Data Sheet Motorized Test Stand w/PC Control **ESM303**

^ ESM303 is shown above configured for a tensile test, with a Series 7 force gauge and G1061-2 wedge grips.

Quick Specs	
Max. force:	**300 lbF [1.5 kN]**
Available speed range:	**0.02 - 45 in/min [0.5 - 1,110 mm/min]**
Max. travel:	**18.0 in [457 mm]**
Max. clearance:	**20.0 in [508 mm]** (may be extended via single- or double-column extension)
Throat depth:	**3.0 in [76 mm]** (may be extended via double column extension)

The ESM303 is a highly configurable single-column force tester for tension and compression measurement applications up to 300 lbF [1.5 kN], with a rugged design suitable for laboratory and production environments. Sample setup and fine positioning are a breeze with available FollowMe™ force-based positioning - using your hand as your guide, push and pull on the force gauge or load cell to move the crosshead at a variable rate of speed.

With generous travel, clearance, and depth dimensions, a wide range of tests can be performed, including break testing, cycling, limit testing to a load or distance, loadholding, elongation testing, tensile testing, compression testing, and more. Satisfy various test methods through an easy-to-use menu, allowing the configuration of test speed, force and distance limits, cycling, preload, and many other functions, all protected by a password. Save up to 50 profiles to accommodate a range of test methods.

When the ESM303's clearance is insufficient for the application, its modular mechanical design allows for single- and double-column extensions. Modularity extends to the controller functions as well. Individual functions, such as travel measurement, cycling, loadholding, etc., may be purchased either upfront or enabled in the field through an activation code. This a-la-carte platform allows for custom configuration as appropriate for the application and budget.

Collect force and travel data, plot and analyze the results, and control test stand motion via PC-based MESUR®gauge Plus software. Or, fully control the stand by a PC through a custom-written program in any language supporting ASCII communications.

Standard Features

- **Selectable speed setting**
- **Upper and lower travel limit switches**
- **Adjustable, removal controller with intuitive menu navigation**
- **Password protection of test parameters**
- **Stepper motor-driven, producing smooth and quiet operation with no speed variation under load**
- **USB output of force vs. time or force vs. travel**
- **Compact footprint, suitable for crowded workbenches**
- **Ergonomic design, with smart, clean cable management**
- **Integrated electronics assembly, easily removed and transported**

Typical Applications

> Typical applications (l to r): extension spring testing, peel testing, compression spring testing, tensile testing

MARK-10

www.hoskin.ca | sales@hoskin.ca
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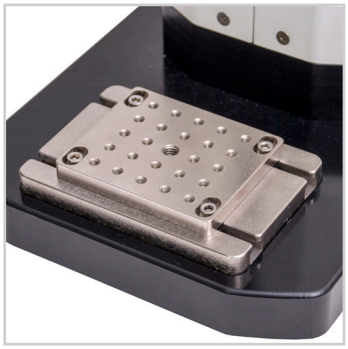
Key Features

Simple controller interface
Rugged aluminum keys are designed for industrial environments, with dedicated *Zero Travel* and *FollowMe*® keys. Removable for remote use.

Limit switches
Adjustable upper and lower solid state limit switches stop test stand travel with 0.001 in. [0.025 mm] repeatability.



Adjustable mounting plate with T-slot base
The mounting plate may be repositioned in the X- and Y-directions, for proper sample alignment. Matrix of threaded holes for fixture mounting.

Modular design
All electronics are installed onto a single panel, easily accessible and removable for updating and service.

Additional Features & Items

FollowMe®
Using your hand as your guide, push and pull on the load cell or force gauge to move the crosshead. Responsive enough for quick positioning as well as fine adjustments.

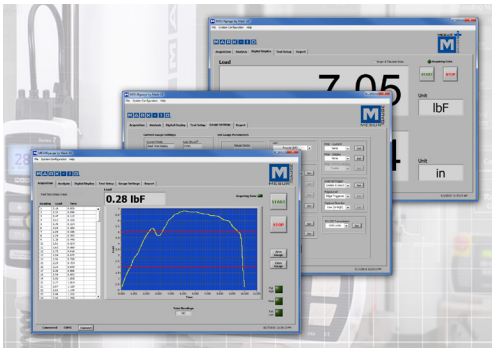
Force gauges
Consider a Series 7 or 5 gauge for force vs. time or force vs. travel data output, and to take advantage of all available test stand functions.

