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Nidec
All for dreams

RINGCONE®
Adjustable Speed Drive
NRX Series

200B to 18K Instruction Manual

Contents

NIDEC DRIVE TECHNOLOGY CORPORATION

Safety Precautions

Be sure to read before use

Thank you for purchasing the NIDEC DRIVE TECHNOLOGY product. To use this product properly and safely, please be sure to read this manual thoroughly before use. Keep this instruction manual where all users can read and/or refer to it at any time.

Before use, please carefully read these safety precautions and follow them for proper use.

This instruction manual categorizes safety precautions as DANGER, WARNING, and CAUTION according to level of importance. Each precaution has an important explanation related to safety. Be sure to observe all precautions.

⚠ DANGER	Indicates a potentially hazardous situation that may result in fire, serious injuries, and/or death if you incorrectly handle this product by neglecting the following precautions.
⚠ WARNING	Indicates a potentially hazardous situation that may result in serious injury if you incorrectly handle this product.
⚠ CAUTION	Indicates a potentially hazardous situation that may result in minor or moderate injury and/or property damage if you incorrectly handle this product. However, more severe results may also occur depending on the situation if mishandled. Be sure to observe all precautions.

The type of precautions we would like you to observe is categorized using the following symbols, and explanations are added (some examples as given below).

- A reminder to pay close attention.
- A prohibited action you must not do.
- A forced action you must always do.

- We are not responsible for damages resulting from negligence through failure to follow the instructions set out in this manual.
- We are not responsible for damages resulting from earthquake and/or fire unrelated to us, actions by third parties, or any other accidents, intentional or through customer negligence, as well as from accidents caused by misuse or improper use under abnormal conditions.
- For information regarding assurance provisions, please read the attached warranty certificate.

Precautions for installation

Do not connect this product to an power source beyond the specified voltage range.
If you connect the product to an power source beyond the voltage range indicated on the motor nameplate, the heated motor could result in motor burns and fire.

Be careful of electric shock during connection.
Do not connect the product with wet (or sweaty) hands. Before wiring, be sure to turn the power OFF. Failure to follow this could result in electric shock.

Do not touch the keyway on the input and output shafts with bare hands.
Be careful to touch the keyway. Failure to follow this could result in injury on your hands or fingers due to the sharp edges.

Do not install Ringcone in a place directly exposed to rain or water.
Failure to follow this could result in electric shock, fire, and/or malfunction. When you use or install the product outdoors, select an outdoor model.

Install the product on a rigid surface that is not prone to vibration.
If the installation surface is not rigid enough, the machine could fall over during operation or a device could be damaged due to excessive vibration.

Mount a safety cover on the rotational items.
Failure to follow this could result in injury on your hands or fingers if you come into contact with the rotational items.

Do not install the product in an area with an ambient temperature of lower than 0°C and higher than 40°C.

If you use the product in a transportation device, or lifting device, apply protective device like brake for safety.

Disconnect the power supply for motor, when connecting.

To prepare pan or something for an oil leakage, if the leaking makes serious issues on application such as food , chemical machines, etc.

Heavy! Be careful when carrying.
Failure to follow this could result in serious injury if you drop the product on your feet accidentally during carrying or installation.

Precautions for operation

Do not use the product in an atmosphere with a risk of fire and/or explosion.
If you use this product in an atmosphere with risk of fire and/or explosion, select the explosion-proof model.

Do not touch the unit because it may become hot during operation.
Failure to follow this could result in burns.

Do not touch the rotating parts during operation.
Do not touch the output shaft, input shaft, or fan.

Avoid operation overloaded.
If you operate the unit with overload, the heated motor could result in motor burns and/or fire.

Before rotating the motor reversely, be sure to stop it completely.

Precautions for inspection and maintenance

Turn the power OFF during inspection.
Confirm the power source complete off before inspection & maintenance.

Do not touch the unit during operation and immediately after operation stops.
The housing temperature will not decrease immediately after operation stops. Confirm that the temperature of the product has decreased before touching for inspection and/or disassembly.

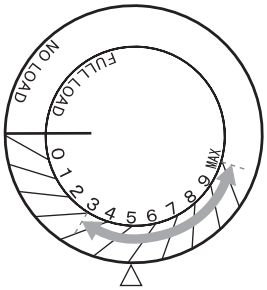
Operating Precautions

About this product

■ Input Speed

・Allowable input speed: NRX−200B to 7500 …700rpm to 2000rpm based on the standard specifications.
NRX−11K to 18K …900rpm to1800rpm

When using the product with a lower input speed than the above, please contact us.



Middle− and high−speed areas...
Indicates the range between 3 and MAX on the dial.

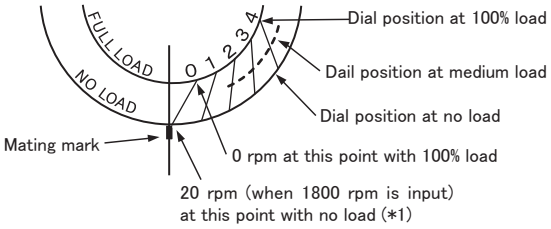
■ Output Speed

・When using product continuously, use it in the middle and high−speed areas, which secures high efficiency.
・If a special request was not given at the time of order, the rotation speed is set to 0 rpm when a light load is applied.
・If you continuously use this unit in the low−speed area of 100 rpm(*1) or less, it could be susceptible to load changes, and the rotation speed might become unstable.

■ Dial Plate & Load

・The output speed will not change as long as a load does not change. If a load changes greatly, however, the output speed might change even at the same dial plate position
・Note that the output speed might change if a load changes greatly.
*We recommend using the automatic control when high accuracy is desired.

(*1) Output speed without the reducer



■ Lubricating oil

Lubricating oil plays an important role, which can be used not only for power transmission, but also for burn, wear, rust prevention, and for cooling.
Since lubricating oil greatly influences the performance of the product and service life, be sure to use the special lubricating oil only.

・Be sure to use the specified lubricating oil.
・Do not mix any other lubrication.
・If you use this product in an area with an ambient temperature of 0ºC or less, or 40ºC or more, heat− or cold−resistant lubricating oil is required.
・Since, unless otherwise requested, the speed drive is filled with the proper amount of lubricating oil before shipping, additional lubrication is not required.
・Check the oil level every day.
・Keep the replacement interval, and replace accordingly.

*Refer to "3 Special lubricating oil" described on page 8.

For purchase of the lubricating oil (special traction drive oil for the speed change section), contact us or any of the ENEOS Corporation offices.

Precautions during operation

・At initial operation, confirm the rotating direction of the output shaft, and gradually apply the load.
・The handle rotational direction and increasing or decreasing speed may depend on the handle mounting direction. For more information, please contact us.
・The surface temperature of the speed drive housing under normal operation can reach up to approximately 50ºC higher than the ambient temperature.
・Switch between forward and reverse rotation after the motor (input) shaft stops completely.
・Never change the speed when operation stops.
・Be careful not to overload.
・NRX is an output torque limiting model. Especially in the middle− and high−speed areas, the speed drive may be overloaded even with the motor rated current value or less. For more information, please contact us.

Inspection

◎ If abnormal high temperature, noise, vibration, and/or oil leakage occur, stop operation immediately and contact us.

■ Daily inspection

- Check to ensure that the load condition is appropriate.
- Check to ensure that the speed drive housing temperature is not extremely high during operation
  (A temperature of up to approximately 50ºC higher than the ambient temperature will not cause any problems).
- Check to ensure that there is no abnormal rolling noise with the bearings and/or traction drive parts.
- Check to ensure that abnormal vibration is not being generated from the speed drive.

<Lubricating oil inspection>

- Check to ensure that the lubricating oil is supplied to the appropriate indication level (check when operation stops).
- Check to ensure that the lubricating oil is not dirty, and that the degree of transparency is high.
- Check to ensure that there is no oil leakage
  (for example, check oil seals on the input and output shaft parts, O-rings, oil gauge, and the area around the oil filling and drain ports).

■ Periodical inspection (every three months)

- Check to ensure that pulleys, sprockets, and speed drive mounting bolts are not loose.
- Check to ensure that there are no problems in the electrical system.
- Check to ensure that the load condition is appropriate.
- Replacement of lubricating oil
  *Refer to “3-1 Special lubricating oil list” and “3-2 Replacement of lubricating oil” , and use the special lubricating oil.

Storing Precautions

If you do not plan to use the product immediately after purchase, store it under the following precautions.

To store temporarily

(1) Store the product in a clean and dry place.
(2) If you store the product outdoors or in a humid place, put it in a box, seal the box, and cover with plastic sheets.
(3) When storing, attach a red rubber stopper into the air release plug, or set a plug stopper to prevent humidity from entering the product.

To store for a long period of time

1) When storing the product in outdoor areas subject to a lot of rain and/or humidity after installing on the site
   (1) Cover the whole product with a water-proof sheet, and fix the sheet securely to prevent it from coming off due to strong wind, as well as to avoid entering rain and/or dust from clearance gap.
   (2) If moisture is expected to evaporate from the ground, put the water-proof sheet underneath to prevent exposure to humidity from the evaporation, filling inside the sheet.
   (3) When storing, attach a red rubber plug into the air release plug, or set a plug stopper to prevent humidity from entering the product.
   (4) Set the cover on the motor terminal box, and seal the lead wire openings to avoid humidity from entering through the terminal box to the inside of the motor.
2) When storing the product indoors
   When there is less humidity, cover the product with a plastic bag, etc., and follow the procedures described in (3) and (4) above.
3) When storing the product for a long period of time, over a year, special rust-proofing specifications are required in addition to the above procedures.
4) Rust-proofing intervals and procedures

Rust-proofing interval		Within one year (our shipping standard)		Over one year to less than three years (our recommendation)		
Instructions at ordering		No particular instructions are necessary		"Special rust-proofing specifications" need to be instructed		
Rust-proofing area		Rust-proofing procedures at factory shipping	Rust-proofing oil agent	Rust-proofing procedures at factory shipping	Rust-proofing oil agent	Procedures after shipping
Exposed parts of the product, input/output shafts, and flange section		Input/output shafts After rinsing, wrap plastic tape around. Flange section After rinsing, apply the rust-proofing oil agent to it, and pack the whole part with a plastic bag.	JIS K2246 NP-2 Idemitsu Daphne Evercoat PL, or equivalent	Input/output shafts After rinsing, apply the rust-proofing oil agent to them, and wrap plastic tape around. Flange section After rinsing, apply the rust-proofing oil agent to it, and pack the whole part with a plastic bag.	Equivalent to JIS K2246 NP-19 Taiyu Sabiden SAP D-15K, or equivalent	Check the condition of the rust-proofing one year after shipping, and re-apply the rust-proofing oil, if necessary. After that, carry out the same procedure every year.
Inside of the product	Grease	Special grease supplied at shipping	–	Special grease supplied at shipping	–	No special procedures are necessary
	Oil	Special oil supplied at shipping (The air breather has been sealed)	–	Add special oil thoroughly inside the housing. (The air breather has been sealed)	–	Take the same procedures as in the left, two years after shipping. When starting operation, replace with new oil, and fill to the specified level.
Supplied oil cooler pump unit	Water-cooled system	Operate with special oil, and drain oil at shipping. (The air breather has been sealed) Eliminate water from pipes completely, dry, and seal the cooling water openings.	–	Add special oil thoroughly inside the unit. (The air breather has been sealed) Eliminate water from pipes completely, dry, and seal the cooling water openings.	–	Take the same procedures as in the left, two years after shipping. When starting operation, replace with new oil.
	Air-cooled system	Operate with special oil, and drain oil at shipping. (The air breather has been sealed)	–	Add special oil thoroughly inside the unit. (The air breather has been sealed)	–	Take the same procedures as in the left, two years after shipping. When starting operation, replace with new oil.

Note: Only when the export rust-proofing specifications or instructions are given, rust-proofing oil is applied to the input/output shafts even in less than one year.

Inspection during storage

Perform periodical inspection to check that the aforementioned storage procedures have been taken properly, and that the storing methods are correct.

Inspection before resuming operation

(1) Return the product to normal conditions from those taken for storage (such as for the amount of special oil).
(2) Since bearings may partially run out of grease resulting from the grease hardening during long-term storage, be sure to turn the motor shaft by hand from the fan side before operation, and check that there are no problems.
(3) Since exposed parts of rubber and/or resin parts in the oil seal, O-ring, and oil gauge, etc., may become deteriorated due to environmental influences, such as temperature, humidity, and/or ultraviolet rays, check those parts before resuming operation. If any deterioration is found, replace with new ones.

1 Installation

1-1 Installation

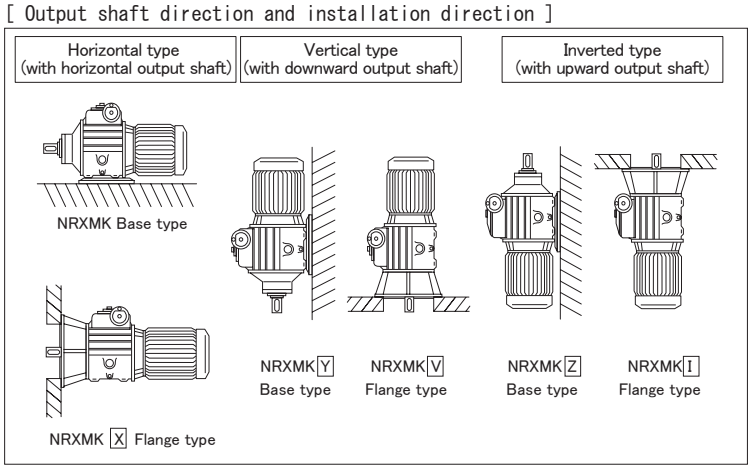
1. Avoid installing the product in a place directly exposed to rain or water.
   - ■ Consult us in advance if you use the product outdoors, or in a place exposed to dust or water.

2. Install the product in an area with an ambient temperature of between 0ºC and 40ºC.
   - ■ If you plan to use the product beyond the above mentioned temperature range (at higher or lower temperature), be sure to consult us.

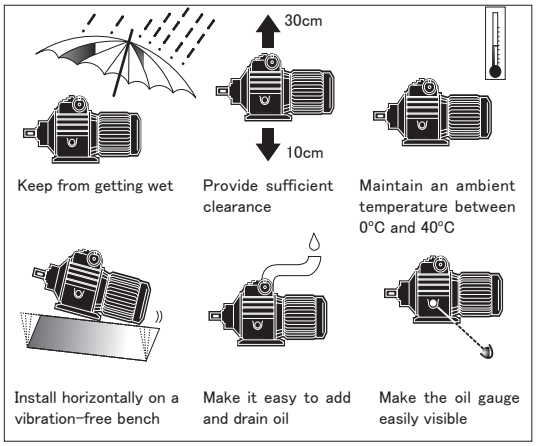
3. Securely fix the product using bolts on a solid installation bench that is not prone to vibration.
   - ■ Install the horizontal type horizontally, the vertical type (with downward output shaft) and inverted type (with upward output shaft) vertically. Failure to follow this could result in malfunction due to poor lubrication.
     For inclined installation, consult us.

4. Install the product in a way that provides easy access for inspection and maintenance.
   - ■ To make it easy to add and drain lubricating oil, install the product at a level of approximately 10 cm from the floor by securing a top clearance of approximately 30 cm.
   - ■ When installed the product into machines, place it so that the oil level can be checked externally, and lubricating oil can be easily replaced using pipes.

[Output shaft direction and installation direction]



[Installation conditions]



1-2 Connections

1. Allow a sufficient margin when setting the rotating speed and torque.
   - ■ When driving the mated machine at the maximum speed, connect the speed drive so that it also operates at the maximum rotation.
   - ■ For machines of which torque increases at the lower speed (such as those with constant horsepower characteristics), set the maximum torque to be within the rated torque of the speed drive.

