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Digital Height Masters

Series 515

This is a standard model with a digital display, that offers you the following benefits:

- It gives you all the essential specifications required for a versatile height standard.
- You can use it to calibrate and set height gauges and other measuring instruments.
- Models have two measuring faces on the same level, one facing up and the other down.



515-374

Metric

No.	Range [mm]	Graduation [mm]	Digital step	Block step	Feed error	Retrace error	Delivered	Mass [kg]
515-374	10 - 310	0,002	0,001 mm	20 mm staggered	±2 µm	2 µm	In a wooden case with certificate of inspection, 11 mm gauge block, SR-44 battery	9,5
515-376	10 - 460	0,002	0,001 mm	20 mm staggered	±2 µm	2 µm	In a wooden case with certificate of inspection, 11 mm gauge block, SR-44 battery	13,6
515-378	10 - 610	0,002	0,001 mm	20 mm staggered	±2,5 µm	2,5 µm	In a wooden case with certificate of inspection, 11 mm gauge block, SR-44 battery	16

Functions	Series 515
DATA (output with cable) / HOLD (display value)	●
Auto Power OFF after 20 min. non use	●
Low voltage alarm	●
Data output	●
PRESET	●
ABS / INC (INC ZERO)	●

Specifications

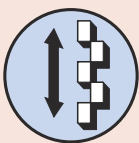
Micrometer adjustment	20 mm
Micrometer feed	0,5 mm
Block pitch accuracy	Range ≤ 310 mm: ±1,5 µm 310 < range ≤ 450 mm: ±2,5 µm 450 < range ≤ 610 mm: ±3,5 µm
Parallelism of blocks	Range ≤ 310 mm: 2 µm 310 < range ≤ 610 mm: 2,5 µm
Battery life	Approx. 1,8 years

Optional accessories

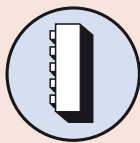
No.	Description
515-111	Auxiliary Block Kit for Bore Gauge, for 515-374/515-376/515-378
959149	Digimatic Cable, Straight, Data Button, 1 m
959150	Digimatic Cable, Straight, Data Button, 2 m
06AFM380C	USB Input Tool Direct (Digimatic USB), Digi/Digi2, Straight, with Data Button
02AZD880G	U-WAVE-T, Buzzer Type, Wireless Transmitter
02AZD730G	U-WAVE-T, IP67 Type, Wireless Transmitter
02AZD790C	U-WAVE-T Connection Cable C, Straight, with Data Button

Consumable spares

No.	Description
938882	Battery SR44 1,5 V



Staggered 20 mm blocks (movable)



Vertical orientation



Riser block (optional)

Height Masters

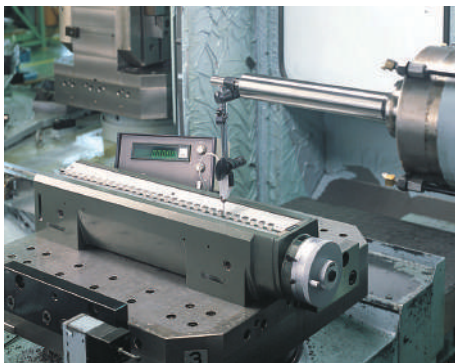
Series 515

This height master offers you the following benefits:

- You can use it to calibrate and set height gauges and other measuring instruments.
- Models with the staggered arrangement of blocks have two measuring faces on the same level, one facing up and the other down.
- It is supplied in a fitted wooden case.



515-520



Using in horizontal orientation

Metric

No.	Range [mm]	Graduation [mm]	Block step	Feed error	Retrace error	Delivered	Mass [kg]
515-520	5 - 610	0,001	10 mm straight	±1,2 μm	1,2 μm	In a wooden case with certificate of inspection	45
515-523	5 - 1010	0,001	10 mm straight	±1,5 μm	1,5 μm	In a wooden case with certificate of inspection, supporting base 900574	63,5

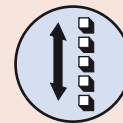
Specifications

Micrometer adjustment	20 mm
Micrometer feed	0,5 mm
Block pitch accuracy	Range ≤ 310 mm: ±1,5 μm 310 < range ≤ 610 mm: ±2,5 μm 610 < range ≤ 1010 mm: ±3,5 μm
Parallelism of blocks	Range ≤ 610 mm: 1,5 μm 610 < range ≤ 1010 mm: 2 μm

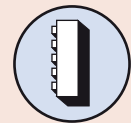
Optional accessories

No.	Description
515-110	Auxiliary Block Kit for Bore Gauge, for 515-520/515-523
900574	Supporting Base for Vertical Operation, for Height Master

900574 : supplied as a standard for 515-523



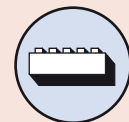
Single-row 10 mm blocks (movable)



Vertical orientation



Riser block (optional)



Horizontal orientation



900574 (optional)
Supporting base for vertical operation

Universal Height Masters

Series 515

This Universal Height Master offers you the following benefits:

- It is designed for both vertical and horizontal orientations, enabling you to carry out a wide range of applications such as accuracy checking of machine tool table movements.
- It is supplied in a fitted wooden case.

