

METROLOGY
LABORATORY

MEASURING MACHINES



Pratt & Whitney®
Measurement Systems, Inc.

The Standard of Accuracy

Pratt & Whitney Metrology Laboratory Measuring Machines are the standard to which all other gages are held subordinate. They are certified traceable to the National Institute of Standards and Technology (NIST) and represent the most dependable, commercially available, absolute reference system for long length measurement.

When describing accuracy, the only meaningful definition must include all elements of the measurement system, from the machine to operator influence. These instruments perpetuate this "Standard of Accuracy" set by Francis Pratt and Amos Whitney over 155 years ago and, as such, deliver time-tested reliability and accuracy.

Instruments are offered in standard lengths up to 80 inches and are available in either digital inch module or laser interferometer versions. Both varieties easily measure length, diameter, pitch diameter, roundness, parallelism and taper. Note: Larger capacity machines are available upon request.

The digital inch module-based measuring instrument utilizes a precision graduated master bar and maintains a non-accumulative accuracy throughout the measuring range.

Our most recently developed laser-based measuring instrument provides laser interferometric measurements over the range of the system while utilizing a single master. It will automatically minimize Abbe error effects.

Simple, Flexible and Fast

Both models are easily mastered. The Digital-Inch Module version is mastered by setting a datum to a master gage and then aligning the measuring head optically with the appropriate graduation on the NIST traceable inch bar. This value is then preset on the digital display and the part to be measured then placed on the elevating table located between the anvils. Finally, the measuring head is advanced until the analog meter indicates zero and the absolute measurement observed on the digital display.

The laser-based measuring instrument is datumed using a calibrated gage block. The instrument scale factor is determined automatically with the optional air and material sensors or manually by entering air temperature, pressure, humidity, and material temperature values. A flexure-based, frictionless tailstock ensures repeatable measurements.



Verifying a precision end measure length

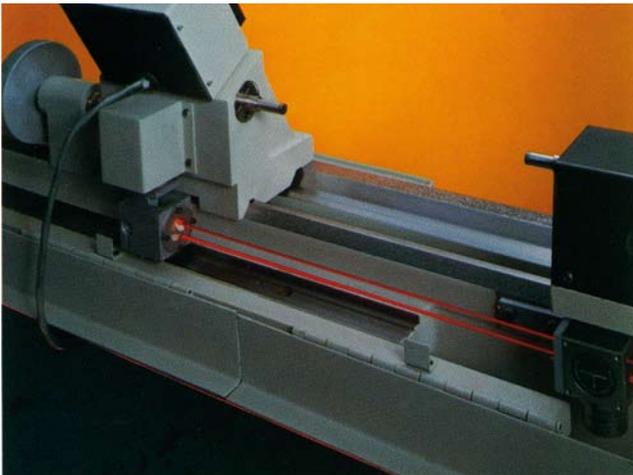
Gage Management Software for the Digital Measuring Machine

Our optional gage management module, designed in accordance with ISO 17025 and ISO 9000, puts gage information at your fingertips. It represents a logical addition to the Digital Measuring Machine* because it makes storing, retrieving and reporting gage information quite simple. You will be able to track and display gage history, wear data, current users, the product evaluated with the gage, calibration dates, days since last calibration, and much more. Additional subsystems of the gage management module include gage studies, gage crib, gage preventative maintenance, and gage archives. With them, you'll be able to control your gage data as well as your gages.

**Not available for the Laser-Based Measuring Machine.*

Guaranteed Service/A2LA Accredited

Pratt & Whitney offers a full one-year warranty and a network of nationwide service personnel who receive up-to-the-minute factory training to provide you with fast, experienced product support and calibration services meeting ISO 17025 standards. We've built these Measuring Machines to exacting standards of accuracy to guarantee you years of high productivity, reliability, and product integrity. Our reputation as well as yours depends on it.



Keysight Technology Laser Transducer System



Digital-Inch Module System with Master Inch Bar

MEASURING MACHINES

■ Laser Transducer System

Keysight Technologies' single axis linear distance measuring system includes the required optics, laser head, and computer system* measurement display. Newer U307 and U308 series instruments employ additional optics to minimize Abbe error and eliminate the need for scraped ways.

■ LVDT Tailstock

This exclusive Pratt & Whitney development allows consistent, fully adjustable measuring pressures from 2 to 48 oz. Constant measuring pressure permits identical readings by different operators. Operator influence is completely eliminated.

■ Seasoned, Rigid Bed

The heavy cast and seasoned iron bed receives stabilizing treatments during all manufacturing stages. This results in an accurate and stable base which permanently resists distortion.

■ Precision Ways

The measuring head and tailstock move on ways which are straight and true.

U305 series ways are hand scraped. U307 and U308 series instruments use precision ground ways.

■ Positioning Head

Non-rotating spindle. Measuring technique is independent of lead screw-driven positioning head. Measurements made between relative positions of optical components.

■ Laser Measurement Display

Provides system resolution of .000001 inches. Allows for material temperature compensation, preset values, and manual velocity of light compensation. Includes computer system.

■ Granite Table and Stand**

Provides required stability to minimize influences on the integrity of the measurement system. Convenient for the storage of masters and accessories.

* Computer not depicted.

