



siskiyou MC1000e-R1 Encoded Device Encoded Device User Manual

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siskiyou

siskiyou MC1000e-R1 Encoded Device Encoded Device



Siskiyou Encoded Device User's Manual

This manual provides information on Siskiyou Corporation's products, including:

- MC1000e-R1
- MC1000e-R/T
- MC1000e-1
- MC1000e
- MC1000e-J
- MC1100e
- DR1000
- RPA Motorized Translation Stages
- Motorized XYZ Stages
- 840 Series Actuators
- Motorized Rotational Stages (RSA-0.5i, RSA-1.0i, RSA-2.0i)
- MXMS-cri Series Microscope Stages
- MX7000 Series Micromanipulators
- MX831 Micromanipulators

Product Warranty

Siskiyou Corporation products are covered by a one-year warranty from the original invoice date. The products will be free of defects in material and workmanship and will meet the specifications stated in the product literature.

Non-Warranty Repairs

If a product needs repairing after the one-year warranty period expires, Siskiyou Corporation will provide an estimate of repair charges and then repair the product upon receiving authorization from the customer. Repairs are warranted for 90 days.

Installation, Setup, and Operation

Refer to the user manual for specific instructions on setting travel limits, mounting actuators and stages, and operating motorized rotational stages.

Inspection

Inspect Siskiyou products immediately upon receipt and notify the carrier if damage is obvious.

Description

Siskiyou's products incorporate mechanical limit switches that cut motor power preventing accidental over-travel.

Contact Information

- **Telephone** (toll-free): 1-877-313-6418
- **E-Mail:** service@siskiyou.com
- **Facsimile:** 1-541-479-3314

Service Information

Please call, email, or fax in your questions to Siskiyou Corporation at:

Telephone (toll free): 1-877-313-6418

E-Mail: service@siskiyou.com

Facsimile: 1-541-479-3314

For a mailing address, refer to page 23.

Product Warranty

Siskiyou Corporation products carry the following warranty, effective for a period of one year from the original invoice date unless otherwise stated in the product literature:

- Siskiyou Corporation products will be free of defects in material and workmanship.
- Siskiyou Corporation products will meet the specifications stated in this catalog.

If you find any defects in material or workmanship, or a failure to meet specifications within the warranty period, return the product to us clearly marked with a Return Authorization (RA) number and we will either repair or replace it at our discretion. Call our toll free telephone number and ask for the service department to request RA numbers.

Our warranty excludes products that have been improperly installed or maintained, modified or misused. Notification of claim must occur within the warranty period. Siskiyou Corporation's liabilities are limited as set forth in our STANDARD TERMS AND CONDITIONS, copies of which are available upon request.

Siskiyou Corporation products unused and undamaged may be returned to Siskiyou Corporation within 30 days of the initial invoice date (60 days outside of the US), but are subject to a 25% restocking fee.

Warranty Repairs

Before shipping a part to Siskiyou Corporation, a Return Authorization (RA) number must be obtained by calling our service department at our toll free telephone number. The product must be shipped prepaid in the original or equivalent packing with the RA number clearly marked on the outside of the box. Pack carefully to prevent damage. Place actuators, stages, manipulators, and controllers in a clean plastic bag to prevent contamination from packing materials. Siskiyou Corporation cannot be responsible for any damage occurring in transit to us. Products are not accepted without a Return Authorization number on the outside of the shipping carton.

Non-Warranty Repairs

If a product needs repairing after the one year warranty period expires, we will first provide an estimate of repair charges and then repair the product upon receiving authorization from you. Repairs are warranted for 90 days. Refer to the above Warranty Repairs information for return procedures.

Introduction

This manual describes the operation of Siskiyou's 840 Series Linear Actuators, 100cri, 200cri, 7000, and 830 Series Stages, RSA-i Series motorized rotational stages, MXMS-cri Series Microscope Stages, MX7000 Series Micromanipulators, and MX831 Micromanipulators, as well as their related controllers.

MXMS-cri Series Microscope Stages, MX7000 Series Micromanipulators, and MX831 Micromanipulators are made up of 7000 Series Stages, and 830 Series Stages. Therefore the descriptions and operating features of the respective stages correspond to the related microscope stage, and micromanipulator systems as well.

Inspection

Siskiyou products are shipped in sturdy, cushioned boxes. Please inspect the instrument and/or controllers immediately and notify the carrier if damage is obvious.

Description

Siskiyou's 840 Series Actuators, 100cri, 200cri, 7000, and 830 Series Stages, MXMS-cri Series Microscope Stages, MX7000 Series Micromanipulators, and MX831 Series Micromanipulators incorporate mechanical limit switches that cut motor power preventing accidental over-travel.

The 840 Series Actuators can be configured with travel limits from approximately 1/32 inch to 2 inches (0.8 mm to 50 mm), enabling them to be used on a wide variety of Siskiyou translation stages.

To provide accurate motion, the 840 Series Actuator's 3/16-inch diameter plunger is non-rotating. A non-rotating low friction composite nut engages the leadscrew and pushes the actuator plunger or stage platform. In the 840 Series Actuators a composite half-nut is used to trigger a travel limit in the extended position while the lead screw nut trips the limit at full retraction.

*** Caution**

If an actuator or stage encounters a hard stop within its range of travel (a translation stage's or mirror mount's end of travel, for example), STOP THE DEVICE AS SOON AS POSSIBLE! CONTINUED OPERATION WILL DAMAGE THE INSTRUMENT!

These actuators and stages are powered by low inertia DC servomotors to provide smooth movement with low acoustic and mechanical noise. Submicron resolution is obtained with a precision stainless steel leadscrew driven through an anti-backlash reduction gearbox.

The motor has an ironless-rotor to permit fast response due to its low inertia. The brushes are precious-metal plated for long life. The factory lubrication has a vapor pressure of 10⁻⁶ Torr at 25°C.



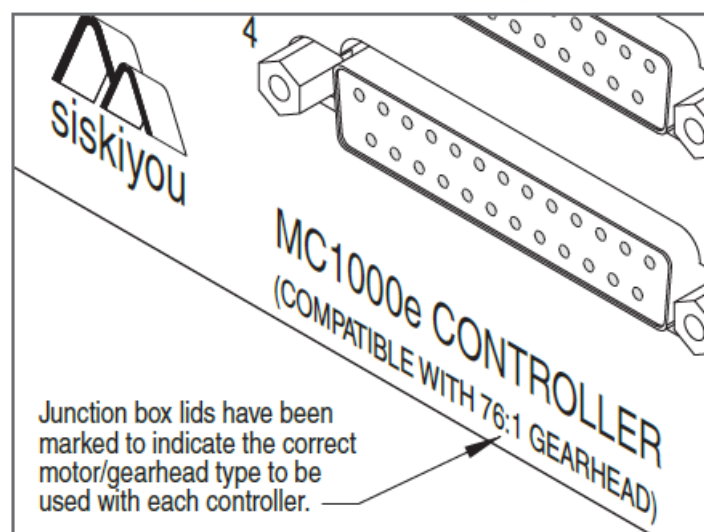
Motion Controller



Digital Readout



Motorized Stage

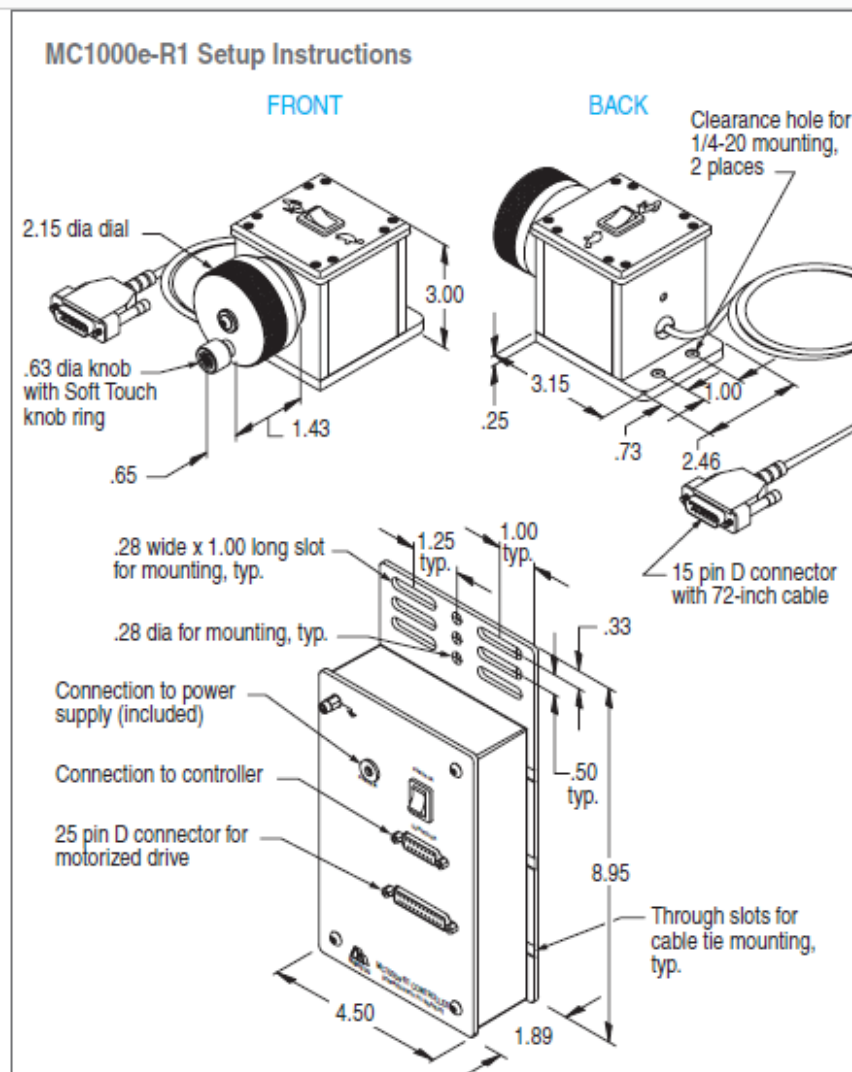




CERTIFIED DEVICE

Performance Specifications

- Minimum controllable motion 0.2 μm
- Maximum speed 1.7 mm/sec
- Power requirements 110 VAC, 50/60 Hz
- Output 15VDC/400mA, via supplied wall mounted power supply



