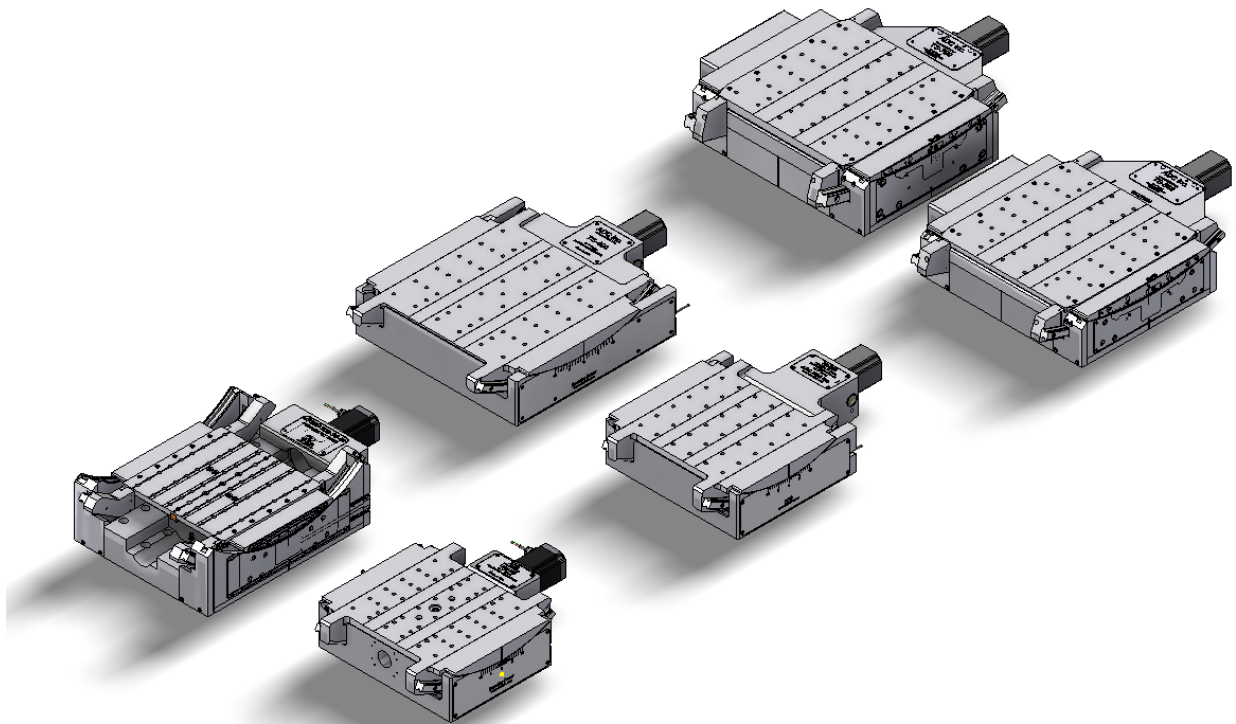




# High Precision Heavy Load Tilt Stages

TS-HD Series & TSW-HD Series



August 2023



## SPECIFICATIONS

The TS-HD and TSW-HD series tilt stages provide a rigid, accurate motion for general goniometric use. Each stage is stepper motor driven and curved linear bearing guided stages with a rugged anodized aluminum body. The top and bottom mounting surfaces are precision ground to provide an optimal interface.

The TS-HD Series uses a tangent bar type mechanism, and the TSW-HD uses a worm drive mechanism. This interface results in a highly resolved, very rigid rotary motion. The stage is guided by preloaded ball type profiled linear rails. An optional optical encoder gives closed loop feedback for the device.

## MECHANICAL

Specification	TS300	TS400	TS565	TS700	TSW300-16	TSW300-34
Travel Range (°)	+/- 8	+/- 7	+ /-4	+/- 4	+/- 8	+/- 17
Repeatability (µrad RMS)	17	17	80	40	45	45
Trajectory Straightness (µm/25mm)	20	20	5	5	TBD	TBD
Runout (µm)	15	15	3	3	TBD	TBD
Full Step Resolution (µrad) (approx.)	35.3	26.4	18.7	15.1	60.4	60.4
Torque (N*m)	270	360	508	630	270	270

