Sumitomo Drive Technologies

# **PARAMAX**<sup>®</sup> SEB Series for Extruder



## «CAUTION »

- These products should be handled, installed, and maintained by trained technicians. Carefully read the maintenance manual before use.
- Oil is removed from these products before shipment. Supply oil according to the maintenance manual before operation.
- A copy of this maintenance manual should be sent to the actual user.
- This maintenance manual should be kept by the user for future reference.

## **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.



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



- Transport, installation, plumbing, operation, maintenance, and inspections should be handled by properly trained technicians; otherwise, personal injury or damage to the machine may result.
- When using the equipment in conjunction with explosion proof motor, a technician with electrical expertise should supervise the transport, installation, plumbing, wiring, operation, maintenance and inspection of the equipment, so as to avoid a potentially hazardous situation that may result in electrical shock, fire, explosion, personal injury and/or damage to the equipment.
- When the unit is to be used in a system for human transport, a protecting device for human safety should be installed to prevent accidents resulting in personal injury, death, or damage to the equipment due to running out of control or falling.
- When the unit is to be used for an elevator or lifter, install a safety protecting device on the elevator side to prevent falling; otherwise, personal injury, death, or damage to the equipment may result.
- Do not disassemble the drive unit or reducer during operation. Even if it is stopped, do not disassemble except dip stick, oil filling/drain port or inspection cover when input/output shaft of the reducer is connected to motor or driven machine: otherwise, personal injury, or damage to the equipment due to running out of control or falling by unmeshing gear and the like may result.



- The unit should be operated only within its design and performance specifications ; otherwise, injury or damage to a system may occur.
- Keep hands and all foreign objects from the internal moving parts of the unit; otherwise, injury or damage to a system may occur.
- Damaged units should be taken off line and not put back in operation until properly repaired.
- Any modifications or alterations of any kind, to the unit, will void the warranty and all subsequent claims.
- Do not remove the rating plate.
- Please install loss prevention device such as oil pan to the machine which is vulnerable to oil especially (machine for food processing and machine for clean room, and so on) in case oil; otherwise, the product may fail because of oil leakage.

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## 1. Inspection Upon Delivery

## 

- Unpack the unit after verifying that it is positioned right side up; otherwise, personal injury may result.
- Verify that the unit received matches your order. Installing an incorrect product may result in personal injury or damage to the equipment.
- Do not remove the nameplate.

Verify the items listed below upon receiving the product. If a nonconformity or problem is found, contact our nearest agent, distributor, or sales office.

(1) Does the description on the nameplate match your order?

(2) Was any part 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 ① MODEL ② RATIO ③ SERIAL NO.

①Type of reducer (see P4)	• PARAMAX <sup>®</sup> •	
2 Reduction ratio	(MODEL 1) (RATIO 2) SF	Service factor
Input power and speed	- INPUT	-
	SERIAL NO. 3	
③Serial number	ြ 💠 Sumitomo Heavy Industries Gearbox Co., Ltd. ထို	\$

Fig.1 Nameplate

## 1-2) Types of Reducers

Symbol meanings are shown below. Please confirm that the nomenclature matches the order. In case of special type, it may not be shown below.



### Table 1

Assembly		
Р	Parallel Shafts	

### Table 2

Number of Gear Stage				
2	Double Reduction			
3	Triple Reduction			

### Table 3

	Thrust Bearing
н	Heavy Thrust Type
М	Medium Thrust Type
Т	Light Thrust Type

Table 4		
Sh	aft Arrangeme	ent
RL	LR	RLWR

2. Storage

If this product is not for immediate use, note the following points when storing.

## 2-1) Storage Location

Store the product indoors in a clean, dry location.

• Do not store outdoors. Store in a location that is free of moisture, dust, extreme temperature changes, corrosive gas, etc.

### 2-2) Storage Period

(1) The storage period should be within the rust proofing period shown below.

- (2) If the storage period exceeds the rust proofing period shown below, adherence to special rust prevention specifications is required. Please consult with us.
- (3) If for export, adherence to export rust prevention specifications is required. Please consult with us.
- (4) Standard Rustproof Specifications
  - 1 External Rustproof

Rust prevention oil is applied when shipping from the factory. Check rust conditions every 6 months after shipment. Reapply the rust prevention process, if necessary.

2 Internal Rustproof

Rust Proofing Period	6 Months
Storage Condition	Store in an ordinary factory or warehouse in an environment where free of moisture, dust, extreme temperature changes, corrosive gas, etc.

(5) If the storage time is longer than 6 months, run the product for a few minutes under no load once every 2 to 3 months.

