
McAllister Technical Services

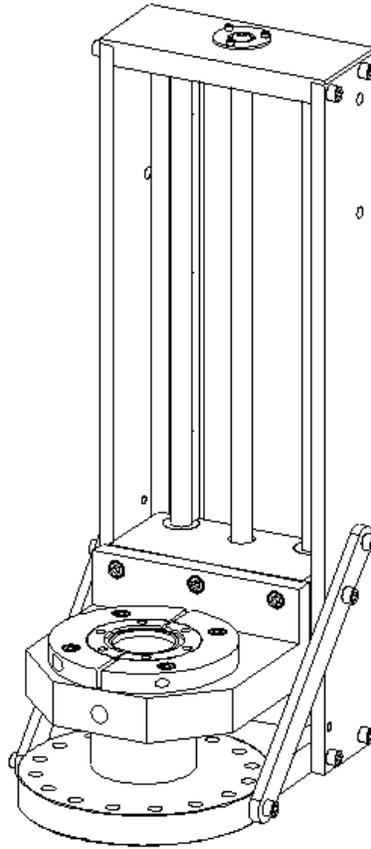
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ZA Series Instructions



THANK YOU for your purchase of MTS' ZA-Series translator. It is the finest of its kind available. We appreciate the confidence you have placed in our company. We encourage your comments and suggestions on this product and its manual. Please read this manual carefully prior to assembling/mounting your manipulator. We have found this will answer many of the commonly asked questions, saving time and aiding understanding. It will be time well spent.

Leak Check Certificate

Model ZA_____ Date_____ Job #_____ Checked by_____

This is to certify that the above-referenced product has been checked on a Helium Mass Spectrometer leak detector having a sensitivity of _____ X 10⁻ std. cc/sec and has been found to have no measurable leak.

Check for Damage

Many shipping companies require that claims for damage and/or loss be filed within a very short period of time, sometimes within one week of delivery! Promptly inspect the shipment for exterior as well as hidden damage. If **any** damage or loss is encountered, be sure to do **ALL** of the following:

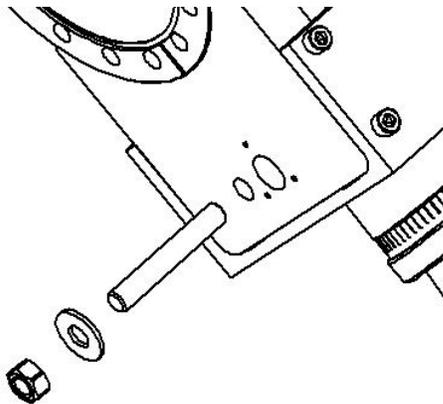
- Notify the shipper promptly. If the damage is significant, insist on an on-site inspection.
- Retain ALL packing materials.
- Do not proceed with installation or unpacking.
- Do not allow the shipping company to remove the goods from your premises without first notifying MTS.

Verify the shipment received against the enclosed packing list and against your order. Notify MTS promptly of any discrepancies. Clean any debris, dust or stray packaging material from the manipulator before removing the flange covers. Check for any loose screws.

Unpacking Instructions

Inspect the unit for hidden damage from shipment. Translators are shipped with custom foam-in-place packing. We have found this to be the best way. The foam is separated approximately halfway inside the carton with thin white plastic. The unit is also bagged in polyethylene, and the flanges are covered with aluminum foil and plastic covers. The bellows is shipped in the **compressed** position and is **wrapped** to prevent damage. All of this is designed to get the unit to you in the same condition it left our shop. We recommend you save the packing box and materials, if possible, for equipment storage or possible future shipment.

1. Take the translator out of the box on a clean, dry, level surface.
2. Unwrap the bellows.
3. **REMOVE THE SHIPPING BOLT AND NUT COMPLETELY!** Be sure to save them for later use.



4. Remove the shipping covers and aluminum foil from the flanges. The translator is now ready for installation.

General Precautions:

Under normal conditions your translator will provide years of trouble-free service, especially if the following simple maintenance is performed. After several bakeouts, it may be necessary to relubricate the lead screw. Use the MoS₂ grease in the supplied syringe.