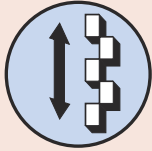


Specifications

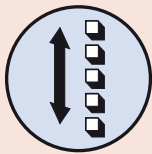
Micrometer adjustment	20 mm
Micrometer feed	0,5 mm
Block pitch accuracy	$\pm 1,5 \mu\text{m}$
Parallelism of blocks	1 μm

Optional accessories

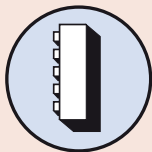
No.	Description
515-112	Auxiliary Block Kit for Bore Gauge, for 515-322



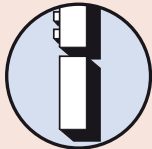
Staggered 20 mm blocks (movable)



Single-row 10 mm blocks (movable)



Vertical orientation



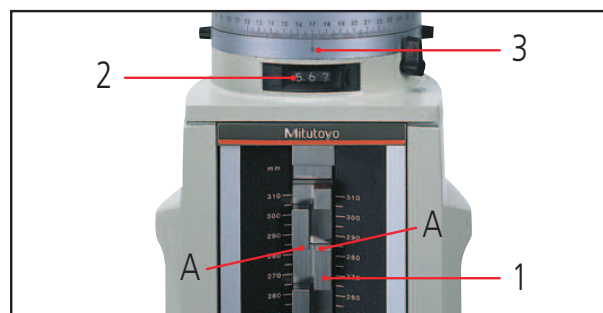
Riser block (optional)



515-322

Metric

No.	Range [mm]	Graduation [mm]	Block step	Feed error	Retrace error	Delivered	Mass [kg]
515-322	5 - 310	0,001	20 mm staggered	$\pm 1 \mu\text{m}$	1 μm	In a wooden case with certificate of inspection	23



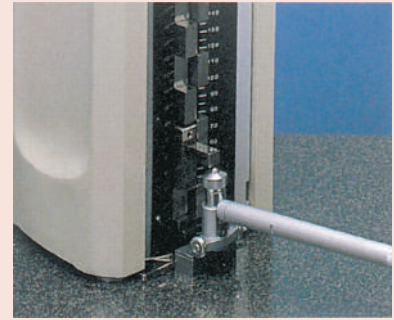
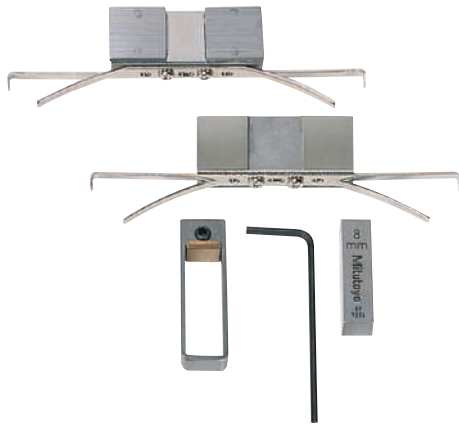
Height A
 1. Scale 280.000 mm
 2. Counter 5.670 mm
 3. Thimble 0.000 mm

285.670 mm

Optional Accessories for Height Master

Series 515

This is an auxiliary block kit that allows you to efficiently carry out reference-setting of dial bore gauges and tubular inside micrometers (18-150mm).



Bore Gauge Series 511 reference setting

Metric

No.	Suitable for Height Master	Mass [kg]
515-112	515-322	0,142
515-110	515-520 / 515-523	0,14
515-111	515-374 / 515-376 / 515-378	0,142

Series 515

These riser blocks offer you the following benefits:

- You can extend the measuring range up to 900mm by using 150, 300 or 600mm riser blocks.
- They can be used with both standard and digital Height Masters.



515-113



515-114



515-115

Metric

No.	Parallelism	Accuracy	Height [mm]	Mass [kg]
515-113	0,6 μm	$\pm 0,6 \mu\text{m}$	150	5,7
515-114	0,8 μm	$\pm 1 \mu\text{m}$	300	11,3
515-115	1 μm	$\pm 2 \mu\text{m}$	600	31



Sample application

Depth Micro Checkers

Series 515

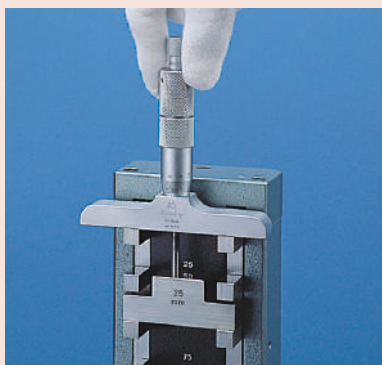
This Depth Micro Checker offers you the following benefits:

- The Depth Micro Checker is designed to let you check and help set the range-end points of a depth micrometer.
- A 25mm carbide gauge block is provided as the reference surface.