2. When connecting the product, do not apply impact force and/or excessive thrust load on the output shaft (use tapping hole on the output shaft for 11K to 18K).

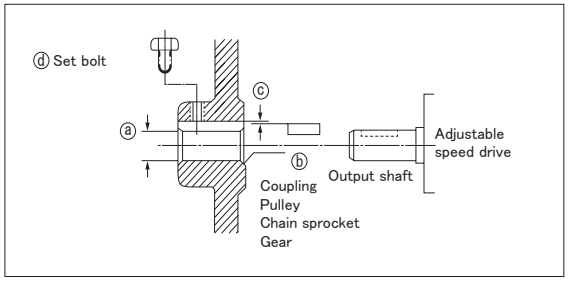
   ⓐ Since the output shaft diameter dimension tolerance of the speed drive has been set to h6 for 200B to 7500, and m6 for 11K to 18K, set the hole tolerance of the coupling, pulley, chain sprocket, and gear, which are to be mounted, to H7 for 200B to 7500, and F7 for 11K to 18K. Then, push the output shaft into the hole by tapping with a wooden or plastic hammer. Pushing the shaft by hitting it hard could result in damage to bearings and/or the inside of the speed drive.

   ⓑ Chamfer the hole mouth by approximately 1 mm.

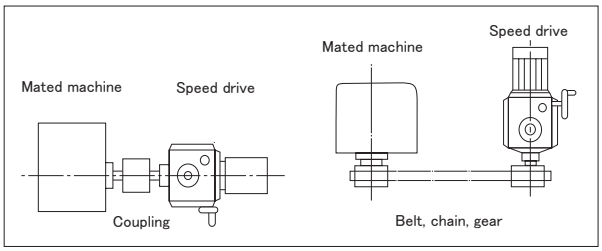
   ⓒ Make clearance of 0.1 mm to 0.2 mm for the key head.

   ⓓ Hold and secure the key head using a set bolt.

   Note: Make the effective diameter of the coupling, pulley, chain sprocket, and gear, etc. at least five times the output (input) shaft diameter of the speed drive. Be careful not to allow impact, vibration, and/or excessive thrust load from the machine to apply to the shaft ends. (For information about allowable shaft weight, refer to the catalog).



3. Ensure centering before connection.
   - ■ For connection with a coupling, properly align the speed drive shaft with the mated machine shaft.
   - ■ For connection with pulley, chain sprocket, and gear, etc., properly make the speed drive shaft parallel with the mated machine shaft, determine the correct center line, and fit precisely.



Note: The output shaft rotation direction for the speed drive equipped with a Coronet speed reducer (N11, 17, 29, 35, 47, 59, 71 types) is the same as that of the input shaft.

1-3 Connection with the oil cooler pump unit

For NRXMK-18K (including models equipped with the reducer)

Since the forced cooling system has been adopted, be sure to connect the supplied oil cooler pump unit according to the following procedures.

■ **Install the oil cooler pump unit at the same level as the oil gauge level of the speed drive.**

■ **Be sure to provide a separate power supply from the speed drive motor.**

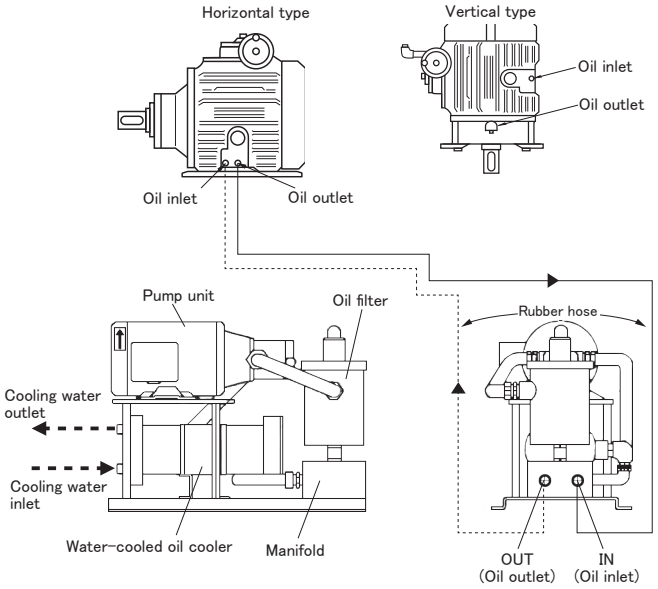
1 Connection method

・Since the speed drive has been shipped with the proper amount of special lubricating oil supplied inside, **do not open the oil inlet (outlet) valves of the speed drive** until all hoses have been connected completely.

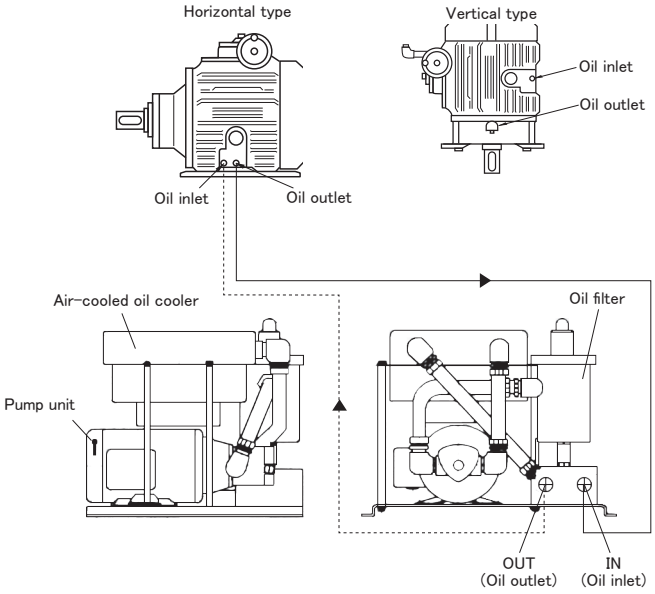
1.Be sure to connect the main unit and oil cooler pump unit using the supplied rubber hoses (two pieces).

2.Connect "IN" of the connection manifold in the unit to the connecting port on the side of the oil outlet in the speed drive, and "OUT" to the connecting port on the side of the oil inlet in the speed drive.

[Water-cooled system]



[Air-cooled system]



・Connect the cooling water hose (needed to be prepared by your company) to the cooling water flow conduit. Pass the cooling water with a flow rate of 20 liter/min.

2 Operation

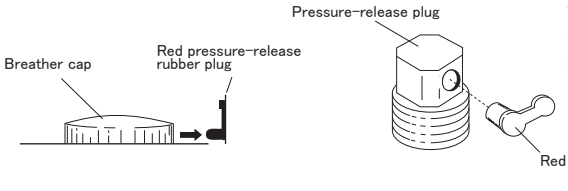
2-1 Precautions before starting operation

1. Since, unless otherwise requested, **the speed drive is filled with the proper amount of lubricating oil** before shipping, additional lubrication is not required *

(Before use, check that lubricating oil has been supplied at the specified level of the oil gauge just in case).

* Note that models with the rod-shaped oil gauge have not been filled with lubricating oil.

■ **Before use, be sure to remove the (red) pressure-release rubber plug attached to the breather cap at the oil filling port.** Also, for models equipped with the reducer (G, W, N types), be sure to remove the (red) pressure-release rubber plug attached to the oil port cap of the reducer.



If you operate the speed drive without removing the (red) rubber plug from the cap, pressure escape routes will be blocked, which could result in oil leakage.

2.Check that electrical wiring has been performed properly.

3.Check that connection to the mated machine has been performed properly (fitting conditions, centering, etc.).

4. At initial operation, confirm the rotating direction of the output shaft, and gradually apply the load.

2-2 Precautions during operation

1. **Never turn the speed change handle when operation stops** (when the motor is not running).
2. Be careful not to overload.
3. The surface temperature of the speed drive housing under normal operation can reach up to approximately 50°C higher than the ambient temperature.
4. If the following events occur, stop operation immediately, and inspect the unit. Take any necessary procedures.

Symptoms	Possible causes
・The temperature suddenly increases. ・An abnormal, loud noise is suddenly generated. ・The rotation speed suddenly becomes unstable. ・Other abnormal events are found.	・The unit has been overloaded ・Lubricating oil has been excessively or insufficiently used, or has deteriorated. Or, a different type of lubricating oil has been used. ・Bearings and/or drive surfaces have been damaged ・Improper connecting conditions with the mated machine, etc.

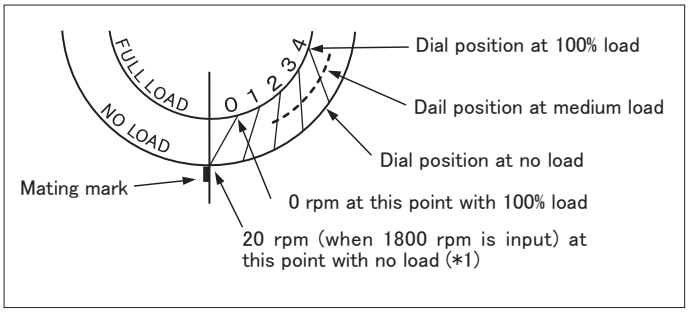
＊ For more details on the above symptoms and possible causes of problems, refer to "5 Troubleshooting" on page 11.

5. Switch between forward and reverse rotation after checking that the motor (input) shaft has stopped operation completely.
   Instantaneous switching between forward and reverse rotation could result in malfunction.

2-3 Dial graduation and load

For NRX, the rotation will not change as long as the load does not change.
If a load changes greatly, however, the rotation speed will change even at the same graduation point.

1. Read the graduation on the dial depending on the load.
2. Note that the rotation speed will change if a load changes greatly. (We recommend using the automatic control when high accuracy is desired).



(*1) Rotation speed for the type without the reducer

2-4 Operation of the oil cooler pump unit

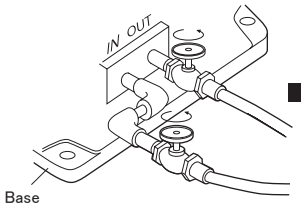
For NRXMK-18K (including models equipped with the reducer)

■ Operate the oil cooler pump unit according to the following procedures.

■ Be sure to provide a separate power supply to the pump unit from the speed drive motor.

1 Before operation, be sure to open the oil inlet (outlet) valves (two positions) of the speed drive.
＊ Operating the pump unit with those valves closed could result in malfunction of the pump unit.

2 Turn the power switch of the oil cooler pump unit ON, and confirm that there is no problem with oil feeding conditions between the speed drive main unit and pump unit, then turn the power switch of the speed drive ON.



Open the oil inlet (outlet) valves of the speed drive

→ Turn the power switch of the oil cooler pump unit ON → Confirm that the oil cooler pump unit has been filled with oil

Confirm that oil has been supplied at the specified level of the oil gauge in the speed drive

→ Turn the power switch of the speed drive ON

3 Confirm the rotation direction of the cooler pump unit motor.

1. Perform wiring so that the motor rotates in a counter-clockwise direction when viewed from the motor fan side.
2. For the indication position of the rotation direction, refer to the table on the right.

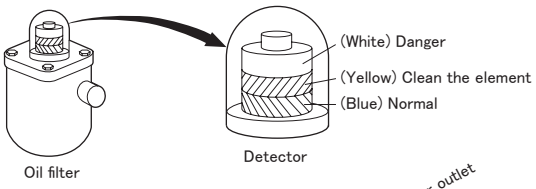
Model	Indication position
RXCA-01 RXCW-01	Indicated on the motor
RXCW-01-1 RXCW-01-2	Indicated on the pump unit

4 Inspection and cleaning of the oil filter

・The filter clogging condition will be indicated by "color" in the detector inside the filter on top of the oil cooler pump unit, depending on the degree of use.

Blue → Normal　Yellow → Clean the element　White → Danger (clean or replace the element)

・When the detector indication ring turns yellow, remove the cover on top of the filter, and clean the element using light oil, etc.



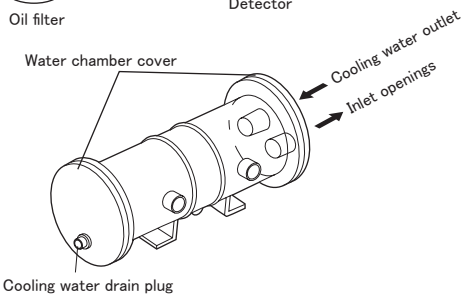
Precautions for the water-cooled pump unit

・Check that water is always running in the oil cooler pump unit.

・If there is a risk of water freezing due to being in cold regions, a time of extreme cold, or when interrupting operation, remove the drain plug of the pump unit, and drain the water from it.

・Since accumulated water deposit inside the pump unit could result in a decrease in cooling function, clean the cooling water conduit once a year.

Note : When cleaning the water conduit, remove the water chamber covers on both sides.



Precautions for the air-cooled pump unit

・When removing the radiator, drain oil first, and remove the outlet/inlet pipes, four supporting bolts (6 x 15), two pan head screws on the fan side (4 x 50), fan, and then motor, in this order. If a large amount of oily dust is attached to the radiator, soak in a warm water solution with dissolved neutral detergent, and rinse in water. After that, blow compressed air on it.

・Clean oil deposit using solvent (Trichloroethylene) approximately once a year
(Deteriorated oil will be dissolved gradually in the solvent. Leave solvent inside for approximately 30 minutes).

3 Installation

3-1 Special Lubricating Oil

Lubricating oil plays an important role in power transmission, and also has various effects on burn, wear, and/or rust prevention, and/or cooling.
Since lubricating oil greatly influences the performance of the product and product life, be sure to use the special traction drive oil for the speed change section. The type of lubricating oil differs between the speed change and speed reduction sections. In the event that different types of oil are used, sufficient performance may not be attained, or extension of the product life may be greatly influenced.

■ The type of lubricating oil differs between the speed change and speed reduction sections. In the event that different types of oil are used, sufficient performance may not be attained, or extension of the product life may be greatly influenced.