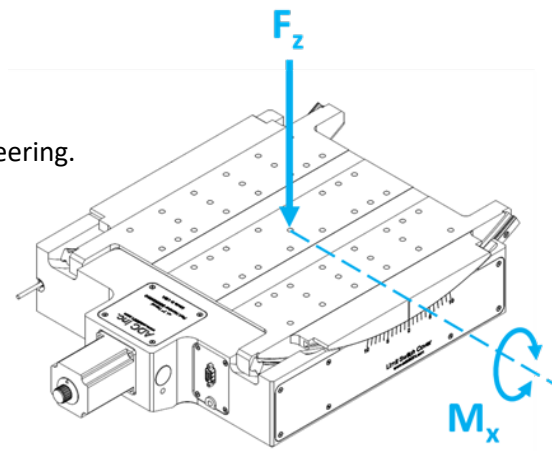
## ELECTRICAL

Motor	Limit Switches	Optical Encoder
2-Phase; 5-Phase Stepper; DC	Mechanical, Normally Closed	Renishaw Incremental or Absolute ( <a href="http://www.renishaw.com">http://www.renishaw.com</a> )

## LOAD CHARACTERISTICS

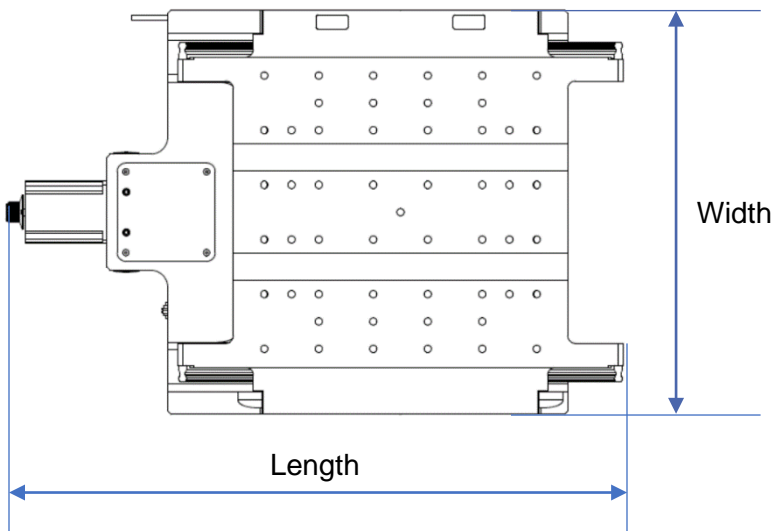
Fz (kN)*	Mx (Nm)
10	250

\*For eccentric maximum load, contact AVS|US engineering.

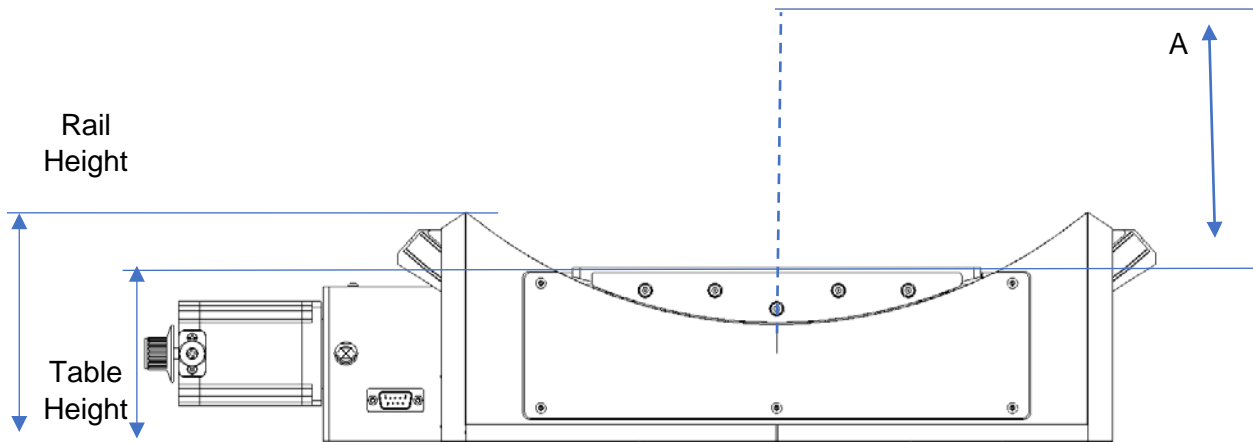


## DIMENSIONS

### Top View



### Side View



(mm)	Length	Width	Table Height	Rail Height	A	Mounting Surface	Curvature of Rails
<b>TS-300</b>	518	347	95	95	237.3	270 x 218	300
<b>TS-400</b>	566	411	95	95	337	284 x 307	400
<b>TS-565</b>	567	338	95	95	501	300 x 300	565
<b>TS-700</b>	570	636	111	111	636	300 x 300	700
<b>TSW-300-16</b>	443	304	96	96	237.3	232 x 218	300
<b>TSW-300-34</b>	568	304	95.8	126	237.5	231 x 225	300

