

CATALOG | MULTIMAR ID/OD COMPARATORS



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Mahr

EXACTLY

I.D./O.D. Gages 36B

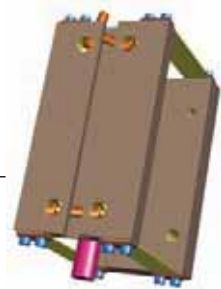
36B Bench Comparator will inspect either inside or outside diameters for production or final inspection, conveniently and quickly.



The contact points are retracted while the workpiece is placed in position by using either of the levers on the front of the gage. This eliminates the possibility of marring fine work surfaces.

The gage has great sensitivity and accuracy because the movement of the sensitive contact is transferred directly and without lost motion through a non-friction pantograph to the readout.

The pressure applied by these contacts on the workpiece can be adjusted to suit requirements so that thinned walled pieces will not be distorted. The upper thumbscrew adjusts this pressure. The workpiece rests on the top face of the jaw contact until the actual measuring contacts touch the work at three single points. These three points establish a plane for maximum stability and help to eliminate unintended part movement. The location of these points of contact, with relation to the face of the workpiece, can be altered to suit special requirements.

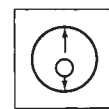


The 36B is provided with either of two types of gaging contact arrangements. These are referred to as the "T"- Plate and the "V"- Plate arrangement. By reversing the plate the gage is easily changed from OD to ID measurement.

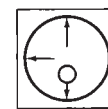
The "T"- Plate arrangement inspects diameters directly. Because of this it is recommended for most inside and outside diameter inspection requirements. To inspect I. D.'s smaller than 5/16" diameter, two contacts only are used as illustrated. The workpiece is "rocked" slightly and the contacts obtain the maximum reading. On holes larger than 5/16" diameter, a third contact is used as a side stop to locate the hole diametrically across the center. See schematic illustrations to the right. For outside diameters, the "T"- Plate and the position of the sensitive and reference contacts are reversed. The contact height can be set by means of gage blocks or micrometers.

The "V"- Plate arrangement can be furnished for certain requirements when tri-lobing or odd number of lobe conditions which may be inherent in certain manufacturing processes. With this arrangement, three contacts are used, two locating and a sensitive contact. With the "V"- Plate the diameter is not measured directly. Instead, the distance between the chord which joins the two locating contacts, and the sensitive contact is measured. Since the amount of variation shown on the dial is the distance between the chord and the sensitive contact, which is not the actual diameter, a special compensated readout is used for this condition. This enables actual or true variations in diameter to be read, provided all three contacts have been properly spaced halfway from the center.

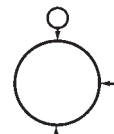
"T" Plates



without
sidestop



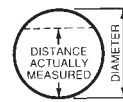
with
sidestop



external

"T"- Plates give a diameter reading directly across the diameter. A third contact may be used as a side-stop or centralizer.

"V" Plates



measures
diameter
indirectly



internal



external

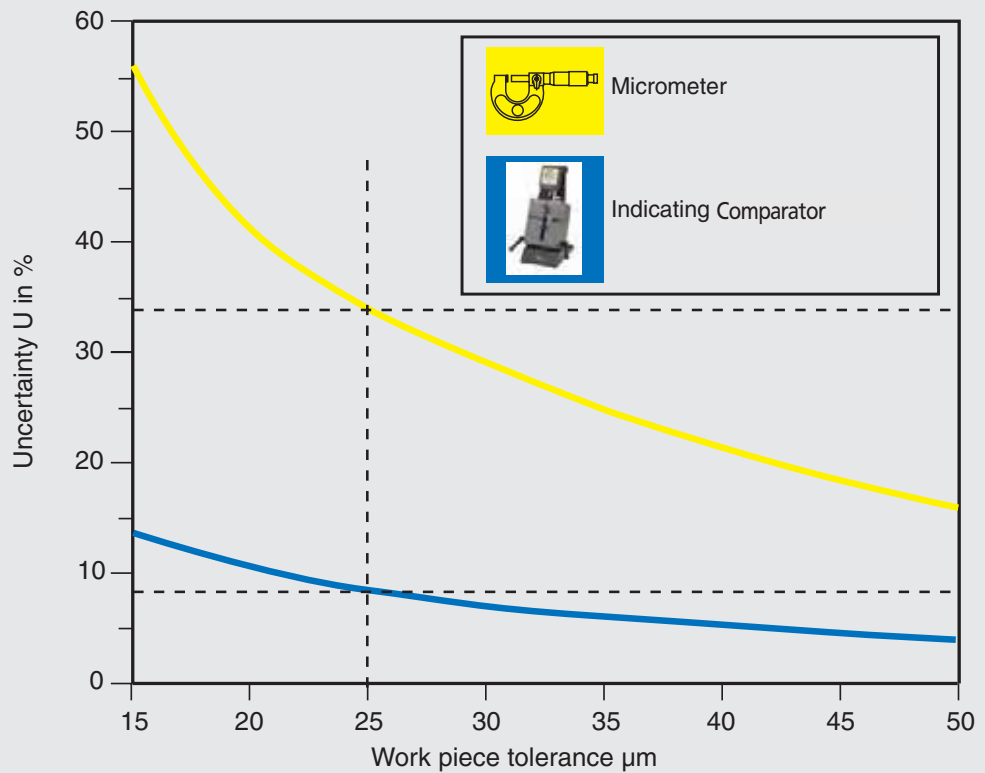
"V"- Plates are self centralizing. Three jaws are used and the measurement is of the distance between the sensitive contact and the chord formed by the two reference contacts. This measurement bears a direct relationship to the diameter and compensation is made by a special ratio indicator so diameter is read directly.