Speed drive				
Speed drive model	RX-60 to 3700 NRX-60 to 7500 ARX-60 to 750 SC-200E to 22000C O-200E to 1500E	RX-5500 7500 NRX-11K 15K	RX-11K to 15K NRX-18K to 30K	
Lubrication system	Speed change section			Gear section
	Oil lubrication		Forced oil lubrication	Oil lubrication
Type	Special traction drive oil for the speed change section			JIS K 2219 Industrial Gear Oil Class 2 ISO VG220
Brand: Idemitsu	RINGCONE Traction Drive Oil TD Oil 10	RINGCONE Traction Drive Oil TD Oil 22		Daphne Super Gear Oil 220
Brand: ENEOS				Bonnoc TS220
Brand: Mobil				Mobilgear 600XP 220
Brand: Showa Shell				Omala S2G 220
Brand: Cosmo				Cosmo Gear SE 220
Replacement interval	Every 20,000 hours, or every 4 – 5 years	Every 5,000 hours, or every year		

Reducer type	Planetary/Pinion reducer			Inscribed planetary reducer				Worm reducer
Speed drive model	RX-60 / 90 NRX-60 / 90 ARX-60 / 90	RX-200B NRX-200B / 400B	RX-400 to 7500 NRX-750 to 18K ARX-400 to 750 SC-200E to 22000C O-200E to 1500E	RX-90 NRX-90 ARX-90	RX-200B to 15K NRX-200B to 30K ARX-400 to 750 SC-200E to 3700E O-200E to 1500E			RX-90 to 3700 NRX-90 to 5500 ARX-90 to 750 SC-200E to 3700E O-200E to 1500E
Nominal reduction ratio	G3M / G5M	G3M / G5M	G3 / G5 / G6	G11 to G71	N(G)11 to 71 C11 to 87			W10 to W30
Reducer frame number	–	–	–	A / B	A / B / C	D to G	H to N	–
Lubrication system	Grease	Grease	Oil	Oil	Grease	Oil		Oil
Type(Viscosity)	NLGI No.1 Grease	NLGI No.0 Grease	JIS K 2219 Industrial Gear Oil Class 2 ISO VG220	JIS K 2213 Turbine Oil Class 2 ISO VG46	NLGI No.2 Grease	JIS K 2219 Industrial Gear Oil Class 2 ISO VG100		JIS K 2219 Industrial Gear Oil Class 2 ISO VG320
Brand: Idemitsu	Daphne Coronex EP No.1	Daphne Polylex No.0	Daphne Super Gear Oil 220	Daphne Mechanic Oil 46	–	Daphne Super Gear Oil 100		Daphne Super Gear Oil 320
Brand: ENEOS	Epnoc Grease AP1	Pyronoc Grease No.0	Bonnoc TS220	FBK Oil RO46	–	Bonnoc TS100		Bonnoc TS320
Brand: Mobil	Mobilux EP No.1	–	Mobilgear 600XP 220	DTE Oil Medium	–	Mobilgear 600XP 100		Mobilgear 600XP 320
Brand: Showa Shell	Alvania EP No.1	Stamina RL No.0	Omala S2G 220	Tellus S2M 46	–	Omala S2G 100		Omala S2G 320
Brand: Cosmo	Dynamax EP No.1	–	Cosmo Gear SE 220	Cosmo Allpus 46	–	Cosmo Gear SE 100		Cosmo Gear SE 320
Brand: Kyodo Yushi	Unilube DL No.1	Excellite EP No.0	–	–	–	–		–
Brand: Nippeco	–	–	–	–	NDS Grease	–		–
Replacement interval	Every 20,000 hours, or every 4 – 5 years		Every 5,000 hours, or every year		Every 20,000 hours, or every 4 – 5 years	Every 5,000 hours, or every year		

Note 1. For lubricating oil supplied at shipping, contact us accordingly.

2. The oil replacement interval differs depending on conditions of use. In particular atmospheres subject to high humidity and/or active gas, shorten the replacement interval described in the above table.

● When using the product at especially low temperatures (approximately −30°C to 0°C) or high temperatures (approximately 40°C or more), heat or cold-resistant lubricating oil and applicable internal parts are required. For details, consult us in advance.

● For purchase of special traction drive oil, contact us or any of the ENEOS Corporation offices.

3-2 Replacement of lubricating oil

■ Speed change section

For special traction drive oil, the oil lifespan is extremely long, and the replacement interval is very long.

＊ For the replacement interval, refer to the above table.

■ Speed reduction section

Replace lubricating oil described in the above table at the specified replacement interval.

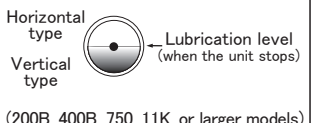
3-3 Oil filling and draining

- Never mix different types of oil. Failure to follow this could result in adverse effect due to the change in oil quality.
- Oil leakage could result in accidents. Wipe away oil spills at the time of filling or draining.

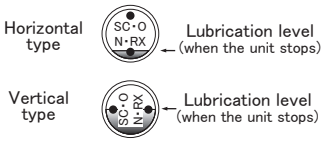
[For the speed change section]

- Add oil up to the specified level of the oil gauge when the speed drive stops.

Note : Continuing operation with insufficient oil could result in damage to internal parts.
Check the oil level every day.



(200B, 400B, 750, 11K, or larger models)

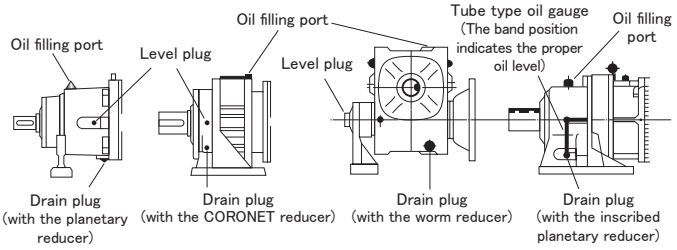


(1500 to 7500)

Note : For the vertical type, be sure to set the unit vertically before adding oil. If oil is added with the unit placed horizontally, the amount of oil will differ, and proper lubrication management cannot be performed. If oil has been added excessively, remove the drain plug, and drain out surplus oil to adjust the amount.

[For the speed reduction section]

- The plug position in the center of the speed reduction section indicates the proper oil level. Remove the upper lubrication plug and level plug, and fill with oil until oil flows out of the level plug.



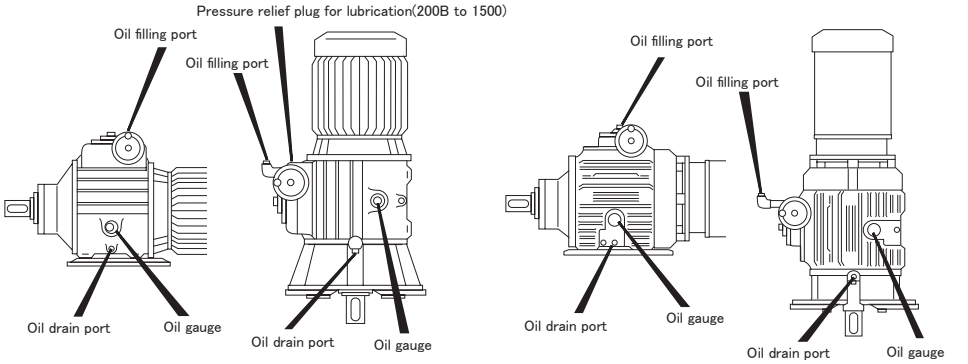
- For the grease lubricated system <Frame A/B/C of N(G)11 to 71>, additional refill is not required in the middle of the replacement interval. When replacing oil, disassemble the unit for overhaul before lubrication.

Note : Before adding oil in the vertical type of models 200B to 1500, be sure to remove the attached pressure relief plug for lubrication, which can be used to release the internal air pressure.
After adding oil, attach the pressure relief plug.

3-4 Proper amount of oil, and oil filling/draining plug positions

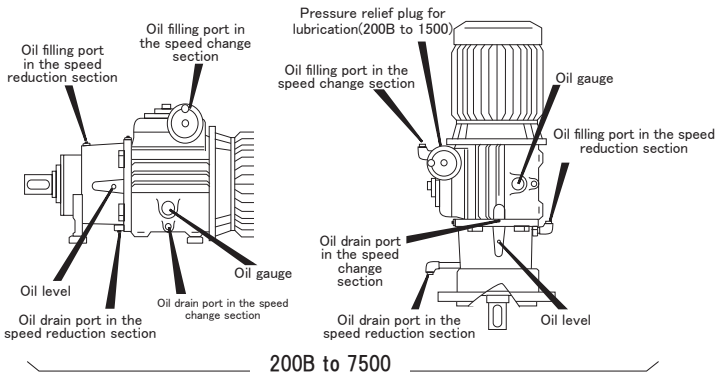
NRX □ (L)

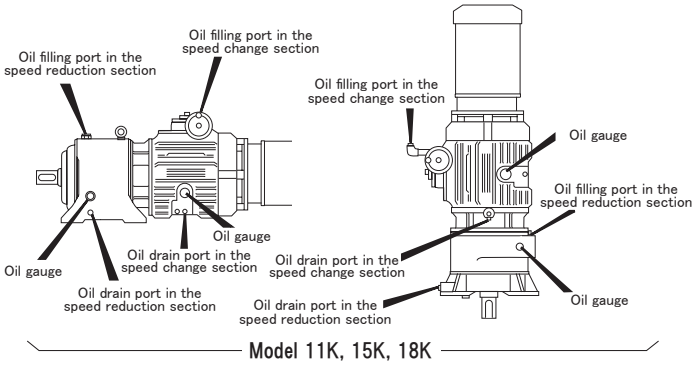
Model	Horizontal type	Vertical type
	Speed change section	Speed change section
200B	0.2	0.4
400B	0.2	0.4
750	0.5	1.0
1500	0.8	1.9
2200	1.8	2.7
3700	2.5	4.8
5500	2.8	5.4
7500	2.2	5.4
11K	5.0	15
15K	5.0	15
18K	5.0	15



NRX □ – □ –G □ Planetary/Pinion reducer (L)

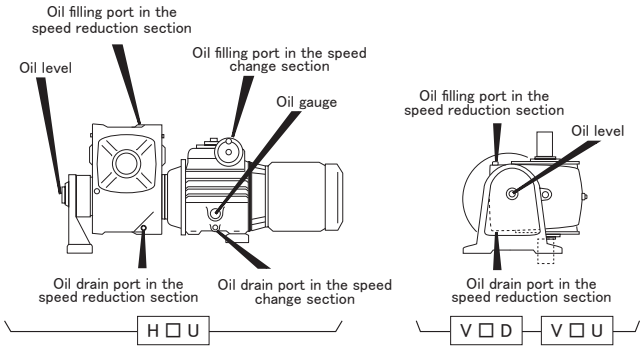
Model	Reduction ratio	Horizontal type		Vertical type	
		Speed change section	Speed reduction section	Speed change section	Speed reduction section
200B	G3M/G5M	0.2	Grease	0.4	Grease
400B	G3M/G5M	0.2	Grease	0.4	Grease
750	G3/6	0.5	0.4	1.0	0.4
1500	G3/6	0.8	0.5	1.9	0.8
2200	G3/6	1.8	1.0	2.7	1.3
3700	G3/6	2.5	1.5	4.8	2.3
5500	G3/6	2.8	1.8	6.5	3.5
7500	G3/6	2.2	1.8	6.5	3.5
11K	G3/5	5.0	9.0	15	18.2
15K	G3/5	5.0	9.0	15	18.2
18K	G3/5	5.0	9.0	15	18.2





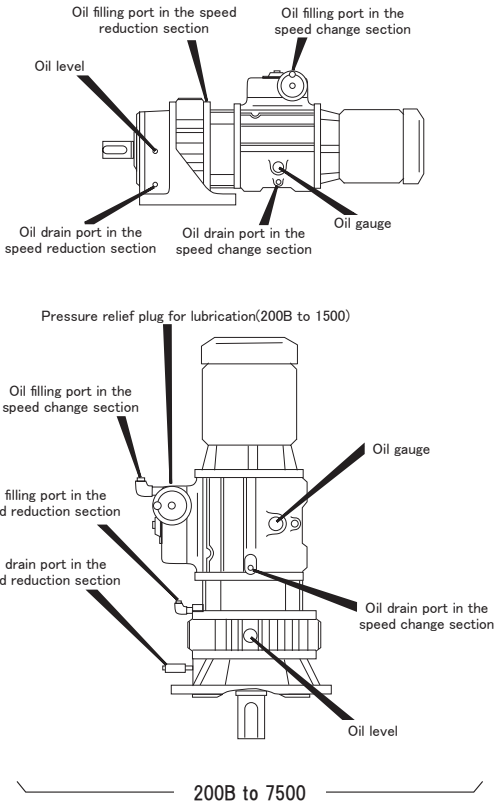
NRX □ – □ –W □ Worm reducer (L)

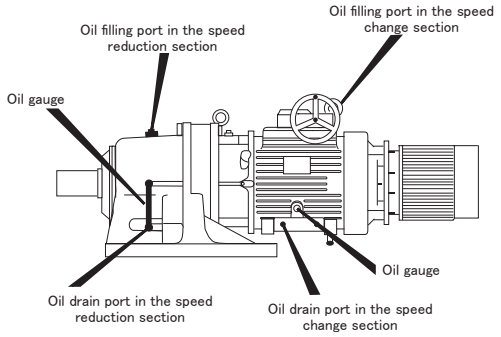
Model		Speed change section	Speed reduction section		
			H □ U	V □ D	V □ U
200B	W10/20/30	0.2	0.25	0.4	0.4
400B	W10	0.2	0.25	0.4	0.4
	W20/30	0.2	0.5	0.6	0.6
750	W10	0.5	0.5	0.6	0.6
	W20/30	0.5	0.7	0.85	0.85
1500	W10	0.8	0.7	0.85	0.85
	W20/30	0.8	1.3	1.5	1.5
2200	W10	1.8	1.3	1.5	1.5
	W20/30	1.8	2.1	2.7	2.7
3700	W10	2.5	2.1	2.7	2.7
	W20/30	2.5	3.3	4.1	4.1
5500	W10	2.8	3.3	4.1	4.1
	W20/30	2.8	5.5	7.5	7.5

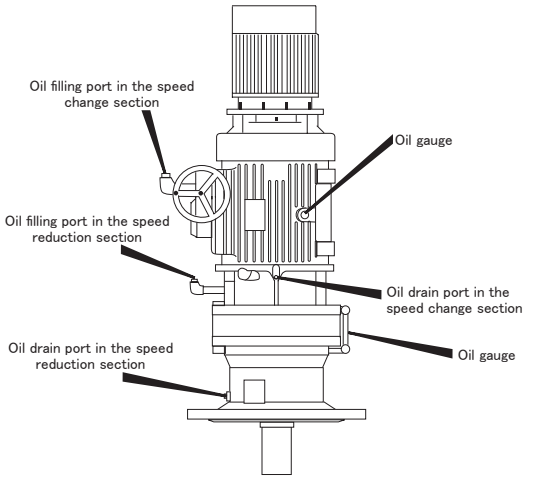


NRX □ – □ – $\frac{N}{C}$ □ Inscribed planetary reducer(L)

Model	Reduction ratio	Frame size	Horizontal type		Vertical type	
			Speed change section	Speed reduction section	Speed change section	Speed reduction section
200B	G11/17	A	0.2	Grease	0.4	Grease
	N29 to 71	B	0.2	Grease	0.4	Grease
400B	N11 to 71	B	0.2	Grease	0.4	Grease
750	N11 to 29	B	0.5	Grease	1.0	Grease
	N35 to 71	C	0.5	Grease	1.0	Grease
1500	N11 to 29	C	0.8	Grease	1.9	Grease
	N35 to 71	D	0.8	0.9	1.9	1.5
2200	N11 to 47	D	1.8	0.9	2.7	1.5
	N59 to 71	E	1.8	1.8	2.7	2.4
3700	N11 to 29	D	2.5	0.9	4.8	1.5
	N35 to 71	E	2.5	1.8	4.8	2.4
5500	N11 to 47	E	2.8	1.8	5.4	2.4
	N59/71	F	2.8	3.2	5.4	4.3
7500	N11 to 35	E	2.2	1.8	5.4	2.4
	N47 to 71	F	2.2	3.2	5.4	4.3
11K	C11 to 43	H	5.0	4.6	15	7
	C87	L	5.0	15	15	18
15K	C11 to 43	H	5.0	4.6	15	7
	C87	L	5.0	15	15	18
18K	C11/21	H	5.0	4.6	15	7
	C29/43	L	5.0	15	15	18







4 Periodical Inspection

4-1 Daily inspection

1.Check to ensure that the speed drive housing temperature is not extremely high during operation.
　＊ A temperature of up to approximately 50°C higher than the ambient temperature will not cause any problems.
2.Check to ensure that there are no abnormal rolling sounds with the bearings and/or friction transmission parts.
3.Check to ensure that abnormal vibration is not being generated from the speed drive.
　＊ If any of these abnormal events occur, stop operation immediately, disassemble and inspect the unit, or contact us.
4.Confirm that oil has been supplied at the specified level of the oil gauge (Check when the unit stops).
5.Check to ensure that the oil has not been contaminated. Check to ensure that oil gauge is transparent enough.
6.Check to ensure that there is no oil leakage anywhere (for example, in oil seals on the input and output shaft parts, O-rings, oil gauge, and/or the area around the oil filling and drain ports, etc.).
　＊ If any oil leakage occurs, replace the necessary parts, or contact us.