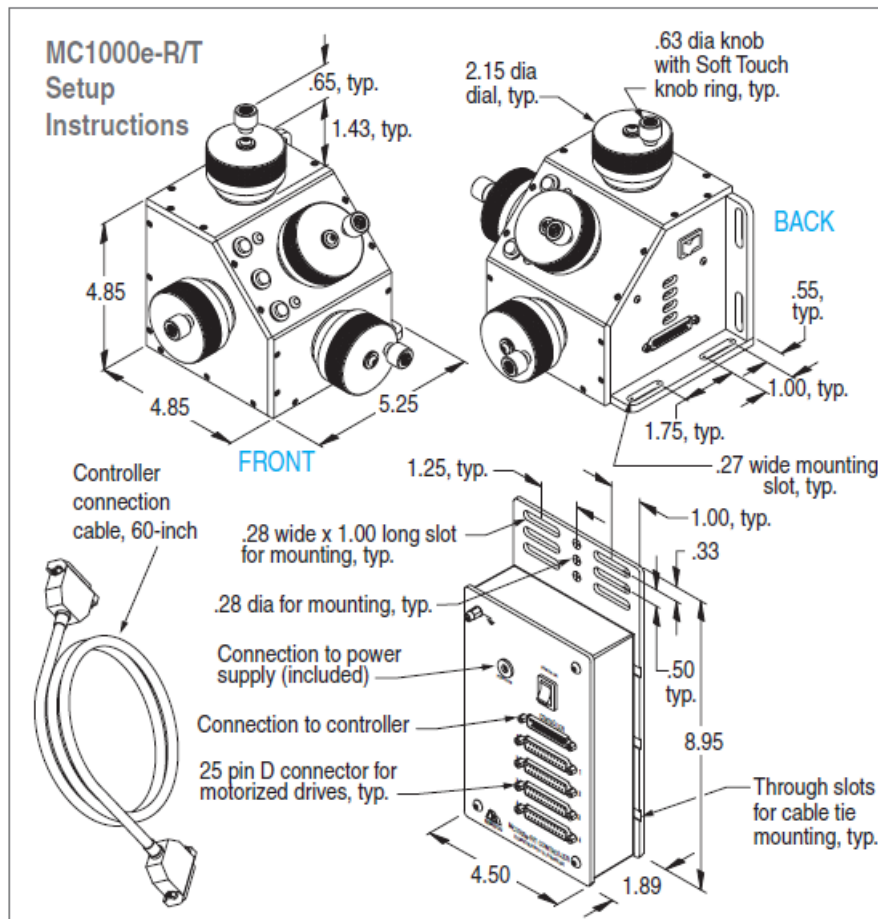
Controller Interfaces

The 840 Series actuators, 7000 Series and 830 Series stages incorporate travel limit switches. Additionally, since these instruments use high torque motors and anti-backlash gearboxes, their comparability with non-Siskiyou controllers may be limited. The following sub-sections describe the comparability and features of Siskiyou controllers.

MC1000e-R1 Single-Axis Dial

The MC1000e-R1 uses encoder feedback from our closed loop devices to cre-ate an electronic link between the controller dial and the device being driven. This direct coupling to the encoder ensures smooth and coordinated motion between the controller and the drive. The encoder coupling enables the use of the DR1000 digital readout for repeated positioning requirements.

A two-position rocker switch is located on the top of the controller. The rapid setting is set to maximize speed (1.7 mm/second) when the dial is turned at 180 RPM. The slow setting is set to maximize resolution (0.2 μ m) but still allow coarse positioning (45 μ m/second).



MC1000e-R/T 4-Axis Closed Loop Dial TARGET/RETRACT

The MC1000e-R/T 4-axis dial controller acts as a remote micrometer control with a user selected target feature for 800 and 7000 series actuators, manipulators, and stages. The MC1000e-R/T 4-axis dial controller acts as a remote micrometer control with a user selected target feature for 800 and 7000 series actuators, manipulators, and stages. The MC1000e-R/T uses encoder feed-back from our closed loop devices to create an electronic link between the controller dial and the device being driven. This direct coupling to the encoder ensures smooth and coordinated motion between the controller and the drive. The encoder coupling enables the use of the DR1000 digital readout for repeat-ed positioning requirements.

A two-position rocker switch is conveniently located on the side of the controller. The rapid setting is set to maximize speed (1.7 mm/second) when the dial is turned at 180 RPM. The slow setting is set to maximize resolution (0.2 μ m) but still allow coarse positioning (800 μ m/second).

The TARGET/RETRACT allows the user to set a target location at a desired point. When it becomes necessary to back away from the experiment area, the user simply depresses the RETRACT button on the controller. The stage/actuator plugged into that axis (No.1), then automatically retracts to its full negative limit. The user can then return to the previously set position by simply depressing the TARGET button. The MC1000e-R/T uses a wall mounted power supply as its source for clean DC power. All cables are shielded and a central ground lug is located on the junction box to ensure noise-free operation during sensitive electrophysiology experiments.



MC1000e-R/T

CERTIFIED DEVICE

Performance Specifications

- Minimum controllable motion 0.2 μm
- Maximum speed 1.7 mm/sec
- Power requirements 110 VAC, 50/60 Hz
- Output 15VDC/400mA,
via supplied wall mounted power supply

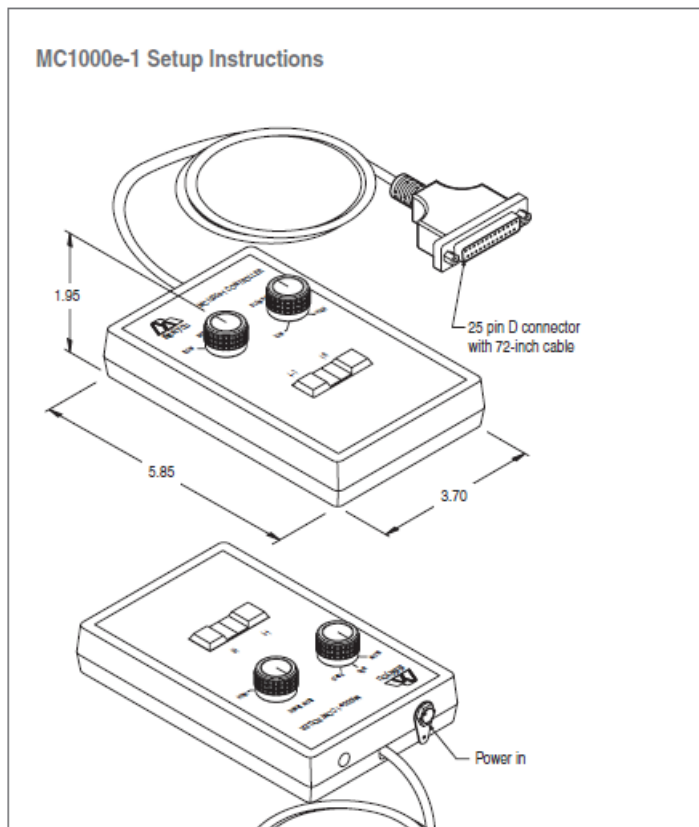


MC1000e-1

CERTIFIED DEVICE

Performance Specifications

- Minimum controllable motion 0.2 μm
- Power requirements 110 VAC, 50/60 Hz
- Output 15VDC/400mA,
via supplied wall mounted power supply

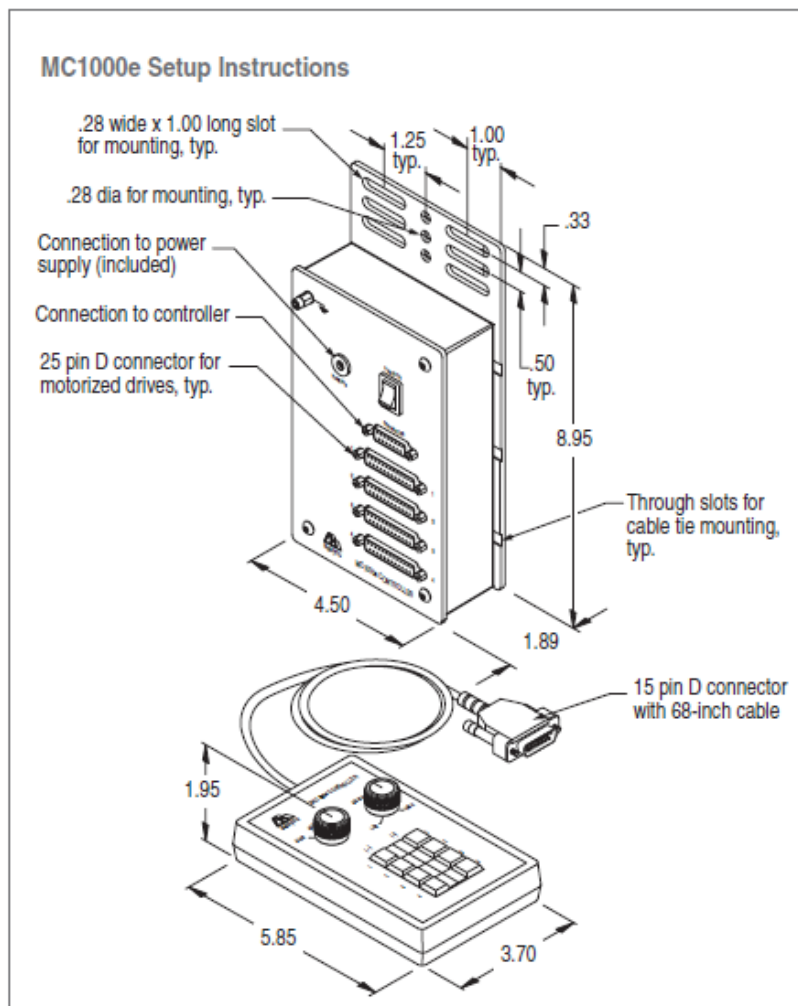


MC1000e-1 Single-Axis Push Button

Siskiyou's MC1000e-1 hand held single axis controller is compatible with all of our 840 Series Actuators, 7000 Series Stages, 830 Series Stages, 7000 Series Micromanipulators, and 831 Series Micromanipulators.

The MC1000e-1 single-axis controller has two preset speed settings: rapid (1.7 mm/sec) and medium (300 $\mu\text{m}/\text{sec}$). The third speed selector (slow) has a variable 330° potentiometer that enables settings from high speed (50 $\mu\text{m}/\text{sec}$) to low speed (2 $\mu\text{m}/\text{sec}$). With the speed selector set at the slowest settings, consistent 0.2 μm moves are made by a bump of the axis button.

The MC1000e-1 controller does not have a junction box. The stage or actuator is connected directly to the 25 pin connector shown. The wall transformer power supply cord plugs into a power jack socket on the end of the case where the cable is shown, right above the logo.



