

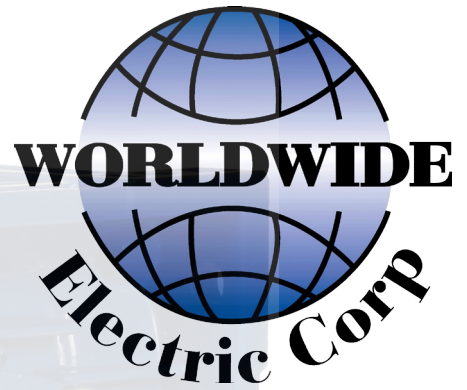
# Installation and Maintenance Manual

## WorldWide CALM Series Aluminum Worm Gear Speed Reducers

Thank you for choosing the WorldWide CALM Series Aluminum Worm Gear Speed Reducers! These speed reducers, made of high-quality aluminum alloy, light in weight, non-rusting, low in noise, suitable for omnibearing installation, are widely used in many industries. With more than 15 years 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 you receive years of trouble-free service from this purchase. If you have any questions whatsoever, please do not hesitate to contact WorldWide Electric's customer service department at 1-800-808-2131.

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CALM-IMM-080414



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# 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 WWE 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 keyway, 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.

# 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 unit is properly aligned with the driven device and all bolts are properly tightened. If using a drive to overspeed 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 cat log for a complete listing of mechanical ratings and available output torque ratings.

# Operational 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 usual 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

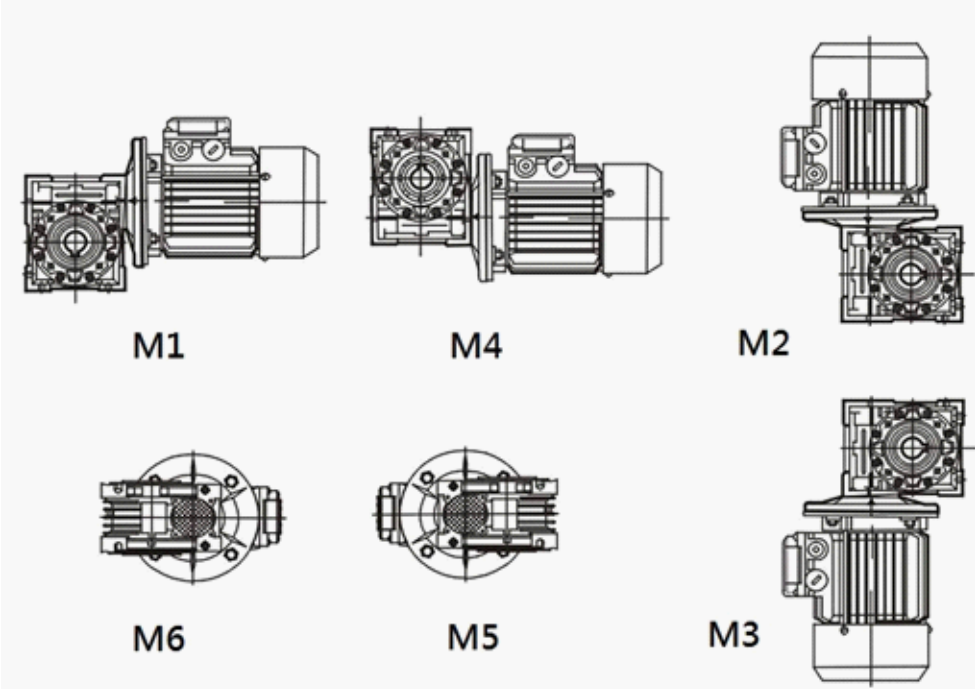
1. Periodically check the outer surfaces of the CALM aluminum speed reducer for debris. Remove surface debris to make sure all air passages are clean, which in turn helps keep the unit running cool.
2. Regular check the unit for oil leaks. Replace leaky oil seals or the entire unit as necessary.
3. Periodically 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 with the breather plug placed at the highest point on the unit. 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:





# Lubrication (Continued)

	<b>M1</b>	<b>M4</b>	<b>M2</b>	<b>M6</b>	<b>M5</b>	<b>M3</b>
CALM30	1.353 oz.	1.014 oz.	1.691 oz.	1.183 oz.	1.183 oz.	1.691 oz.
CALM40	2.705 oz.	2.029 oz.	3.381 oz.	2.367 oz.	2.367 oz.	3.381 oz.
CALM50	3.381 oz.	2.536 oz.	4.227 oz.	2.874 oz.	2.874 oz.	4.227 oz.
CALM63	8.454 oz.	6.425 oz.	10.482 oz.	7.439 oz.	7.439 oz.	10.482 oz.
CALM75	16.907 oz.	12.511 oz.	20.965 oz.	14.540 oz.	14.540 oz.	20.965 oz.
CALM90	27.051 oz.	20.288 oz.	33.814 oz.	23.670 oz.	23.670 oz.	33.814 oz.

