

Sumitomo Drive Technologies

E CYCLO[®] **High Precision Gearboxes**

ECY Series



<Note>

- This product should be handled by only those who have been trained for the work.
Please read this manual carefully before use.
- Deliver this manual to the customer who will actually use the product.
- This instruction manual should be carefully stored.

[Introduction] Safety Precautions

- Carefully read this maintenance manual and all accompanying documents before use (installation, operation, maintenance, inspection, etc.). Thoroughly understand the machine, information about safety, and all precautions for correct operation. Maintain this manual for future reference.
- Pay particular attention to the "DANGER" and "CAUTION" warnings regarding safety and proper use.



DANGER

Improper handling may result in physical damage, serious personal injury and/or death.



CAUTION

Improper handling may result in physical damage and/or personal injury.

Matters described in  **CAUTION** may lead to serious danger depending on the situation. Be sure to observe important matters described herein.



DANGER

- Transport, installation, plumbing, wiring, operation, maintenance and inspections should be handled by properly trained technicians; otherwise, electric shock, injury, fire, or damage to the equipment may result.
- When the unit is to be used in a system for transport of human beings, a protective device should be installed. There is a risk of personal injury or damage to the equipment due to runaway or falling.
- When the unit is to be used in an elevator, install a protective device on the elevator side to prevent it from falling; otherwise, personal injury, death, or damage to the equipment may result.

【Contents】

Contents

【Introduction】 Safety Precautions	1
【Contents】	2
【1】 Inspection Upon Delivery	3
【2】 Storage	5
【3】 Transportation	6
【4】 Installation	7
【5】 Lubrication	8
【6】 Coupling with Other Machines	9
【7】 Operation	14
【8】 Daily Inspection and Maintenance	16
【9】 Structural Drawing	18
【10】 Warranty	19

【1】 Inspection Upon Delivery



CAUTION

- Unpack the unit after verifying that it is positioned right side up; otherwise, injury may result.
- Verify that the unit received is in fact the unit ordered. When a different unit is installed, injury or damage to the equipment may result.
- Do not remove the nameplate.

Upon delivery and receipt of the reducer check the following. If a nonconformity or problem is found, contact our nearest agent, distributor, or sales office.

[1] Do the items on the nameplate conform to what was ordered?

[2] Were there any parts that were broken during transport?

[3] Are all bolts and nuts tightened firmly?

1-1 How to Check the Nameplate



When making an inquiry, advise us of the [1] Nomenclature and [2] Serial No.

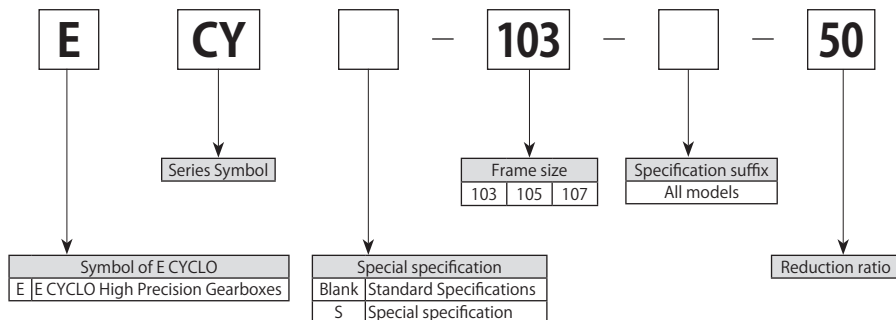
1-2 Lubrication Method

E CYCLO High Precision Gearboxes EGY Series is a grease-lubricated unit. Grease is injected into the unit components before shipment so that no further lubrication is necessary during use.

【1】 Inspection Upon Delivery

1-3 Nomenclature

The meanings of the symbols are as follows. Verify that the nomenclature matches that of the order.



【2】 Storage

When storing reducers for any extended period of time, consider the following important points.

2-1 Storage Location

Store the unit indoors in a clean dry location.

Do not store the unit outdoors or in locations where there is excessive moisture, dust, severe temperature change, corrosive gas, etc.

