

Mitutoyo Quality

SMALL TOOL INSTRUMENTS AND DATA MANAGEMENT

HOLTEST / BOREMATIC

High-accuracy Holtest Series micrometers make three-point / two-point bore diameter measurements



Bulletin No. 2230

High-accuracy world-class performing Three-Point / Two-Point Holtest



The Mitutoyo Holtest series, known for its highly stable three-point self-centering action has been further enhanced with titanium nitride coated contact surfaces.

Borematic

- Titanium-coated measuring pins provide excellent durability and impact resistance and allow the instrument to measure right to the bottom of a blind hole.
- Digital display with quick-action lever operation enables quick and easy measurement.
- Built-in Absolute System eliminates the need to set the origin point every time the unit is turned on. The system is immune to over-speed errors, thus increasing the reliability of measurement.
- DIGIMATIC Borematic is compatible with statistical process control systems and measurement support systems.
- Built-in tolerance judgment function allows go/no-go judgment based on user-defined upper and lower limit settings.

Holtest

- Titanium-coated measuring pins provide excellent durability and impact resistance and allow the instrument to measure right to the bottom of a blind hole.
- Three-point design ensures self-centering action for stable measurements in the range above 8mm bore diameter.
- Bore micrometers fitted with the constant-force ratchet enable consistent measurements with minimal operator variation.

Digimatic Holtest

- Titanium-coated measuring pins provide excellent durability and impact resistance and allow the instrument to measure right to the bottom of a blind hole.
- DIGIMATIC Holtest is equipped with a digital display for easy readability.
- ABS (absolute) and INC (incremental) measuring modes are supported for maximum efficiency.
- DIGIMATIC Holtest is compatible with statistical process control systems and measurement support systems.
- DIGIMATIC Holtest can memorize two preset values for the datum point.
- Function lock key prevents changing the datum point accidentally.
- Constant-force ratchet enable consistent measurements with minimal operator variation.

Holtest Type II

- The anvils and cone are made from an alloy tool steel with a hardness of HRC60.5 or more.
- Custom dimensions are available by special order.

Titanium-coated Measuring Pins

A titanium-nitride coating is applied to the contact faces of the measuring pins (over 6mm range models). Titanium-nitride coated measuring pins provide excellent durability and impact resistance.

Measuring a Blind Hole

Measuring pins attached to the anvils permit measuring the diameter of a blind hole almost down to the bottom. *The Holtest type II does not use measuring pins.



Measuring Range	а	b	с		
2-6	—	_	2		
6-12	2	—	2.5		
12-20	0.3 (2.6)	5.6	3.5 (3.5)		
20-30	0.3 (3.4)	8.3	5.2 (5.2)		
30-50	0.3 (3.4)	13	10 (10)		
50-100 / 50-125* *Borematic	0.3 (3.4)	17	14 (14)		
100-300	12.4 (19.6)	21	13.8 (13.8)		
(): Holtest Type II					

Measuring Deep Holes

An extension rod (optional accessory) can be fitted to enable measurement of deep holes.



Inspection Certificate Included

The inspection certificate supplied with each instrument ensures

product quality and safety. Mitutoyo will issue an A2LA/NIST calibration certificate on request for an additional cost.



Borematic Quick, spring-loaded lever action/movement

Individual Gages: includes one digital display unit and one interchangeable measuring head (plus adapter if required)

