

INSTRUCTION MANUAL

FRRC-275 SERIES PRECISION ROTARY FEEDTHROUGHS [ROTARY COAXIAL MOTION]

Version 2

SERIAL # _____

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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 FRRC-275 Series Precision Rotary Feedthroughs are rotary positioning devices with independent* rotary actuation down the center of the 3/8" rotating shaft.

(*See "note", operation section.)

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

The FRRC Series are available with standard or custom shaft lengths. They can be fitted with an azimuthal rotation gearbox supplying 360-degree continuous rotation.

The rotations may be motor driven as an option. Stepping or synchronous motors may be used, depending upon application.

Unpacking

FRRC 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 antiseize lubricant be used on all mounting bolts. This is especially important if the unit will be subject to bakeouts.

Many FRRC units are ordered with long output shafts. The shafts are straightened to provide <+/- 0.005" runout at the tip when used in the vertical orientation, knobs up. Because of the lengths, high probe rigidity is not available. Use care so as not to bend this shaft set when installing or working on the instrument.

Operation

The FRRC Precision Rotary Feedthrough provides two coaxial rotary actuations.

OUTER 3/8" TUBE:

The outer tube position is actuated by the base rotary knob (3"diameter). The standard model is graduated in 1° increments and includes a position lock. The positioning resolution of the feedthrough is 0.1°. To achieve the full resolution, the fine adjust option is required.

INNER 1/8" SHAFT:

The inner shaft is actuated by the small FPRM-133 rotary actuator mounted atop the base rotary feedthrough. Two locks are supplied.

By operating the stage lock (small thumb screw) and releasing the large aluminum knob clamp lock, the inner shaft will stay stationary^{*} with respect to the outer 3/8 shaft (both rotate together when the base rotary knob is adjusted).

By operating the large aluminum knob clamp lock and releasing the stage lock (small thumb screw), the inner shaft will stay stationary with respect to the base flange (not rotate when the base rotary knob is adjusted).

Do not operate both locks at the same time. equipment damage may occur.

The two rotary shafts are intended for precision rotary positioning. They are not intended for continuous rotary drive. Operate these units only as

intended.

*NOTE:

The inner and outer shafts are separately actuated by the FPRM-133 top and larger rotary base stages respectfully. The actuation is basically "independent", but a minor dependency may be observed if the upper rotary stage is locked and the base stage is adjusted over a large range. This "dependency" may be as large as 1° over a 180° change in the outer co-axial shaft position.

<u>Adjustments</u>

Your Feedthrough is correctly adjusted prior to shipment. There are no user adjustments available on this unit. Please consult with the factory if difficulty is encountered.

Lubrication

All external bearings and stages are lubricated with "Molycoat" brand high temperature dry lubricant. 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.

The internal bearings are lubricated with Tungsten disulfide.

*** 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.

Bakeout Procedure:

The standard FRRC-275 feedthrough may be baked without any disassembly. We do not recommend stage temperatures exceed 175 degrees C continuously and 200 degrees C intermittently (less than 12 hours) for maximum service life.

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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