**All Laser-Based Measuring Machines are furnished with a granite table and stand, as depicted.



DIGITAL INCH
MODULE-BASED

MEASURING MACHINES

■ LVTD Tailstock

This exclusive Pratt & Whitney development allows consistent, fully adjustable measuring pressures from 2 to 48 oz. Constant measuring pressure permits identical readings by different operators. Operator influence is completely eliminated.

■ Seasoned, Rigid Bed

The heavy cast and seasoned iron bed receives stabilizing treatments during all manufacturing stages. This results in an accurate and stable base which permanently resists distortion.

■ Precision Ways

The measuring head and tailstock move on hand-scraped ways which are straight and true.

■ Master Inch Bar

This carefully seasoned inch bar, located at the rear of the bed, contains hardened stainless steel reference points at one inch intervals. Each point has a microscopic hair line inscribed. The exact separation of one inch is transferred, under special control and clean-room conditions, from a Master Bar.

■ Digital Inch Module

Manufactured under controlled conditions on specially designed precision equipment. Precisely moves the spindle longitudinally to the measuring position. The rotary encoder attached to the dividing screw gives direct measuring readouts to .000010 inch. The microscope provides accurate alignment of the measuring head at the desired inch reference point.

■ Direct Reading Digital Display

Easy-to-read computer display provides direct reading in inch or metric units.

■ Granite Table and Base*

Provides required stability to minimize influences on the integrity of the measurement system. Convenience for storage of masters and accessories.

**The 80" Digital Measuring Machine comes with a granite table and stand. The 24" and 48" Digital Measuring Machines come with a granite table and cabinet as depicted.*



MODELS AND SPECIFICATIONS

LASER-BASED

Model Number	U308019/U305638	U307549/U305468	U307740/U305469	U305603
Measuring Range	24"/610mm	48"/1219mm	80"/2032mm	120"/3048mm
Laser Transducer Accuracy	± .1 Microinch per inch. Note: Temperature of all system components stabilized. All measurements referenced to 68°F, 29.291" of Hg, 50% relative humidity.			
System Resolution	.000001 inch (1 microinch) .00001 mm (.01 micron)			
System Accuracy	± 10 microinches per 24" travel of gage head plus: ± .1 microinch/inch using manual VOL compensation with VOL exactly known in beam path.			
Measuring Pressure	Adjustable 2-48 oz./57-1361 grams			
Laser Measurement Display	Provides control and display interface for Laser Measurement System, including thermal expansion and manual velocity of light (V.O.L.). Automatic V.O.L. compensation is optional.			
System Output	USB ports			
Electrical Requirement	115V 60Hz/220V 50Hz			
STANDARD EQUIPMENT				
Included with the measuring instrument are carbide-tipped anvils, an elevating table, flatted cylinder, cylindrical supports and tool kit consisting of a lap, lapping compound and a ball tester, all in a wooden case.				
POPULAR OPTIONAL ACCESSORIES				
	U302590	Additional Elevating Table (single axis)		
	U307574	Spherical Adapters (Ball diameter 0.375")		
	U302595	Magnetic Wire Holders		
	PWI-10751D	Air Sensor (w. 15 meter cable)		
	PWI-10757F	Material Sensor (w. 25 meter cable)		
	DI0063012	USB Sensor Hub (required for sensors)		

DIGITAL INCH MODULE-BASED

Model Number	U304393	U304395	U304396	U304397
Measuring Range	24"/610mm	48"/1219mm	80"/2032mm	120"/3048mm
System Accuracy	± .000050"			
System Resolution	.000010"			
Measuring Pressure	Adjustable 2-48 oz./57-1361 grams			
Measurement Display	inch/metric (switchable with direct conversion), floating zero, preset capability 8 digits, keyboard programming, test and set up mode.			
System Output	RS232C Connector			
Electrical Requirement	115V 60Hz/220V 50Hz			
STANDARD EQUIPMENT				
Included with the measuring instrument are carbide-tipped anvils, an elevating table, flatted cylinder, cylindrical supports and tool kit consisting of a lap, lap compound, a ball tester and a camel hair brush, all in a wooden case.				
POPULAR OPTIONAL ACCESSORIES				
	U302590	Additional Elevating Table (single axis)		
	U307574	Spherical Adapters (Ball diameter 0.375")		
	U302595	Magnetic Wire Holders		
	302558	Extra Flatted Cylinder		
	S303573	Dial Indicator Bracket		
	U307528	Thread-Micrometer Standard Measuring Kit		
	U306596	GageCal Automatic Tolerancing Software (requires a computer)		

WARRANTY POLICY

Any part which, under normal operating conditions in the plant of the original purchaser, proves defective in material or workmanship within one (1) year from the date of shipment as determined by **Pratt & Whitney's** inspection, will be repaired free of charge, f.o.b. factory Bloomfield, Connecticut, provided that the product has been properly installed, maintained and operated within the limits of rated and normal usage.



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U.S. Export Control Laws Compliance:

Export and re-export of laser measuring instruments manufactured by Pratt & Whitney are subject to U.S. Export Administration Regulations, which are administered by the Commerce Department. The applicable restrictions vary depending on the specific product involved and its destination. In some cases, U.S. law requires the U.S. Government approval be obtained prior to resale, export or re-export. Clarification can be obtained by contacting Pratt & Whitney or an appropriate U.S. Government agency.