Metric		Inch/Metric		with titanium-coated measuring pins		
Size range	Order No.	Size range	Order No.	Accuracy	Extension rod	
6-8mm	568-361	0.275 in - 0.350 in	568-461			
8-10mm	568-362	0.350 in - 0.425 in	568-462	±5μm (Witnin 5μm) +0.00025 in (within 0.00025 in)	100mm (952322)	
10-12mm	568-363	0.425 in - 0.500 in	568-463	10.00025 11 (Within 0.00025 11)		
12-16mm	568-364	0.50 in - 0.65 in	568-464	±5µm (within 5µm)	1E0mm (0E2621)	
16-20mm	568-365	0.65 in - 0.80 in	568-465	±0.00025 in (within 0.00025 in)	150mm (952621)	
20-25mm	568-366	0.8 in - 1.0 in	568-466		150mm (952622)	
25-30mm	568-367	1.0 in - 1.2 in	568-467			
30-40mm	568-368	1.2 in - 1.6 in	568-468			
40-50mm	568-369	1.6 in - 2.0 in	568-469			
50-63mm	568-370	2.0 in - 2.5 in	568-470	±6µm (within 6µm)		
62-75mm	568-371	2.5 in - 3.0 in	568-471	±0.0003 in (within 0.0003 in)		
75-88mm	568-372	3.0 in - 3.5 in	568-472		1E0mm (0E2622)	
87-100mm	568-373	3.5 in - 4.0 in	568-473		150mm (952025)	
100-113mm	568-374	4.0 in - 4.5 in	568-474			
112-125mm	568-375	4.5 in - 5.0 in	568-475			



Technical Data

Resolution: 0.001mm or 0.00005 in/0.001mm Display: LCD Response speed: Infinite Battery: SR44 (1 pc), **938882**, for initial operational checks (standard accessory)

Battery life: Approx. 5,000 hours in continuous use Scale type: Electrostatic capacitance absolute encoder

Functions

GO/NO-GO judgment, GO/NO-GO judgment zoom, 2-Point Preset, Zero-setting, Data hold, Error alarm, Low battery voltage alert, Data output, Function Lock, 330° rotary display, inch/mm conversion (inch/mm models)

Optional Accessory

:	Extension rod (refer to the order No. list)
02AZE140F:	For foot switch
02AZD790F:	For standard (160mm)
	Connecting cables for U-WAVE-T
06ADV380F:	USB Input Tool Direct (2m)
905409:	SPC cable (2m)
905338:	SPC cable (1m)
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Extension rod

Complete Unit Gage Sets: includes several individual gages to cover the overall size range of the set

Metric with titanium-coated measuring pins			Inch/Metric		with titanium-coated measuring		
Overall range	Order No.	Range of Individual gages	Setting rings included	Overall rang	e Order No.	Range of Individual gages	Setting rings included
6-12mm	568-955	6-8, 8-10, 10-12mm	ø8mm, ø10mm	0.275 in-0.5 i	n 568-965	0.275-0.35 in, 0.35-0.425 in, 0.425-0.5 in	0.35 in DIA., 0.425 in DIA.
12-25mm	568-956	12-16, 16-20, 20-25mm	ø16mm, ø20mm	0.5 in-1 in	568-966	0.5-0.65 in, 0.65-0.8 in, 0.8-1 in	0.65 in DIA., 0.8 in DIA.
25-50mm	568-957	25-30, 30-40, 40-50mm	ø25mm, ø40mm	1 in-2 in	568-967	1-1.2 in, 1.2-1.6 in, 1.6-2 in	1.2 in DIA., 1.6 in DIA.
50-75mm	568-958	50-63, 62-75mm	ø62mm	2 in-3 in	568-968	2-2.5 in, 2.5-3 in	2.5 in DIA.
75-100mm	568-959	75-88, 87-100mm	ø87mm	3 in-4 in	568-969	3-3.5 in, 3.5-4 in	3.5 in DIA.

Interchangeable-Head Sets: includes one digital display unit with several interchangeable measuring heads (and adapters as required) to cover the total size range plus one extension rod

Metric		with	titanium-coated measuring pins	Inch/Metric		wit	h titanium-coated measuring pins
Overall range	Order No.	Range of each head	Setting rings included	Overall range	Order No.	Range of Individual gages	Setting rings included
6-12mm	568-924	6-8, 8-10, 10-12mm	ø8mm, ø10mm	0.275 in-0.5 in	568-928	0.275-0.35 in, 0.35-0.425 in, 0.425-0.5 in	0.35 in DIA., 0.425 in DIA.
12-25mm	568-925	12-16, 16-20, 20-25mm	ø16mm, ø20mm	0.5 in-1 in	568-929	0.5-0.65 in, 0.65-0.8 in, 0.8-1 in	0.65 in DIA., 0.8 in DIA.
25-50mm	568-926	25-30, 30-40, 40-50mm	ø30mm, ø40mm	1 in-2 in	568-930	1-1.2 in, 1.2-1.6 in, 1.6-2 in	1.2 in DIA., 1.6 in DIA.
50-100mm	568-927	50-63, 62-75, 75-88,	ø62mm, ø87mm	2 in-4 in	568-936	2-2.5 in, 2.5-3 in, 3-3.5 in, 3.5-4 in	2.5 in DIA., 3.5 in DIA.
50 10011111		87-100mm					