MC1000e 4-Axis Push Button

Siskiyou's MC1000e hand held 4-axis controller is compatible with all of our 840 Series Actuators, 7000 Series Stages, 830 Series Stages, 7000 Series Micromanipulators, and 831 Series Micromanipulators. The MC1000e Controller is a closed loop controller that enable the user to consistently perform single step moves as small as 0.2 μm .

The MC1000e 4-axis controller has two preset speed settings: rapid (1.7 mm/sec) and medium (300 $\mu\text{m}/\text{sec}$). The third speed selector (slow) has a variable 330° potentiometer that enables settings from high speed (50 $\mu\text{m}/\text{sec}$) to low speed (2 $\mu\text{m}/\text{sec}$). With the speed selector set at the slowest settings, consistent 0.2 μm moves are made by a bump of the axis button.



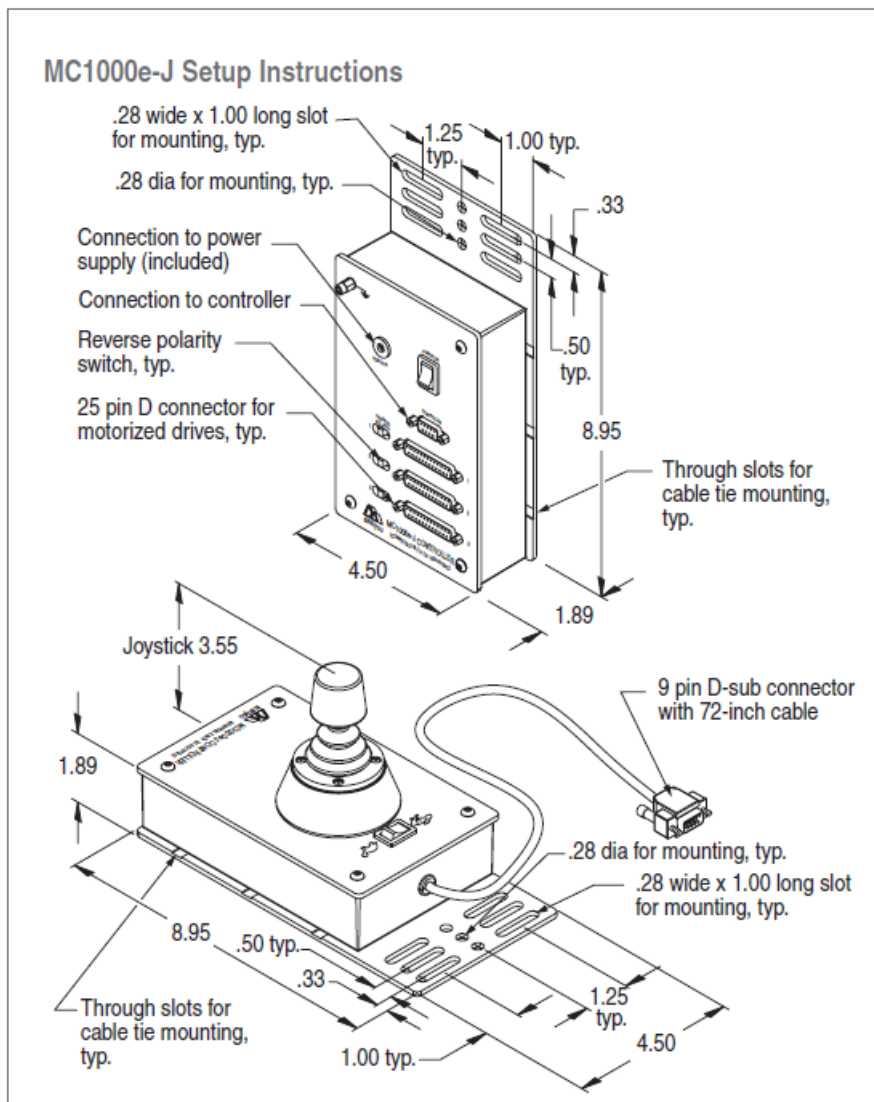
CERTIFIED DEVICE

Performance Specifications

- Minimum controllable motion 0.2 μm
- Power requirements 110 VAC, 50/60 Hz
- Output 15VDC/400mA,
via supplied wall mounted power supply



CERTIFIED DEVICE



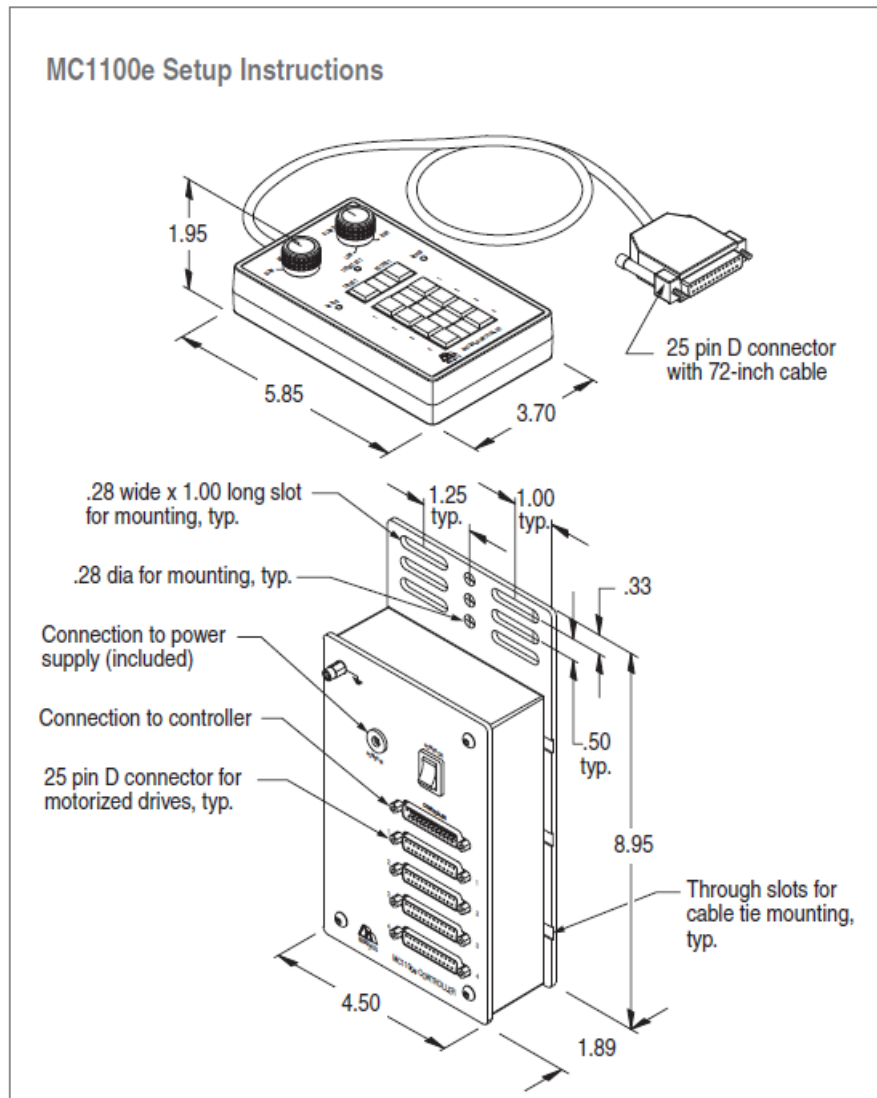
MC1000e-J 3-Axis Joystick

Siskiyou's MC1000e-J 3-axis joy-stick controller is compatible with all of our 840 Series Actuators, 7000 Series Stages, 830 Series Stages, 7000 Series Micromanipulators, and 831 Series Micromanipulators. The MC1000e-J controller is a closed loop controller that enables the user to consistently perform smooth joy-stick motion as small

as 1 μm .

A two-position rocker switch is located on the top of the controller. The rapid setting is set to maximize speed (1.7 mm/second) when the joystick is moved to its farthest position from center. The slow setting is set to maximize resolution (0.2 μm) but still allow coarse positioning (20 μm /second).

Reverse polarity switches are included for each motion direction of the MC1000e-J. By switching the polarity, the direction of motion relative to the joystick is reversed.



MC1100e 4-Axis Targeting

Siskiyou's MC1100e hand held 4-axis controller is compatible with all of our 840 Series Actuators, 7000 Series Stages, 830 Series Stages, 7000 Series Micromanipulators, and 831 Series Micromanipulators. The MC1100e Controller is a closed loop controller that enables the user to consistently perform single step moves as small as 0.2 μm . The MC1100e incorporates a "Targeting" feature for one axis. This feature enables the user to pre-set a target point on that axis, "Retract" to the negative limit of travel and return to that pre-set point simply by depressing the "Target" button on the controller.

The targeting axis is axis number 1. To set a point of reference when axis 1 is in a desired position, push the "Target Set" button. To retract the motorized axis 1, push the "Retract" button. Once this axis has reached its reverse limit switch the red LED will light up. To bring the axis back to the target position, push the "Target" button. When the green LED lights up, the motorizer is in the target position. For best results and to avoid backlash, the direction of travel when the "Target Set" button is pushed should be a forward move; that is, the same travel direction as the movement from the limit switch to the target.