2-2 Storage Period

- Storage period should be less than 1 year.
- Standard Rust Prevention Specifications
 - External rust prevention Standard specification is no coating. Although we use the rust protection packages, please apply the rust-proofing on each products once opened, however the surface condition should be checked for rust on the machined surfaces 6 months after shipment. When long-term storage is necessary, rust prevention such as application of rust prevention oil should be performed.
 - Internal rust prevention The unit should generally be stored inside a factory or warehouse in an environment that is free from moisture, dust, severe temperature change, corrosive gas, etc.
- When the unit will be shipped overseas or stored for a period of longer than 1 year, please contact us for special rust prevention specifications.
- When the unit will be stored for a period of longer than 1 year, the unit should be operated for a few minutes under no-load conditions every two or three months.

2-3 Use After Storage

- The oil seal is prone to deterioration due to the surrounding conditions such as temperature, ultraviolet rays, etc., so after long-term storage, the unit should be inspected before operation, and any deteriorated parts should be replaced with new parts.
- When the storage period is 2 years or longer, the oil seals and grease should be replaced before starting operation. In the case of maintenance with disassembly, please contact the nearest agent, dealer or our sales office.
- At the start of operation, make sure there is no abnormal noise, vibration, heat, etc. If any abnormality is found, immediately contact the nearest agent, dealer or our sales office.

【3】 Transportation



DANGER

- Do not stand directly under a unit suspended by a crane or other lifting mechanism; otherwise, injury or death may result.



CAUTION

- Exercise ample care so as not to drop or tip over the unit during transportation.
- When lifting the unit using eye bolts in the threaded holes provided on the main unit, refer to the package, exterior drawings, catalog, etc., and do not lift a unit that is heavier than the rated load of the eye bolts; otherwise, the falling/tumbling of the unit or damage to the lifting devices may cause personal injury or equipment damage.
- After the unit has been mounted in the machine, avoid lifting the entire machine with using the eye bolts; otherwise, it may result in injury or damage to the equipment due to the unit falling or tipping over, or due to failure of the eye bolts.
- Use proper lifting fixtures, and make sure the eye bolts and nuts are not loose before lifting.

[4] Installation



CAUTION

- Do not use the unit for a purpose other than that indicated on the nameplate or in the manufacturing specifications; otherwise, injury or damage to the equipment may result.
- Do not place any object that will hinder ventilation around the reducer; otherwise, the cooling effect is reduced, possibly leading to fire or burns due to excessive heat built-up.
- Absolutely do not stand on or hang from the unit; otherwise, injury or damage to the equipment may result.
- When the unit is used in food processing applications, machines for cleanroom and so on, vulnerable to oil contamination, install an oil pan or other such device to cope with grease leakage due to breakdown or failure; otherwise, grease leakage may cause failure of the unit, etc.

4-1 Place of Installation

Ambient temperature -10 to 40°C (Start failure may occur depending on the speed and torque of the motor in use, so consult us if the reducer will be used at about -10 to 0°C.)

Ambient humidity 85% or less. No condensation.

Altitude 1000m max.

Ambient atmosphere There should be no corrosive gas, combustible gas, or steam.

The location should be free from dust and well ventilated.

Installation Indoor (Free from dust, water, other liquids)

- Mounting in conditions other than the above requires adherence to special specifications. Please consult with us.
- Mount in a location that enables easy operation, such as inspection and maintenance.
- Mount on a sufficiently rigid member.

4-2 Installation Angle

There is no limit on a mounting angle.

【5】 Lubrication



DANGER

- Be sure to use the recommended lubricating grease. If grease other than the recommended grease is used, not only will the performance and life of unit be greatly decreased, but failure of the equipment could occur due to damage to the internal parts of the reducer, and locking of the reducer.



CAUTION

- Dispose of the reducer as general industrial waste.

