2-4 Installing

- Avoid using the product in a place directly exposed to rain or water.
  - Consult us in advance if you use it outdoors or in a place exposed to dust or water.
- Install the product in an area with an ambient temperature of between 0ºC and 40ºC.
- Securely connect the product using bolts on a solid surface that is not prone to vibration.
- Install the product in a way that provides easy access for inspection and maintenance.

2-5 Connection to the output shaft side

- Any gear, pulley, and sprocket should be mounted to the output flange properly so that it allows proper centering onto the output shaft. Also, mount these items so that it does not create an excessive thrust load.
- Any coupling and sprocket should be mounted to the output shaft properly so that it does add an excessive thrust load. Do not hit the shaft hard when mounting such a component. Doing so could result in damage to the bearings and/or internal components of the reducer.
- High backlash in the shaft or key of the connection coupling could result in abrasion damage.
- Ensure proper centering before connection.

2-6 Precautions before starting operation

- The reducer is filled with the proper amount of lubricant and shipped from the factory. You can use it right out of the box.
- At initial operation, confirm the rotating direction of the output shaft and gradually apply the load.

2-7 Precautions during operation

- Be careful to avoid operation overload.
- Adjust the input rotation speed to within the specified number of rotations.
- If the following events occur, stop operation immediately and inspect the reducer.
  - The temperature suddenly increases.
  - An abnormal loud noise is suddenly generated.
  - The rotation speed suddenly becomes unstable.
- The following results are possible causes of those events. Take necessary measures promptly.
  - Operation is overloaded.
  - Bearings, gears, and/or transmission surfaces get damaged.
  - There are some problems such as poor connection with other machines.

3-1 Lubricant management

- The grease cannot be changed.

4-1 Daily inspection

- Check to ensure that the reducer housing temperature is not extremely high during operation.
  (Max. 90ºC)
- Check to ensure that an abnormal noise is not generated in bearings and gears.
- Check to ensure that an abnormal vibration is not generated from the reducer.
  ＊ If any of these abnormal events occur, stop operation immediately and contact us.
- Check to ensure that there is no oil leakage.
  ＊ If an oil leakage occurs, contact us.

4-2 Periodical inspection

- Check to ensure that the load condition and rotation are appropriate.
- Check to ensure that pulleys, sprockets, and reducer mounting bolts are not loose.
- Inspect and maintain major parts.
  ＊ If any of these abnormal events occur, stop operation immediately and contact us.

NIDEC DRIVE TECHNOLOGY CORPORATION

〈Web Page Information〉 Please scan the QR code or access the URL below.

Contact Us
https://www.nidec.com/en/nidec-drivetechnology/inquiry/

Sales Offices
https://www.nidec.com/en/nidec-drivetechnology/corporate/network/sales/

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

English

Nidec
All for dreams

348-23-022-2

High Rigid Reducer for Servo Motor

ABLE REDUCER

VRXF・VRSF (Standard type/ LB type/ High precision type)/
VRG / EVRG / NEV / STH Series

Adapter type
VRXF / VRSF / VRG / VRS / VRB / VRT / VRL / PRE / PRF / EVS / EVB / EVL / EVT / STH Series

Operation Manual

Thank you for purchasing our ABLE reducers.

ABLE reducers were originally developed by NIDEC-DRIVE TECHNOLOGY CORPORATION and were specially designed for high perfomance servo motors. These products require precision fittings. Incorrect operation could cause not only insufficient performance but also malfunctions. Before using the product, please read this operation manual thoroughly and to become knowledgeable about the installation process, operation, and maintenance.

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

Precautions for installation

Do not touch the keyway on the input and output shafts with bare hands.
Your hands or fingers could be injured due to the keyway's sharp edges.

Do not hit the output shaft hard when mounting a coupling or sprocket.

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

Do not install the product in an area with an ambient temperature of 0ºC or less, or 40ºC or more.

Mount a safety cover on the rotor.
If you touch the rotor with your hands or fingers, you could be injured.

Before connecting to the motor, turn the power off and make sure that the motor has stopped.

If you use this product in a transportation device, or lifting and lowering device, provide protective equipment on the device side for safety puporses.

Heavy. Pay attention when transporting the product.
If you drop the product on your feet accidentally during transport or installation, you could be seriously injured.

In the event that oil leakage could occur due to a malfunction, mount an accessory item that would prevent contamination, for example an oil cup in food or chemical process machinery.

Precautions for operation

Do not touch the rotating parts during operation
Do not touch the output and input shafts.

Do not touch the product because it may become hot during operation
Touching the hot unit could result in burns.