*** Note:** For all axes to operate, the targeting axis 1 must be connected.



CERTIFIED DEVICE

Performance Specifications

- Minimum controllable motion 0.2 μm
- Power requirements 110 VAC, 50/60 Hz
- Output 15VDC/400mA,
via supplied wall mounted power supply



CERTIFIED DEVICE

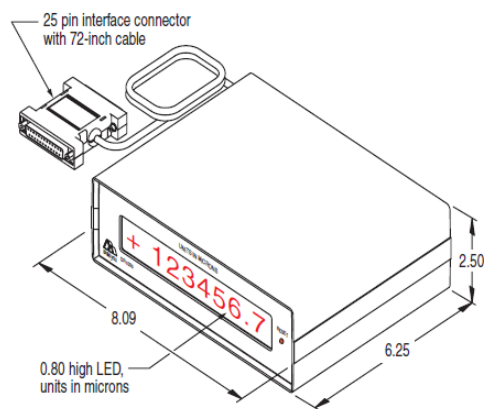
Performance Specifications

- Minimum travel increment 0.1 μm
- Maximum travel display 500,000 μm
- Accuracy 99%
- Power requirements Power is supplied through the e Series motion controller junction box



CERTIFIED DEVICE

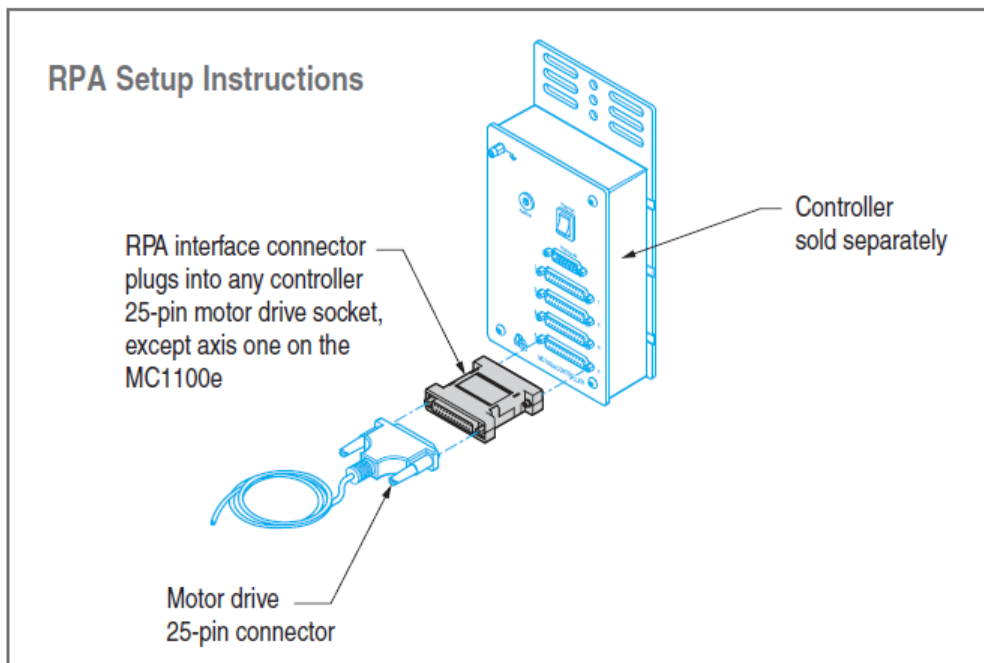
DR1000 Setup Instructions



DR1000 Digital Readout

The digital readout may be installed on any of our e series controllers and is connected in series via a double-sided connector between the controller junction box and the device D connector. The DR1000 has a face mounted ZERO RESET button.

* **Note:** The DR1000 is intended for linear motion devices.
The DR1000 is not compatible with the MC2000 Series controllers.



RPA Reverse Polarity Adapter

The RPA is an interface plug that reverses the motion direction of stages and actuators. Used to reverse axis direction relative to controller. Use on MC1000e-1, MC1000e, MC1000e-R1, and MC1100e.

*** Note:** Not for use on the targeting axis, axis number 1, on the MC1100e.

Motorized Translation Stages

The 100cri motorized crossed roller bearing translation stage has more bearing area than similar stages. The increased bearing surface ensures true bidirectional axial positioning even at submicron levels.

100cri stages are an integration of our 100cr crossed roller translation stage and our 841 actuators. Our e series and MC2000 Series controllers drive the stage through a closed loop interface between the controller and the motor encoder. The closed loop connection ensures 0.2 μm and 0.1 μm resolution, respectively. The encoder coupling also enables the use of the DR1000 digital readout for repeated or relative positioning requirements. There is a man-readable scale on both the top and bottom of the drive housing. They are available in either right- or left-hand versions. Multiple 100cri units are stackable for XY positioning requirements and are compatible with our MX- AB angle block for Z axis applications.

- No maintenance is required under normal operating conditions.

The 200cri motorized crossed roller bearing translation stage has more bearing area than similar stages. The increased bearing surface ensures true bidirectional axial positioning even at submicron levels.

200cri stages are an integration of our 200cr crossed roller translation stage and our 842 actuators. Our e series and MC2000 Series controllers drive the stage through a closed loop interface between the controller and the motor encoder. The closed loop connection ensures 0.2 μm and 0.1 μm resolution, respectively. The encoder coupling also enables the use of the DR1000 digital readout for repeated or relative positioning requirements. There is a man-readable scale on both the top and bottom of the drive housing. They are available in either right- or left-hand versions. Multiple 200cri units are stackable for XY positioning requirements and are compatible with our MX- AB2 angle block for Z axis applications.

- No maintenance is required under normal operating conditions.



CERTIFIED DEVICE

Performance Specifications

- Maximum horizontal axis load 30 lbs
- Maximum vertical axis load 10 lbs
- Travel 1.0 inch (25 mm)
- Backlash $\leq 5 \mu\text{m}$
- Point-to-point accuracy $\pm 2 \mu\text{m}$



CERTIFIED DEVICE

Performance Specifications

- Maximum horizontal axis load 30 lbs
- Maximum vertical axis load 10 lbs
- Travel 2.0 inch (50 mm)
- Backlash $\leq 5 \mu\text{m}$
- Point-to-point accuracy $\pm 2 \mu\text{m}$



CERTIFIED DEVICE

Performance Specifications

- Maximum horizontal axis load 15 lbs
- Maximum vertical axis load 3 lbs
- Travel 1.0 inch (25 mm)
- Backlash $\leq 5 \mu\text{m}$
- Point-to-point accuracy $\pm 2 \mu\text{m}$



CERTIFIED DEVICE

Performance Specifications

- Maximum load 200 lbs, centered
- Travel/axis 1.0 inch (25 mm)
- Minimum controllable motion:
- Backlash $\leq 5 \mu\text{m}$
- Point to point accuracy $\pm 2 \mu\text{m}$

The 831 motorized precision ball bearing translation stage has more bearing area than similar stages. The increased bearing surface ensures true bidirectional axial positioning even at submicron levels. 831 stages are an integration of our 331 translation stage and our 841 actuators. Our e series and MC2000 Series controllers drive the stage through a closed loop interface between the controller and the motor encoder. The closed loop connection ensures 0.2 μm and 0.1 μm resolution, respectively. The encoder coupling also enables the use of the DR1000 digital readout for repeated or relative positioning requirements. There is a man-readable scale on both the top and bottom of the drive housing. They are available in either right- or left-hand versions. 831s are stackable for XY positioning requirements and are compatible with our MX-AB for

Z axis
applications.

- No maintenance is required under normal operating conditions.

The MXMS-cri series microscope translators are designed to be stable XY translators for fixed stage experiments. MXMS-cri series translators have a full 25 mm of XY translation and have full crossed roller bearing stages in all three locations.

MXMS-cri series translators can be controlled with any e series and MC2000 Series controllers. Our controllers drive the stage through a closed loop inter-face between the controller and the motor encoder. The closed loop connection ensures 0.2 μm and 0.1 μm resolution, respectively. The encoder coupling also enables the use of the DR1000 digital readout for repeated or relative positioning requirements. All cables are shielded to ensure noise-free operation during sensitive electrophysiology experiments.

- No maintenance is required under normal operating conditions.

Motorized XYZ Stages

The 7000 series motorized crossed roller bearing translation stages are an integrated version of our 1600 series crossed roller translation stage. They use a precision pre-loaded lead screw to ensure drift-free operation.

Our e series and MC2000 Series controllers drive the stage through a closed loop interface between the controller and the motor encoder. The closed loop connection ensures 0.2 μm and 0.1 μm resolution, respectively. The encoder coupling also enables the use of the DR1000 digital readout for repeated or relative positioning requirements.

7000 series stages come standard with our ABP-R mounting plate. The design of this mounting plate enables coarse positioning between platform mounting holes as well as 360° of coarse rotational positioning. If rotation with a solid submicron level stop is required, the MX-RS rotation stage is designed to mount directly into the ABP-R and has mounting holes for all 1600 series stages.

- No maintenance is required under normal operating conditions.

The MX7600 uses a precision pre-loaded lead screw to ensure drift-free operation and has applications in patch recording experiments. The motorized 4-axis micromanipulator incorporates our MXC-45 pipette holder mounted to an adjustable clamp on the \emptyset axis. This clamp allows the MXC-45 and \emptyset axis to be adjusted to the desired angle of approach from 0° to 180° for true axial approach. The MXC-45's built in rotational stop allows easy pipette replacement.

The MX7600 can be used with our e series and MC2000 Series controllers to drive the 7600 stage through a closed loop interface between the control-ler and the motor encoder. The closed loop connection ensures 0.2 μm and 0.1 μm resolution, respectively. The encoder coupling also enables the use of the DR1000 digital readout for repeated or relative positioning requirements. All cables are shielded to ensure noise-free operation during sensitive electrophysi-ology experiments.

MX7600 series stages come standard with our ABP-R mounting plate. The design of this mounting plate enables coarse positioning between platform mounting holes as well as 360° of coarse rotational positioning. If rotation with a solid submicron level stop is required, the MX-RS rotation stage is designed to mount directly into the ABP-R and has mounting holes to attach to the base of the MX7600.

- No maintenance is required under normal operating conditions.



CERTIFIED DEVICE

Performance Specifications

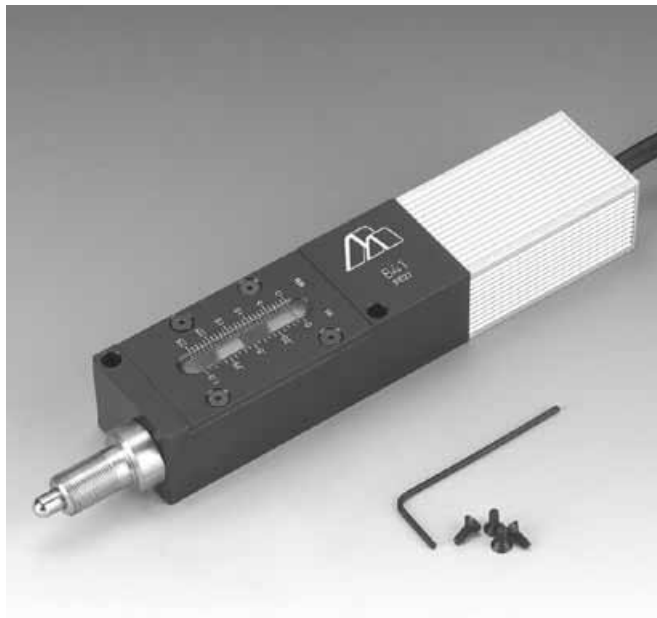
- Maximum horizontal axis load 5 lbs
- Maximum vertical axis load 2 lbs
- Travel 0.80 inch (20 mm)
- Backlash $\leq 5 \mu\text{m}$
- Point to point accuracy $\pm 2 \mu\text{m}$



CERTIFIED DEVICE

Performance Specifications

- Maximum load 2 lbs
- Travel/axis 0.80 inch (20 mm)
- Minimum controllable motion $0.1 \mu\text{m}$
- Backlash $\leq 5 \mu\text{m}$
- Point to point accuracy $\pm 2 \mu\text{m}$



Performance Specifications

- Maximum axial load 15 lbs (6.8 kg)
- Backlash $\leq 5 \mu\text{m}$
- Point to point accuracy $\pm 2 \mu\text{m}$
- Components shipped with unit
- 9/16" hex retaining locknut
- 0.050-inch hex Allen wrench
- #2-56 flat head screws, quantity of 4

Tools required for travel limit adjustment

0.050-inch hex Allen wrench

Note: Allen wrench and four extra #2-56 flat head screws shipped with unit.