Grips and eye end adapters
Wide range of grips for tensile, peel, compression, and specialized applications. Eye end adapters allow for quick grip installation and removal, and prevent rotation.

Indicator / load cell adapter
Accommodates any Mark-10 indicator and Series R01 or R03 force sensors. Includes mounting hardware.

Column extensions
Select from single- and double-column extensions for oversized samples. Three lengths are available - 6, 12 and 24 in [150, 300, and 600 mm]. Double-column extensions accommodate up to a 20 in. [508 mm] wide sample, or ø21.5 in [ø546 mm] round sample. Base contains rows of T-slots for fixture mounting.

Safety Shield
Provides pinch and sample debris protection for the operator. An electrical interlock prevents test stand operation while the door is open.



MESUR®gauge Plus Software
Acquire data and control test stand motion simultaneously via MESUR®gauge Plus. The software tabulates and graphs data, calculates statistics, and provides reporting and output tools.

Optional Functions

Any of the below functions may be purchased at time of order or may be enabled in the field at a later date via a code activation process. The only exception is the AF009 travel measurement option, which additionally requires field hardware installation. A complete options package is also available, including all of the below functions at a discounted price. The test stand is shipped in Demo Mode, during which time all available functions are temporarily enabled for 160 hours of operation.

Function	Part No.	Description	Requirements
FollowMe®	AF008	Crosshead movement responds to manually pushing or pulling on the force gauge shaft or load cell. Increasing force produces greater speeds. Ideal for setups and quick positioning.	- Series 7 or 5 gauge or indicator with load cell - 09-1214 interface cable
Travel indication	AF009	Travel is indicated on the control unit display, with output via USB. The most recent position is displayed upon powering on. An internal scale utilizing Renishaw technology produces significantly higher accuracy than with conventional rotary encoder-based designs. Backlash and nonlinearity are virtually eliminated.	- Field hardware installation required. - If data output to a PC is required, add 09-1214 and 09-1158 cables, and a Series 7 or 5 gauge or indicator with load cell.
Computer control	AF010	The ESM303 may be fully controlled by a PC through a custom-written program in any language supporting ASCII communications. Also responds to the legacy Chatillon TCD command set and legacy Nexygen TCD software (not available from Mark-10). This option is not required for MESUR™gauge Plus software.	- Series 7 or 5 gauge or indicator with load cell - AF009 travel indication - 09-1214 interface cable - 09-1158 USB output cable - For full speed range, consider AF017 and AF018 speed range extensions
Programmable travel limits	AF011	The stand stops at or cycles between programmable upper and lower travel distances.	- AF009 travel indication option
Overload protection	AF012	Protects a force gauge or force sensor against overload. Program the desired percentage of full scale of the gauge. Adjustable analog voltage setting allows the stand to interface with virtually any gauge with analog output.	- Series 7 or 5 gauge or indicator with load cell - 09-1214 interface cable
Auto return	AF013	The crosshead moves to a limit switch, force set point, travel position, or break, then stops and reverses direction at full speed to the opposite limit.	- If reversing at force set point: Series 7 or 5 gauge or indicator with load cell, and 09-1214 interface cable - If reversing at travel limit: AF011 programmable travel limits option - If reversing at break: AF019 break detection option and 09-1214 interface cable
Cycling / dwell time	AF014	Same as auto return, but with the ability to program up to 100,000 cycles. Programmable dwell time for upper and lower limits (set independently) can be set up for up to 10,000 seconds.	- Same as auto return, at the same speed in each direction. Add AF016 for independent up and down speeds.
Independent up and down speeds	AF016	Individually configure speeds for the up and down directions.	---
Low speed range extension	AF017	Extends the standard speed range down to 0.02 in/min (0.5 mm/min).	---
High speed range extension	AF018	Extends the standard speed range up to 45 in/min (1,100 mm/min).	---
Break detection	AF019	Crosshead stops at a sudden drop in force. Programmable percentage of peak force.	- Series 7 or 5 gauge or indicator with load cell - 09-1214 interface cable
Load holding	AF020	Dynamically adjusts the crosshead position to maintain a programmed load for an indefinite or specified period of time.	- Series 7 or 5 gauge or indicator with load cell - If a specified time is required, add AF014 cycling / dwell time option - 09-1214 interface cable
Preload / sample touch	AF021	Stops the crosshead and/or zeroes the travel display at an initial preload - useful in tensile, compression, spring, elongation, and other applications. Preload is programmable as a percentage of force gauge/load cell full scale. Three modes: (1) stop, (2) stop and zero, and (3) zero without stopping.	- AF009 travel indication - Series 7 or 5 gauge or indicator with load cell - 09-1214 interface cable
Profiles	AF022	Save and recall sets of test parameters, such as speeds, travel limits, preloads, etc. Up to 50 profiles may be stored.	---
Complete options package	**AFCOMP**	**Includes all functions listed above, plus 09-1214 interface cable and 09-1158 USB cable. Requires a Series 7 or 5 gauge or indicator with load cell.**	