## 2-3) Operation After Storage

- (1) Oil seals are affected by temperature, ultraviolet light and other ambient conditions and can easily degrade. After long storage period, inspect before operation, and replace any degraded seals with new seals.
- (2) At startup, check that there are no unusual noises, vibrations, temperature rises, or other symptoms. For models with brakes, check that brakes work properly. If any abnormalities are found, immediately contact the nearest agent, distributor, or sales office.

## 3. Transport

### A DANGER

• Do not step under a unit suspended by a crane or other lifting mechanism for transport; otherwise, injury or death may result.

## **A**CAUTION

- Be careful not to drop the unit. When a hanging bolt or hole is provided, be sure to use it. After mounting a unit on a machine, do not hoist the entire machine by using the hanging bolt or hole; otherwise, personal injury or damage to the equipment and/or lifting device may result.
- Before hoisting, refer to the nameplate, crate, outline drawing, catalog, etc. for the weight of the unit. Never hoist a unit that exceeds the load capacity of the crane or other mechanism being used to lift it; otherwise, personal injury or damage to the equipment and/or lifting device may result.
- When the products are lifted, use suitable lifting parts, and confirm that eye-bolts and nuts are not loose.

4. Installation

## 

- Do not use the products for purposes other than those shown on the nameplate or in the manufacturing specifications; otherwise, personal injury, or damage to the equipment may result.
- Do not place any object around the products that will hinder ventilation. Insufficient ventilation can cause excessive heat that may result in burns or fire.
- Do not step on or hang from the products; otherwise injury may result.
- Do not touch the shaft end of the products, inside keyways with bare hands; otherwise, injury may result.
- Please install loss prevention device such as oil pan to the machine which is vulnerable to oil especially (machine for food processing and machine for clean room, and so on) in case oil; otherwise, the product may fail because of oil leakage.

### 4-1) Installation Location

 Ambient Temperature:
 -10 to +40°C

 Ambient Humidity:
 85%RH or less with no condensation

 Atmosphere:
 No corrosive or volatile gases, no steam

 Dust-free, well-ventilated area.
 Installation Location:

 Installation Location:
 Indoors (area with minimal dust, no contact with water)

- Mounting in conditions other than the above requires adherence to optional specifications. Please consult with us.
- Drives built according to special specifications, such as outdoor type, explosion proofing, etc. can be used in the specified mounting environments.
- Mount in a location that enables easy operation, such as inspection and maintenance.
- Mount on a sufficiently rigid base.

## 4-2) Installation Angle

Install reducers on a level base. (Contact factory for installation on an inclined base) When the unit is manufactured for inclined installation, do not install it at any angle other than the one specified. For standard type, the installation angle shall be within limits shown in Fig. 2.

• Use installation bolts corresponding to JIS strength class 8.8 or its equivalent.



Fig. 2 The Limits of the Installation Angle

## 5. Coupling With Other Machines

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- Confirm the rotation direction before coupling the unit with the driven machine. Incorrect rotation direction may cause personal injury or damage to the equipment.
- When operating the product alone (uncoupled), remove the key that is temporarily attached to the slow speed shaft; otherwise the key could fly off, and injury may result.
- Attach the cover to the rotating parts to avoid someone touching them; otherwise, injury may result.
- When coupling the product with another machine, check that the centering, the belt tension and parallelism of the pulleys 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 there is a risk of injury due to scattering the broken pieces or of damage to the products.

### 5-1) Mounting Connector

- When mounting Connector, do not apply impact or excessive axial load to the shaft. The bearing could be damaged, or the collar could come off.
- Shrinkage or shaft-end thread fit (see Fig. 3) is recommend.

### (1) When using a coupling

The alignment accuracy (A, B, X) in Fig. 4 should be no more than that shown in Table 5.





Table 5 Alignment Precision for Flexible Coupling

Allowable Dimensional Error for A	0.05mm
Allowable Dimensional Error for B	0.05mm
Dimension for X	manufacturer-specified value

(2) When Using Chains, Sprockets, or Gears

- When using a chain, attach it so that the chain tension angle is perpendicular to the shaft.
- The pitch circle diameter of the sprocket and gear shall be more than three times of the shaft diameter.
- The load point of the sprocket or gear should be nearer to the product than to center of the shaft.

### (3) When Using a V Belt

- Over-tightening the V belt will damage the shaft and bearing. Refer to the V belt catalog or other reference for V belt tension.
- The parallelism, eccentricity  $\beta$  between the two pulleys should be within 20'. (See Fig. 5)
- When using multiple V belts, use the same V belts having the same circumferential length





## 6. Operation

## 

- Do not approach or touch rotating parts (slow speed shaft etc.) during operation; otherwise loose clothing may became caught in these rotating parts and cause serious injury or death.
- When the power supply is interrupted, be sure to turn off the power switch; otherwise, restoration of power may cause electric shock, personal injury, or damage to the equipment.

