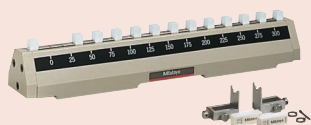




Height Masters
Page 314



Check Masters
Page 318



Calibration Tools
Page 322

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.	Delivered	Block step	Feed error	Retrace error	Mass [kg]
515-374	In a wooden case with certificate of inspection, 11 mm gauge block, SR-44 battery	20 mm staggered	±2 µm	2 µm	9,5
515-376	In a wooden case with certificate of inspection, 11 mm gauge block, SR-44 battery	20 mm staggered	±2 µm	2 µm	13,6
515-378	In a wooden case with certificate of inspection, 11 mm gauge block, SR-44 battery	20 mm staggered	±2,5 µm	2,5 µm	16

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

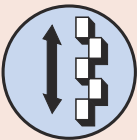
Specifications	
Micrometer adjustment	20 mm
Micrometer feed	0,5 mm
Block pitch accuracy	Range ≤ 310 mm: ±1,5 µm 310 < range ≤ 450 mm: ±2,5 µm 450 < range ≤ 610 mm: ±3,5 µm
Parallelism of blocks	Range ≤ 310 mm: 2 µm 310 < range ≤ 610 mm: 2,5 µm
Battery life	Approx. 1.8 years

Optional accessories

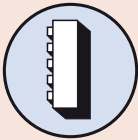
No.	Description
515-111	Auxiliary Block Kit for Bore Gauge, for 515-374/515-376/515-378
959149	Digimatic Cable, Straight, Data Button,, 1m
959150	Digimatic Cable, Straight, Data Button,, 2m
06AFM380C	USB Input Tool Direct (Digimatic USB), Digi/Digi2, Straight, with Data Button
02AZD880G	U-WAVE-T, Buzzer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

Consumable spares

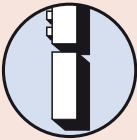
No.	Description
938882	Battery SR44 1.5V



Staggered 20 mm blocks (movable)



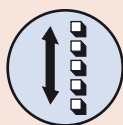
Vertical orientation



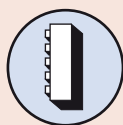
Riser block (optional)

Specifications

Micrometer adjustment	20 mm
Micrometer feed	0,5 mm
Block pitch accuracy	Range \leq 310 mm: $\pm 1.5 \mu\text{m}$ 310 < range \leq 610 mm: $\pm 2.5 \mu\text{m}$ 610 < range \leq 1010 mm: $\pm 3.5 \mu\text{m}$
Parallelism of blocks	Range \leq 610 mm: $1.5 \mu\text{m}$ 610 < range \leq 1010 mm: $2 \mu\text{m}$



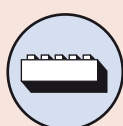
Single-row 10 mm
blocks (movable)



Vertical
orientation



Riser block
(optional)



Horizontal
orientation



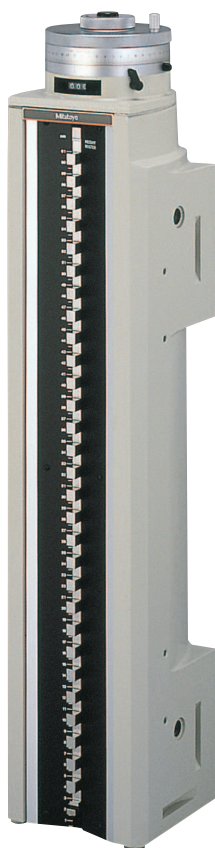
900574 (optional)
Supporting base for vertical operation

Height Masters

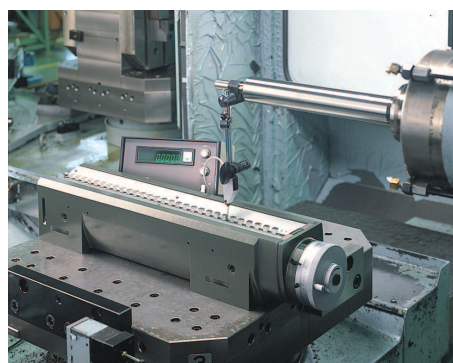
Series 515

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.	Block step	Feed error	Retrace error	Delivered	Mass [kg]
515-520	10 mm straight	$\pm 1,2 \mu\text{m}$	$1,2 \mu\text{m}$	In a wooden case with certificate of inspection	45
515-523	10 mm straight	$\pm 1,5 \mu\text{m}$	$1,5 \mu\text{m}$	In a wooden case with certificate of inspection	63,5