Specifications

Load capacity: < 24 in [610 mm]/min: > 24 in [610 mm]/min:	 300 lbF [1.5 kN] 200 lbF [1 kN]
Speed range: Standard: Optional:	 0.5 - 13 in/min [13 - 330 mm/min] 0.02 - 45 in/min [0.5 - 1,100 mm/min]
Maximum travel:	18.0 in [457 mm]
Speed setting accuracy:	±0.2%
Speed variation with load:	±0% [Stepper motor driven]
Travel accuracy:	±0.002 in per 10 in [±0.05 mm per 250 mm]
Travel resolution:	0.001 in [0.02 mm]
Travel display position retention:	Most recent position is recalled upon powering on
Limit switch repeatability:	±0.001 in [0.03 mm]
Power:	Universal input 80-240 VAC, 50/60 Hz, 60W
Weight:	56.5 lb [25.6 kg]

* Because load cell deflection and system deflection are present and not automatically compensated for, this equipment is recommended for applications requiring at least 0.2 in [5 mm] of travel distance.

Ordering Information

Hardware	
ESM303	Motorized test stand,110V*
09-1214	Interface cable, gauge / indicator to ESM303
09-1158	USB output cable
AC1062	Load cell / indicator mounting kit
ESM303-001-1 / -2 / -3	Single column extension, 6 / 12 / 24 in. [150 / 300 / 600 mm]
ESM303-002-1 / -2 / -3	Double column extension, 6 / 12 / 24 in. [150 / 300 / 600 mm]
ESM303-003	Safety shield
Controller Options	
AF008	FollowMe® force-based manual positioning
AF009	Travel indication, with USB output
AF010	Computer control, via USB
AF011	Programmable travel limits
AF012	Integrated overload protection
AF013	Auto return
AF014	Cycling / dwell time
AF016	Independent up and down speeds
AF017	Extended speed range, low
AF018	Extended speed range, high
AF019	Break detection
AF020	Load holding
AF021	Preload / sample touch
AF022	Profiles
AFCOMP	Complete options package (includes all Controller Options, plus 09-1124 and 09-1158 cables)

* ESM303 contains a universal power supply (80 - 240V) and includes a power cord with US plug.
Add suffix 'E' for Euro plug, 'U' for UK plug, or 'A' for Australian plug. Ex: ESM303E

In The Box

The ESM303 test stand is shipped as shown, and includes the following accessories:

(1) G1024 extension rod, 2”

(1) G1028 small hook

(1) G1038 medium hook

(1) G1039 coupling, #10-32F/F

(1) G1009 compression plate, 2” dia.

(1) G1030 thread adapter, 5/16-18M to #10-32F

(4) Thumb screw for force gauge / indicator

(2) Thumb screw for limit switch

(1) Allen wrench set

(1) Control panel

(1) Control panel mounting bracket and hardware

(1) Power cord

Dimensions in (mm)