907036B 10/24

User's Guide

OPTICALLY ENCODED TRANSLATION STAGES

Precision Stainless-Steel Translation Stages
Models 9066-COM-E and 9067-COM-E

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1 The Basics

1.1 Introduction

The Model 9066-COM-E and Model 9067-COM-E precision stainless-steel translation stages reflect Newport's dedication to Simply Better™ photonics tools.
The crossed-roller bearing design with hardened and polished stainless-steel races provides smooth and precise positioning.
The high-resolution encoder provides position measurement capabilities and easy integration with our Picomotor™ micrometer replacement actuators (MRAs).

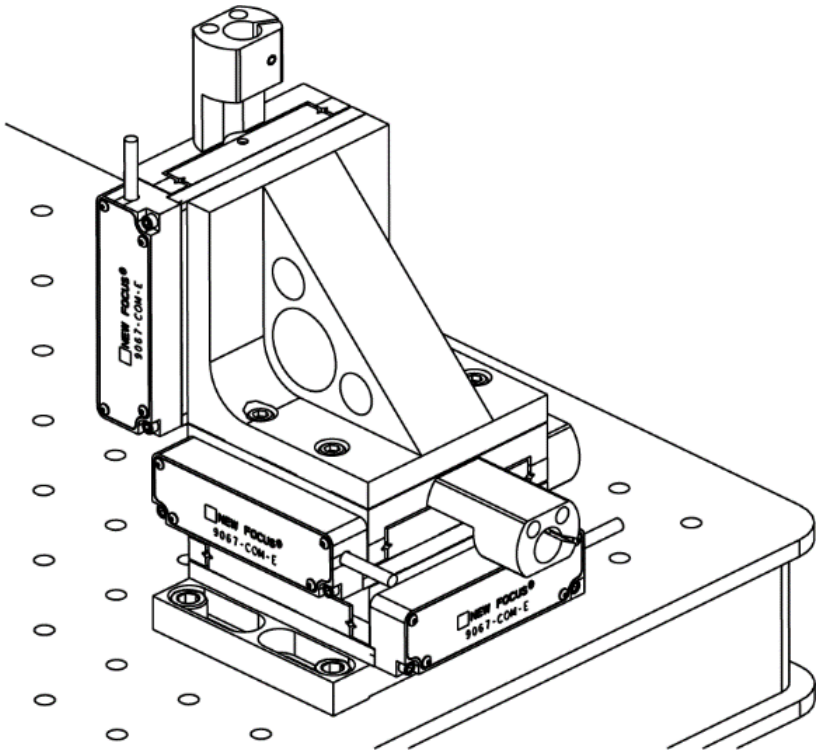


Figure 1 - Use optional accessories to combine single stages into multi-axis stages, as shown here

2 Two Sizes - Same Features

Our optically encoded stainless-steel translation stages are available in two different ranges of travel (1/2" for Model 9066-COM-E(-M) and 1" for Model 9067-COM-E(-M)).