## ORDERING INFORMATION

Tilt Stages can be ordered with different configurations. Please use the codes provided below when ordering. Please call or e-mail to ask about any other customization required.

TS-HD	TS-300	TS-400	TS-565	TS-700	TSW-300-16	TSW-300-32
<b>Air / Vacuum Options</b>	-A (Standard Air Stage) -V (Vacuum Stage; ask about options when placing order)					
<b>Encoder Options</b>	-R (With Incremental Optical Encoder) -A (With Absolute Optical Encoder) -N (Without Encoder)					
<b>Brake Options</b>	-B (With Brake, 24VDC) -N (Without Brake)					
<b>Motor Options</b>	-2PH (Standard 2 Phase Bi-Polar Stepper Motor) -5PH (5 Phase Stepper Motor) -DC (DC Motor)					
<b>Gearbox Option</b>	-G (customer to enter desired ratio; 3:1 to 100:1 available)					

### Example Order #1:

**TS300-A-E-N-2PH**

This is an order for a TS565 Precision Goniometer in air, with encoder, no brake, and a 2-phase motor, no gearbox is implied.

### Example Order #2:

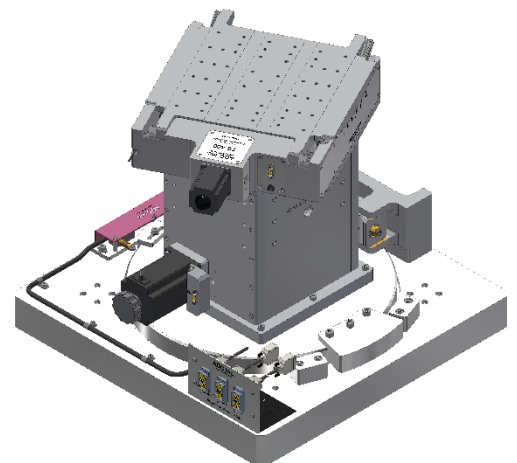
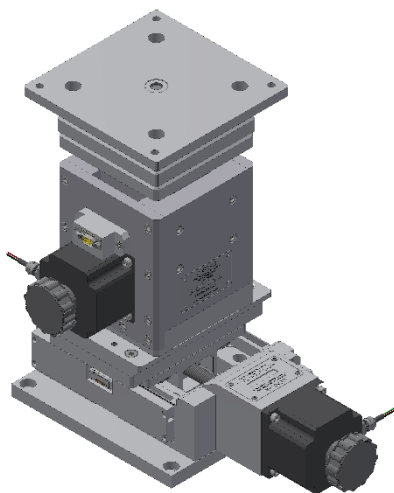
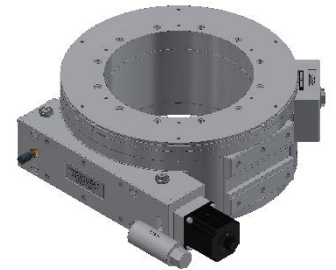
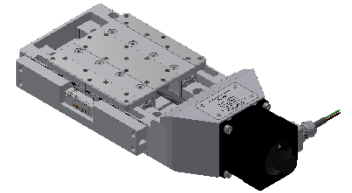
**TSW300-16-A-E-N-2PH**

This is an order for a TS300 Precision Goniometer with +/- 8 degrees of travel in air, with encoder, no brake, and a 2-phase motor, no gearbox is implied.

## OTHER STAGES



Linear Stages	Lift Stages
DS210	DJ210
DS310	DJ310
DS410	DJ410
DS510	BJ10
	BJ25
Tilt Stages/ Goniometers	Rotation Stages
TS-50	RS-100
TS-90	RS-200
TS-160	RS-300
TS-300	RS-400
TS-400	RS-500
TS-565	
TS-700	



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