Universal Height Masters

Series 515

This Universal Height Master offers you the following benefits:

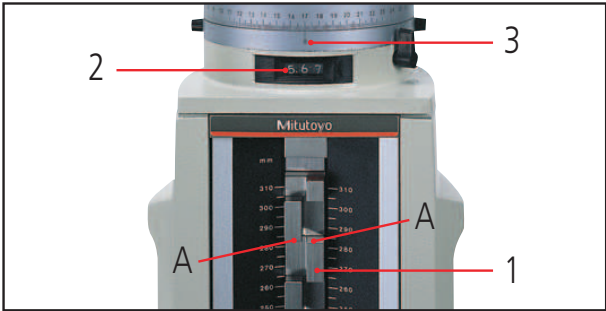
- It is designed for both vertical and horizontal orientations, enabling you to carry out a wide range of applications such as accuracy checking of machine tool table movements.
- It is supplied in a fitted wooden case.



515-322

Metric

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



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

285.670 mm

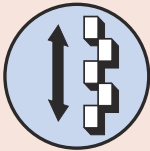


Specifications

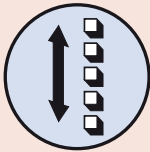
Micrometer adjustment	20 mm
Micrometer feed	0,5 mm
Block pitch accuracy	$\pm 1,5 \mu\text{m}$
Parallelism of blocks	$1 \mu\text{m}$

Optional accessories

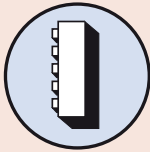
No.	Description
515-112	Auxiliary Block Kit for Bore Gauge, for 515-322



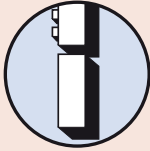
Staggered 20 mm blocks (movable)



Single-row 10 mm blocks (movable)



Vertical orientation

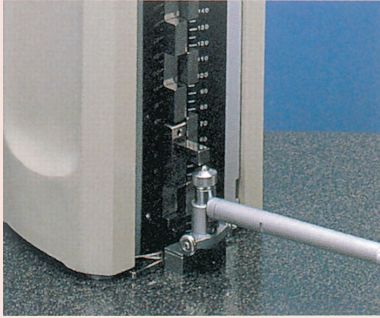


Riser block (optional)

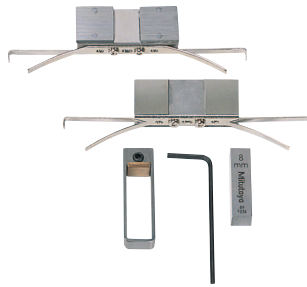
Optional Accessories for Height Master

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 gage reference setting



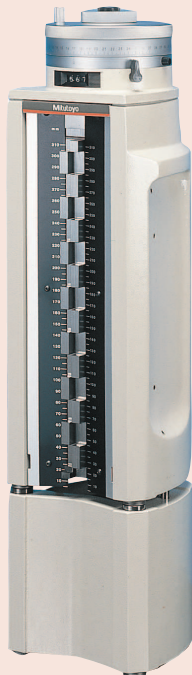
Metric

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.



Sample application



515-113



515-114



515-115

Metric

No.	Parallelism	Height [mm]	Mass [kg]
515-113	0,6 μ m	150	5,7
515-114	0,8 μ m	300	11,3
515-115	1 μ m	600	31

Depth Micro Checkers

Series 515

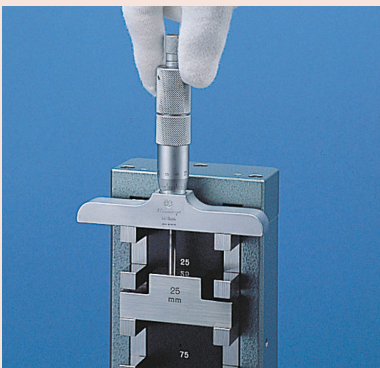
This Depth Micro Checker offers you the following benefits:

- 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= lenght to check (mm)