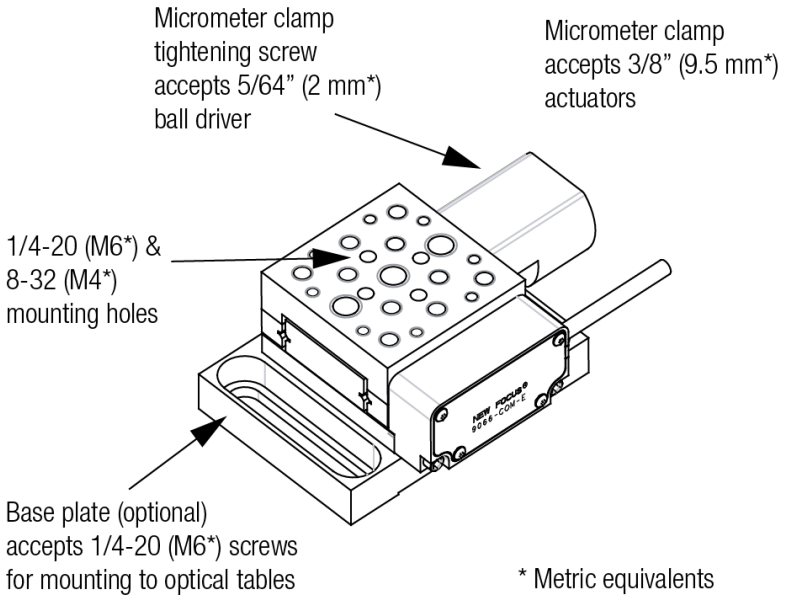


Figure 2 - Model 9066-COM-E (shown with Model 9042 base plate)

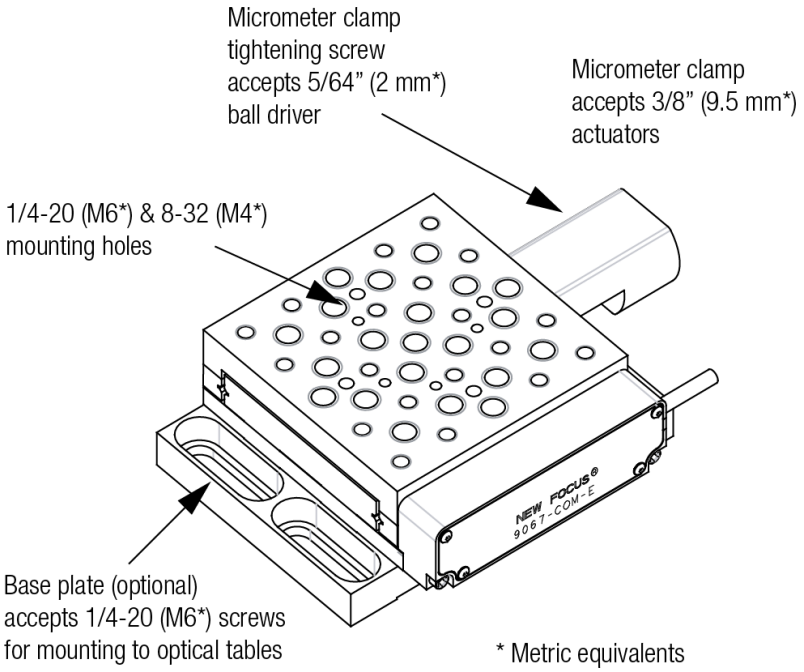


Figure 3 - Model 9067-COM-E (shown with Model 9160 base plate)

2.1 Adding and Reconfiguring Stages

1. Insert two 0.125" diameter x 0.25" long dowel pins (included).
2. Align the top stage to the dowel pins and install two socket-head cap screws (included, see the table below for screw size), as shown in Figure 4.

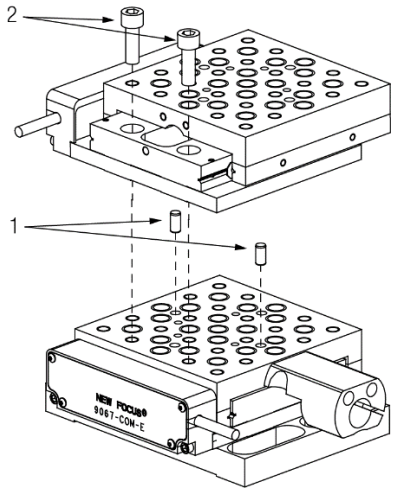


Figure 4 - Combining two stages to create an XY stage

3. Slide the top stage to the end of its travel and stop the stage by inserting a 5/64" (2 mm) ball driver (see Figure 5).
4. Secure the stage with two socket-head cap screws.
5. Attach the micrometer clamp using two #3-48 x 5/8" socket-head cap screws (included).