Interchangeable-Head Set: 568-957

(IP)65

Digimatic Holtest

Stable, micrometer-based movement

Individual Gages: includes one combination display unit and one interchangeable measuring head

Metric		Inch/Metric		with titanium-coated measuring pins		
Range	Order No.	Range	Order No.	Accuracy	Extension rod	
6-8mm	468-161	0.275 in - 0.35 in	468-261	2 (
8-10mm	468-162	0.35 in - 0.425 in	468-262	$\pm 2\mu m$ (max diff. of $2\mu m$) ± 0.0001 in (max diff. of 0.0001 in)	100mm (952322	
10-12mm	468-163	0.425 in - 0.5 in	468-263			
12-16mm	468-164	0.5 in - 0.65 in	468-264	±3μm (max diff. of 2μm)	150mm (052621	
16-20mm	468-165	0.65 in - 0.8 in	468-265	±0.00015 in (max diff. of 0.00015 in)	150mm (952021	
20-25mm	468-166	0.8 in - 1 in	468-266			
25-30mm	468-167	1 in - 1.2 in	468-267		150mm /052622	
30-40mm	468-168	1.2 in - 1.6 in	468-268	$\pm 3\mu$ m (max diff. of 3μ m) ± 0.00015 in (max diff. of 0.00015 in)	150mm (952022	
40-50mm	468-169	1.6 in - 2 in	468-269	±0.00015 III (IIIax uIII. 01 0.00015 III)		
50-63mm	468-170	2 in - 2.5 in	468-270			
62-75mm	468-171	2.5 in - 3 in	468-271			
75-88mm	468-172	3 in - 3.5 in	468-272	$\pm 4\mu m$ (max diff. of 4 μ m) +0.0002 in (max diff. of 0.0002 in)		
87-100mm	468-173	3.5 in - 4 in	468-273			
100-125mm	468-174	4 in - 5 in	468-274			
125-150mm	468-175	5 in - 6 in	468-275	±5μm (max diff. of 5μm)	150mm (052622	
150-175mm	468-176	6 in - 7 in	468-276	±0.00025 in (max diff. of 0.00025 in)		
175-200mm	468-177	7 in - 8 in	468-277			
200-225mm	468-178	8 in - 9 in	468-278			
225-250mm	468-179	9 in - 10 in	468-279	±6μm (max diff. of 6μm)		
250-275mm	468-180	10 in - 11 in	468-280	±0.0003 in (max diff. of 0.0003 in)		
275-300mm	468-181	11 in - 12 in	468-281			

Technical Data

Display: LCD Battery: SR44 (1 pc), **938882**,

for initial operational checks (standard accessory) Battery life: Approx. 1.2 years under normal use Scale type: Electromagnetic induction rotary encoder

Functions

Zero-setting, Origin restoration, Data hold, 2-point Preset Function lock (see illustration of lock symbol below)

Optional Accessories

05CZA662:	SPC cable (1m)				
05CZA663:	SPC cable (2m)				
06ADV380B:	USB Input Tool Direct (2m)				
Connecting cables for U-WAVE-T 02AZD790B : For standard (160mm) 02A7E140B : For foot switch					
04AZB157: :	Mounting bracket Extension rod (refer to the order No. list				





Complete Unit Sets: includes several individual gages to cover the overall size range of the set

