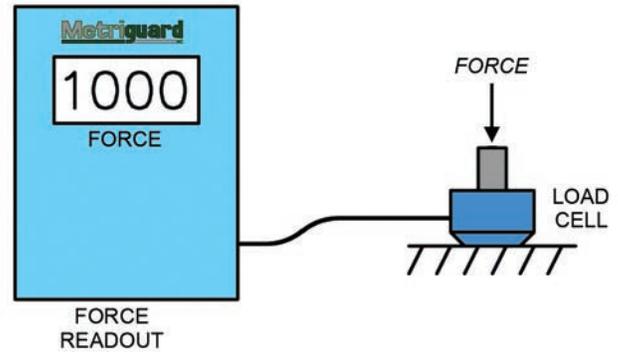


# Force Measurement Systems

Metriguard offers a variety of force measurement options for optimum system configuration and flexibility. Our sales department would be happy to discuss the best fit for your application or how to optimize performance in your operation.

## Electronic Force Measurement Systems

- Metriguard's finest force measurement system
- Standard with Models 412 and 422 Tension Testers
- Optional with Models 401 and 403 Tension Proof Testers, and Models 810 and 870 Compression Testers
- Eliminates errors caused by cylinder friction in hydraulic pressure indication of force
- Provides direct digital readout of force as well as analog output of force signal
- Measures in either standard English or metric units



Schematic of electronic force measurement system components.

## Description

### General

The Metriguard electronic load cell force measurement system is standard for the Models 412 and 422 Tension Proof Testers. It is also available as an option for the Models 401 and 403 Tension Proof Testers and the Models 810 and 870.

A general purpose version of the system is available for special customer applications, in which case the load cell is extra because it needs to be specified to fit the application.

- An electronic load cell force measuring system consists of an electronics unit and a load cell.
- The electronics unit applies stabilized signals to the load cell and processes the signals from the load cell with low noise amplification and coherent detection methods. These methods increase the dynamic range of forces that can be measured.
- The load cell is physically located within a machine so that the load to be measured or a known fraction of it is applied to the load cell.
- Load cells used by Metriguard are carefully selected to be stable and reliable with appropriate tolerances for variables such as temperature, off-axis loading, and overload. Other selection criteria include linearity and sensitivity.

A shunt calibration feature is provided with each system. Once the system is calibrated, the calibration is easily checked with a push-button calibration switch on the electronic unit's front panel. This method uses the system's load cell as a calibrating device. If the calibration checks without adjustment when using the shunt calibrator, the operator can be confident that the force measurement system has retained its calibration.

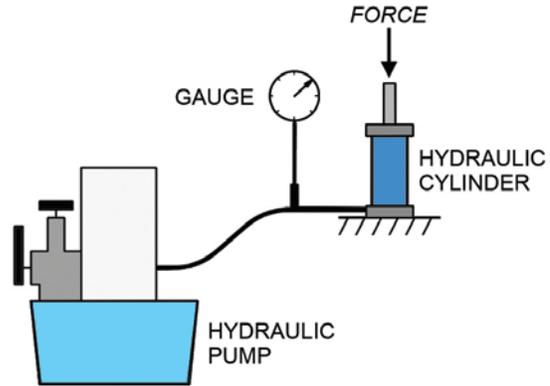
## Specifications

Force Outputs.....	Digital panel meter and BNC front panel connector (0-10 volts)
Force Ranges.....	Selected by a front panel range switch
Digital Panel Meter.....	Display selected from force, peak force, or power supply voltages via front panel function switch
Shunt calibration.....	Activated by front panel switch
Load Cell Capacities:.....	Model 401: 50,000 lbs Model 403: 50,000 lbs Model 412: 50,000 lbs Model 422: 100,000 lbs Model 810: 10,000 lbs Model 870: 100,000 lbs

## Hydraulic Force Measurement Systems

- May be used with Metriguard Models 401 and 403 Tension Proof Testers or the Models 810 and 870 Compression Testers
- Low cost

The hydraulic pressure measuring option gives a digital readout of pressure with peak pressure storage. This option does not indicate the actual force applied by the testing machine; it measures hydraulic pressure which is proportional to force, with an error component due to cylinder friction.



Schematic of hydraulic force measurement system components.