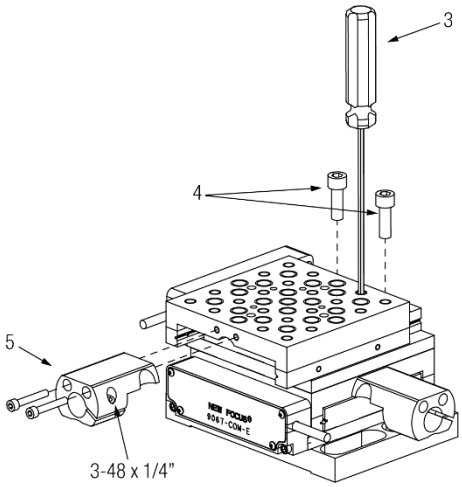


Figure 5 - Combining two stages to create an XY stage (continued)

Socket-Head Cap Screw Size (steps 2 and 4)			
9066	9066-M	9067	9067-M
#4-40 x 5/8"	M2.5 x 16 mm	#8-32 x 5/8"	M4 x 16 mm

3 Accessories

3.1 Accessories for Model 9066-COM-E / 9066-COM-E-M

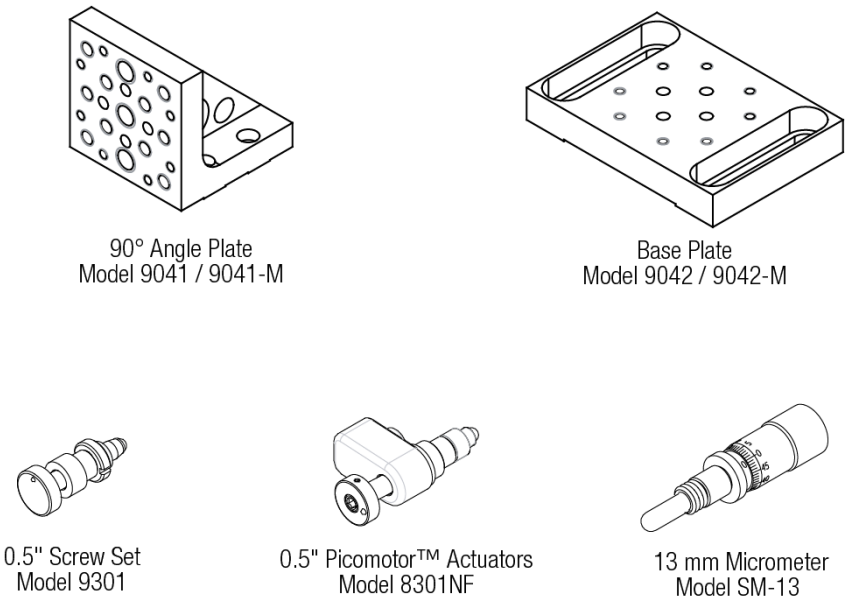


Figure 6 - Accessories for Model 9066-COM-E / 9066-COM-E-M

3.2 Accessories for Model 9067-COM-E / 9067-COM-E-M

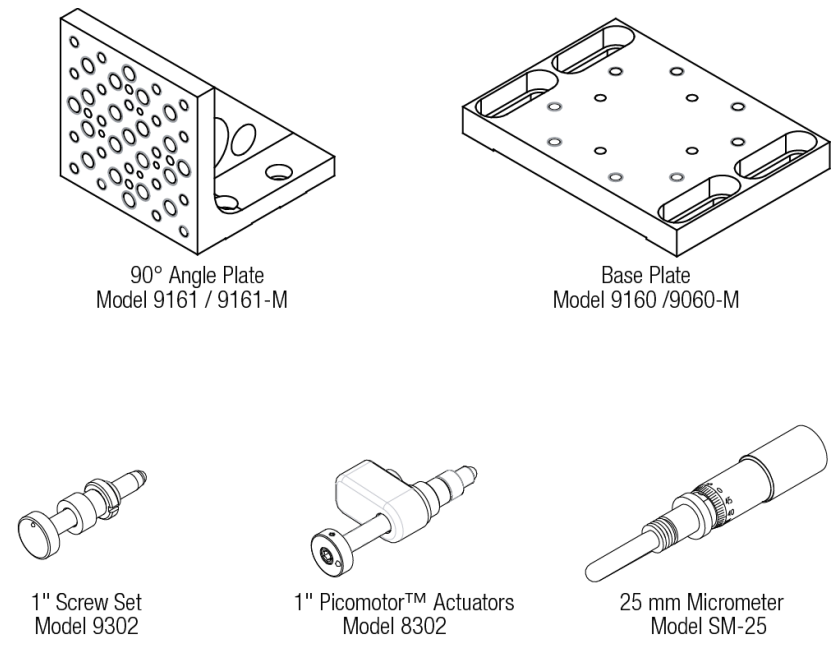


Figure 7 - Accessories for Model 9067-COM-E / 9067-COM-E-M