## 

- Do not put fingers or foreign objects into the opening of the products; otherwise, electric shock, injury, fire, or damage to the equipment may result.
- The products becomes very hot during operation. Touching the unit may result in burns.
- Do not remove the inspection cover while driving. Lubricating oil may blow out and cause burns.
- When rotating in reverse, be sure to stop it once and then start again; otherwise, damage to the unit may occur.
- Do not loosen the oil filler plug during operation; otherwise, hot, splashing lubricant may cause burns.
- If any abnormality occurs during operation, stop operation immediately; otherwise, electric shock, personal injury, or fire may result.
- Do not operate the unit under more than rated load; otherwise, personal injury, or damage to the equipment may result.

• This product is shipped without lubricating oil, so be sure to fill the recommended lubricant oil before operation.

After installation and wiring are completed, check the following before operating.

- (1) Is the wiring correct?
- (2) Is the unit properly coupled with the driven machine?
- (3) Are mounting bolts tightened firmly?
- (4) Is the direction of rotation as required?

After confirming these items, perform leveling operation with a light load, and make sure that there is no abnormal vibration, sound, or temperature rise before performing the main operation. Check the items shown in Table 6.

Table 6 Items to Check During Operation

Items to Check During Operation					
Does abnormal sound or vibration generate?	<ul><li>(1) Is the housing deformed because the installation surface is not flat?</li><li>(2) Is insufficient rigidity of the installation base generating resonance?</li><li>(3) Is the shaft center aligned with the driven machine?</li><li>(4) Is the vibration of the driven machine transmitted to the products?</li></ul>				
Is the surface temperature abnormally high?	<ul><li>(1) Does the current value to the gearmotor exceed the rated current shown on the nameplate?</li><li>(2) Does the voltage rise or drop substantially?</li><li>(3) Is the ambient temperature too high?</li><li>(4) Is the oil level appropriate?</li></ul>				

If any abnormalities are found, immediately stop operation and contact the nearest agent, distributor, or sales office.

## 7. Daily Inspection and Maintenance

## 

- Do not approach or touch any rotating parts (slow speed shaft etc.) during maintenance or inspection while operating the unit; otherwise, loose clothing may become caught in these rotating parts and cause serious injury or death.
- When checking the tooth surface at the stop, make sure to stop the motor and driven unit rotation; otherwise, loose clothing may become caught in the gear meshing part and cause serious injury or death.
- Do not operate the unit without a safety cover (removed during inspection) ; otherwise, loose clothing may become caught in these rotating parts and cause serious injury or death.

## 

- Do not put fingers or foreign objects into the opening of the products; otherwise, electric shock, injury, fire, or damage to the equipment may result.
- The products becomes very hot during operation. Touching the unit with bare hands may result in serious burns.
- Do not operate the unit without a safety cover (removed during inspection); otherwise loose clothing may became caught in these rotating parts and cause serious injury or death.
- When any abnormality happens, observe the condition based on maintenance manual. Do not operate the unit until the cause is detected and repaired.
- Change lubricant according to the maintenance manual instructions. Be sure to use lubricant that we recommend.
- Do not change lubricant during operation or immediately after stopping operation; otherwise, burns may result.
- Do not remove the inspection cover while driving. Lubricating oil may blow out and cause burns.
- Do not operate damaged products otherwise, injury, fire, or damage to the equipment may result.
- We cannot assume any responsibility for damage or injury resulting from an unauthorized modification by a customer, as it is outside the scope of the warranty.
- Dispose of products lubricant as general industrial waste.

## 7-1) Daily Inspection

Make certain to carry out daily inspections in accordance with Table 7. Lack of inspections is a source of trouble.

### Table 7

Inspection Item		Inspection Detail
Current Value		Is the current no greater than the rated value shown on the nameplate?
N	oise	Are there unusual noises, or are there extreme changes in the noises?
Vibi	ration	Is there abnormally large vibration? Are there extreme changes?
Surface Temperature		Is the surface temperature unusually high (higher than 90°C )? Is there a sudden rise? (Temperature rises during operation will differ according to model and type. However, there is no particular problem if fluctuation is slight if the surface temperature of gear is approximately 80°C.)
	while stopped	Does the oil level decrease? (Check it with a dipstick or oil gauge while the machine stops.)
Oil Level for electric pump model		Is the function of oil signal or flow gauge normal? If their function is abnormal, which means lubrication failure due to inadequate oil, broken pump or clogging pipe, so stop the unit and inspect it.
Oil, Grease Leaks		Does oil or grease leak through oil seal?
Mounting Bolts		Are the mounting bolts loose?
Chain, V-Belt		Are the chain or V-belt loose?