Lubricant, light machine oil

* Note: Use sparingly ONLY on the non-rotating push rod, in the area that extends through the brass nose mount, and only if necessary.

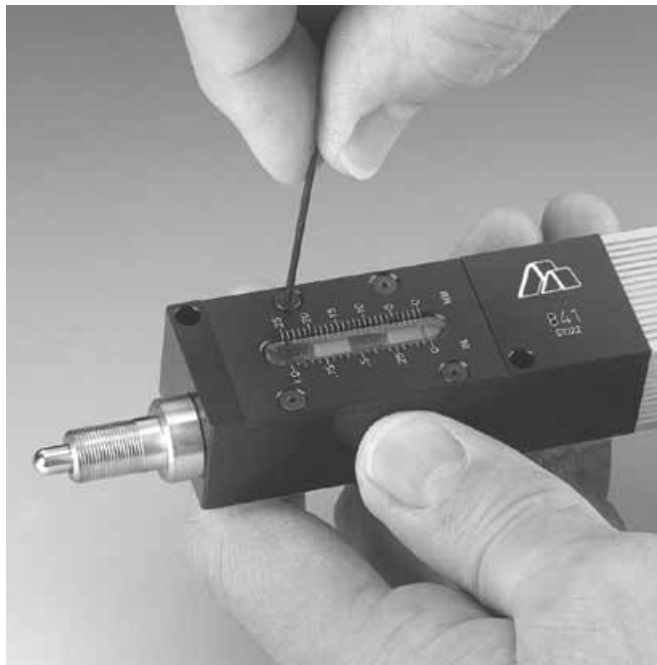


Figure 1

Remove the indicator window lid with the actuator in the zero position.

Model 840 Series Actuator

The 840 Series Actuators can be configured with travel limits from approximately 1/32 inch to 2 inches (0.8 mm to 50 mm), enabling them to be used on a wide variety of Siskiyou translation stages.

To provide accurate motion, the 840 Series Actuator's 3/16-inch diameter plunger is non-rotating. The standard gearbox ratio actuator can produce a maximum thrust in excess of 25 pounds (11 kg); but, when operating continuously over many cycles, the maximum load is rated at 18 pounds (8 kg). A non-rotating low friction composite nut engages the leadscrew and pushes the actuator plunger or stage platform. In the 840 Series Actuators a composite half-nut is used to trigger a travel limit in the extended position while the lead screw nut trips the limit at full retraction. The limit switches are repeatable to approximately 40 μ m.

Installation, Setup, and Operation

Setting the Travel Limits

(840 Series Actuators only)

Before mounting the 840 Series Actuator, follow the directions below to adjust the travel limits such that the actuator will trigger one of its limit switches before encountering any external hard stop such as the end of travel of a translation stage. Failure to do this may result in damage to the actuator and/or the stage. Actuators are shipped with the travel limit set to less than 1/2 inch (12mm) to prevent accidental over-travel in most instances.

Remove the Coarse Travel Indicator Window

Find a clean, flat surface to disassemble the actuator. (Tapped hole optical tables are not recommended since many of the parts are small and may drop into the table.) Using your controller, adjust the actuator to the zero position as read on the coarse position scale as shown in Figure 1. Remove the four #2-56 flat head screws holding the indicator window lid, place them to the side and gently lift off the lid, Figure 2.

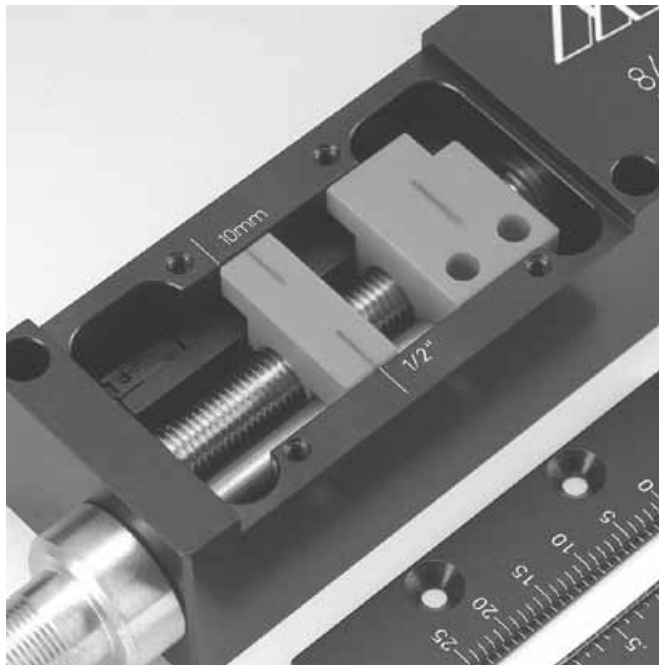


Figure 2

Approximate travel range markings assist in quick travel adjustment.

Ramped corner
towards brass
nose mount

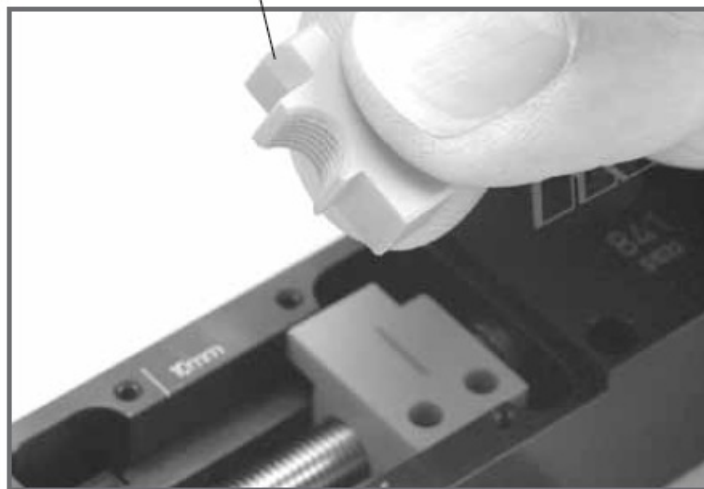


Figure 3

The half nut's ramped corner triggers the positive limit switch.

Reposition the Half-Nut to the Desired Travel

After removing the lid, laser marked lines indicating approximate travel ranges can be seen. Remove the half-nut by lifting it from the leadscrew. Note its orientation with respect to the leadscrew since it only fits one way (Figure 3). Approximate travel is set by replacing the half-nut onto the leadscrew with its center scribe mark aligned to one of the markings on the actuator body (Figure 4). These marks are only an aid to determining travel. The half nut may be placed anywhere along the lead screw. For full 840 Series Actuator travel, remove the half nut completely

and store it in a safe place for future use in case shorter travel is desired.

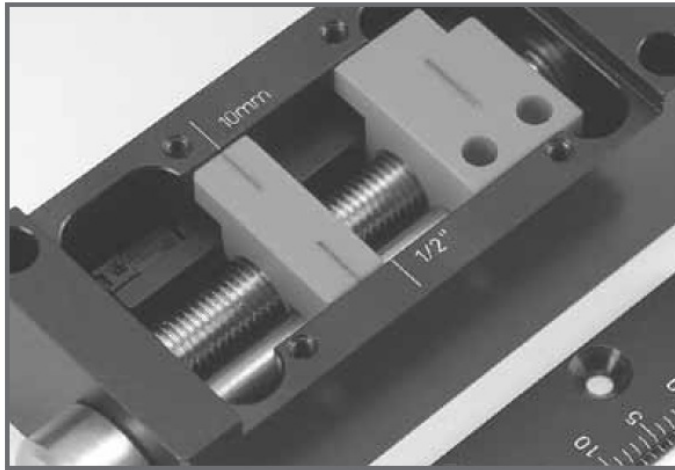


Figure 4
Place the half nut on the lead screw to set the approximate travel.

Replace the Coarse Travel Indicator Window

After inspecting the half-nut placement to ensure that it is fully seated on the lead screw, replace the lid and tighten the four #2-56 screws. Be sure to tighten the screws completely for proper operation (Figures 5 & 6). If the lid is loose, the half nut may ride up off the lead screw at the end of travel and defeat the purpose of the limit switch resulting possibly in damage to the actuator or the equipment it is moving.

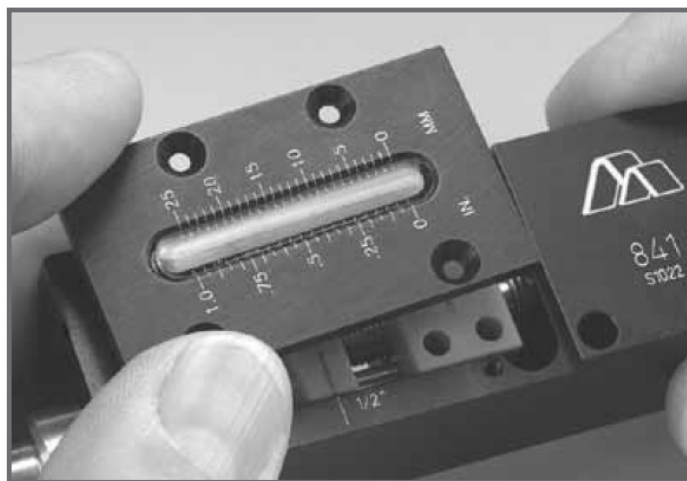


Figure 5
Replace the actuator lid, after seating the half nut on the lead screw.