5-1 Grease

- Depending on the specifications for use, the actual grease used may differ from the listed grease, so be sure to check the delivery specifications.
- As a guide, change the grease and perform maintenance with disassembly of the equipment after every 20,000 hours of operation or every 3 to 5 years. In the case of maintenance with disassembly, please contact the nearest agent, dealer or sales office.

■ ECY Series

The unit is filled with grease before shipment, so the unit can be used as is.

Table 5-1 Recommended grease

Product Name	Manufacturer	Ambient temperature
HGO-3 No.00	NIPPECO	-10 ~ 40°C

【6】 Coupling with Other Machines



CAUTION

- Confirm the direction of rotation before coupling with the driven machine; otherwise, injury or damage to the equipment may result.
- Provide a cover etc. so that the rotating part cannot be touched; otherwise, injury may result.
- When coupling the reducer with a load, check that the centering, belt tension, parallelism of the pulleys, etc. are within the specified limits. When the unit is directly coupled with another machine, check that the direct coupling accuracy is within the specified limits. When a belt is used for coupling the unit with another machine, check the belt tension. Correctly tighten bolts on the pulley and coupling before operation; otherwise, injury may result because of misalignment.
- Please tighten the output ring gear housing, the cross roller and the eccentric high speed shaft with the specified number of the bolts and torque. Reducer may not function optimally when fixed with improper number of bolts or tightening torque.

6-1 Coupling Installation

- When installing a coupling, do not apply an impact force or excessive thrust to the slow speed end cover (including the output ring gear housing) or shaft; otherwise, the bearing may be damaged.
- When chain sprockets, gears or pullers are coupled with the reducer, please use within the range of the allowable radial axial load, or shaft and bearing may be damaged.

[6] Coupling with Other Machines

6-2 Speed Ratio and Rotation Direction

The rotation direction and speed ratio are as illustrated in Fig. 6-1 depending on the fixed, input, and output locations.

- i : Speed ratio (= [Output speed]/[Input speed])
" + " indicates that the input and output are in the same direction.
" - " indicates opposite direction.
- n : Reduction ratio of the gearbox.

■ ECY シリーズ

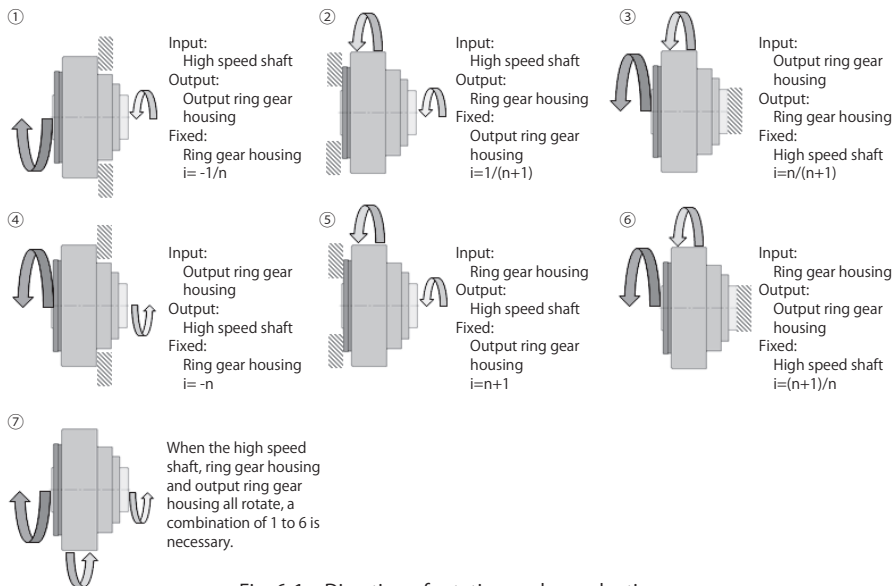
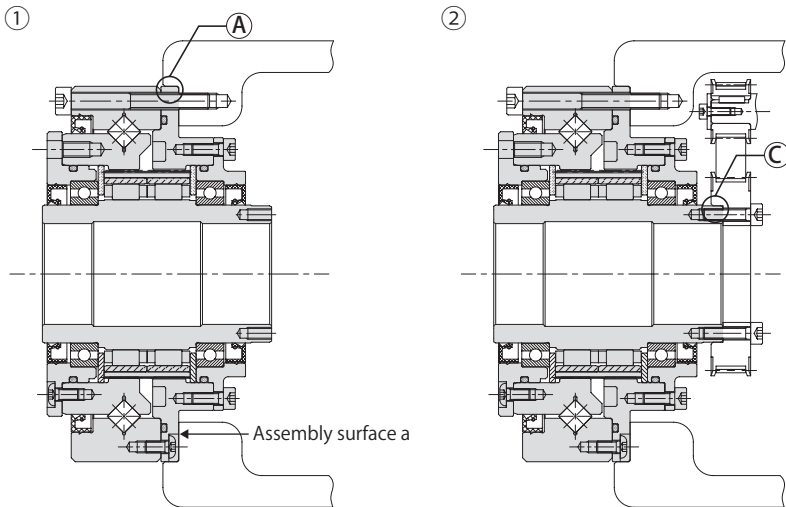


