

WedgeRock RT/RTC Series

Thrust/Temperature Compensation Unit

INSTALLATION COMMISSIONING, OPERATION & MAINTENANCE MANUAL

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1.0 Introduction

1.1 Purpose

The purpose of this manual is to provide necessary information for:

- Installation
- Commissioning
- Operation
- Maintenance



Caution:

Failure to observe instructions contained in this manual could result in personal injury, property damage, and may void warranty. Read this manual carefully before installing and using the product. Additional information will be provided on request.

1.2 Audience

This manual is intended for qualified personnel who are tasked to deal with all aspects of the RT/RTC operator.

2.0 Safety

2.1 General Safety Information

Responsibility

The end user or contractor is responsible for implementing required protective measures on site, such as personal protective equipment, lockout-tagout, or barriers. Safety guidelines provided in this document are intended to supplement site/facility work practice and policy.

Qualification of Personnel

All activities addressed in this manual must be carried out by suitably qualified personnel having been authorized by the end user and/or contractor. Prior to working on this product, personnel must have thoroughly read and understood these instructions.


Only WedgeRock approved replacement parts should be used. Modifications or changes to components can invalidate warranty or any actuator qualifications.



2.2 Safety Terminology and Symbols

It is important to read, understand, and follow safety messages and regulations carefully before handling product. Instructions are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product
- Product malfunction
- Environmental contamination

All safety messages are flagged with an exclamation symbol and the word Caution, Warning, or Danger.

Hazard Level	Indication
 Danger:	A hazardous situation which, if not avoided, will result in death or serious injury.

	Warning:	A hazardous situation which, if not avoided, could result in death or serious injury.
	Caution:	A hazardous situation which, if not avoided, could result in minor or moderate injury.
	Notice:	<ul style="list-style-type: none"> • A potential situation which, if not avoided, could result in undesirable conditions. • A practice not related to personal injury.

2.3 Environmental Safety

The Work Area

Always keep work area clean.

Waste and Emissions Regulations

Observe safety regulations regarding waste and emissions:

- Appropriately dispose of all waste.
- Clean up spills in accordance with safety and environmental procedures.
- Report all environmental emissions to the appropriate authorities.



WARNING:

If the product has been contaminated in any way, such as from toxic chemicals or nuclear radiation, **do not** send the product to WedgeRock unless it has been properly decontaminated.

2.4 User Safety

Safety Equipment

Use safety equipment according to the company and manufacturers guidance.

Recommended personal protective equipment (PPE) in the work area:

- Safety Glasses
- Protective Shoes
- Protective Gloves

- Hard hats when applicable

Precautions before Work

- Make sure of clear path of retreat.
- Make sure product cannot roll or fall over and injure people or damage property.
- Make sure lifting equipment is in serviceable condition.
- Check explosion risk before using electric hand tools.
- Lock and tag out any potentially dangerous energy sources.
- Disconnect electrical power from electric actuator if used to prevent unintended movement.

Precautions during Work

- Never work alone.
- Always wear protective clothing and hand protection.
- Stay clear of suspended loads.
- Always lift the product by its lifting device.



WARNING:

Do not disassemble the RT/RTC assembly if it is malfunctioning. There is a possibility of releasing potential energy. Contact WedgeRock for further instructions.

3.0 Transportation, Handling, Lifting, Storage, & Packaging

3.1 Inspect the Delivery after Transport

Inspect the package

1. Inspect for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. File a claim with the shipping company if anything is out of order. If product has been picked up from distributor, make a claim directly to distributor.

Inspect the unit

1. Remove packing materials from product. Dispose of all packing materials in accordance with local regulations.
2. Inspect product to determine if parts have been damaged or are missing.
3. If applicable, unfasten product by removing screws, bolts, or straps. For personal safety, be careful when handling nails and straps.
4. Contact sales representative if anything is out of order

3.2 Transportation Guidelines



WARNING:

Dropping, rolling or tipping units, or applying other shock loads, can cause property damage and personal injury. Ensure unit is properly supported and secure during lifting and handling.