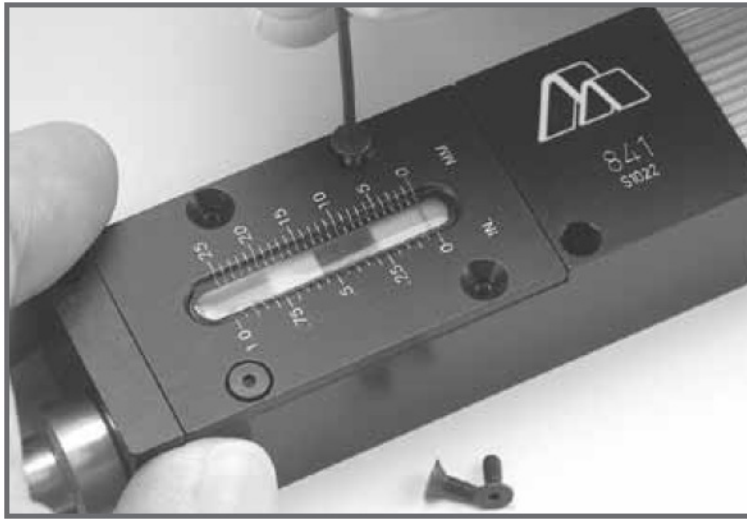
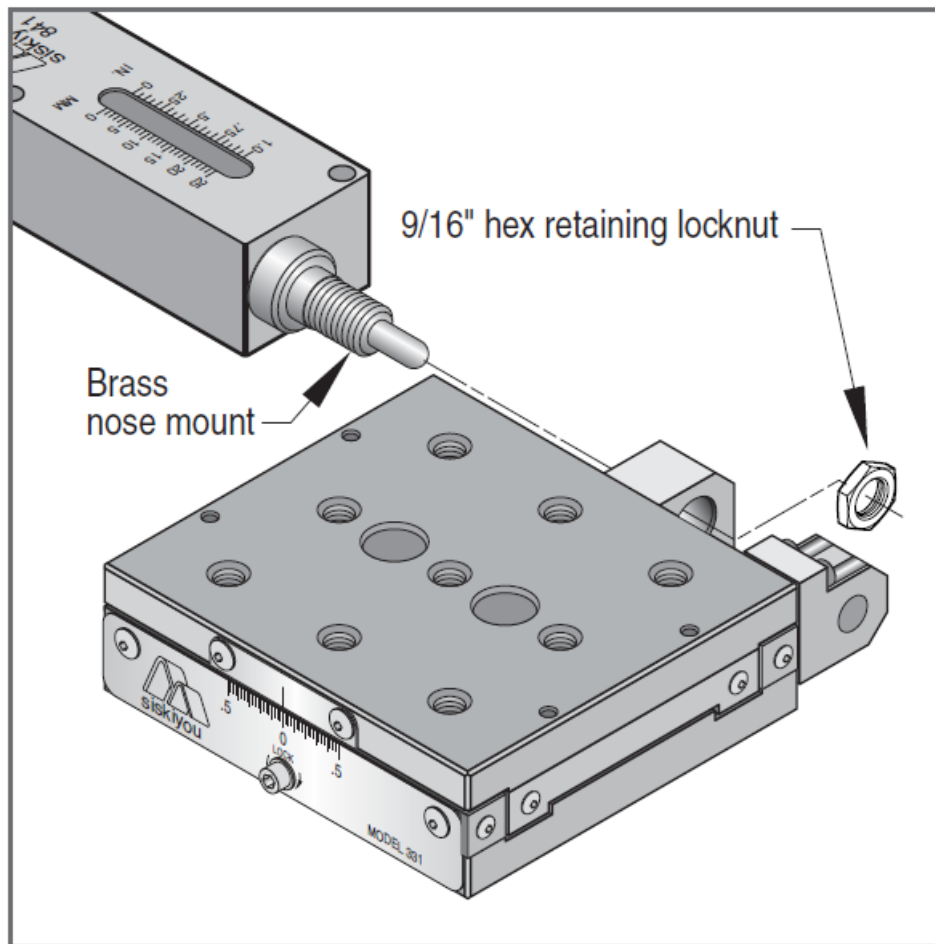


Figure 6
Tighten all four screws securely for proper operation.

Actuator mounting

The 840 Series Actuators may be mounted using either the 3/8 inch brass nose mount or by attachment using the clearance holes in the actuator body. When using the brass mounting sleeve, the actuator may be mounted to a wide variety of Siskiyou's components in one of four ways:

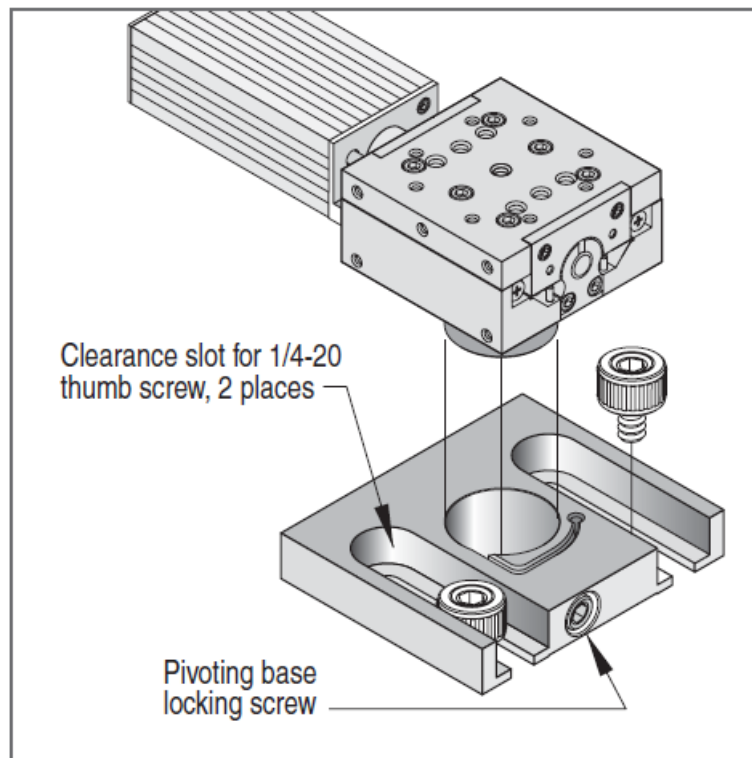
1. Unscrew the 9/16" retaining locknut and insert the 840 Series Actuator into the mount. Either use a wrench to tighten the nut, or if space permits, gently rotate the actuator body while holding the nut stationary with the fingers or a small screwdriver to tighten the whole assembly.
2. When the mount has a set screw, the retaining nut is not used. Insert the actuator and tighten the set screw.
3. In rare cases, when neither of the above two mounting methods can be used, it might be necessary to partially disassemble the device in which the actuator is being used. When access to the retaining nut side is reached, follow method #1 above.
4. For panel mounting in panels up to 1/2" thick, drill a 3/8" hole. Insert actuator and tighten retaining nut.



Stage mounting

The 7000 Series and 831 Series Stages have specific mounting procedures for the two styles of stage. To mount the 7000 Series Stages, loosen the 1/4-20 pivoting base locking screw located in the side of the supplied ABP-R mounting base. Once loosened, slide the stage and the mounting base apart. Next, mount the ABP-R mounting base in the desired location with the two 1/4-20 thumb screws that are supplied. Once mounting base is in the desired position, slide the stage back into place and lock with the 1/4-20 pivoting base locking screw. The 7000 Series Stages may also be mounted using any of the 8-32 or 4-40 holes in the base or side of the stage.

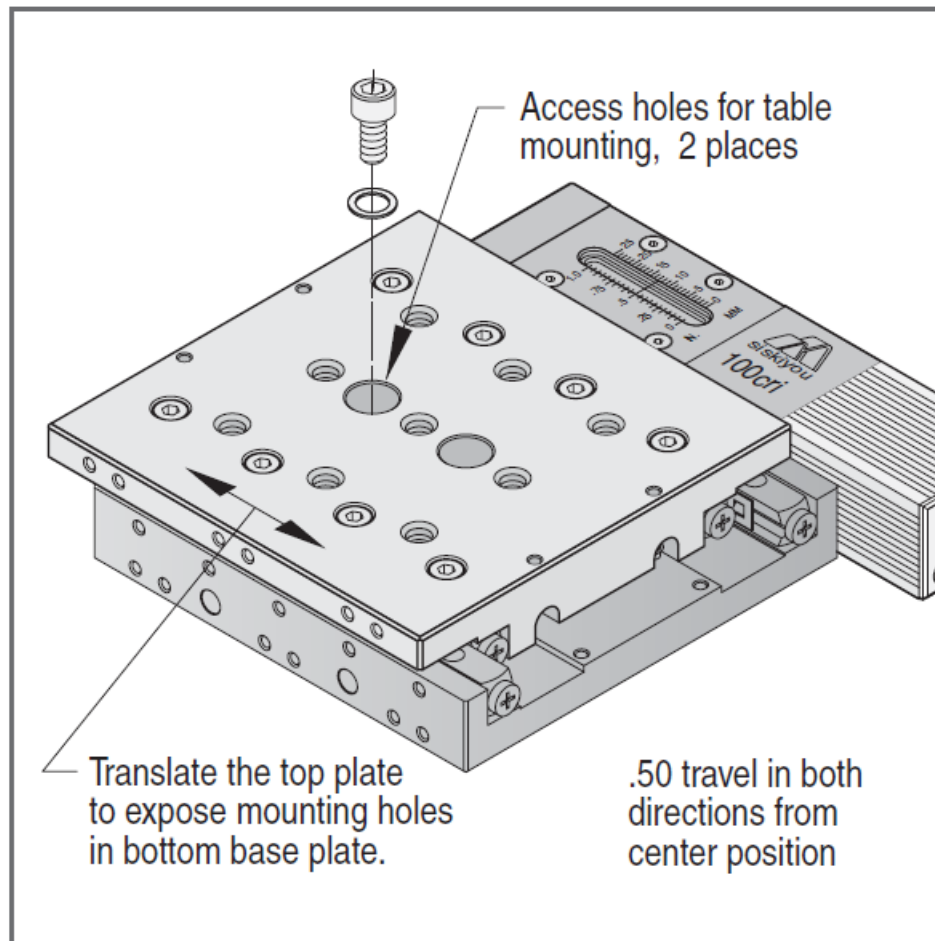
*** Note:** Care should be taken to not over tighten or use screws which are too long when using these mounting points.



