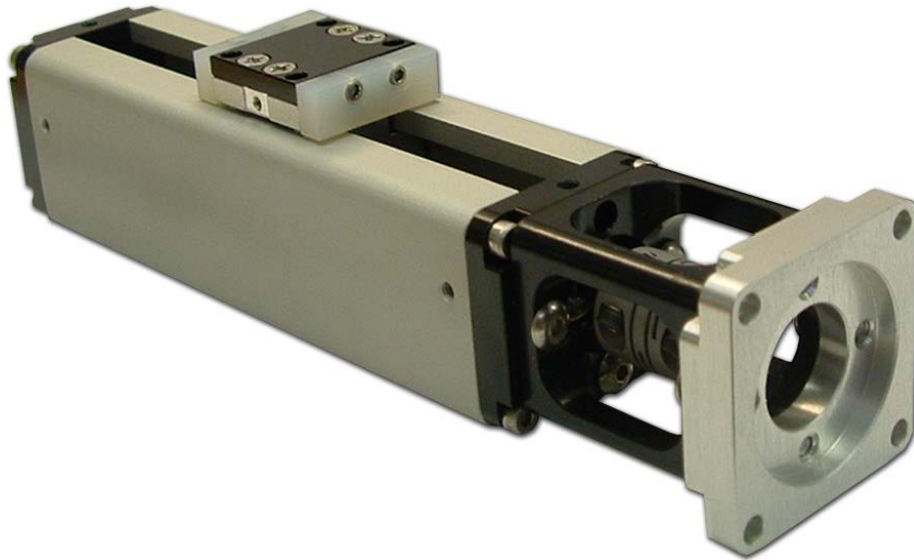


# MS028 SERIES

Micro Supported Rail System

## USER'S MANUAL



## Anaheim Automation's MS028 Series User's Guide

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## Contents

Using This Manual .....	4
Product Returns .....	4
Unpacking and Handling .....	4
Assembly Diagram .....	5
Specifications & Dimensions .....	5
Part Number Configuration.....	7
Mounting the MS028 .....	7
Mounting a Load to the MS028 .....	7
Step Motor Information.....	8
<i>Electrical Rating Information</i> .....	8
<i>Electrical Schematic</i> .....	8
<i>Switching Sequence</i> .....	8
Limit Switch Information .....	9
<i>Dimensions</i> .....	9
<i>Wiring</i> .....	9

## Using This Manual

The MS028 Series are small packaged positioning stage systems which in a standard configuration include a step motor and coupling. The MS028 has a cross sectional size of 28mm x 28mm, travel lengths up to 205mm, an anti-backlash TFE coated leadscrew and a square rail supported carriage for mounting a load.

This manual provides the basic information necessary to unpack, set up, and configure the MS028. If additional information is required beyond what is presented here, please refer to the Support section of our website or contact Anaheim Automation Applications Engineering.

## Product Returns

All returns for warranty or out-of-warranty repairs must first receive an RMA (Return Material Authorization) number. Please contact Anaheim Automation Customer Service Department with information about the return and an RMA number will be issued if warranted.

Products returned to the factory will be examined and tested for failure mode and cause. Anaheim Automation Customer Service will contact the customer with the repair cost if the required repair is out of warranty.