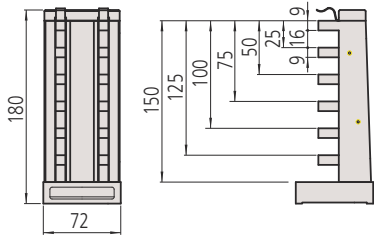


515-571

Metric

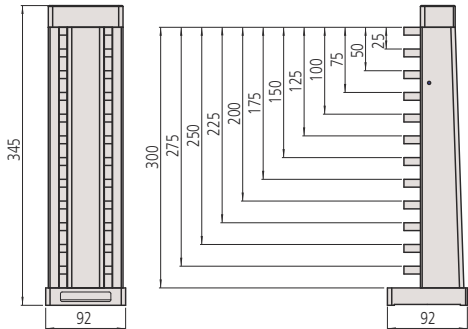
No.	Reference length	Delivered	Mass [kg]
515-570	25, 50, 75, 100, 125, 150 mm	In a wooden case with certificate of inspection, 25 mm carbide reference block	3
515-571	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300 mm	In a wooden case with certificate of inspection, 25 mm carbide reference block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

mm



515-570

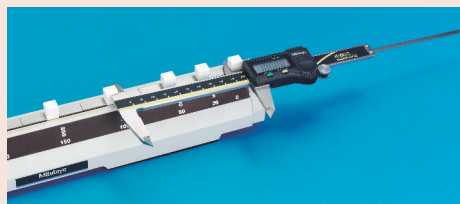
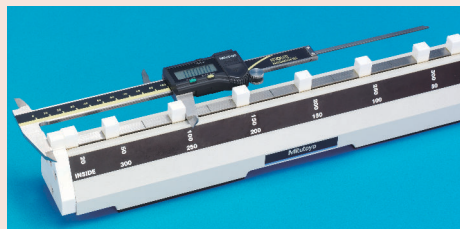
mm



515-571

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

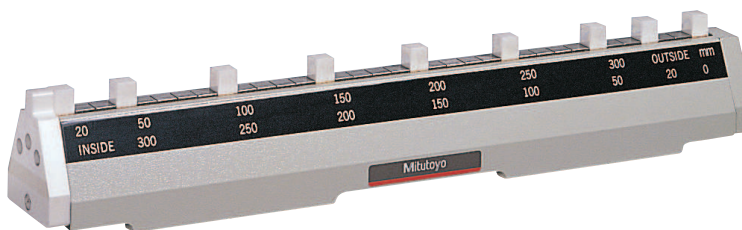


CERA Caliper Checkers

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.

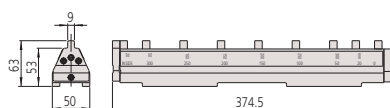


515-555

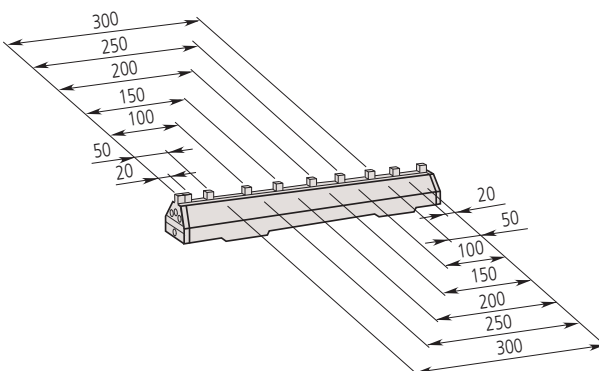
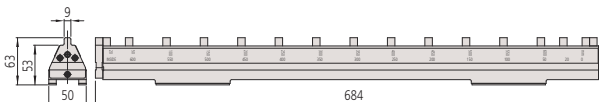
Metric

