

# GTS-V Series

## High-Precision Vertical Linear Stages



GTS-V Series achieves the longest travel range, highest speed and best accuracy and repeatability compared to other platform vertical stages.

### Linear Guides

The linear guides used in the GTS30V (Crossed Roller with Anti creep) and the GTS70V (Recirculating bearings) were chosen to provide the straightest trajectory, smooth and precise motion and robust, long term operation. Crossed roller bearings in the GTS30V have the added advantage of more quiet, ripple-free motion, which is important in metrology level applications.

### High Efficiency Drive Train

A folded DC motor with a precision ground, low-friction lead screw delivers ultra-smooth motion even at high loads. A reduction belt between the motor and the lead screw increases the available output torque and reduces servo sensitivity, ensuring down to 100 nm MIM.

### Direct Position Feedback

Precision position feedback is supplied by a linear scale encoder, which contributes to sub-micron MIM and makes the GTS-V less susceptible to hysteresis. The direct read encoder system is impervious to position drift caused by motion-induced heating of the lead screw for improved accuracy and repeatability. The CC version with a motor mounted rotary encoder, features a higher load capacity.

### Plug and Play - ESP Compatible

The GTS30V and GTS70V/VCC are ESP-compatible stages. When connected to a Newport controller, it is quickly recognized and its operating parameters are configured without the need for user input. This Plug and Play feature is not only transparent to the use, but it also ensures the safe operation of the stage.

### Manual Knob

The manual knob is convenient when the power is off and when quick and coarse adjustment is needed.

### Guaranteed Performance

Every GTS-V stage comes with a free test report that proves the unit meets or exceeds the published guaranteed performance specifications.



### Key Features

- 30 mm or 70 mm of precision vertical travel in a compact unit
- Unobstructed access to the payload from any direction
- High sensitivity, excellent repeatability and high accuracy motion from an integrated linear or rotary encoder

# GTS-V High-Precision Vertical Linear Stages

## Design Details

- Base Material High-strength Anodized Aluminum
- Bearings Anti-creep crossed roller bearings/recirculating ball bearing
- Drive Mechanism Precision ground lead screw, gravity preloaded nut
- Drive Screw Pitch 1 mm
- Feedback Linear steel scale, 20  $\mu\text{m}$  signal period, 0.05  $\mu\text{m}$  resolution, RS-422 differential output or motor mounted rotary encoder in the CC version
- Limit Switches Optical
- Origin Optical, located 5 mm from lower position travel limit
- Drive Type DC Servo
- Cable Length 3 m (included)



## Specifications

	GTS30V	GTS70VCC Rotary Encoder	GTS70V Linear Encoder
Travel Range (mm) <sup>(1)</sup>	30	70	70
Minimum Incremental Motion ( $\mu\text{m}$ )	0.1	0.25	0.1
Bi-directional Repeatability ( $\mu\text{m}$ )	$\pm 0.1$	$\pm 0.5$	$\pm 0.2$
Accuracy ( $\mu\text{m}$ )	$\pm 0.75$	$\pm 1.75$	$\pm 1$
Maximum Speed (mm/s)	10	5 <sup>(2)</sup>	10
Centered Load Capacity (N)	40	70	40
Straightness, Flatness( $\mu\text{m}$ )	$\pm 0.75$	$\pm 5$	$\pm 5$
Pitch/Roll ( $\mu\text{rad}$ ) <sup>(3)</sup>	$\pm 25$	$\pm 80$	$\pm 80$
MTBF (h)	20,000 hours at 25% load and with a 30% duty cycle		

<sup>1)</sup> GTS30V: -5 to +25mm

GTS70V: 0 to +70mm, when driven by ESP302 and XPS and -5 to +65 mm, when driven by SMC100CC

GTS70VCC: 0 to +70mm

<sup>2)</sup> 10 mm/s, if used with 40 N payload

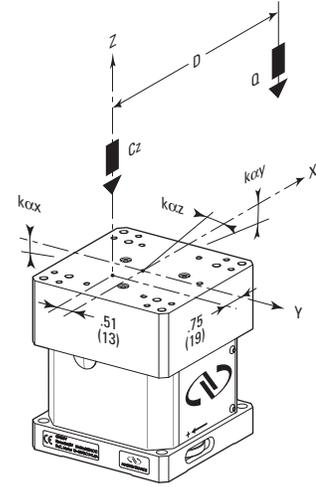
<sup>3)</sup> To obtain arcsec units, divide  $\mu\text{rad}$  value by 4.8.