Precautions for inspection and maintenance

Turn off the power during inspection
To prevent electric shock, confirm the motor has completely stopped before inspection and/or repair.

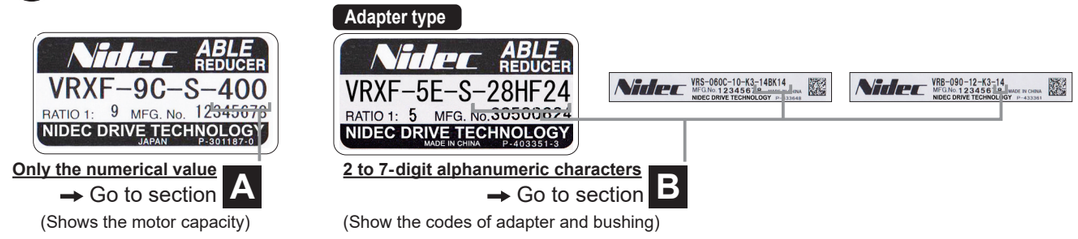
Do not touch the product during operation or immediately after operation
The housing temperature will not decrease immediately after the operation stops. Confirm that the temperature of the product has decreased before touching it for inspection and/or disassembly.

Precautions for storage

For temporary storage, keep to the following directions when storing the product.
(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 and cover with plastic sheets to avoid direct exposure to rainwater or external air(take the necessary measures to avoid damage build-up of condensation and/or rust).

Identify the product correctly.

* The nameplate is attached to the main unit.



Only the numerical value → Go to section **A**
(Shows the motor capacity)

2 to 7-digit alphanumeric characters → Go to section **B**
(Show the codes of adapter and bushing)

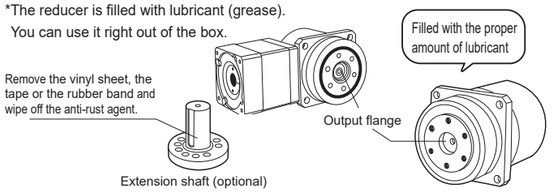
A **VRG / EVRG Series** | **VRXF・VRSF:** Standard type / LB type / High precision type **/ STH Series** | **NEV Series**

B **Adapter type** **VRXF / VRSF / VRG / VRS / VRB / VRL / VRT / PRE / PRF / EVS / EVB / EVL / EVT / STH Series**

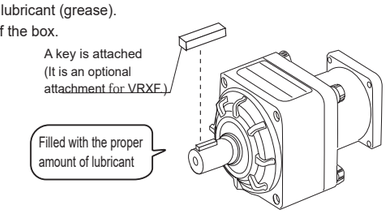
1-1 When the reducer arrives...

Confirm that the model number of the reducer you ordered matches the one on the nameplate of that delivered.

Wipe off the anti-rust agent applied to the surface of the reducer output flange.
*A key is secured using tape or a rubber band on the optional extension shaft.
Remove the vinyl sheet, the tape or the rubber band and wipe off the anti-rust agent on the surface.
*The reducer is filled with lubricant (grease).
You can use it right out of the box.

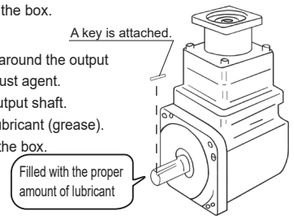


Remove the vinyl sheet, the tape or the rubber band wrapped around the output shaft and wipe off the applied anti-rust agent.
*A key is attached to the output shaft. (It is an optional attachment for VRXF.)
*The reducer is filled with lubricant (grease).
You can use it right out of the box.

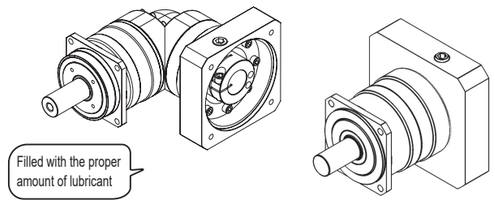


[Hollow shaft type]
Wipe off the anti-rust agent applied to the through hole of the reducer.
*The reducer is filled with lubricant (grease).
You can use it right out of the box.

[Solid shaft type]
Remove the tape wrapped around the output shaft and wipe off the anti-rust agent.
*A key is attached to the output shaft.
*The reducer is filled with lubricant (grease).
You can use it right out of the box.



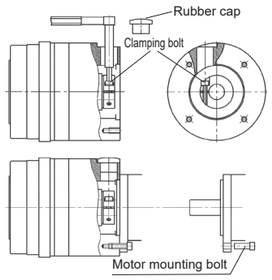
Wipe off the anti-rust agent applied to the input and output shafts of the reducer.
*The reducer is filled with lubricant (grease). You can use it right out of the box.