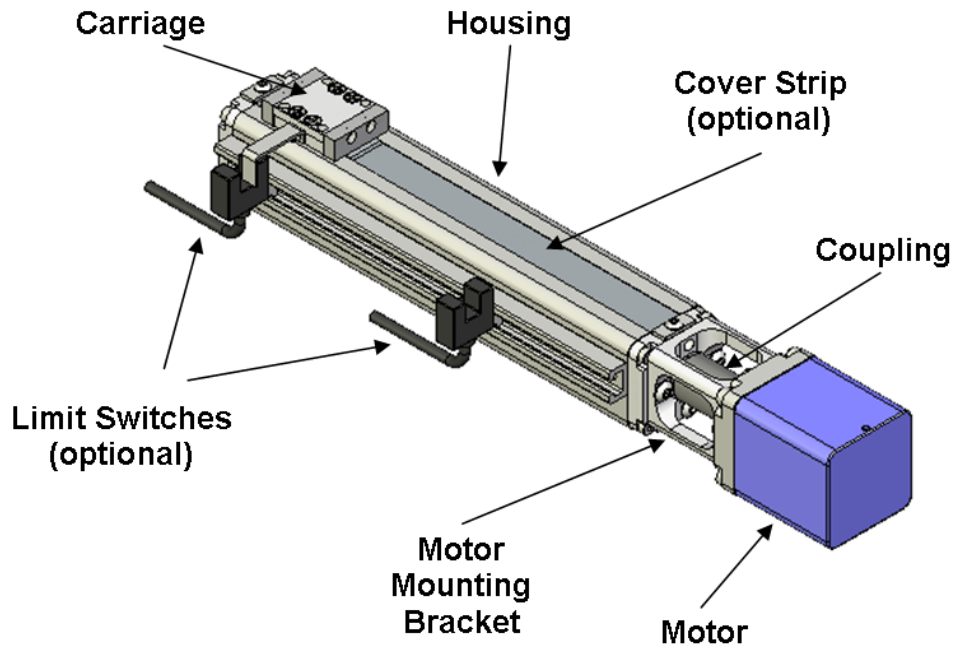
## Unpacking and Handling

Carefully remove the MS028 from its shipping box and inspect the unit for any evidence of shipping damage. Report any damage immediately to Anaheim Automation. Please save the shipping box for damage inspection or its use in returning product if necessary.

Please observe the following guidelines for handling and mounting of your MS028:

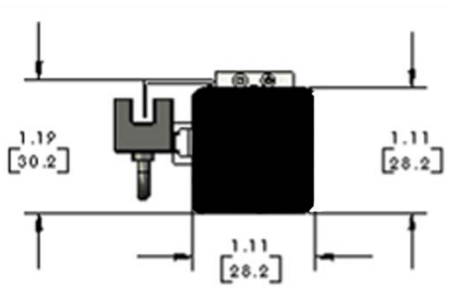
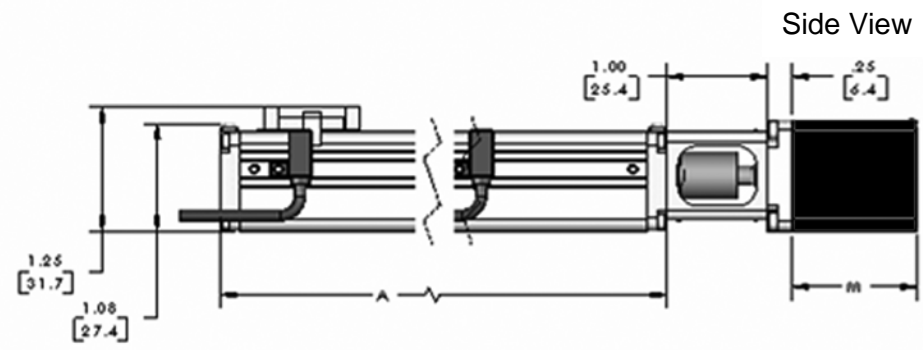
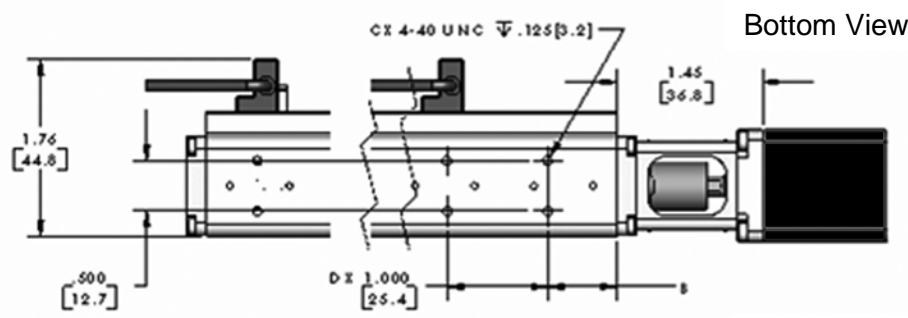
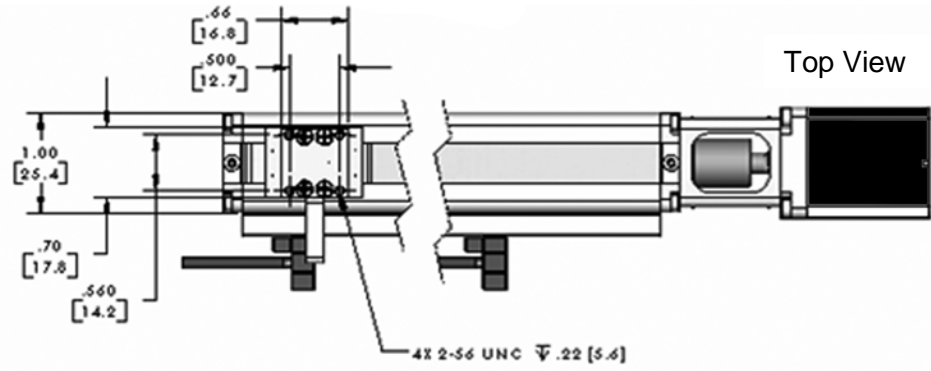
- Do not drop the stage on any hard surface or subject it to any impact loads. Dropping the stage or other impact loads may result in bearing damage or misalignment.
- Do not drill holes into the stage. Drilling holes into the stage can generate particles and machining forces that may affect the operation of the stage. Anaheim Automation can supply the MS028 with modifications to your drawing. Please contact the factory for a quote.
- Do not expose the MS028 to mist, spray or submersion in liquids. Do not disassemble the MS028. Unauthorized adjustments may alter the specifications and void the product warranty.

