



IRONHORSE® ALUMINUM WORM GEAR INSTALLATION AND MAINTENANCE

USER MANUAL OVERVIEW

OVERVIEW OF THIS PUBLICATION

The IronHorse Worm Gearbox Installation and Maintenance guide describes the installation, operation, and preventative maintenance of IronHorse Worm Gearboxes.

WHO SHOULD READ THIS MANUAL

This manual contains important information for people who will install, maintain, and/or operate any of the IronHorse Worm Gearboxes.

TECHNICAL SUPPORT

Our technical support group is glad to work with you to answer your questions. Please call the technical support group if you need technical assistance, or visit our web site. Our website contains technical and non-technical information about our products and our company.

By telephone: (770) 844-4200 (Mon – Fri, 9:00 am – 6:00 pm ET)

On the Web: www.automationdirect.com

SPECIAL SYMBOLS



NOTE: When you see the “notepad” icon in the left-hand margin, the paragraph to its immediate right will be a special note which presents information that may make your work quicker or more efficient.

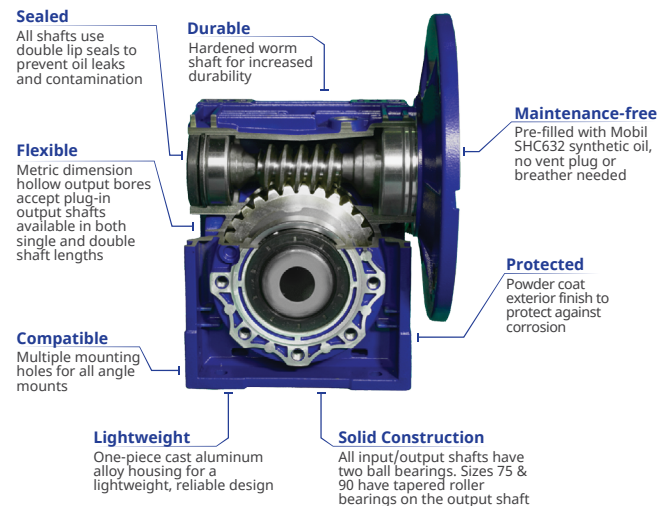


WARNING: WHEN YOU SEE THE “EXCLAMATION MARK” ICON IN THE LEFT-HAND MARGIN, THE PARAGRAPH TO ITS IMMEDIATE RIGHT WILL BE A WARNING. THIS INFORMATION COULD PREVENT INJURY, LOSS OF PROPERTY, OR EVEN DEATH (IN EXTREME CASES). ANY WARNING IN THIS MANUAL SHOULD BE REGARDED AS CRITICAL INFORMATION THAT SHOULD BE READ IN ITS ENTIRETY.

IRONHORSE® WORM GEARBOX INTRODUCTION

PURPOSE OF WORM GEARBOXES

Gearboxes, also known as enclosed gear drives or speed reducers, are mechanical drive components that can control a load at a reduced fixed ratio of the motor speed. The output torque is also increased by the same ratio, while the horsepower remains the same (less efficiency losses). For example, a 10:1 ratio gearbox outputs approximately the same motor output horsepower, but motor speed is divided by 10, and motor torque is multiplied by 10. The gear drive components consist of a Worm and Worm Gear to generate the speed reduction and changes the drive direction by 90 degrees.



