

## Miscellaneous

### Move to other products

- 1 SPC
  - 2 Caliper
  - 3 Depth gage
  - 4 Height gage
  - 5 Micrometer
  - 6 Inside micrometer
  - 7 Micrometer head
  - 8 Indicator
  - 9 Test indicator
  - 10 Gage head
  - 11 Gauge Block
  - 12 Reference gage
  - 13 Surface plate
- Miscellaneous
- 15 Linear scale
  - 16 Digimatic scale unit
  - 17 Profile projector
  - 18 Microscope
  - 19 Contracer
  - 20 Surftest
  - 21 Formtracer
  - 22 Roundtest
  - 23 Hardness tester
  - 24 CMM
  - 25 Flexible measuring gage
  - 26 Vision measuring system
  - 27 Detailed shape measuring system
  - 28 Laser scan micrometer
  - 29 DIY tools

## List of products

Square Master  
SERIES 311



Precision Squares  
SERIES 916



Precision Dial Square  
SERIES 7



Spring Dividers  
SERIES 950



CERA Straight Master  
SERIES 311



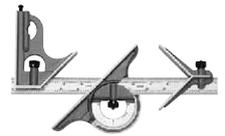
Bench Comparator  
SERIES 162



Bench Centers  
SERIES 967



Combination Square Sets  
SERIES 180



Digimatic Universal Protractor  
SERIES 187



Universal Bevel Protractor  
SERIES 187



Bevel Protractor  
SERIES 187



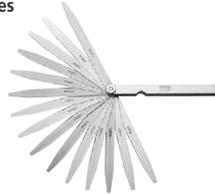
Precision Levels  
SERIES 960



Steel Rules  
SERIES 182



Thickness Gages  
SERIES 184



Radius Gages  
SERIES 186



Pitch Gages  
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Clear Loupe  
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Litematic  
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Litematic Head  
SERIES 318



Neo-Derm  
SERIES 179



Digi-Derm  
SERIES 179



# Square Master

## SERIES 311 — Squareness/Straightness Measuring Instrument

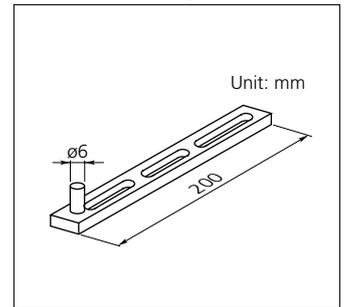


311-245

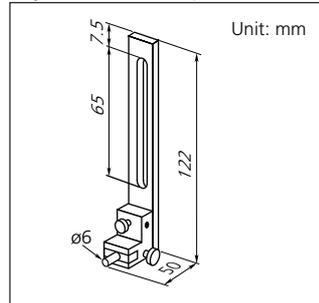
Riser block (optional)



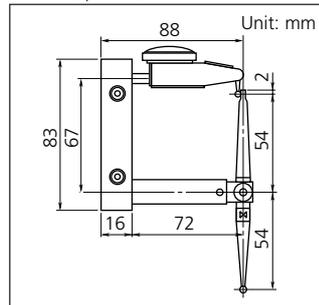
Extension holder (optional)



Adjustable holder (optional)



Feeler (optional)



MISCELLANEOUS

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1234

### FEATURES

- Squareness (perpendicularity) and straightness measurements can be performed accurately and efficiently by moving a lever. (Parallelism between surfaces can be determined from straightness measurements.)
- With a dial test indicator for reading displacements.
- Its own squareness is adjustable.

### SPECIFICATIONS

#### Metric

Vertical travel	Order No.	Squareness	Straightness	Dial test indicator (provided)	Graduation	Range	Dial reading	Accuracy	Mass
150mm	311-215	3μm	2μm	0.002mm	0.2mm	0-100-0	3μm	13.7kg	
250mm	311-225	6μm	2.5μm	0.002mm	0.2mm	0-100-0	3μm	16.2kg	
450mm	311-245	9μm	3.5μm	0.002mm	0.2mm	0-100-0	3μm	24kg	

#### Inch

Vertical travel	Order No.	Squareness	Straightness	Dial test indicator (provided)	Graduation	Range	Dial reading	Accuracy	Mass
6"	311-216	.00012"	.00008"	.0001"	.008"	0-4-0	±.0001"	30.14 lbs.	
10"	311-226	.00024"	.0001"	.0001"	.008"	0-4-0	±.0001"	35.64 lbs.	
18"	311-246	.00036"	.00014"	.0001"	.008"	0-4-0	±.0001"	52.8 lbs.	

### OPTIONAL ACCESSORIES

Order No.	Description
(See page 293.)	Riser blocks*
517-665	Granite square, 45 (W)x140 (D)x280 (H)mm
900571	Adjustable holder
900551	Extension holder
900565	Feeler**

\*Not available for 450mm (18") model.

\*\*Adapter (902803) is required for metric model.

# Precision Squares

## SERIES 916



### FEATURES

- Regular type and beveled-edge type squares are available.
- All edges are hardened and precision ground.

### SPECIFICATIONS

#### Squares (Beveled-edge Type)

Dimensions (HxW)	Order No.	Squareness Outside	Squareness Inside
50x40mm	916-100	2.5µm	6µm
75x50mm	916-101	3µm	6.5µm
100x70mm	916-102	3µm	7µm
150x100mm	916-103	3.5µm	8µm
200x130mm	916-104	4µm	9µm

### Squares

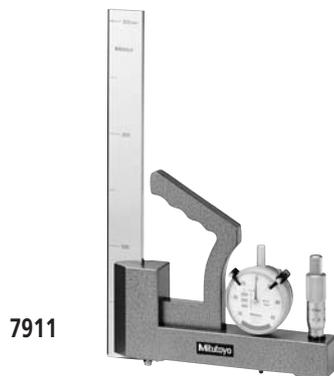
Dimensions (HxW)	Order No.	Squareness Outside	Squareness Inside
50x40mm	916-211	6µm	12.5µm
75x50mm	916-212	6.5µm	14µm
100x70mm	916-213	7µm	15µm
150x100mm	916-214	8µm	17.5µm
200x130mm	916-215	9µm	20µm
250x165mm	916-216	10µm	22.5µm
300x200mm	916-217	11µm	25µm
400x250mm	916-218	13µm	30µm

### Squares with Stand

Dimensions (HxW)	Order No.	Squareness Outside	Squareness Inside
75x50mm	916-401	6.5µm	14µm
100x70mm	916-402	7µm	15µm
150x100mm	916-403	8µm	17.5µm
200x130mm	916-404	9µm	20µm
250x165mm	916-405	10µm	22.5µm
300x200mm	916-406	11µm	25µm
400x250mm	916-407	13µm	30µm
500x300mm	—	15µm	35µm
750x400mm	—	20µm	47.5µm
1000x500mm	—	25µm	60µm

# Precision Dial Square

## SERIES 7



### FEATURES

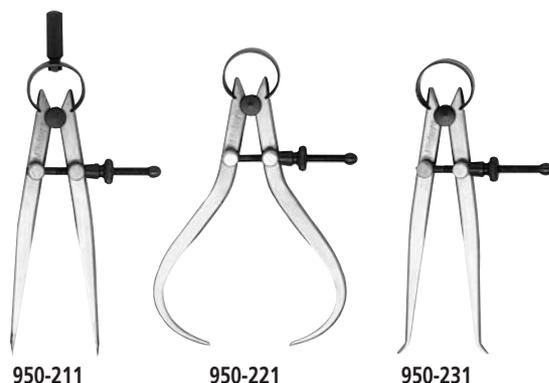
- Regular type and beveled-edge type blades are interchangeable.
- Squareness is indicated numerically on the dial.