4 Attaching the Stage to an Optical Table

Attach the stage to an optical table using four 1/4-20 (M6) screws.

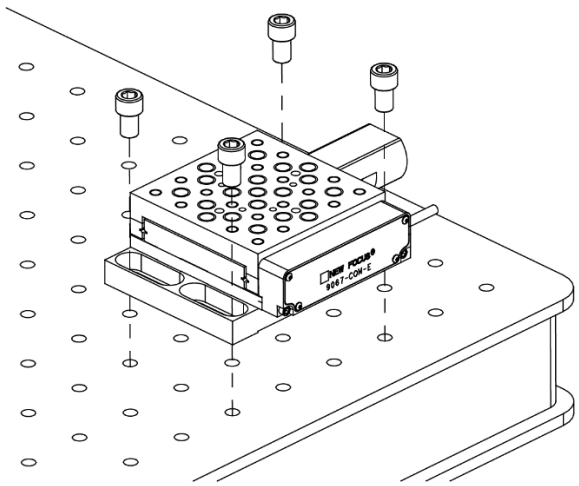


Figure 8 - Attaching the stage to an optical table

5 Adding a 90° Angle Plate

To add a Z axis to a stage configuration, you will need to use a 90° angle plate.

1. Insert two 0.125" diameter x 0.25" long dowel pins.
2. Secure the angle plate with four socket-head cap screws.

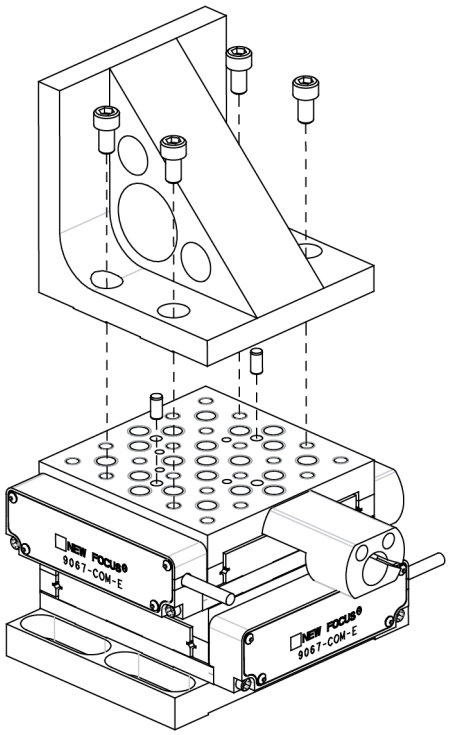
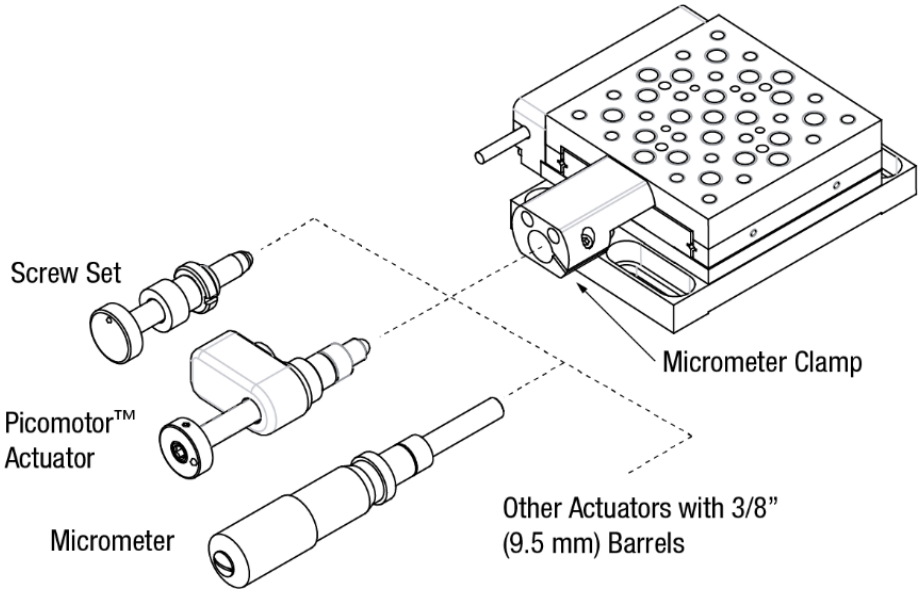


