of oil contained in modern gearboxes.
3. With a standard worm gearbox, the maximum allowable inside temperature is 90 degrees Celsius. Higher temperature could damage the oil seals.
4. It is not unusual for the unit to run slightly hotter than normal during the break-in period of the gearbox (i.e. the first 200 hours of service).
5. After the first 200 hours of service, the temperature should remain fairly constant as the gearbox runs at normal speed. At this stage of operation, excess changes in operating temperature may indicate a problem with the installation of the gearbox.

Routine Maintenance

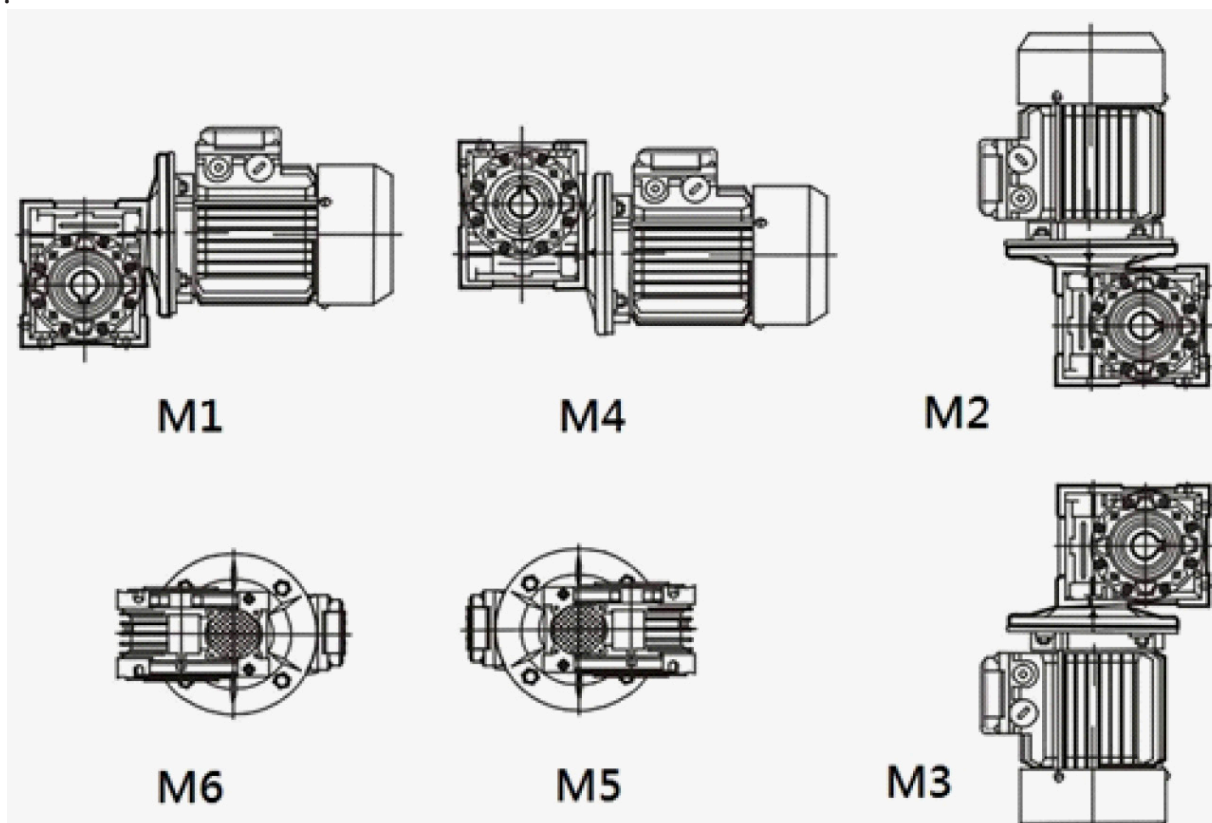
1. Periodically check the outer surfaces of the CALM aluminum speed reducer for debris. Remove surface debris to make sure all air passages are clean, which in turn helps keep the unit running cool.
2. Regularly check the unit for oil leaks. Replace leaky oil seals or the entire unit as necessary.
3. Periodically verify the unit has the correct quantity of lubricant.

Extended Storage

1. Do not store outdoors in areas exposed to weather or with excessive humidity.
2. For storage periods longer than 60 days, all machined surfaces such as flanges and shafts must be protected with a suitable anti-oxidation product.
3. In the case of long periods of storage (4-6 months), units should be completely filled with oil. Before operation, restore the oil fill quantity to the proper level and type of oil (see **Lubrication** section of this document). Additionally, the output shaft should be rotated frequently during extended storage or the oil seal may become dry and potentially dry rot. If this is the case, please change rubber seal before operation as it may stick to the shaft in operation. Over extended periods of idle time, the seal may lose its proper elasticity and should be replaced. Contact WWE for available spare parts.