4-2 Periodical inspection (approximately at least every three months)

1.Check to ensure that there is no excessive overload.
2.Check to ensure that pulleys, sprockets, and speed drive mounting bolts are not loose.
3.Check to ensure that there are no problems in the electrical system.
4. Inspect and maintain major parts.
　＊ If abnormal sounds occur inside of the speed drive, stop operation immediately, disassemble and inspect the unit, or contact us.
5.Check to ensure that the specified time of replacement for lubricating oil has not passed.
　＊ Check to ensure that oil level has not decreased, and that it's not dark in color.　Check the specified replacement interval.

5 Troubleshooting

Symptoms				Possible causes	Remedies
When load is applied	The unit does not rotate (drive)	Fuse has blown		Abnormal load may have been applied	After inspection, decrease load to the specified level
				Fuse capacity may be insufficient	Replace with a fuse with the specified capacity
		Load is excessive		Speed drive capacity may be insufficient	Check the model and type again
				Pressure contact of the driving surface may be defective	Inspect the pressure contact condition, and replace worn parts, if necessary
		The mated machine and its connecting mechanism have malfunctioned			After inspection, adjust or repair
	The unit rotates (drives)	Temperature has increased abnormally (overheating)		Pressure contact of the driving surface may be excessive	Adjust the pressure contact condition
				Voltage may decrease	Consult the power company
				Load is excessive	After inspection, decrease load to the specified level
				High viscosity oil	Replace with the specified or equivalent oil
				The amount of oil may be excessive, insufficient, or oil may be deteriorated	Replace with the specified or equivalent oil (in the specified amount)
		The rotation speed has been unstable	Slipping occurs	The connecting part with the mated machine may be defective	After inspection, adjust or repair
				High viscosity oil	Replace with the specified or equivalent oil
				Load is excessive	After inspection, decrease load to the specified level
				Pressure contact of the driving surface may be defective	Adjust the pressure contact condition
				The driving surface may have been worn	Replace the ring and cone with normal parts
			Slipping does not occur	Electric power may decrease	Consult the power company
				Load is excessive	After inspection, decrease load to the specified level
		Abnormal sound is heard	The unit may be running with the missing phase (Three phases may be functioning as one phase)		Inspect electric wires, and/or consult the power company
			Sound has changed when changing the speed	Bearing on the output side may be damaged	Replace the bearing
				The drive surface on the output side may be damaged	Replace the ring and cone with normal parts
			Sound has not changed even when changing the speed	Bearing on the input side may be damaged	Replace the bearing
				The drive surface on the input shaft side may be damaged	Replace the ring and cone with normal parts
				The motor key section may be damaged	Replace the key and shaft with normal parts
When no load is applied	The unit does not rotate (start)			The ring and cone may be disconnected	Reapir the unit
				The ring and cone may have contact failure	Adjust the shim
				Fuse may have blown	Adjust terminal contact, or replace the fuse
				The switch may have contact failure	Adjust the contact part
				The stator coil may have been disconnected	Repair at a specialized factory
				The connecting wire may have been disconnected	After inspecting the disconnected part, replace
				Bearing may be damaged	Replace the bearing
				The connecting wire may have been disconnected in one phase	Replace with a complete set
	The unit rotates (starts)	The unit rotates in the reverse direction		Wiring connection may be incorrect	Replace two of three power leads
		The rotation speed has not increased		The switch may have contact failure (Governor switch on the single phase)	Adjust the contact part
				The stator coil may have been short-circuited in one phase	Repair at a specialized factory
				The rotor may come into contact with the stator	Replace the bearing, or repair at a specialized factory
				High viscosity oil	Replace with the specified or equivalent oil
				The driving surface may have been worn	Replace the driving part with a normal part
		Abnormal sound is heard	Sound has changed when changing the speed	Bearing on the output side may be damaged	Replace the bearing
				The drive surface on the output side may be damaged	Replace the ring and cone with normal parts
			Sound has not changed even when changing the speed	Bearing on the input side may be damaged	Replace the bearing
				The drive surface on the input shaft side may be damaged	Replace the ring and cone with normal parts
				The motor key section may be damaged	Replace the key and shaft with normal parts
	● Oil leakage occurs			O-ring may be defective	Replace the deformed or cracked O-ring with a normal part
				Oil seal may be defective	Replace the hardened or deformed oil seal with a normal part
				Mounting bolts may be loose	Tighten the bolts properly
				Lubricating oil may be excessive	Adjust to the specified amount
				Packing or bonding agent may not have been fixed	Apply the bonding agent evenly Replace the packing with a normal part
				The pressure-release rubber plug may have been left	Remove the rubber plug

6 Disassembly & Reassembly

If problems or malfunction have occurred in the unit, and disassembly inspection is required, refer to the disassembly and reassembly figures on the following pages, and perform accordingly (refer to "5 Troubleshooting" on page 11).

Note: Since models larger than the medium-scale type (1.5 kW type), and those equipped with the reducer have heavy parts, hoist or crane equipment may be required at the time of disassembly and reassembly.

Note: When disassembly and reassembly are performed by our workers, please have your company remove and mount the speed drive.

6-1 Disassembly procedure

(1) Remove the plug from the oil drain port, and drain oil completely.
(2) Remove the top cover.
(3) Remove the output shaft assembly from the main unit.
(4) Remove the cam assembly from the output shaft assembly.
(5) Remove the cone assembly.
(6) Remove the ring assembly.
(7) Remove the input disc from the motor shaft.

- **Inspection & Washing**
- After disassembly, inspect each part, and wash all parts with washing oil.
- Replace defective parts with normal ones.

Keep all disassembled parts away from dust until reassembly.

6-2 Reassembly procedure

- **Perform reassembly in the reverse order of disassembly.**
- Put packing in joint parts between the M flange/output shaft holder/motor and the main unit housing/covers. In such cases, replace deformed or cracked packing with normal one.

* When reassembly is complete, adjust pressure contact force inside according to "6-3 Shim (pressure contact force) adjustment".

6-3 Shim (pressure contact force) adjustment

- **Since shim (pressure contact force) has been sufficiently adjusted at shipping, readjustment is not necessary before use.**

When disassembly and reassembly have been performed due to unavoidable circumstances, readjust shim according to the following procedure.

NRX □ *For models with the reducer, refer to the respective page.

● Adjustment procedure

When reassembly is complete after disassembly, in order for the "automatic pressure adjustment mechanism" to function effectively, adjust pressure contact force using the shim inside the bearing cover.

·When reassembling the speed change section, move the ring to the low speed end (output shaft) in advance.

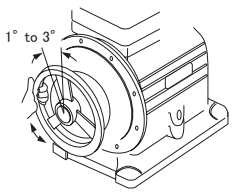
● Procedure

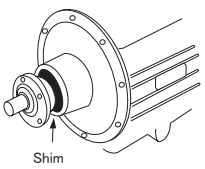
(1) Tighten the bearing cover completely.
(2) Mount a pulley on the output shaft, and manually turn the pulley from side to side to seat internal parts.

NRX □ -200B/400B NRX □ -750 to 2200
Adjust by output shaft backlash

(3) When turning the pulley from side to side, check that output shaft backlash is within the range of values in the table below.
If backlash is too large or small, remove the bearing cover, and adjust to the normal value by increasing or decreasing the shim (0.1 mm to 0.2 mm thick).

Model	Output backlash
200B/400B 750/1500	1° to 3°
2200	After adjusting to 1° to 3°, add a shim 0.2 mm thick.



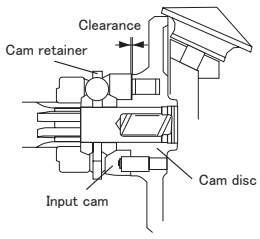


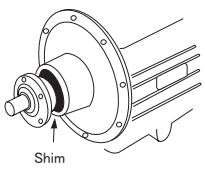
(4) When shim (pressure contact force) adjustment is complete, mount the top cover, and set the dial.
Under no load, align the mating mark with 0 (zero) for NO LOAD on the dial, and tighten using the bolt.

NRX □ -3700 to 18K
Adjust by clearance between the cam disc and input cam

(3) Remove the top cover.
(4) Look into the inside of the main unit, and check that clearance between the cam disc and input cam is within the range of values in the table below.
If clearance is too large or small, remove the bearing cover, and adjust to the normal value by increasing or decreasing the shim (0.1 mm to 0.2 mm thick).

Model	Clearance of the cam disc
3700 to 18K	Adjust clearance to 0 to 0.1 mm, and add a shim 0.1 mm to 0.15 mm thick (0.05 mm to 0.1 mm thick when applying pressure).





(5) When shim (pressure contact force) adjustment is complete, mount the top cover, and set the dial.
Under no load, align the mating mark with 0 (zero) for NO LOAD on the dial, and tighten using the bolt.

NRX □− □−G □ with planetary reducer

NRX □− □−W □ with worm reducer

● When reassembly of the speed change and reduction sections is complete after disassembly, adjust pressure contact force according to the following procedure.

● When reassembling the speed change section, move the ring to the low speed end (output shaft) in advance.

● Procedure

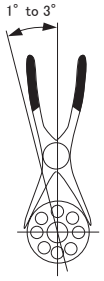
(1) Remove the top cover in the speed change section, look into the inside, and adjust pressure contact force according to the following procedure.

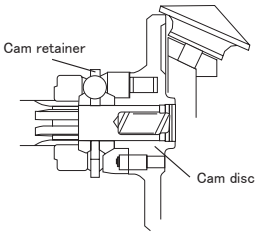
(2) Only for W type (with worm reducer), loosen the hexagon socket set screw. *Refer to the disassembly and reassembly diagram for the worm reducer section on page 19

NRX □ −200B to 2200−G □ NRX □ −200B to 2200−W □
Adjust by cam retainer backlash

(3) Hold the cam retainer with pliers, etc., and check that the total backlash is within the range of values in the table below. If backlash is too large or small, remove the bearing cover (HS blind cover for W type), and adjust to the normal value by increasing or decreasing the shim (0.1 mm to 0.2 mm thick).

Model	Cam retainer backlash
200B/400B 750/1500	1° to 3°
2200	After adjusting to 1° to 3°, add a shim 0.2 mm thick.

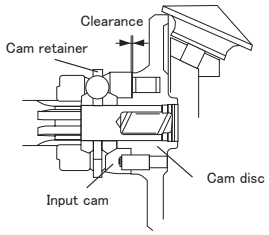




NRX □ −3700 or larger −G □ NRX □ −3700 or larger −W □ NRX □ −11K to 18K−C □ H/L
Adjust by clearance between the cam disc and input cam

(3) Look into the inside of the speed drive, and check that clearance between the cam disc and input cam is within the range of values in the table below. If clearance is too large or small, remove the bearing cover (HS blind cover for W type), and adjust to the normal value by increasing or decreasing the shim (0.1 mm to 0.2 mm thick).

Model	Clearance of the cam disc
3700 to 18K	Adjust clearance to 0 to 0.1 mm, and add a shim 0.1 mm to 0.15 mm thick (0.05 mm to 0.1 mm thick when applying pressure).



(4) Only for W type (with worm reducer), tighten the hexagon socket set screw after shim (pressure contact force) adjustment.

(5) Set the dial.

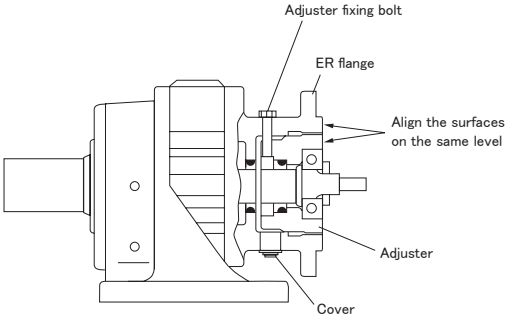
* Refer to the procedure for the standard NRX □ on page 12.

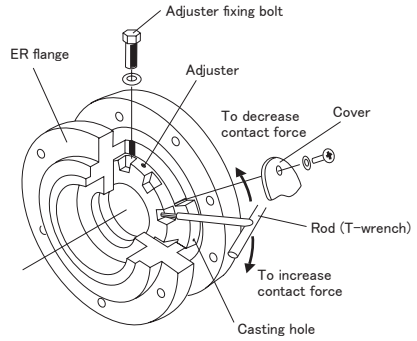
● When reassembly of the speed change and reduction sections is complete after disassembly, adjust pressure contact force according to the following procedure.

● When reassembling the speed change section, move the ring to the low speed end (output shaft) in advance.

● Procedure

(1) Put a rod (T–wrench) etc. into the ER flange adjustment hole, and align the ER flange and adjuster surfaces on the same level by turning the adjuster. After that, assemble the main units of the speed reduction and change sections.





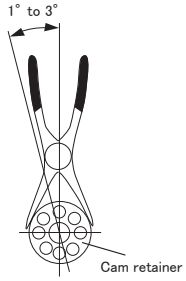
(2) Remove the top cover in the speed change section, look into the inside, and adjust pressure contact force by turning the adjuster with a rod (T–wrench) etc. according to the following procedure.

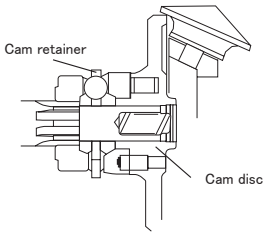
(3) Check pressure contact force adjustment according to the tables below.
(Turning the adjuster clockwise increases contact force, and turning counterclockwise decreases contact force when viewed from the output shaft)

NRX □ –200B to 2200–N □
Adjust by cam retainer backlash

(4) Hold the cam retainer with pliers, etc., and check that the total backlash is within the range of values in the table below.
If backlash is too large or small, turn the ER flange adjuster, and make adjustment.

Model	Cam retainer backlash
200B/400B 750/1500	1° to 3°
2200	After adjusting to 1° to 3°, turn the adjuster by one pitch to increase contact force

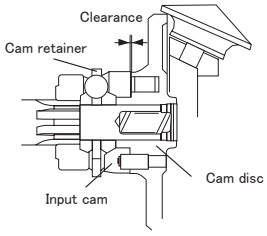




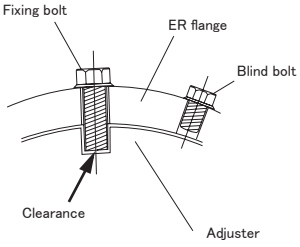
NRX □ – 3700 to 7500–N □
Adjust by clearance between the cam disc and input cam

(4) Look into the inside of the speed drive, and check that clearance between the cam disc and input cam is within the range of values in the table below.
If clearance is too large or small, turn the ER flange adjuster, and make adjustment.

Model	Clearance of the cam disc
3700 to 7500	After adjusting clearance to 0 to 0.1 mm, turn the adjuster by one pitch to increase contact force



(5) When shim (pressure contact force) adjustment is complete, secure the adjuster using the fixing bolt, and set the blind bolt on the other side.
Note: The fixing bolt is used to keep the adjuster from turning. Keep the tip of the bolt from coming into contact with the bottom of the adjuster.



(6) Set the dial.

*Refer to the procedure for the standard NRX □ on page 12.

Disassembly and reassembly diagram for speed change section 1 NRXM (K) -200B to 7500

* For the speed reduction section, refer to the disassembly and reassembly diagram for the respective speed reduction section on pages 18 to 21.