Used to inspect parts with odd number lobing conditions.

Advantages of a Bench ID/OD Comparator

- **Reduced Measuring Uncertainty**

Comparators have notably reduced measuring uncertainty in comparison to a micrometer.



Measuring Uncertainty U is dependent upon the tolerance of the work piece

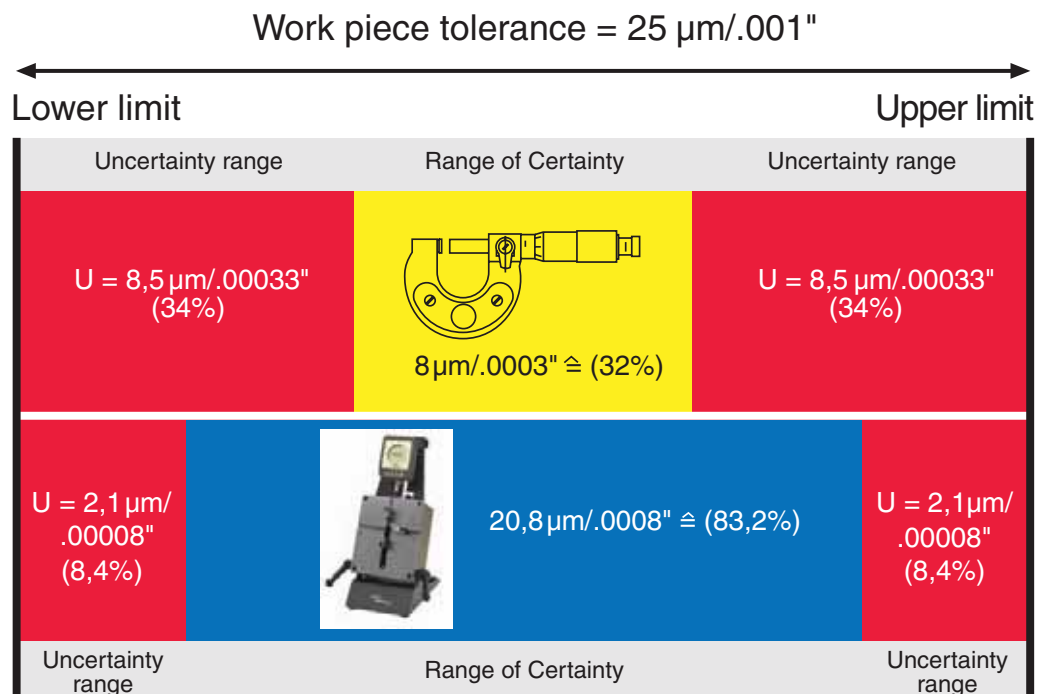
- **Reduced Measuring Uncertainty**

Example:

Workpiece tolerance 25 μm/.001"

The measured value in the uncertainty range can lie outside of the tolerance range, therefore the utilized tolerance of the micrometer is reduced to only 32% (8 μm)/.0003".

With a comparator 83% (20,8 μm/.0008") of the workpiece tolerance can be utilized.