## Selection Table of Lubricant

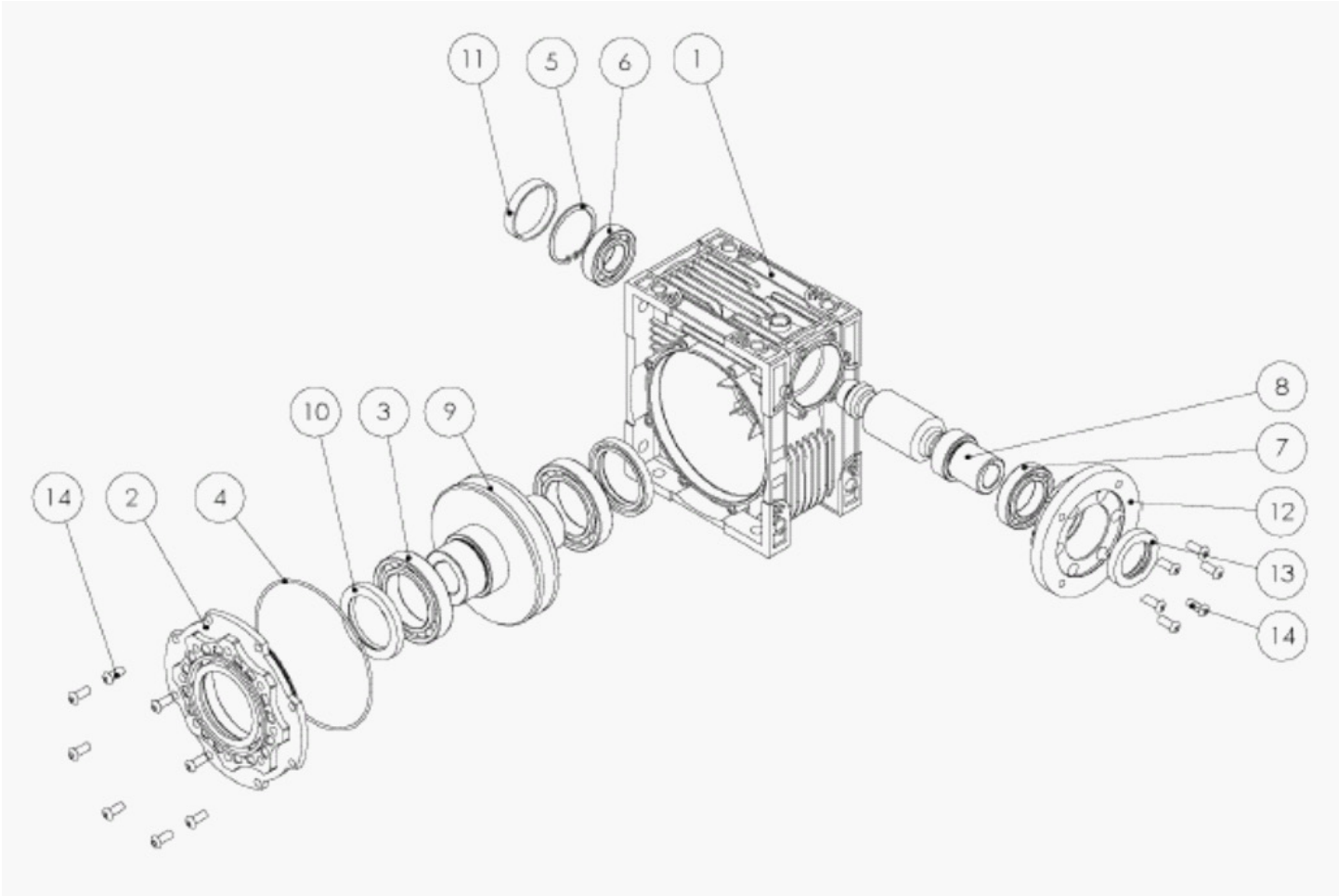
<b>Temperature (°C)</b>	<b>-25 ~ 50 Synthetic Oil</b>	<b>-10 ~ 50 Synthetic Oil</b>
ISO	VG320	VG460
Shell	Omala S4 WE 320	Omala S4 WE 460
Mobil	Mobilgear SHC 632	Mobilgear SHC 634
Castrol	Alphasyn PG 320	Alphasyn PG 460
BP	Enersyn SG-XP 320	Enersyn SG-XP 460