Specifications

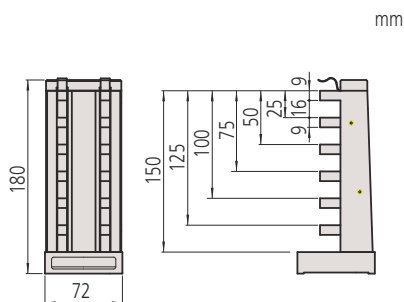
Anvil block accuracy	$\pm 0,5 \mu\text{m}$
Block pitch accuracy	$\pm (1+L/150)\mu\text{m}$ L= length to check (mm)



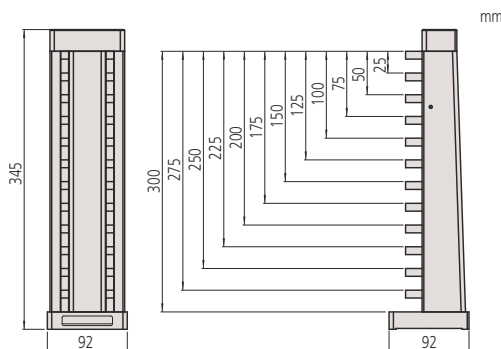
515-571

Metric

No.	Range [mm]	Reference length	Delivered	Mass [kg]
515-570	0 - 150	25, 50, 75, 100, 125, 150 mm	In a wooden case with certificate of inspection, 25 mm carbide reference block	3
515-571	0 - 300	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300 mm	In a wooden case with certificate of inspection, 25 mm carbide reference block	17



515-570



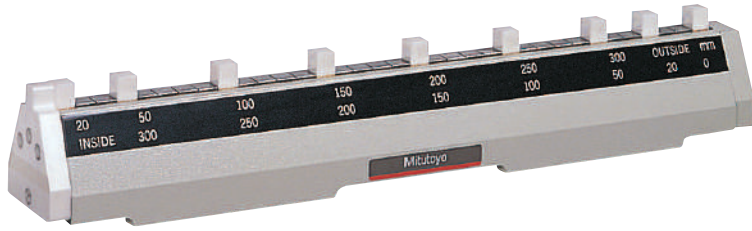
515-571

CERA Caliper Checkers

Series 515

This CERA Caliper Checker offers you the following benefits:

- You can set and inspect caliper and height gauges.
- It comes with ceramic gauge blocks.

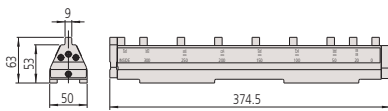


515-555

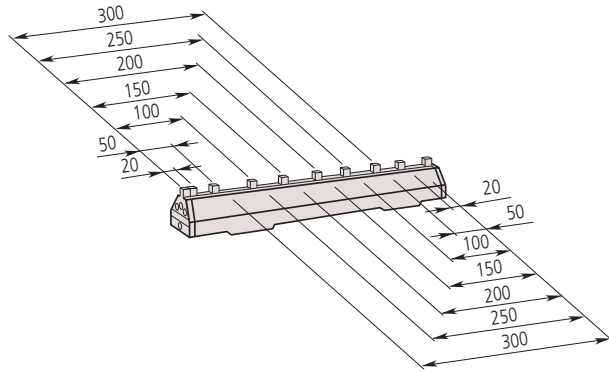
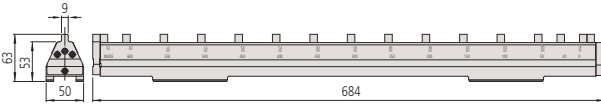
Metric

No.	Range [mm]	Reference checking lengths available for outside/inside measurement	Delivered	Mass [kg]
515-555	0 - 300	20, 50, 100, 150, 200, 250 and 300 mm	In a paper case with certificate of inspection	4
515-556-2	0 - 600	20, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550 and 600 mm	In a paper case with certificate of inspection	8,5