### SPECIFICATIONS

Size	Order No.	Graduation	Range	Squareness
300mm	7911	0.005mm	±0.17mm	±2.5µm/300mm
600mm	7912	0.025mm	±0.24mm	±5µm/600mm

# Spring Dividers, Outside Spring Calipers, Inside Spring Calipers

## SERIES 950



### FEATURES

- Spring Divider — Fully hardened and tempered joints, spring, washers and divider points.
- Outside Spring Caliper — Contact ends fully rounded to give accurate dimensions.
- Inside Spring Caliper — Ends fully rounded to give accurate contact with a workpiece.

### SPECIFICATIONS

Range	Order No. Spring divider	Order No. Outside spring calipers	Order No. Inside spring calipers
4" (100mm)	950-211	950-221	950-231
6" (150mm)	950-212	950-222	950-232
8" (200mm)	950-213	950-223	950-233

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# CERA Straight Master

## SERIES 311 — Straightness Measuring Instrument



CERA Straight master is a master gage used for the straightness inspection of each axis movement such as a CMM, machine tool, semiconductor related equipment and form measuring machine. An alminaceramic material is adopted to achieve the significant weight reduction compared with the conventional masters made from a stone or iron. Double faced type is laping the double face which can be used for straightness in horizontal and vertical as a reference square.

### FEATURES

- Alminaceramic made
- 50mm/100" pitch gradation scales
- Precision lapped measuring surface
- Little secular change
- Lightweight



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### Metric High accuracy type

Nominal length	Order No.	Section form	Straightness	Mass
400mm	<b>311-332</b>	35mm x 50mm	0.2μm	3.96 lbs.
700mm	<b>311-335</b>	35mm x 50mm	0.4μm	6.6 lbs.
1000mm	<b>311-337</b>	45mm x 80mm	0.5μm	17.6 lbs.
1300mm	<b>311-339</b>	45mm x 80mm	0.7μm	22 lbs.

### Inch High accuracy type

Nominal length	Order No.	Section form	Straightness	Mass
16"	<b>311-342</b>	1.38" x 1.97"	8μin	3.96 lbs.
28"	<b>311-345</b>	1.38" x 1.97"	16μin	6.6 lbs.
40"	<b>311-347</b>	1.78" x 3.15"	20μin	17.6 lbs.
50"	<b>311-349</b>	1.78" x 3.15"	28μin	22 lbs.

### SPECIFICATIONS

#### Metric Standard type

Nominal length	Order No.	Section form	Straightness	Mass
400mm	<b>311-302</b>	35mm x 50mm	0.3μm	3.96 lbs.
700mm	<b>311-305</b>	35mm x 50mm	0.5μm	6.6 lbs.
1000mm	<b>311-307</b>	45mm x 80mm	1μm	17.6 lbs.
1300mm	<b>311-309</b>	45mm x 80mm	1.5μm	22 lbs.

#### Inch Standard type

Nominal length	Order No.	Section form	Straightness	Mass
16"	<b>311-322</b>	1.38" x 1.97"	12μin	3.96 lbs.
28"	<b>311-325</b>	1.38" x 1.97"	20μin	6.6 lbs.
40"	<b>311-327</b>	1.78" x 3.15"	40μin	17.6 lbs.
50"	<b>311-329</b>	1.78" x 3.15"	60μin	22 lbs.

#### Metric Double faced type

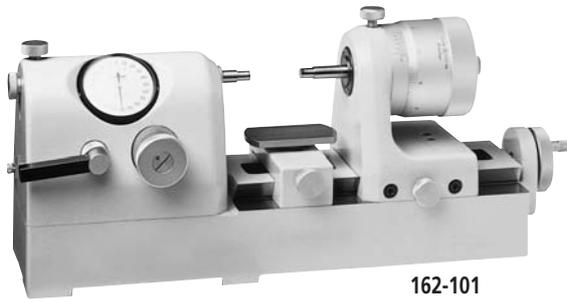
Nominal length	Order No.	Section form	Straightness	Mass
400mm	<b>311-352</b>	45mm x 80mm	0.3μm	7.7 lbs.
700mm	<b>311-355</b>	45mm x 80mm	0.5μm	12.1 lbs.
1000mm	<b>311-357</b>	45mm x 80mm	1μm	17.6 lbs.
1300mm	<b>311-359</b>	45mm x 80mm	1.5μm	22 lbs.

#### Inch Double faced type

Nominal length	Order No.	Section form	Straightness	Mass
16"	<b>311-362</b>	1.78" x 3.15"	8μin	3.96 lbs.
28"	<b>311-365</b>	1.78" x 3.15"	16μin	6.6 lbs.
40"	<b>311-367</b>	1.78" x 3.15"	20μin	17.6 lbs.
50"	<b>311-369</b>	1.78" x 3.15"	28μin	22 lbs.

# Bench Comparator

## SERIES 162



162-101

### SPECIFICATIONS

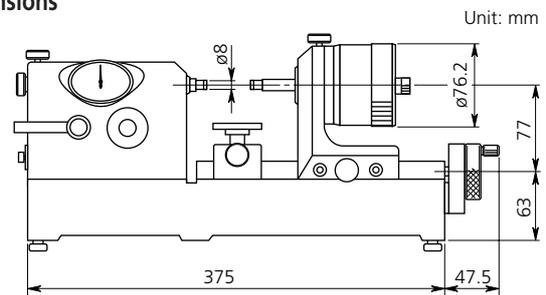
Metric				
Maximum workpiece height	Order No.	Dial Indicator Range	Dial Indicator Graduation	Mass
100mm	162-101	±0.1mm	0.001mm	15kg

Inch				
Maximum workpiece height	Order No.	Dial Indicator Range	Dial Indicator Graduation	Mass
4"	162-102	±.005"	.0001"	33 lbs.

### FEATURES

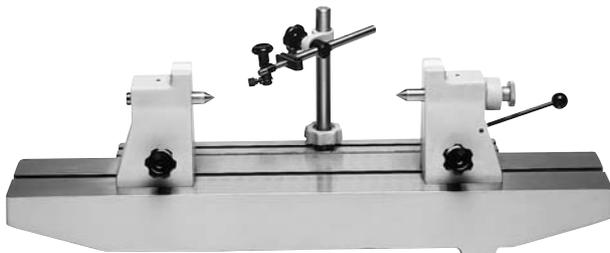
- 25mm/1" stroke micrometer head (Graduation: 0.001mm/.0001") is provided.
- Retractable anvil with dial indicator for high accuracy inspection of mass-produced parts.
- Anvil pressure is variable.
- Adjustable workpiece stage height.
- Dial Indicator is shockproof.
- ø8mm (or 3/8") probe of Mitutoyo Mu-Checker can be attached for higher precision measurement if required.