Bearing name number list

Model \ Bearing position	Output shaft A	Output shaft B	Output shaft C	Input disc D	Input disc G	Motor shaft E	Motor shaft F
200B/400B	6203ZZ	6203	–	51204	–	–	–
750	6204ZZ	TMB204	51204	51305	–	–	–
1500	6206ZZ	6206	51206	51405	–	–	–
2200	6207ZZ	6207	51207	51407	6008	–	–
3700	6208ZZ	6307	51307	51408	6010	–	–
5500/7500	6210ZZ	6308	51308	51410	6011	6210LLU	6011LLU

A, B, E, F, G: Ball bearing (ZZ: metal seal type, LLU: contact rubber seal type) C, D: Thrust bearing

Vertical type of NRXM(K)-200B/400B

*The bearing type on the output shaft A is LLU.

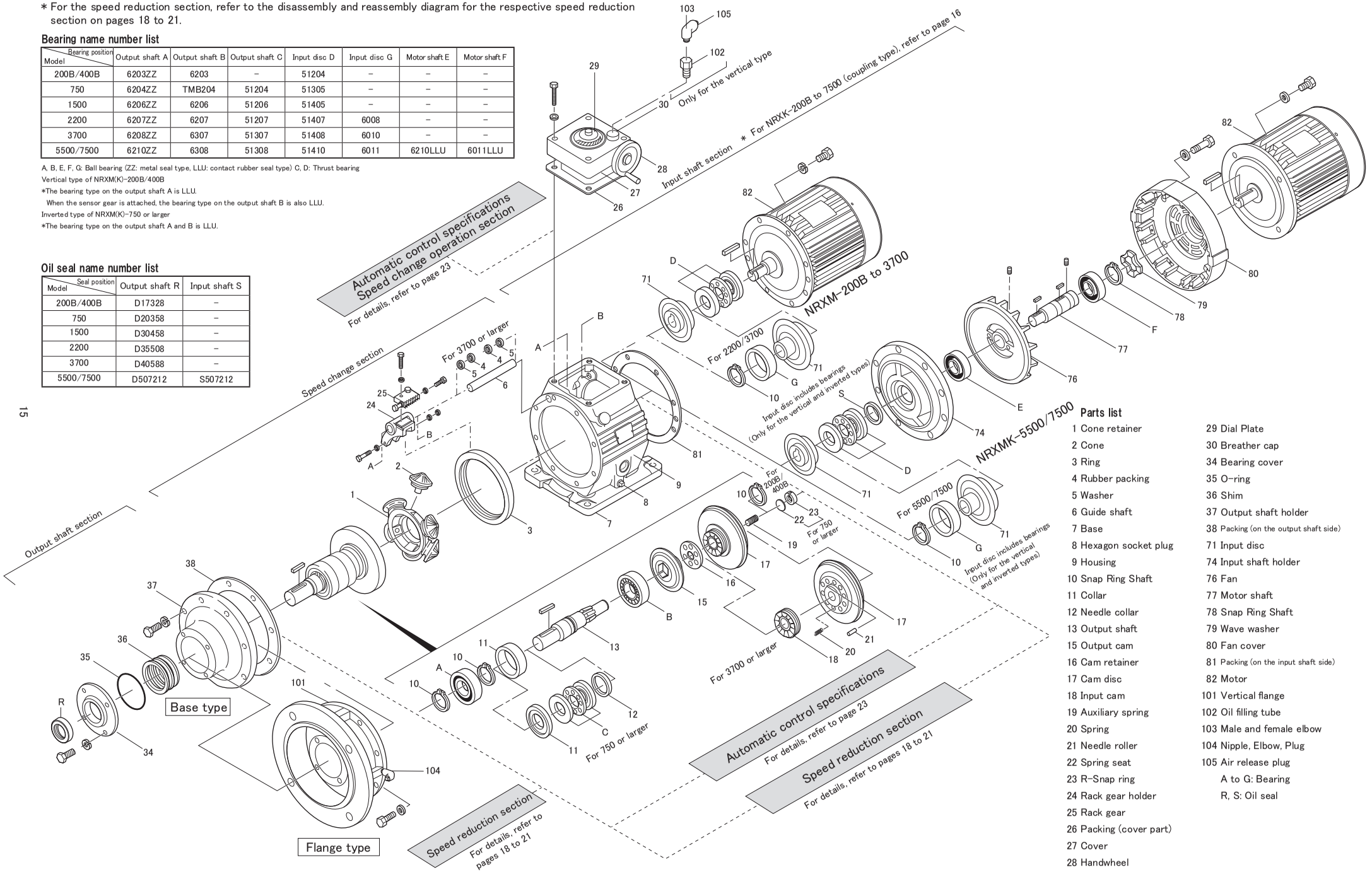
When the sensor gear is attached, the bearing type on the output shaft B is also LLU.

Inverted type of NRXM(K)-750 or larger

*The bearing type on the output shaft A and B is LLU.

Oil seal name number list

Model \ Seal position	Output shaft R	Input shaft S
200B/400B	D17328	–
750	D20358	–
1500	D30458	–
2200	D35508	–
3700	D40588	–
5500/7500	D507212	S507212



Parts list

1 Cone retainer
2 Cone
3 Ring
4 Rubber packing
5 Washer
6 Guide shaft
7 Base
8 Hexagon socket plug
9 Housing
10 Snap Ring Shaft
11 Collar
12 Needle collar
13 Output shaft
15 Output cam
16 Cam retainer
17 Cam disc
18 Input cam
19 Auxiliary spring
20 Spring
21 Needle roller
22 Spring seat
23 R-Snap ring
24 Rack gear holder
25 Rack gear
26 Packing (cover part)
27 Cover
28 Handwheel
29 Dial Plate
30 Breather cap
34 Bearing cover
35 O-ring
36 Shim
37 Output shaft holder
38 Packing (on the output shaft side)
71 Input disc
74 Input shaft holder
76 Fan
77 Motor shaft
78 Snap Ring Shaft
79 Wave washer
80 Fan cover
81 Packing (on the input shaft side)
82 Motor
101 Vertical flange
102 Oil filling tube
103 Male and female elbow
104 Nipple, Elbow, Plug
105 Air release plug
A to G: Bearing
R, S: Oil seal

Disassembly and reassembly diagram for speed change section input shaft 2 NRXK-200B to 7500

* For the speed change section, refer to page 15.

NRXK

Bearing name number list

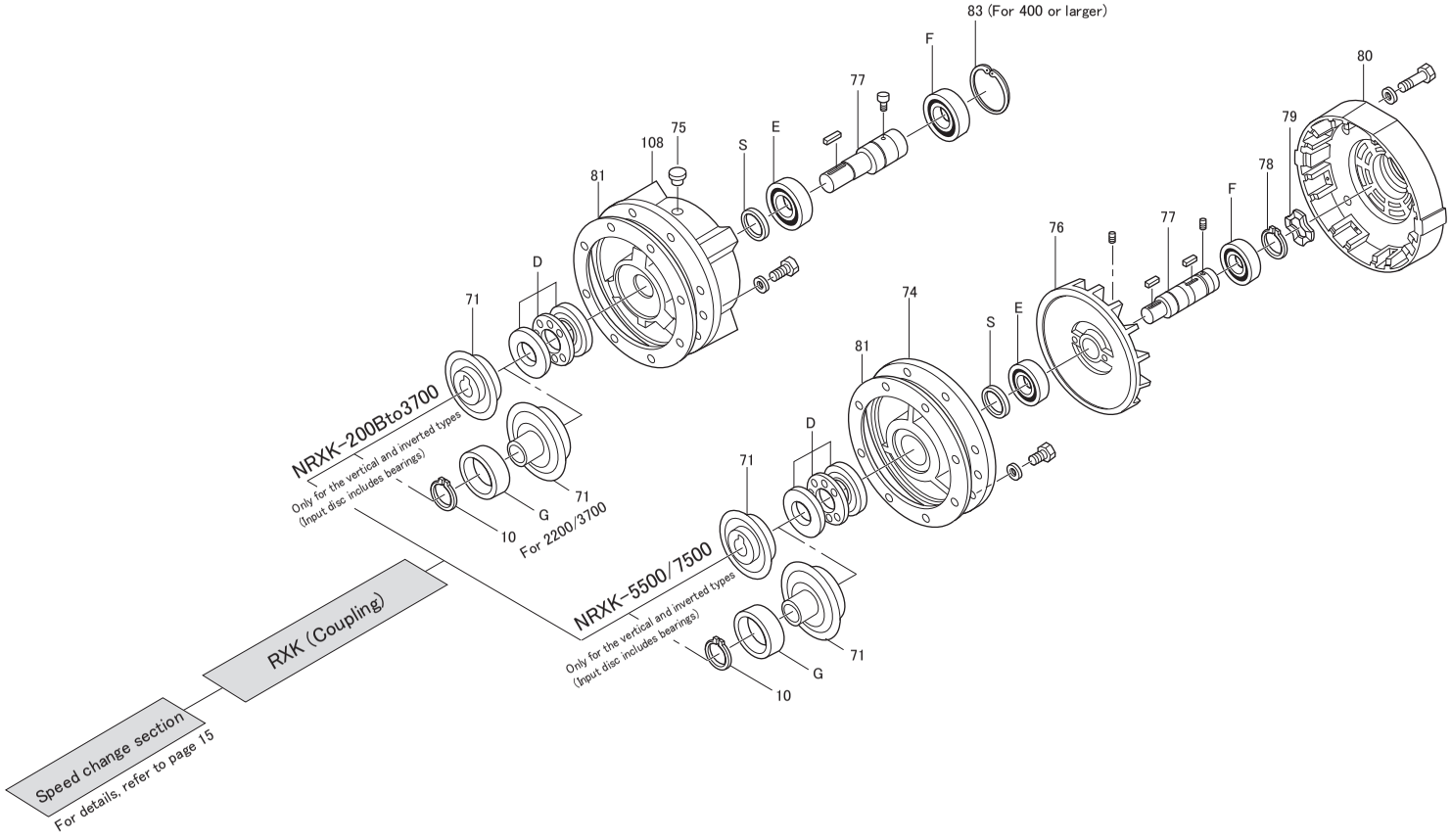
Model \ Bearing position	Input disc D	Input shaft E	Input shaft F	Input shaft G
200B/400B	51204	6005ZZ	6005ZZ	–
750	51305	6007ZZ	6007ZZ	–
1500	51405	6008ZZ	6008ZZ	–
2200	51407	6209ZZ	6209ZZ	6008
3700	51408	6209ZZ	6209ZZ	6010
5500/7500	51410	6210LLU	6211LLU	6011

D: Thrust bearing

E, F, G: Ball bearing (ZZ: metal seal type, LLU: contact rubber seal type)

Oil seal name number list

Model \ Seal position	Motor shaft S
200B/400B	S20358
750	S25408
1500	S25408
2200	S35508
3700	S40558
5500/7500	S507212



Parts list

10 Snap Ring Shaft
71 Input disc
74 Input shaft holder
75 Rubber plug
76 Fan
77 Motor shaft
78 Snap Ring Shaft
79 Wave washer
80 Fan cover
81 Packing (on the input shaft side)
83 R-Snap ring
D, E, F, G: Bearing
S: Oil seal
108 Motor flange

Disassembly and reassembly diagram for speed change section 3 NRXMK-11K to 18K

*For details on the speed reduction section, please refer to the disassembly and reassembly diagram for the respective speed reduction section on pages 19 and 22.

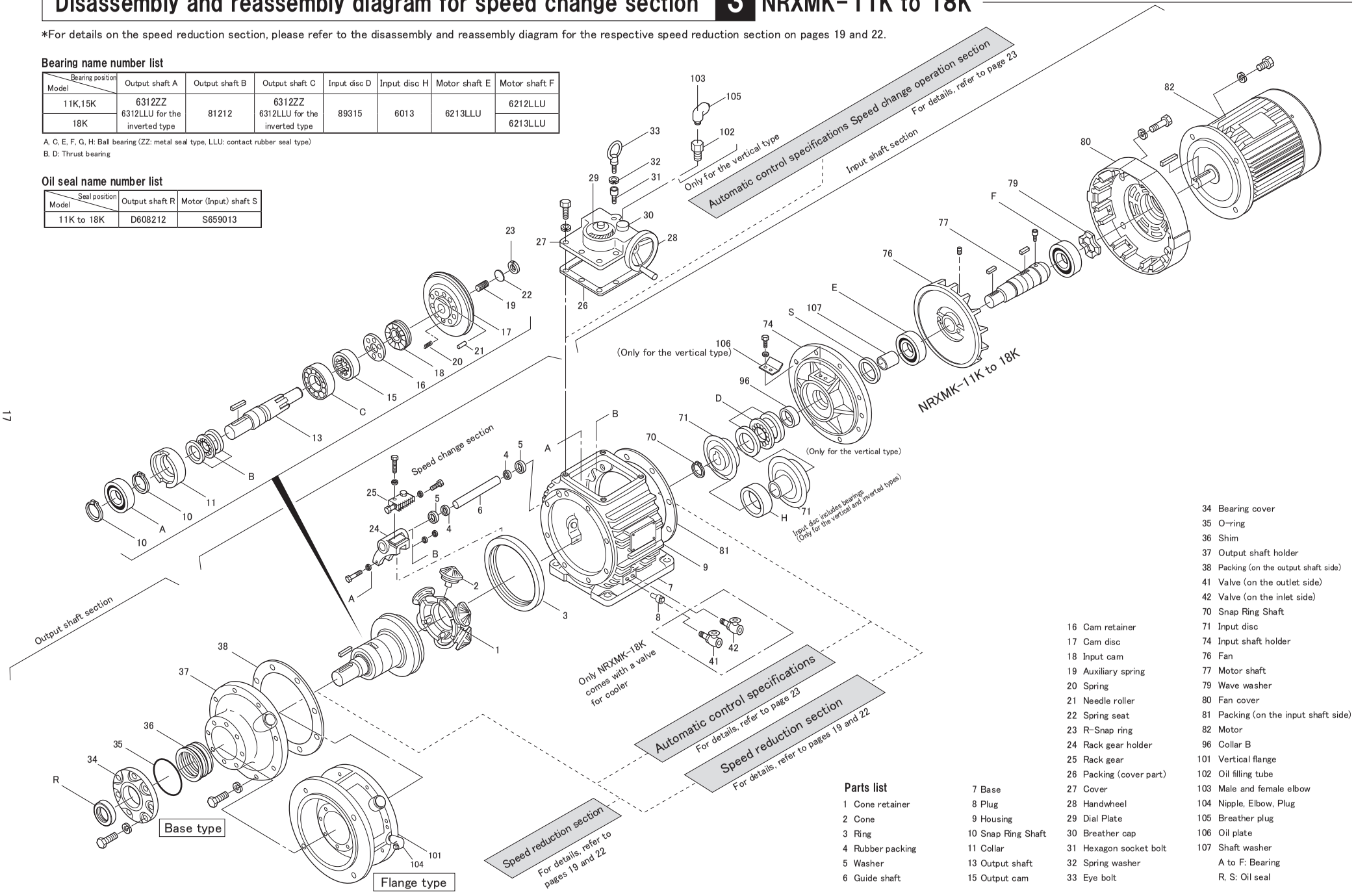
Bearing name number list

Bearing position / Model	Output shaft A	Output shaft B	Output shaft C	Input disc D	Input disc H	Motor shaft E	Motor shaft F
11K,15K	6312ZZ 6312LLU for the inverted type	81212	6312ZZ 6312LLU for the inverted type	89315	6013	6213LLU	6212LLU
18K							6213LLU

A, C, E, F, G, H: Ball bearing (ZZ: metal seal type, LLU: contact rubber seal type)
B, D: Thrust bearing

Oil seal name number list

Seal position / Model	Output shaft R	Motor (Input) shaft S
11K to 18K	D608212	S659013



Parts list

1 Cone retainer
2 Cone
3 Ring
4 Rubber packing
5 Washer
6 Guide shaft
7 Base
8 Plug
9 Housing
10 Snap Ring Shaft
11 Collar
13 Output shaft
15 Output cam
16 Cam retainer
17 Cam disc
18 Input cam
19 Auxiliary spring
20 Spring
21 Needle roller
22 Spring seat
23 R-Snap ring
24 Rack gear holder
25 Rack gear
26 Packing (cover part)
27 Cover
28 Handwheel
29 Dial Plate
30 Breather cap
31 Hexagon socket bolt
32 Spring washer
33 Eye bolt
34 Bearing cover
35 O-ring
36 Shim
37 Output shaft holder
38 Packing (on the output shaft side)
41 Valve (on the outlet side)
42 Valve (on the inlet side)
70 Snap Ring Shaft
71 Input disc
74 Input shaft holder
76 Fan
77 Motor shaft
79 Wave washer
80 Fan cover
81 Packing (on the input shaft side)
82 Motor
96 Collar B
101 Vertical flange
102 Oil filling tube
103 Male and female elbow
104 Nipple, Elbow, Plug
105 Breather plug
106 Oil plate
107 Shaft washer
A to F: Bearing
R, S: Oil seal

Disassembly and reassembly diagram for planetary reducer section 1 NRXM(K)-200B/400B-G3M, G5M / NRXM(K)-750 to 7500-G3, G6

*For the speed change section, refer to page 15.