If any abnormality is discovered during the daily inspection, take measures in accordance with "9. Troubleshooting" (P14). If these actions do not solve the issue, immediately contact the nearest agent, distributor, or sales office.

## 7-2) Check the Lubrication Method

- Please look for the relevant items and make certain to do maintenance. Neglecting maintenance is a source of trouble.
- (1) Refer to Table 8 for the standard lubrication method.
- (2) Table 9 shows the description part of the maintenance method.
- (3) Refer to Table 10 for the standard input speed.

Table 8 Standard Lubrication Method (when driving at standard input speed)

Assembly		Size						
		004	005	010	020	030	040	050
Parallel Shaft 2-Stage	Horizontal	Oil Bath						
Parallel Shaft 3-Stage	Horizontal	—				Oil I	Bath	

Contact us when the input speed is different from the standard one.

Table 9 Maintenance Manual Pages

	Supply of Oil	Pag	es Where Maintena	Vhere Maintenance Method Is Shown			
Lubrication Method	Before Initial Operation After Purchase	Oil Change Period	Recommended Oil	Disposal of Oil	Parts		
Oil Bath	Necessary	7-3) (1) P.11	7-3) (2) P.11	7-3) (4) P.12	7-5) P.13		

Table 10 Standard Speed Table

Assembly		Sizo							h	npu	ıt S	pee	d r	/mi	n							
Asse	пыу	SIZE		7	50		10	00								15	00			18	00	
Parallel Shaft 2-Stage	Horizontal	004-070																				
Parallel Shaft 3-Stage	Horizontal	060, 070																				

Note 1. The ranges except shaded areas show the standard input speed.

2. Consult us for the ranges exceed the shading areas and the ranges in this table.

## 

• For equipment with a motorized oil pump, run the pump prior to starting the reducer. Start motor of reducer after lubricant has circulated through the bearings; otherwise, the damage to the equipment may result.

• In order to check the circulation of lubricating oil, install a flow switch or flow site and stop the reducer when there is an abnormality.

## 7-3) Lubrication Maintenance

### (1) Oil Change Interval

### Table 11 Oil Change Interval

		Interval	Usage Conditions
Oil Filling		At purchasing	
	1st time	After 500 hours or 6 months, whichever comes first	
Oil Change	2nd time	After 2500 hours or 6 months, whichever comes first	
Oli Change	3rd time or	Every 5000 hours or one year, whichever comes first	Oil temperature is below 70 $^\circ\!\!\!C$
	later	Every 2500 hours or half year, whichever comes firs	Oil temperature is 70 ℃ or higher

• Please consult oil manufacturer when atmosphere contains corrosive gas or where ambient temperature changes dramatically.

### (2) Lubricant Selection

Table 12 Oil Viscosit

	Ambient Temperature $^\circ\!C$								
	-10-15	0-30	10-50						
ISO* AGMA	VG100 3EP	VG150 4EP	VG220 5EP						

\*: Viscosity at ISO 40 °C (mm<sup>2</sup>/s)

### Table 13 Recommended Lubricant

Refer to Table 12 to select appropriate oil viscosity.

Table 13 shows recommended lubricants.

	Viscosity Classification (ISO) mm²/s (40°C)	AGMA	BP		Castrol		Chevron	TEXACO	Мо	obil	Sh	ell	Total
	VG100	3EP	Energol GR-XP 100	Alpha SP 100	Optigear BM 100	Tribol 1100/100	Gear Compounds EP 100	Meropa WM 100	-	Mobilgear 600XP 100	Shell Omala S2 G 100	Shell Omala S2 GX 100	CARTER EP 100
Gear Oil	VG150	4EP	Energol GR-XP 150	Alpha SP 150	Optigear BM 150	Tribol 1100/150	Gear Compounds EP 150	Meropa WM 150	Spartan EP 150	Mobilgear 600XP 150	Shell Omala S2 G 150	Shell Omala S2 GX 150	CARTER EP 150
	VG220	5EP	Energol GR-XP 220	Alpha SP 220	Optigear BM 220	Tribol 1100/220	Gear Compounds EP 220	Meropa WM 220	Spartan EP 220	Mobilgear 600XP 220	Shell Omala S2 G 220	Shell Omala S2 GX 220	CARTER EP 220

### (3) Oil Quantity

An estimated oil quantity for standard specifications is shown in "11. Oil quantity" (P17). Use a dipstick or visible oil gauge to check the oil level even after filling with indicated oil quantity.