### Dimensions



# Bench Centers

## SERIES 967



967-201

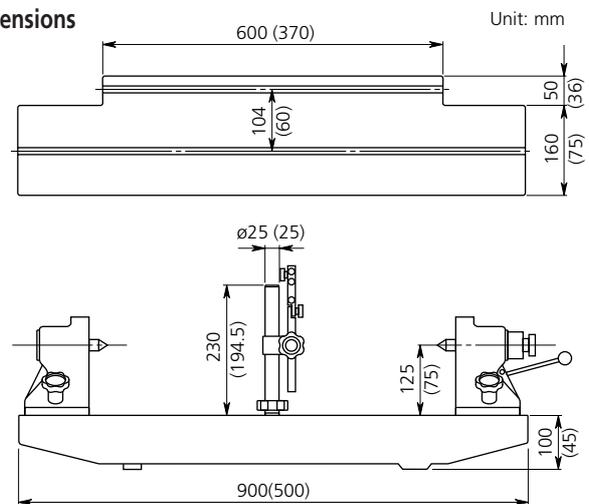
### FEATURES

- Used with a dial test indicator (optional), the Bench Center provides precision measurement of concentricity verification on cylindrical workpieces.
- With an indicator clamp. (Holding stem diameter: 8mm)

### SPECIFICATIONS

Maximum workpiece height	Order No.	Maximum workpiece dia.	Mass
300mm	967-201	150mm	13kg

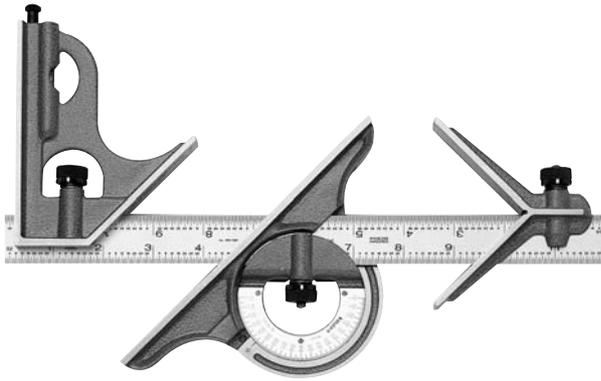
### Dimensions



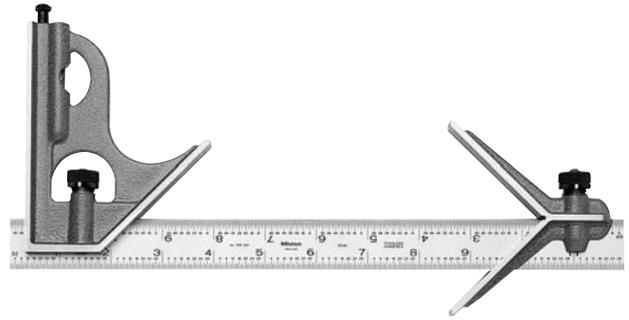
967-201

# Combination Square Sets

## SERIES 180



180-905 (Complete set)



180-903 (Semi-complete set)

### FEATURES

- Three measuring heads are attached to the stainless steel rule (blade), allowing versatile measurements on various types of workpieces.  
 Square head — Used to set the rule at 90 degrees or 45 degrees to an edge of a workpiece.  
 Center head — Used to locate centers of round workpieces.  
 Protractor head — Used to set the rule at a desired angle to an edge of a workpiece. Also used for measuring angles.
- The measuring heads are hardened.
- Economy sets not including a protractor head are also available.

### Blades (Individual)

Range	Order No.	Graduation
150mm	<b>180-405</b>	1mm, 0.5mm, 1mm, 0.5mm
300mm	<b>180-505</b>	1mm, 0.5mm, 1mm, 0.5mm
450mm	<b>180-705</b>	1mm, 0.5mm, 1mm, 0.5mm
600mm	<b>180-605</b>	1mm, 0.5mm, 1mm, 0.5mm
6"/150mm	<b>180-403</b>	1/32", 1/64", 1mm, 0.5mm
12"/300mm	<b>180-503</b>	1/32", 1/64", 1mm, 0.5mm
18"/450mm	<b>180-703</b>	1/32", 1/64", 1mm, 0.5mm
24"/600mm	<b>180-603</b>	1/32", 1/64", 1mm, 0.5mm
6"	<b>180-401</b>	1/8", 1/16", 1/32", 1/64"
6"	<b>180-402</b>	1/32", 1/50", 1/64", 1/100"
12"	<b>180-501</b>	1/8", 1/16", 1/32", 1/64"
12"	<b>180-502</b>	1/32", 1/50", 1/64", 1/100"
18"	<b>180-701</b>	1/8", 1/16", 1/32", 1/64"
18"	<b>180-702</b>	1/32", 1/50", 1/64", 1/100"
24"	<b>180-601</b>	1/8", 1/16", 1/32", 1/64"
24"	<b>180-602</b>	1/32", 1/50", 1/64", 1/100"

### Measuring Heads (Individual)

Order No.	Description	Remarks
<b>180-101</b>	Square head	For 150mm (6") blades
<b>180-102</b>	Square head	For 300mm (12"), 450mm (18"), 600mm (24") blades
<b>180-201</b>	Center head	For 150mm (6") blades
<b>180-202</b>	Center head	For 300mm (12"), 450mm (18"), 600mm (24") blades
<b>180-301</b>	Protractor head	For 300mm (12"), 450mm (18"), 600mm (24") blades

### SPECIFICATIONS

Metric Combination Square Sets			
Size	Order No. Complete	Order No. Semi-complete	Remarks
150mm	—	<b>180-919</b>	With blade ( <b>180-405</b> )
300mm	<b>180-910</b>	<b>180-920</b>	With blade ( <b>180-505</b> )

Inch/Metric Combination Square Sets			
Size	Order No. Complete	Order No. Semi-complete	Remarks
6"/150mm	—	<b>180-915</b>	With blade ( <b>180-403</b> )
12"/300mm	<b>180-907</b>	<b>180-909</b>	With blade ( <b>180-503</b> )

Inch Combination Square Sets			
Size	Order No. Complete	Order No. Semi-complete	Remarks
6"	—	<b>180-901</b>	With blade ( <b>180-401</b> )
6"	—	<b>180-902</b>	With blade ( <b>180-402</b> )
12"	<b>180-905</b>	<b>180-903</b>	With blade ( <b>180-501</b> )
12"	<b>180-906</b>	<b>180-904</b>	With blade ( <b>180-502</b> )

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# Digimatic Universal Protractor

SERIES 187



## FEATURES

- Data output function make it easy to see the statistical data.
- Setting preset value.
- Removable blade.
- Can be attached to height gages.

## SPECIFICATIONS

Order No.	187-501	187-502	187-551	187-552
Blade length	150mm	300mm	6"	12"
Measuring range	-360° to +360°			
Resolution	1' (0.01°)			
Tolerance	±2" (±0.03°)			
Repeatability	1'			
IP	40			
Response speed	3rps			
Battery	Lithium battery			
Battery life	2,000 hours			
Thermal	0°C to 40°C			
Function	Zero setting, Switchable direction, Data output, Data hold, presetting, sexagesimal/decimal notation			
Mass	624g	662g	621g	659g
Standard accessories	Battery, mm height gage holder (950750)		Battery, inch height gage holder (950749)	

# Universal Bevel Protractor

SERIES 187



## FEATURES

- High-precision angle gage for accurate angle measurement of machines, molds, and jigs.
- Can be attached to height gages.

## SPECIFICATIONS

Metric			
Blade length	Order No.	Graduation	Remarks
150, 300mm	187-901	5 min. (0° - 90° - 0°)	w/60°, 45°, 30° edges
150mm	187-907	5 min. (0° - 90° - 0°)	w/60°, 45° edges
300mm	187-908	5 min. (0° - 90° - 0°)	w/60°, 45° edges

Inch			
Blade length	Order No.	Graduation	Remarks
6", 12"	187-902	5 min. (0° - 90° - 0°)	w/60°, 45°, 30° edges
6"	187-904	5 min. (0° - 90° - 0°)	w/60°, 45° edges
12"	187-906	5 min. (0° - 90° - 0°)	w/60°, 45° edges

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# Bevel Protractor

SERIES 187



## FEATURES

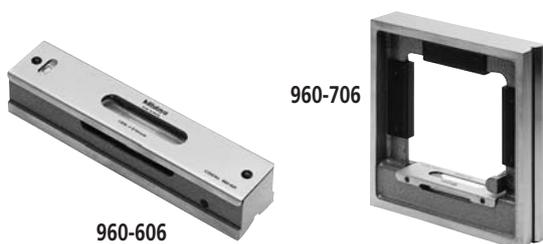
- Consists of three sheets of stainless steel, the middle one of which is made for angle measurements.

