

Mitutoyo

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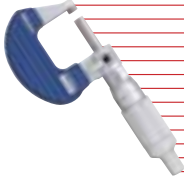
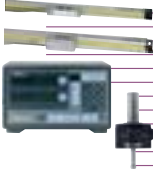






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Small Tool Instruments and Data Management



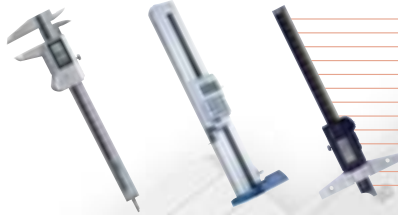
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PRODUCT NEWS



MeasurLink® Statistical software

Detailed information on page 15.



USB-Interface

Detailed information on page 19.



Data transmitter DMX-1 USB

Detailed information on page 20.



Data transmitter DMX-2 USB

Detailed information on page 20.



MeasurLink® Statistical software



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"DIGIMATIC" Mini-Processors



Pages 16–17

Signal cables



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"DIGIMATIC" Data transmitters



Pages 19–23



Basic information to statistical process control SPC

- **Quality Control (abbreviated "QC")**

Inspection, analysis and action applied to manufacturing operation to economically achieve and maintain the required level of quality of the product and service. Statistical quality control (abbreviated SQC) applies statistical techniques to quality control.

- **Subgroup**

To investigate whether or not measurements are stable, samples are taken from the entire set of measurements and classified according to time, raw material, and other factors. Each set of samples is called a subgroup.

- **BIAS**

The difference between the mean (or estimated mean) of measurements and the expected value.

- **Dispersion**

A measure of the variation of measurements. The degree of dispersion is usually quantified in terms of the standard deviation.

- **Sample**

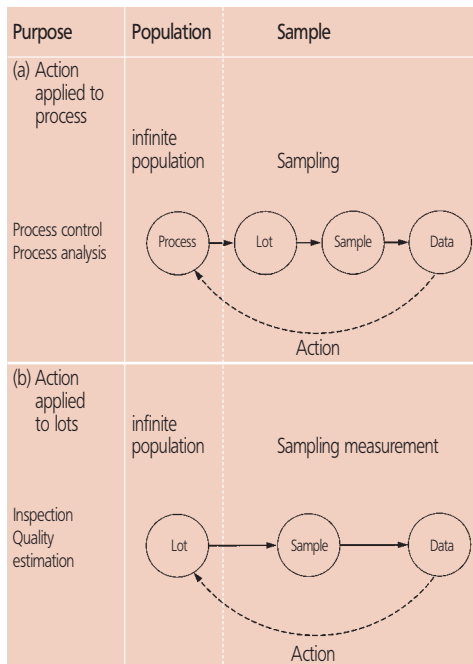
A collection of objects that are taken from a population in order to investigate specific characteristics.

- **Sample size**

The number of objects in a sample.

- **Population**

The entire group of objects to which statistical analysis is applied.



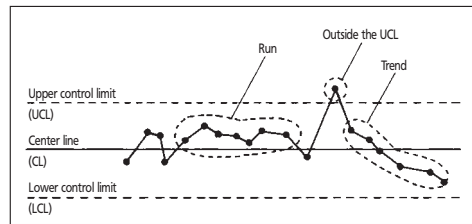
- **Process capability**

Process capability is the reproducibility of the product when the process is under control and any assignable causes of error have been removed.

- **Control chart**

The control chart shows the central tendency of the quality characteristics. It is used for effectively implementing process control by determining whether a variation in quality is assignable to a change in process conditions or to random causes.

A control chart consists of a center line (CL) and upper and lower control limit lines (UCL and LCL, upper and lower tolerance limits respectively) which are determined based on the past performance of the manufacturing process. If the characteristic values plotted on the chart are between the upper and lower control limits and are free from abnormal tendencies, the process is considered to be under control.

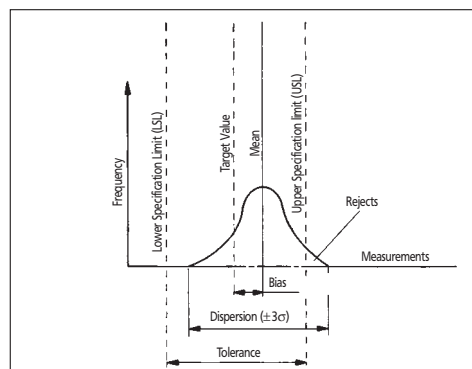


- **\bar{X} R chart**

The \bar{X} R chart is a combination of a \bar{X} chart (which indicates the mean of each subgroup) and an R chart (which indicates the range of dispersion). It provides very useful information for checking abnormal conditions based on the tendency of the mean and range of subgroups. It is often used for controlling the process in terms of dimensions, yield, tensile strength, and other quality characteristics of the product.

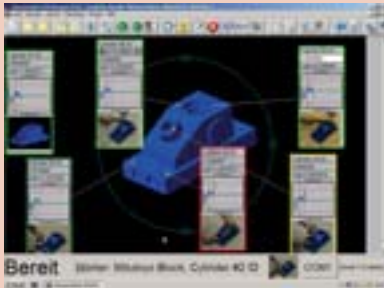
- **Histogram**

A graphical representation of the distribution of measurements by means of rectangles whose widths represents intervals into which the range (maximum – minimum) of observed values is divided and whose heights represent the number of observations occurring in each interval (frequency). It provides an overview of the mean and the degree of dispersion. When the plotted points are distributed in a symmetrical, bell-shaped form, it is called the normal distribution.





Real-Time_Stat-Measure



Real-Time-Plus_Stat-Measure-Plus



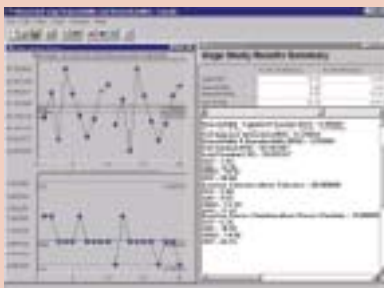
Process Analyzer



Process Manager



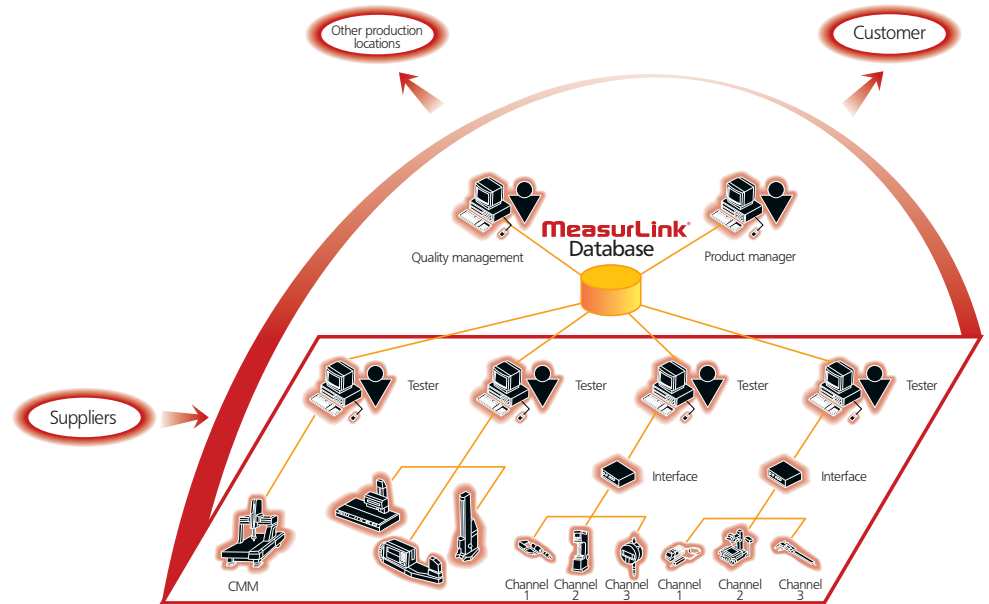
Gauge management



Gage-RR

MeasurLink®

The complete solution for quality data processing with no limits



Universal compatibility with custom functionality

Now all-encompassing quality assurance is even more efficient and convenient with measuring instruments from Mitutoyo and MeasurLink®, the comprehensive software for evaluating and exchanging quality data.

MeasurLink® supports all Mitutoyo digital measuring systems – from calipers through to vision systems or coordinate measuring machines.

Even data from analogue devices can be easily integrated into the process environment after manual acquisition.

With its open program architecture, MeasurLink® can even process the measuring results from instruments from other manufacturers and incorporate them into its own work processes. This places the user in a whole new dimension of measured-data-assisted quality assurance.

With MeasurLink®, all Mitutoyo measuring systems can now be combined in a single quality analysis system.

Data obtained from various instruments is collated centrally, evaluated and efficiently documented according to need. This database is then available to all users within the company, optimising quality assurance. It is completely irrelevant whether the measuring systems networked with MeasurLink® are concentrated in one site in the company or are scattered over several locations – one important benefit for international users.

What is more: the networking capabilities of MeasurLink® reach far beyond your own company. MeasurLink® can also link your supplier's Mitutoyo measuring systems into its own data monitoring process, regardless of whether the supplier is based in the immediate neighbourhood or on the other side of the world, and no matter what type of measuring system from the wide Mitutoyo range is used there.



Pocket-ML

"DIGIMATIC" Mini Processor Type DP-1 VR

- Mitutoyo's DP-1 VR is so compact, it fits right on your palm. But with this powerful little device you can print data from calipers, micrometers and other measuring devices equipped with DIGIMATIC port and even perform statistical evaluations.
- Printing speed is excellent, too, easy accessible with a one-touch start and with the built in thermal line printer there's almost no noise. The thermosensitive paper has outstanding durability and chemical resistance for long-term storage.
- The DP-1 VR even lets you transmit the data to a computer using an RS-232 C connecting cable.
- Easy printing function
- Excellent readability due to large character print
- Clock function for loading measuring data
- Processing Capacity for up to 9.999 data

Series 264



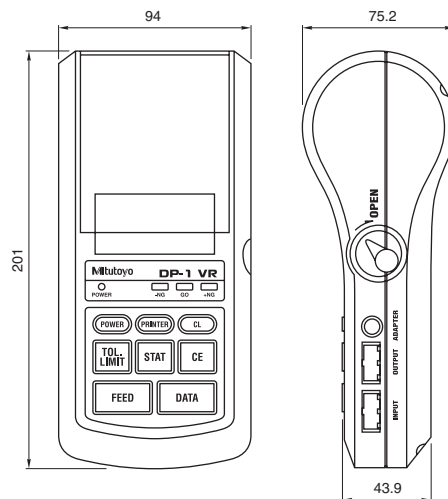
No. 264-504 D (DP-1 VR)