200B/400B G3M/G5M

Bearing name number list

Model \ Bearing position	Output shaft 2A	Output shaft 2B	Input shaft 2C	Input shaft 2D
200B/400B	6205ZZ	6304ZZ	6204ZZ	6303

2A, 2B, 2C, 2D: Ball bearing (ZZ: metal seal type)
The bearing type on the input shaft 2C/2D for the inverted type is LLU when the sensor gear is attached.

Oil seal name number list

Model \ Seal position	Output shaft 2R	Input shaft 2S
200B/400B	D25408	S20358

750 to 7500 G3 / G6

Bearing name number list

The number of pieces is indicated in brackets.
The number of pieces without bracket indication is one.

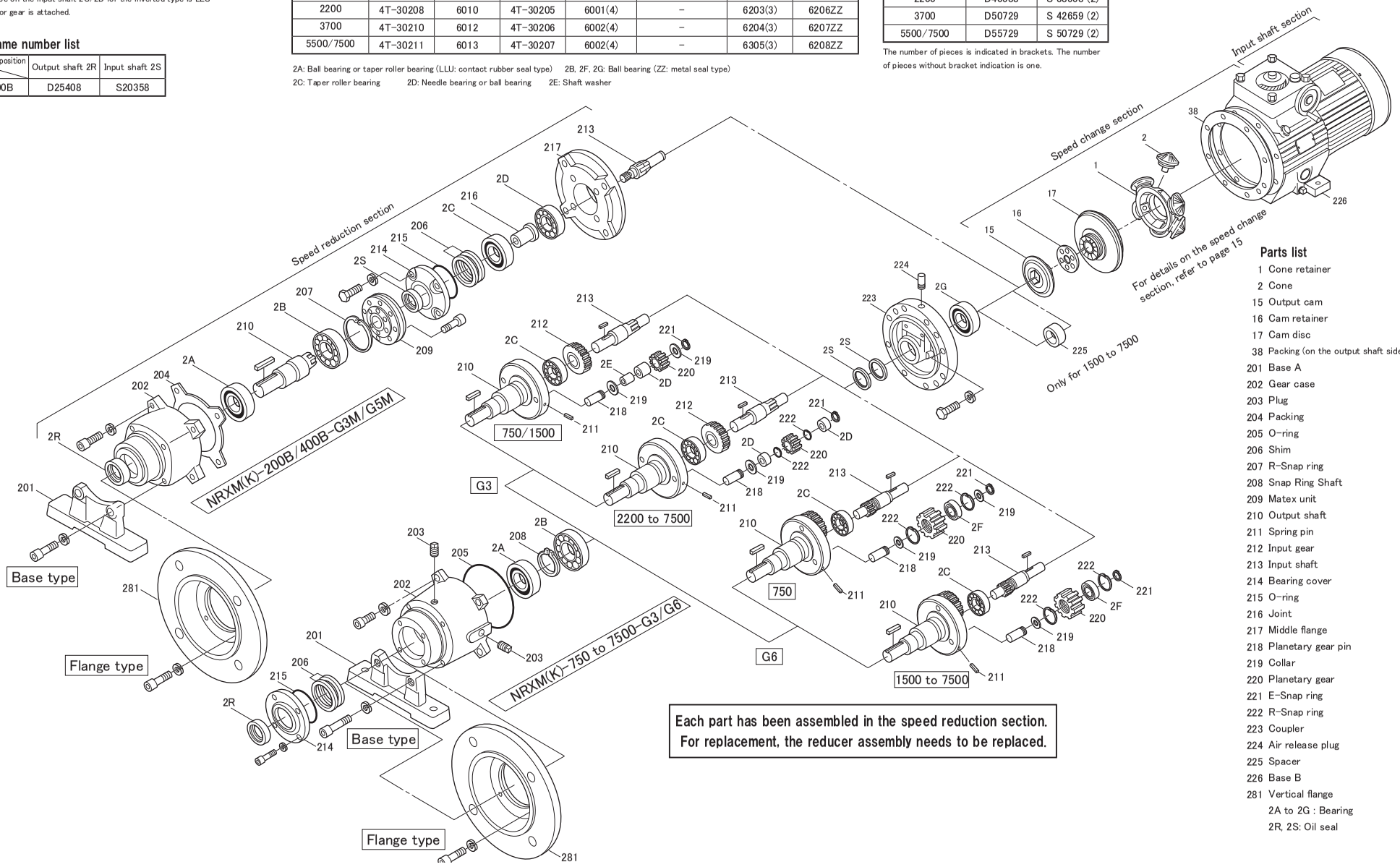
Model \ Bearing position	Output shaft 2A	Output shaft 2B	Output shaft 2C	G3		G6	Input shaft 2G
				Planetary gear 2D	Planetary gear 2E	Planetary gear 2F	
750	6206LLU	6007	4T-30203	HK 1212(2)	IR 8×12 ×12.5(2)	6200(3)	6203ZZ
1500	6207LLU	6009	4T-30204	HK 1516(2)	IR 12 ×15 ×16.5(2)	6202(3)	6205ZZ
2200	4T-30208	6010	4T-30205	6001(4)	–	6203(3)	6206ZZ
3700	4T-30210	6012	4T-30206	6002(4)	–	6204(3)	6207ZZ
5500/7500	4T-30211	6013	4T-30207	6002(4)	–	6305(3)	6208ZZ

2A: Ball bearing or taper roller bearing (LLU: contact rubber seal type) 2B, 2F, 2G: Ball bearing (ZZ: metal seal type)
2C: Taper roller bearing 2D: Needle bearing or ball bearing 2E: Shaft washer

Oil seal name number list

Model \ Seal position	Output shaft 2R	Input shaft 2S
750	D30458	S 25408 (2)
1500	D35508	S 32458 (2)
2200	D40588	S 38558 (2)
3700	D50729	S 42659 (2)
5500/7500	D55729	S 50729 (2)

The number of pieces is indicated in brackets. The number of pieces without bracket indication is one.



Parts list

1 Cone retainer
2 Cone
15 Output cam
16 Cam retainer
17 Cam disc
38 Packing (on the output shaft side)
201 Base A
202 Gear case
203 Plug
204 Packing
205 O-ring
206 Shim
207 R-Snap ring
208 Snap Ring Shaft
209 Matex unit
210 Output shaft
211 Spring pin
212 Input gear
213 Input shaft
214 Bearing cover
215 O-ring
216 Joint
217 Middle flange
218 Planetary gear pin
219 Collar
220 Planetary gear
221 E-Snap ring
222 R-Snap ring
223 Coupler
224 Air release plug
225 Spacer
226 Base B
281 Vertical flange
2A to 2G : Bearing
2R, 2S: Oil seal

Each part has been assembled in the speed reduction section. For replacement, the reducer assembly needs to be replaced.

Disassembly and reassembly diagram for planetary and pinion reducer section 2

NRXMK-11K to 18K-G3,G5

*For the speed change section, refer to page 17.

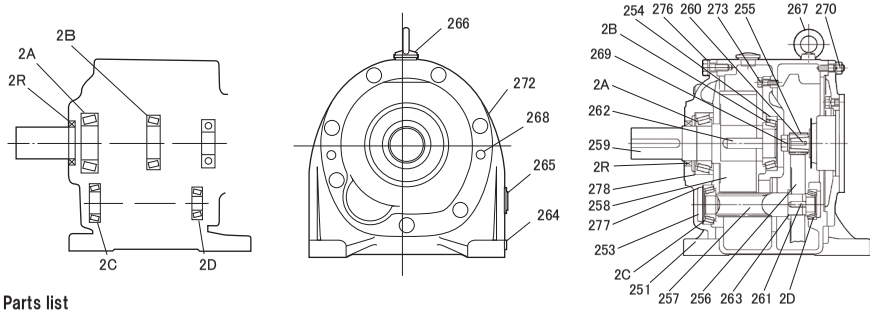
Bearing name number list

Bearing position / Speed drive model	Reduction ratio	Output shaft 2A	Output shaft 2B	Pinion shaft 2C	Pinion shaft 2D
11K to 18K	G3/G5	HR32216J	HR32213J	HR30308J	HR32207J

2A, 2B, 2C, 2D: Tapered roller bearing

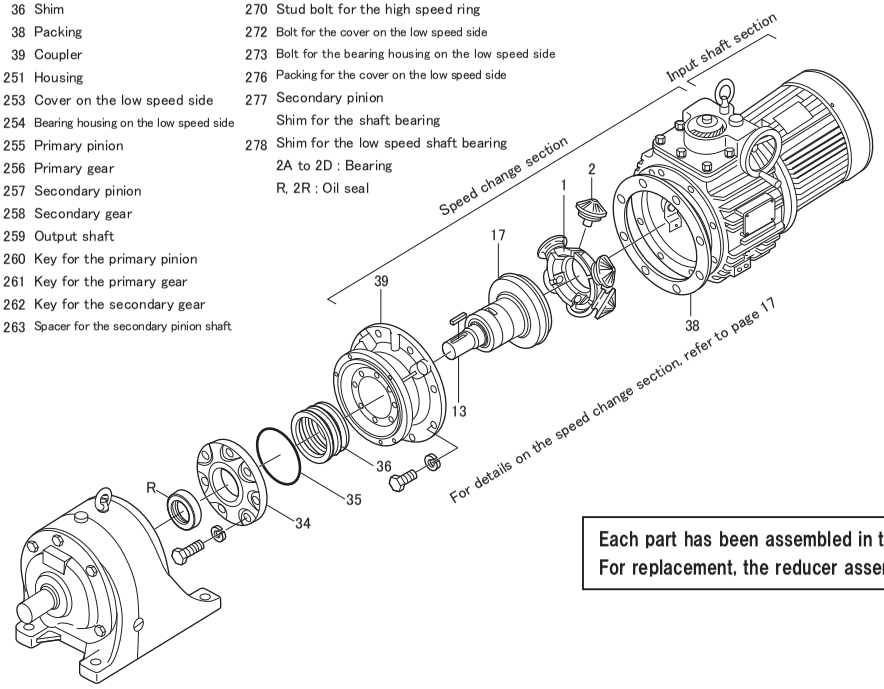
Oil seal name number list The number of pieces is indicated in brackets. The number of pieces without bracket indication is one.

Seal position / Speed drive model	Reduction ratio	Output shaft R	Output shaft 2R
11K to 18K	G3 / G5	D608212(2)	D8010513



Parts list

1 Cone retainer
2 Cone
13 Speed drive output shaft
17 Cam disc (on the output shaft side)
34 Bearing cover
35 O-ring
36 Shim
38 Packing
39 Coupler
251 Housing
253 Cover on the low speed side
254 Bearing housing on the low speed side
255 Primary pinion
256 Primary gear
257 Secondary pinion
258 Secondary gear
259 Output shaft
260 Key for the primary pinion
261 Key for the primary gear
262 Key for the secondary gear
263 Spacer for the secondary pinion shaft
264 Drain plug
265 Oil gauge
266 Vent hole
267 Eye bolt
268 Pin for the cover on the low speed side
269 Locknut for the primary pinion
270 Stud bolt for the high speed ring
272 Bolt for the cover on the low speed side
273 Bolt for the bearing housing on the low speed side
276 Packing for the cover on the low speed side
277 Secondary pinion
Shim for the shaft bearing
278 Shim for the low speed shaft bearing
2A to 2D : Bearing
R, 2R : Oil seal



Each part has been assembled in the speed reduction section.
For replacement, the reducer assembly needs to be replaced.

Disassembly and reassembly diagram for worm reducer section

NRXM(K)-200B to 5500-W10/W20/W30

*For the speed change section, refer to page 15.

Bearing name number list The number of pieces is indicated in brackets. The number of pieces without bracket indication is one.

Model / Bearing position		Output shaft 4A	Worm shaft 4B	Worm shaft 4C
200B	W10	6204LLU(2)	7203 BDF(2)	6905
	W20 / 30			
400B	W10			
	W20 / 30	6205LLU(2)	7204 BDF(2)	6005
750	W10			6204
	W20 / 30	6206LLU(2)	7304 BDF(2)	60/28
1500	W10			
	W20 / 30	6207LLU(2)	7305 BDF(2)	6007
2200	W10			
	W20 / 30	6208LLU(2)	7306 BDF(2)	6910
3700	W10			
	W20 / 30	6210LLU(2)	7308 BDF(2)	6210
5500	W10			
	W20 / 30	6212LLU(2)	7309BDF(2)	6211

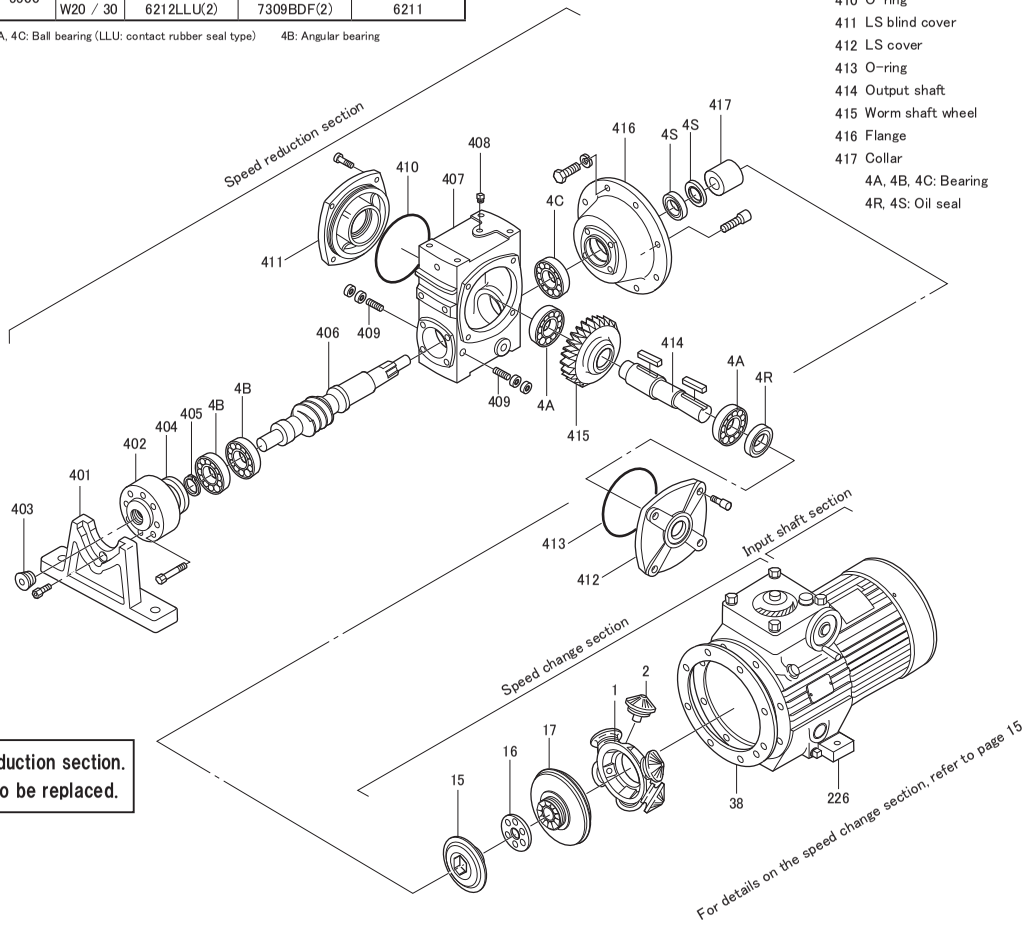
4A, 4C: Ball bearing (LLU: contact rubber seal type) 4B: Angular bearing

Oil seal name number list The number of pieces is indicated in brackets. The number of pieces without bracket indication is one.