## Force Measurement System Options

LOAD CELLS & ACCESSORIES	PART NUMBER
Load Cell, 10 lbf capacity, "S" type	SEN-STR-1001
Load Cell, 50 lbf capacity, "S" type	SEN-STR-1004
Load Cell, 500 lbf capacity, "S" type	SEN-STR-1005
Load Cell, 1,000 lbf capacity, universal	SEN-STR-1003
Load Cell, 5,000 lbf capacity, universal	SEN-STR-1007
Load Cell, 10,000 lbf capacity, universal	SEN-STR-1002
Load Cell, 25,000 lbf capacity, tension link	SEN-STR-1009
Load Cell, 50,000 lbf capacity, compression	SEN-STR-1006
Load Cell, 50,000 lbf capacity, universal	SEN-STR-1014
Load Cell, 100,000 lbf capacity, compression	SEN-STR-1013
Load Cell, 100,000 lbf capacity, tension link	SEN-STR-1008
Connector, cable-end socket (fits all load cells except tension links)	CON-PLU-1030
Indicator, tension link	DIS-TRA-1001
Cable, tension link	WIR-MUL-1003

A variety of load cell capacities and accessories are available for our force measurement systems.

The large capacity tension calibration link (SEN-STR-1008) is available separately from the entire calibration link assembly, as are all replacement load cells. Note: this tension link is actually 14 inches (35.6 cm) long and weighs over 17 pounds (about 8 kg).



# Force Measurement Systems

## Tension Calibration Systems

### Tension Calibration Systems

- Tension calibration links (or force calibration links) give independent measurements of force for checking the force calibration of Metriguard Tension Proof Testers.
- Each tension calibration link assembly includes two wood-faced steel paddles for insertion into the clamps, a tension load cell with steel pins for attachment to the paddles, and a readout unit.
- Calibration of the tension load cell and readout unit is traceable to the National Institute of Standards and Technology.

### Mounting Pedestal

(MIS-MEC-1004)

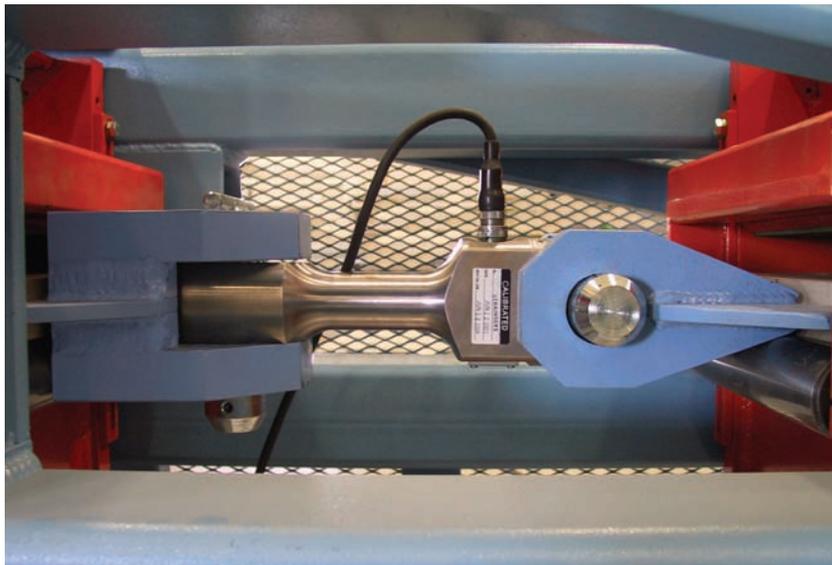
This stand holds the chosen force measurement system and stands free of the tester machinery.

Weight ..... 75 lbs (34 kg)

Size (L x W x H)..... 24 x 24 x 45 in  
610 x 610 x 1143 mm)

Tension Calibration (TC) Link Options					
MODEL	TC LINK ASSEMBLY PART NUMBER	SIZE (W X L)	CAPACITY	GAUGE LENGTH	SHIPPING WEIGHT
401, 403, 412	SYS-ASM-1001	5 7/8 x 25 in (149 x 635 mm)	100,000 lb (440 kN)	24 in (610 mm)	130 lb (59 kg)
403, 412	SYS-ASM-1005	12 3/4 x 26 in (324 x 660 mm)	100,000 lb (440 kN)	24 in (610 mm)	160 lb (73 kg)
422	SYS-ASM-1002	12 3/4 x 32 3/4 in (324 x 832 mm)	100,000 lb (440 kN)	24 in (610 mm)	200 lb (91 kg)
4100	SYS-ASM-1004	6 x 12 in (152 x 305 mm)	25,000 lb (111 kN)	12 in (305 mm)	120 lb (54 kg)

A variety of tension calibration link assemblies are available for Metriguard Tension Proof Testers. This table shows the assemblies compatible with the various tension testers.



Side view of a tension calibration link assembly (SYS-ASM-1005) clamped in a Model 412 Tension Proof Tester.