2-1 Mounting a servo motor

- When you mount a servo motor in your company, keep to the following directions.
- Motor mounting flanges of ABLE reducers have different dimensions depending on the servo motor to be mounted. Motors other than those specified cannot be mounted. Be sure to mount the servo motor you specified at the time of order.
- An anti-rust agent may have been applied to the output shaft on a servo motor.

[VRG / EVRG Series Motor mounting procedure]



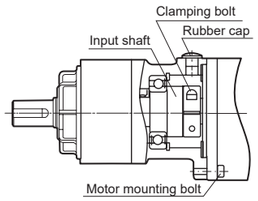
[Table 1 Bolt tightening torque]

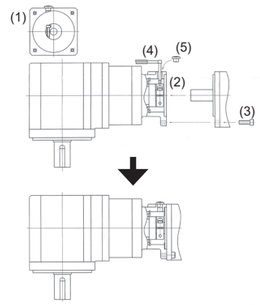
Bolt size	Motor mounting bolt		Clamping bolt	
	N・m	kgf・m	N・m	kgf・m
M3	1.0	0.10	1.8	0.18
M4	2.3	0.23	4.3	0.44
M5	4.7	0.48	8.7	0.89
M6	8.0	0.82	15	1.5
M8	19	1.9	36	3.7
M10	38	3.9	72	7.3
M12	67	6.8		

When mounting a keyless motor

[Table 2 Bolt tightening torque]

Bolt size	VRXF/VRSF/NEV/STH		VRXF/STH		VRSF/NEV	
	Motor mounting bolt		Clamping bolt			
	N・m	kgf・m	N・m	kgf・m	N・m	kgf・m
M3	1.1	0.11	–		1.5	0.15
M4	2.5	0.26	4.3	0.44	3.5	0.36
M5	5.1	0.52	8.7	0.89	7.1	0.72
M6	8.7	0.89	15	1.5	12	1.22
M8	21	2.1			30	3.06
M10	42	4.3	–		59	6.02
M12	72	7.3			–	
M16	134	14				



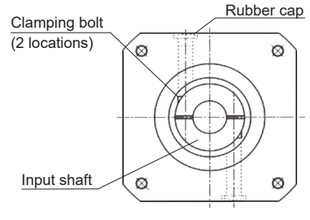


(1) Wipe off the anti-rust agent and oil on the mounting surface toward the motor shaft.
(2) Remove the rubber cap. Turn the input shaft and align the clamping bolt head to the rubber cap hole. At this step, be sure that the clamping bolt is loose.
(3) Insert the reducer motor shaft into the input shaft carefully. (Check to ensure it can be inserted without it getting stuck) Be careful not to tilt the motor when inserting the key.
(4) Mount the motor shaft to the reducer without any gaps, and tighten the motor mounting bolt to the specified torque using a torque wrench*.
(5) Tighten the clamping bolt of the input shaft to the specified torque using a torque wrench*.
(6) Mount the rubber cap. The procedure is complete.

***The bolt tightening torque varies depending on the series.**

VRG / EVRG Series	[Table 1]
VRXF / STH Series (keyless)	[Table 2]
VRSF / NEV Series (keyless)	[Table 2]
VRXF / VRSF / NEV Series (with keyway)	[Table 3]

***In some models there are 2 Clamping bolts in 2 locations.**

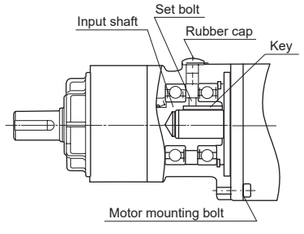


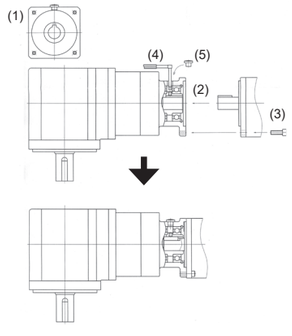
For the models with 2 Clamping bolts at the reducer motor shaft, tighten both bolts equally to the specified torque. The tightening torque of the Clamping bolt is specified in (Table 2).