(4) Fill/Drain Oil

Supply oil through the filling port on top of the main unit. Check the oil level with a visible oil gauge (Fig. 6).



Prevent bolt, washer, dust, water or other foreign object from entering during oil-filling process. If the oil level is lower than the range, the unit will not be lubricated sufficiently. If the oil level is higher than the range, deterioration of the oil is accelerated due to oil temperature rise. Remove drain plug located lower part of the unit to drain when lubricant is still warm. For the model with air breather, remove the air breather at the time of filling and discharging oil leads to smooth operation.

## 7-4) Lubricant Cooler (Special specification)

- Periodically inspect and clean the cooling pipe and water cooling unit. The periodical inspection cycle depends on the degree of oil contamination and the quality of cooling water. However, be sure to conduct inspection and cleaning every 3-6 months.
- Unless water quality control is sufficient, water leakage may occur although inspection and cleaning are conducted periodically.
- The quality of cooling water should conform to guideline of water quality for refrigeration and air conditioning equipment JRA-GL 02-1994 by the Japan refrigeration and air conditioning industry association. (Table 14)
- (1) Maintenance of Cooling Pipe
  - Remove the lubricant from the reducer and remove the cooling pipe mounting bolt, and the cooling pipe can be removed from the reducer. Remove the cover plate tightening bolt, and separate the cover plate from the main unit for inspection.
  - When the reducer will not be used for an extended period of time, remove the cooling water. Cooling water remaining in the pipe will cause corrosion. The same applies to cases where the reducer operation is stopped in places where cooling water will be frozen in winter.
- (2) Maintenance of Water Cooling Unit
  - Remove the hood on the u-turn side to check the water cooling unit for contamination. Remove the oil from the drain plug of the cooling unit to check the condition of the oil side.
  - Check the anticorrision zinc bar at that time, and replace it with a new one when it is reduced by half or less. It should be changed in 3-6 months depending on the water quality.
  - When the reducer is to be operated in places where cooling water is frozen in winter, remove cooling water every day.

### Table 14 Guideline of Water Quality for Refrigeration and Air Conditioning Equipment (JRA-GL 02-1994)

				_		5 1 1		
	Items		Water Quality Standards Values (Circulating Water in Cooling Systems)			Items		Water Quality Standards Values (Circulating Water in Cooling Systems)
	pH (25°C)		6.5-8.2			Iron	mg/L	1.0 or less
	Electric Conductivity (25°C)	mS/m	80 or less		Cton doud	Copper	mg/L	0.3 or less
	Chloride Ion	mg/L	200 or less			Sulfide Ion	mg/L	Not detected
Standard	Sulfuric Acid Ion	mg/L	200 or less		ltoms	Ammonium Ion	mg/L	1.0 or less
Items	Acid Consumption	mg/L	100 or less		Items	Residual Chlorine	mg/L	0.3 or less
	Total Hardness	mg/L	200 or less			Free Carbon	mg/L	4.0 or less
	Calcium Hardness	mg/L	150 or less	]		Ryzner Stability Inde	x	6.0-7.0
	Ionic Silica	mg/L	50 or less					

## 7-5) Parts Maintenance

Although it depends on operation conditions, maintenance with disassembly after approximately 3 to 5 years increase lifetime. Contact the nearest authorized maintenance shop regarding maintenance with disassembly.

**Replacement Parts** 

- © Bearing, oil seal, nilos ring, collar, key, shim, packing, retaining ring, visible gauge or air breather
- O Check and replace if the shaft or gear is damaged
- © Check other parts (including special application) when required

This product shall be returned to the factory for repairing/maintenance with disassembly. Please inform the serial number, model name, number of unit and operation period.

## 8. Disassembly/Reassembly

## **A**CAUTION

• Repair, disassembly, and reassembly should be handled by properly technicians; otherwise, the system may be damaged.

• Keep hands and all foreign objects from keyway and other sharp edges of parts; otherwise, injury may occur.

- Disassemble them at a clean, dry location.
- Keep accessory parts like screws in the box to prevent loss.
- Carefully handle parts to prevent damage.

## 

• Identify any abnormalities during operation and take appropriate corrective action outlined in this maintenance manual. Do not operate the unit until corrective action has been taken.

If any abnormal condition occurs, refer to table below and promptly take appropriate measures. If these actions do not solve the issue, immediately contact the nearest agent, distributor, or sales office.

