

# Force Test Stands Series **TSF**

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MODELS TSFM500, TSFM500H, TSF & TSFH

## User's Guide

# Thanks!

Thank you for purchasing a Mark-10 Series TSF Force Measurement Test Stand. We are confident that you will get many years of great service from this product.

Mark-10 test stands are ruggedly built for many years of service in laboratory and industrial environments.

This User's Guide provides unpacking, setup, and operator instructions. Dimensions and specifications are also provided for each model. For additional information or answers to your questions, please contact us. Our technical support and engineering teams will be eager to assist you.

Thank you again for your purchase and happy testing!

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## OTHER MARK-10 PRODUCTS

*A full line of force and torque measurement products and related items – force gauges, torque gauges, force and torque measurement test stands, sensors, grips, systems*



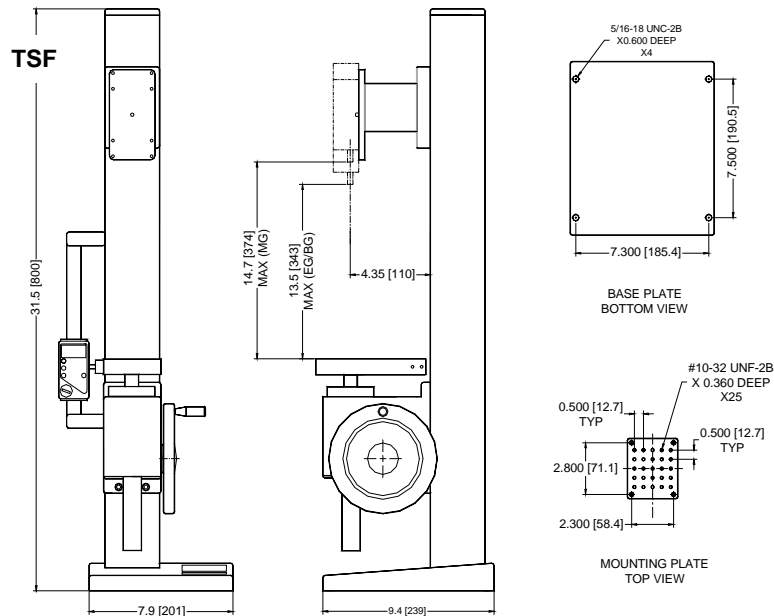
## WARRANTY

Mark-10 Corporation expressly warrants to its buyer for three (3) years from the date of delivery that the goods sold are free from defects in workmanship and materials. Mark-10 Corporation will, at its option, repair or replace or refund the purchase price of goods found to be defective. This remedy shall be the buyer's sole and exclusive remedy. Any modification, abuse, exposure to corrosive environment or use other than intended will void this warranty. This warranty is in lieu of all other warranties, including implied warranties of merchantability and fitness for an intended purpose. In no event shall Mark-10 Corporation be liable for any incidental and consequential damages in connection with goods sold or any part thereof.

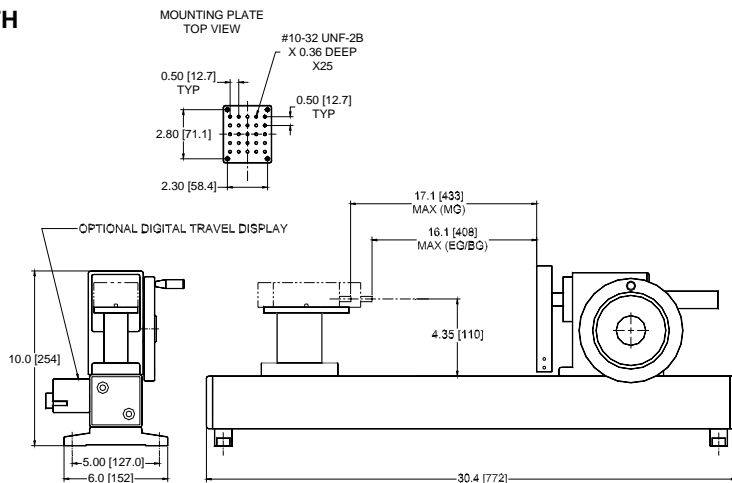
# TSF / TSFH

## DIMENSIONS

IN [MM]



## TSFH



## LIST OF INCLUDED ITEMS

Item	Quantity	
	TSF / TSFM500	TSFH / TSFM500H
Force measurement test stand	1	1
User's guide (this booklet)	1	1
Base	1	-
Mounting leg	-	2
Column cap	1	2
5/16-18 x 1" screw for base installation	4	-
1/4-20 x 3/4" screw for top cap installation	2	4
Thumb screw for gauge mounting	4	4
Mounting hole drill template	1	-
Attachment kit – includes three hooks (small, medium, and large), 2" and 3" diameter compression plates, and two couplers (#10-32 and 5/16-18)	1	1
Tool kit	1	1
Control unit with power cord (TSFM500 and TSFM500H, only)	1	1

## UNPACKING AND SETTING UP

- Carefully unpack the test stand from the box and inspect for any damage. Check the contents to ensure that you have received a test stand complete with all accessories – see the list of included items above.
- Remove the foam from the middle portion of the test stand column and remove the plywood caps by unscrewing the pair of screws at each end. For models TSF and TSFM500, install the base with four 5/16-18 x 1" screws and the top cap with two 1/4-20 x 3/4" screws. For models TSFH and TSFM500H, install the two column caps with two 1/4-20 x 3/4" screws each. Store all packaging materials for possible future use.
- Place the stand on a firm, flat and level working surface free from vibration to ensure accurate readings. It is recommended that the test stand can be secured to a work bench – see your model's "Operation" section for further details.