Example for application



No. 937179 T



Dimensions in mm

Specifications

No. 264-504 D	DP-1 VR
Printing method:	Thermal line printer
Printing dot:	384 dot (8 dot / mm)
Printing speed:	6.5 mm/s (using AC adapter)
Printing paper:	48 m
Printing line:	ca. 6500 lines for large characters ca. 12.000 lines for normal characters
Processing capacity:	Mode 1/2/3: 9.999 data Mode 0: 100.000 data
Printing data:	Measurement data, GO/±NG judgment, number of data, maximum / minimum value, range, average, standard deviation, number of defective, fraction defective, process capability index, histogram, D-chart, control chart generation for Xd-bar and control limit data, date and time
Output function:	Output the measuring data (RS-232 C) or GO/±NG judgment
Input timer:	0,25 s; 1 s; 5 s; 30 s; 1 min; 30 min; 60 min (0.25 sec. only statistical function)
Power:	AC adapter 6 V (no interchangeable to DP-1 HS) Electric battery: LR-6 (alkaline), Ni-MH (rechargeable, batteries are not charged in the device)
Battery life:	10 years (clock battery), 10,000 lines (1600 mA 1time/5 sec. using the nickel hydrofluoric battery)
Operating temperature:	(using AC adapter): 0° to 45° C/ (using battery): 10° to 45° C
Storage temperature:	-10° to 50° C

Standard accessories

- No. 09EAA088 D AC adapter
- No. 09EAA069 D Printer paper (1 roll)

Optional accessories

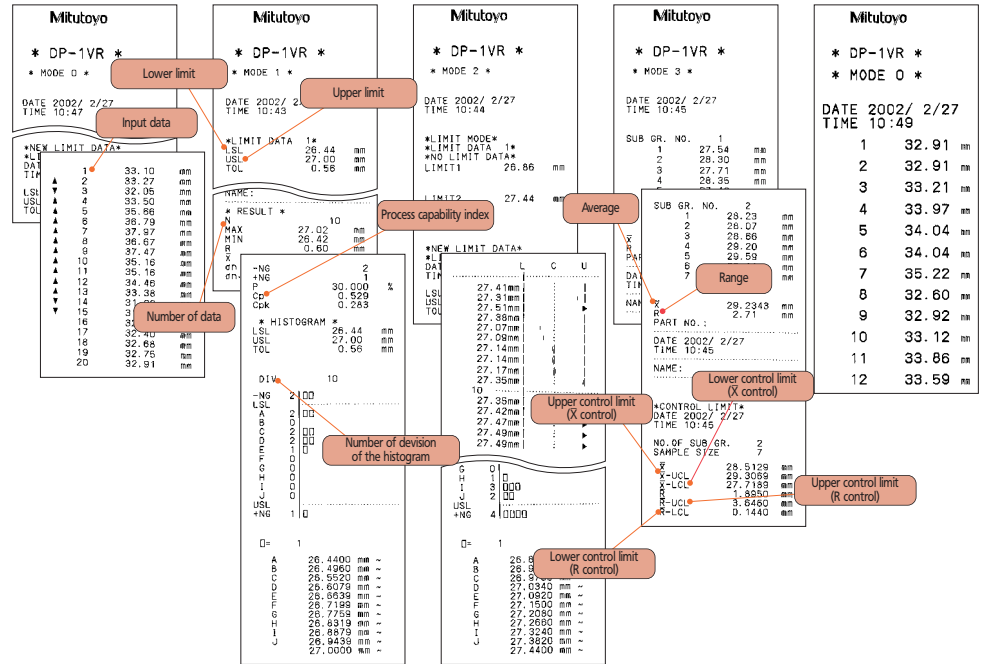
- No. 937179 T Footswitch
- No. 09EAA084 RS-232 C-Signal cable 1 m (9-Pin)
for connection DP-1 VR to PC
- No. 965516 GO/NG Cable
- No. 09EAA094 RS-232 C-Signal cable 1 m (25-Pin)
For DP-1 VR connection to display
Glass scale KS/KC/KL/KLL/KA

Consumable Spares

- No. 011037 LR-6 batteries (4 pieces)
- No. 011348 NI-MH-batteries (rechargeable)
- No. 09EAA082-5 Printer paper (5 rolls)

"DIGIMATIC" Mini Processor Type DP-1 VR

Series 264



Key functions

PRINTER ON/OFF	Mode 0	Mode 1, 2
CL	Only measurement data clear. Press before setting limit.	
CE	Cancel the previous measurement data.	
TOLLIMIT	Press before entering or finish the upper/lower measurement mode. Cancel measurement mode.	
STAT	Do not operate	Making histogram to printout the calculation result via statistical analysis
FEED	Printer paper is fed when this key is pressed	
DATA	Enter data via measuring devices	
PRINTER ON/OFF	Controls the printer's ON/OFF status	
POWER	Power ON/OFF	

Mode 3		
	Subgroup in measurement	Subgroup after measurement
CL	Reentering from data No. 1	Only measurement data clear.
CE	Cancel previous measurement data.	Cancel previous subgroup.
TOLLIMIT	Exiting the measurement.	Go to next subgroup measurement.
STAT	Finish the subgroup measurement. Printout the X-R calculation result.	Print out and calculate the control limit value from each subgroup to complete
FEED	Printer paper is fed when this key is pressed	
DATA	Enter data via measuring devices	
PRINTER ON/OFF	Controls the printer's ON/OFF status	
POWER	Power ON/OFF	

"DIGIMATIC" Signal Cables

- Mitutoyo's "DIGIMATIC"-format allows for connecting not only numerous additional devices, such as printers, counters and the like, but also for connecting one or more "DIGIMATIC"-measuring instruments to an external PC employing a Mitutoyo transmitter with RS-232 C signal cable.



Plug connectors to the measuring instruments

Plug connectors to the peripherals (DMX transmitters or data printers)

"DIGIMATIC" measuring instruments require either of the following items for data transmission:

1. Footswitch
2. Data key on the instrument (if present)
3. Data request from the PC
4. Signal cables with data key (if connectable to the measuring instrument)

Order No.		Port	Application with	Measurement instruments Signal cable plugs	
1 m	2 m				
905338	905409		ABSOLUTE DIGIMATIC Dial Indicator Type IDS (Series 543) ABSOLUTE DIGIMATIC Dial Indicator Type IDC (Series 543) ABSOLUTE DIGIMATIC Dial Indicator Type IDU (Series 575) ABSOLUTE DIGIMATIC Thickness gauge (Series 547) ABSOLUTE DIGIMATIC Caliper (Series 500 with the exception of IP-65/66/67 calipers, Series 550, 551, 573) "DIGIMATIC" Workshop Caliper (Series 552) "DIGIMATIC" Height gauge (Series 192, 570) ABSOLUTE DIGIMATIC Depth gauge (Series 547) Portabel hardness testing devices (Series 811) ABSOLUTE DIGIMATIC inside measuring device Bore Gage (Series 511)	Straight (without data key) 	
905689	905690		Back side (without data key) 		
905691	905692		Right (without data key) 		
905693	905694		Left (without data key) 		
959149	959150		with data key 		
05CZA662	05CZA663		with data key and screws 		
05CZA624	05CZA625		with data key and screws 		
937387	965013			ABSOLUTE Quick Micrometer (Series 227, 293) "DIGIMATIC" Micrometers (Series 293, 314, 317, 323, 324, 326, 331, 340, 342, 343, 369, 389, 395, 406, 422) "DIGIMATIC" Micrometer heads (Series 164) "DIGIMATIC" Standard micrometer (Series 121) "DIGIMATIC" Inside micrometer (Series 337, 339) Three-point inside micrometer "DIGIMATIC-Holtest" (Series 468) ABSOLUTE DIGIMATIC Borematic (Series 568) Height Micrometer "Heightmaster" (Series 515) Stationary hardness tester "Wizhard" (Series 810) Stationary hardness tester "Micro Vickers HM" (Series 810) Stationary hardness tester "Micro Vickers HV" (Series 810)	6 Pins (without data key)
937386	965012			HH-120/140 Portable hardness tester (Series 810) ATK Stationary hardness tester (Series 810) ARK Stationary hardness tester (Series 810)	10 Pins (without data key)
936937	965014			ABSOLUTE DIGIMATIC Dial Indicator Type ID-F (Series 543) "DIGIMATIC" Dial Indicator Type ID-H (Series 543) Portable surface roughness tester SJ-201 P/S/PR (Series 178) Portable surface roughness tester SJ-301/S/PR (Series 178) Portable surface roughness tester SJ-401/SJ-402 (Series 178) Profile projector PJ-Series (Series 303) Profile projector PH-Series (Series 172) Height Micrometer "CERA-Heightmaster" (Series 515) Linear Height Gage "Linear Height" (Series 518) Height gauge QM-Height (Series 518) "Mu-Checker" Electronic length measuring instrument (Series 519) LINEAR GAGES Counter (Series 542) LSM-6000 Counter for Laser Scan Micrometer (Series 544) Laser-Scan Micrometer LSM 9506 "DIGIMATIC" Multi-unit (Series 572) „LITEMATIC" VL-50 (Series 318)	Identical connectors on both ends (without data key)

"DIGIMATIC" Signal Cables

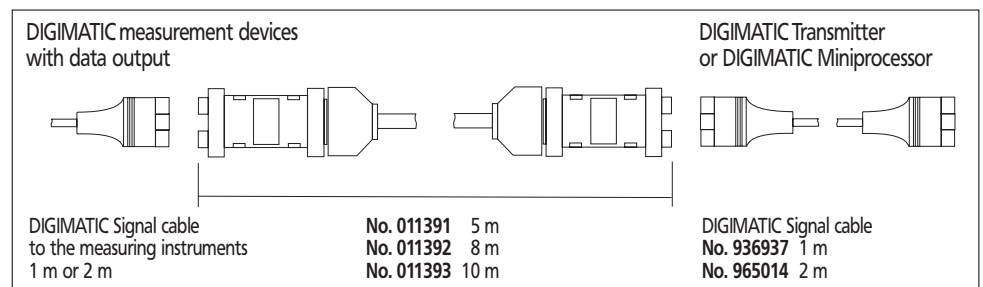
- Mitutoyo's "DIGIMATIC"-format allows for connecting not only numerous additional devices, such as printers, counters and the like, but also for connecting one or more "DIGIMATIC"-measuring instruments to an external PC employing a Mitutoyo transmitter with RS-232 C signal cable.

"DIGIMATIC" extension cable



No. 011393

Length	No.
5 m	011391
8 m	011392
10 m	011393



"DIGIMATIC" Data transmitter

"DIGIMATIC" USB interface

"DIGIMATIC" USB interface for connecting a "DIGIMATIC" measuring instrument to a PC-USB interface for direct reading into an application software such as Microsoft Excel.



No. 264-014



Interface parameters

Software compatibility: Windows 98
Windows 2000
Windows ME
Windows XP
Pocket PC 2002

Optional accessory

No. 937179T Footswitch

"DIGIMATIC" DMX-Transmitters

- Measuring device interface for transmitting measured values from Mitutoyo measuring instruments into appropriate application programs. The instrument communicates with the PC via a driver program generally included with the CAQ software. The application defines what measuring devices are to be read in, how often the measurement is to be repeated etc.

