



HIGH  
TEMP  
BEARINGS

MOUNTED HT750/H1000/NT600  
INSTALLATION MANUAL

## Mounted HT750/1000/ NT600 Installation Manual



HT750/1000 or NT600 sleeve bearings are self-lubricating, non-locating, maintenance free bearings. The bearing material provides dry film lubrication between the shaft and the bearing surface as the shaft rotates. The lubricant prevents shaft wear, and will not squeeze out while sitting idle. The bearing will wear overtime, this is normal. The rate of wear is dependent on rotational speed, load and degree of contamination. Life can be maximized by following the recommendations provided in this manual. Shaft collars are need for axial location and may be used with slight amounts of thrust load, per the angular load table. All bearings are self-aligning within 2-3 degrees. Never oil or grease a carbon-graphite bearing.

### **HT750/HT1000/NT600 Bearings Are Best For:**

**Speed:** Less than 200 RPM

**Temperature:** Less than -40 ° F or greater than 212° F

**Difficult service/PM conditions:** difficult, costly, or not likely to receive regular PM

**Environment:** High level of exposure to liquids

**Axial shaft movement:** axial shaft growth or movement expected

### **Sleeve Bearing Temperature Limits:**

#### **HT750 Carbon-Graphite:**

Continuous service for applications from -40° F to 750° F, including wet and submerged environments.

#### **HT1000 Carbon-Graphite:**

For very hot or cold applications from -200 ° F to 1000 ° F. Water can react with HT1000 graphite to restrict shaft movement; it should not be used between -40° F and 250° F.

#### **NT 600 PTFE Composite:**

Continuous service from 500° F to -400° F. For a broad range of service requirements including high to low temperature, wet, submerged and corrosive applications.

**Sleeve bearings require more torque than ball bearings, this is important to consider when multiple bearings are driven from a single drive.**

Coefficient of friction mounted ball bearing:  $f=0.001$

Coefficient of friction NT polymer on Steel:  $f=0.03$

Coefficient of friction HT750/1000 carbon-graphite on Steel:  $f=0.2$

***For multiple rollers using carbon bearings with shaft temperatures less than 500°F, NT bearings will greatly reduce drive torque and eliminate noise.***

### **Shafting Recommendations:**

For extended bearing life, the recommended shaft conditions are:

- Free of burrs and other positive defects
- Hardened to 35 Rockwell "C" or higher
- Surface RA 10 -20 micro-inches (.25 to .50 micro-meters)
- Shaft tolerance should be  $+.000/-0.002$ " ( $+.000/-0.051$  millimeters) or better
- Shafting resistant to corrosion for the service conditions

Oxidation or contamination on the shafting may eliminate shaft to bearing clearance, infrequently actuated carbon-graphite HT750 or HT1000 bearings can seize under these conditions. NT600 PTFE composite bearings have been engineered for service with high levels of contamination and corrosion.

## **Installation:**

**Warning:** Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed: Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by High Temp Bearings, Inc. nor are the responsibility of High Temp bearings Inc. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a fail-safe device must be an integral part of the driven equipment beyond the speed reducer output shaft.

**!NEVER USE OIL OR GREASE ON THE BUSHING OR SHAFT WHEN USING HT750 OR HT1000 CARBON GRAPHITE BEARINGS.THIS CAN RESULT IN BEARING FAILURE. A BINDING PASTE WILL FORM OVER TIME OR WHEN EXPOSED TO HEAT!**

## ***Shaft and Bearing Preparation:***

1. The shaft should be cleaned free of grease, oil, dirt, oxidation or other contaminates and be milled with minimal taper and eccentricity. For optimal service, the shaft should meet or exceed the shafting recommendations.
2. Check the bearing bore and shaft diameter to ensure sufficient clearance at the operating temperature. For high temperature applications, proper shaft to bearing radial clearance is necessary to prevent thermal seizing. Standard bearing bores are listed with the product dimensions.
  - a. NT bearing liners are designed with proper clearance for all operating temperatures using standard commercial shafting dimensions and tolerances
3. Wipe any contamination from the bore of the bearings.
  - a. HT1000 bearings may have a white film on the surface, this should be wiped clean from the bore prior to installation

**Bearing Installation:**

1. Take the bearing unit (Pillow Block, Flange, etc..) and slide it onto the shaft. For high temperature applications, proper shaft to bearing clearance is necessary.
2. Position and align the mounted unit on the shaft and torque down the housing to the frame with the appropriate unlubricated, dry SAE grade 2 bolts. If necessary, use shims to achieve alignment.
  - a. An anti-rotation screw can be added to the housing through the pre-existing flange grease zerk port. This is not supplied in standard construction due to hard earned experience that shows a higher incidence of equipment malfunction when installed in basic radial load applications. In general, housing anti-rotation screws should only be used if the insert is expected to sustain axial loads.