I.D./O.D. Gages 36B

The economical way to check outside diameters on the shop floor.

Features

- Adjustable retraction of sensitive contact allows measurement of grooves and races. Retraction normally set at 6mm / 0.25", is adjustable to 10mm / 0.40".
- Frictionless reed-spring (pantograph) motion transfer for repeatability.
- Gaging pressure is adjustable from 0 - 35N / 0 - 8lb.
- Two styles available. 2-point "T"-Plate or 3 point "V"-Plate
- Two sizes available.
- Adjustable base: Gage can be positioned on any angle from horizontal to vertical.
- Variety of readout devices available.
- Reverse the top-plate to change from I.D. to O.D. measurement
- Supplied with JW-9 Jaws

EMD-36B-10



Technical Data

Style	Capacity		Order no. With 0.0001" Dial Indicator	Order no. With 0.002mm Dial Indicator	Order no.* With Max μ m [®] III	Order no.* With Max μ m [®] III & Output	Order no.* With μ Max μ m & Output	Order no. w/o Indicator metric 8mm mounting shaft
	I.D.	O.D.						
"T" Plate	.75" - 5.5" 19 - 140mm	.25" - 5" 6 - 127mm	36B-10	36B-10M	EMD-36B-10	EMD-36B-10D	EDI-36B-10	2003200**
"T" Plate	.75" - 7.75" 19 - 197mm	.25" - 8.75" 6 - 222mm	36B-20	36B-20M	EMD-36B-20	EMD-36B-20D	EDI-36B-20	2003201**
"V" Plate	.812" - 5" 21 - 127mm	.312" - 4.625" 8 - 117mm	36B-9	36B-9M		EMD-36B-9D	EDI-36B-9	
"V" Plate	.812" - 5" 21 - 229mm	.312" - 9.5" 8 - 241mm	36B-19	36B-19M		EMD-36B-19D	EDI-36B-19	

* Selectable Resolution



Indicating Instruments **

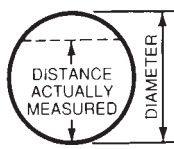
All indicating instruments that has an 8mm mounting shank may be used. Recommended are:

Indicating Instruments	Readings	Order no.
Millitast 1083	1 μ m	4336800
Millitast 1085	1 μ m	4336301
μ Max μ m	1 μ m	EDI-20302

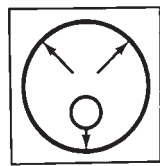
Max μ m[®] III Indicator for "V"- Plate Models

Digital Range	Stem Length	Order no.
$\pm 1\text{mm} / \pm 0.040''$ or $\pm 0.199\text{mm} / \pm 0.020''$	17mm / .670''	2033145*

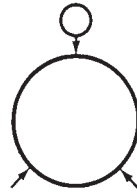
* Max μ m[®] III 4:5 ratio model includes Data Output (6 pin) and user selectable setup for range, resolution, units and measuring direction



measures diameter indirectly



internal



external

EMD-36B-19D
I.D./O.D. Gage



Jaw Sets

Model Numbers on the preceding page include a set of Model JW-9 Jaws. Model JW-58 Jaws (tungsten carbide).



Order no. (3 jaw set)	Adjustment Height	Material: Contact and Rest Surface	Replacement Contact Pins (3 required)
JW-9	0.79-19mm/.031-.75''	Steel	PS-55
JW-58	0.79-18mm/.031-.72''	Tungsten Carbide	PS-226
2220461*	0.79 - 18mm		2225694

* Normally furnished with Metric Version

For special jaw configurations or for other indicators, contact Mahr Federal Customer Resources Center.

Special Contacts: Steel

Special steel ball contacts can be made in a variety of different diameters for your measurement applications.



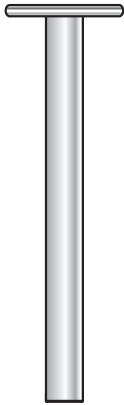
Special Contacts: Tungsten Carbide

Side mounted Tungsten Carbide spherical contacts can be made for measuring internal and external gears and splines.



Special Contacts: Doughnut

Specially designed Doughnut shaped contacts are used, as an example, in the bearing industry calling out for wider than normal contacts to reach into bearing raceways.