Model / Seal position		Output shaft 4R	Worm shaft 4S
200B	W10 / 20 / 30	S 20358	S 25357 (2)
400B	W10		
	W20 / 30	S 25408	S 25357 (2)
750	W10		S 20358 (2)
	W20 / 30	S 305011	S 28408 (2)
1500	W10		
	W20 / 30	S 355511	S 35508 (2)
2200	W10		
	W20 / 30	S 406212	S 50659 (2)
3700	W10		
	W20 / 30	S 507212	S 50729 (2)
5500	W10		
	W20 / 30	S 608212	S557812(2)

Parts list

1 Cone retainer
2 Cone
15 Output cam
16 Cam retainer
17 Cam disc
38 Packing (on the output shaft side)
226 Base B
401 Stand
402 HS blind cover
403 Oil check plug
404 Shim
405 Snap Ring Shaft
406 Worm shaft
407 Housing
408 Oil filling plug
409 Hexagon socket set screw
410 O-ring
411 LS blind cover
412 LS cover
413 O-ring
414 Output shaft
415 Worm shaft wheel
416 Flange
417 Collar
4A, 4B, 4C: Bearing
4R, 4S: Oil seal



Disassembly and reassembly diagram for CORONET reducer section 1 N11 to N71 Frame A, B, C / NRXM(K)-200B to 1500-G□A, N□C

*For the speed change section, refer to page 15.

Bearing name number list

Bearing position / Frame size	Reduction ratio	Output shaft 3A	Output shaft 3B	Input shaft 3C	Input shaft 3G
A	G11	6206 ZZ	6008 ZZ	NF 153212	IR 121512
	G17				–
B	N11	6307 ZZ	6209 ZZ	NF 153212	IR 121512
	N17,29,35,47,59,71				–
C	N11	6309 ZZ	6212 ZZ	NF 2204	IR 172016
	N17,29,35,47,59,71				–

3A, 3B, 3E: Ball bearing (ZZ: metal seal type)
3C: Roller bearing 3F: Thrust bearing 3G: Shaft washer
NRXM(K)-200B/400B
*The bearing type on the input shaft 3E for the inverted type is LLU when the sensor gear is attached.

Bearing name number list

Bearing position / Speed drive model	Input shaft 3E	Input shaft 3F
200B	6304ZZ	–
400B	6304ZZ	–
750	6305 ZZ	51204
1500	6306 ZZ	51206

Oil seal name number list

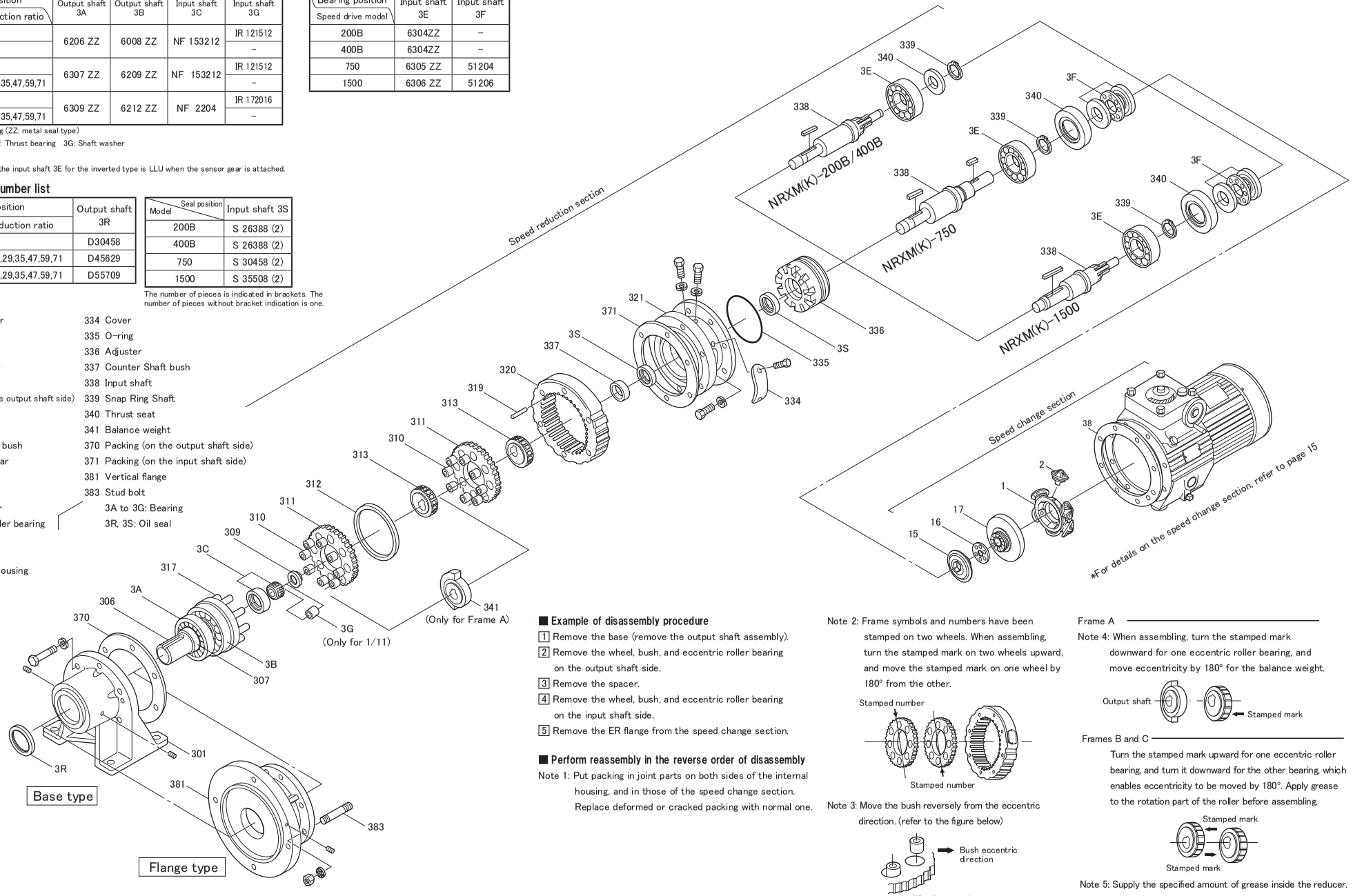
Seal position / Frame size	Reduction ratio	Output shaft 3R
A	G11,17	D30458
B	N11,17,29,35,47,59,71	D45629
C	N11,17,29,35,47,59,71	D55709

Model / Seal position	Input shaft 3S
200B	S 26388 (2)
400B	S 26388 (2)
750	S 30458 (2)
1500	S 35508 (2)

The number of pieces is indicated in brackets. The number of pieces without bracket indication is one.

Parts list

1	Cone retainer	334	Cover
2	Cone	335	O-ring
15	Output cam	336	Adjuster
16	Cam retainer	337	Counter Shaft bush
17	Cam disc	338	Input shaft
38	Packing (on the output shaft side)	339	Snap Ring Shaft
301	Base	340	Thrust seat
306	Output shaft	341	Balance weight
307	Output shaft bush	370	Packing (on the output shaft side)
309	Distance collar	371	Packing (on the input shaft side)
310	Bush	381	Vertical flange
311	Wheel	383	Stud bolt
312	Wheel spacer		3A to 3G: Bearing
313	Eccentric roller bearing		3R, 3S: Oil seal
317	Carrier pin		
319	Internal pin		
320	Internal pin housing		
321	ER flange		



■ Example of disassembly procedure

1. Remove the base (remove the output shaft assembly).
2. Remove the wheel, bush, and eccentric roller bearing on the output shaft side.
3. Remove the spacer.
4. Remove the wheel, bush, and eccentric roller bearing on the input shaft side.
5. Remove the ER flange from the speed change section.

■ Perform reassembly in the reverse order of disassembly

Note 1: Put packing in joint parts on both sides of the internal housing, and in those of the speed change section. Replace deformed or cracked packing with normal one.

Note 2: Frame symbols and numbers have been stamped on two wheels. When assembling, turn the stamped mark on two wheels upward, and move the stamped mark on one wheel by 180° from the other.

Note 3: Move the bush reversely from the eccentric direction. (refer to the figure below)

Frame A

Note 4: When assembling, turn the stamped mark downward for one eccentric roller bearing, and move eccentricity by 180° for the balance weight.

Frames B and C

Turn the stamped mark upward for one eccentric roller bearing, and turn it downward for the other bearing, which enables eccentricity to be moved by 180°. Apply grease to the rotation part of the roller before assembling.

Note 5: Supply the specified amount of grease inside the reducer.

Disassembly and reassembly diagram for CORONET reducer section 2 N11 to N71 Frame D, E, F / NRXM(K) -1500 to 7500-N□D, N□E, N□F

＊For the speed change section, refer to page 15.

Bearing name number list

Bearing position / Frame size	Reduction ratio	Output shaft 3A	Input shaft 3C	Input shaft 3D
D	N11	6213NR	NF 2204	6010
	N17,29,35,47,59,71		NF 2305	6210
E	N11	6315NR	NF 2305	6015
	N17,29,35,47,59,71		NF 2306	
F	N11,17	6319NR	NF 2306	6216
	N29,35,47,59,71		NF 2308	

3A, 3D, 3E: Ball bearing (ZZ: metal seal type, NR: with snap ring)
3C: Roller bearing 3F: Thrust bearing
3A: LLU for the inverted type
3D: ZZ for the vertical type

Bearing name number list

Bearing position / Speed drive model	Input shaft 3E	Input shaft 3F
1500	6306 ZZ	51206
2200	6307 ZZ	51207
3700	6307 ZZ	51307
5500/7500	6309 ZZ	51308

Oil seal name number list

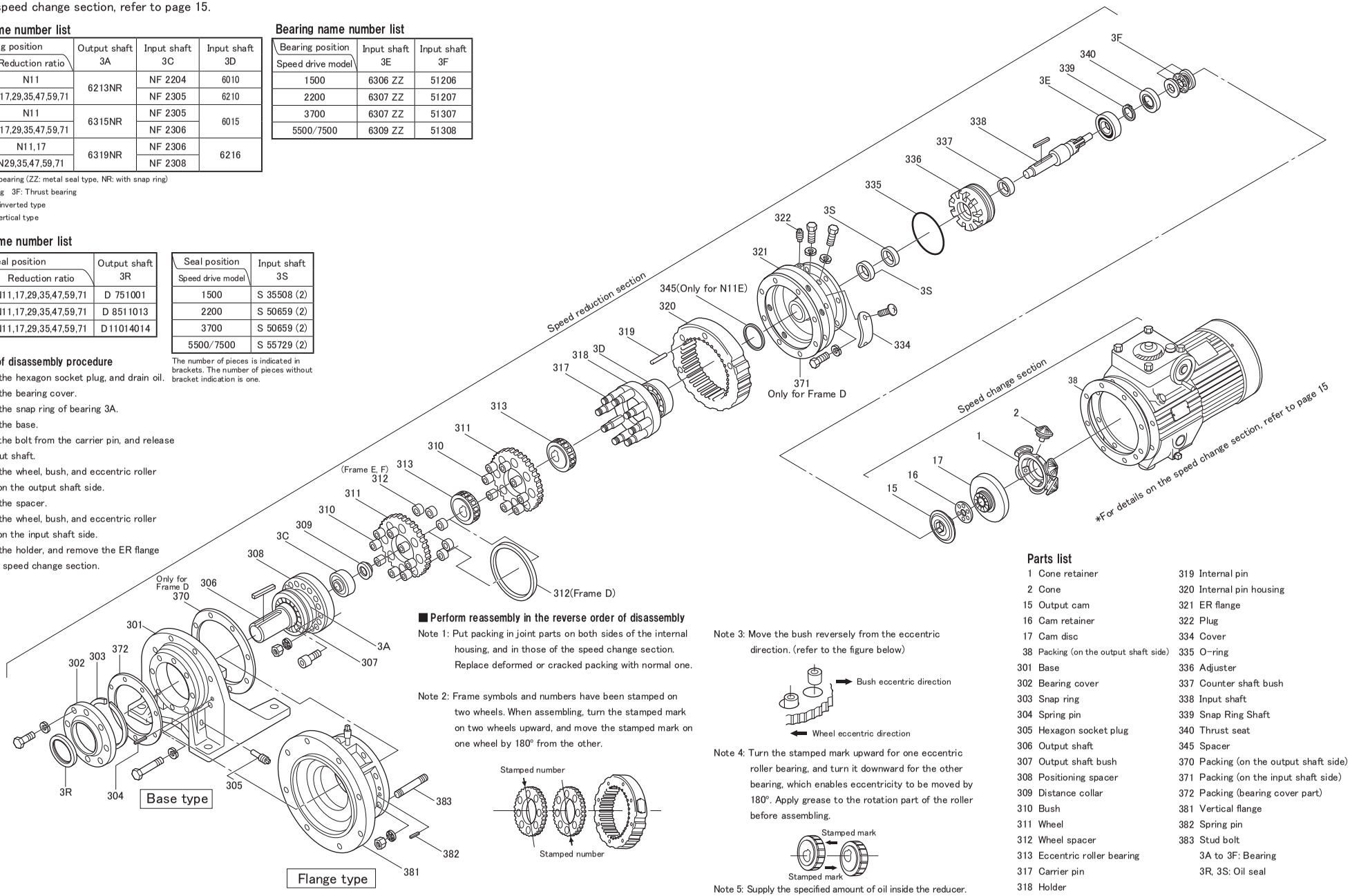
Seal position / Frame size	Reduction ratio	Output shaft 3R
D	N11,17,29,35,47,59,71	D 751001
E	N11,17,29,35,47,59,71	D 8511013
F	N11,17,29,35,47,59,71	D11014014

Seal position / Speed drive model	Input shaft 3S
1500	S 35508 (2)
2200	S 50659 (2)
3700	S 50659 (2)
5500/7500	S 55729 (2)

The number of pieces is indicated in brackets. The number of pieces without bracket indication is one.