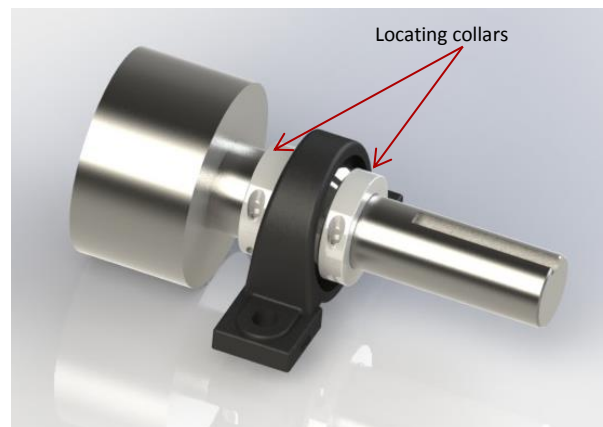
*Housing Flange “Dry” Bolt Torques*

SAE Grade 2 Bolt	Torque (in-lbs)
<b>3/8-13</b>	240
<b>7/16-14</b>	384
<b>1/2-13</b>	600
<b>9/16-12</b>	840
<b>5/8-11</b>	1200
<b>3/4-10</b>	1950
<b>7/8-9</b>	2890
<b>1-1/8-7</b>	4248

**Thrust (Axial) Loads:**

1. For locating the shaft and preventing axial movement, collars should be used on either side of the bearing on the drive end for the best performance. Clearance of .010” to .020” between the bearing and collar face should be maintained. Minor axial loads can be supported by the bearing with collars according to the angular load table. If significant axial loading is expected, the housing should have an anti-rotation screw installed. (HTB will tap anti-rotation screws on request)

**Warning: Do not place collars on both ends of the shaft restricting axial thermal expansion. Equipment damage may occur.**



**Run in Period:**

For optimal performance, the bearing should be mounted on the shaft and run for a short period of time without load to establish a lubricant film. This will help prevent starting damage to the bearing once placed under full load.

### ***Shaft Corrosion:***

When using HT750/HT1000 Carbon-Graphite bearings and the shaft or area around the bearing is exposed to corrosives, oxidation or waste, material can accumulate between the shaft and bearing. This will eliminate clearance, eventually binding the shaft. To prevent seizure, corrosion resistant shafting and preparation of the surrounding equipment should be performed. Additionally regularly schedule movement of the shaft will prevent seizure by breaking up contamination deposits.

- The NT600 PTFE Bearing is extremely resistant to shaft seizure, and will provide bind free service for all contaminated and corrosive applications

### **Maintenance:**

- Sleeve bearings are largely maintenance free and are fully self-lubricating when used correctly. Periodically inspect the bearings for unacceptable wear and replace as necessary. If worn more than 1/8", graphite should be replaced independent of current service.
- For infrequent movement applications using carbon-graphite, periodic actuation every 90 days is recommended to prevent contamination buildup between the shaft and bearing.
- **Never oil or grease a carbon-graphite bearing, it can result in bearing failure. A binding paste will form over time or when exposed to heat.**

## Special Applications:

### HTB Sleeve Bearing Solutions

- Custom and very large bores
- Housings in stainless, ductile or wrought alloys
- Fully split construction
- Custom or alternative housings
- Extreme temperature
- High loads, speeds or drive torque reduction
- Chemically aggressive conditions
- Reduced noise



### High Temp Bearings Inc. products

- Carbon and composite sleeve bearings
- Hydrodynamic bearings
- Mounted roller bearings
- SAF pillow block bearings
- Rod end bearings
- Set collars



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