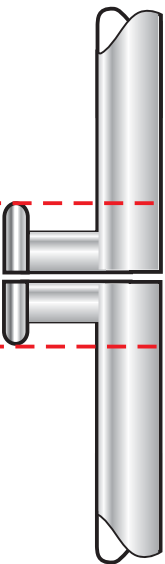
Special Contacts: TC Ball

Spherical diameter tips are ideal for measuring inside or outside radial formed recesses of precision parts.

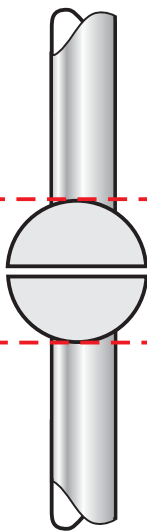


Special Contacts: Pie Plate

Special jaws shaped like large half-discs, are used by the plastic industry to accurately measure semi-flexible round cups where reduced deflection is important.



Side View



Front View

JW-9 w/TC Wear Pads

Specially designed jaws supplied with Tungsten Carbide wear surfaces provide extra long jaw life.

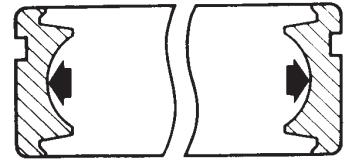


36B ID/OD Comparator for Bearings



machining or ball track honing and can be equipped with air or electronic gaging equipment for higher magnifications.

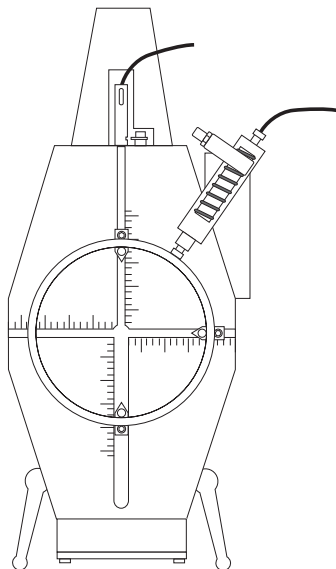
The Model 36 is an ideal gage for bearing measurement because of its performance on the shop floor. Model 36B per W-11546 is a design comparator for checking ball track diameters of inner rings after grinding. The gaging contacts are nominal size balls which "knockout" for easy replacement when worn. The gage is vertically oriented so that the contacts seat positively on the bottom of the ball track during gaging. A pair of operating levers provides long range retraction of the sensitive contact for easy insertion and removal of work. This gage is also ideal for use at screw



Special Long Range Version Gages

Specially Designed ID/OD bench gages can be manufactured with special jaws and longer retractions up to 1.250" for all your measurement needs.

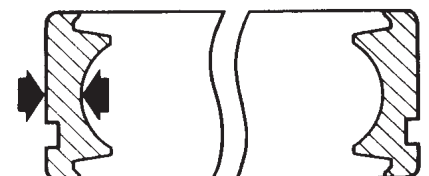
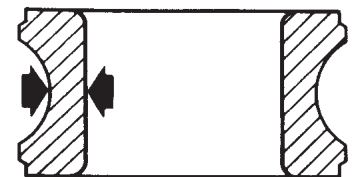
36B with additional probes for Wall thickness or concentricity.



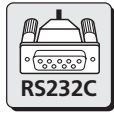
The 36B gages can be easily modified to add probes to provide additional information such as run-out, wall thickness or concentricity. The location of the additional probe will make the determination of what specific check is being performed.

When the probe is in-line with the sensitive contact of the 36B then wall thickness can be read differentially. When placed offset from the contact concentricity or run-out can be monitored.

This setup is ideal for use with column gages or bench amplifiers to display high resolution readings for the operator.



Digital Universal Caliper 25 ES Varimeter



Applications

For measuring:

- Outside and inside dimensions
- Centering shoulders
- Narrow collars

- External and internal tapers
- Dovetails
- Grooves
- Distances between hole centers
- For scribing of work pieces

Illustration is shown with accessories, these are sold separately

Features

Functions:

ON/OFF
RESET (zero setting) mm/inch
HOLD (storage of measuring values)

DATA (Data transmission)

PRESET (for entering a numerical value)

TOL (Tolerance display)

- Capacitive measuring system, life of the battery approx. 2 years
- Max Measuring speed: 1,5m/s (60"/s)
- Data output: Opto RS232C via data connection cable
- High contrast 6mm Liquid Crystal Display