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

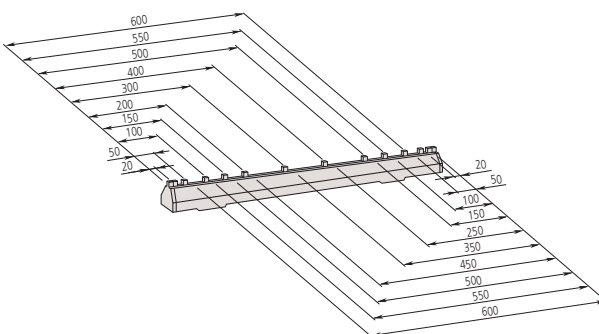
515-555



515-556-2



515-555



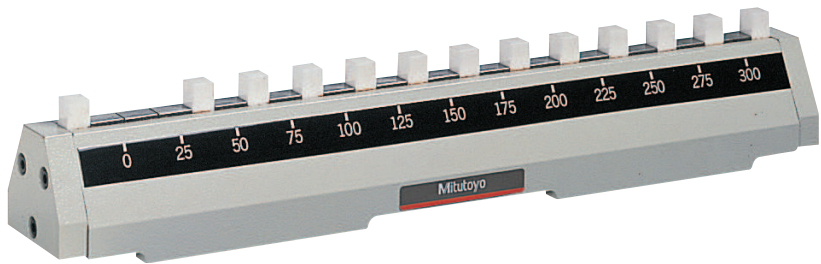
515-556-2

Inside Micro Checkers

Series 515

This Inside Micro Checker offers you the following benefits:

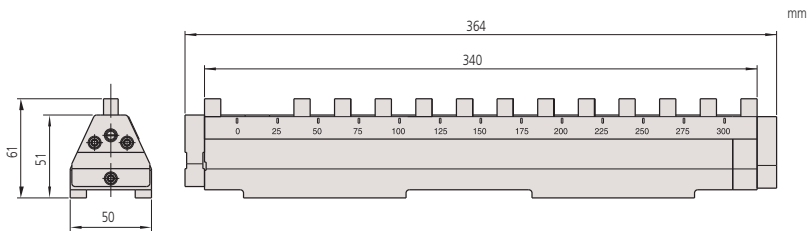
- Applicable for Series 133, 139 and 145 (over 50 mm).
- Not applicable for Series 137, 141, 337 and 339
- It designed to act as a setting standard for inside micrometers.
- It comes with ceramic gauge blocks.



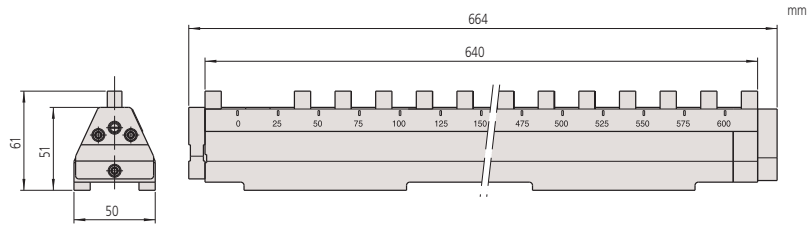
515-585

Metric

No.	Reference length	Delivered	Mass [kg]
515-585	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, 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



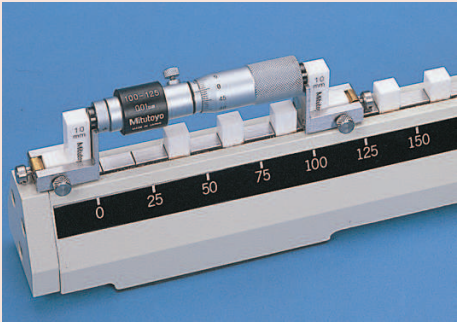
515-586

Specifications

Block pitch accuracy

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

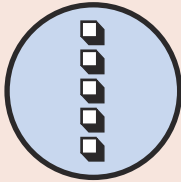
L = Length to check (mm)



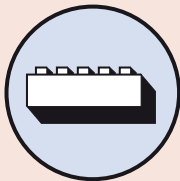
Application with Series 133

Specifications

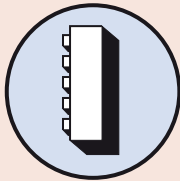
Block step	10 mm
Block pitch accuracy	Range \leq 310 mm: $\pm 2,5 \mu\text{m}$ 310 < range \leq 610 mm: $\pm 3,5 \mu\text{m}$ 610 < range \leq 1010 mm: $\pm 5,0 \mu\text{m}$ 1010 < range \leq 1510 mm: $\pm 8,0 \mu\text{m}$
Parallelism of blocks	Range \leq 310 mm: $1,2 \mu\text{m}$ 310 < range \leq 610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