## TSM500 / TSM500H

### SAFETY TIPS

- Wear eye and face protection when testing. Although the test stand has relatively slow moving mechanisms, be aware of the dangers posed by potential energies that can accumulate in the sample during testing.
- Keep away from the moving parts of the test stand.
- Never operate the test stand if there is any visible damage to the power cord or the control unit. The test stand is powered by 110/220 volts that are present in both the power cord and the control unit. Any contact with this high voltage can cause serious injury or even death.
- Ensure that the control unit be kept away from water or any other electrically conductive liquids at all times.
- Make sure the electrical outlet powering the test stand has local earth ground (3-hole outlet).
- Do not remove the cover of the control unit or motor drive unless instructed to do so by a Mark-10 representative. Always disconnect power before removing the cover. Use Mark-10 replacement parts, only, if any repairs are needed.

### SETUP

Place the stand on a clean, flat and level work area that meets the criteria outlined in the work area safety instructions. For accurate readings, the area should be free of vibrations.

If desired, the stand can be mounted to the work area with two 5/16 screws. Included is a mounting hole drill template for quick setup. Before the stand can be mounted, the belt cover surrounding the fine adjustment knob on the right hand side of the stand has to be removed. Using a flat screwdriver, loosen the four captive screws and slide off the cover.

After the two 5/16 screws holding the stand are tight, place the belt cover back into place. While making sure that there is no contact with the fine adjustment knob, tighten the screws in the four corners.

## TSF / TSFH

### OPERATION

1. Mount the test stand to a firm, flat, and level working surface for maximum safety and accuracy using four 5/16 screws (not included). Use the included mounting hole drill template to accurately drill the holes. Testing can take place without securing the test stand in such a manner, however, it is strongly recommended that the stand be secured, especially for large forces.
2. Install a force gauge onto the gauge plate with four thumb screws. All Mark-10 force gauges mount directly to the stand without adapters.
3. Install any required attachments, including grips, adapters, and other materials necessary for your test sample. Make sure these items are set up in a secure and safe manner.
4. Begin the test by turning the hand wheel clockwise for compression or counter-clockwise for tension.

The gauge bracket's height can be adjusted along the column. Loosen the four screws that secure the bracket to the column, adjust to the desired height, and retighten the screws.

*Note:* To maintain smooth operation of the test stand, avoid overloads and repetitive shock loads.

### Optional Equipment

#### *Digital Travel Display Kit*

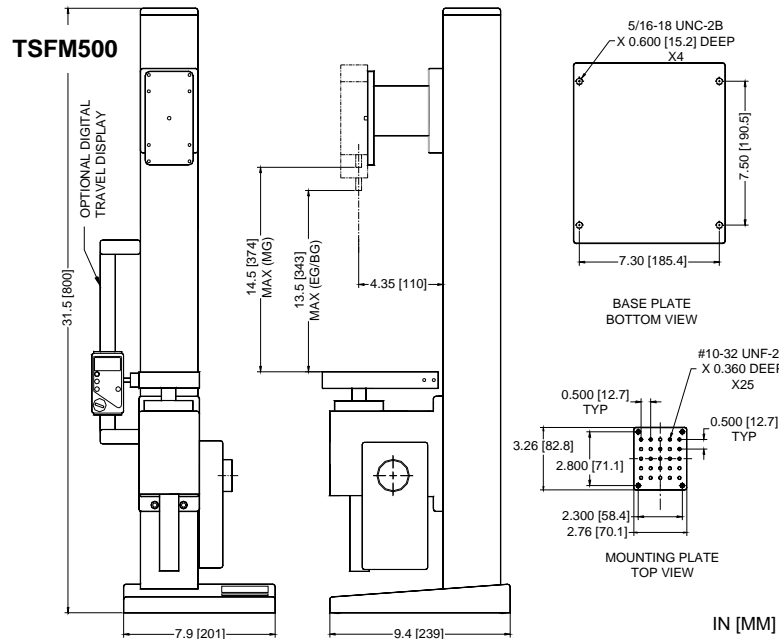
This travel indicator has a 5-digit display (0.0005" [0.01 mm] resolution) and a computer interface for automated data collection. If purchased at the same time as the test stand, no setup is needed. Otherwise, it may be easily installed by the user.