- Interchangeable measuring arms
- Due to the patented mounting fixture of the measuring arms and or measuring attachments provided on both the upper and lower longitudinal face of the arm holders, the digital display is always in the operators line of vision
- The application range can be easily extended by re-

- reversing the measuring arms
- Both measuring arms can be moved along the beam, thus having a well balanced weight distribution even with small dimensions
- Slide and beam are made of hardened stainless steel
- Supplied with battery

Technical Data

Measuring Range*		Resolution	Error Limit (DIN 862)	Weight	Order no.	Order no. wooden case		
outside mm (inch)	inside mm (inch)						mm/inch	g/lbs+
(0 - 12)	0 - 300	(1 - 13)	25 - 35	.0005"/0,01	.0015/ 0,03	770/1.7	4118700	4118750
(0 - 12)	0 - 300	(1 - 13)	25 - 35	.0005"/0,01	.0015/ 0,03	750/1.6	4118701**	4118750
(0 - 24)	0 - 600	(1 - 25)	25 - 625	.0005"/0,01	.0015/ 0,03	1050/2.3	4118702	4118751
(0 - 40)	0 - 1000	(1 - 41)	25 - 1025	.0005"/0,01	.0020/ 0,03	1470/3.2	4118703	4118752

* Dependent upon which accessories are being used, the measuring range can be extended by a further 75mm (2.95") by reversing the measuring arms 844 Te/Tx