When mounting a key motor

[Table 3 Bolt tightening torque]

Bolt size	Motor mounting bolt		Set bolt	
	N·m	kgf·m	N·m	kgf·m
M3	1.1	0.11	–	–
M4	2.5	0.26	2.0	0.20
M5	5.1	0.52	4.3	0.44
M6	8.7	0.89	7.3	0.74
M8	21	2.1	16.8	1.71
M10	42	4.3	–	
M12	72	7.3		
M16	134	14		

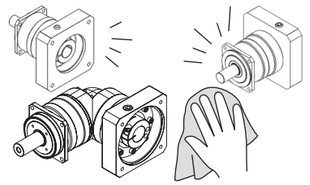




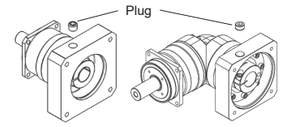
(1) Remove the rubber cap. Turn the input shaft and align the keyway to the rubber cap hole.
(2) Apply an anti-baking agent (molybdenum disulfide etc.) to the motor shaft, and carefully insert the key along the keyway into the input shaft. (Check to ensure it can be inserted without it getting stuck) Be careful not to tilt the motor when inserting the key.
(3) Mount the motor to the reducer, and tighten the bolts to the specified torque using a torque wrench*.
(4) Hold the key securely and tighten the set bolt of the input shaft to the specified torque using a torque wrench*. (See Table 3)
(5) Mount the rubber cap. The procedure is complete.

- When you mount a servo motor in your company, keep to the following directions.
- Motor mounting flanges of ABLE reducers have different dimensions depending on the servo motor to be mounted. Motors other than those specified cannot be mounted. Be sure to mount the servo motor you specified at the time of order.
- An anti-rust agent may have been applied to the output shaft on a servo motor.

1 Wipe off the anti-rust agent and oil on the mounting surface toward the motor shaft.

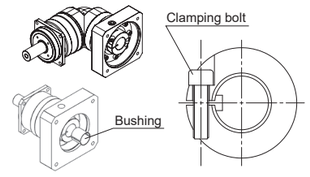


2 Remove the plug.

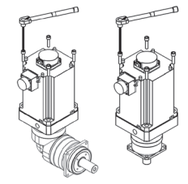


3 Turn the input shaft and align the clamping bolt head to the rubber cap hole. At this step, be sure that the clamping bolt is loose. Face the mounting surface toward the motor upward and place the reducer vertically on a flat surface.

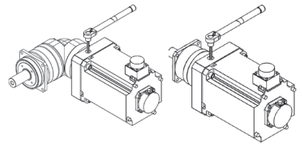
(When a bushing is included, mount it as shown in the diagram.)



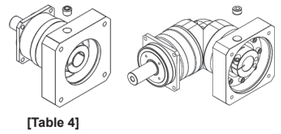
4 Insert the motor shaft to the input shaft slowly without impacting. Confirm that the motor mounting flange surface contacts tightly with the flange surface of the reducer. Tighten the motor mounting bolts to the specified torque. (See Table 4)



5 Tighten the clamping bolt of the input shaft to the specified torque using a torque wrench. (See Table 4)



6 Mount the plug. The procedure is complete.



[Table 4]

Bolt size	Motor mounting bolt		Clamping bolt	
	N·m	kgf·m	N·m	kgf·m
M3	1.1	0.11	1.9	0.18
M4	2.5	0.26	4.3	0.44
M5	5.1	0.52	8.7	0.89
M6	8.7	0.89	15	1.5
M8	21	2.1	36	3.7
M10	42	4.3	71	7.2
M12	72	7.3	125	13
M16	134	14	–	–

2-2 Mounting the reducer

When mounting the reducer to a device, confirm that the mounting surface is flat and free from burrs, and tighten the bolts to the specified torque using a torque wrench.

VRXF / VRSF / NEV / STH

Bolt size		M5	M6	M8	M10
Tightening torque	N·m	5.8	9.8	19.6	39.2
	kgf·m	0.6	1.0	2.0	4.0

VRG / EVRG / VRS / VRB / VRL / VRT/ EVS / EVB / EVL / EVT

Bolt size		M3	M4	M5	M6	M8	M10	M12	M16	M20
Tightening torque	N·m	1.9	4.3	8.7	15	36	71	125	310	603
	kgf·m	0.18	0.44	0.89	1.5	3.7	7.2	13	32	62

*Recommended bolt: Strength 12.9 or more

PRE / PRF

Bolt size		M5	M6	M8	M10	M12
Tightening torque	N·m	7.4	13	31	61	106
	kgf·m	0.76	1.3	3.2	6.2	11

*Recommended bolt: Strength 10.9 or more

2-3 Mounting to the output flange part (only for the flange type)

When mounting a device component to the output flange part, tighten it to the specified torque using a torque wrench.

VRG / EVRG / VRT / EVT / STH

Bolt size		M3	M4	M5	M6	M8	M10	M12	M16	M20
Tightening torque	N·m	1.9	4.3	8.7	15	36	71	125	310	603
	kgf·m	0.18	0.44	0.89	1.5	3.7	7.2	13	32	62

*Recommended bolt: Strength 12.9 or more