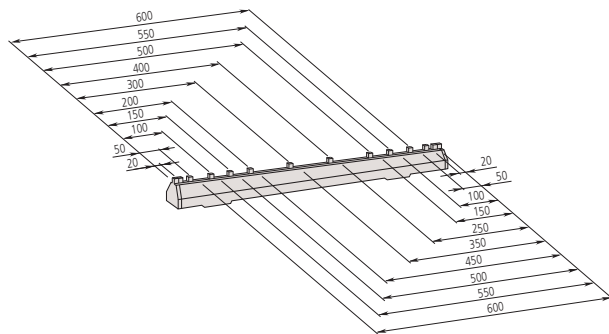
515-555



515-556-2



515-555



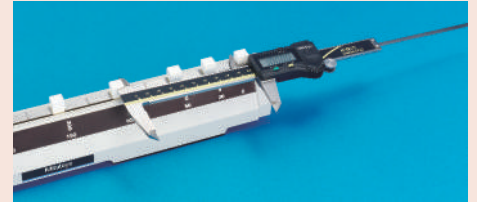
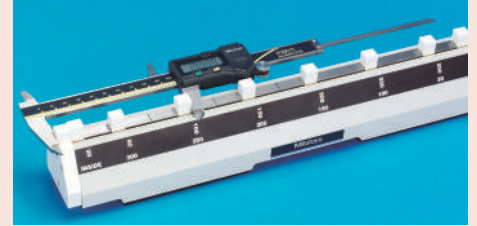
515-556-2

Specifications

Block pitch accuracy	20 - 300 mm: $\pm 0,005$ mm 350 - 600 mm: $\pm 0,007$ mm
Parallelism of blocks	20 - 300 mm: 0,002 mm 350 - 600 mm: 0,004 mm

Optional accessories

No.	Description
602162	Wooden Case (300 mm), for Caliper Checker
602164	Wooden Case (600 mm), for Caliper Checker



Specifications

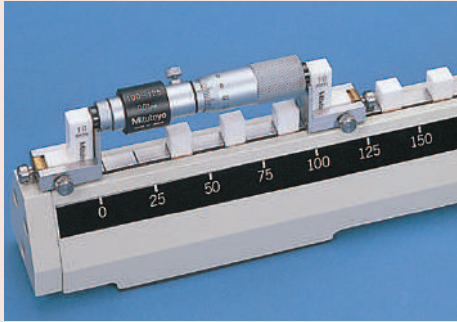
Block pitch accuracy

$$\pm(1+L/150) \mu\text{m}$$

L = Length to check (mm)



Support clamps with 10 mm gauge blocks



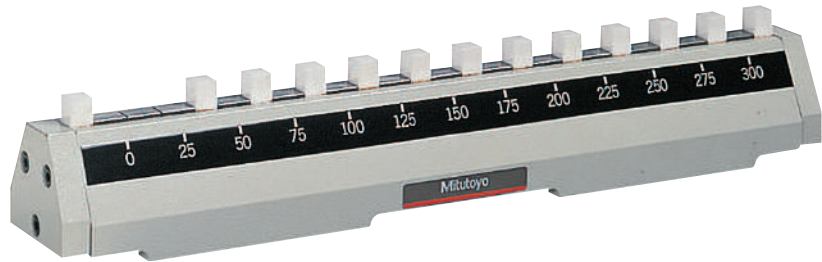
Application with Series 133

Inside Micro Checkers

Series 515

This Inside Micro Checker offers you the following benefits:

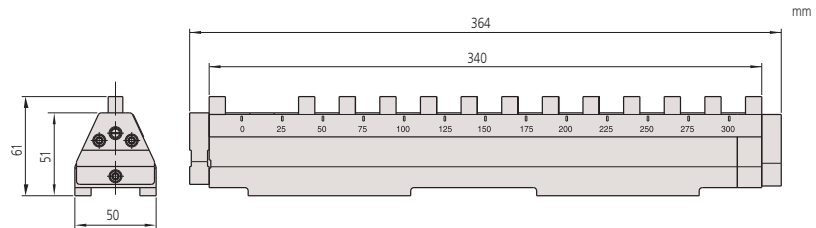
- Applicable for Series 133, 139 and 145 (over 50 mm).
- Not applicable for Series 137, 141, 337 and 339
- It designed to act as a setting standard for inside micrometers.
- It comes with ceramic gauge blocks.



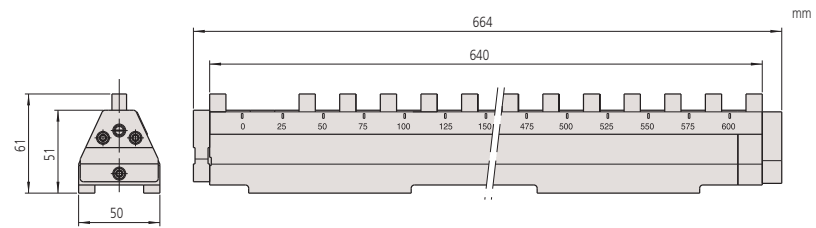
515-585

Metric

No.	Range [mm]	Graduation [mm]	Reference length	Delivered	Mass [kg]
515-585	25 - 300	25	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300 mm	In a wooden case with certificate of inspection, support clamps, 2x10 mm gauge block grade 0	3,9
515-586	25 - 600	25	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 325, 350, 375, 400, 425, 450, 475, 500, 525, 550, 575, 600 mm	In a wooden case with certificate of inspection, support clamps, 2x 10 mm gauge block	7