CAUTION:

Risk of injury or equipment damage from use of inadequate lifting devices. Ensure lifting devices (such as chains, straps, forklifts, cranes, etc.) are rated to sufficient capacity.

WARNING



- Risk of serious personal injury or equipment damage. Proper lifting practices are critical to safe transport of heavy equipment. Ensure practices used follow all applicable regulations and standards.
- Safe lifting points are specifically identified in manual and general arrangement drawing. It is critical to lift equipment only at designated points.
- Lifting points are not designed to lift both the RT/RTC actuator and valves or other objects that may be attached.
- Lifting and handling heavy equipment poses a crush hazard. Use caution during lifting and handling and wear appropriate Personal Protective Equipment (PPE, such as steel-toed shoes, gloves, etc.) at all times. Seek assistance if necessary.



Figure 1 - Example of a Proper Lifting Method

3.3 Storage guidelines

Storage requirements are dependent on storage duration. The normal packaging is designed only to protect the unit during shipping.

Length of time in storage	Storage requirements
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Upon receipt/short-term (less than six months)	<ul style="list-style-type: none">• Store in a covered and dry location.• Store the unit free from dirt.• Store on a pallet or up off the ground.
Long-term (more than six months)	<ul style="list-style-type: none">• In addition to the short-term requirements, apply rust inhibitor to uncoated faces such as the baseplate and motor adapter if any. Inspect every six months and reapply if needed.

4.0 Product description

4.1 General description

RT/RTC units are designed for efficient reliable operation. These assemblies are commonly interfaced between an actuator and a valve as a thrust compensation unit due to valve operation and/or thermal expansion. Operation can be performed by a user with a handwheel, a gearbox, or by using a standard electric actuator.

4.2 Nameplate information

Every gear actuator has a nameplate that provides information including:

- Purchase Order Number
- Serial Number
- Model Description
- General Arrangement Part Number
- Weight
- Ratio
- Manufacturing Date
- Tag Number (upon request)

5.0 Installation



WARNING:

Ensure shaft being driven by gear actuator is not able to rotate while installing gear operator. If installing in the field, valves should be shut with pipeline flow stopped, dampers and gates should be locked or placed in a position that prevent movement. Failure to do so may cause unexpected movement resulting in personal injury and damage to equipment.

5.1 Drive Nut Installation

1. Install the thrust washer [1]
 - a. In some assemblies, the thrust washer [1] is pre-installed into the drive housing [2]. Visually inspect the drive housing [2] to confirm pre-installation with the use of **Figure 2** and **Figure 3**. Contact WedgeRock for assembly-specific verification of the thrust washer [1] installation.
2. Install drive nut spline [3] into the drive housing spline [2]
3. Thread and bottom out the drive nut retainer [4] into the drive housing thread [2], ensure snug fit of components by pressing on drive nut [3] to check axial clearance
4. Locate dutchman holes on the drive nut retainer thread [4] and drive housing thread [2], install the pull-out dowel pin [5] by adjusting the drive nut retainer thread [4] such that the dutchman holes match. This can be done by slightly backing out the drive nut retainer [4].
5. With the use of a 'blue' semi-permanent thread locker, install the button head cap screw [6] to retain the pull-out dowel pin [5].

Notice:	It is critical to install semi-permanent thread locking compound on the button head cap screw [6] thread
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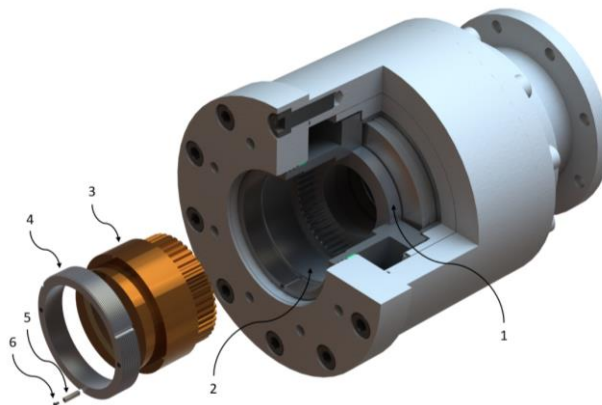