## SPECIFICATIONS

Blade length	Order No.	Graduation	Remarks
135mm	187-201	5 min. (0° - 90° - 0°)	w/60°, 30° edges

# Precision Levels

SERIES 960



## FEATURES

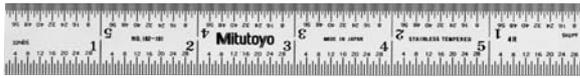
- High precision longitudinal and transverse vials make it possible to check or level surfaces.

## SPECIFICATIONS

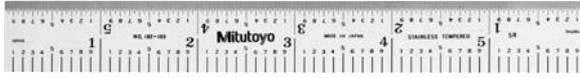
Order No.	Sensitivity	Accuracy of graduations	Dimensions (WxDxH)
960-606	0.02mm/m	±0.7	200x44x38.2mm
960-706	0.02mm/m	±0.3	200x44x200mm

# Steel Rules

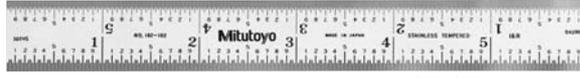
## SERIES 182



182-101



182-103



182-102



182-105



182-201



182-202



182-205

### FEATURES

- Clear graduations on satin-chrome finish.
- Stainless tempered.

### SPECIFICATIONS

#### Metric Wide Rigid Rules

Graduations	Range	Order No.	Width
1mm, 0.5mm (on both faces)	150mm	182-111	19mm
	300mm	182-131	25mm
	450mm	182-151	30mm
	600mm	182-171	30mm

#### Inch/Metric Wide Rigid Rules

Graduations	Range	Order No.	Width
1/32", 1/64", 1mm, 0.5mm	6"/150mm	182-105	.75"
	12"/300mm	182-125	.98"
	18"/450mm	182-145	1.18"
	24"/600mm	182-165	1.18"
1/50", 1/100", 1mm, 0.5mm	6"/150mm	182-106	.75"
	12"/300mm	182-126	.98"
1/10", 1/100", 1mm, 0.5mm	6"/150mm	182-107	.75"
1/10", 1/50", 1mm, 0.5mm	6"/150mm	182-108	.75"

#### Inch Wide Rigid Rules

Graduations	Range	Order No.	Width
1/8", 1/16", 1/32", 1/64"	6"	182-101	.75"
	12"	182-121	.98"
	18"	182-241	1.18"
	24"	182-161	1.18"
1/50", 1/100", 1/32", 1/64"	6"	182-102	.75"
	12"	182-122	.98"
	18"	182-142	1.18"
	24"	182-162	1.18"
1/10", 1/100", 1/32", 1/64"	6"	182-103	.75"
	12"	182-123	.98"
	18"	182-143	1.18"
	24"	182-163	1.18"
1/10", 1/50", 1/32", 1/64"	6"	182-104	.75"
	12"	182-124	.98"

#### Metric Full-Flexible Rules

Graduations	Range	Order No.	Width
1mm, 0.5mm (on both faces)	150mm	182-211	12mm
	300mm	182-231	12mm
	450mm	182-251	18mm
	600mm	182-271	18mm

#### Inch/Metric Full-Flexible Rules

Graduations	Range	Order No.	Width
1/32", 1/64", 1mm, 0.5mm	6"/150mm	182-205	.47"
	12"/300mm	182-225	.47"
	18"/450mm	182-245	.71"
	24"/600mm	182-265	.71"
1/50", 1/100", 1mm, 0.5mm	6"/150mm	182-206	.47"
	12"/300mm	182-226	.47"
1/10", 1/100", 1mm, 0.5mm	6"/150mm	182-207	.47"
1/10", 1/50", 1mm, 0.5mm	6"/150mm	182-208	.47"

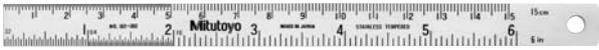
#### Inch Full-Flexible Rules

Graduations	Range	Order No.	Width
1/8", 1/16", 1/32", 1/64"	6"	182-201	.47"
	12"	182-221	.47"
	18"	182-241	.71"
	24"	182-261	.71"
1/50", 1/100", 1/32", 1/64"	6"	182-202	.47"
	12"	182-222	.47"
	18"	182-242	.71"
	24"	182-262	.71"
1/10", 1/100", 1/32", 1/64"	6"	182-203	.47"
	12"	182-223	.47"
	18"	182-243	.71"
	24"	182-263	.71"
1/10", 1/50", 1/32", 1/64"	6"	182-204	.47"
	12"	182-224	.47"

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Semi-Flexible Rules



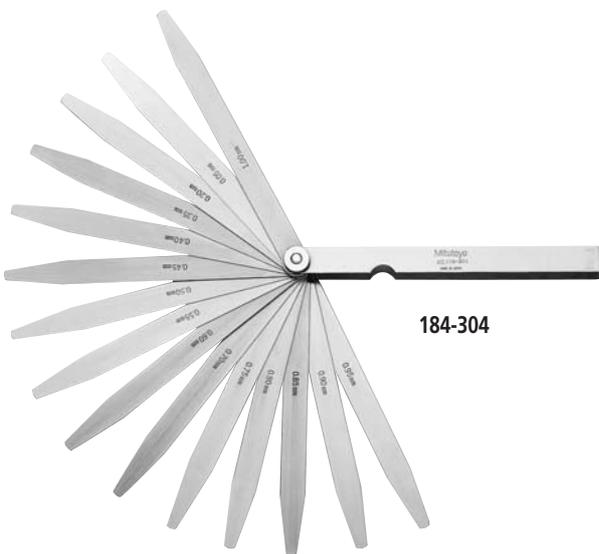
182-302

Inch/Metric			
Graduations*	Range	Order No.	Width
1/16", 1/32", 1/64", 1mm, 0.5mm	6"/150mm	<b>182-302</b>	.51"
	8"/200mm	<b>182-303</b>	.51"
	12"/300mm	<b>182-305</b>	.59"
	20"/500mm	<b>182-307</b>	.59"
	40"/1000mm	<b>182-309</b>	.59"

\* Engraved on the frontside only.

# Thickness Gages

## SERIES 184



184-304

### FEATURES

- Metric thickness gages are available with tapered leaves.
- Inch thickness gages are tapered or straight leaves.
- Each leaf is marked with its thickness.
- Each leaf is detachable if necessary.

### SPECIFICATIONS

Metric			
Range	Order No.	Composition of leaves	Remarks
0.05 - 1mm (28 leaves)	<b>184-313S</b>	0.05 - 0.15mm by 0.01mm, 0.2 - 1mm by 0.05mm	—
	<b>184-303S</b>	0.05 - 0.15mm by 0.01mm, 0.2 - 1mm by 0.05mm	Long leaf
0.05 - 1mm (20 leaves)	<b>184-304S</b>	0.05 - 1mm by 0.05mm	Long leaf
0.05 - 1mm (13 leaves)	<b>184-305S</b>	0.05 - 0.3mm by 0.05mm, 0.4 - 1mm by 0.1mm	—
	<b>184-301S</b>	0.05 - 0.3mm by 0.05mm, 0.4 - 1mm by 0.1mm	Long leaf
0.05 - 0.8mm (10 leaves)	<b>184-306S</b>	0.05 - 0.2mm by 0.05mm, 0.3 - 0.8mm by 0.1mm	—
	<b>184-308S</b>	0.05 - 0.2mm by 0.05mm, 0.2 - 0.5mm by 0.1mm	Long leaf
0.03 - 0.5mm (13 leaves)	<b>184-307S</b>	0.03 - 0.1mm by 0.01mm, 0.2 - 0.5mm by 0.1mm 0.15mm	—
	<b>184-302S</b>	0.03 - 0.1mm by 0.01mm, 0.2 - 0.5mm by 0.1mm 0.15mm	Long leaf

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# Radius Gages

## SERIES 186



186-105



186-110

### FEATURES

- Radius size is stamped on each gage.
- Both concave and convex radius gages become a pair.
- With a locking clamp.