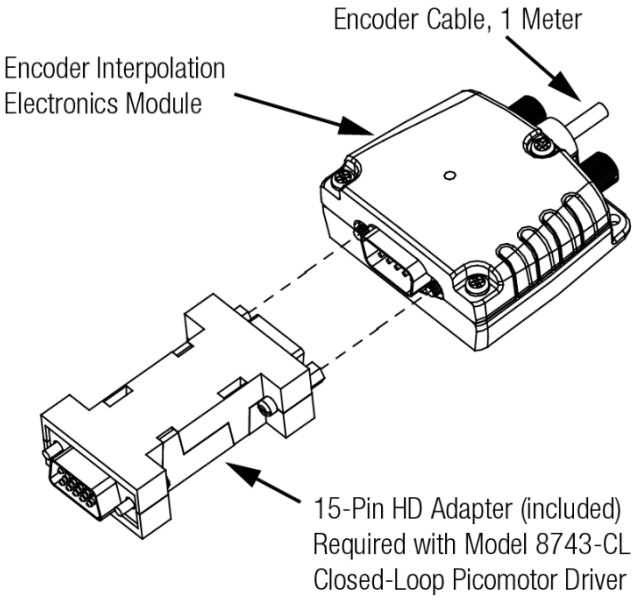
Figure 9 - Adding a 90° angle plate

6 Adding Actuators

The micrometer clamps provided with the stages accept all actuators with standard 3/8" (9.5-mm) barrel sizes, including micrometers, fine-pitched screw sets, and Picomotor™ micrometer replacement actuators (MRAs) from Newport.



7 Connecting the Encoder to an iPico™ Driver



A high-density (HD) 15-pin male connector is provided for making the necessary connections from the 8743-CL controller to the encoder. The pin descriptors for this connector are shown in Figure 10.

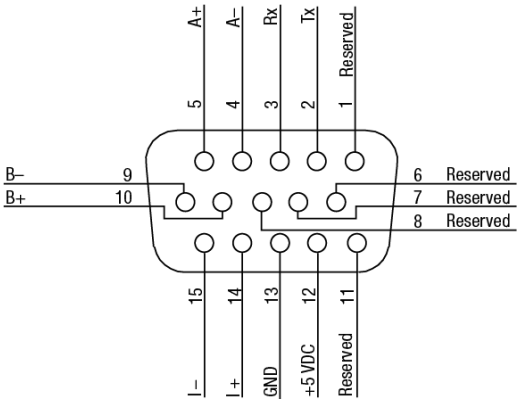


Figure 10 - Pin descriptions for the encoder's 15-pin high density 'D' connector

Pin	Encoder Output	Adapter Pinout
1	Reserved	Not Connected
2	Serial I/F—Tx	Not Connected*
3	Serial I/F—Rx	Not Connected*
4	A- quadrature	A+
5	A+ quadrature	A-
6	Reserved	Not Connected
7	Reserved	Not Connected
8	Reserved	Not Connected
9	B- quadrature	B- quadrature
10	B+ quadrature	B+ quadrature
11	Reserved	Not Connected
12	+5 VDC	+5 VDC
13	Ground	Ground*
14	I+ Index	I+ Index
15	I- Index	I- Index

* Pins 2, 3, and 13 are tied together at the driver end of the 15-pin HD adapter and are not connected through to the encoder end.