Figure 2 - RT/RTC Drive Nut Installation, Pre-Installed Thrust Washer

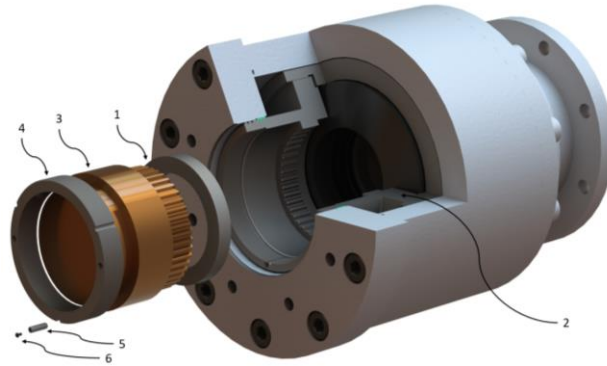


Figure 3 – RT/RTC Drive Nut Installation, Uninstalled Thrust Washer

5.2 Pre-Installation

Wipe baseplate underside (mounting surface) and mating flange completely.

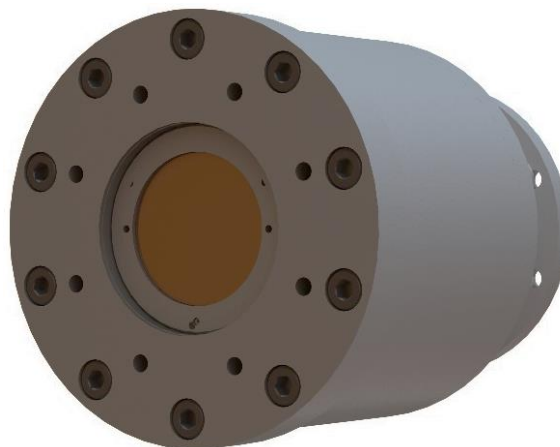


Figure 4 – RT/RTC Baseplate



Figure 5 – RT/RTC Mounting Flange

5.3 Installation of RT/RTC on to Valve

1. Apply grease or other lubricant to the valve thread before installing thrust compensator assembly
2. Align thread with valve thread and carefully mesh threads
3. Align and valve flange mounting holes by turning input shaft
4. Install mounting bolts and tighten incrementally in a crossing pattern
5. See bolt torque specification chart for torque values

5.4 Installation of Electric Actuator on RT/RTC

If the RTC is designed and configured for motorized service, an electric actuator may be used to operate. Refer to the electric actuator IOM to Install. A motorizable RTC can be assembled with a motor adapter flange. Consult WedgeRock to confirm maximum allowable input speed and cycle rating.

6.0 Removal



WARNING:

Ensure the device being operated is secure and the thread being driven by the RTC actuator will not rotate uncontrollably after removal. **Do not** remove the actuator if the valve or gate is blocked. **Do not** remove the actuator if the valve or gate is in a thermally expanded condition. Failure to conduct a comprehensive risk assessment of RTC removal can lead to personal injury and damage to equipment.

6.1 Removal of RT/RTC from Valve

To disassemble the RT/RTC actuator from the valve

1. Attach lifting slings as shown on **Figure 1** in **Section 3.2**
2. Remove mounting bolts
3. Unthread RT/RTC from the valve

6.2 Removal of Electric Actuator from RT/RTC Operator



WARNING:

In some configurations, the electric actuator may be relied on for its self-locking features to keep the input shaft from spinning uncontrollably. It is good practice to verify that the RTC actuator is completely in its unloaded condition with all potential thrust load removed before removing the electric actuator. Failure to do so may cause the electric actuator to rotate out of control once bolts are removed.