### SPECIFICATIONS

Metric			
Range	Order No.	Composition of leaves	Remarks
0.4 - 6mm (18 pairs)	<b>186-110</b>	0.4, 0.8, 1, 1.2, 1.5, 1.6mm, 1.75 - 3mm by 0.25mm, 3.5 - 6mm by 0.5mm	90° arc
0.5 - 13mm (26 pairs)	<b>186-902</b>	0.5 - 13mm by 0.5mm	90° arc
1 - 7mm (34 pairs)	<b>186-105</b>	1 - 3mm by 0.25mm 3.5 - 7mm by 0.5mm	180° arc
7.5 - 15mm (32 pairs)	<b>186-106</b>	7.5 - 15mm by 0.5mm	180° arc
15.5 - 25mm (30 pairs)	<b>186-107</b>	15.5 - 20mm by 0.5mm, 21 - 25mm by 1mm	180° arc

Inch			
Range	Order No.	Composition of leaves	Remarks
1/32" - 17/64" (16 pairs)	<b>186-103</b>	1/32" - 17/64" by 64ths	90° arc
1/32" - 1/4" (15 pairs)	<b>186-101</b>	1/32" - 1/4" by 64ths	180° arc
17/64" - 1/2" (16 pairs)	<b>186-102</b>	17/64" - 1/2" by 64ths	180° arc
9/32" - 33/64" (16 pairs)	<b>186-104</b>	9/32" - 33/64" by 64ths	90° arc
1/64" - 1/2" (25 leaves)	<b>186-901*</b>	1/64" - 17/64" by 64ths, 9/32" - 1/2" by 32nds	—

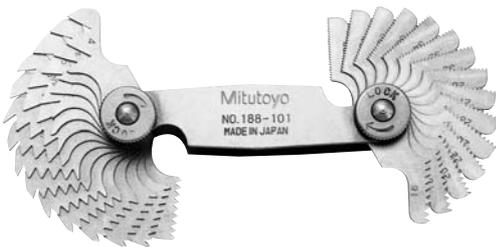
\*Each gage has five measuring locations.

MISCELLANEOUS

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# Pitch Gages

## SERIES 188



188-101

### FEATURES

- Thread pitch size is stamped on each gage.
- Metric, Unified, and Whitworth screw pitch gages.

### SPECIFICATIONS

#### Metric Screw Pitch Gages

Range	Order No.	Composition of leaves
0.35 - 6mm (22 leaves)	<b>188-130</b>	0.35, 0.4, 0.45, 0.5, 0.6, 0.7, 0.75, 0.8, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6mm and 60° angle gage
0.4 - 7mm (21 leaves)	<b>188-122</b>	0.4, 0.5, 0.7, 0.75, 0.8, 0.9, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7mm
0.4 - 7mm (18 leaves)	<b>188-121</b>	0.4, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7mm

#### Unified Screw Pitch Gages

Range	Order No.	Composition of leaves
4 - 42 TPI (30 leaves)	<b>188-111</b>	4, 4 1/2, 5, 5 1/2, 6, 7, 8, 9, 10, 11, 11 1/2, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42 TPI

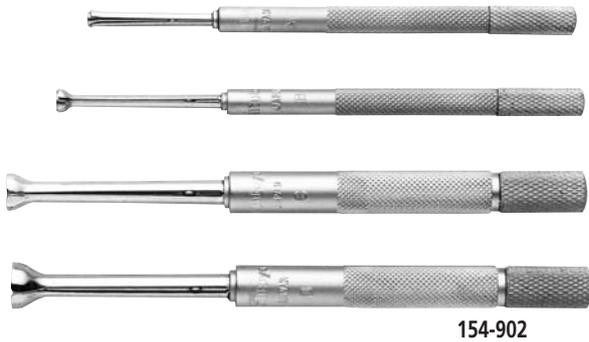
Note: Metric and Unified Pitch Gage Set (**188-151**) is available. It consists of **188-122** (Metric) and **188-111** (Unified).

#### Whitworth Screw Pitch Gages

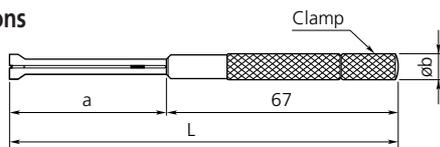
Range	Order No.	Composition of leaves
4 - 42 TPI (30 leaves)	<b>188-101</b>	4, 4 1/2, 5, 5 1/2, 6, 7, 8, 9, 10, 11, 11 1/2, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42 TPI
4 - 60 TPI (28 leaves)	<b>188-102</b>	4, 4 1/2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 34, 36, 40, 48, 60 TPI

# Small Hole Gage Set

## SERIES 154



### Dimensions



Unit: mm

Order No.	L	a	b
154-101	90	22.5	5.5
154-102	97.6	30	5.5
154-103	102.8	35	8.5
154-104	108	40	8.5

### FEATURES

- Used with an outside micrometer for measuring inside diameter of bores.
- 4 sizes of gages are supplied in a fitted case.
- Extra long for gaging deep and shallow holes, slots, and similar workpieces.
- Gaging surface is fully hardened to insure long tool life.

### SPECIFICATIONS

Metric		
Total range	Order No.	Assortment of gages
ø3 - 13mm (4-gage set)	<b>154-902</b>	ø3 - 5mm gage ( <b>154-101</b> ) ø5 - 7.5mm gage ( <b>154-102</b> ) ø7.5 - 10mm gage ( <b>154-103</b> ) ø10 - 13mm gage ( <b>154-104</b> )

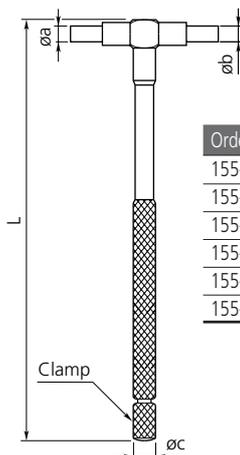
Inch		
Total range	Order No.	Assortment of gages
.125" - .5" DIA. (4-gage set)	<b>154-902</b>	.125" - .2" DIA. gage ( <b>154-105</b> ) .2" - .3" DIA. gage ( <b>154-106</b> ) .3" - .4" DIA. gage ( <b>154-107</b> ) .4" - .5" DIA. gage ( <b>154-108</b> )

# Telescoping Gage Set

## SERIES 155



### Dimensions



Unit: mm

Order No.	L	a	b	c
155-127	110	4	3	5
155-128	110	5	3.5	5.5
155-129	110	5	3.5	5.5
155-130	150	7.5	6	8
155-131	150	7.5	6	8
155-132	150	7.5	6	8

### FEATURES

- Spring-loaded plunger expands within the bore (or groove), allowing determination of the internal diameter (or groove width).
- With a knurled clamp.