515-585



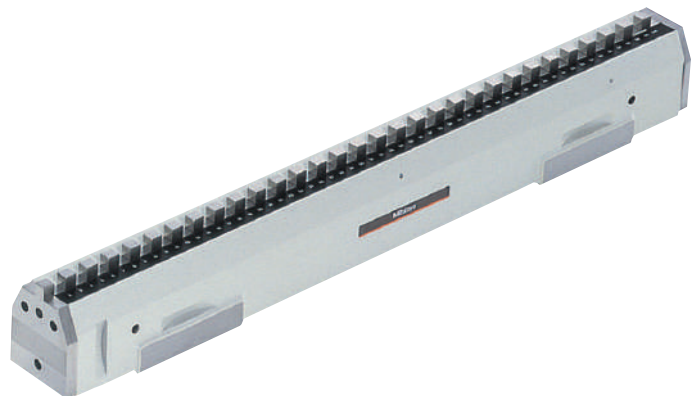
515-586

Check Masters

Series 515

This Check Master allows you to test precision tool and coordinate measuring machines, and offers you the following benefits:

- You can test the X, Y and Z-coordinate axes of precision tool machines and coordinate measuring machines.
- It consists of rigidly clamped gauge blocks with a step of 10mm.
- It is supplied in a fitted wooden case.



515-722

Metric

No.	Range [mm]	Delivered	Mass [kg]
515-720	0 - 310	In a wooden case with certificate of inspection	7
515-721	0 - 450	In a wooden case with certificate of inspection	10
515-722	0 - 610	In a wooden case with certificate of inspection	13
515-723	0 - 1010	In a wooden case with certificate of inspection	22
515-724	0 - 1510	In a wooden case with certificate of inspection	30



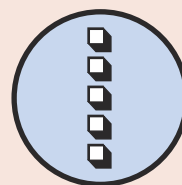
515-724

515-723

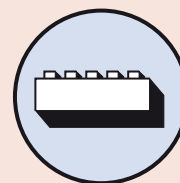
515-722

Specifications

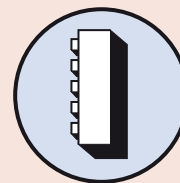
Block step	10 mm
Block pitch accuracy	Range \leq 310 mm: $\pm 2,5 \mu\text{m}$ 310 < range \leq 610 mm: $\pm 3,5 \mu\text{m}$ 610 < range \leq 1010 mm: $\pm 5,0 \mu\text{m}$ 1010 < range \leq 1510 mm: $\pm 8,0 \mu\text{m}$
Parallelism of blocks	Range \leq 310 mm: 1,2 μm 310 < range \leq 610 mm: 1,5 μm 610 < range \leq 1010 mm: 2,0 μm 1010 < range \leq 1510 mm: 2,5 μm
Hardness	> 64 HRC



Single-row 10 mm blocks



Horizontal orientation



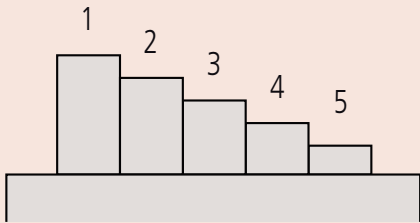
Vertical orientation

Step Masters

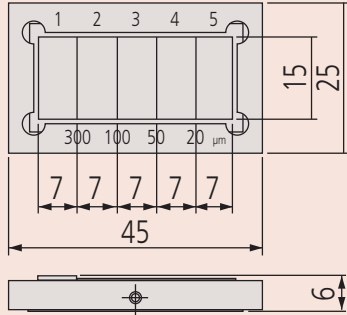
Series 516

The Step Master is a gauge that provides you with four small increments in height and offers you the following benefits:

- It is constructed from an assembly of five highly accurate, steel or ceramic gauge blocks.
- Each adjacent step is calibrated to a resolution of 0,01 μm by using an interferometer with an accuracy tolerance of $\pm 0,2 \mu\text{m}$.