Using the 15-pin HD adapter, the stage encoder can be read using a Model 8743-CL Closed-Loop Picomotor™ Driver. The distributed control network (Picomotor Application) software utility available on the Newport web site, www.newport.com, provides an easy way to observe the encoder count.

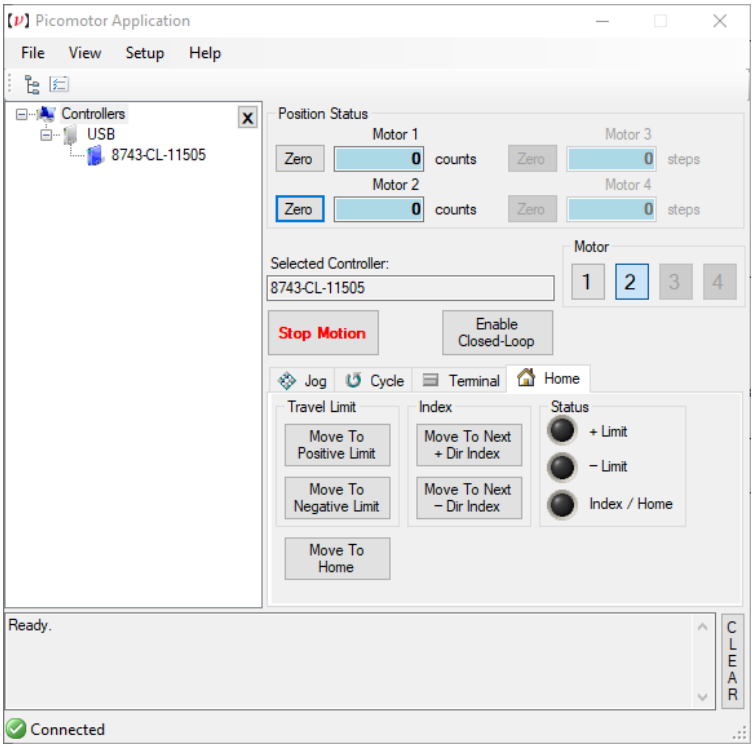


Figure 11 – New Focus™ Picomotor Application software

If you install a Picomotor™ micrometer replacement actuator (MRA) on the stage, you can achieve closed- loop control of the stage simply by plugging the actuator's RJ-22 connector into the 8743-CL.
For more information on the iPico™ family of motion control products, refer to the user's guide for the Intelligent Picomotor Control Modules (available for download from www.newport.com).

8 Connecting the Encoder to 3rd-Party Motion Controllers

Depending on the control card you are using, the following connections may need to be made:

Note **You will need to refer to the user's manual for your control system to determine the corresponding signal connectors on your control card.**

1. **A+, A-, B+, B- (A/B Quadrature)**: Most, if not all, controllers accept A+, A-, B+ and B- differential signals. The encoder's four A/B quadrature signals will need to be connected to the controller's corresponding inputs (A+ to A+, A- to A-, etc.).
2. **I+, I- (Index Pulse Signals)**: The index pulse (differential signal via I+ and I-) is also a standard signal, although this signal is not used in all applications. It is recommended that this signal be connected if the controller accepts it.
3. **+5 VDC, Ground (Power Supply)**: The +5 VDC and Ground are required to power the encoder electronics.
4. **Tx, Rx (Serial Interface)**: The Tx and Rx signals are for a computer interface that allows Newport to program the resolution and output frequency. The Tx, Rx, and Reserved pins should not be connected to any signal source.

Note **There are four indicator LEDs on the side of the encoder connector. If any of these LEDs glow yellow or red, there is a problem with the encoder alignment. See Figure 12.**

9 Troubleshooting

9.1 Encoder Alignment

The encoder interface box has four LEDs on the side of it: the Power/Calibration indicator and three signal indicators (see Figure 12).