### SPECIFICATIONS

Metric		
Total range	Order No.	Assortment of gages
8 - 150mm (6-gage set)	<b>155-905</b>	8 - 12.7mm gage ( <b>155-127</b> ) 12.7 - 19mm gage ( <b>155-128</b> ) 19 - 32mm gage ( <b>155-129</b> ) 32 - 54mm gage ( <b>155-130</b> ) 54 - 90mm gage ( <b>155-131</b> ) 90 - 150mm gage ( <b>155-132</b> )

Inch		
Total range	Order No.	Assortment of gages
.313" - 6" (6-gage set)*	<b>155-903</b>	.313" - .5" gage ( <b>155-121</b> ) .5" - .75" gage ( <b>155-122</b> ) .75" - 1.25" gage ( <b>155-123</b> ) 1.25" - 2.125" gage ( <b>155-124</b> ) 2.125" - 3.5" gage ( <b>155-125</b> ) 3.5" - 6" gage ( <b>155-126</b> )

\*4-gage set (Total range: .313" - 2.125" (**155-907**)) and 5-gage set (Total range: .5" - 6" (**155-904**)) are also available.

# Dial Tension Gages

## SERIES 546



### FEATURES

- Can measure dynamic tension in Newton (N) units.
- Dial Tension Gages are widely used to determine the contact force of other measuring instruments as well as that of electrical relays, micro-switches, valves and precision springs.
- Convenient peak-hold type gages are also available.

### SPECIFICATIONS

Range	Minimum reading	Order No. Standard type	Order No. Peak-hold type
6 - 50 mN	2 mN	<b>546-112</b>	—
10 - 100 mN	5 mN	<b>546-113</b>	<b>546-133</b>
30 - 300 mN	10 mN	<b>546-114</b>	<b>546-134</b>
0.06 - 0.5 N	0.02 N	<b>546-115</b>	<b>546-135</b>
0.1 - 1 N	0.05 N	<b>546-116</b>	<b>546-136</b>
0.15 - 1.5 N	0.05 N	<b>546-117</b>	<b>546-137</b>
0.3 - 3 N	0.1 N	<b>546-118</b>	<b>546-138</b>
0.6 - 5 N	0.2 N	<b>546-119</b>	<b>546-139</b>

# Micro Jack

## SERIES 7



### FEATURES

- Used for accurate leveling of machines, surface plates, and other precision instruments.
- Easy adjustment under heavy load.

### SPECIFICATIONS

<b>Metric</b>			
Height adjustment	Order No.	Graduation	Maximum load
60 - 75mm	<b>7850</b>	0.01mm	400kgf
<b>Inch</b>			
Height adjustment	Order No.	Graduation	Maximum load
2.5" - 3"	<b>7851</b>	.001"	880 lbs.

# V-Block Sets

## SERIES 181



### FEATURES

- Two V-blocks per set.
- Magnetic type is available. (The magnetic type V-block is not provided with a workpiece clamp.)

### SPECIFICATIONS

<b>Metric</b>			
Maximum workpiece dia.	Order No.	Mass	Remarks
25mm	<b>181-902</b>	0.3kg	With clamp
50mm	<b>181-947</b>	4.2kg	Magnetic type
<b>Inch</b>			
Maximum workpiece dia.	Order No.	Mass	Remarks
1"	<b>181-901</b>	.66 lbs.	With clamp

# Pocket Magnifiers

## SERIES 183



### FEATURES

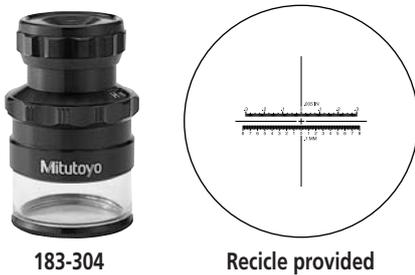
- Suitable for inspecting metal surfaces.

### SPECIFICATIONS

Magnification	Order No.	Remarks
25X	183-201	Pen type
	183-202	With stand
50X	183-203	With stand

# Zoom Loupe

## SERIES 183



183-304

Reticle provided

### FEATURES

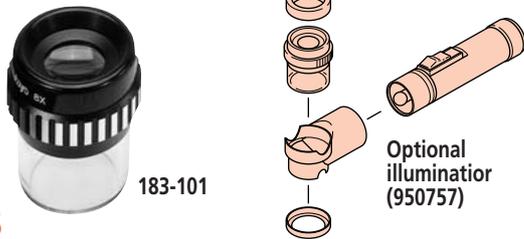
- Allows the user 8X-16X zoomable observation.
- Magnification indicator is provided for 8X, 10X, 12X, 14X, and 16X observation.
- Metric and inch scales are provided for measuring.
- Comes with a carrying case.

### SPECIFICATIONS

Magnification	Order No.	Remarks
8X - 16X (zoom)	183-304	With reticle (Scale graduation: 0.1mm, .0005")

# Pocket Comparators

## SERIES 183



183-101

Optional illuminator (950757)

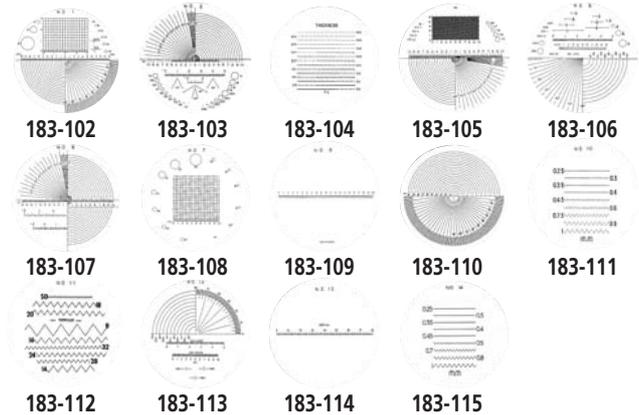
### FEATURES

- By replacing optional reticles, dimensional, angle, and other types of measurements can be performed.
- Illuminator (950757) is available.

### SPECIFICATIONS

Magnification	Order No.	Remarks
8X	183-101	Optional reticles available.
9X	183-121	Optional reticles available.
10X	183-131	Optional reticles available.

### Reticles



# Clear Loupe

## SERIES 183



183-301

183-302

183-303

### SPECIFICATIONS

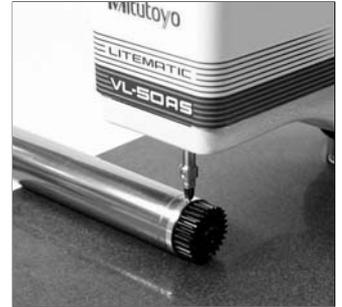
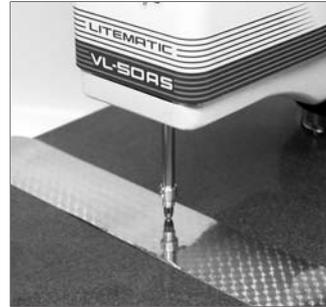
Magnification	Order No.	Remarks
7X	183-301	Drawtube removable
10X	183-302	Drawtube removable
15X	183-303	Drawtube removable

# Litematic

## SERIES 318



318-201



### FEATURES

- The Litematic is suitable for measuring easily-deformed workpieces and high-precision parts such as pin gages, thin-wall bearings, plastic parts, and springs.
- Extra-low measuring force of 0.01N (1gf).
- Ceramic anvil is free from corrosion and easy to maintain.
- Provided with an SPC output port.