Table	e 15 Tr	oubleshooting				
		Problem	Cause	Correction		
The slow	motor spee	rotates without a load but the d shaft does not rotate	Damage to gear/shaft due to overload	Confer with authorized maintenance shop.		
		The switch everheats	Insufficient switch capacity	Replace with specified fuse.		
		The switch overheats	Overload	Decrease the load to the specified value.		
The	٨	Euco tripping	Insufficient fuse capacity	Replace with specified fuse.		
out	en a		Overload	Decrease the load to the specified value.		
tput	loa		Voltage drop	Contact the electric power company.		
sha	dis	The speed will not increase and the motor is overheating	Overload	Decrease the load to the specified value.		
fttu	appl	and the motor is of children ing	Short-circuited motor stator coil	Confer with authorized maintenance shop.		
rns	ied		The key is not inserted	Insert key.		
Nith		It stops	Bearing burnout	Confer with authorized maintenance shop.		
out			Poor adjustment of protection device	Adjust the protection device.		
a load	The motor runs in the reverse direction		Wiring error	Change the connection.		
	<b>F</b>		The lead wire is short circuited.	Confer with authorized maintenance shop.		
	Fuse tripping		Poor contact between motor and starter	Make good connection.		
			Overload	Decrease the load to the specified value.		
			Voltage drop or rise	Contact the electric power company.		
Exce	ssive	temperature rise	Damaged bearing	Confer with authorized maintenance shop.		
			The ambient temperature is high	Improve the ventilation method.		
			Damage to gear/bearing due to overload	Confer with authorized maintenance shop.		
		asks from the clow/high speed	Damage to oil seal	Confer with authorized maintenance shop.		
Dil leak	shaft	t.	Scratches or abrasion on the shaft where the sealing lip touches	Confer with authorized maintenance shop.		
age	Oil le hous	eaks from the split line of sing.	Loose bolt	Tighten the bolt to proper torque.		
			Gear, shaft, bearing damage	Confer with authorized maintenance shop.		
			Warping of housing because the installation surface is not flat	Make the installation base flat or make adjustment using liners, etc.		
Abn vibra	Abnormal sound. Excessively high vibration.		Resonance due to insufficient rigidity of installation base	Reinforce the installation base to increase rigidity.		
			Misalignment of shaft with driven machine	Align the shaft centers.		
			Transmission of vibration from the driven machine	Individually operate the products to check the source of the sound.		

10. Construction Drawing



Ref. No.	Part Name
1-6	Bearing
7-9	Oil seal
10	Helical gear
11	Кеу
12	Кеу
13	Helical pinion shaft
14	Helical gear
15	Helical pinion shaft
16	Кеу
17	Flange cover
18	Hollow shaft
19	Housing

Fig. 8 SEB005-050 (Heavy Thrust Type, Medium Thrust Type)

Ref. No.	Part Name
1-7	Bearing
8-10	Oil seal
11	Helical gear
12	Кеу
13	Кеу
14	Collar
15	Collar
16	Helical pinion shaft
17	Helical gear
18	Helical pinion shaft
19	Кеу
20	Bearing case
21	Hollow shaft
22	Housing
23	Cover



Ref. No.	Part Name
1-7	Bearing
8-10	Oil seal
11	Helical gear
12	Кеу
13	Кеу
14	Collar
15	Collar
16	Helical pinion shaft
17	Helical gear
18	Helical pinion shaft
19	Кеу
20	Bearing case
21	Hollow shaft
22	Housing
23	Cover



Fig. 10 SEB030-050 (Light Thrust Type)

Ref. No.	Part Name
1-7	Bearing
8-10	Oil seal
11	Helical gear
12	Кеу
13	Кеу
14	Collar
15	Oil pump
16	Helical pinion shaft
17	Helical gear
18	Helical pinion shaft
19	Кеу
20	Hollow shaft
21	Housing
22	Flange cover

## 11. Oil Quantity

### Table 16 Approximate Quantity of Oil

Unit: Liter

	Horizontal								
Size		Parallel Shaft 3-Stage							
	Heavy Thrust Type	Medium Thrust Type	Light Thrust Type	Medium Thrust Type					
004	_	2	—	—					
005	3	3	_	_					
010	6	6	_	_					
020	8	8	—	—					
030	10	10	12	—					
040	18	18	25	—					
050	27	27	35	_					
060	_	48	_	60					
070	_	75	_	75					

## 12. Oil Fill and Drain Plug Locations







Fig.12 SEB005-050 (Heavy Thrust Type, Medium Thrust Type)

Fig. 13 SEB060, 070



Fig. 14 SEB030-050 (Light Thrust Type)