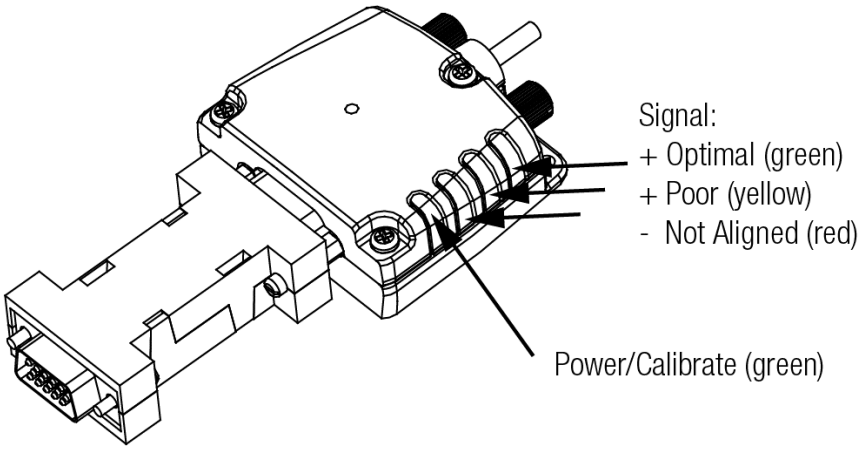


Figure 12 - Alignment and index indicators

The Optimal indicator should glow green or bright green when the encoder is properly aligned and installed as it was in the factory. If the Poor or Not Aligned indicators are lit, then there is an alignment problem with the encoder head in the stage. You will need to return the unit to Newport for repair using Service Form.

Note **The signal indicator will turn off when the encoder is at the index mark.**

9.2 No Encoder Pulses

First check that there is power to the stage; the green Power indicator should be lit. Next, check that the A+, A-, B+, and B- encoder lines are properly attached to your motion controller. If you are using an 8743-CL make sure the 15-pin HD adapter is installed.

9.3 Continuously Changing Encoder Count

Check that the actuator is securely fastened in its clamp. It may be that the stage's return spring is causing the actuator to slowly slip out of the clamp.
Next check to make sure the encoder lines are properly connected to your controller. Be sure to use the 15-pin HD adapter with the Model 8743-CL controller.
If the problem persists, look for vibrations which could cause 80 nm or more of encoder motion.

Note **The Model 8751-C Closed-Loop Picomotor™ Driver is not compatible with the "-E" stages. Call Newport for information on obtaining Model 8743-CL drivers.**

9.4 Encoder Count Jumps Unexpectedly

The "-E" stages are not compatible with older Newport Model 8751-C Closed-Loop Picomotor™ Drivers. If you are using one of these drivers, you may see the encoder count jump by 256 near count locations which are multiples of 256.
Call Newport for information on obtaining Model 8743-CL drivers.