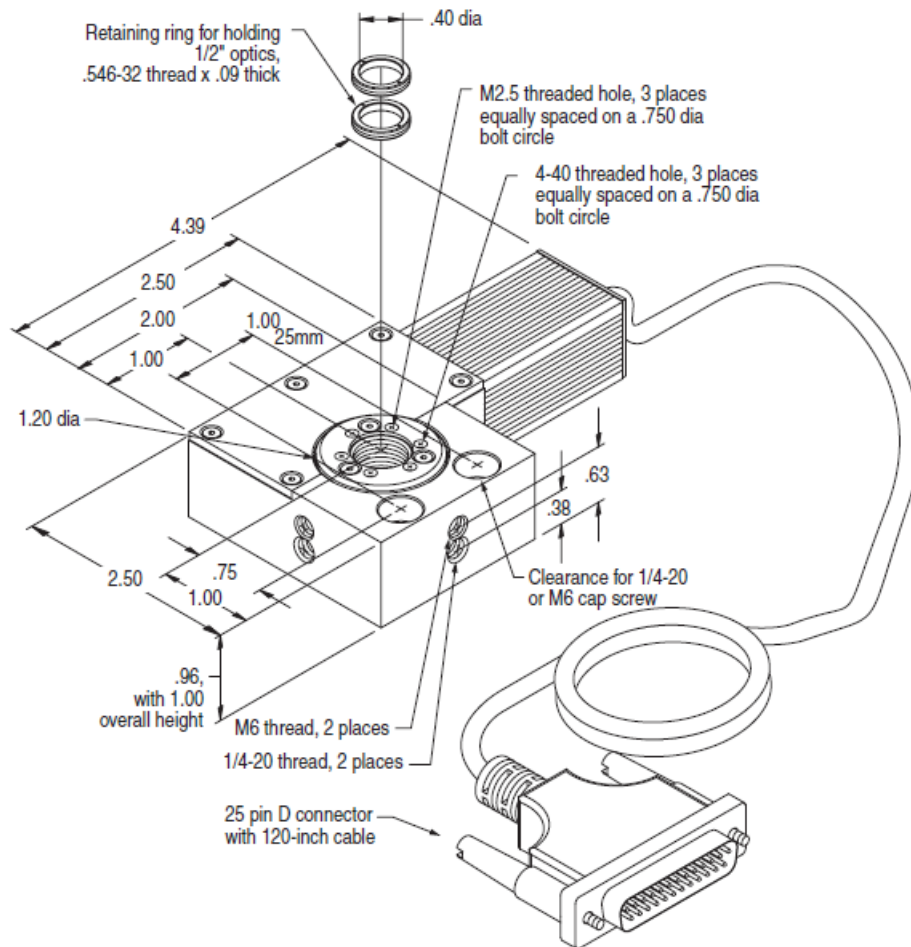
Vacuum compatible versions

840 Series Actuators, 7000 Series, and 831 Series Stages can be ordered to operate cleanly within a vacuum environment as high as 10^{-6} Torr. The following describes the alterations that make the standard actuators vacuum compatible;

1. Six foot Teflon-coated cable from actuator/stage attached to six foot standard cable.
2. Uncanonicalized aluminum body without label.
3. No fastener sealing compound.
4. The window material is removed.
5. Special lubricant with vapor pressure of 10^{-6} Torr at 39°C .
6. All blind holes and cavities are vented.



RSA-0.5i Setup Instructions



Motorized Rotational Stages

All rotational stages use ball bearings for smooth motion and solid support.

RSA-0.5i

The compact size and high performance of our RSA-0.5i motorized rotation stage make it ideal for motorized rotation applications in the laboratory as well as OEM systems. By employing our standard encoded DC servo motor, the overall thickness of the base is minimized to 1.0-inch [25-mm].

Standard mounting features include both 1/4-20 and M6 tapped holes on two edges for post or AS spacer mounting with the axis of rotation horizontal. Additionally, universal counterbores (U.S. system and metric spread) are included for attachment directly to a isolation table or platform with the axis of rotation vertical. The 0.5-inch inner diameter of the rotating dial accepts com-mon 0.5-inch and 12-mm optics and is supplied with two Delrin® retaining rings. The dial has six tapped holes (3 each 4-40 and M2.5) on the face to attach other optical or mechanical elements.

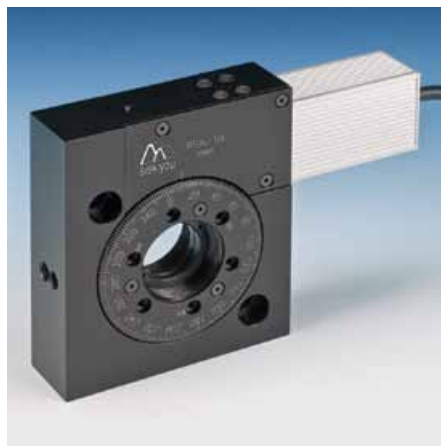
The RSA-0.5i's compact design and right angle drive are ideal for close coupled optic stacking.



CERTIFIED DEVICE

Performance Specifications

- Maximum load when axis of rotation is vertical 2 lbs when axis of rotation is horizontal 0.5 lbs
- Travel 360° continuous
- Unidirectional repeatability 6 arc seconds
- Backlash 100 arc seconds
- Minimum controllable motion 6 arc seconds
- Runout / wobble 530 arc seconds
- Encoder counts per revolution 2,137,184
- Maximum speed 10 rpm

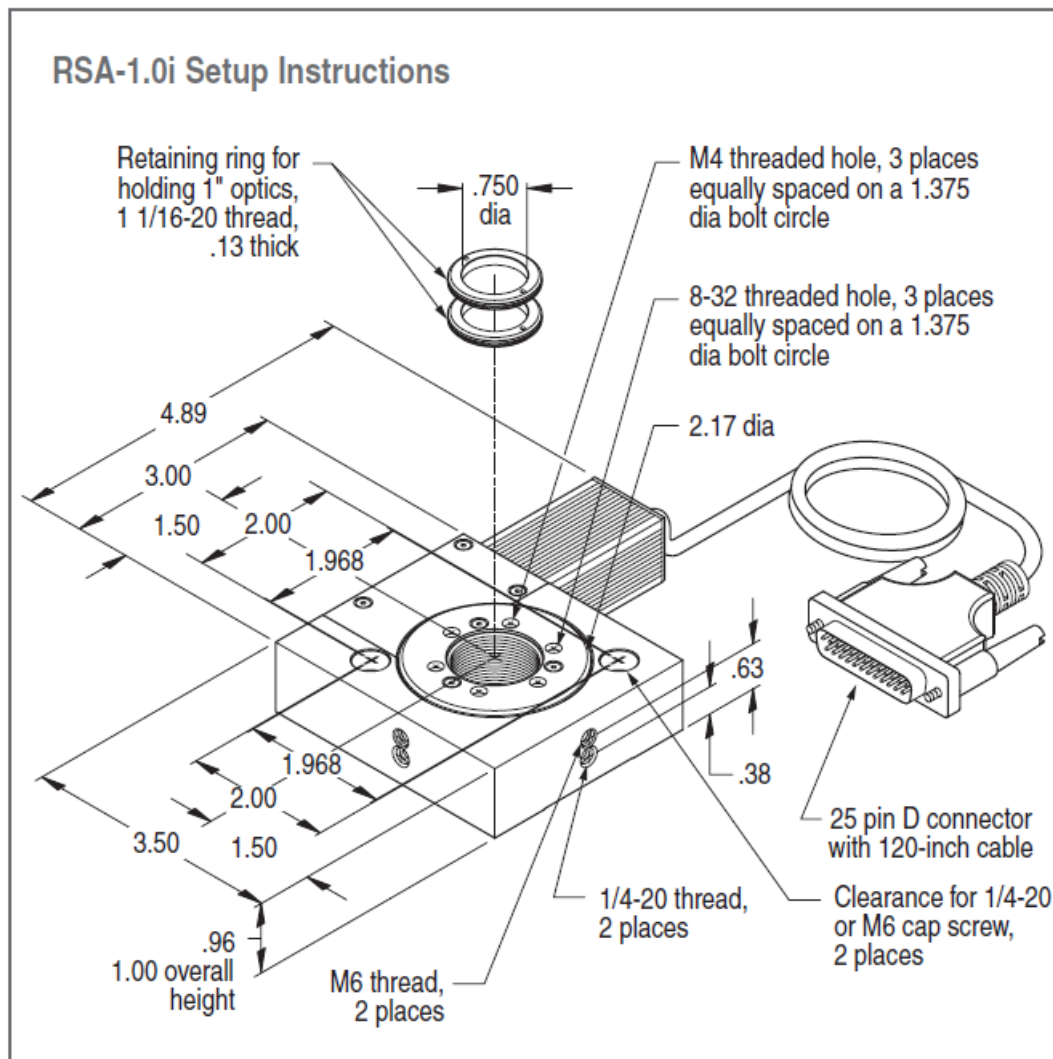


CERTIFIED DEVICE

Performance Specifications

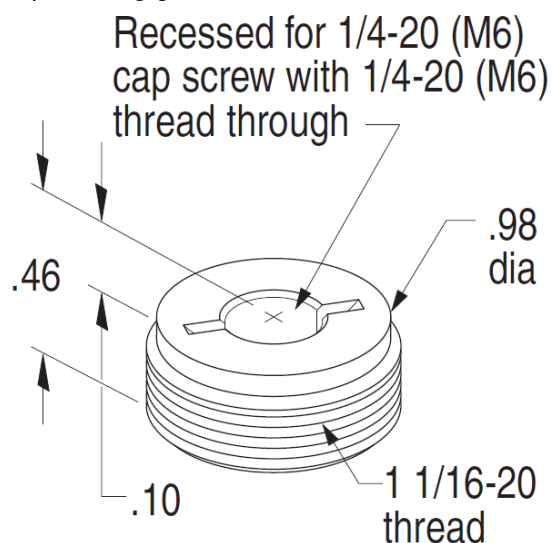
- Maximum load
when axis of rotation is vertical 8 lbs
when axis of rotation is horizontal 2 lbs
- Unidirectional repeatability 6 arc seconds
- Backlash 100 arc seconds
- Minimum controllable motion 6 arc seconds
- Runout / Wobble 412 arc seconds