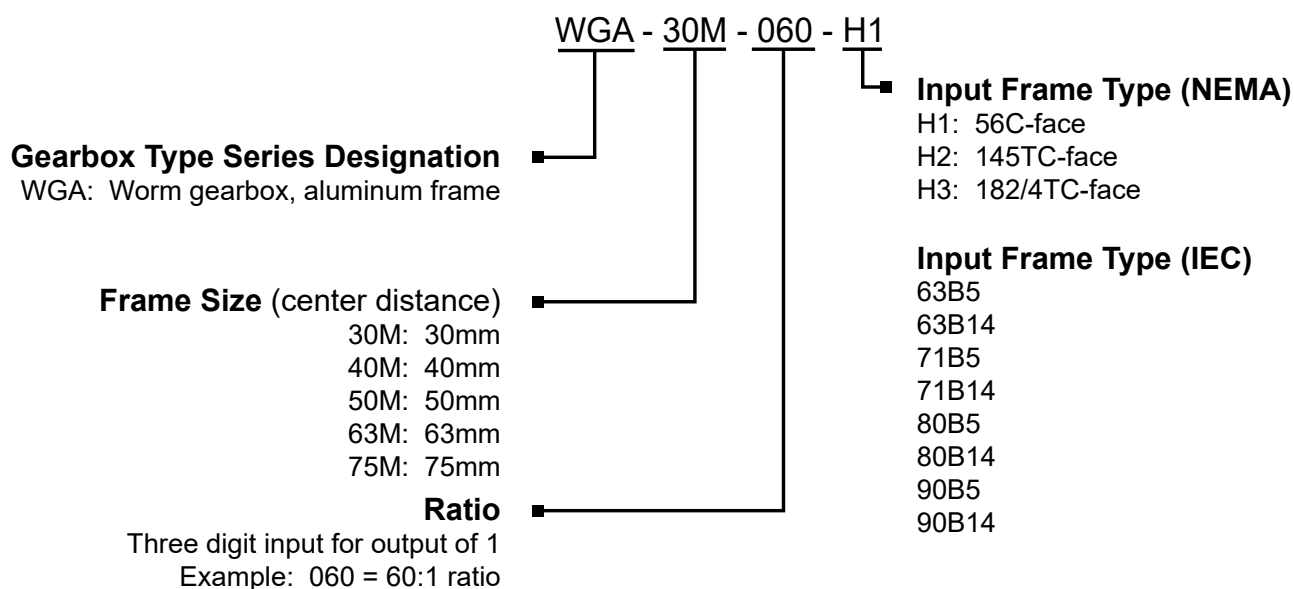
The WGA series have a cast aluminum housing with fins to transfer heat away during continuous running. This allows the WGA series to operate without a Breather Vent. However a Breather Vent is supplied, separately, for extra thermal expansion protection if desired. The output bore is Hollow all the way thru to provide numerous mounting options, including direct mounting to load shaft or insertion of Output shaft accessories. The Input Frame is configured for either NEMA or IEC motor mounting.

IronHorse worm gearboxes are manufactured in an ISO9001 certified plant by one of the leading and most internationally acclaimed gearbox manufacturers in the world today. Only the highest quality materials are tested, certified, and used in the manufacturing process. Strict adherence to and compliance with the toughest international and U.S. testing standards and manufacturing procedures assure you the highest quality products.

PACKAGE CONTENTS

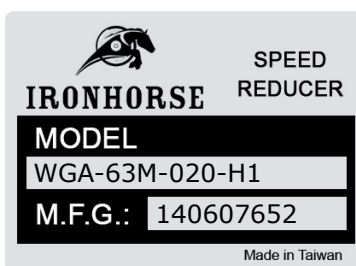
After receiving the IronHorse Worm Gearbox, please check for the following:

- *Make sure the package includes the speed reducer and the breather vent.*
- *Inspect the unit to insure it was not damaged during shipment.*
- *Make sure that the part number on the gearbox nameplate is the same as the part number that you ordered.*
- *Inspect the cardboard package for oil stains or moist oil film. If this is present, assume the gearbox oil has leaked out and should not be used as-is. Return to ADC for full refund or replacement.*

PART NUMBER EXPLANATION**NAMEPLATE INFORMATION****WGA Series Gearbox**

Gearbox Model #

Gearbox Serial #



Country of Origin

OPERATIONAL NOTES

NOTE: WGA Series aluminum worm gear boxes are sized and rated for a 1.0 mechanical service factor when operated at 1750 RPM.

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 Variable Frequency Drive (VFD) to over speed the motor, the input speed of the worm shaft should not exceed 1800 revolutions per minute (RPM).

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.

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. 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 ensuring good passage of air from the fan side across the motor.