** Without fine adjustment

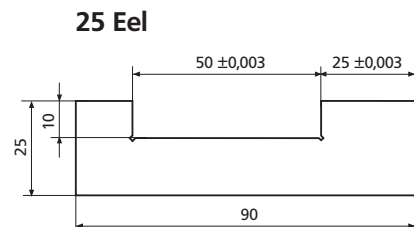
Accessories

Setting Gauge, hardened steel, screwed into wooden case

Battery 3V, type CR 2032

Data Connection Cable RS232C (2m), SUB-Djack 9-pin

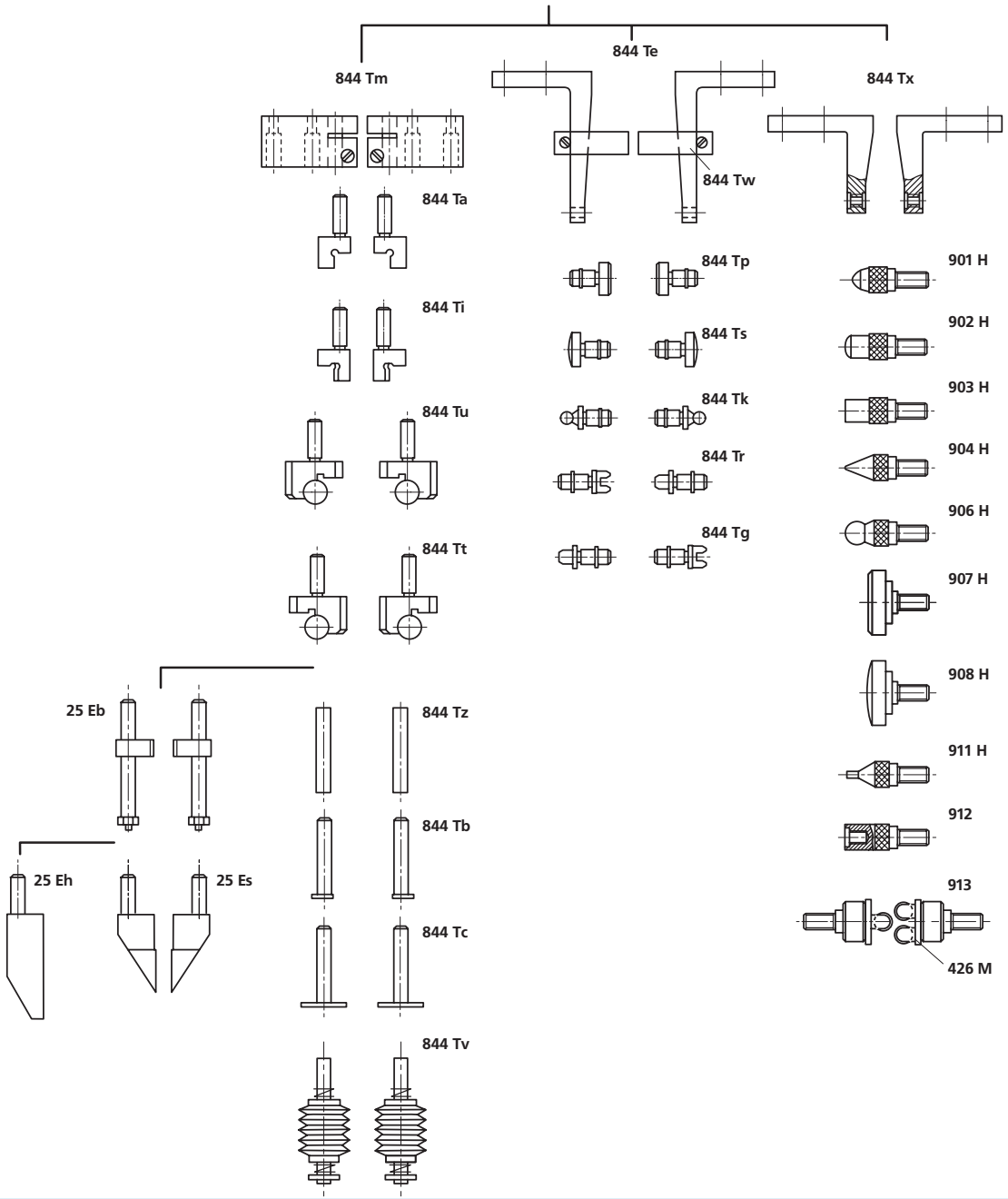
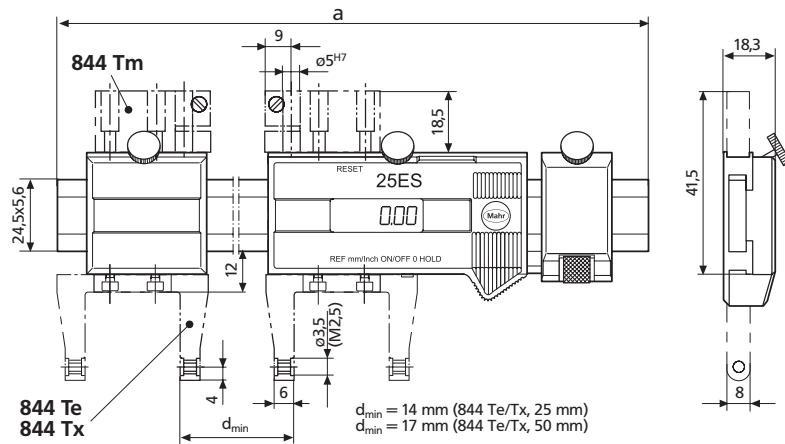
	Order no.
25 Eel	4118520
16 ESv	4102520
16 ESv	4102510



Digital Universal Caliper 25 ES Varimeter Measuring arms, Mounting attachment and anvils

Dimensions

Application ranges		a
inch/mm		inch/mm
0 - 12"/ 0 - 300		18.5"/ 475
0 - 24"/ 0 - 600		30.5"/ 775
0 - 40"/ 0 - 1000		46.2"/ 1175



Universal Measuring Instrument 844 T Multimar for external and internal dimensions

Applications

For Measuring:

- External and internal dimensions
- External and internal threads
- Centering shoulders
- Narrow collars, recesses and grooves
- External and internal tapers



- External and internal serrations, and much more

Features

- Rugged, ground and hard chrome plated column
- Movable arm holder is mounted in precision ball guide to eliminate play and friction.
- The stationary arm holder can be moved for course adjustment along the column.
- High measuring sensitivity and accuracy due to stability provided by movable arm holder
- Constant measuring force due to the built-in spring
- The direction of the measuring force can be changed for either internal or external measurements
- The reversible measuring arms can be used to extend the range of application

Technical Data

Application Range*		Extended application range		Distance of removable anvil	Order no.**	Order no. wooden case
mm	(inch)	mm	inch	mm/inch		
25 - 110	(1 - 4.33")	25 - 185	(1 - 7.28")	10/.4"	4500001	4500010
100 - 260	(4 - 10.24")	100 - 335	(4 - 13.18")	10/.4"	4500002	4500011
250 - 610	(10 - 24.02")	250 - 685	(10 - 26.96")	10/.4"	4500003	4500012
600 - 1010	(24 - 39.75")	600 - 1085	(24 - 42.71")	10/.4"	4500004	4500013

* These application ranges only apply to internal measurements. For external measurements the range of application is reduced by 25mm (1"). The extension of the application range takes place when the measuring elements are rotated through 180°.

