Harmonic Installation, Operation, & Maintenance Instructions

HANDLING

- Cone Drive Harmonic Solutions® are machined and assembled in a controlled environment designed to provide cleanliness and thermal stability. The assembly area is based on an ISO Class 8 (or better) Clean Room. Product handling by the user shall make every effort to insure it is handled with care in the same manner, with appropriate measures to avoid contamination from entering the unit.
- Use of ISO Class 5 (or better) Clean Room lint-free gloves is recommended when handling the product.
- Use of ISO Class 5 (or better) Clean Room lint-free cleaning wipes is recommended for cleaning and preparing the product for use.
- Use ethyl or methyl alcohol (or similar) with lint-free cleaning wipes to clean the product, but not an excessive amount to dilute the lubricant. Do not use solvents as these may damage seals, o-rings, and adhesive joints.
- The individual components have been machined to be a matched set. Do not mix components or the warranty will be void. If components are mixed, the life and performance of the product will quickly deteriorate.
- Do not drop the unit, or subject the components to impact of any type. If any component of the product is dropped, impacted, or damaged in any way, it should be considered suspect and should not be used.
- Avoid dust, dirt, chips, or other debris and foreign matter. Refer to the ISO Class 8 (or better) Clean Room requirements.

INSTALLATION REQUIREMENTS

- Refer to the approved lubricant list for the harmonic product line found at www.conedrive.com/resources for lubricants that have been tested and approved for use by Cone Drive. Unapproved lubricants will void the warranty. Contact ae@conedrive.com if application requires custom lubrication.
- Alignment and accuracy of input and output interfaces is critical to the product life and function. Refer to the approval drawing or standard product drawing for alignment and accuracy requirements of interface components and features.
- The standard product is designed for indoor use where the ambient temperature range is 32°F to 100°F, and no water or excess humidity comes in contact with the product. For other ambient environments contact Cone Drive at ae@conedrive.com.
- The standard product must not be used in an explosive or corrosive environment.
- Recommended Break-In Procedure for standard product: After appropriately applying approved lubrication, operate the unit under the following conditions:
  - After installation, rotate the input both clockwise and counterclockwise at 250 RPM for 30 sec and then 1000 RPM for 5 minutes. Maximum operation temperature should not exceed 175°F. If the unit exhibits a sharp increase of operating temperature or the temperature exceeds 175°F, the unit may be damaged and should be inspected.
  - The maximum acceptable input speed is 3000 RPM during the break-in period. Cone Drive recommends a slower input speed during the break-in procedure.
  - Rotate the output as close to, or over one full revolution, before reversing.

MAINTENANCE

- Refer to the approved lubricant list for the harmonic product line found at www.conedrive.com/resources for lubricants that have been tested and approved for use by Cone Drive. Unapproved lubricants will void the warranty.
- Grease – Standard for all models.
  - Grease life will decrease as temperature increases.
  - If using continuously in one direction, grease may be squeezed from the gear mesh. More frequent grease replacement may be required.
  - Grease should be contained in the unit via seals. The grease should be free from any foreign material which could contaminate the grease, or reduce the anti-wear properties.
  - Grease should be changed after the first 100 hours of operation, and every 2000 hours, or 12 months of operation after the first grease change. Actual running torque levels beyond the catalog average torque rating will require more frequent grease changes.
  - It is necessary to mix and/or stir stored grease prior to applying to the gearing to avoid separation of the grease.
- Oil – Optional for component sets and gearhead models shipped without grease.
  - Oil levels are specific for different types; refer to the approval drawing. Oil should be changed after the first 100 hours of operation, and every 2000 hours, or 12 months of operation after the first oil change. Actual running torque levels beyond the catalog average torque rating will require more frequent oil changes.

STORAGE

- The product is shipped in Vapor Corrosion Inhibitor (VCI) polyethylene bags. Do not remove the product from the VCI polyethylene bag until ready for installation.
- The Cone Drive Harmonic Solutions® unit is built to order. Cone Drive recommends using the product as soon as possible in order to avoid grease separation, seal lip material hardening, and/or rust formation. If possible, do not store the unit for more than six months without verifying the product integrity prior to installation into the application. If the unit is suspect, contact Cone Drive at ae@conedrive.com for discussion and possible evaluation of the product.
- If spare units are purchased and stored, Cone Drive recommends using the spare units in a "first in, first out" method in order to use the oldest unit first (rotate unused spares).
- Environmental and/or ambient conditions of storage.
  - 20% to 80% relative humidity (without condensation).
  - Minimal, or no exposure to direct sunlight.
  - Indoor storage, with a temperature and humidity controlled environment is strongly recommended.

SAFETY

- Obtain the appropriate Safety Data Sheet for the lubricant used in the product. Safety Data Sheets are available from the lubricant manufacturer.
- The user is responsible for ensuring the product has the correct guarding and safety measures in place to prevent human injury and/or equipment damage. All individuals involved with the installation and use of this product must use appropriate personal protection safety equipment to prevent human injury.
- The standard product is intended for use in typical industrial applications. Please contact Cone Drive at ae@conedrive.com for applications involving human transport or contact, medical equipment, nuclear equipment, aircraft equipment, space or vacuum equipment or safety related applications.
- Disposal of this product and lubricant should be handled in such a manner that is consistent with local laws and ordinances. The product and lubricant should be considered industrial waste at time of disposal. Metal recycling is encouraged when feasible.

OPERATING CONDITIONS

- Do not exceed the product ratings.
- Refer to the standard product catalog for product life calculations.
- When excessive input torque is applied during operation, the engagement of the teeth between the ID spline and the OD spline may be compromised causing ratcheting. Ratcheting torque information may be obtained from Cone Drive at ae@conedrive.com. If ratcheting occurs, the life and torque capacity will be reduced.
- When excessive output torque and/or overhung loads are applied, permanent damage may occur.

WARRANTY

- Refer to Cone Drive Sales Terms and Conditions found at www.conedrive.com/resources.

Cone Drive reserves the right to improve, or change product design, specifications, and dimensions without notice.
The performance of this product can be fully achieved if it is handled, installed, operated, and maintained correctly.