# GTS-V High-Precision Vertical Linear Stages

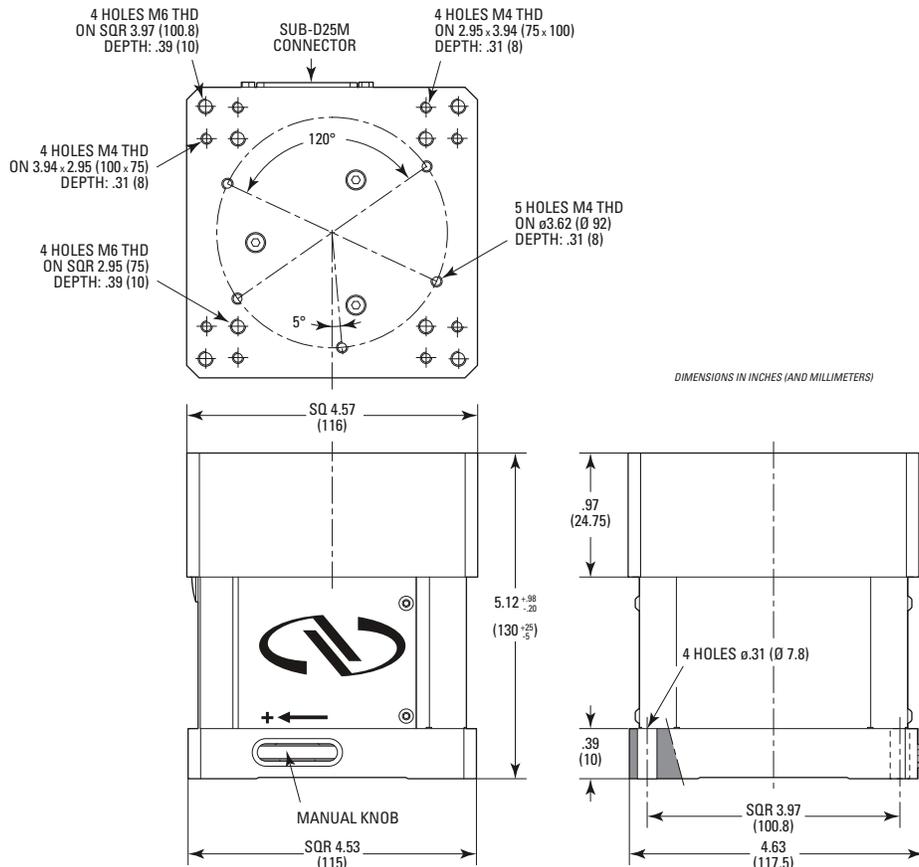
## Load Characteristics and Stiffness

	GTS30V	GTS70V/VCC
• Cz, Centered load capacity	40 N	40 N / 70 N
• Kax, Compliance in roll	40 $\mu$ rad/Nm	8 $\mu$ rad/Nm
• Kay, Compliance in pitch	40 $\mu$ rad/Nm	33 $\mu$ rad/Nm
• Kaz, Compliance in yaw	25 $\mu$ rad/Nm	50 $\mu$ rad/Nm
• Q, Off-center load (N)	$Q \leq Cz \div (1 + D/30)$	$Q \leq Cz \div (1 + D/30)$

Where D = Cantilever distance (mm) and Dmax = 100mm

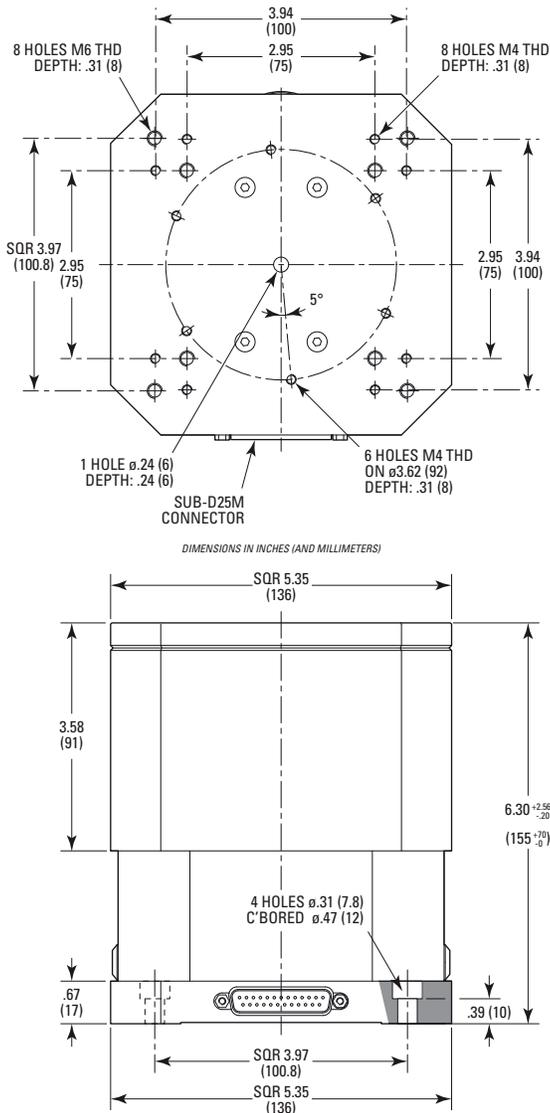


## Dimensions

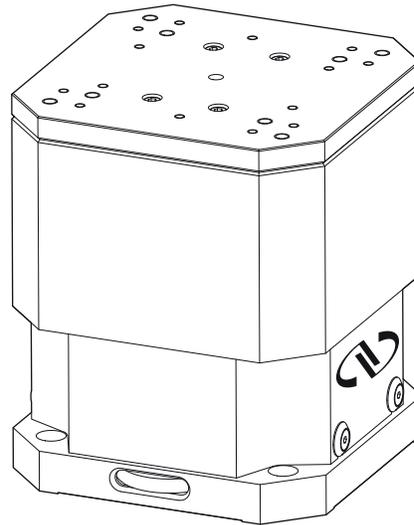


**GTS30V**

# GTS-V High-Precision Vertical Linear Stages



## GTS70V & GTS70VCC



## Ordering Information

Stages	Code
High Precision Vertical Stage, 30 mm Travel	GTS30V
High Precision Vertical Stage, Rotary Encoder, 70 mm Travel	GTS70VCC
High Precision Vertical Stage, Linear Encoder, 70 mm Travel	GTS70V

## Recommended Controllers/Drivers

1- to 8-axis universal high-performance motion controller/driver	XPS-Dx
Universal digital driver card for stepper, DC and direct motors (XPS-D)	XPS-DRV11
1- to 4-axis universal high-performance motion controller/driver	XPS-RLx
PWM drive module for DC brush and stepper motors, 3 A/43 V max (XPS-RL)	XPS-DRV01
1- to 3-axis motion controller/driver	ESP301
Single-axis DC motor controller/driver	SMC100CC



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