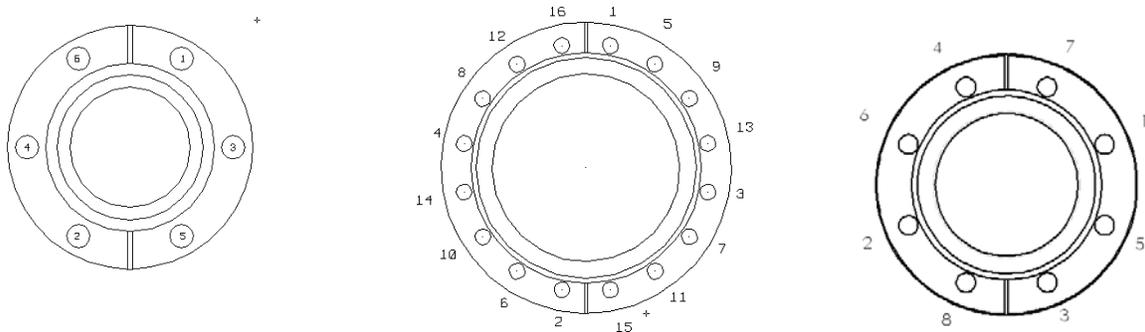
1. Do not allow contamination to get into the bellows interior.
2. The stainless steel bellows is made from thin material and is fragile. Do not hit it or allow it to hit other objects.

Use the appropriate bolts, nuts, washers and gasket to mount the translator to your chamber or device. The standard ZA-Series translator uses the following bolt sizes:

Location	Nominal Flange Size	Bolts SAE (Metric) Sizes
ZA12-Series Top flange (Standard tapped)	2.75" (70 mm)	1/4-28 X 7/8 (M6 X 1 X 20)
ZA45-Series Top flange (Standard tapped)	4.50 " (114 mm)	5/16-24 X 1.25 (M8 X 1.25 X 35)
ZA60-Series Top flange (Standard tapped)	6.00" (152 mm)	5/16-24 X 1.5 (M8 X 1.25 X 35)
Bottom Flange (Standard non-tapped)	4.50" (114 mm)	5/16-24 X 2 (M8 X 1.25 X 50)
Bottom Flange	6.0" (150 mm)	5/16-24 X 2 (M8 X 1.25 X 50)

(Standard non-tapped)		
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When tightening the flange bolts, make sure the bolt heads and threads are in good condition, the threads are lubricated with anti-seize material and that the wrench fits properly. Turn the bolts deliberately and with great care. A stripped, seized or broken bolt can be frustrating. A slipped wrench can puncture the bellows or injure hands. Install the ZA-Series translator on your chamber as you would any other ConFlat® type flange. Use standard, 0.080" thick, flat copper gaskets. The following tightening sequence for **lubricated bolts with washers** is recommended. First finger-tighten all bolts evenly, then sequentially torque the bolts in even steps.



Bakeout:

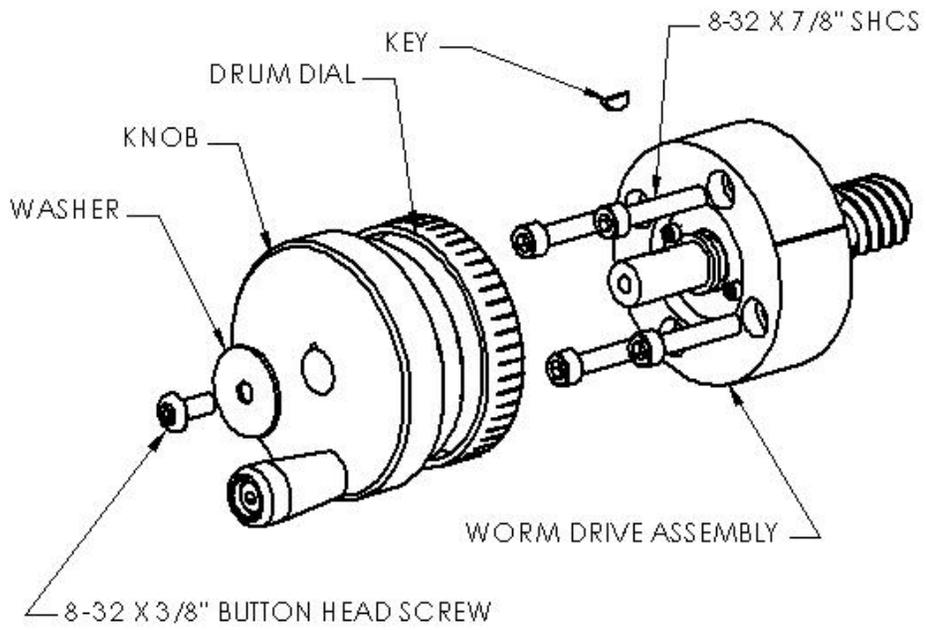
Bakeout in normal fashion, but do not exceed 150°C without relubrication after every bakeout. Do not exceed 200°C. Higher temperatures can damage the precision components. Monitor the temperature during bakeout. Never move the translator during bakeout or when it is above ambient temperature. Always remove any motor or limit switches before bakeout.

Motors and limit switches

Motors and limit switches can easily be installed in the field. To install a motorized drive:

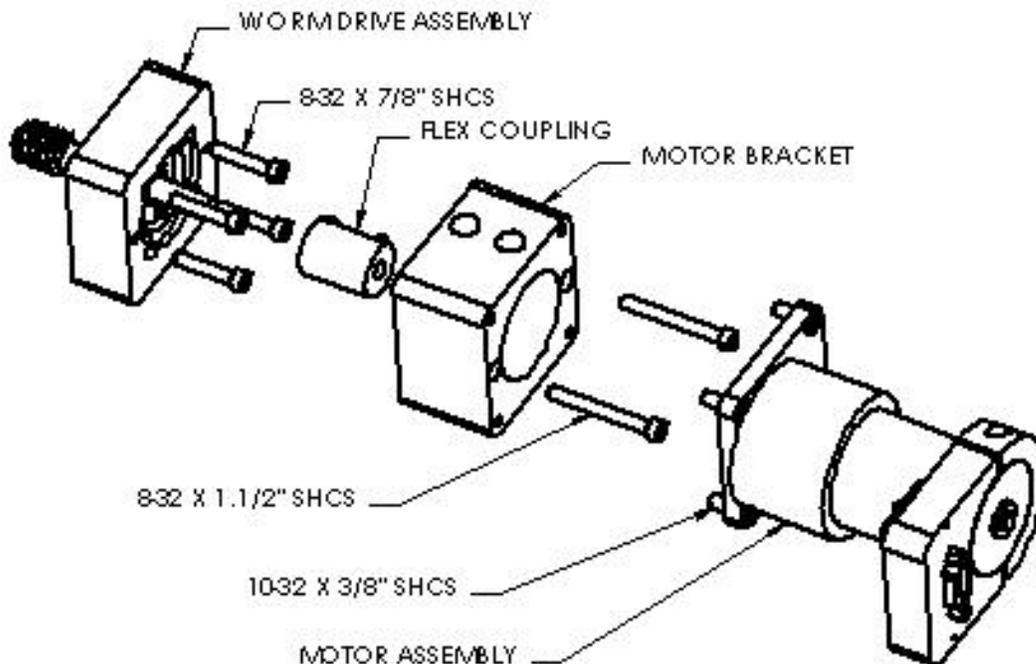
Remove the crank assembly

1. Lower the manipulator to it's lowest position (fully compressed)
2. Remove the 8-32 X 3/8" button head screw
3. Remove the washer
4. Slide the crank knob from the drive shaft
5. Remove the drum dial
6. Don't forget the key in the shaft
7. Remove the four 8-32 X 7/8" socket head cap screws
8. Remove the round worm drive assembly