IRONHORSE® WORM GEARBOX INSTALLATION

Read these instructions thoroughly before installing or operating the gearbox.

INSTALLATION INSTRUCTIONS

- Add or partially drain oil as needed depending upon the mounting orientation. (Refer to the lubrication section of this manual for more information.)
- Install the breather vent (if needed*).
- Align all shafts accurately, since improper alignment can result in premature failure. Use flexible couplings to compensate for slight misalignment.
- For hollow-bore output gearboxes – Use anti-seize compound when inserting the load shaft into the hollow output shaft. It is preferable to size the load shaft with sufficient length to allow complete insertion through the hollow output shaft of the gearbox. This allows equal support of the load shaft by both of the output shaft bearings.
- Mount the gearbox to a rigid foundation, and use the maximum possible bolt size. Periodically inspect the mounting bolts.
- Mount auxiliary drive components such as sprockets, gears and pulleys on the gearbox shaft as close to the housing as possible in order to minimize the effects of overhung loads. Avoid force fits that might damage bearings or gears.
- Check and record gear backlash at installation and again at regular intervals. This should be done by measuring the rotary movement of the output shaft, rotating the shaft alternately clockwise and counterclockwise at a suitable radius while holding the input shaft stationary. The gearbox should be replaced when the backlash exceeds four times the measurement taken at installation.
- Gear drives are rated for 1750 input rpm and Class I Service (Service Factor 1.0), using Mobil synthetic SHC632 oil.
- Initial operating temperatures may be higher than normal during the break-in period of the gear set. For maximum life, **DO NOT ALLOW THE GEARBOX TO OPERATE CONTINUOUSLY ABOVE 225°F** at the gear case. In the event of overheating, check for overloads or high ambient temperatures. Keep shafts and breather vents clean to prevent foreign particles from entering seals or gear housing.



**NOTE: Breather vents are not needed on aluminum frame gearboxes unless they are being used in environments with large temperature swings. Please install the breather vent when used in such environments in order to prevent pressure buildup in the gearbox.*

BREATHER VENT INSTALLATION

All IronHorse Worm Gearboxes are tested and filled with Mobil synthetic lubricant prior to shipment. All vent openings are plugged by the manufacturer to prevent the loss of lubricant in shipment. The breather vent is shipped loose in the package with all gearboxes. Breather vent use with aluminum gearboxes is not required, but is optional. If a breather vent is used for the aluminum gearbox, the gearbox mounting position is restricted to position “A” for WGA-30M through WGA-50M and position “A” and “C” for WGA-63M through WGA-75M gearboxes.

- *The breather vent should be installed in the uppermost position.*
- *For all mounting positions where the breather vent is located in a horizontal plane, the vent hole must point upward.*
- *For all mounting positions where the vented plug is located in a vertical plane, the vent hole must point toward the center of the gearbox housing.*
- *Failure to properly install the breather vent can lead to pressurization of the gearbox housing as operating temperature rises, resulting in leakage at the shaft seals.*

IRONHORSE® WORM GEARBOX LUBRICATION & MOUNTING ORIENTATIONS

Lubricant selection is important to all gearboxes, and it is particularly critical for the worm gear type. An oil with special characteristics and a relatively high viscosity is required due to sliding action between the gear teeth where they mesh. Aside from improper gearbox selection, inadequate lubrication is the greatest factor contributing to premature worm gearbox failures. Improper lubrication also causes reduced gearbox performance.

LUBRICATION INSTRUCTIONS

IronHorse Worm Gearboxes are shipped to you filled with Mobil synthetic oil. Oil must be added or partially drained depending upon your mounting orientation, as shown in the Lubricant Capacities table.

Since many oils are not suitable for worm gears, it is very important to use the proper lubricant type. It is also very important to keep the oil free from oxidation and contamination by water or debris. For longer service life, the gearbox should be periodically drained (preferably while warm) and refilled to the proper level with a recommended gear oil. Non-synthetic oils should be changed every 6 months or 250 hours of operation under normal operating conditions. However, synthetic lubricants have increased resistance to thermal and oxidation degradation, and do not need to be changed as frequently.