Type DMX-1 serial



No. 011216 DMX-1

The **DMX-1 serial** is a microcontrolled interface for connecting a measurement device with "DIGIMATIC" interface to an external computer featuring RS-232 C interface. The device works without external power supply (The handshake lines RTS and DTR are necessary for the power supply). Incl. footswitch connector*.

* Data transfer can be initiated with footswitch available as optional accessory.

Type DMX-1 USB



No. 011442 DMX-1 USB

The **DMX-1 USB** is a microcontrolled interface for connecting a measurement device with "DIGIMATIC" interface to an external computer featuring USB interface. The device reports as "virtual" RS-232 C interface to the computer. Incl. footswitch connector*.

* Data transfer can be initiated with footswitch available as optional accessory.

Type DMX-2 serial



No. 011189 DMX-2

The **DMX-2 serial** is a microcontrolled interface for connecting two measurement devices with "DIGIMATIC" interface to the RS-232 C interface of a computer. The device works without external power supply (The handshake lines RTS and DTR are necessary for the power supply).

Data transfer can be initiated with footswitch and adapter for footswitch available as optional accessory.

Type DMX-2 USB



No. 011443 DMX-2 USB

The **DMX-2 USB** is a microcontrolled interface for connecting two measurement devices with "DIGIMATIC" interface to the USB interface of a computer. The device reports, depending on setting as "virtual" RS-232 C interface or as keyboard to the computer. Incl. footswitch connector*.

* Data transfer can be initiated with footswitch available as optional accessory.

Type DMX-3



No. 011253

Das **DMX-3** allows for connecting three measurement devices featuring "DIGIMATIC" interfaces to the RS-232 C interfaces. Power supply with AC/DC adapter (standard accessory). Incl. footswitch connector*.

* Data transfer can be initiated with footswitch available as optional accessory.

Interface parameters

Type No.	DMX-1 serial 011216
Data output:	(D-SUB 9) RS-232 C
Number of input channels:	1
Baud rate:	9600 Baud
Data bits:	8
Stop bits:	1
Parity:	none

Type No.	DMX-1 USB 011442
Data output:	USB with RS-232 C (serial) Emulation
Number of input channels:	1

Optional accessories

No. 011196 Connecting cable for computer D-SUB 9 – D-SUB 9 (2 m)

No. 937179 T Footswitch

Interface parameters

Type No.	DMX-2 serial 011189
Data output	(D-SUB 9) RS-232 C
Number of input channels:	2
Baud rate:	9600 Baud
Data bits:	8
Stop bits:	1
Parity:	none

Type No.	DMX-2 USB 011443
Data output:	USB with RS-232 C (serial) or probe Emulation

Optional accessories

No. 011197 Connecting cable for computer D-SUB 25 – D-SUB 9 (0,2 m)

No. 011119 Connecting cable for computer D-SUB 25 – D-SUB 9 (2 m)

No. I-1502067 Connecting cable for computer D-SUB 25 – D-SUB 25 (2 m)

No. 011193 Adapter for footswitch

No. 937179 T Footswitch



011193

Interface parameters

Type No.	DMX-3 011253
Data output:	(D-SUB 9) RS-232 C
Number of input channels:	3
Baud rate:	1200/9600 Baud (adjustable with jumper)
Data bits:	8
Stop bits:	1
Parity:	none

Optional accessories

No. 011196 Connecting cable for computer D-SUB 9 – D-SUB 9 (2 m)

No. 937179 T Footswitch

No. 011444 Adapter cable USB to RS-232C

Interface parameters

Type	DMX 4-1
No.	011319
Data output:	(D-SUB 9) RS-232 C
Number of input channels:	4 / 2
Baud rate:	9600 Baud
Data bits:	8
Stop bits:	1
Parity:	none

RS-232 C connection options of:

- Layer thickness measuring device : DIGI-DERM 1100 / 2100
- Laser Scan Micrometer: LSM 5000 / 6000
- Linear scale display: KS counter (1 axis, 2 axes) + KA counter
- Contact arm dial gauge series 209
- EF display for linear gauge
- QM-Height
- Linear Height LH-600 B / C / CG
- Sartorius Balance MC 1
- Mettler Balance PM3000
- Kern Balance 510

Optional accessories

- No. 011196 Connecting cable for computer
D-SUB 9 – D-SUB 9 (2 m)
- No. 937179 T Footswitch

RS-232 C connection cable for DMX 4-2

- No. 011338 DIGI-DERM 1100/2100
- No. 011339 KS counter + KA counter
- No. 011340 EF-P counter, laser; LH-600 B / C / CG
- No. 011341 Contact dial gauge series 209
- No. 011342 Standard Opto RS-232
- No. 011343 Sartorius MC1 balance, Mettler balance
- No. 011344 Core 510 balance
- No. 011387 QM height

Interface parameters

Type	DMX-8
No.	011190
Data output	(D-SUB 9) RS-232 C
Number of input channels:	8
Baud rate:	9600 Baud
Data bits:	8
Stop bits:	1
Parity:	none

Interface parameters

Type	DMX-16
No.	011191
Number of input channels:	16
As for DMX-8	

Interface parameters

Type	DMX-16 C
No.	011255
As for DMX-16	

Optional accessories

- No. 011196 Connecting cable for computer
(2 m)
- No. 937179 T Footswitch

“DIGIMATIC” DMX-Transmitters

- Measuring device interface for transmitting measured values from Mitutoyo measuring instruments into appropriate application programs. The instrument communicates with the PC via a driver program generally included with the CAQ software. The application defines what measuring devices are to be read in, how often the measurement is to be repeated etc.

Type DMX 4-2

The **DMX 4-2** is an interface that allows for connecting four “DIGIMATIC” measuring instruments and two measuring instruments with Multi-RS-232 Interface to a PC with RS-232 C Interface.

The DMX 4-2 takes on the following functions:

1. Adaptation of the signal level of the measuring device to the requirements of the serial interface
2. Translation of the various measurement signals into a common format
3. Communication between measuring devices and PC (channel selection etc.)

Incl. footswitch connector*.

* Data transfer can be initiated with footswitch available as optional accessory.



No. 011319

Type DMX-8; DMX-16

The **DMX-8** and **DMX-16** are interfaces for connecting measurement devices featuring “DIGIMATIC” ports to the RS-232 C interface of an external computer. Power supply 220 V–240 V 50 Hz. Incl. footswitch connector*.

* Data transfer can be initiated with footswitch available as optional accessory.



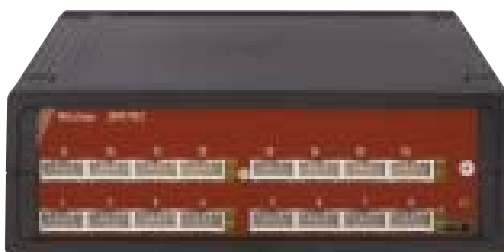
No. 011190

Type DMX-16 C

The **DMX-16 C** features integrated microprocessors for data processing, thus enabling simultaneous input from all measurement instruments and increasing data processing speed.

For the Dial indicators Series 575 integrated power supply and a ABS-ZERO key are made available.

Incl. footswitch connector*.



No. 011255

"DIGIMATIC" DMX-Transmitters

Type DMX-3 T USB

Keyboard interface

The measurement converter **DMX-3 T USB** allows for connection of three "DIGIMATIC" measurement instruments to the keyboard interface of an IBM-compatible computer. Thus applications asking for manual input of measurement data only (such as spread sheet calculation, word processing) are being provided with the respective interface. After the operator initiates data transmission the DMX-3 T USB simulates the keyboard input from the measurement device. The keyboard remains operative.



No. 011192



No. 011192

Type DMX-3 T/FS USB

Keyboard interface

Specifications same as DMX-3 T USB, but the measured values can only be triggered via footswitches. The footswitch is available as a special accessory.



No. 011220



No. 011220

"DIGIMATIC" Switch Box

The measurement switch box allows for connecting up to five "DIGIMATIC" measurement devices to a single "DIGIMATIC"-Data processor (e.g. DMX-1).



No. 011235



Interface parameters

Type No.	DMX-3 T USB 011192
Number of input channels:	3
Data output:	USB keyboard / PS2 keyboard

Standard accessory

Keyboard cable for PS2 keyboard
Connection: USB cable for direct connection to PC-USB

Interface parameters

Type No.	DMX-3 T/FS USB 011220
Number of input channels:	3
Data output:	USB keyboard / PS2 keyboard

Optional accessory

No. 937179 T Footswitch

Standard accessory

Keyboard cable for PS2 keyboard
Connection: USB cable for direct connection to PC-USB

Interface parameters

Type No.	Switch box 011235
Number of input channels:	5
Data output:	"DIGIMATIC"

Optional accessories

No. 936937 Signal cable (1 m)
No. 526688 D AC/DC adapter (9 V, 500 mA)
No. 937179 T Footswitch

"DIGIMATIC" Transmitters DL-1000 / DL-1000 M

- The "DIGIMATIC" DL-1000/DL-1000 M are data logger for storing measurement data that have been recorded by a "DIGIMATIC" measuring to be output to a computer.
 - The measuring device is connected to the I/O port of the DL 1000/DL-1000 M with a data cable and the measurement data are being transferred with the data switch on the measuring device or the DL 1000/DL-1000 M.
 - For data transfer to the computer the devices are hooked up to an interface connection with the computer. (See pages 20–22).
 - Data transfer from the DL 1000/DL-1000 M are being executed with the data or footswitch of an interface or upon request from the respective software.
- With regards to the interfaces of the measurement devices the DL 1000/DL-1000 M acts like a "DIGIMATIC" measurement instrument.
- Data can be output directly to a connected printer with "DIGIMATIC" interface.

Type DL-1000 / DL-1000 M



No. 011264 / No. 011264 M

Specifications

Type DL-1000
No. 011264
Type DL-1000 M
No. 011264 M
Dimension: 120 x 60 x 26 mm
Mass: 130 g

Memory

(DL-1000 / DL-1000 M): Up to 999 measurement values can be stored by the data loggers.
(DL-1000 M): Sample or feature related operation is possible.
A maximum of 100 features from 9 samples can be loaded. If the number of features is reduced, the available number of samples is increased. Based on the number of features, the DL-1000 M will calculate automatically how many samples are available.
If, e.g., you want to measure 10 features, you can choose a maximum of 99 samples.

Data format

All data are loaded or output in Mitutoyo "DIGIMATIC" compatible format.

Connection to measuring instruments

To output measurement values, DL-1000/DL-1000 M can be connected to any interface or protocol printer which allow for connecting Mitutoyo "DIGIMATIC" compatible measuring instruments.