## Assembly Diagram



## Specifications & Dimensions

Part Number	Maximum Dynamic Load (lbs)	Travel (MM)	Lead (in)	Accuracy (in/in)	Max Linear Speed (in/sec)	Lead-screw Efficiency	Coeff of Friction (Constant)	Drag Torque (in/oz)	Motor Torque (oz in)
MS028-010-XX-X	5	10	.100	.0006	2.5	69	.09	< .5	8.3
MS028-025-XX-X	5	25	.100	.0006	2.5	69	.09	< .5	8.3
MS028-040-XX-X	5	40	.100	.0006	2.5	69	.09	< .5	8.3
MS028-055-XX-X	5	55	.100	.0006	2.5	69	.09	< .5	8.3
MS028-070-XX-X	5	70	.100	.0006	2.5	69	.09	< .5	8.3
MS028-085-XX-X	5	85	.100	.0006	2.5	69	.09	< .5	8.3
MS028-100-XX-X	5	100	.100	.0006	2.5	69	.09	< .5	8.3
MS028-115-XX-X	5	115	.100	.0006	2.5	69	.09	< .5	8.3
MS028-130-XX-X	5	130	.100	.0006	2.5	69	.09	< .5	8.3
MS028-145-XX-X	5	145	.100	.0006	2.5	69	.09	< .5	8.3
MS028-160-XX-X	5	160	.100	.0006	2.5	69	.09	< .5	8.3
MS028-175-XX-X	5	175	.100	.0006	2.5	69	.09	< .5	8.3
MS028-190-XX-X	5	190	.100	.0006	2.5	69	.09	< .5	8.3
MS028-205-XX-X	5	205	.100	.0006	2.5	69	.09	< .5	8.3



Motor	Dim M in (mm)
11Y102S-LW4	1.25 (31.8)
11Y202S-LW4	1.75 (44.5)
11Y302S-LW4	2.00 (50.8)