Synthetic lubricant should be changed every 6,000 hours of operation or every two years, whichever ever comes first.

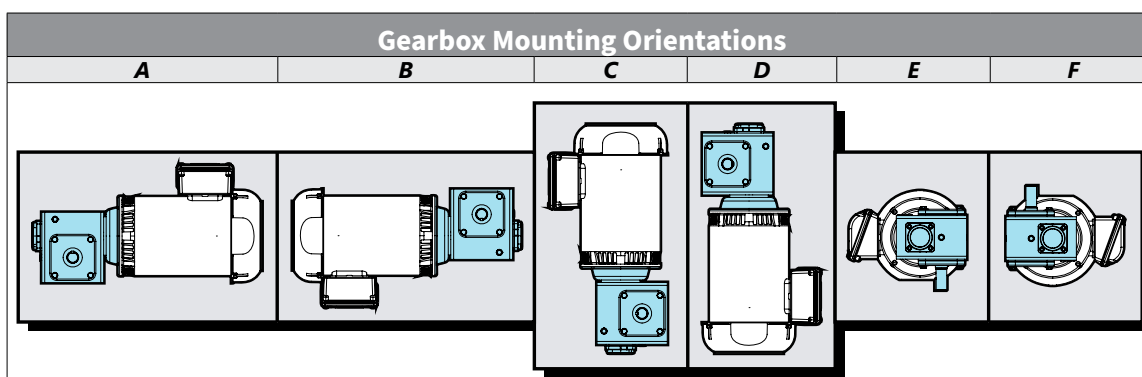


WARNING: SOME LUBRICANTS CONTAIN NON-CORROSIVE EXTREME PRESSURE ADDITIVES. **DO NOT USE** LUBRICANTS THAT CONTAIN SULPHUR AND/OR CHLORINE, WHICH ARE CORROSIVE TO BRONZE GEARS. ALSO, SOME EXTREME PRESSURE LUBRICANTS CONTAIN MATERIALS THAT ARE TOXIC. AVOID THE USE OF THESE LUBRICANTS WHERE HARMFUL EFFECTS CAN OCCUR.

LUBRICANT CAPACITIES AND MOUNTING ORIENTATIONS

WARNING: TOO MUCH OIL WILL CAUSE OVERHEATING, AND TOO LITTLE OIL WILL RESULT IN GEAR FAILURE. CHECK OIL LEVEL REGULARLY. MORE FREQUENT OIL CHANGES ARE RECOMMENDED WHEN OPERATING CONTINUOUSLY, AT HIGH TEMPERATURES, OR UNDER CONDITIONS OF EXTREME DIRT OR DUST.

IronHorse Aluminum Worm Gearbox Lubricant Capacities						
Gearbox Mounting Orientation	A	B	C	D	E	F
Gearbox Part Number	Approx Capacity (fl oz)					
WGA-30M-xxx-xx	1.35	1.01	1.69		1.18	
WGA-40M-xxx-xx	2.71	2.03	3.38		2.37	
WGA-50M-xxx-xx	3.38	2.54	4.23		2.87	
WGA-63M-xxx-xx	8.45	6.43	10.48		7.44	
WGA-75M-xxx-xx	16.91	12.51	20.97		14.54	
*Gearboxes are shipped filled with oil sufficient for mounting orientation "A". Oil must be added to or removed from gearboxes installed in other mounting orientations.						



IRONHORSE® WORM GEARBOX SEAL SIZES**ALUMINUM WORM GEARBOX INPUT AND OUTPUT SEAL SIZES**

Aluminum Worm Gearbox Seal Sizes		
Model #	Input Seals (mm)	Output Seals (mm)
WGA-30M-xxx-xx	25 x 62 x 7	25 x 47 x 7
WGA-40M-xxx-xx	25 x 35 x 7	30 x 40 x 7
WGA-50M-xxx-xx	30 x 47 x 7	40 x 62 x 8
WGA-63M-xxx-xx	35 x 52 x 8	45 x 65 x 10
WGA-75M-xxx-xx	45 x 60 x 10	50 x 72 x 8

OPERATING TEMPERATURE

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. 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. With a standard worm gearbox, the maximum allowable ambient temperature is 90 degrees Celsius. Higher temperature could damage the oil seals. 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). 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.