Standard accessories:

1 battery (9 V) block Lithium
Signal cable 10 pole to 10 pole (0.25 m)

Optional accessories:

No. 936937 Signal cable (1 m)
No. 965014 Signal cable (2 m)

Keys and functions

Depending on the selected mode the keys of the Digi-Log enable the following functions:

	Measuring mode	Output mode
	Transfers the actual value at the cursor position to the Digi-Log. Same function as data switch on measuring device.	Transfer the displayed value of the Digi-Log to an interface or printer
	The DL-1000/DL-1000 M is turned off after 4 sec.	The DL-1000/DL-1000 M is turned off after 4 sec.
	Scrolls the list of measured data up or down by one value.	Scrolls the list of measured data up or down by one value.
	Scrolls the list of measured data up or down by 50 value.	Scrolls the list of measured data up or down by 50 value.
	Switches to output mode.	Switches to measurement mode.
	Mode < Erase memory? > No	Mode < Erase memory? > No
	Mode < Erase memory? > Yes	Mode < Erase memory? > Yes
	Switches to block creation (DL-1000 M only).	All measurement values starting with the current position are output in 0,6 sec cycles.
	Not used.	All measurement values starting with the current position are output in 1,1 sec cycles.

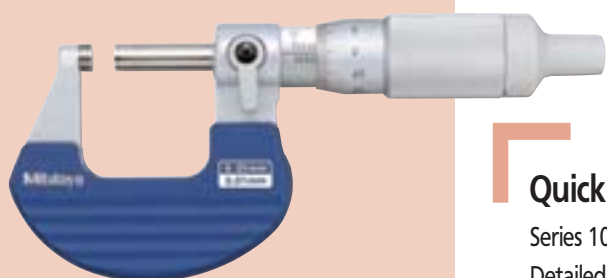
PRODUCT NEWS



"DIGIMATIC" Quick Micrometer

Series 293

Detailed information on pages 28 and 29.



Quick Micrometer with ratchet thimble

Series 102

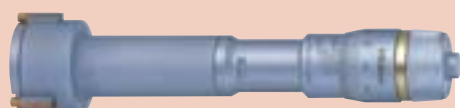
Detailed information on page 36.



Special Version Micrometers

Various series

Detailed information from page 43.



Threepoint Internal Micrometers "Holtest"

Series 368

Detailed information on pages 80 up to 83.



Miniature micrometer heads

Series 148

Detailed information on page 92.



"DIGIMATIC" Micrometer Heads

Series 350

Detailed information on page 103.



Digital Micrometers



Pages 28–34

Analogue Micrometers



Pages 35–42

Special Version Micrometers



Pages 43–63

**External screw type micrometers
– accessories**



Pages 65–69

Depth Micrometer



Pages 70–71

Inside Micrometers



Pages 73–77

Threepoint Internal Micrometers

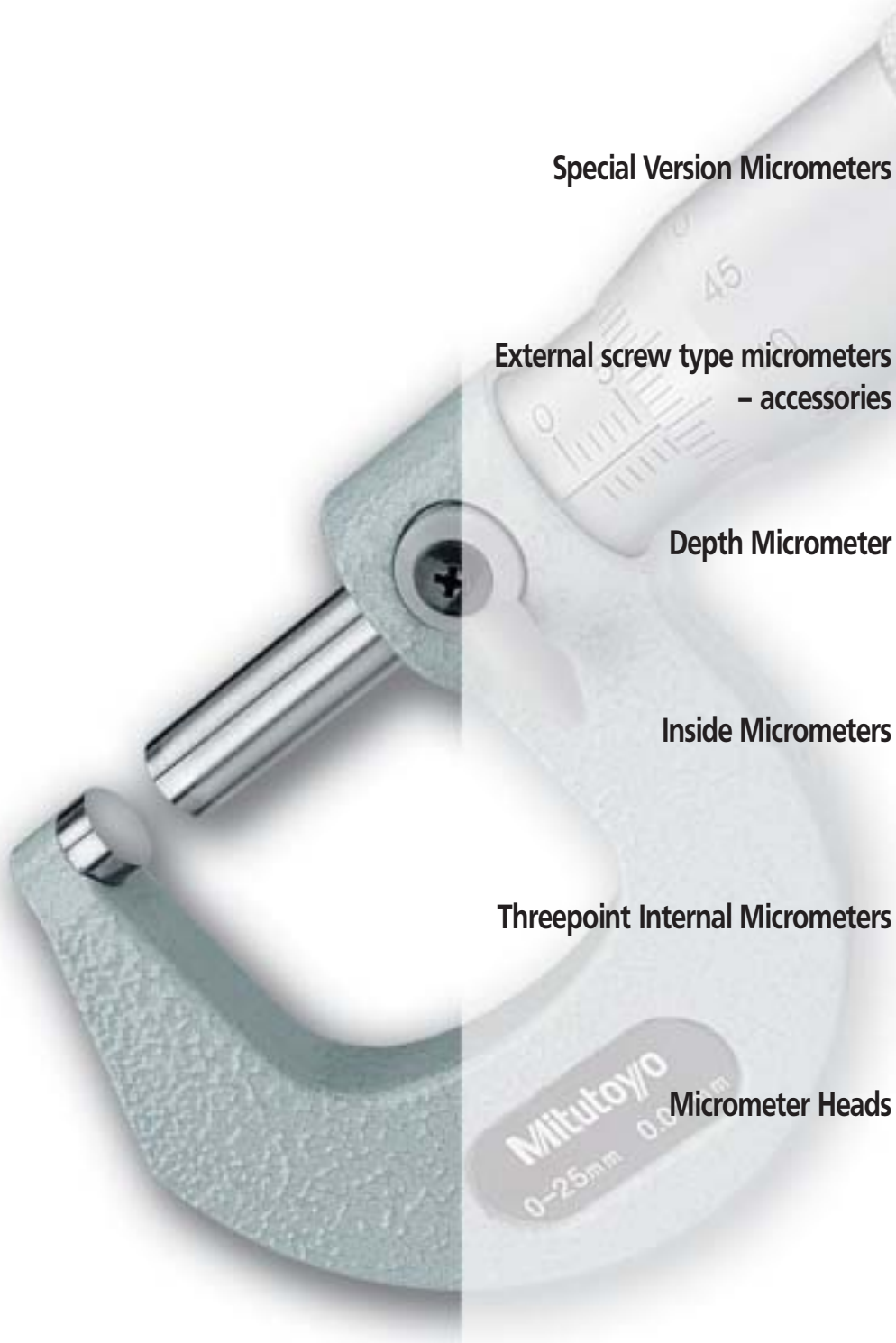


Pages 80–87

Micrometer Heads

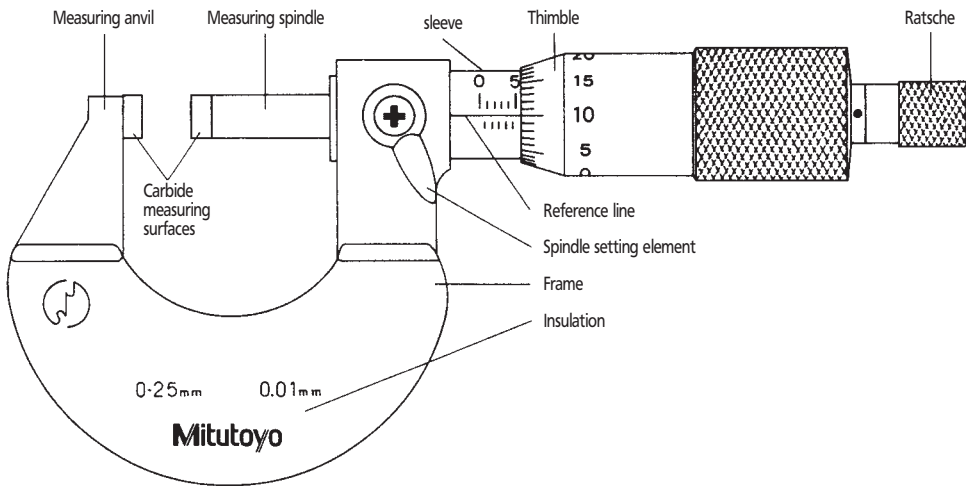


Pages 88–105



Basic Information on Micrometers

Accuracy of micrometers according to DIN 863 (as of 1999)



Limit of error G (DIN 863)

Limit of error G must be complied with on setting the indication at any point in the measuring range (see diagram)

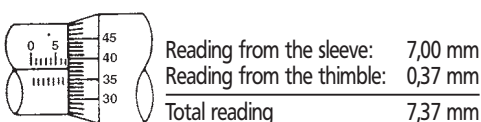
Measuring range mm	Error limit G μm	Tolerance of parallelism of the measuring surfaces at a measuring force of 10 N μm
0 up to 25	4	2
25 up to 50	4	2
50 up to 75	5	3
75 up to 100	5	3
100 up to 125	6	3
125 up to 150	6	3
150 up to 175	7	4
175 up to 200	7	4
200 up to 225	8	4
225 up to 250	8	4
250 up to 275	9	5
275 up to 300	9	5
300 up to 325	10	5
325 up to 350	10	5
350 up to 375	11	6
375 up to 400	11	6
400 up to 425	12	6
425 up to 450	12	6
450 up to 475	13	7
475 up to 500	13	7

Tolerance of flatness of the surfaces: 0,6 μm

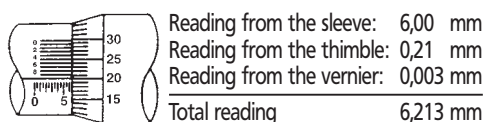
Mitutoyo outside micrometers are available up to a range of 2000 mm.

How to read the micrometer correctly:

For the design with division: 0,01 mm



For the design with vernier: 0,001 mm



Testing the error limit G

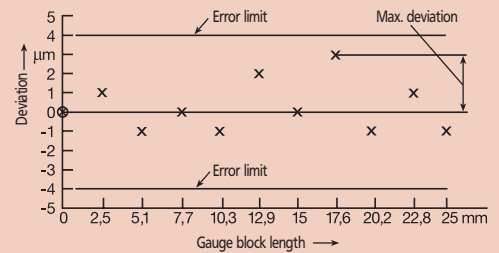


Diagram of the deviations of a micrometer with measuring range 0 mm to 25 mm which has been set to the initial value of the measuring range.

The compliance with error limit G can be tested using gauge blocks of tolerance class 1 according to DIN ISO 3650.

The gauge blocks have to be combined in such a way that the measuring spindles can be tested in a way that corresponds to an integral multiple of the nominal pitch as well as at all places situated in between.

The following gauge block combinations are recommended: 2,5; 5,1; 7,7; 10,3; 12,9; 15,0; 17,6; 20,2; 22,8; 25 mm

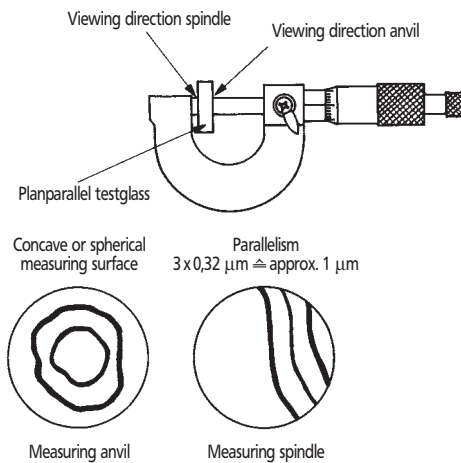
Gauge blocks from page 303

Testing Parallelism and Flatness

These tests are performed with optical glass flats which are pressed onto the surfaces to be tested. As a result of narrow air wedges between the glass plate and the measuring surface, interference bands occur whose centers are $0.32 \mu\text{m}$ apart (with an assumed light wavelength of 640 nm).

