INSTRUCTION MANUAL

ECT SERIES TRANSLATORS

Version 2

SERIAL # _____

11.2023
231 B Otto Street - Port Townsend, WA 98368 - (360)385-7707

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

ECT Linear Translators

The ECT series of translators provide rugged, stable linear translation in a wide range of bellows sizes. Depending upon size and stroke, two or three acme lead screws are used to position the traveling flange. Two or three 3/4" diameter stainless guide rods are used to guide the drive axis. These units offer unparalleled mechanical support for customer payloads. They are available with bellows ID's from 1.39" through 6" standard, with larger ID's available. Standard flange sizes are selected to correspond with the bellows ID, but specials are easily provided.

Standard units are covered under our 5 YEAR GUARANTEE.
Motor drives are available.

Unpacking

ECT Translators are shipped with custom foam-in-place packing. We have found this the only system to provide adequate protection for shipment. The foam is separated approximately half way inside the crate with thin blue plastic. The bellows assembly is shipped in place protected by a cardboard or thick paper wrap about the bellows. The greased lead screws are wrapped to prevent lubricant migration during shipment. These protectors should be left in place until the manipulator is fully mounted.

We strongly recommend the packing crate with packing be saved for possible future shipment or equipment storage.

Installation

WARNING

Shipping vibration can loosen screws. The user must check to verify the screw fasteners have not backed off on the unit during shipment. This is critical for safe operation.

***THIS IS IMPORTANT ***

The standard ECT Translator 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 6" OD flange. (other flanges are available). 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.

WARNING

ECT translators are capable of horizontal and inverted operation. Note payload and center-of- gravity considerations prior to such operation.

Payload Considerations

The two lead screw ECT Series instruments have a 45# equipment payload for vertical operation. (Note: NOT inverted mounting!) This number is increased to 80# for three lead screw models. This payload is based upon the total load on the traveling flange with the base flange securely attached to the customers chamber, providing a strong and stable mounting. The payload center of gravity must be within the diameter of the traveling flange nominal OD detail and within a distance of 2 times this nominal flange diameter.

Please consult the factory if your application requires:

- Payload greater than 45#
- (80# on 3 lead screw units)
- Center of gravity beyond above limits
- Mounting orientation other than standard vertical
- (i.e., angled, horizontal, inverted, etc)

Many ECT units can be used in the above conditions. We are happy to work with your application to establish and verify suitability for your application.

Adjustments

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

TRAVEL LIMIT STOP COLLARS/SCREWS:

Some models come equipped with stop screws attached to the Z Back or collars clamped to the guide rods or the Z axis lead screw. These stops limit travel to the specifications of the device, such that the bellows is not extended beyond its operating parameters. If a need arises to move these stops, replace them accurately upon re-assembly. Over extension of the bellows will cause premature failure of the bellows and/or mechanical damage to the manipulator or other equipment.

Lubrication

All bearings, gears, gearboxes, and lead screws are lubricated with Thermionics GHT-2 high temperature lubricant. The user will need to add more lubricant from time to time, depending on the frequency and temperature of bakeouts and operating environment.

WARNING

Additional lubricant must be added to the lead screw as the use and operating environment requires. The standard lifting mechanism is a bronze acme thread on a burnished steel acme lead screw. This is a sliding contact, requiring lubrication. Equipment overloading, heavy use, high temperature bakeouts, environmental conditions, etc. can and will remove the lubricant from this interface. **THIS WILL CAUSE PREMATURE WEAR.** If this is continued to an extreme, the nut will fail and allow the stage to suddenly drop. **THIS SITUATION IS DANGEROUS TO EQUIPMENT AND PERSONNEL AND MUST BE AVOIDED.** Inspect this mechanism and relubricate as needed. The mechanism should have 0.002" to 0.006" vertical (axial) backlash maximum. If more is detected, consult the factory for suitable service/repair.

WARNING

This 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 gasses at elevated temperatures.

Bakeout Procedure

We recommend limiting the temperature of the device (and the lubricant) to a maximum bakeout temperature of 200 C. Bakeouts of long duration (12 hours or more) should be limited to lower temperatures. We recommend 180 C maximum for long bakeouts.

Our bakeout temperatures are conservative. We find they lead to long service life and high reliability. Tear-down and re-lubrication is held to a minimum. Operation outside these parameters cannot be guaranteed.

SUMMARY: The ECT translator can be baked with standard UHV bakeout procedures.

See safety warnings under "Lubrication".

DO NOT RUN UNCONTROLLED BAKEOUTS OR BAKEOUTS OVER 200 C

All motors and limit switches/ position indicators must be removed prior to bakeout.

Motorized operation

Your translator can be motorized. Retrofit kits are available for field installation. Please consult the factory for further information.

All motors and limit switches/ position indicators must be removed prior to bakeout.

Removal and Adjustment Procedures

Z DRIVE:

The Z drive motor is removed by first removing the two SHCS attaching the motor drive to the base flange. The motor and worm drive assembly is removed as a unit.

LIMIT SWITCHES:

The limit switches are mounted in removable assemblies. Simply remove the two associated mounting screws and remove the plate.

POSITION INDICATORS:

Position indicators may be removed with limit switch mounting plates or individually as required. Care should be used upon re-assembly to dress the wires as not to interfere with stage motion.

WIRING COLOR CODE… Limit switches and Position indicators

SWITCHES:

Common	Yellow
Normally closed	Green
Normally open	Red

LED POSITION INDICATORS: CLI870W

Pin #

1. Red
2. Yellow
3. Green
4. Black

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.

END