Fig. 6-1 Direction of rotation and speed ratio

[6] Coupling with Other Machines

6-3 Assembly Procedure

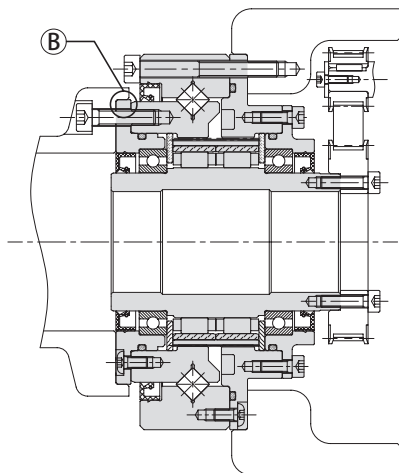
■ ECY Series



- Fix the reducer to the casing of machine with bolts. (Spigot ①)
(Ensure that the width of spigot ① is no more than the width of the fixed ring gear housing.
Apply liquid gasket to the assembly surface a, if necessary.)
- The pulley and other input parts are bolted to the high speed shaft. (Spigot ②)

【6】 Coupling with Other Machines

③



- Bolt the slow speed end cover (including the output ring gear housing) to the output shaft of the device. (Spigot ®)

Note: When bolting the output shaft of the device to the slow speed end cover (including the output ring gear housing), set the bolt length shorter than the tapping depth.

【6】 Coupling with Other Machines

Table 6-1 Mounting bolts

Frame size	Tightening of the output ring gear housing			
	bolts	Bolt PCD	Bolt tightening torque	
	Number and size	mm	N·m	kgf·cm
103	16-M3	48.0	1.96	20
105	16-M3	55.5	1.96	20
107	16-M4	63.0	4.61	47

Frame size	Tightening of the cross roller			
	bolts	Bolt PCD	Bolt tightening torque	
	Number and size	mm	N·m	kgf·cm
103	16-M3	68.0	1.96	20
105	16-M3	78.0	1.96	20
107	16-M4	87.5	4.61	47

Frame size	Tightening of the eccentric high speed shaft			
	bolts	Bolt PCD	Bolt tightening torque	
	Number and size	mm	N·m	kgf·cm
103	6-M2	22	0.55	5.6
105	8-M2	24	0.55	5.6
107	6-M3	30	1.96	20

- Bolt: Hexagon socket head bolts of strength class 12.9 of JIS B 1176.
- Seat scratching measures: Spring washer (JIS B 1251, 2 types)
- Locking measure: Adhesive (Loctite 262, etc) in addition to conical spring washers
- Recommended liquid gasket: ThreeBond Co., Ltd., Liquid gasket ThreeBond 1215

【7】 Operation



DANGER

- Do not touch rotating parts during operation; otherwise, loose clothing caught in these rotating parts (slow speed end cover, etc.) may result in serious injury.