- Encoder counts per revolution 3,885,740
- Maximum speed 5 rpm



Adapter for RSA-1.0i

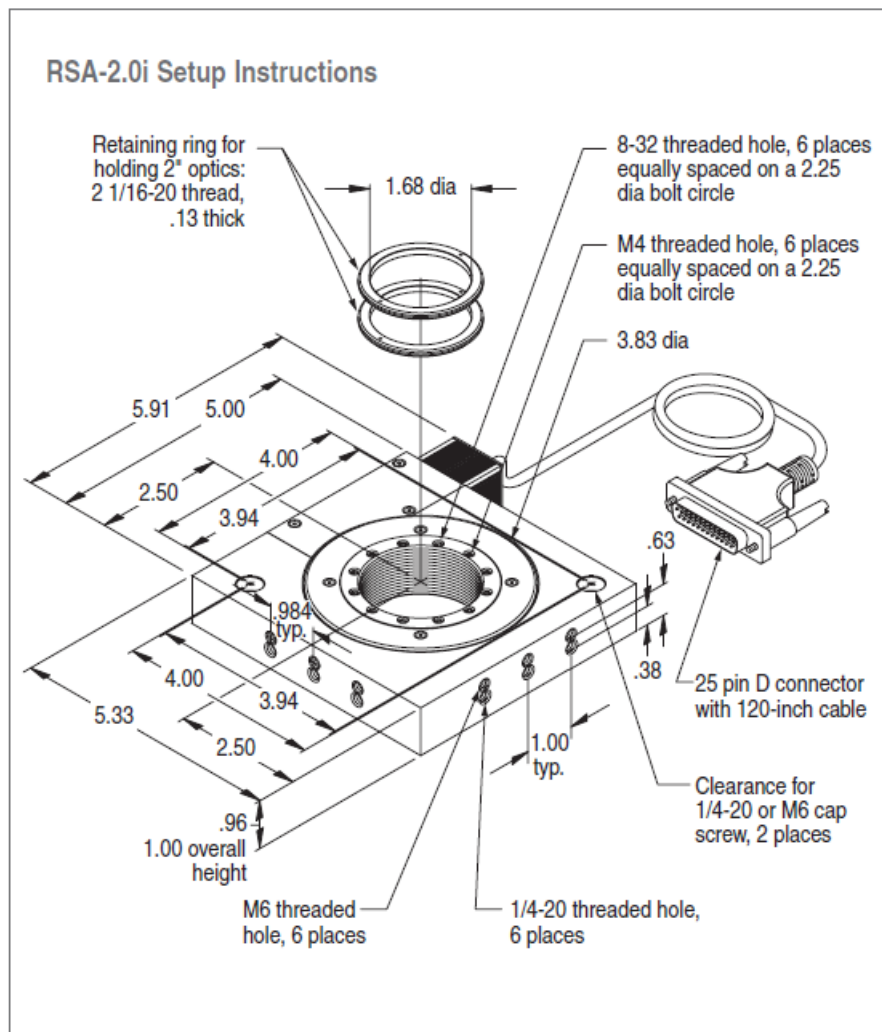
The RS-1.0i threaded adapter provides a change from a 11/16-20 internal thread to a 1/4-20 (M6) thread. Also used on Model OG-1.0P series, polarizing gimbal mount.



RSA-1.0i

The compact size and high performance of our RSA-1.0i motorized rotation stage makes it ideal for motorized rotation applications in the laboratory as well as OEM systems. By employing our standard DC servo motor, the overall thick-ness of the base is minimized to 1.0-inch (25-mm). Standard mounting features include both 1/4-20

and M6 tapped holes on two edges for post or AS spacer mounting with the axis of rotation horizontal. Additionally, universal slots (U.S. system and metric spread) are included for attachment directly to a isolation table or platform with the axis of rotation vertical. The 1.0-inch inner diameter of the rotating dial accepts common 1.0-inch and 25-mm optics and is supplied with two Delrin® retaining rings. The dial has six tapped holes (3 each 8-32 and M4) on the face to attach other optical or mechanical elements.



RSA-2.0i

The compact size and high performance of our RSA-2.0i motorized rotation stage make it ideal for motorized rotation applications in the laboratory as well as OEM systems. By employing our standard DC servo motor, the overall thick-ness of the base is minimized to 1.0-inch [25-mm].

Standard mounting features include both 1/4-20 and M6 tapped holes on two edges for post or AS spacer mounting with the axis of rotation horizontal. Additionally, universal slots (U.S. system and metric spread) are included for attachment directly to a isolation table or platform with the axis of rotation verti-cal. The 2.0-inch inner diameter of the rotating dial accepts common 2.0-inch and 50-mm optics and is supplied with two Delrin® retaining rings. The dial has twelve tapped holes (6 each 8-32 and M4) on the face to attach other optical or mechanical elements.



RSA-2.0i

CERTIFIED DEVICE

Performance Specifications

- Maximum load
 - when axis of rotation is vertical 12 lbs
 - when axis of rotation is horizontal 4 lbs
- Travel 360° continuous
- Unidirectional repeatability 10 arc seconds
- Backlash 120 arc seconds
- Minimum controllable motion 10 arc seconds
- Runout / Wobble 300 arc seconds
- Encoder counts per revolution 6,994,345
- Maximum speed 3 rpm

Maintenance and Service

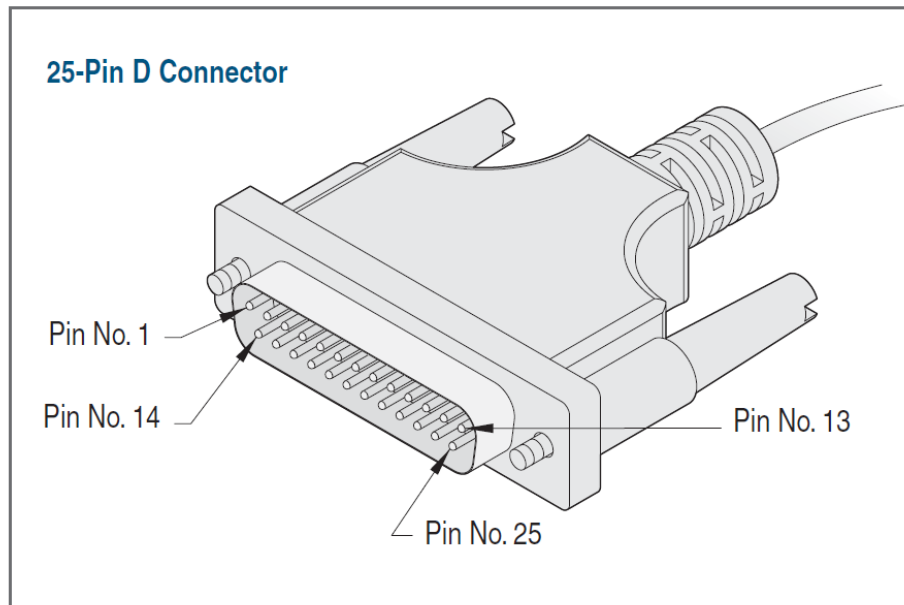
No scheduled maintenance is required for these products. There are no maintenance procedures which may be performed by the user. The actuator should be cared for and handled as any fine instrument. Keep the unit clean and free of moisture, solvents, or other foreign matter.

Should it become necessary to service a product, read the instructions for repairs on page 2 of this manual and complete a copy of the Service Form to be returned with the unit, page 22 of this manual.

Connector Pin Assignments

- Pins Function
- 5 & 6 Motor +
- 7 & 8 Motor –
- 14 Shield ground (encoder channels)

- 17 Forward limit
- 18 Reverse limit
- 19 Channel A
- 20 Channel B
- 21 +5VDC (5ma @ 5V DC)
- 22 -VDC ground



*** Caution**

Do not attempt to adjust the actuator/stages mechanical assembly in any way other than out-lined above (see Section 3.1, Setting the Travel Limits, page 14). Any attempt to disassemble the actuator will cause a misalignment. Call the factory before you try to adjust, repair, or alter any of the 840 Series Actuators, or all series of Stages with-out factory-provided instructions. Any unauthorized attempts to adjust, repair, or alter the actuators or controllers will invalidate your warranty.

Drawings

For the most current drawings of Siskiyou's Actuators, Stages or Micromanipulators see our website at www.siskiyou.com

Specifications

Encoder resolution

- 840 Series Actuators, MXMS-cri, 0.005 μm
- 100cri, 200cri, 7000, and 831 Series Stages

Nominal gearbox ratio and maximum speed

- Backlash, typical with external load of 2 lbs (0.9 kg)
- 841 and 842 Actuators < 5 μm
- 100cri, 200cri, MXMS-cri, 7000 & 831 Series Stages < 10 μm
- Accuracy < 0.1% of travel, cumulative
- Encoder Magnetic, open collector, quadrature output, +5V supply

- Absolute cyclic pitch error < 1 micron
- Time to reach full speed < 50 msec at maximum speed and acceleration settings
- Maximum actuator side load 5 lbs (2.3 kg) at full shaft extension
- Maximum actuator axial load 18 lbs (8.2 kg)
- Maximum Stage side load
 - 7000 Series 1 lb (0.45 kg) at full extension
 - 831 Series 5 lbs (2.3 kg) at full extension
- Maximum Stage axial load
 - 7000 Series 2 lbs (0.9 kg)
 - 831 Series 10 lbs (4.5 kg)
- Cable 10-foot (3.05-m) cable integral to actuator / stage terminated with 25-pin male "D" sub connector
- Temperature range 0°F to 120°F (-18°C to 49°C)
- Actuator / Stage case Black / clear anodized aluminum
- Vacuum compatibility Special order vacuum-compatible versions for operation to 10⁻⁶ Torr; temperature range restricted as stated above.

CONTACT

- Company _____
 - Address _____
 - City, St Zip _____
 - Country _____
 - Sales Order _____
 - PO Number _____
 - Purchase Date _____
 - Return Authorization No. _____
- Note:** Call the toll free number prior to returning the item.
- Date _____
 - Technical Contact _____
 - Telephone _____
 - Fax _____
 - Email _____

PRODUCT

- Model Number _____
- Serial Number _____
- Describe any modifications made to the unit

REASON FOR RETURN

- List all control settings and describe problems

Diagram

RETURN TO

- Email addresses: sales@siskiyou.com service@siskiyou.com tech@siskiyou.com
- Website: www.siskiyou.com

Siskiyou Corporation

RA# _____
110 S.W. Booth Street
Grants Pass, OR 97526-2410
U.S.A.

RA **Number** must be clearly written on the outside of the shipping carton



All dimensions in this manual are given in inches unless specified otherwise.

Contact Information

Mailing Address
Siskiyou Corporation
110 S.W. Booth Street
Grants Pass, OR 97526-2410

Sales and Service

sales@siskiyou.com
service@siskiyou.com
telephone (toll free): 1-877-313-6418

Technical Assistance
tech@siskiyou.com
telephone: 1-541-479-8697

Facsimile: 1-541-479-3314

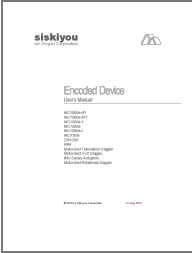
Website
www.siskiyou.com
webmaster@siskiyou.com

International
Please call or visit our website for international contacts.

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Photos by Robert Jaffe email robjaffe@mind.net

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Telephone 541-479-8697
Toll-Free 877-313-6418
Facsimile 541-479-3314
Website www.siskiyou.com

Documents / Resources

	<p>siskiyou MC1000e-R1 Encoded Device Encoded Device [pdf] User Manual MC1000e-R1 Encoded Device Encoded Device, MC1000e-R1, Encoded Device Encoded Device eEncoded Device</p>
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References

-  [SISKIYOU Corporation Home](#)