Lubrication

The CALM series aluminum worm gear speed reducers are supplied complete with a Mobil synthetic oil lubricant suitable in oil level for a M1 mounting position. It is not necessary to change the oil in these gearboxes after the initial break-in period. CALM series units are considered maintenance free. Please see the table below for the recommended quantity of lubricant for the various mounting positions. Some mounting positions will require the addition of oil and some positions will require less oil and require that oil be removed. The various Mounting positions and recommended oil lubrication levels are outlined below:



Recommended Oil Fill Levels

CALM series (fl. Oz)						
SIZE	M1	M4	M2	M6	M5	M3
#30	1.353	1.014	1.691	1.183	1.183	1.691
#40	2.705	2.029	3.381	2.367	2.367	3.381
#50	3.381	2.536	4.227	2.874	2.874	4.227
#63	8.454	6.425	10.482	7.439	7.439	10.482
#75	16.907	12.511	20.965	14.540	14.540	20.965
#90	27.051	20.288	33.814	23.670	23.670	33.814

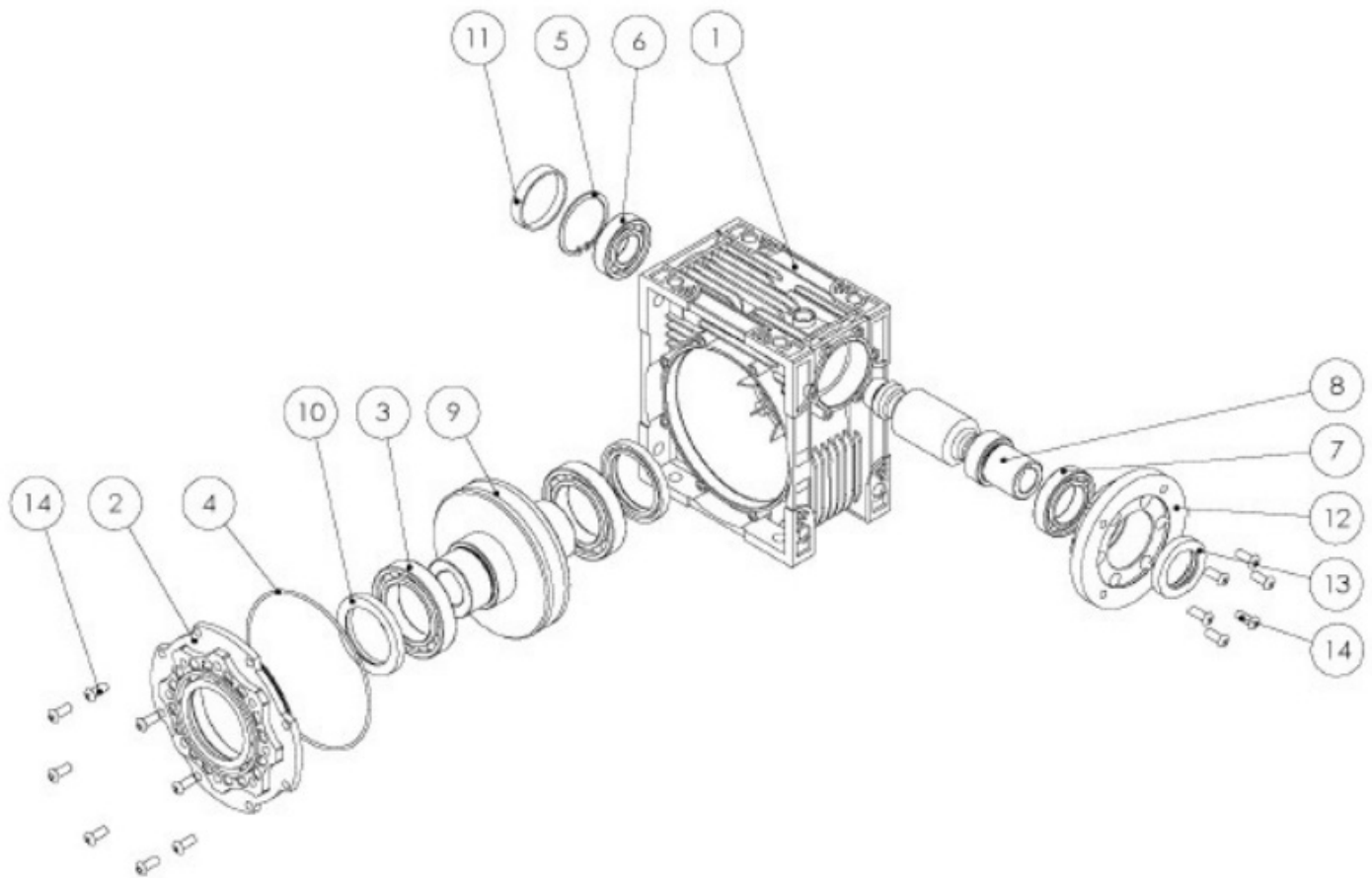
Lubricants Table

WWE Model	ISO VG	Temperature In Degrees Celsius		Shell	Mobil	Castrol	BP	
CALM 30~90	ISO VG 320	-25	+50	OMALA S4 WE 320	MOBILGEAR SHC 632	ALPHASYN PG 320	ENERSYN SG-XP 320	Synthetic Oil
CALM 30~90	ISO VG 460	-10	+50	OMALA S4 WE 460	MOBILGEAR SHC 634	ALPHASYN PG 460	ENERSYN SG-XP 460	Synthetic Oil