■ Example of disassembly procedure

1. Remove the hexagon socket plug, and drain oil.
2. Remove the bearing cover.
3. Remove the snap ring of bearing 3A.
4. Remove the base.
5. Remove the bolt from the carrier pin, and release the output shaft.
6. Remove the wheel, bush, and eccentric roller bearing on the output shaft side.
7. Remove the spacer.
8. Remove the wheel, bush, and eccentric roller bearing on the input shaft side.
9. Remove the holder, and remove the ER flange from the speed change section.



■ Perform reassembly in the reverse order of disassembly

Note 1: Put packing in joint parts on both sides of the internal housing, and in those of the speed change section. Replace deformed or cracked packing with normal one.

Note 2: Frame symbols and numbers have been stamped on two wheels. When assembling, turn the stamped mark on two wheels upward, and move the stamped mark on one wheel by 180° from the other.

Note 3: Move the bush reversely from the eccentric direction. (refer to the figure below)

Note 4: Turn the stamped mark upward for one eccentric roller bearing, and turn it downward for the other bearing, which enables eccentricity to be moved by 180°. Apply grease to the rotation part of the roller before assembling.

Note 5: Supply the specified amount of oil inside the reducer.

Parts list

1	Cone retainer	319	Internal pin
2	Cone	320	Internal pin housing
15	Output cam	321	ER flange
16	Cam retainer	322	Plug
17	Cam disc	334	Cover
38	Packing (on the output shaft side)	335	O-ring
301	Base	336	Adjuster
302	Bearing cover	337	Counter shaft bush
303	Snap ring	338	Input shaft
304	Spring pin	339	Snap Ring Shaft
305	Hexagon socket plug	340	Thrust seat
306	Output shaft	345	Spacer
307	Output shaft bush	370	Packing (on the output shaft side)
308	Positioning spacer	371	Packing (on the input shaft side)
309	Distance collar	372	Packing (bearing cover part)
310	Bush	381	Vertical flange
311	Wheel	382	Spring pin
312	Wheel spacer	383	Stud bolt
313	Eccentric roller bearing		3A to 3F: Bearing
317	Carrier pin		3R, 3S: Oil seal
318	Holder		

Disassembly and reassembly diagram for inscribed planetary reducer section 3 C11 to C87 Frame H, L NRXMK-11K to 18K-C□H, C□L

＊For the speed change section, refer to page 17.

Bearing name number list

Bearing position / Frame size and reduction ratio		Flange section ⑭	Flange section ⑮	Flange section ⑯	Speed reduction section ②	Speed reduction section ⑤	Speed reduction section ⑦	Speed reduction section ⑧
H	C11,21,29,43,87	6312	6312ZZ	81212	6408	85UZS89T2	6221NR	6026
L	C11,21,29,43,87	6312	5312	81212	NJ313EV3	E-105UZS223	23026BNRC2	NUP228C2

Oil seal name number list The number of pieces is indicated in brackets. The number of pieces without bracket indication is one.

Seal position / Frame size and reduction ratio		Flange section ⑳	Speed reduction section ⑯
H	C11,21,29,43,87	S8010513(2)	D12015516
L	C11,21,29,43,87	S8010513(2)	D16019016

■ Example of disassembly procedure

・Place the speed reduction section down, remove upper bolts, and separate the low speed section.

Disassembly procedure for the speed reduction section

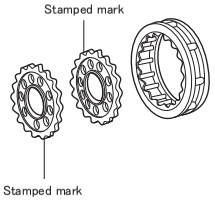
Inner roller ㊼ ▶ Wheels ㊸ ▶ Spacer ring ㊽ ▶ Snap Ring Shaft ① ▶ Bearing ② ▶ Distance piece B ③, End bracket ④ ▶ Eccentric Roller Bearing ㊷ (with bearing ⑤) ▶ Curve disc ㊸ ▶ End bracket ④ ▶ Size ㊶ ▶ Outer pin ㊹ ▶ Outer roller ㊺ ▶

Disassembly procedure for the low speed section

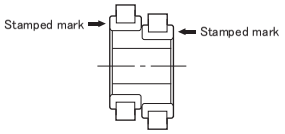
Cover (Gland) ⑰ ▶ Snap ring shaft for bearing ⑦ ▶ Low speed shaft ⑥ (with ⑦⑩⑧⑱)

■ Perform reassembly in the reverse order of disassembly

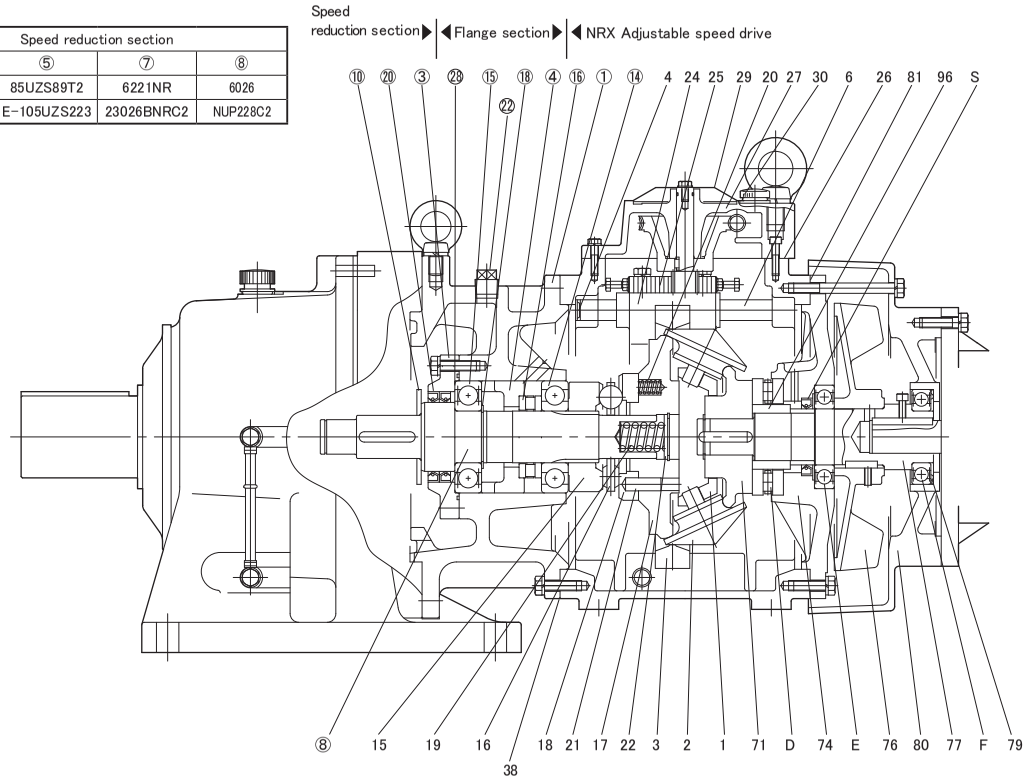
Note 1 : Frame symbols and numbers have been stamped on two wheels. When assembling, turn the stamped mark on two wheels up, and move the stamped mark on one wheel by 180° from the other.



Note 2:Place both stamped surfaces outward, respectively, and assemble into the Eccentric Roller Bearing ㊷.



Note 3: Worn or damaged oil seals, collars, and/or packing, etc. could result in oil leakage. Be sure to replace them with new ones.



Parts list

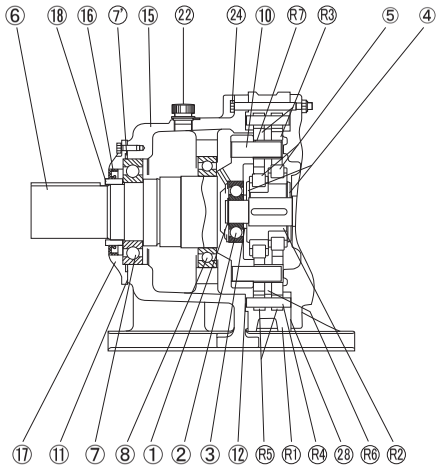
■ Speed change section

1 Cone retainer
2 Cone
3 Ring
4 Rubber packing
6 Guide shaft
15 Output cam
16 Cam retainer
17 Cam disc
18 Input cam
19 Auxiliary spring
20 Spring
21 Needle roller
22 Spring seat
24 Rack gear holder
25 Rack gear
26 Cover packing
27 Cover
29 Dial Plate
30 Breather cap
38 Packing (on the output shaft side)
71 Input disc
74 Input shaft holder
76 Fan
77 Motor shaft
79 Wave washer
80 Fan cover
81 Packing (on the input shaft side)
96 Collar B
D Thrust roller bearing
E Ball bearing
F Ball bearing
S Oil seal

■ Flange section

① Flange
③ Bearing cover
④ Collar
⑧ Counter Shaft
⑩ End bracket
⑭ Ball bearing
⑮ Ball bearing
⑯ Thrust roller bearing
⑱ Snap Ring Shaft
⑳ Oil seal
㉒ Plug
㉘ Shim

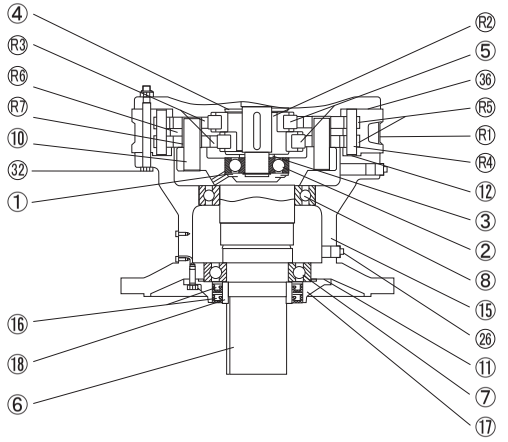
■ Speed reduction section (horizontal type)



Parts list

① Snap Ring Shaft
② Bearing
③ Distance piece B
④ End bracket
⑤ Bearing
⑥ Low speed shaft
⑦ Bearing
⑦ Snap Ring Shaft
⑧ Bearing
⑩ Inner pin
⑪ Packing
⑫ Packing
⑮ Outer side cover
⑯ Oil seal
⑰ Cover
⑱ Collar
㉒ Oil filling plug
㉔ Upper bolt
㉘ Packing
㊶ Frame
㊷ Eccentric Roller Bearing
㊸ Wheels
㊹ Outer pin
㊺ Outer roller
㊽ Spacer ring
㊼ Inner roller

■ Speed reduction section (vertical type)

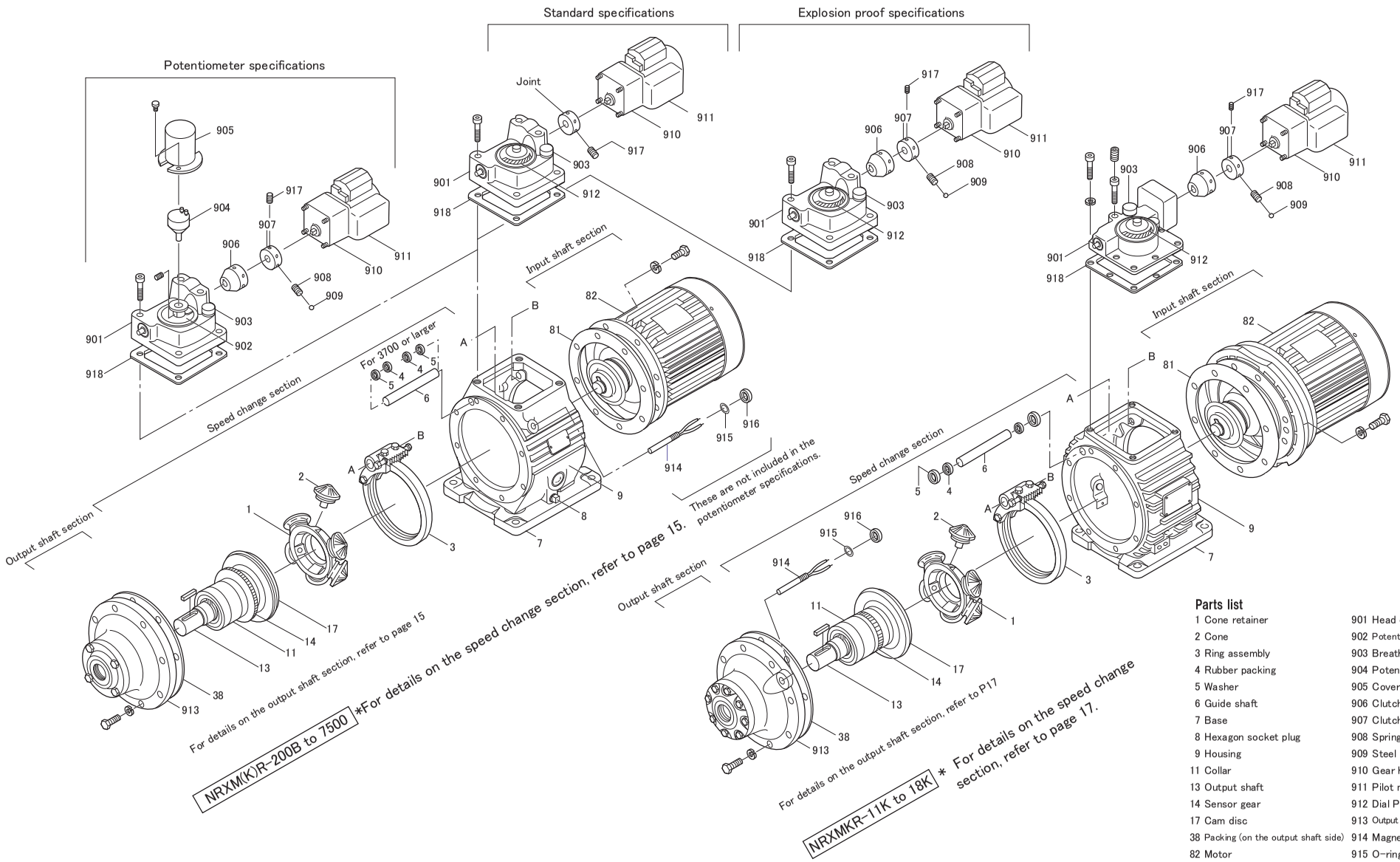


Parts list

① Snap Ring Shaft
② Bearing
③ Distance piece B
④ End bracket
⑤ Bearing
⑥ Low speed shaft
⑦ Bearing
⑧ Bearing
⑩ Inner pin
⑪ Packing
⑫ Packing
⑮ Outer cover with flange
⑯ Oil seal
⑰ Gland
⑱ Collar
㉖ Plug
㉜ Upper bolt
㊳ Packing
㊶ Frame
㊷ Eccentric Roller Bearing
㊸ Wheels
㊹ Outer pin
㊺ Outer roller
㊽ Spacer ring
㊼ Inner roller

Disassembly and reassembly diagram for automatic control specifications speed change section

NRXM(K)R-200B to 18K



Parts list

1 Cone retainer	901 Head cover
2 Cone	902 Potentiometer mounting base
3 Ring assembly	903 Breather cap
4 Rubber packing	904 Potentiometer
5 Washer	905 Cover
6 Guide shaft	906 Clutch A
7 Base	907 Clutch B
8 Hexagon socket plug	908 Spring
9 Housing	909 Steel ball
11 Collar	910 Gear head
13 Output shaft	911 Pilot motor
14 Sensor gear	912 Dial Plate
17 Cam disc	913 Output shaft holder assembly
38 Packing (on the output shaft side)	914 Magnetic sensor
82 Motor	915 O-ring
81 Packing (on the input shaft side)	916 Round nut
	917 Set bolt
	918 Packing (head cover part)

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Nidec Shimpo Corporation change its company name to Nidec Drive Technology Corporation on April 1, 2023.