Single-row 10 mm blocks



Horizontal orientation



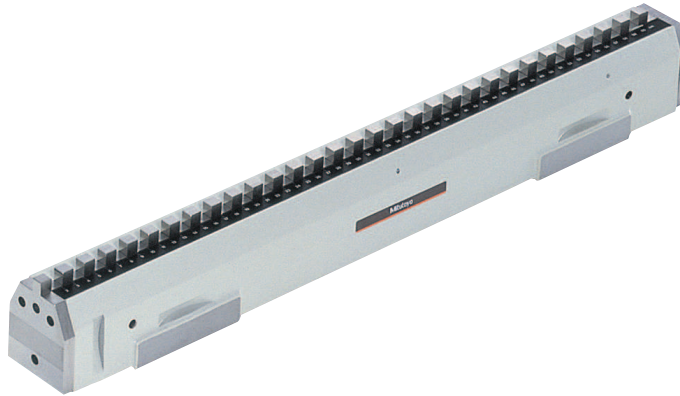
Vertical orientation

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.	Delivered	Mass [kg]
515-720	In a wooden case with certificate of inspection	7
515-721	In a wooden case with certificate of inspection	10
515-722	In a wooden case with certificate of inspection	13
515-723	In a wooden case with certificate of inspection	22
515-724	In a wooden case with certificate of inspection	30



515-724

515-723

515-722

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 $\pm 0,2 \mu\text{m}$.



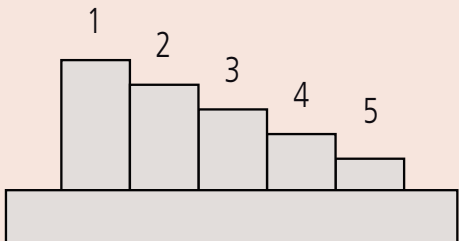
516-499 Ceramic type



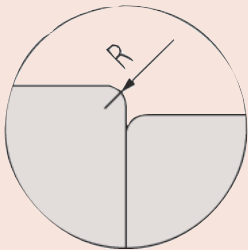
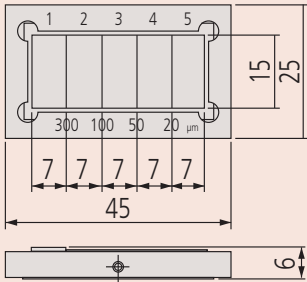
516-199 Steel type

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



Step value	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

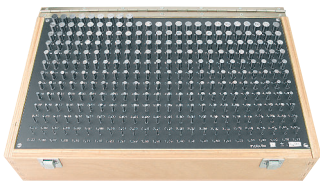


Cylindrical Measuring Pins

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.	Delivered	Accuracy	Grade	Remarks	Mass [kg]
926-210	In a wooden box	DIN 2269	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.	7,335
926-212	In a wooden box	DIN 2269	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.	7,295

Set of 91 pieces

No.	Delivered	Accuracy	Grade	Remarks	Mass [kg]
926-220	In a wooden box	DIN 2269	1	1-10 mm, rising by 0,1 mm	3
926-222	In a wooden box	DIN 2269	2	1-10 mm, rising by 0,1 mm	3

Specifications

Accuracy	DIN 2269
Finish	Very fine ground, from $\varnothing 3 \text{ mm}$ inscribed
Hardness	HRC 60-62
Roughness	$RA \leq 0,1 \mu\text{m}$
Length [mm]	up to $\varnothing 6 \text{ mm} = 50 \text{ mm}$ over $\varnothing 6 \text{ mm} = 70 \text{ mm}$

Specifications

Accuracy	$(1,5+2L/1000) \mu\text{m}$ L = measured length (mm)
Material	Sodium glass
Thermal expansion coefficient	$(8\pm 1) \times 10^{-6}/\text{K}$

Glass Scales

Series 182

These high precision glass scales offer you the following benefits:

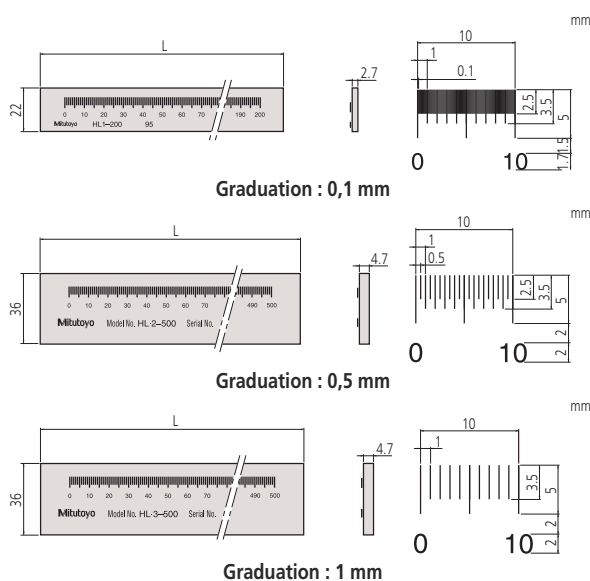
- They are manufactured using Mitutoyo's leading-edge Linear Scale production technology.
- They are ideal for checking the magnification accuracy of profile projectors and microscopes, as well as the table feed accuracy of measuring equipment.



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

Metric

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



Low Expansion Glass Scales

Series 182

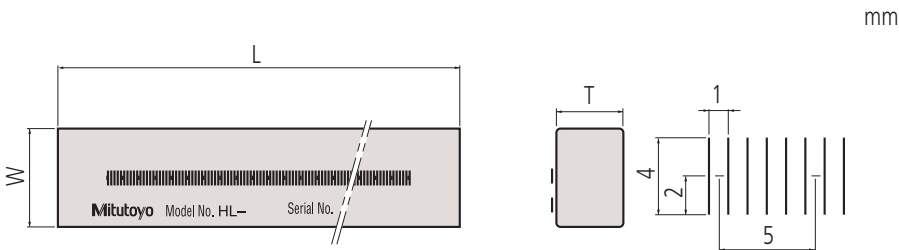
- These high precision glass scales offer you the following benefits:
- They are manufactured using Mitutoyo's leading-edge Linear Scale production technology.
 - You can use them as a standard for calibrating graduating scales, with high accuracy.



182-502-60
182-501-60

Metric

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



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	$(0\pm0,02) \times 10^{-6}/\text{K}$

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



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.



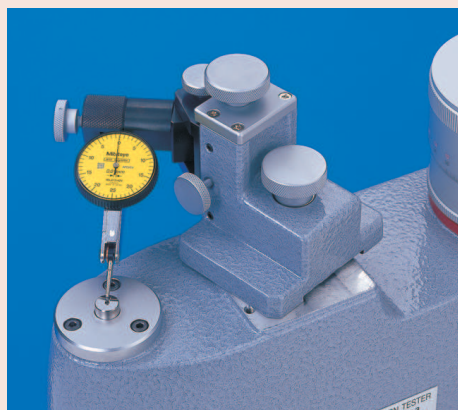
170-102-12

Metric

No.	Delivered	Spindle feed error [µm]	Hysteresis	Mass [kg]
170-102-12	With holder 12AAK821	±2	0,5 µm	7,5

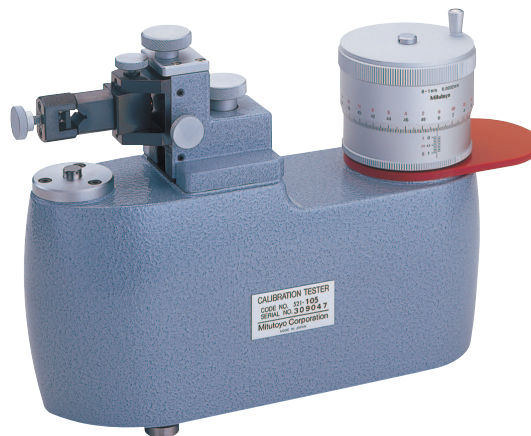
Specifications

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



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.	Spindle feed error [µm]	Hysteresis	Mass [kg]
521-103	±0,2	0,2 µm	7
521-105	±0,8	0,8 µm	7,5

Calibration Testers i-Checker 2000

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.



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



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



170-402D
with optional accessories

Metric			
No.	Delivered	Accuracy	Mass
170-402D	With ø8 mm stem bush, software i-Pak, certificate of inspection	$\pm(0,1+0,4L/100) \mu\text{m}$ L = measured length (mm)	20.0 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]	Resolution	Measuring unit	Mass [kg]
565-151D-01	0,1 - 250	0,4 N (upper) 0,2 N (lower)	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, 0,1µm
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, 0,1µm
516-650E	Maintenance Kit for Gauge Blocks
516-145-E2	Calibration Master for GB-Comparator, 11pcs., Refer to EA-10/02