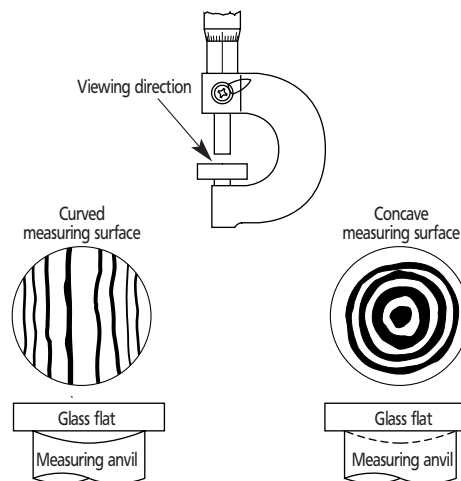
Parallelism of measuring surfaces

The parallelism of the measuring surfaces of outside micrometers with measuring ranges of 0 to 25 mm, 25 to 50 mm, 50 to 75 mm and 75 to 100 mm can be tested using three or four plane-parallel test glasses whose length differs from the spindle pitch by around one third or one quarter, so that the test can be performed at three or four points on a full revolution of the spindle. The plane-parallel test-glass is placed against the measuring surface using the coupling. By carefully moving the test glass between the measuring surfaces, the smallest number of visible interference rings or bands on a measuring surface is determined, and the number of interference rings or bands on the opposite measuring surface is added to this. A fringe zone of a maximum of 0.4 mm is not taken into account during the test.



Flatness of measuring surfaces

The flatness of measuring surfaces is tested with a flat that minimises the number of interference bands or rings and forms close curves. A fringe zone of a maximum of 0.4 mm is not taken into account during the test.



See page 67 for optical glass flats and optical parallels

"DIGIMATIC" Micrometer

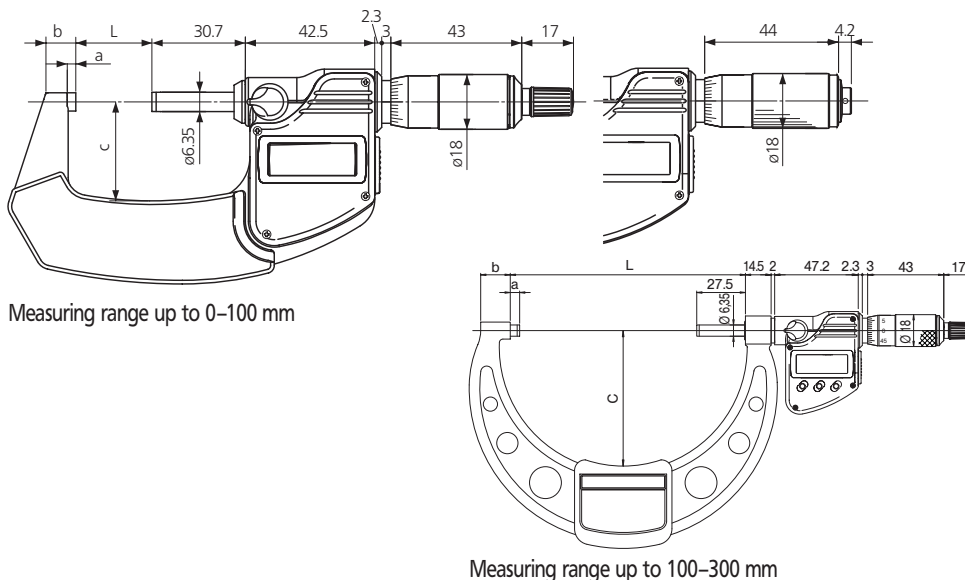
• Digital standard external screw type micrometer with IP-65 protection.

Series 293
with data output



Measuring range mm	No.	Error limit* μm	L mm	a mm	b mm	c mm	Mass g
With ratchet (standard version)							
0-25	293-230	2	-	2,8	9,0	25,0	270
25-50	293-231	2	25,0	2,8	9,8	32,0	330
50-75	293-232	2	50,0	2,8	12,6	47,0	470
75-100	293-233	3	75,0	2,8	14,0	60,0	625
100-125	293-250	3	132,8	5,3	16,7	76,5	600
125-150	293-251	3	158,2	5,7	18,8	91,0	740
150-175	293-252	4	183,6	6,1	19,1	103,1	800
175-200	293-253	4	208,8	6,3	18,2	115,3	970
200-225	293-254	4	234,2	6,7	16,8	126,8	1100
225-250	293-255	5	258,0	5,5	18,0	139,8	1270
250-275	293-256	5	284,0	6,5	18,0	152,3	1340
275-300	293-257	5	309,0	6,5	18,0	166,0	1540
With ratchet thimble							
0-25	293-234	2	-	2,8	9,0	25,0	270
25-50	293-235	2	25,0	2,8	9,8	32,0	330
50-75	293-236	2	50,0	2,8	12,6	47,0	470
75-100	293-237	3	75,0	2,8	14,0	60,0	625
With friction thimble							
0-25	293-238	2	-	2,8	9,0	25,0	270
Set		Contents:					
0-50	293-966	293-230, 293-231					
0-75	293-962	293-230, 293-231, 293-232					
0-100	293-963	293-230, 293-231, 293-232, 293-233					

* Accuracy exceeding the requirements of DIN 863



Functions	Series 293
ORIGIN up to 100 mm	●
ZERO/ABS	●
Preset from 100 mm upwards (replacing ORIGIN function)	●
HOLD	●
Data output	●

Specifications

Accuracy: Factory specification
 Resolution: 0,001 mm
 Scales: thimble and sleeve satin chrome finish
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish
 Frame: enamelled
 Measuring force: 5-10 N

Including box, key, 1 battery, gauge block from 25 mm and up to 50 mm measuring range with factory certificate

Optional accessories

No. 05CZA662 Signal cable with data key (1 m)
 No. 05CZA663 Signal cable with data key (2 m)

Consumable Spares

No. 938882 Battery SR-44



With ratchet (standard version)



Ratchet thimble



Friction thimble



The use of top quality materials provides outstanding resistance to oils and chemicals

Functions	Series 293	
	293-571 up to 293-578	293-240 up to 293-243
ORIGIN		●
ZERO/ABS	●	●
Preset from 100 mm upwards (replacing ORIGIN function)	●	
HOLD	●	●
Data output	●	

Specifications

Accuracy: according to DIN 863-1
Resolution: 0,001 mm
Scales: thimble and sleeve
satin chrome finish
Measuring spindle: with spindle lock
Measuring surfaces: carbide-tipped,
precision ground,
micro-lap finish
Frame: enamelled
Measuring force: 10–14 N
Including box, gauge block, key,
2 batteries

Optional accessories

No. 937387 Signal cable (1 m)
No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

"DIGIMATIC" Micrometer

• Digital standard micrometer, measuring range 300–500 mm.

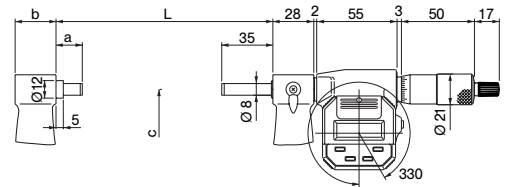
Series 293

DIN 863-1 with data output



293-572

Measuring range mm	No.	L mm	a mm	b mm	c mm	Mass g
300–325	293-571	353	18	28	187	2085
325–350	293-572	378	18	28	199	2255
350–375	293-573	403	18	28	212	2405
375–400	293-574	428	18	28	224	2555
400–425	293-575	453	18	28	236	2815
425–450	293-576	478	18	28	248	3065
450–475	293-577	503	18	28	261	3315
475–500	293-578	528	18	28	273	3550



"DIGIMATIC" Micrometer

• Digital standard micrometer with IP-65 protection, large digits and 1 μm resolution.

Series 293

without data output



293-240



Specifications

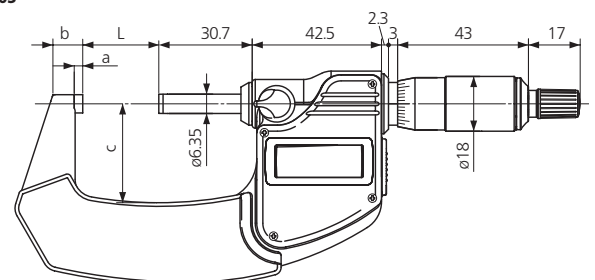
Accuracy: Factory specification
Resolution: 0,001 mm
Scales: thimble and sleeve
satin chrome finish
Measuring surfaces: carbide-tipped,
precision ground,
micro-lap finish
Frame: enamelled
Measuring force: 5–10 N
Including box, key, 1 battery,
gauge block from 25 mm and up to 50 mm
measuring range with factory certificate

Consumable Spares

No. 938882 Battery SR-44

Measuring range mm	No.	Error limit* μm	L mm	a mm	b mm	c mm	Mass g
With ratchet (standard version)							
0– 25	293-240	2	–	9,0	25	59,8	270
25– 50	293-241	2	25	9,8	32	70,3	330
50– 75	293-242	2	50	12,6	47	91,9	470
75–100	293-243	3	75	14,0	60	112,9	625

* Accuracy exceeding the requirements of DIN 863



"DIGIMATIC" Micrometer

- Handy and slim design compared to customary available micrometers.

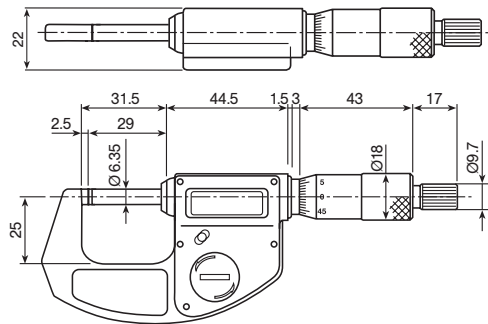
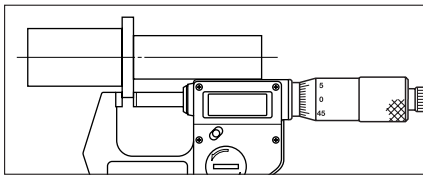
Series 293

DIN 863-1 without data output



293-805

Measuring range mm	No.	Measuring force N	Mass g
0-25	293-805	5-10	250



"DIGIMATIC" Micrometer

- External screw type micrometer with 1 mm pitch to avoid reading errors.
- With large measuring surfaces.