Travel in (mm)	Dim A in (mm)	Dim B in (mm)	Qty C	Qty D
0.39 (10)	2.05 (52)	.325 (8.3)	4	1
0.98 (25)	2.64 (67)	.687 (17.2)	4	1
1.57 (40)	3.23 (82)	.325 (8.3)	6	2
2.17 (55)	3.82 (97)	.687 (17.4)	6	2
2.76 (70)	4.41 (112)	.325 (8.3)	8	3
3.35 (85)	5.00 (127)	.325 (8.3)	10	4
3.94 (100)	5.59 (142)	.687 (17.4)	10	4
4.53 (115)	6.18 (157)	.325 (8.3)	12	5
5.12 (130)	6.77 (172)	.687 (17.4)	12	5
5.71 (145)	7.36 (187)	.325 (8.3)	14	6
6.30 (160)	7.96 (202)	.687 (17.4)	14	6
6.89 (175)	8.55 (217)	.325 (8.3)	16	7
7.48 (190)	9.14 (232)	.325 (8.3)	18	8
8.07 (205)	9.73 (247)	.687 (17.4)	18	8

## Part Number Configuration

The part number for the Microstage MS028 is determined as follows:

**MS028 - 010 - C - N - 1A - N**

Base Price
\$672

Travel Options		
010	10mm	-
025	25mm	\$30
055	55mm	\$90
100	100mm	\$180
145	145mm	\$270
205	205mm	\$390

Screw Options
C .100"

Limit Options		
N	No Limits	-
S	End of Travel	\$75

Encoder Options		
N	No Encoder	-
B	400 Line Encoder	\$56
C	1000 Line Encoder	\$66

Accessories		
MS028-XY-KIT	Mounting hardware for XY configuration	\$75
MS028-Z-KIT	Mounting hardware for XYZ configuration	\$125

Motor Options				
Motors Only				
SS	DS	Motor Type	SS	DS
1A	1E	Size 11, 1 Stack, 1A	\$69	\$72
1B	1F	Size11, 2 Stack, 1A	\$73	\$77
1C	1G	Size 11, 3 Stack, 1A	\$78	\$82
No Motor				
01	Coupling with no motor		-	
SS = Single Shaft, DS = Dual Shaft				

- All Tables Include 3ft of Motor Cable
- All Tables With Limits Include 3ft of Limit Cable
- All Tables With Encoders Include 3ft of Encoder Cable
- Custom Options Available, Contact Factory For Details

## Mounting the MS028

Threaded mounting holes are located on the underside of the housing. The holes for the MS028 are 4-40 UNC with a .125" depth. Generally it is best to have through holes matching the pattern of the mounting holes in the surface to which it is to be secured such that 4-40 screws pass through the surface and into the threads in the housing of this manual for the location and number of holes based on the length of the MS028. Care should be taken to not let the mounting screws penetrate the carriage more than the .125" depth or there may be interference with moving components in the stage.

## Mounting a Load to the MS028

Four (4) 2-56 UNC with .222" depth are located on the top of the carriage for mounting a load to the MS028 (See the Dimensions section). Care should be taken not to exceed this maximum depth so as to not interfere with other components of the carriage assembly.

Motor	Bipolar Torque (oz in)	Series Current (A)	Series Inductance (mH)	Rotor Inertia (oz in sec <sup>2</sup> )	Shaft Diameter (in)	# of Leads	Weight (lbs)	Length (in)
11Y102S-LW4	8.3	0.67	4.0	0.00013	0.197	4	0.24	1.25
11Y202S-LW4	13.2	0.67	5.0	0.00017	0.197	4	0.31	1.75
11Y302S-LW4	16.7	0.67	7.0	0.00025	0.197	4	0.44	2.00

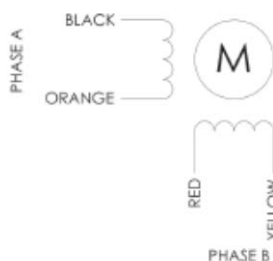
## Step Motor Information

The standard motor which comes with the MS028 is a 1.8° hybrid step motor with four leads. This motor can be connected to all bipolar step motor driver/controller. Full torque will be available from the motor when used with a drive which has a rated output with at least .67 amps per phase. Here are the ratings for the standard MS028 step motor:

### *Electrical Rating Information*

Other motors are available from Anaheim Automation including longer stack length step motors, motors with built in drive/controllers, and brushless motors. Please contact the factory for more information.