	1/2	2/3	3/4	4/5
516-198, 516-498	10 μm	5 μm	2 μm	1 μm
516-199, 516-499	300 μm	100 μm	50 μm	20 μm



516-499 Ceramic type



516-199 Steel type

Metric

No.	Block step	Material	Delivered	Mass [kg]
516-198	10, 5, 2, 1 μm	Steel	In a wooden case with certificate of inspection	0,15
516-198-24	10, 5, 2, 1 μm	Steel	In a wooden case with JCSS calibration certificate	0,15
516-199	300, 100, 50, 20 μm	Steel	In a wooden case with certificate of inspection	0,15
516-199-24	300, 100, 50, 20 μm	Steel	In a wooden case with JCSS calibration certificate	0,15
516-498	10, 5, 2, 1 μm	Ceramic	In a wooden case with certificate of inspection	0,14
516-498-24	10, 5, 2, 1 μm	Ceramic	In a wooden case with JCSS calibration certificate	0,14
516-499	300, 100, 50, 20 μm	Ceramic	In a wooden case with certificate of inspection	0,14
516-499-24	300, 100, 50, 20 μm	Ceramic	In a wooden case with JCSS calibration certificate	0,14

Specifications

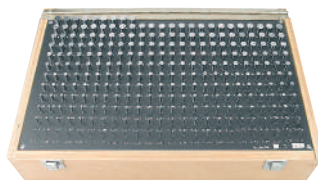
Accuracy	DIN 2269 error limit of diameter grade 1: $\pm 1 \mu\text{m}$ grade 2: $\pm 2 \mu\text{m}$
Finish	Very fine ground, from $\varnothing 3 \text{ mm}$ inscribed
Hardness	HRC 60-62
Roughness	$RA \leq 0,1 \mu\text{m}$
Length	up to $\varnothing 6 \text{ mm} = 50 \text{ mm}$ over $\varnothing 6 \text{ mm} = 70 \text{ mm}$

Cylindrical Measuring Pins

Series 926

This is a complete incremental set of plug (or pin) gauges, that offers you the following benefits:

- It includes 91 or 273 pieces that you can use in the inspection room, or on the shop floor in tool and fixture making.



926-210



926-222

Set of 273 pieces

No.	Grade	Remarks	Delivered	Mass [kg]
926-210	1	1-10 mm, rising by 0,1 mm (91 pins). Each of these 91 pins are flanked by a +0,01 mm (oversize) and a -0,01 mm (undersize) pin.	In a wooden box	7,335
926-212	2	1-10 mm, rising by 0,1 mm (91 pins). Each of these 91 pins are flanked by a +0,01 mm (oversize) and a -0,01 mm (undersize) pin.	In a wooden box	7,295

Set of 91 pieces

No.	Grade	Remarks	Delivered	Mass [kg]
926-220	1	1-10 mm, rising by 0,1 mm	In a wooden box	3
926-222	2	1-10 mm, rising by 0,1 mm	In a wooden box	3

Glass Scales

Series 182

These high precision glass scales offer you the following benefits:

- They are manufactured using Mitutoyo's leading-edge Linear Scale production technology.
- They are ideal for checking the magnification accuracy of profile projectors and microscopes, as well as the table feed accuracy of measuring equipment.



Specifications

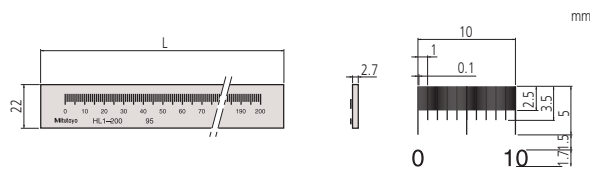
Accuracy	(1,5+2L/1000) μm L = measured length (mm)
Material	Sodium glass
Thermal expansion coefficient	(8±1) x 10 ⁻⁶ /K



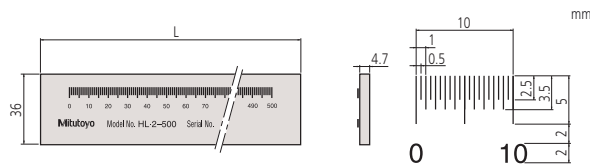
182-525-10 / 182-523-10 / 182-522-10 / 182-513-10

Metric

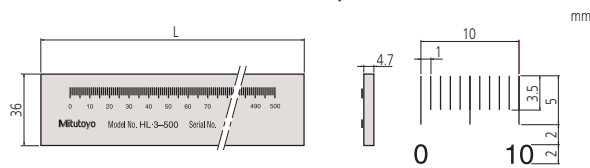
No.	Range [mm]	Graduation [mm]	Thickness of graduation line [μm]	L [mm]	Delivered	Mass [kg]
182-511-10	0 - 50	0,1	20	75	In a wooden case with certificate of inspection	0,23
182-512-10	0 - 100	0,1	20	125	In a wooden case with certificate of inspection	0,24
182-521-10	0 - 100	0,5	50	130	In a wooden case with certificate of inspection	0,27
182-513-10	0 - 150	0,1	20	175	In a wooden case with certificate of inspection	0,35
182-514-10	0 - 200	0,1	20	225	In a wooden case with certificate of inspection	0,36
182-522-10	0 - 200	0,5	50	230	In a wooden case with certificate of inspection	0,32
182-531-10	0 - 250	1	100	280	In a wooden case with certificate of inspection	0,55
182-523-10	0 - 300	0,5	50	330	In a wooden case with certificate of inspection	0,57
182-524-10	0 - 400	0,5	50	430	In a wooden case with certificate of inspection	0,71
182-525-10	0 - 500	0,5	50	530	In a wooden case with certificate of inspection	0,86
182-532-10	0 - 500	1	100	530	In a wooden case with certificate of inspection	0,86
182-533-10	0 - 750	1	100	780	In a wooden case with certificate of inspection	1,22
182-534-10	0 - 1000	1	100	1030	In a wooden case with certificate of inspection	1,54