Metric	etric with titanium-coated measuring pins			Inch/Metric		wit	h titanium-coated measuring pins
Overall range	Order No.	Range of Individual gages	Setting rings included	Overall range	Order No.	Range of Individual gages	Setting rings included
6-12mm	468-981	6-8, 8-10, 10-12mm	ø8mm, ø10mm	0.275 in-0.5 in	468-986	0.275-0.35 in, 0.35-0.425 in, 0.425-0.5 in	0.35 in DIA., 0.425 in DIA.
12-25mm	468-982	12-16, 16-20, 20-25mm	ø16mm, ø20mm	0.5 in-1 in	468-987	0.5-0.65 in, 0.65-0.8 in, 0.8-1 in	0.65 in DIA., 0.8 in DIA.
25-50mm	468-983	25-30, 30-40, 40-50mm	ø30mm, ø40mm	1 in-2 in	468-988	1-1.2 in, 1.2-1.6 in, 1.6-2 in	1.2 in DIA., 1.6 in DIA.
50-75mm	468-984	50-63, 62-75mm	ø62mm	2 in-3 in	468-989	2-2.5 in, 2.5-3 in	2.5 in DIA.
75-100mm	468-985	75-88, 87-100mm	ø87mm	3 in-4 in	468-990	3-3.5 in, 3.5-4 in	3.5 in DIA.

Interchangeable-Head Gage Sets: includes one combination display unit with several interchangeable measuring heads to cover the total size range plus one extension rod

Metric with titanium-coated measuring pin						
Range	Order No.	Range of each head	Setting rings included			
6-12mm	468-971	6-8, 8-10, 10-12mm	ø8mm, ø10mm			
12-20mm	468-972	12-16, 16-20mm	ø16mm			
20-50mm	468-973	20-25, 25-30, 30-40, 40-50mm	ø25mm, ø40mm			
50-100mm	468-974	50-63, 62-75, 75-88, 87-100mm	ø62mm, ø87mm			
100-200mm	468-975	100-125, 125-150, 150-175, 175-200mm	ø125mm, ø175mm			

Inch/Metric		wit	h titanium-coated measuring pins
Range	Order No.	Range of each head	Setting rings included
0.275 in-0.5 in	468-976	0.275-0.35 in, 0.35-0.425 in, 0.425-0.5 in	0.35 in DIA., 0.425 in DIA.
0.5 in-0.8 in	468-977	0.5-0.65 in, 0.65-0.8 in	0.65 in DIA.
0.8 in-2 in	468-978	0.8-1 in, 1-1.2 in, 1.2-1.6 in, 1.6-2 in	1 in DIA., 1.6 in DIA.
2 in-4 in	468-979	2-2.5 in, 2.5-3 in, 3-3.5 in, 3.5-4 in	2.5 in DIA., 3.5 in DIA
4 in-8 in	468-980	4-5 in, 5-6 in, 6-7 in, 7-8 in	5 in DIA., 7 in DIA.





Interchangeable-Head Sets (interchangeable measuring heads)