### *Electrical Schematic*





## Switching Sequence

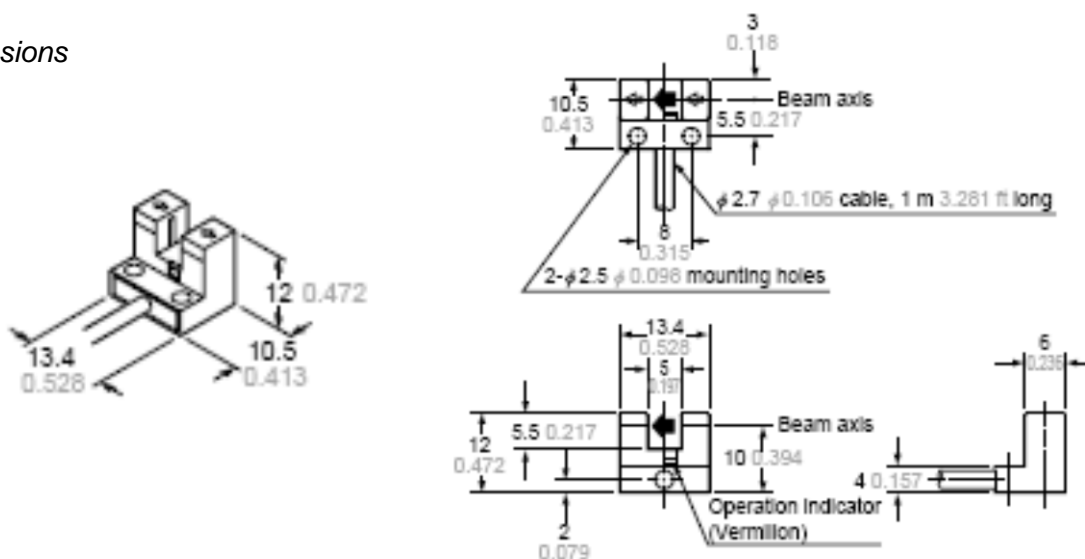
	Black	Orange	Red	Yellow
Step 1	+	-	+	-
Step 2	-	+	+	-
Step 3	-	+	-	+
Step 4	+	-	-	+

## Limit Switch Information

If your MS028 has the optional limit switches they will be mounted on the side of the stage housing and are adjustable. Depending on the driver used the limit switches can be configured as end-of-travel limits and/or one of them can be configured as a home switch.

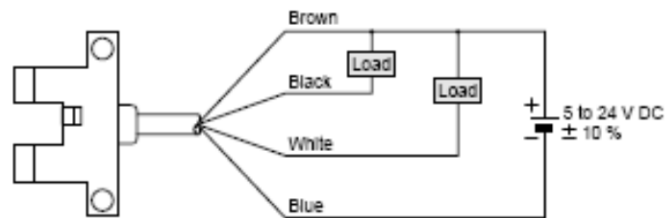
The limits are SUNX model PM-L24, an infrared U-channel switch which is interrupted by a flag mounted to the moving carriage of the MS028. The output of the switches is NPN open-collector with both Light-ON and Dark-ON modes. A 1.0 meter cable is supplied to make the connections to the driver.

## Dimensions



## Wiring

### Wiring diagram



### Output operation

	Color code	Output operation
Output 1	Black	Light-ON
Output 2	White	Dark-ON

Generally, Output 2 will be used because the switch output will then go ON when the flag interrupts the switch. In addition, for safety the switch will appear triggered (shutting down travel) if there is a break in the wiring to the switch.

If further more detailed information is required for the sensor, please refer to this URL:  
<http://www.sunx-ramco.com/SunxPDFFiles/PM.pdf> .