CAUTION

- Do not put fingers or foreign object into the opening of the reducer; otherwise, injury or damage to the equipment may result.
- The reducer will become very hot during operation. Do not touch or come in contact with the unit; otherwise, burns may result.
- If anomaly occurs during operation, stop operation immediately; otherwise, injury may result.
- Do not operate the unit with the exceeding number of input speed and torque specified in the rating table in the catalogue.

7-1 Check Before Operation

After installation, check the following items before starting operation.

- Is the coupling with the driven machine performed correctly?
- Are the mounting bolts for each part securely tightened?
- Is the direction of rotation as planned?

After checking the items described above, perform a no-load break-in operation and gradually apply a load. When doing this, check the items in Table 7-1.

7-2 Check During Operation

Table 7-1 Check items during operation

Is there any abnormal noise or vibration?	• Is the ring gear housing distorted because the installation surface is not flat? • Is there vibration due to insufficient rigidity of installed parts? • Does the center axis of the driven machine match? • Is vibration of the driven machine transmitted to the reducer?
Is the surface temperature abnormally high?	• Is the ambient temperature at the place of usage high?

When an abnormality is found, stop operation and contact the nearest agent, dealer or sales office.

【8】 Daily Inspection and Maintenance



DANGER

- Do not approach or touch any rotating parts (slow speed end cover, etc.) during maintenance or inspection of the unit; otherwise, loose clothing caught in these rotating parts may result in injury or death.



CAUTION

- Do not put fingers or foreign object into the opening of the reducer; otherwise, injury or damage to the equipment may result.
- The reducer will become very hot during operation. Do not touch the unit with bare hands; otherwise, burns may result.
- Identify and provide appropriate corrective action in a timely fashion and according to this maintenance manual if any abnormal operating characteristics are observed. Do not operate the unit corrective action has been taken.
- Do not use damaged reducers; otherwise, injury or damage to the equipment may result.
- We can not assume any responsibility for damage or injury as a result of an unauthorized modification by a customer.
- Dispose of the reducer as general industrial waste.

[8] Daily Inspection and Maintenance

8-1 Daily Inspection

To ensure proper and continued optimum operation, use table1 to perform daily inspections. All of the answers should be "No."

Table 8-1 Daily Inspection

Inspection Item	Details of Inspection
Noise	Is there abnormal sound? Is there sudden change in sound?
Vibration	Is vibration abnormally large? Does vibration change suddenly?
Surface temperature	Is the surface temperature abnormally high? Does the surface temperature rise suddenly?
Grease leakage	Is there any grease leakage from mounting surfaces or oil seal part? Is there any rust on the sliding surface of the oil seal?
Mounting bolts	Have any of the mounting bolts become loose?
Lost motion (hystericis loss)	Has lost motion (hystericis loss) increased?

- If any abnormality is found during daily inspection, contact the nearest agent, dealer or sales office.

8-2 Maintenance of Main Unit

- Oil seals have a life, and after long-term use there may be a decrease in the seal effect due to natural deterioration and wear. Although the seal life greatly differs depending on the operating conditions and surrounding environment of the reducer, it is recommended that the seal be replaced every 1 to 3 years.
If the sliding surface of the oil seal becomes worn or rusted, replace the seal with a new one. The sliding surface is made of a carbon steel, so rusting may occur and advance due to moisture, etc., which may lead to damage of the oil seal, so periodically take rust prevention measures.
- Maintenance such as replacing oil seals and grease, disassembly inspection and repairs should never be attempted by the customer, but should always be performed by a skilled worker of this company who has special tools and expertise. In the case of maintenance with disassembly, please contact the nearest agent, dealer or sales office.