Holtest

Stable, micrometer-based movement

Individual Gages: includes a micrometer thimble with measuring head

Metric		Inch/Metric		with titanium-coated measuring pins		
Size range	Order No.	Size range	Order No.	Accuracy	Extension rod	
2-2.5mm	368-001	0.08 in - 0.1 in	368-021			
2.5-3mm	368-002	0.1 in - 0.12 in	368-022			
3-4mm	368-003	0.12 in - 0.16 in	368-023			
4-5mm	368-004	0.16 in - 0.2 in	368-024	2 / I''(2)	_	
5-6mm	368-005	0.2 in - 0.24 in	368-025	$\pm 2\mu$ m (max diff. 2μ m) ± 0.0001 in (max diff. 0.0001 in)		
—	—	0.24 in - 0.28 in	368-026	±0.0001 III (IIIdx uitt. 0.0001 III)		
6-8mm	368-161	0.275 in - 0.35 in	368-261			
8-10mm	368-162	0.35 in - 0.425 in	368-262		100mm (952322)	
10-12mm	368-163	0.425 in - 0.5 in	368-263			
12-16mm	368-164	0.5 in - 0.65 in	368-264		1E0mm (0E2621)	
16-20mm	368-165	0.65 in - 0.8 in	368-265		130mm (332021)	
20-25mm	20-25mm 368-166 0.		368-266			
25-30mm 368-167		1 in - 1.2 in	368-267	$\pm 3\mu$ m (max diff. 3μ m) ± 0.00015 in (max diff. 0.00015 in)	150mm (052622)	
30-40mm	30-40mm 368-168 1.2	1.2 in - 1.6 in	368-268	10.00015 III (IIIdx dill. 0.00015 III)		
40-50mm	40-50mm 368-169 1		368-269			
50-63mm	368-170	2 in - 2.5 in	368-270			
62-75mm	368-171	2.5 in - 3 in	368-271	A (
75-88mm	368-172	3 in - 3.5 in	368-272	$\pm 4\mu$ m (max diff. 4μ m) ± 0.0002 in (max diff. 0.0002 in)		
87-100mm	368-173	3.5 in - 4 in	368-273			
100-125mm	368-174	4 in - 5 in	368-274			
125-150mm	368-175	5 in - 6 in	368-275	±5µm (max diff. 5µm)	1E0mm (0E2622)	
150-175mm 368-176 6 in		6 in - 7 in	368-276	±0.00025 in (max diff. 0.00025 in)	15011111 (952025)	
175-200mm	368-177	7 in - 8 in	368-277			
200-225mm	368-178	8 in - 9 in	368-278			
225-250mm	368-179	9 in - 10 in	368-279	±6μm (max diff. 6μm)		
250-275mm	368-180	10 in - 11 in	368-280	±0.0003 in (max diff. 0.0003 in)		
275-300mm	368-181	11 in - 12 in	368-281			

Technical Data

Accuracy: Refer to the order No. list. Graduation: 0.001mm, 0.005mm*, 0.0001 in or 0.0002 in* (*over 12mm or 0.5 in models) Metric

	Range	Measuring method	Measuring pin material				
	2-3mm 0.08-0.12 in	Two-point	Carbide				
	3-6mm 0.12-0.28 in	Two-point	Carbide				
6-12mm 0.28-0.5 in		Three-point	Carbide				
over 12mm over 0.5 in		Three-point	Titanium-coated alloy steel				

Optional Accessories

Extension rod (refer to the order No. list)

Name of Each Part



Complete Unit Gage Sets: includes several individual gages to cover the overall size range of the set

Metric		with	titanium-coated measuring pins
Overall range	Order No.	Range of each gage	Setting rings included
2-3mm	368-906	2-2.5, 2.5-3mm	ø2.5mm
3-6mm	368-907	3-4, 4-5, 5-6mm	ø4mm, ø5mm
6-12mm	368-911	6-8, 8-10, 10-12mm	ø8mm, ø10mm
12-20mm	368-912	12-16, 16-20mm	ø16mm
20-50mm	368-913	20-25, 25-30, 30-40, 40-50mm	ø25mm, ø40mm
50-100mm	368-914	50-63, 62-75, 75-88, 87-100mm	ø62mm, ø87mm
100-200mm	368-915	100-125, 125-150, 150-175, 175-200mm	ø125mm, ø175mm



Inch/Metric		with	titanium-coated measuring pins
Overall range	Order No.	Range of each gage	Setting rings included
0.08 in-0.12 in	368-926	0.08-0.1 in, 0.1-0.12 in	0.1 in DIA.
0.12 in-0.28 in	368-927	0.12-0.16 in, 0.16-0.2 in, 0.20.24 in, 0.24028 in	0.16 in DIA., 0.24 in DIA.
0.275 in-0.5 in	368-916	0.275-0.35 in, 0.35-0.425 in, 0.425-0.5 in	0.35 in DIA., 0.5 in DIA.
0.5 in-0.8 in	368-917	0.5-0.65 in, 0.65-0.8 in	0.65 in DIA.
0.8 in-2 in	368-918	0.8-1 in, 1-1.2 in, 1.2-1.6 in, 1.6-2 in	1 in DIA., 1.6 in DIA.
2 in-4 in	368-919	2-2.5 in, 2.5-3 in, 3-3.5 in, 3.5-4 in	2.5 in DIA., 3.5 in DIA.
4 in-8 in	368-920	4-5 in, 5-6 in, 6-7 in, 7-8 in	5 in DIA., 7 in DIA.