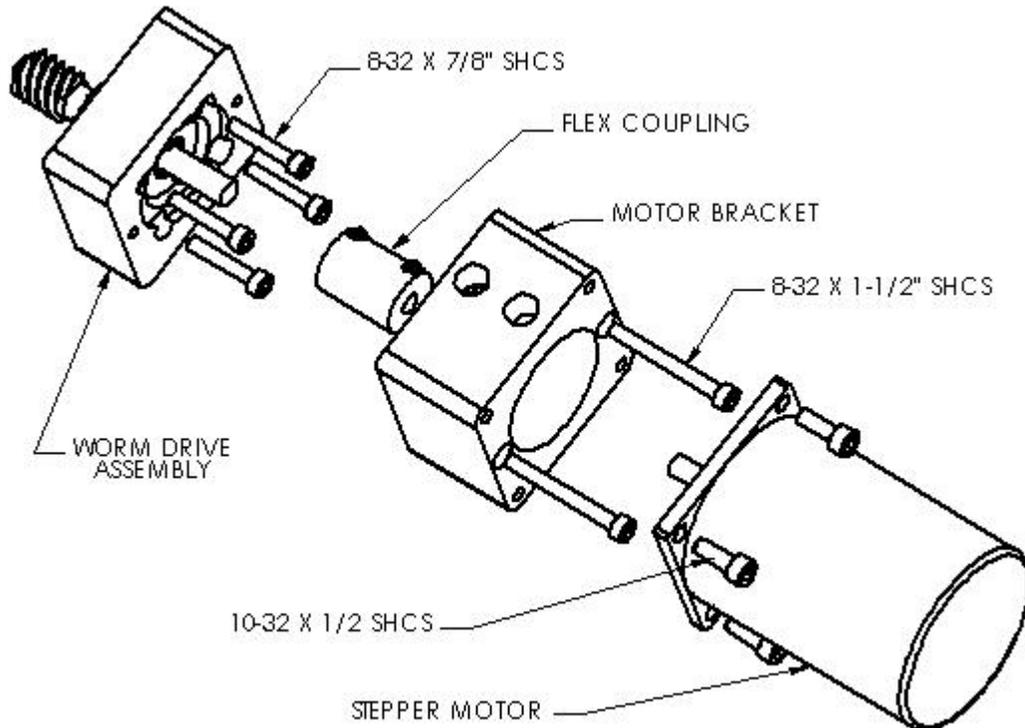
Installation of the D.C. Motor

1. Install the square worm drive assembly.
2. Install and tighten the four 8-32 X 7/8" socket head cap screws while adjusting the backlash between the worm and worm gear.
3. Place the flex coupling on the shaft.
4. Position the motor bracket on the worm drive assembly.
5. Align the screws of the flex coupling with the holes in the motor bracket.
6. Tighten the flex coupling screw closest to the worm drive assembly.
7. Install and tighten the two 8-32 X 1-1/2" socket head cap screws into the motor bracket.
8. Verify that you can tighten the flex coupling screws through the holes in the side of the motor bracket.
9. Install the motor assembly.
 - Two of the 10-32 X 3/8" socket head cap screws are captured by the motor.
 - Tighten all of the four 10-32 X 3/8" socket head cap screws evenly, allowing the shaft of the motor to slide into the flex coupling.
 - To access the clamp screws, it may be necessary to loosen the flex coupling at the motor end if it is tight on the motor shaft.
10. Tighten the screws on the flex coupling.



