thermionics laboratory, inc.

INSTRUCTION MANUAL

FRLC-275 SERIES PRECISION ROTARY FEEDTHROUGHS
[WITH LINEAR COAXIAL MOTION]

Version 2

SERIAL # _____

11.2023
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Preface

Congratulations! You have purchased a precision vacuum positioning device from Thermionics. This unit is capable of many years of use with minimal care and maintenance. This manual is a tool to aid you in obtaining this service.

We at Thermionics encourage your comments and suggestions on this manual.

Product Description

The FRLC-275 Series Precision Rotary Feedthroughs are rotary positioning devices with independent linear actuation down the center of the 3/8" rotating shaft. This unit is available with a 1/2" or 1" linear range, micrometer actuated.

The standard rotary stage is graduated in one-degree (1°) increments. The mechanical resolution of the rotary feedthrough is 0.1° but utilizing this fine resolution manually with a 3" dial is not practical. If 0.1° resolution is needed, the optional stage should be used.

The FRLC Series is available with an optional fine adjust (tangential adjustment screw) rotary stage. This stage offers the user unparalleled fine adjustment capability. Both the standard and fine adjustment rotary stages come with position locks, standard.

The FRLC Series are available with standard or custom shaft lengths. They can be fitted with an azimuthal rotation gearbox supplying +/- 180-degree rotation or a precision geared flip assembly (0 to 90 degrees). They may also be fitted with custom sample mounts, or those available from other vacuum equipment manufacturers.

The rotational and/or linear travel may be motor driven as an option. Stepping or synchronous motors may be used, depending upon application.

Unpacking

FRLC Feedthroughs are shipped in custom foam-in-place packing if not mounted to a manipulator or translator. We have found this the only system to provide adequate protection for shipment. The foam is separated approximately halfway inside the box with thin blue plastic. We strongly recommend the packing box with packing be saved for possible future shipment or equipment storage.

Installation

The feedthrough can be installed directly from the crate. As usual, care should be exercised to protect the knife seal edge. The standard unit mounts to a 2.75" OD flange. (other flanges are available as required). Proper tightening technique should be observed whenever tightening a metal sealed flange. We recommend a small quantity of high temperature anti-seize lubricant be used on all mounting bolts. This is especially important if the unit will be subject to bakeouts.

The rotary shaft has been trued to within +/- 0.005" runout at the tip. Care should be exercised so as not to bend the 3/8" shaft while installing the unit.

Adjustments

Your Feedthrough is correctly adjusted prior to shipment. This section is included to aid the user in making changes in these settings if he so desires.

MICROMETERS:
Micrometer play is affected by two adjustments. These adjustments should only be attempted with the micrometer removed from the apparatus. The lubricant is Thermionics GAH High Temperature Lubricant.

SEE SAFETY WARNINGS UNDER "Lubrication".

Non-rotating spindle micrometers are used on FRLC feedthroughs. Spindle play is adjusted by the position of an end nut with a second lock nut at the end of the spindle (outside). They are covered by a knurled cap at the end of the micrometer handle.

The micrometer thread/ nut play is adjustable by removing the micrometer handle and tightening or loosening a knurled nut on the barrel. It is necessary to remove the two end nuts mentioned in the above adjustment procedure

to remove the micrometer handle.

Lubrication

All exterior bearings are lubricated with Molycoat high temperature dry film lubricant from Dow Industries. In manual use, additional lubricant is not normally required.

With motor drive use, the user may need to add more lubricant from time to time. Please contact the factory if this action is required.

The internal bearings are lubricated with Tungsten disulfide.

Micrometer thread lubrication is Thermionics GAH-2 Series High Temperature Lubricant. The user may need to add more lubricant from time to time, depending on the frequency and temperature of bakeouts and operating environment.

*** WARNING ***

GAH-2 lubricant has been tested to 230°C. We recommend limiting the temperature of the lubricant to 200°C or less.

Avoid inhalation of decomposition products formed above 300°C.
This material may give off **toxic gases** at elevated temperatures.

MOTOR DRIVE UNITS
Motor drive unit gear trains are lubricated with GAH-2 high temperature lubricant. Additional lubricant will need to be added from time to time depending upon use, bakeout temperature and frequency, and operation conditions.

Bakeout Procedure:

We recommend continuous bakeout temperatures up to 200°C for maximum service life.

Automatic temperature control with the sensor(s) correctly located in the top of the area being heated is highly recommended.

Remove motor drives from the feedthrough prior to bakeout. See lubricant temperature warning in **the "Lubrication"** section above.

NOTE: Do not run uncontrolled bakeouts!

Automatic temperature control with the sensor (s) correctly located in the top of the area being heated is highly recommended.

NOTE: Do not run uncontrolled bakeouts or bakeouts approaching 300°C.

We at Thermionics have a large stake in your new equipment operating up to your expectations. If you experience difficulty with this unit, or any other aspect of your endeavor where our experience might be of value, we want to hear from you. We want to be part of your success.

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