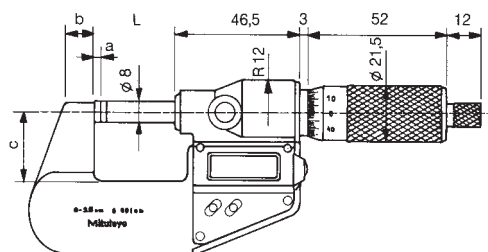
Series 293

DIN 863-1 with data output



293-151-30

Measuring range mm	No.	L mm	a mm	b mm	c mm	Mass g
0-25	293-151-30	31,8	2,8	7	26	320
25-50	293-152-30	56,8	2,8	7	33	390
50-75	293-153-30	81,8	2,8	10	48	530
75-100	293-154-30	106,8	2,8	11	61	670



Functions	Series 293	
	293-151-30 up to 293-154-30	293-805
ORIGIN	●	
ZERO / ABS	●	
DATA / HOLD	●	
ZERO		●
Data output	●	

Specifications

Accuracy: according to DIN 863-1
 Resolution: 0,001 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish
 Including box, key, 1 battery

Consumable Spares

No. 938882 Battery SR-44

Specifications

with ratchet thimble
 Accuracy: according to DIN 863-1
 Resolution: 0,001 mm
 Scales: thimble and sleeve satin chrome finish, Ø 21,5 mm
 Measuring spindle: with spindle lock
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish
 Frame: enamelled
 Measuring force: 5-10 N
 Steigung: 1 mm
 Including box, gauge block (from 25-50 mm), insulation, key, 1 battery

Optional accessories

No. 937387 Signal cable (1 m)
 No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

ABSOLUTE "DIGIMATIC" Quick Micrometer

- **Large digits, long battery life**

Easy to read display due to large digits with 7,5 mm in height. Exceptional battery life of 3,5 years lasting three times as long as customary batteries with micrometers.

- **Precision measurement at high speeds**

These micrometers feature an absolute linear scale with a resolution of 1 μm . Due to the ABSOLUTE scale display errors with high speed movement are being prevented. There are no restrictions with regards to the movement speed.

- **IP-54 protection**

Manufactured according to IP-54 protection standards. (IP-54 protection does not apply when the protective cover is open or a signal cable connected to the data output.) Also for series 369 and 422 (see pages 33 and 34).

- **Precise measuring on delicate, soft surfaces**

Since the micrometer is equipped with non-rotating spindle even delicate surfaces can be measured.

Series 293

"Quick" external screw type micrometer in standard version

With non-rotating spindle

ABSOLUTE™
Absolute System Patented by MITUTOYO

IP 54



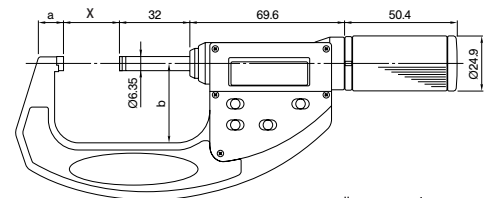
293-661-10



293-666 with fixing device 156-105 M (optional accessories)

Measuring range mm	No.	Error limit μm	Flatness μm	Parallelism μm	Measuring force N	a mm	b mm	x mm	Mass g
0- 30	293-661-10*	2	$\leq 0,3$	$\leq 2,0$	5-10	9,0	25	-	275
0- 30	293-666	2	$\leq 0,3$	$\leq 2,0$	5-10	9,0	25	-	275
25- 55	293-667	3	$\leq 0,3$	$\leq 2,0$	5-10	11,3	36	25	355
50- 80	293-668	3	$\leq 0,3$	$\leq 2,0$	5-10	13,1	47	50	525
75-105	293-669	3	$\leq 0,3$	$\leq 2,0$	5-10	13,5	60	75	625

* without data output



x = smallest measuring range

Special versions can be found on the next pages

™ Patent numbers see page 464

Functions	Series 293	
	293-666 up to 293-669	293-661-10
ON / OFF	●	●
ORIGIN	●	●
DATA / HOLD	●	●
ZERO / ABS (from 25-50 mm)	●	●
Data output	●	

Specifications

Accuracy: Factory specification
Resolution: 0,001 mm
Frame: enamelled

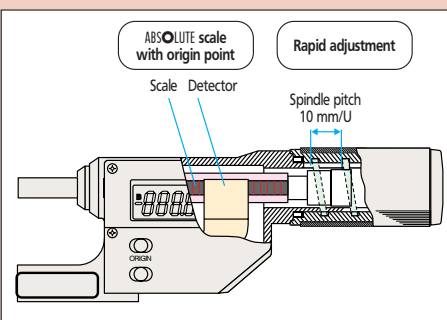
Including box, gauge block (from 25-55 mm), 1 battery

Optional accessories

No. 937387 Signal cable (1 m)
No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44



This micrometer has a newly developed spindle mechanism enabling a spindle drive of 10 mm/U and a measuring range of 30 mm. The drive rate is therefore 20x higher than in conventional micrometers.

ABSOLUTE "DIGIMATIC" Quick Micrometer

• For principle of function and advantages, see page 31.

Series 227

"Quick" external screw type micrometer with adjustable measuring force

Measuring force: 0,5– 2,5 N (at 227–201 / 227–203),
2,0–10,0 N (at 227–202 / 227–204)



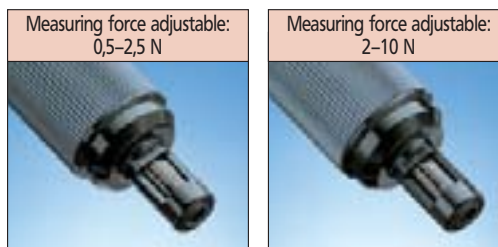
227-201

ABSOLUTE™
Absolute System Patented by MITUTOYO



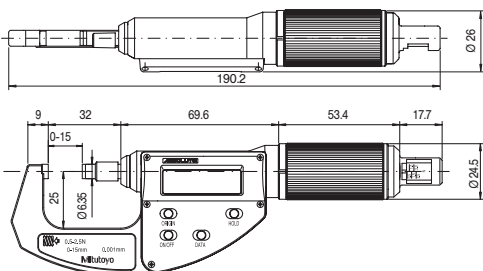
227-204

ABSOLUTE™
Absolute System Patented by MITUTOYO

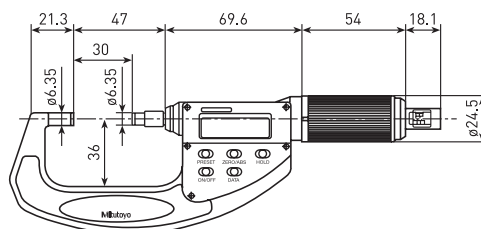


No.	Measuring range mm	Adjustable range of measuring force	Measuring force (N)* Scala	Error limit der Measuring force (pre-set measuring force)	Error limit μm	Mass g
227-201	0-15	0,5- 2,5 N	0,5; 1,0; 1,5; 2,0; 2,5	0,1 + (adjusted measuring force / 10) N	2	300
227-202	0-15	2,0-10,0 N	2; 4; 6; 8; 10	0,4 + (adjusted measuring force / 10) N	2	300
227-203	15-30	0,5- 2,5 N	0,5; 1,0; 1,5; 2,0; 2,5	0,1 + (adjusted measuring force / 10) N	2	380
227-204	15-30	2,0-10,0 N	2; 4; 6; 8; 10	0,4 + (adjusted measuring force / 10) N	2	380

* This model is also available as special manufacture with fixed measuring force.



227-201 / -202



227-203 / -204

™ Patent numbers see page 464

Functions	227-201 227-202	227-203 227-204
ON / OFF	●	●
ORIGIN	●	●
DATA / HOLD	●	●
ZERO / ABS	●	●
Data output	●	●

Specifications

Accuracy: Factory specification
Resolution: 0,001 mm
Flatness: ≤ 0,3 μm
Parallelism: ≤ 2 μm
Frame: enamelled
Measuring direction: horizontal *

Including box, gauge block (from 15–30 mm),
screwdriver, 1 battery

* = Modification of the measuring direction affects the measuring force due to the gravitational force; the deviations guaranteed are only valid for horizontal measuring direction (± 3 degrees).

Optional accessories

No. 937387 Signal cable (1 m)
No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44



ABSOLUTE "DIGIMATIC" Quick Micrometer

• For principle of function and advantages, see page 31.

Series 369

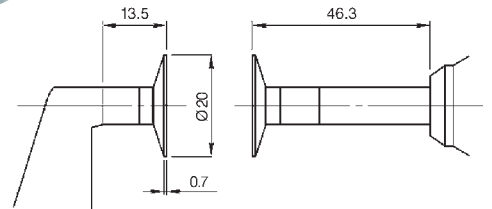
"Quick" Micrometer with non-rotating spindle and disc-shaped measuring surfaces for measuring felt, rubber, cardboard, fabric etc.

ABSOLUTE™ IP54
Absolute System Patented by MITUTOYO



369-411

Measuring range mm	No.	Error limit μm	Measuring surface Offset mm	Mass g
0-30	369-411	4	$\varnothing 20$	360
25-55	369-412	4	$\varnothing 20$	490



Series 227

"Quick" Micrometer with non-rotating spindle and disc-shaped measuring surfaces and adjustable measuring force for measuring felt, rubber, cardboard etc.

Measuring force: 0,5 – 2,5 N (at 227-221)
2,0 – 10,0 N (at 227-222)

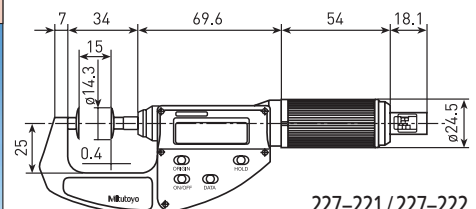
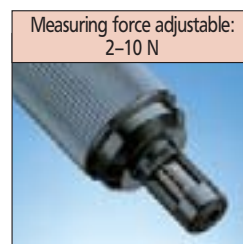
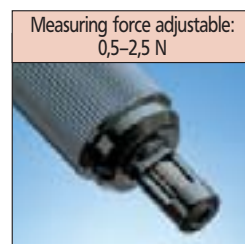
ABSOLUTE™
Absolute System Patented by MITUTOYO



227-221

No.	Measuring range mm	Adjustable range of measuring force	Measuring force (N)* Scale	Error limit of measuring force (pre-set measuring force)	Error limits μm	Measuring range Continuous \varnothing mm	Mass g
227-221	0-15	0,5- 2,5 N	0,5; 1,0; 1,5; 2,0; 2,5	0,1 + (adjusted measuring force / 10) N	4	14,3	300
227-222	0-15	2,0-10,0 N	2; 4; 6; 8; 10	0,4 + (adjusted measuring force / 10) N	4	14,3	300

* This model is also available as special manufacture with fixed measuring force.