【9】 Structural Drawing

9-1 Structural Drawing

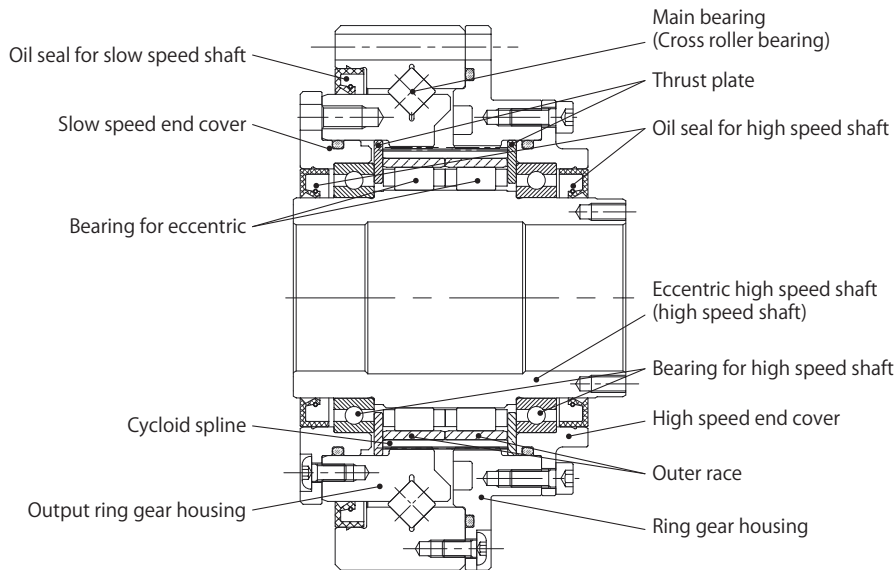


Fig. 9-1 ECY Series

[10] Warranty

The scope of warranty of our delivered products is limited only to what we manufactured.

Warranty (period and contents)

Warranty Period	The warranty period for the Products shall be 18 months after the shipment of the Products from the seller's works or 12 months from the Products coming into operation, whether comes first.
Warranty Condition	In the event that any problem or damage to the Product arises during the "Warranty Period" from defects in the Product whenever the Product is properly installed and combined with the Buyer's equipment or machines, maintained as specified in this manual, and properly operated under the conditions described in this manual, or as otherwise agree upon in writing between the Seller and the Buyer or its customers; the Seller will provide, at its sole discretion, appropriate repair or replacement of the Product without charge at a designated facility, except as stipulated in the "Warranty Exclusions" as described below. However, if the Product is installed or integrated into the Buyer's equipment or machines, the Seller shall not reimburse the cost of : removal or re-installation of the Product or other incidental costs related thereto, any lost opportunity, any profit loss or other incidental or consequential losses or damages incurred by the Buyer or its customers.
Warranty Exclusions	Notwithstanding the above warranty, the warranty as set forth herein shall not apply to any problem or damage to the Product that is caused by: 1. installation, connection, combination or integration of the Product in or to the other equipment or machine that is rendered by any person or entity other than the Seller ; 2. insufficient maintenance or improper operation by the Buyer or its customers, such that the Product is not maintained in accordance with the maintenance manual provided or designated by the Seller ; 3. improper use or operation of the Product by the Buyer or its customers that is not informed to the Seller, including, without limitation, the Buyer's or its customers, operation of the Product not in conformity with the specifications, or use of lubricating oil in the Product that is not recommended by the Seller ; 4. any problem or damage on any equipment or machine to which the Product is installed, connected or combined or on any specifications particular to the Buyer or its customers ; 5. any changes, modifications, improvements or alterations to the Product or those functions that are rendered on the Product by any person or entity other than the Seller ; 6. any parts in the Product that are supplied or designated by the Buyer or its customers ; 7. earthquake, fire, flood, sea-breeze, gas, thunder, acts of God or any other reasons beyond the control of the Seller ; 8. normal wear and tear, or deterioration of the Product's parts, such as bearings, oil-seals ; 9. any other troubles, problems or damage to the Product that are not attributable to the Seller.

【MEMO】

Specifications, dimensions, and other items are subject to change without prior notice.



Power Transmission & Controls Group

Headquarter ThinkPark Tower, 1-1 Osaki 2-chome, Shinagawa-ku, Tokyo 141-6025, Japan

No.FM1001E-1.0

EE01 Printed 2020.04