## 13. Warranty

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

Warranty (period and description)

Warranty Period	The warranty period applies only to new products and represents 18 months after the shipment or 12 months after the actual operation, whichever is shorter.
Description	If the product failed within the warranty period, during which despite a proper mounting, connection and maintenance & administration are followed according to the maintenance manual, and the product is properly run based on the specification on the catalog or under conditions agreed separately, we will repair or provide an alternative product at our discretion for free of charge, except the exclusions below. However, as far as the product is connected with customers' other devices, we will not indemnify those expenses on dismounting from/mounting on the devices, etc. and other associated construction expenses, transportation expenses and opportunity loss and operation loss the customers suffered from, and other indirect damages.
Exclusion from the Warranty	<ul> <li>The following items will be excluded from the warranty:</li> <li>1. A breakdown resulting from defects in the installation of the product and coupling with other devices, etc.</li> <li>2. A breakdown resulting from insufficient maintenance &amp; administration and improper handling of the product, including a case that the product is not stored according to our defined storage manual.</li> <li>3. A breakdown resulting from operation which does not fall within our specification and other operation conditions and use status we hardly can know or a failure caused by the use of lubricant which we do not recommend.</li> <li>4. A breakdown resulting from defects, special specification, etc of device prepared and connected by customer.</li> <li>5. A breakdown resulting from disassembly, parts replacement, and modification conducted by the customer.</li> <li>6. A breakdown resulting from defects in parts supplied or specified by customers.</li> <li>7. A breakdown caused by inevitable force including earthquake, fire, flood disaster, salt damage, gas damage, and lightning strike, etc.</li> <li>8. Natural wear and tear, abrasion, and deterioration of such relevant consumable parts as a bearing and oil seal, etc. under normal usage.</li> <li>9. A breakdown caused for reasons not attributable to each of the above item.</li> </ul>

## **Worldwide Locations**

### U.S.A

#### Sumitomo Machinery Corporation of America (SMA)

4200 Holland Blvd. Chesapeake, VA 23323, U.S.A. TEL (1)757-485-3355 FAX (1)757-485-7490

### Canada

**SM Cyclo of Canada, Ltd. (SMC)** 1453 Cornwall Road, Oakville, ON L6J 7T5, Canada TEL (1)905-469-1050 FAX (1)905-469-1055

#### Mexico

SM Cyclo de México, S.A. de C.V. (SMME) Fresnos #201, Pocket Park Oriente, 67258 Juárez, N.L. México TEL (52)81-2188-2154

#### Brazil

### Sumitomo Indústrias Pesadas do Brasil Ltda. (SHIB)

Av. Sumitomo, 500 – Itaim Mirim – Itu/SP – CEP: 13312-839 – Brazil TEL (55)11-4403-9292

### Chile

SM-Cyclo de Chile Ltda. (SMCH) Camino a Coronel Km.10 Modulo 3A, San Pedro de la Paz, Biobío, Chile TEL (56)41-246-9806 FAX (56)41-246-9808

### Argentina

SM-Cyclo de Argentina S.A. (SMAR) Ing Delpini 2230, B1615KGB Malvinas Argentinas, Grand Bourg, Buenos Aires, Argentina TEL (54)3327-45-4095

### Guatemala

SM Cyclo de Guatemala Ensambladora, Ltda. (SMGT)

Parque Industrial Unisur, 0 Calle B 19-50 Zona 3, Bodega D-1 Delta Bárcenas, Villa Nueva, Guatemala TEL (502)6648-0500 FAX (502)6631-9171

### Colombia

SM Cyclo Colombia, S.A.S. (SMCO) Parque Industrial Celta, Km 7.0 Autopista Medellín, Costado Occidental, Funza, CUN, 250027, Colombia TEL (57)1-300-0673 FAX (57)1300-0673 ext. 105

### Peru

SM Cyclo de Perú, S.A.C. (SMPE)

Jr. Monte Rosa 255, Oficina 702, Santiago de Surco-

#### Lima 15038, Peru TEL (51)1-7130342 FAX (51)1-7150223

Germany

Sumitomo (SHI) Cyclo Drive Germany GmbH (SCG)

Cyclostraße 92, 85229 Markt Indersdorf, Germany TEL (49)8136-66-0

### Austria

### Sumitomo (SHI) Cyclo Drive Germany GmbH (SCG)

Austria Branch Office Gruentalerstraße 30A, 4020 Linz, Austria TEL (43)664-2840490

### Belgium

Hansen Industrial Transmissions NV (HIT) Leonardo da Vincilaan 1, Edegem, Belgium TEL (32)3-450-12-11