Graduation : 0,1 mm



Graduation : 0,5 mm



Graduation : 1 mm

Low Expansion Glass Scales

Series 182

These high precision glass scales offer you the following benefits:

- They are manufactured using Mitutoyo's leading-edge Linear Scale production technology.
- You can use them as a standard for calibrating graduating scales, with high accuracy.



Specifications

Accuracy	$(0,5+L/1000) \mu\text{m}$ L = measured length (mm)
Graduation	1 mm
Thickness of graduation line	4 μm
Material	Low expansion glass
Thermal expansion coefficient	$(0\pm 0,02) \times 10^{-6}/\text{K}$

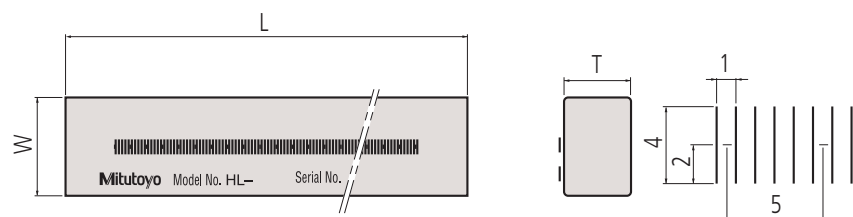


182-502-60
182-501-60

Metric

No.	Range [mm]	L [mm]	T [mm]	W [mm]	Delivered	Mass [kg]
182-501-50	0 - 250	280	10	20	In a wooden case with certificate of inspection	0,75
182-501-60	0 - 250	280	10	20	In a wooden case with JCSS calibration certificate	0,75
182-502-50	0 - 500	530	20	30	In a wooden case with certificate of inspection	1,8
182-502-60	0 - 500	530	20	30	In a wooden case with JCSS calibration certificate	1,8

mm



Calibration Testers

Series 170

This Calibration Tester offers you the following benefits:

- It enables you to test dial indicators, lever gauges and bore gauges with 0,01mm scale graduation.
- Bore gauges can be supported both horizontally and vertically.



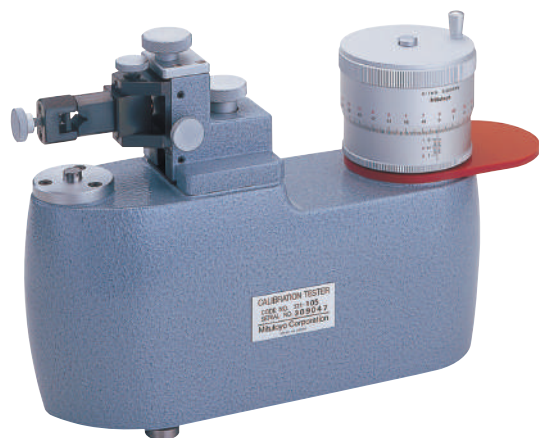
170-102-12

Metric

No.	Range [mm]	Spindle feed error [μm]	Hysteresis	Delivered	Mass [kg]
170-102-12	0 - 25	±2	0,5 μm	With bore gauge (Series 511) holder 12AAK821	7,5

Series 521

This allows the calibration of digital and analogue indicators, lever gauges and measuring probes with a maximum measuring span of 5mm.



521-105

Metric

No.	Range [mm]	Spindle feed error [μm]	Hysteresis	Mass [kg]
521-103	0 - 1	±0,2	0,2 μm	7
521-105	0 - 5	±0,8	0,8 μm	7,5

Specifications

Graduation	0,001 mm
Measuring face	Carbide tipped, rotating
Clamping range	Ø 6/8 mm

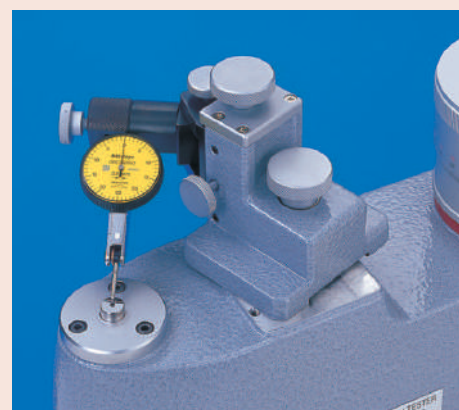
Optional accessories

No.	Description
12AAK824	Horizontal Holder for Bore Gauge, For Series 170



Specifications

Graduation	0,0002 mm
Measuring face	Carbide tipped, non rotating
Clamping range	Ø 4-10 mm