227-221 / 227-222

™ Patent numbers see page 464

Functions	Series 369	Series 227
ON / OFF	●	●
ORIGIN	●	●
DATA / HOLD	●	●
ZERO / ABS*	●	●
Data output	●	●

* Only measuring range 25-55 mm

Specifications

Accuracy: Factory specification
Resolution: 0,001 mm
Measuring force: 3-8 N
Frame: enamelled
Including box, gauge block (from 25-55 mm), 1 battery

Optional accessories

No. 937387 Signal cable (1 m)
No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Specifications

Accuracy: Factory specification
Resolution: 0,001 mm
Flatness: $\leq 1 \mu\text{m}$
Parallelism: $\leq 3 \mu\text{m}$
Frame: enamelled
Measuring direction: horizontal *

Including box, screwdriver, 1 battery

* = Modification of the measuring direction affects the measuring force due to the gravitational force; the deviations guaranteed are only valid for horizontal measuring direction (± 3 degrees).

Optional accessories

No. 937387 Signal cable (1 m)
No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

ABSOLUTE "DIGIMATIC" Quick Micrometer

• For principle of function and advantages, see page 31.

Series 422

"Quick" Micrometer with non-rotating spindle and offset measuring surfaces for measuring narrow outside grooves

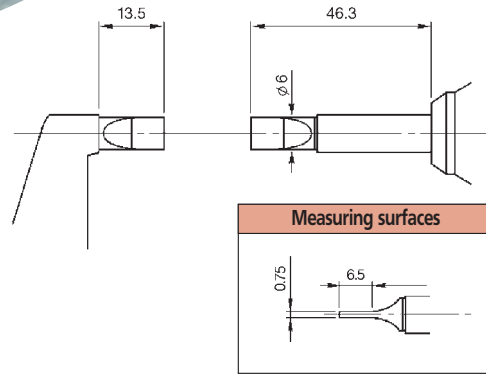
ABSOLUTE™
Absolute System Patented by MITUTOYO

IP54



422-411

Measuring range mm	No.	Error limit μm	Measuring force N	Mass g
0-30	422-411	3	5-10	350
25-55	422-412	3	5-10	490



Series 342

"Quick" Micrometer with non-rotating spindle for measuring crimp heights

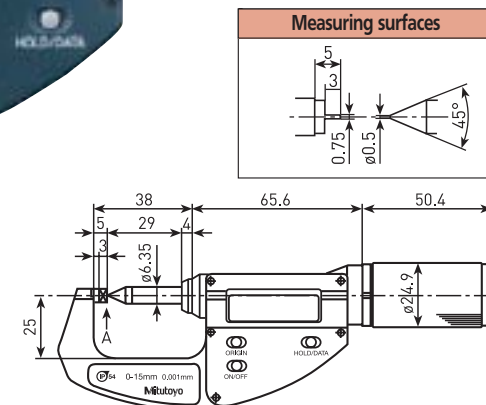
ABSOLUTE™
Absolute System Patented by MITUTOYO

IP54



342-451

Measuring range mm	No.	Error limit μm	Measuring force N	Mass g
0-15	342-451	3	4-6	275



Functions	Series 422	Series 342
ON / OFF	●	●
ORIGIN	●	●
DATA / HOLD	●	●
ZERO / ABS*	●	●
Data output	●	●

* Only measuring range 25-55 mm

Specifications

Accuracy: Factory specification

Resolution: 0,001 mm

Frame: enamelled

Including box, gauge block (from 25-55 mm), 1 battery

Optional accessories

No. 937387 Signal cable (1 m)

No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Specifications

Accuracy: Factory specification

Resolution: 0,001 mm

Frame: enamelled

Including box, 1 battery

Optional accessories

No. 937387 Signal cable (1 m)

No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

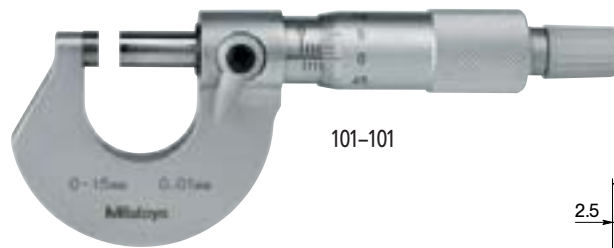
™ Patent numbers see page 464

Outside Micrometer

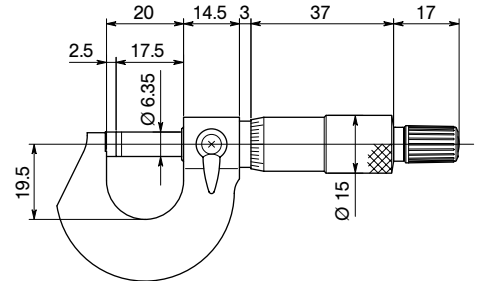
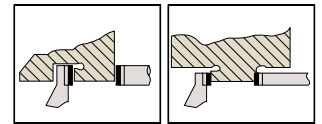
Specifications

Accuracy: DIN 863-1
 Graduation: 0,01 mm
 Scales: thimble and sleeve
 satin chrome finish,
 Ø 15 mm
 Measuring spindle: Ø 6,35 mm
 spindle pitch 0,5 mm
 with spindle lock
 Measuring surfaces: carbide-tipped,
 precision ground and
 micro-lap finish
 Frame: forged steel frame,
 satin chrome finish
 Measuring force: 5–10 N
 Including box, key

Series 101 DIN 863-1 Small version



101-101



Measuring range mm	No.	Mass g
0–15	101-101	125

Specifications

Accuracy: DIN 863-1
 Scales: thimble and sleeve
 satin chrome finish,
 Ø 18 mm
 Measuring spindle: spindle pitch 0,5 mm
 with spindle lock
 Measuring surfaces: carbide-tipped,
 precision ground and
 micro-lap finish
 Frame: enamelled
 Measuring force: 5–10 N
 Including box, gauge block (from 25–100 mm),
 up to 50 mm with factory certificate, insulation,
 key

Series 102 DIN 863-1 Rugged design



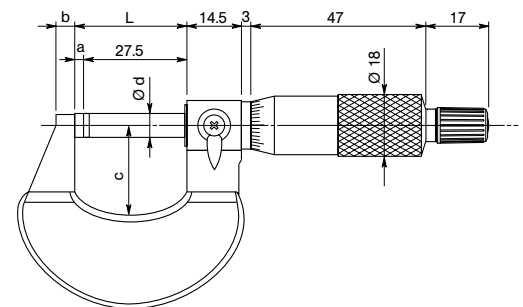
102-301



102-305 friction thimble

Measuring range mm	No.	Graduation	L	a	b	c	d	Mass g
0– 25	102-301	0,01	30,3	2,8	5	26	6,35	180
25– 50	102-302	0,01	55,3	2,8	8	32	6,35	270
50– 75	102-303	0,01	80,3	2,8	9	45	6,35	375
75–100	102-304	0,01	105,3	2,8	10	58	6,35	490
0– 25	102-307	0,001	30,3	2,8	5	26	6,35	180
25– 50	102-308	0,001	55,3	2,8	8	32	6,35	270
with friction thimble								
0– 25	102-305	0,01	30,3	2,8	5	26	6,35	180
25– 50	102-306	0,01	55,3	2,8	8	32	6,35	270

Series 102 As a set



102-911

Measuring range mm	No.	Set combination	Mass g
0–100	102-911	102-301/302/303/304	1315

Micrometers with ratchet thimble

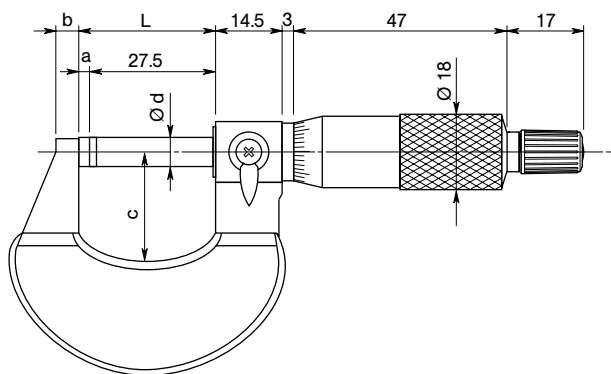
- Quick micrometer with combined ratchet stop.
- For single-handed operation and operation in the holder.
- High level of safety when used in single-handed operation. Test results show that unaccustomed users obtain significantly better results with the new Quick micrometer.
- With factory certificate.

Series 102



Measuring range mm	No.	Graduation mm	L mm	a mm	b mm	c mm	d mm	Mass g
0- 25	102-701	0,01	30,3	2,8	5	26	6,35	180
0- 25	102-707	0,001*	55,3	2,8	8	32	6,35	270

* Nonius



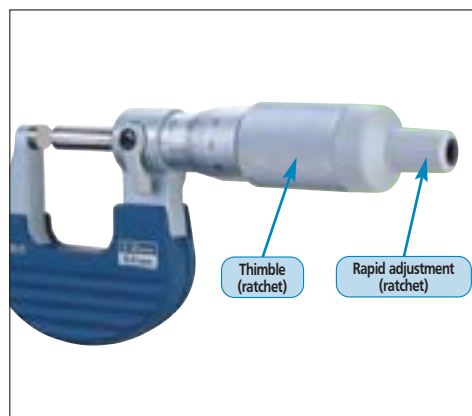
Specifications

Accuracy: Factory specification
 Error limit: 3 µm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring spindle: spindle pitch 0,5 mm with spindle lock
 Measuring surfaces: carbide-tipped, precision ground and micro-lap finish enamelled
 Frame: Flatness of measuring surfaces: 0,6 µm
 Parallelism of measuring surfaces: 2 µm
 Measuring force: 5-10 N

Including box, with factory certificate, insulation, key



Including box and with factory certificate



The rapid adjuster can be used to turn the spindle quickly at any time

Single-handed operation

Outside Micrometer

Specifications

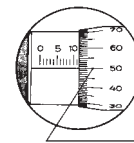
Accuracy: DIN 863-1
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, Ø 21 mm
 Measuring spindle: Ø 8 mm spindle pitch 1 mm with spindle lock
 Measuring surfaces: carbide-tipped, precision ground and micro-lap finish
 Frame: forged, satin chrome finish
 Measuring force: 5-10 N
 Including box, gauge block (25-50 mm), insulation, key

Series 102

DIN 863-1
 Heavy duty workshop design
 With 1 mm spindle pitch to avoid display error

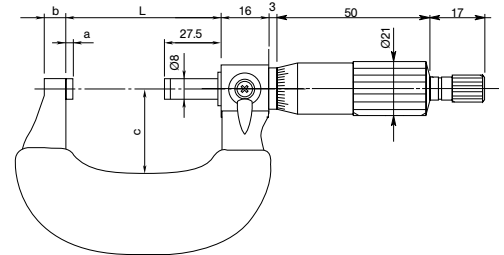


102-450



with 100 step graduation (pitch 1 mm)
 The measured values can be read directly from the 100 step graduation on the thimble without calculation of mm-values.