368-912

Holtest Type II

Stable, micrometer-based movement

Individual Gages: includes a micrometer thimble with measuring head

Metric		Inch/Metric			
Range	Order No.	Range	Order No.	Accuracy	Extension rod
12-16mm	368-764	0.5 in - 0.65 in	368-864	±2µm (within 2µm)	1E0mm (0E2621)
16-20mm	368-765	0.65 in - 0.8 in	368-865	±0.0001 in (within 0.0001 in)	150mm (95202 i)
20-25mm	368-766	0.8 in - 1 in	368-866		
25-30mm	368-767	1 in - 1.2 in	368-867		1E0mm (0E2622)
30-40mm	368-768	1.2 in - 1.6 in	368-868		
40-50mm	368-769	1.6 in - 2 in	368-869	±3µm (within 3µm)	
50-63mm	368-770	2 in - 2.5 in	368-870	±0.00015 in (within 0.00015 in)	
62-75mm	368-771	2.5 in - 3 in	368-871		
75-88mm	368-772	3 in - 3.5 in	368-872		
87-100mm	368-773	3.5 in - 4 in	368-873		
100-125mm	368-774	4 in - 5 in	368-874		
125-150mm	368-775	5 in - 6 in	368-875		1E0mm (0E2622)
150-175mm	368-776	6 in - 7 in	368-876		
175-200mm	368-777	7 in - 8 in	368-877	±5µm (within 5µm)	
200-225mm	368-778	8 in - 9 in	368-878	±0.00025 in (within 0.00025 in)	
225-250mm	368-779	9 in - 10 in	368-879		
250-275mm	368-780	10 in - 11 in	368-880		
275-300mm	368-781	11 in - 12 in	368-881		



Technical Data

Accuracy:	Refer to the list of specifications.
Graduation:	0.005mm or 0.0002 in
Measuring method:	Three-point method
Contact point:	Hardened steel

Complete Unit Gage Sets:

includes several individual gages to cover the
overall size range of the set

Metric				
Overall range	Order No.	Range of each gage	Setting rings included	
12-20mm	368-991	12-16, 16-20mm	ø16mm	
20-50mm	368-992	20-25, 25-30, 30-40, 40-50mm	ø25mm, ø40mm	
50-100mm	368-993	50-63, 62-75, 75-88, 87-100mm	ø62mm, ø87mm	
100-200mm	368-994	100-125, 125-150, 150-175, 175-200mm	ø125mm, ø175mm	



Overall range	Order No.	Range of each gage	Setting rings included
0.5 in-0.8 in	368-995	0.5-0.65 in, 0.65-0.8 in	0.65 in DIA.
0.8 in-2 in	368-996	0.8-1 in, 1-1.2 in, 1.2-1.6 in, 1.6-2 in	1 in DIA., 1.6 in DIA.
2 in-4 in	368-997	2-2.5 in, 2.5-3 in, 3-3.5 in, 3.5-4 in	2.5 in DIA., 3.5 in DIA.
4 in-8 in	368-998	4-5 in, 5-6 in, 6-7 in, 7-8 in	5 in DIA., 7 in DIA.









Optional Setting Rings



Features

- Used for quick zero adjustment of dial bore gages, Holtest and inside micrometers.
- Actual inside diameter is marked on each ring.
- Ceramic setting rings do not require anticorrosion treatment and have extremely high wear-resistance, resulting in simple maintenance and long life.

Technical Data

The marked value may differ from nominal size by: ±10µm for ø1-100mm ±20µm for ø125-300mm ±0.0004" for 0.1"-1.8 in DIA. ±0.0008" for 2"-12 in DIA.