All application ranges depend upon which anvil is being used.

** Excludes indicating instrument

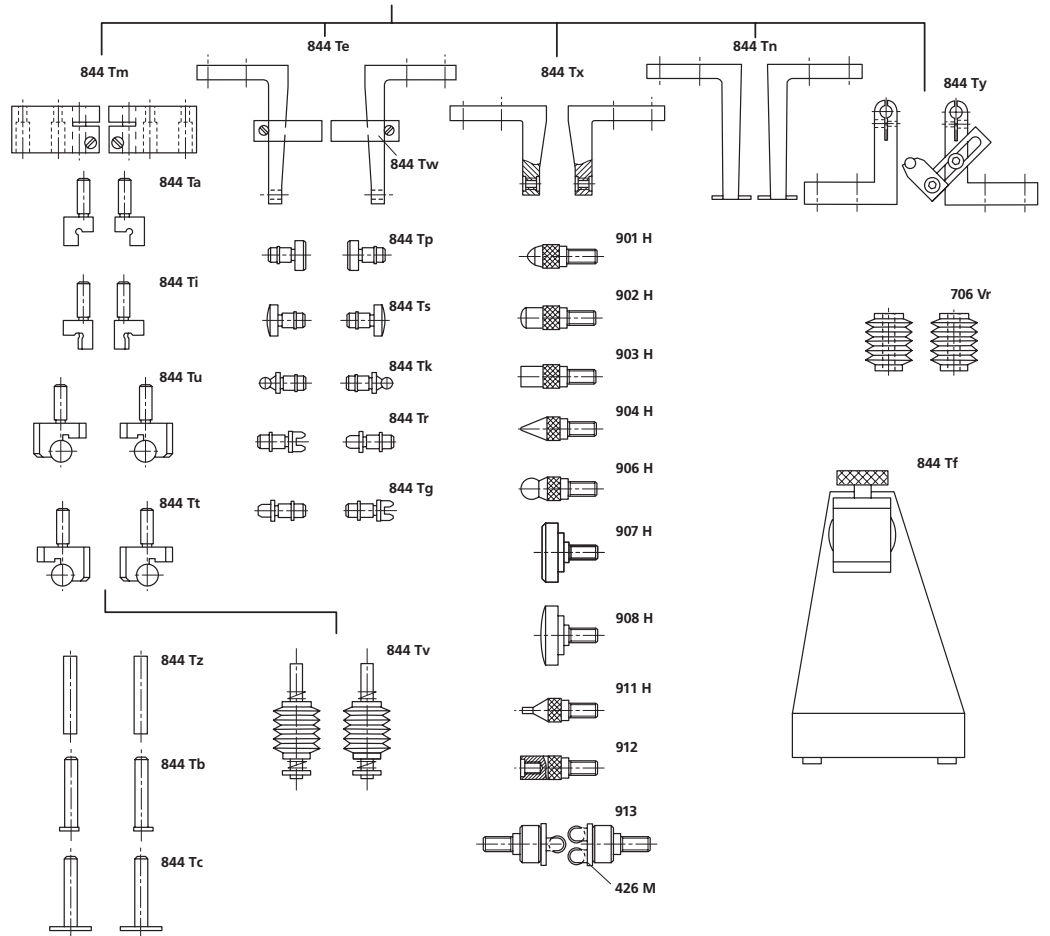
Indicating Instruments

All indicating instruments that have an 8mm mounting shank may be used
Recommended are:

Indicating instrument	Readings		Order no.
	mm/inch	mm/inch	
Dial indicator 810 S	0,01mm/		4311210
Zentiness 1010 / 1010 Z	0,01mm/	.0005"	4332000/4332900
Compramess 1004 / 1004 Z	5µm/	.0001"	4333000/4333900
Digital Indicator "Millitast" 1083	1µm/	.00005"*	4336800
Digital Indicator "Millitast" 1085	1µm/	.00005"*	4336301
µMaxµm XL (XLI-30000)	1µm/	.00005"*	XLI-30000

* Resolution

Digital Indicators see chapter 5 of the Dimensional Metrology catalog



• Our yardstick is our success. As one of the world's largest and most innovative manufacturers of measuring equipment, we make it our task to ensure that your results are accurate.

Our Catalog - Dimensional Metrology is available upon request!



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