### SPECIFICATIONS

#### Metric

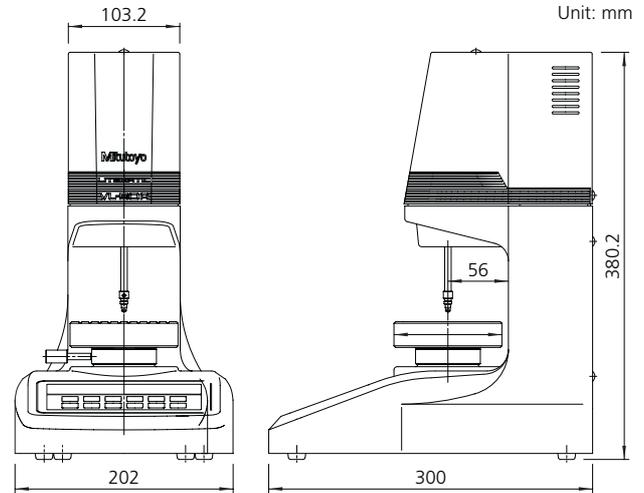
Order No.	318-201 ■	318-213 ■
Range	0 - 50mm	
Resolution	0.001mm, 0.0001mm (switchable)	
Accuracy	1μm	
Repeatability (σ)	0.08μm (normal measurement mode)	
Measuring force	0.01N (1gf)	
Spindle up/down speed	Normal feed: 3mm/s Fast feed: 10mm/s	
Contact point	ø3mm carbide steel ball (interchangeable)	
Workpiece table	ø100mm ceramic (grooved replaceable)	—
Display	LED	
Functions	Zero-setting, Presetting, MAX/MIN measurement, Runout (TIR) measurement, Data hold, Inch/mm conversion (on inch/mm model only)	
Data output	SPC	
Power supply	85 - 264V AC, 50/60Hz	
Mass	19kg	5kg

#### Inch/Metric

Order No.	318-202 ■
Range	0 - 2"
Resolution	.00005", .00001", 0.001mm, 0.0001mm (switchable)
Accuracy	.00004"
Repeatability (σ)	.000004" (normal measurement mode)

Note: To denote your AC line voltage fill the blank of order number with the following suffixes (e.g. 318-201A). **A** for 120V, **D** for 220V, **E** for 240V. No suffix is required for 100V.

### Dimensions



### OPTIONAL ACCESSORIES

Order No.	Description
936937	SPC cable (1m)
965014	SPC cable (2m)
101118	Contact point, Shell
120066	Contact point, ø0.45mm needle (carbide)
120065	Contact point, ø1mm needle (carbide)
120064	Contact point, ø1.5mm needle (carbide)
137257	Contact point, ø2mm needle (carbide)
120059	Contact point, ø7mm spherical (carbide)
120060	Contact point, ø10.5mm spherical (carbide)

Note: Measuring force varies (0.01N - 0.06N) according to the interchangeable contact point selected.

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# Litematic Head

SERIES 318



318-205



## FEATURES

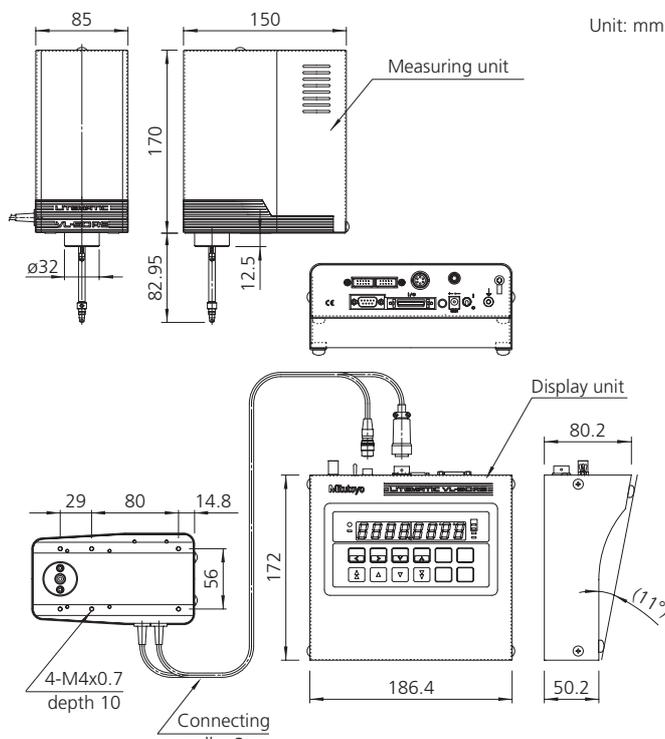
- Two-piece version of Mitutoyo's popular, low force table-top measuring instrument Litematic.
- The measuring unit can be mounted onto fixtures or an optional stand to allow great flexibility of use.

## SPECIFICATIONS

Metric		
Order No.	100V AC	318-213
	120V AC	318-213A
	220V AC	318-213D
	240V AC	318-213E
Range	0 - 50mm	0 - 5mm
Resolution	0.001mm, 0.0001mm (switchable)	
Accuracy	1µm	
Repeatability (σ)	0.08µm (normal measurement mode)	
Measuring force	0.01N (1gf)	
Spindle up/down speed	Normal feed: 3mm/s Fast feed: 10mm/s	
IP protection level	(Not guaranteed)	IP-64*
Contact point	ø3mm carbide ball (interchangeable)	
Display	LED	
Functions	Zero-setting, Presetting, MAX/MIN measurement, Runout (TIR) measurement, Data hold, Inch/mm conversion (on inch/mm model only)	
Data output	SPC	
Power supply	85 - 264V AC, 50/60Hz	
Mass	Measuring unit: 2.7kg	Display unit: 2.2kg

\*Measuring unit only

## Dimensions



- Display unit: 180(W)x258(D)x84(H)mm

## OPTIONAL ACCESSORIES

Order No.	Description
936937	SPC cable (1m)
965014	SPC cable (2m)
957460	300x250mm granite stand with bracket (957463)
101118	Contact point, Shell
120066	Contact point, ø0.45mm needle (Carbide)
120065	Contact point, ø1mm needle (Carbide)
120064	Contact point, ø1.5mm needle (Carbide)
137257	Contact point, ø2mm needle (Carbide)
120059	Contact point, ø7mm ball (Carbide)
120060	Contact point, ø10.5mm ball (Carbide)

Note: Measuring force varies according to the interchangeable contact point selected

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# Neo-Derm

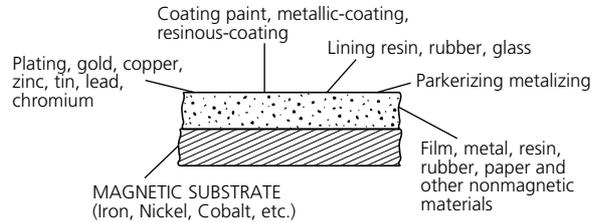
## SERIES 179 — Electronic Coating Thickness Gage



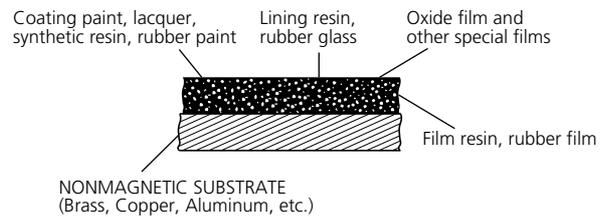
179-701

### APPLICATIONS

#### Nonmagnetic coatings on magnetic substrata



#### Nonconductive coatings on nonmagnetic substrata



### FEATURES

- Battery operated, compact coating thickness gage.
- A set of calibration films and a metallic base is provided for each Neo-Derm.
- Measures the thickness of nonmagnetic coating on magnetic substrata or a layer of nonconductive material on nonmagnetic substrata.

### OPTIONAL ACCESSORIES

Order No.	Description
732135*	Special probe for inside wall measurement of bore
526688	AC adapter (100V AC)
526688A	AC adapter (120V AC)
526688D	AC adapter (220V AC)
526688E	AC adapter (220/240V AC)

\*Cannot be used with 179-721.