EXTENDED STORAGE

Do not store outdoors in areas exposed to weather or with excessive humidity. For storage periods longer than 60 days, all machined surfaces such as flanges and shafts must be protected with a suitable anti-oxidation product. 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 Instructions" on page 6 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.

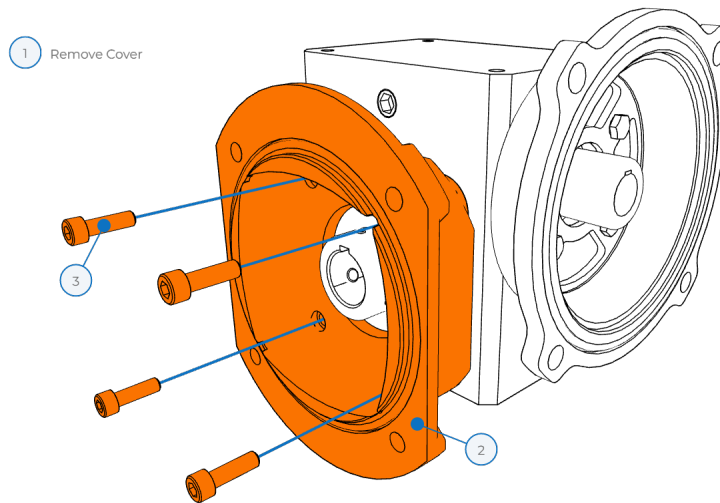
ROUTINE MAINTENANCE

Periodically check the outer surfaces of the WGA series worm gearbox for debris. Remove surface debris, especially between the housing fins, to make sure all air passages are clean, which in turn helps keep the unit running cool. Regularly check the unit for oil leaks. Replace leaky oil seals or the entire unit as necessary. Periodically verify the unit has the correct quantity of lubricant.

ACCESSORIES

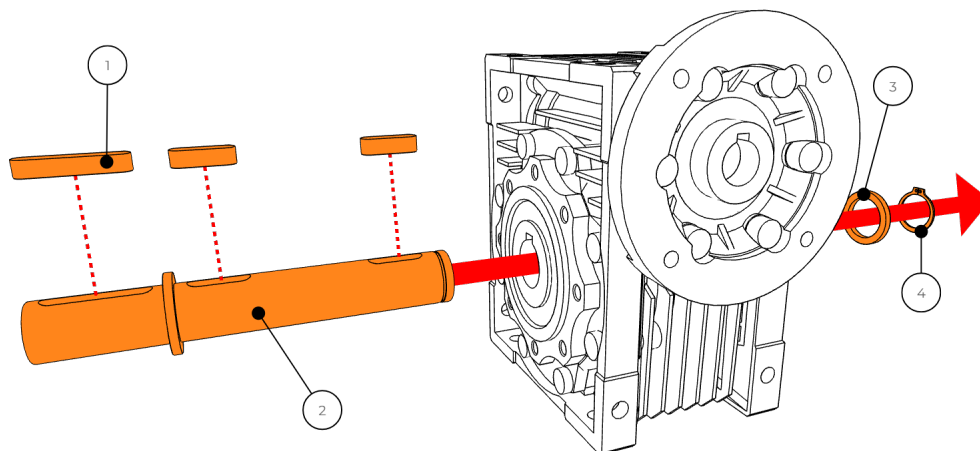
FLANGE

- 1) Remove the cover.
- 2) Remove the bearing race from the existing output cover.
- 3) Install the bearing race in the output flange.
- 4) Place the flange on the gearbox as shown.
- 5) Install SHCS and tighten.