# Troubleshooting

<b>Problem</b>	<b>Reason</b>	<b>Action</b>
1. The motor does not run without load	<ol style="list-style-type: none"> <li>1. No power available</li> <li>2. Gear, axis and bearing may be damaged from misalignment during installation</li> <li>3. Bearing failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Check power source</li> <li>2. Check gearbox alignment and bearing condition - fix alignment and bearing issues</li> <li>3. Replace gearbox or bearings</li> </ol>
2. The motor does not run with a load	<ol style="list-style-type: none"> <li>1. Motor may be undersized for application</li> <li>2. Gearbox may be undersized for the load</li> <li>3. Gearbox is damaged</li> </ol>	<ol style="list-style-type: none"> <li>1. Review motor capability and size accordingly for the load</li> <li>2. Review gearbox capability and size accordingly for the load</li> <li>3. Replace damaged gearbox</li> </ol>
3. The output shaft turns in the wrong direction	<ol style="list-style-type: none"> <li>1. The motor polarity is reversed</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust wiring to correct for motor polarity</li> </ol>
4. Cyclical noise inside the gearbox	<ol style="list-style-type: none"> <li>1. Damaged gears</li> </ol>	<ol style="list-style-type: none"> <li>1. Unit may correct itself after first 3 hours of use; not harmful to the gearbox if the noise level is tolerable for the application</li> </ol>
5. Non-cyclical noise inside the gearbox	<ol style="list-style-type: none"> <li>1. The inside of the gearbox is dirty</li> </ol>	<ol style="list-style-type: none"> <li>1. 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</li> </ol>
6. The temperature of the gearbox housing is too high	<ol style="list-style-type: none"> <li>1. Wrong gearbox size or incorrect mounting position or insufficient gearbox lubricant</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the installation, application parameters and proper lubrication recommendations for the mounting position in use</li> </ol>
7. Output speed is different than expected	<ol style="list-style-type: none"> <li>1. Incorrect motor input or incorrect reduction ratio selected</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the motor or the gearbox with a correctly sized input and reduction ratio</li> </ol>
8. Oil leaks from the shaft	<ol style="list-style-type: none"> <li>1. Defective seals or improperly seated seals</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the seals or reposition seals</li> </ol>
9. Oil leaks from the seals	<ol style="list-style-type: none"> <li>1. Flanges are not tightened properly or seals are defective or damaged in transport</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten the flanges or replace damaged seals</li> </ol>
10. A whistling noise is coming from the gearbox	<ol style="list-style-type: none"> <li>1. Defective bearings or device not correctly assembled; defective gears or not enough lubricant</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace bearings or replace gears or fill to correct lubricant quantity</li> </ol>
11. Unit runs hot after break-in period	<ol style="list-style-type: none"> <li>1. Check load conditions</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce or discharge load; check application conditions</li> </ol>
	<ol style="list-style-type: none"> <li>2. Units starts and stops too many times per hour</li> </ol>	<ol style="list-style-type: none"> <li>2. Reduce use frequency</li> </ol>
	<ol style="list-style-type: none"> <li>3. Bearing is damaged</li> </ol>	<ol style="list-style-type: none"> <li>3. Repair or replace</li> </ol>



# Exploded View - Parts Listing



- 1. Housing
- 2. Cover
- 3. Bearing
- 4. O-Ring
- 5. Snap Ring
- 6. Bearing
- 7. Bearing
- 8. Input Shaft
- 9. Worm Wheel
- 10. Oil Seal
- 11. Oil Seal
- 12. Input Flange
- 13. Oil Seal
- 14. Bolt

# Limited Warranty

WorldWide Electric Corporation (The Company) warrants its aluminum worm gear speed reducer to be free from defects in materials or workmanship to the original purchaser for a period of two years from the date of sale (invoice).

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, misuse, 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 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 exclusive remedy under this warranty, shall at its 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.**