To disassemble the electric actuator from the RT/RTC actuator

1. Slowly loosen bolts holding the electric actuator to the motor flange.
2. With the bolts loosened, verify the actuator housing is free to rotate on the flange and is not under any amount of built up torque.
3. Refer to the electric actuator IOM for further removal instructions.

6.3 Drive Nut Removal

To remove the RT/RTC drive nut from the drive housing:

1. Referencing **Figure 2** and **Figure 3** from **Section 5.1**; remove the button head cap screw from the drive housing

2. Remove the pull-out dowel pin from the dutchman interface between the drive housing and drive nut retainer
3. Unthread and remove the drive nut retainer
4. Remove the drive nut
5. Remove the thrust washer
 - In some assemblies, the thrust washer is pre-installed into the drive housing. Visually inspect the drive housing to confirm pre-installation. Reference **Figure 2** and **Figure 3** from **Section 5.1**. Contact WedgeRock for assembly-specific verification of the thrust washer installation.

7.0 Commissioning

7.1 Electric Actuator

If an electric actuator is installed, refer to the electric actuator IOM for commissioning.

8.0 Operation

The RT/RTC actuator is operated by rotating the input shaft clockwise or counterclockwise which results in the output hub rotating. Refer to the general arrangement drawing for output rotation direction with a given input rotation.

8.1 Manual Operation

To operate the RT/RTC manually, a hand wheel, chain wheel, or drive nut may be provided. Limit input speed to less than 100 RPM and ensure input torque does not exceed rating provided by WedgeRock.



CAUTION:

Do not replace the factory hand wheel with a different size without consulting the factory. Do not install chain wheels if not installed from the factory. Do not use cheater bars or drive the gear in any way it was not intended as this will void the warranty and may cause damage to the gear actuator, valve stem, drive shafts, or other torque transmitting devices as well as being dangerous to the user.

9.0 Maintenance

9.1 Lubrication

The RTC actuator is lubricated for life at the factory. Added or replacement lubrication will not be necessary throughout its rated life.

9.2 Spare Parts

In general, spare parts are not required for the life of the RTC actuator. If spare parts are required, contact your WedgeRock sales representative or go to <https://wedgerock.com/contact/> for information.

9.3 Service

WedgeRock has service personnel available to install, maintain, and repair all WedgeRock products. For more information, contact your WedgeRock sales representative or go to <https://wedgerock.com/contact/> for information.

10.0 Torque Chart

Torque Chart [Grade 5]				
Diameter & TPI	Torque			
	Dry [K=0.20]		Lubricated [K=0.15]	
	[Ft-Lbs]	[Nm]	[Ft-Lbs]	[Nm]
1/4-20	8.0	10.8	6.3	8.5
5/16-18	17	23	13	18
3/8-16	30	41	23	31
7/16-14	50	68	35	47
1/2-13	75	102	55	75
9/16-12	110	149	80	108
5/8-11	150	203	110	149
3/4-10	260	353	200	271
7/8-9	430	583	320	434
1-8	640	868	480	651
1-1/8-7	790	1071	600	813
1-1/4-7	1,120	1519	840	1139
1-3/8-6	1,470	1993	1,100	1491
1-1/2-6	1,960	2657	1,460	1979

Torque Chart [Class 8.8]				
Diameter & Pitch	Torque			
	Dry [K=0.20]		Lubricated [K=0.15]	
	[Ft-Lbs]	[Nm]	[Ft-Lbs]	[Nm]
M6X1.00	7.7	10.5	5.8	7.9
M8X1.25	19	26	14	19
M10X1.50	37	51	28	38
M12X1.75	65	88	49	66
M14X2.00	103	140	77	105
M16X2.00	162	219	121	164
M18X2.50	229	311	172	233
M20X2.50	325	441	244	331
M22X2.50	443	600	332	450
M24X3.00	562	762	422	572
M27X3.00	822	1115	617	837
M30X3.50	1117	1515	838	1136
M33X3.50	1520	2061	1140	1546
M36X4.00	1952	2647	1464	1985