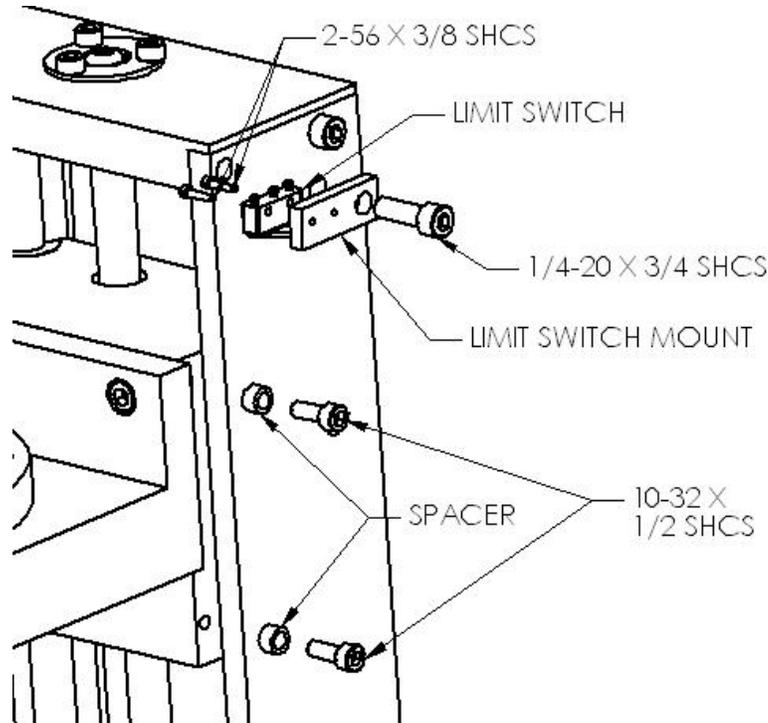
Installation of the Stepper Motor

1. Install the square worm drive assembly as above.
2. Install and tighten the four 8-32 X 7/8" socket head cap screws, as above.
3. Place the flex coupling on the shaft.
4. Position the motor bracket on the worm drive assembly.
5. Align the screws of the flex coupling with the holes in the motor bracket.
6. Tighten the flex coupling screw closest to the worm drive assembly.
7. Install and tighten the two 8-32 X 1-1/2" socket head cap screws into the motor bracket.
8. Verify that you can tighten the flex coupling screws through the holes in the side of the motor bracket.
9. Install the motor.
 - To access the clamp screws, it may be necessary to loosen the flex coupling at the motor end if it is tight on the motor shaft.
10. Install and tighten the four 10-32 X 1/2" socket heat cap screws
11. Tighten the screws on the flex coupling.



Installation of Limit Switches

1. Install the upper limit switch using the supplied hole in the upper part of the backbone. Note the orientation of the limit switch, using the following drawing as a guide. Mount the limit switch, then the limit switch mount. Attach the two to the backbone using the 1/4-20 X 3/4 socket head cap screw provided.
2. Install the spacers in the traveler in the holes supplied. Attach using the 10-32 X 1/2 socket head cap screws provided. Use the following drawing as a guide.
3. Finally, install the lower limit switch using the supplied hole in the lower part of the backbone. Note the orientation. Attach them to the backbone using the 1/4-20 X 3/4 socket head cap screw provided. The limit switches may now be wired.



Lubrication:

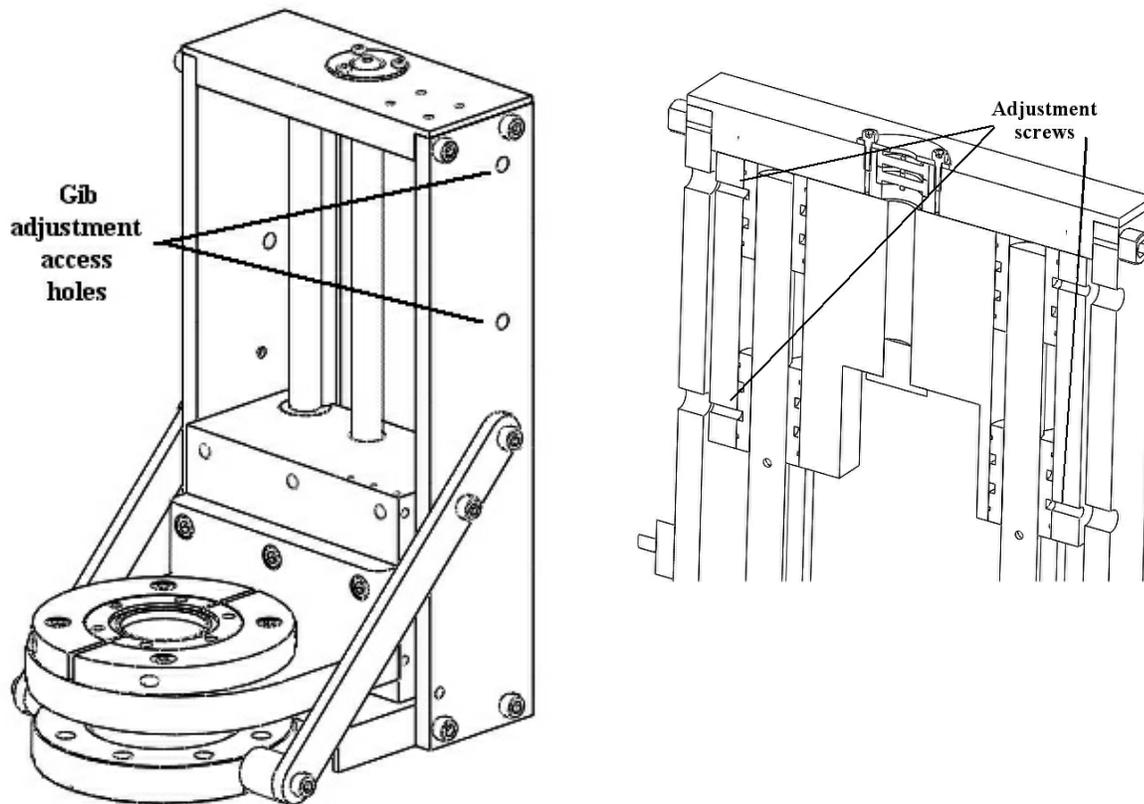
Under normal conditions, your translator will provide years of trouble-free service. As delivered, the lead screw and ball bearings are lubricated with molybdenum disulfide. Relubricate the ball bearings every third or fourth bake out with the molybdenum disulfide grease provided. Do not use hydrocarbon grease such as Felpro C100™ for bearings or lead screws that will be baked because the hydrocarbon greases will cake and dry out. After several bakeouts, it may be necessary to relubricate the drive screw. Use the MoS₂ grease in the supplied syringe. A small amount applied to the drive screw as you run it up and down is sufficient.

We have operated your unit prior to shipment to assure that it works properly. Prior to calling the factory, check to make certain you have removed all shipping constraints, have read

these instructions, and have checked for shipping damage. It is best to have the translator close to the phone, for ease of description.

1 Adjustment of Gibs

The traveling flange and its carrier (traveler) move up and down on 2 guide rails that are mounted on support rails and secured to the backbone. The traveler houses four linear bearings that ride on the guide rails. These bearings can be adjusted for play. Move the traveler so that its set screws line up with the access holes in either side of the backbone. Adjust the set screws to vary the play between the bearing and the guide rod but be careful not to over tighten.



Packaging for storage or reshipment:

The bellows on your unit is particularly susceptible to damage/contamination. Normal precautions for shipment are, therefore, usually inadequate. Please follow these guidelines:

1. Work on a clean surface when packaging.
2. Place aluminum foil over the bellows openings, then re-install the shipping covers. Do not allow any contamination to get into the bellows interior.

3. Move the Z-axis to the fully compressed position. Wrap cardboard around the bellows and seal with tape. Make certain the cardboard extends up/down into the plate areas. The bellows is most susceptible to damage if the box is dropped and it bangs into the plates.
4. Place the unit in a polyethylene bag.
5. Place the lower piece of foam-in-place packaging in the box (check the condition of the box and replace as necessary). Place the unit into the foam as indicated by the outline in the foam.
6. Place the wrapped micrometers into the box. Place the upper piece of foam-in-place packaging over the unit as indicated by the outline in it.
7. Secure the box shut, and the manipulator is ready to ship or store.

Accessories included:

Hex wrench kit

Lubrication kit consisting of 1 each:

High temperature (black) grease for bearings.

High temperature (clear) grease for lead screws.

E900L lubricant for ball screws (where applicable).

Parts and factory service:

Replacement parts and non-warranty factory service are available on a fast turnaround basis. Please consult the factory with your specific need.

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