Calibration Testers i-Checker 2000



Specifications

Max. drive speed	10 mm/s
Drive method	Motor drive, semi automatic, fully automatic only for indicator with data output
Scale	Linear encoder
Power supply	100VAC to 240VAC ±10%, 50/60Hz
PC connection	USB

Optional accessories

No.	Description
02ASK000	Test Indicator Accessory Set, I-Checker, For Ø6mm Stem
02ASK180	Test Indicator Accessory Set, I-Checker, For Ø8mm Stem
02ASK040	Stem Bush for I-Checker, For Ø6mm Stem
02ASL150	Stem Bush for I-Checker, For ø10mm Stem
02ASK060	Stem Bush for I-Checker, For Ø12mm Stem
02ASK070	Stem Bush for I-Checker, For Ø15mm Stem
02ASK080	Stem Bush for I-Checker, For Ø20mm Stem
02ASK710	Stem Bush for I-Checker, For Ø28mm Stem
02ASK090	Stem Bush for I-Checker, For Ø9,525mm (3/8") Stem
02ASU162	Cylinder Gauge Set, IC-2000



Calibration of Dial Test Indicator (Lever Type) with optional accessories

Series 170

- i-Checker is specially designed to calibrate dial indicators, dial test indicators, bore gauges, electronic digital indicator gauges and other electronic gauges.
- Inspection can be performed 2,5 times faster compared to the previous model.
- This instrument achieves the high accuracy and therefore guarantees ultra-reliable inspection results.
- Digital indicators equipped with a data output function are checked very efficiently due to spindle positioning at the inspection points and recording of measurement results being under fully automatic control.
- Analog type indicators are inspected in semi-automatic mode with the pointer of the indicator being manually adjusted at each measuring point with automatic transfer of inspection results and movement to the next measuring point.



170-402D with optional accessories

Metric

No.	Range [mm]	Digital step	Accuracy	Delivered	Mass
170-402D	0 - 100	0,01 µm	±(0,1+4L/1000) µm L = measured length (mm)	With ø8 mm stem bush, software i-Pak, certificate of inspection	20 kg



Gauge Block Comparators GBCD-250

Series 565

This Manual Comparator with Dual Gauge Heads offers you the following benefits:

- It performs gauge block calibration according to EN ISO 3650.
- You can easily compare gauge blocks between 0,1 mm and 250 mm with reference gauge blocks.
- The upper and lower gauging heads give you of easy, high-accuracy measurement.



No.	Range [mm]	Measuring force [N]	Stroke [mm]	Measuring range [mm]	Resolution	Measuring unit	Mass [kg]
565-151D-01	0,1 - 250	0,4 N (upper) 0,2 N (lower)	10,5	0,2 - 8,2	0,001 μm	Linear Gauge (upper, lower)	55

Gauge Block Comparators GBCD-100A

Series 565

- It performs gauge block calibration according to EN ISO 3650
- Measures the length of rectangular gauge blocks in the size range 0,5 mm to 100 mm. It automatically compares a test block with an appropriate reference gauge block.
- The compensation result is not affected by any warping of thinner gauge blocks due to the use of upper and lower gage heads (dual-head system).
- Measurement configuration: 1 cycle of automatic comparison measurement with a standard gauge block.



No.	Range [mm]	Measuring force [N]	Resolution	Measuring unit
565-172	0,5 - 100	0,8 N (upper) 0,4 N (lower)	0,01 μm	Inductive probe (upper, lower)

Optional accessories

No.	Description
02ASW561	Software GB-PAK-A, Vers. 4.0X, for New GBCD-250 Installation, English Version
02ASF040	Heat Protection Shield, For GBCD-250
02ASP422	RS-232C Cable
02ASD130	Square Gauge Block Holder, For GBCD-210
601644	Cerastone for Gauge Blocks, 150x50x20mm
158-120	Optical Flat, 15mm, D=60mm, 0,1 μm
516-650E	Maintenance Kit for Gauge Blocks
516-145-E2	Calibration Master for GB-Comparator, 11pcs., Refer to EA-10/02

Optional accessories

No.	Description
02ASW551	Software GB-PAK-A, Vers. 4.0X, for New GBCD-100A Installation, English Version
601644	Cerastone for Gauge Blocks, 150x50x20mm
158-120	Optical Flat, 15mm, D=60mm, 0,1 μm
516-650E	Maintenance Kit for Gauge Blocks
516-146-E2	Calibration Master for GB-Comparator, 12pcs., Eng., GBCD, Cal. Cert., Trace.