10 Specifications

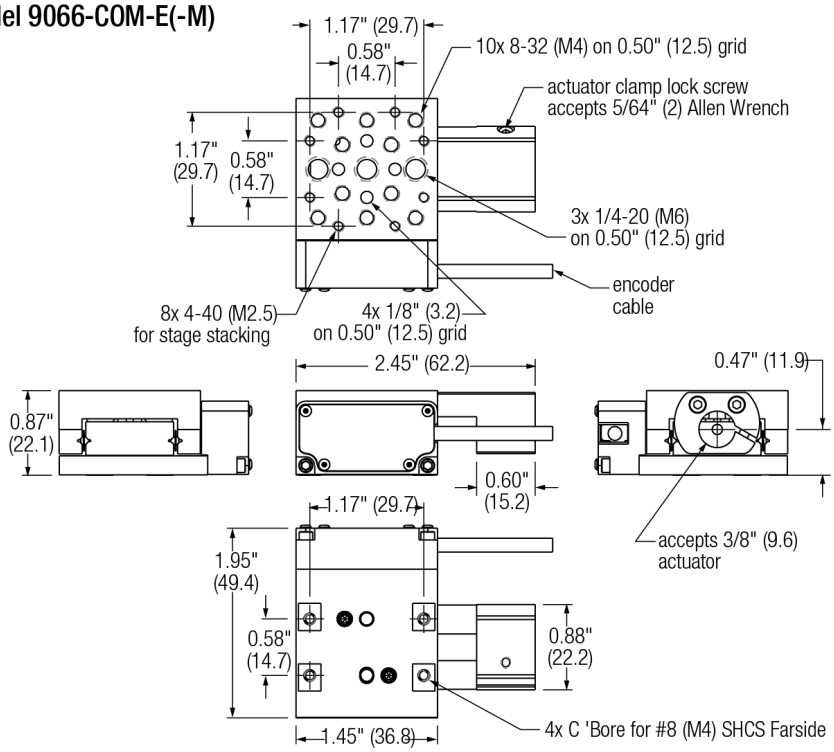
10.1 Characteristics

Model #	9066	9067
Maximum Travel	0.53" (13 mm)	1.03" (25 mm)
Straightness	3 µm	3 µm
Flatness	3 µm	3 µm
Load Capacity, normal	25 lbs (111 N)	50 lbs (222 N)
Load Capacity, axial	10 lbs (44.5 N)	18 lbs (80 N)
Encoder Resolution*	80 nm	80 nm
Encoder Accuracy*	±3 µm	±3 µm
Index Mark	Yes	Yes

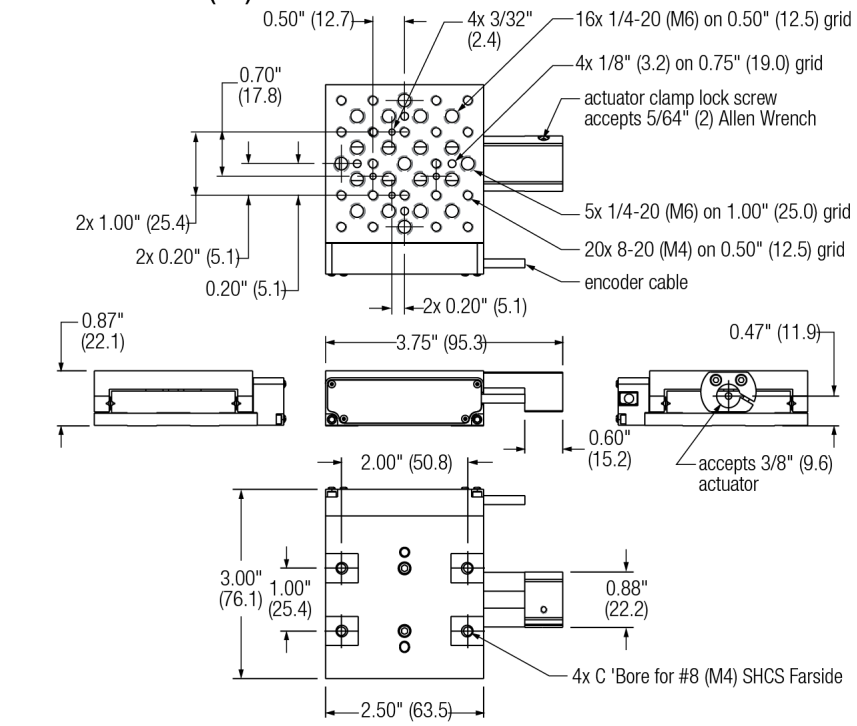
* At constant temperature.

11 Dimensions

Model 9066-COM-E(-M)



Model 9067-COM-E(-M)



12 Service Form

Your Local Representative
Tel.:
Fax:

Name:
Company:
Address:
Country:
P.O. Number:
Item(s) Being Returned:
Model#:

Return authorization #:
(Please obtain prior to return of item)
Date:
Phone Number:
Fax Number:

Serial #:

Description:
Reasons of return of goods (please list any specific problems):

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