Troubleshooting

Breakdown	Possible cause	Remedy
The motor does not run without load	No power available	Check power source
	Gear, axis and bearing may be damaged from misalignment during installation	Check gearbox alignment and bearing condition – fix alignment issues
	Bearing failure	Replace gearbox or bearings
The motor does not run with a load	Motor may be undersized for the application	Review motor capability and size accordingly for the load
	Gearbox may be undersized for the load	Review gearbox capability and size accordingly for the load
	Gearbox is damaged	Replace damaged gearbox
The output shaft turns in the wrong direction	The motor polarity is reversed	Adjust wiring to correct for motor polarity
Cyclical noise inside the gearbox	Damaged gears	Unit may correct itself after first 3 hours of use; not harmful to the gearbox if the noise level is tolerable for the application
Non-cyclical noise inside the gearbox	The inside of the gearbox is dirty	Unit may correct itself after first 3 hours of use; not harmful to the gearbox if the noise level is tolerable for the application; replace oil
The temperature of the gearbox housing is too high	Wrong gearbox size or incorrect mounting position or insufficient gearbox lubricant	Check the installation, application parameters and proper lubrication recommendations for the mounting position in use
Output speed is different than expected	Incorrect motor input or incorrect reduction ratio selected	Replace the motor or the gearbox with a correctly sized input and reduction ratio
Oil leaks from the shaft	Defective seals or improperly seated seals	Replace the seals or reposition seals
Oil leaks from the seals	Flanges are not tightened properly or seals are defective or damaged in transport	Tighten the flanges or replace damaged seals
A whistling noise is coming from the gearbox	Defective bearings or device not correctly assembled; defective gears or not enough lubricant	Replace bearings or replace gears or fill to correct lubricant quantity
Unit runs hot after break-in period	Check load conditions	Reduce or discharge load; check application conditions
	Units starts and stops too many times per hour	Reduce use frequency
	Bearing is damaged	Repair or replace

Exploded View – Parts Listing



ITEM	PARTS NAME	ITEM	PARTS NAME
1	HOUSING	8	INPUT SHAFT
2	COVER	9	WORM WHEEL
3	BEARING	10	OIL SEAL
4	O-RING	11	OIL SEAL
5	SNAP RING	12	INPUT FLANGE
6	BEARING	13	OIL SEAL
7	BEARING	14	BOLT

Limited Warranty

WorldWide Electric Corporation (The Company) Warranties It's Products To Be Free From Defects In Materials Or Workmanship To The Original Purchaser For A Period Of One (1) Year From The Date Of Purchase. For This Warranty To Be Effective, This Product Must Be Installed, Used and Maintained By The Original Purchaser In Accordance With Good Industry Standards. The Warranty Does Not Cover Normal Wear, Tear and Erosion From Use, Mis-use, Abuse Or Corrosion.

In The Event Of Failure, It Shall Be The Responsibility Of The Original Purchaser To Notify The Company Either In Writing Or By Telephone To Make Arrangements For The Correction Of The Problem. The Purchaser Shall Be Responsible For Transportation Charges Connected With The Return, Exchange Or Repair Of Parts. Returns Found Defective Upon Inspection By Our Warranty Department Or Authorized Warranty Service Agent Will Be Replaced Free Of Charge.

The Company Shall Not Be Liable For Any Labor Cost Connected With The Replacement Of The Equipment, The Replacement Of The Parts Or Adjustments To The Equipment By The Purchaser Or Their Contractor Without The Company's Prior Written Approval. The Company, As The Exclusive Remedy Under This Warranty, Shall At It's Option Repair Or Replace Defective Items Or, If Agreed Upon, Refund The Purchase Price Less Reasonable Allowance For Depreciation In Exchange For The Product.

THE COMPANY MAKES NO OTHER WARRANTIES AND ALL IMPLIED OR EXPRESSED WARRANTIES AND REPRESENTATIONS, EXCEPT THAT OF TITLE, ARE DISCLAIMED. ALL IMPLIED WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR USE BUT NOT LIMITED TO JUST THOSE THAT ARE DISCLAIMED. LIABILITY FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES AND LOSSES UNDER ANY AND ALL WARRANTIES WHETHER IN CONTRACT, TORT OR OTHERWISE ARE EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW.



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