### SPECIFICATIONS

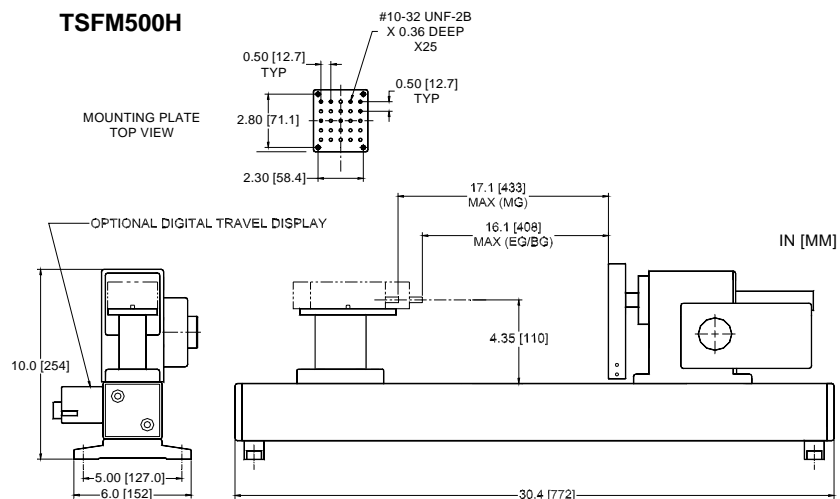
Load capacity	1000 lb [4500 N]
Maximum travel	4" [102 mm]
Travel rate	0.013" [0.34 mm]/rev
Weight (test stand only)	TSF: 33 lb [14.5 kg], TSFH: 27 lb [12.3 kg]

# TSFM500 / TSFM500H

## DIMENSIONS



## TSFM500H



# TSFM500 / TSFM500H

With the base removed, the test stand can be easily integrated into large systems such as production lines. In general, the stand can be mounted on any angle (upside down, for example), although extra care should be taken during installation and operation.

After the stand is in a stable and secure position, install a force gauge with four thumb screws (provided). All Mark-10 gauges mount directly without adapters.

Plug the control unit cable into the 9-pin male connector located above the motor in the rear of the stand.

Plug the power cord into the remote console and the other end into a wall outlet.

Turn on the power with the switch located on the control unit beside the power cord.

The test stand is now ready for operation.

## OPERATION

1. Mount the test stand to a firm, flat, and level working surface for maximum safety and accuracy using four 5/16 screws (not included). Use the included mounting hole drill template to accurately drill the holes. Testing can take place without securing the test stand in such a manner, however, it is strongly recommended that the stand be secured.
2. Install a force gauge onto the gauge plate with four thumb screws. All Mark-10 force gauges mount directly to the stand without adapters.
3. Install any required attachments, including grips, adapters, and other materials necessary for your test sample. Make sure these items are set up in a secure and safe manner.
4. Power on the control unit (further instructions to follow). For fine adjustment or otherwise manual testing, turn the knob on the right hand side of the stand clockwise for compression, counterclockwise for tension.

## TSM500 / TSM500H

The gauge bracket's height can be adjusted along the column. Loosen the four screws that secure the bracket to the column, adjust to the desired height, and retighten the screws.

*Note:* To maintain smooth operation of the test stand, avoid overloads and repetitive shock loads.

### Optional Equipment

#### Digital Travel Display Kit

This travel indicator has a 5-digit display (0.0005" [0.01 mm] resolution) and a computer interface for automated data collection. If purchased at the same time as the test stand, no setup is needed. Otherwise, it may be easily installed by the user.

#### Limit Switches

Adjust the switches' vertical positions by loosening and re-tightening the wing screws. A limit condition is indicated by an amber light on the front surface of each sensor.

**Upper limit switch** – while a limit condition exists, the slider will not move up

**Lower limit switch** – while a limit condition exists, the slider will not move down

### Using the Control Unit

#### UP

Press and hold for tension, release button to stop motion. Located on the face of the Control Unit.

#### DOWN

Press and hold for compression, release button to stop motion. Located on the face of the Control Unit.

#### SPEED CONTROL DIAL

Adjust speed by turning the dial 0.2 – 5.5 in/min [5 – 140 mm/min]. Located on the face of the Control Unit.

#### POWER SWITCH

Use this switch, in the left rear of the Control Unit, to turn on and turn off power to the test stand. Power is indicated by an amber light on the face of the Control Unit.

## TSM500 / TSM500H

#### POWER PLUG RECEPTACLE

Located in the left rear of the Control Unit. Plug the power cord in here.

#### CONTROL CABLE

Plug this cable into the lower male connector on the test stand, adjacent to the motor.

### SPECIFICATIONS

Load capacity	500 lbF [2.2 kN]
Speed range	0.2 - 5.5 in/min [5 - 140 mm/min]
Maximum travel	4" [102 mm]
Speed variation with load	±0% (Stepper motor driven)
Speed accuracy	±5% of setting
Power	Universal input, 80 - 240 VAC, 50/60 Hz
Fuse type	1.2A, 250V, 3AG SLO BLO
Weight (test stand only)	TSM500: 36 lb [16.3 kg] TSM500H: 30 lb [13.6 kg]
Control unit weight	2.7 lb [1.2 kg]