Cylindricity of setting rings: 1.0µm for ø1-60mm 1.5µm for ø62-90mm 2.0µm for ø100-150mm 2.5µm for ø175-225mm 3.0µm for ø250-300mm 0.00004" for 0.1" - 2.4" DIA. 0.00006" for 2.5" - 3.6" DIA. 0.00008" for 4" - 6" DIA. 0.00010" for 7" - 9" DIA.

Measuring Direction

0.00012" for 10" - 12" DIA.



Inch		
Size	Order No.	Accuracy*
0.1"	177-209	
0.16"	177-206 / 177-518**	
0.24"	177-207 / 177-520**	
0.275"	177-281 / 177-522**	
0.35"	177-179 / 177-523**	
0.425"	177-283 / 177-524**	
0.50"	177-180 / 177-525**	
0.60"	177-181	
0.65"	177-182 / 177-527**	
0.70"	177-183	
0.80"	177-287 / 177-529**	
1.0"	177-184 / 177-530**	
1.2"	177-289 / 177-531**	±0.00006"
1.4"	177-185 / 177-532**	
1.6"	177-291 / 177-533**	
1.8"	177-186 / 177-534**	
2.0"	177-187	
2.4"	177-293	
2.5"	177-315	
2.8"	177-188	
3.0"	177-317	
3.2"	177-295	
3.5"	177-319	
3.6"	177-189	
4.0"	177-297	
5.0"	177-299	
6.0"	177-301	
7.0"	177-303	
8.0"	177-305	+0 0001 "
9.0"	177-307	10.0001
10.0"	177-309	
11.0"	177-311	
12.0"	177-313	
*Accuracy of ma	arked diameter	

Size	Order No.	Accuracy*
1mm	177-220	/ lecaracy
1 1mm	177-222	
1.7mm	177-225	
1.2mm	177-223	
1.Jmm	177-227	
1.75mm	177-236	
7.7.511111 7mm	177 220	
2111111 2.2Emm	177 242	
2.2011111	177 200	
2.5[1][1]	177-208	
2.7511111	1//-240	
311111 2.25mm	177-240	
3.2011111	1/7-200	
3.5mm	1//-252	
3./5mm	1//-255	
4mm	1//-204 / 1//-418**	
4.5mm	177-257	
5mm	177-205	
5.5mm	177-263	±1.5µm
6mm	177-267 / 177-420**	
6.5mm	177-271	
7mm	177-275	
8mm	177-125 / 177-423**	
9mm	177-279	
10mm	177-126 / 177-424**	
12mm	177-284 / 177-425**	
14mm	177-132	
16mm	177-177 / 177-427**	
17mm	177-133	
18mm	177-285	
20mm	177-286 / 177-429**	
25mm	177-139 / 177-430**	
30mm	177-288 / 177-431**	
35mm	177-140 / 177-432**	
40mm	177-290 / 177-433**	
45mm	177-178 / 177-434**	
50mm	177-146	
60mm	177-292	
62mm	177-314	
70mm	177-147	
75mm	177-316	
80mm	177-294	
87mm	177-318	
90mm	177-148	
100mm	177-296	±2.5um
125mm	177-298	- F
150mm	177-300	
175mm	177-302	
200mm	177-304	
225mm	177-306	
250mm	177-308	
275mm	177-310	
300mm	177-312	
Juonin	177-512	

Matula

**Ceramic

*Accuracy of marked diameter **Ceramic

Dimensions



Borematic

Holtest



		Unit: mm
	_	
L2		
,	1 1	

Range	L2	Lı		
2-3	12 103.5 - 104			
3-6	22	2 113 - 114		
External appearance differs				

Nange	L2	LI	
6-12	59	102 - 104	
12-20	82	126 - 130	
20-30	94	137 - 142	
30-50	102	145 - 155	
50-100	105	150 - 163	
100-300	161	227 - 252	
External appearance differs depending on the measuring range.			

Digimatic Holtest



Holtest Type II



Unit: mm

Range	Lz	Lı	
12-20	82	126 - 130	
20-30	94	137 - 142	
30-50	102	145 - 155	
50-100	105	150 - 163	
100-300	161	227 - 252	

External appearance differs depending on the measuring range.





WILLRICH PRECISION

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