### France

SM-Cyclo France SAS (SMFR) 8 Avenue Christian Doppler, 77700 Serris, France TEL (33)1-64-17-17-20

### Italy

SM-Cyclo Italy SrI (SMIT) Via dell' Artigianato 23, 20007 Cornaredo MI, Italy TEL (39)293-481101

### Spain

Sociedad Industrial de Transmisiones, S.A. (SIT) Paseo de Ubarburu 67, 20014 San Sebastián

Guipúzcoa, Spain TEL (34)9434-572-00

### United Kingdom

SM-Cyclo UK Ltd. (SMUK) 29 Bergen Way, Hull, HU7 0YQ, United Kingdom TEL (44)1482-790340

### Turkey

#### SM-Cyclo Turkey Güç Aktarım Sis. Tic. Ltd. Sti. (SMTR)

Barbaros Mh. Çiğdem Sk. Ağaoğlu, Office Mrk. No:1 Kat:4 D.18 34746, Ataşehir/İstanbul, Turkey TEL (90)216-250-60-69 FAX (90)216-250-55-56

### India

### Sumi-Cyclo Drive India Private Limited (SDI)

Gat No. 186, Global Raisoni Industrial Park Alandi Markal Road, Fulgaon, Pune 411 033, India TEL (91)96077-45353

### China

#### Sumitomo (SHI) Cyclo Drive Shanghai, Ltd. (SCS)

Room 1101, SMEG Plaza, Office Building, No.1386 Hongqiao Road, Changning District, Shanghai, China 200336 TEL (86)21-3462-7877 FAX (86)21-3462-7922

### Hong Kong

SM-Cyclo of Hong Kong Co., Ltd. (SMHK) Unit 19, 28/F, Metropole Square, 2 On Yiu Street, Sha Tin, New Territories, Hong Kong, China TEL (852)2460-1881 FAX (852)2460-1882

### Taiwan

 Tatung SM-Cyclo Co., Ltd. (TSC)

 22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.

 TEL (886)2-2595-7275

 FAX (886)2-2595-5594

### Korea

Sumitomo (SHI) Cyclo Drive Korea, Ltd. (SCK) 913, 19 Saemunan-ro 5-gil, Jongno-gu, Seoul, Republic of Korea 03173 TEL (82)2-730-0151 FAX (82)2-730-0156

### Singapore

## Sumitomo (SHI) Cyclo Drive Asia Pacific Pte. Ltd. (SCA)

83 Joo Koon Circle, Singapore 629109 TEL (65)6591-7800 FAX (65)6863-4238

### Philippines

#### Sumitomo (SHI) Cyclo Drive Asia Pacific Pte. Ltd. Philippines Branch Office (SMPH)

C4 & C5 Buildings Granville Industrial Complex, Governor's Drive, Bo. Bancal, Carmona, 4116 Cavite, Philippines TEL (63)2-8584-4921 FAX (63)2-8584-4922

### Vietnam

SM-Cyclo (Vietnam) Co., Ltd. (SMVN) Factory 2B, Lot K1-2-5, Road No. 2-3-5A, Le Minh Xuan Industrial Park, Binh Chanh Dist., Ho Chi Minh, Ho Chi Minh City, Vietnam TEL (84)28-3766-3709 FAX (84)28-3766-3710

### Malaysia

SM-Cyclo (Malaysia) Sdn. Bhd. (SMMA) No.7C, Jalan Anggerik Mokara 31/56, Kota Kemuning, Seksyen 31, 40460 Shah Alam, Selangor, Malaysia TEL (60)3-5121-0455 FAX (60)3-5121-0578

### Indonesia

PT. SM-Cyclo Indonesia (SMID)

Cikarang Jalan Sungkai Blok F 25 No. 09K, Delta Silicon III, Lippo Cikarang, Bekasi, Jawa Barat, Indonesia TEL (62)21-29612100 FAX (62)21-29612211

### Thailand

SM-Cyclo (Thailand) Co., Ltd. (SMTH) 1 Empire Tower, 21st Floor Unit 2103-4, South Sathorn Road, Yan Nawa, Bangkok 10120, Thailand TEL (66)2-670-0998 FAX (66)2-670-0999

### Australia

### Sumitomo (SHI) Hansen Australia Pty. Ltd. (SHAU)

181 Power Street Glendenning, NSW 2761, Australia TEL (61)1300-037-483

### Japan

Sumitomo Heavy Industries, Ltd. (SHI) ThinkPark Tower, 1-1 Osaki 2-chome, Shinagawa-ku, Tokyo 141-6025, Japan TEL (81)3-6737-2511 FAX (81)3-6866-5160



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