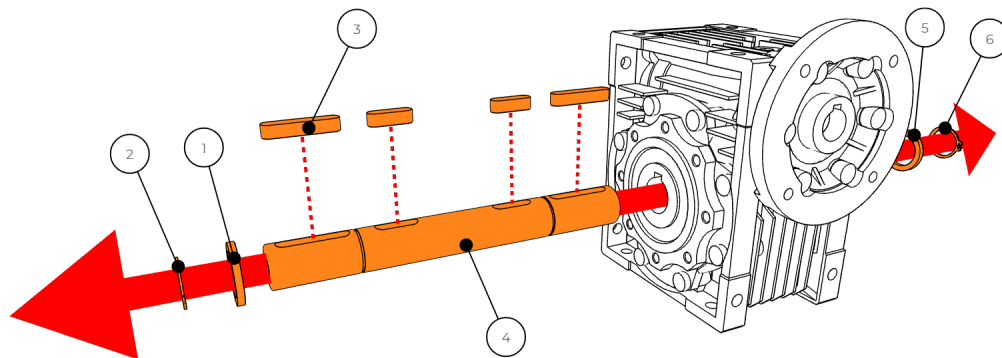
SINGLE SHAFT

- 1) Insert keys (included) into the shaft.
- 2) Insert the shaft into the gearbox, aligning the keys with the key slots.
- 3) Place the spacer (item 3) and secure in place using the provided clip (Item 4).

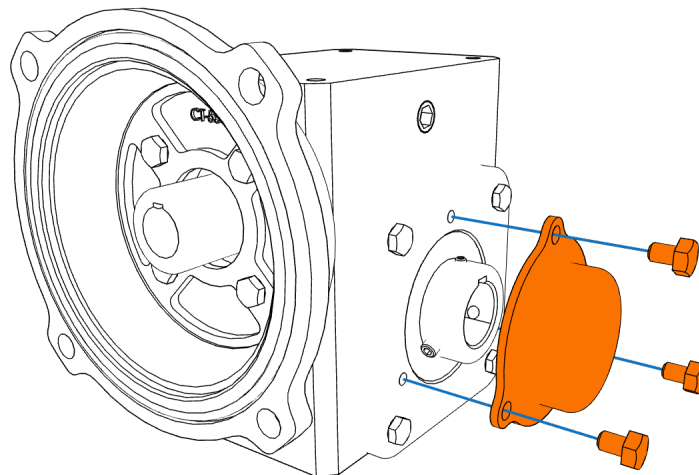


DUAL SHAFT

- 1) Slide a spacer (item 1) and install a clip (item 2) on one end of the shaft.
- 2) Insert keys (included) into the shaft.
- 3) Insert the shaft into the gearbox, aligning the keys with the key slots.
- 4) Slide the remaining spacer (Item 5) over the shaft and secure in place using the provided clip (Item 6).

**OUTPUT COVER**

Install the output cover as shown below using the hex bolts provided.



TROUBLESHOOTING

Breakdown	Possible cause	Remedy
<i>The motor does not run without load</i>	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
<i>The motor does not run with a load</i>	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
<i>The output shaft turns in the wrong direction</i>	The motor polarity is reversed	Adjust wiring to correct for motor polarity
<i>Cyclical noise inside the gearbox</i>	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
<i>Non-cyclical noise inside the gearbox</i>	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
<i>The temperature of the gearbox housing is too high</i>	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
<i>Output speed is different than expected</i>	Incorrect motor input or incorrect reduction ratio selected	Replace the motor or the gearbox with a correctly sized input and reduction ratio
<i>Oil leaks from the shaft</i>	Defective seals or improperly seated seals	Replace the seals or reposition seals
<i>Oil leaks from the seals</i>	Flanges are not tightened properly or seals are defective or damaged in transport	Tighten the flanges or replace damaged seals
<i>A whistling noise is coming from the gearbox</i>	Defective bearings or device notcorrectly assembled; defective gears or not enough lubricant	Replace bearings or replace gears or fill to correct lubricant quantity
<i>Unit runs hot after break-in period</i>	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