### SPECIFICATIONS

Metric	Neo-Derm			
Order No.	179-700	179-701	179-702	179-721
Applications on magnetic substrata	Nonmagnetic coatings on magnetic substrata	Nonmagnetic coatings on magnetic substrata	Nonmagnetic coatings on nonmagnetic substrata*	Nonmagnetic coatings
Range	0 - 50 $\mu$ m	HIGH: 0 - 100 $\mu$ m LOW: 50 - 500 $\mu$ m	HIGH: 0 - 600 $\mu$ m LOW: 0.5 - 2mm	HIGH: 0 - 100 $\mu$ m LOW: 0 - 500 $\mu$ m
Accuracy	$\pm 1\mu$ m (up to 20 $\mu$ m), $\pm 5\%$ of reading (over 20 $\mu$ m)	$\pm 1.5\mu$ m (up to 30 $\mu$ m), $\pm 5\%$ of reading (over 30 $\mu$ m)	$\pm 2.5\mu$ m (up to 50 $\mu$ m), $\pm 5\%$ of reading (over 50 $\mu$ m)	$\pm 3\%$ of full scale
Minimum coating area	$\phi 5$ mm	$\phi 5$ mm	$\phi 5$ mm	$\phi 8$ mm
Minimum radius of curved workpiece	Convex: 3mm Concave: 25mm	Convex: 3mm Concave: 25mm	Convex: 3mm Concave: 25mm	Convex: 7mm Concave: 25mm
Calibration films provided	25 $\mu$ m, 50 $\mu$ m	25 $\mu$ m, 50 $\mu$ m, 100 $\mu$ m, 250 $\mu$ m, 250 $\mu$ m	100 $\mu$ m, 250 $\mu$ m, 0.5mm, 1.0mm, 2.0mm	25 $\mu$ m, 50 $\mu$ m, 100 $\mu$ m, 250 $\mu$ m, 250 $\mu$ m
Power supply	Battery (9V DC)/ via AC adapter (optional)	Battery (9V DC)/ via AC adapter (optional)	Battery (9V DC)/ via AC adapter (optional)	Battery (9V DC)/ via AC adapter (optional)
Dimensions (WxDxH)	106x62x163mm	106x62x163mm	106x62x163mm	106x62x163mm
Mass	600g	600g	600g	600g

\*Measurement is impossible if the substrate is an austenitic stainless steel.

Inch/Metric	Neo-Derm	
Order No.	179-711	179-712
Applications	Nonmagnetic coatings on magnetic substrata	Nonmagnetic coatings on magnetic substrata
Range	HIGH: 0 - .004"/0 - 100 $\mu$ m LOW: .002" - .02"/50-500 $\mu$ m	HIGH: 0 - .025"/0 - 600 $\mu$ m LOW: .02" - .08"/0.5 - 2mm
Accuracy	$\pm .00006$ " (up to .0012"), $\pm 5\%$ of reading (over .0012")	$\pm .0001$ " (up to .002"), $\pm 5\%$ of reading (over .002")

# Digi-Derm

## SERIES 179 — Electronic Coating Thickness Gage



179-755

### SPECIFICATIONS

Metric	Digi-Derm	
Order No.	179-745*	179-755
Applications	Nonmagnetic coatings on magnetic substrata	Nonconductive coatings on nonmagnetic substrata**
Range	0 - 1.5mm	0 - 1.0mm
Resolution	0.001mm	0.001mm
Accuracy	±2µm (up to 0.1mm), ±2% of readout (up to 1.1mm over 0.1mm), ±3% of readout (over 1.1mm)	±2µm (up to 0.1mm), ±2% of readout (over 0.1mm)
Min. coating area	ø5mm	ø8mm
Min. radius of curved workpiece	Convex: 3mm Concave: 25mm	Convex: 7mm Concave: 25mm
Calibration films provided	25µm, 50µm, 100µm, 250µm, 0.5mm, 1.0mm, 1.5mm	25µm, 50µm, 100µm, 250µm, 0.5mm, 1.0mm
Display	LCD	LCD
Data output	SPC	SPC
Power supply	4 batteries (6V DC)/ via AC adapter (optional)	4 batteries (6V DC)/ via AC adapter (optional)
Dimensions (WxDxH)	100x44x180mm	100x44x180mm
Mass	500g	500g

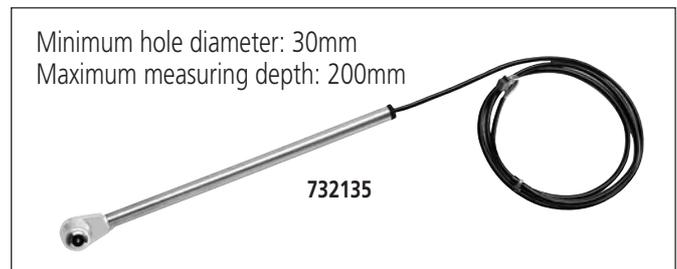
\*Economy model without SPC output (179-741) is also available.  
\*\*Measurement is impossible if the substrate is an austenitic stainless steel.

Inch/Metric	Digi-Derm	
Order No.	179-746	179-756
Applications	Nonmagnetic coatings on magnetic substrata	Nonconductive coatings on nonmagnetic substrata**
Range	0 - .059"	0 - .039"
Resolution	.00005"/0.001mm	.00005"/0.001mm
Accuracy	±.00008" (up to .0039"), ±2% of readout (up to .043" over .0039"), ±3% of readout (over .043")	±.00008" (up to .0039"), ±2% of readout (over .0039")

\*\*Measurement is impossible if the substrate is an austenitic stainless steel.

### FEATURES

- Measurements are displayed on the clear LCD screen and can be output for SPC data analysis.
- Battery powered for portable use and can also operate on AC power with an optional adapter.
- A set of calibration films and a metallic base is provided for each Digi-Derm.
- Special probe for measuring the coating thickness on the inside wall of bores is optional (732135).



Minimum hole diameter: 30mm  
Maximum measuring depth: 200mm

732135

### OPTIONAL ACCESSORIES

Order No.	Description
936937	SPC cable (1m)
965014	SPC cable (2m)
732135*	Special probe for inside wall measurement of bore
528041	AC adapter (100V AC)
528041A	AC adapter (120V AC)
528041D	AC adapter (220V AC)
528041E	AC adapter (220/240V AC)

\*Cannot be used with 179-755 or 179-756.

### Consumables of Neo-Derm/Digi-Derm

Order No.	Description	Qty.
527599	Calibration film (25µm)	1 pc.
527600	Calibration film (50µm)	1 pc.
527601	Calibration film (100µm)	1 pc.
527602	Calibration film (250µm)	1 pc.
527603	Calibration film (0.5mm)	1 pc.
527604	Calibration film (1.0mm)	1 pc.
527605	Calibration film (2.0mm)	1 pc.
685013	Calibration film (1.5mm)	1 pc.
933038	Metallic base for calibration film (Magnetic)	1 pc.
937305	Metallic base for calibration film (Nonmagnetic)	1 pc.
937287	Calibration film set (25µm, 50µm)	1 set
937288	Calibration film set (25µm, 50µm, 100µm, 250µm, 250µm)	1 set
937289	Calibration film set (100µm, 250µm, 0.5mm, 1.0mm, 2.0mm)	1 set
945014	Calibration film set (25µm, 50µm, 100µm, 250µm, 0.5mm, 1.0mm, 1.5mm)	1 set
945049	Calibration film set (25µm, 50µm, 100µm, 250µm, 0.5mm, 1.0mm)	1 set

MISCELLANEOUS

3456  
1234