Measuring range mm	No.	L mm	a mm	b mm	c mm	Mass g
0-25	102-450	30	2,5	5	26,0	270
25-50	102-451	55	2,5	8	32,5	310



Specifications

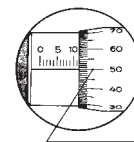
Accuracy: DIN 863-1
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, Ø 30 mm
 Measuring spindle: Ø 8 mm spindle pitch 1 mm with spindle lock
 Measuring surfaces: carbide-tipped, precision ground and micro-lap finish
 Frame: forged, satin chrome finish
 Measuring force: 5-10 N
 Including box, gauge block (25-50 mm), insulation, key

Series 102

DIN 863-1
 Large Thimble
 With 1 mm spindle pitch to avoid display error

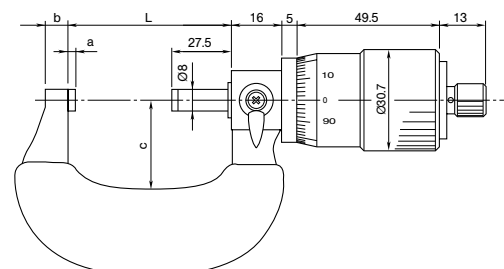


102-650



with 100 step graduation (pitch 1 mm)
 The measured values can be read directly from the 100 step graduation on the thimble without calculation of mm-values.

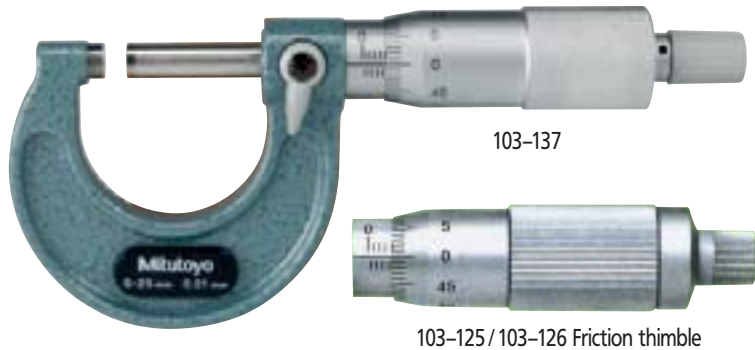
Measuring range mm	No.	L mm	a mm	b mm	c mm	Mass g
0- 25	102-650	30	2,5	5	26,0	345
25- 50	102-651	55	2,5	8	32,5	405
50- 75	102-652	80	2,5	9	45,0	570
75-100	102-653	105	2,5	9	58,0	640



Outside Micrometer

Series 103

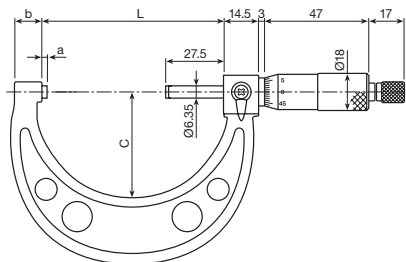
Light-weight workshop design



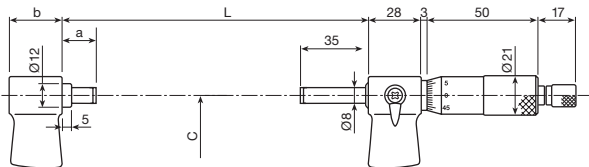
Specifications

Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish,
 Measuring spindle: spindle pitch 0,5 mm with spindle lock
 Measuring surfaces: carbide-tipped, precision ground and micro-lap finish
 Frame: enamelled
 Measuring force: 5-10 N (from 100 mm: 5-15 N)
 Including box, gauge block (from 25-600 mm), up to 50 mm with factory certificate, key

Measuring range mm	No.	L mm	a mm	b mm	c mm	Mass g
Accuracy: DIN 863-1						
0-25	103-137	30,3	2,8	9	28	175
25-50	103-138	55,3	2,8	10	38	215
50-75	103-139-10	80,3	2,8	12	49	315
75-100	103-140-10	105,3	2,8	14	60	375
100-125	103-141-10	132,8	5,3	17	79	515
125-150	103-142-10	158,2	5,7	19	94	665
150-175	103-143-10	183,6	6,1	20	106	720
175-200	103-144-10	208,8	6,3	19	118	920
200-225	103-145-10	234,2	6,7	18	130	1080
225-250	103-146-10	258,0	5,5	18	143	1255
250-275	103-147-10	284,0	6,5	18	156	1405
275-300	103-148-10	309,0	6,5	18	169	1565
300-325	103-149	353,0	18,0	28	187	1985
325-350	103-150	378,0	18,0	28	199	2155
350-375	103-151	403,0	18,0	28	212	2305
375-400	103-152	428,0	18,0	28	224	2455
400-425	103-153	453,0	18,0	28	236	2715
425-450	103-154	478,0	18,0	28	248	2965
450-475	103-155	503,0	18,0	28	261	3215
475-500	103-156	528,0	18,0	28	273	3450
Accuracy: Factory specification, Error limits: $(1 + L/75) \mu\text{m}$ L in mm						
500-525	103-157	575,0	40,0	28	307	4060
525-550	103-158	575,0	15,0	28	307	4080
550-575	103-159	625,0	40,0	28	332	4500
575-600	103-160	625,0	15,0	28	332	4525
Friction thimble; Accuracy: DIN 863-1						
0-25	103-125	30,3	2,8	9	28	175
25-50	103-126	55,3	2,8	10	3	215



Measuring range 0-300 mm



Measuring range 300-600 mm

Outside Micrometer

Specifications

Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish,
 Measuring spindle: spindle pitch 0,5 mm with spindle lock
 Measuring surfaces: carbide-tipped, precision ground and micro-lap finish
 Frame: enamelled
 Measuring force: 5–10 N (from 100 mm: 5–15 N)
 Including box, gauge block (from 25–600 mm), up to 50 mm with factory certificate, key

Series 103

As a set



103-913-30

Measuring range mm	No.	Set combination	Mass g
0–75	103-927-10	3 outside micrometers, 2 gauge blocks	750
0–150	103-913-30	6 outside micrometers, 5 gauge blocks	2435
0–300	103-914-30	12 outside micrometers, 11 gauge blocks	10130
150–300	103-915-10	6 outside micrometers, 6 gauge blocks	7695

Specifications

Accuracy: DIN 863-1
 Graduation: 0,01 mm, nonius: 0,001 mm
 Scales: thimble and sleeve satin chrome finish, Ø 20 mm
 Measuring spindle: Ø 8 mm spindle pitch 0,5 mm
 Measuring surfaces: carbide-tipped, precision ground and micro-lap finish
 Frame: forged steel frame
 Measuring force: Friction thimble 5–10 N
 Including box, gauge block (25–50 mm), insulation, key

Series 106

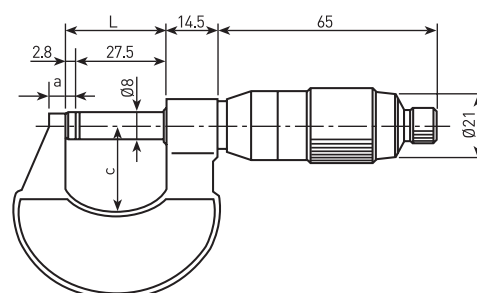
DIN 863-1

Non-rotating spindle, easy to re-adjust
 Friction spindle with non-parallax reading of 0,001 mm



106-101

Measuring range mm	No.	L mm	a mm	c mm	Mass g
0–25	106-101	30,3	5	26	270
25–50	106-103	55,3	8	29	310



Outside Micrometer Special versions

- With exchangeable measuring anvil for a variable measuring range.

Series 104

DIN 863-1, Form D 16



104-135 A

Measuring range mm	No.	Inserts	Standards	Mass kg
0- 50	104-171	1	-	0,32
0- 100	104-139 A	4	3	0,79
0- 150	104-135 A	6	5	1,35
100- 200	104-140 A	4	4	1,38
150- 300	104-136 A	6	6	2,65
200- 300	104-141 A	4	4	2,22
300- 400	104-142 A	4	4	3,31
400- 500	104-143 A	4	4	4,81
500- 600	104-144 A	4	4	6,35
600- 700	104-145 A	4	4	7,72
700- 800	104-146 A	4	4	9,08
800- 900	104-147 A	4	4	10,41
900-1000	104-148 A	4	4	11,78

Series 340

"DIGIMATIC" Type,
with data output
DIN 863-1, Form D 16



Measuring range up to 300 mm



340-251

Measuring range mm	No.	Inserts	Protection IP-65	Standards	Mass kg
0- 150	340-251	6	●	5	0,96
150- 300	340-252	6	●	6	1,88
300- 400	340-513	4	-	4	3,31
400- 500	340-514	4	-	4	4,81
500- 600	340-515	4	-	4	6,35
600- 700	340-516	4	-	4	7,72
700- 800	340-517	4	-	4	9,08
800- 900	340-518	4	-	4	10,41
900-1000	340-519	4	-	4	11,78

Specifications

Accuracy: DIN 863-1 ab 500 mm
Factory specification
Error limit: $(4 + \frac{1}{75}) \mu\text{m}$; L in mm

Graduation: 0,01 mm

Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm (up to 300 mm)
Ø 21 mm (over 300 mm)

Measuring spindle: Ø 6,35 mm (up to 300 mm)
Ø 8 mm (over 300 mm)
spindle pitch 0,5 mm,
with spindle lock

Measuring surfaces: hardened, precision ground

Frame: light weight construction,
enamelled

Measuring force: 5-10 N (10-14 N for range
of 300 mm and more)

Including box, standards, measuring inserts, key

Specifications

Protection class: IP-65
(Measuring range up to 300 mm)

Accuracy: DIN 863-1 ab 500 mm
Factory specification
Error limit: $(4 + \frac{1}{75}) \mu\text{m}$; L in mm

Resolution: 0,001 mm

Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm (up to 300 mm)
Ø 21 mm (over 300 mm)

Measuring spindle: Ø 6,35 mm (up to 300 mm)
Ø 8 mm (over 300 mm)
spindle pitch 0,5 mm,
with spindle lock

Measuring surfaces: hardened, precision ground

Frame: light weight construction,
enamelled

Measuring force: 5-10 N (10-14 N for
measuring range over 300 mm)

Including box, standards, measuring inserts,
key, 1 battery

Optional accessories

- No. 05CZA662 Signal cable (1 m) (for devices up to 300 mm Measuring range)
- No. 05CZA663 Signal cable (2 m) (for devices up to 300 mm Measuring range)
- No. 937387 Signal cable (1 m) (for devices from 300 mm Measuring range)
- No. 965013 Signal cable (2 m) (for devices from 300 mm Measuring range)

Consumable Spares

- No. 938882 Battery SR-44



Specifications

Accuracy: Factory specification
Error limit: $(6 + \frac{L}{75}) \mu\text{m}$; L in mm
max. measuring length

Graduation: 0,01 mm

Scales: thimble and sleeve
satin chrome finish,
Ø 21 mm

Measuring spindle: Ø 8 mm
spindle pitch 0,5 mm

Measuring surfaces: carbide-tipped, precision
ground, micro-lap finish

Frame: light-weight welded,
enamelled

Measuring force: 5–10 N

Including box, standards (2 pieces),
adjustable stopper

Optional accessories

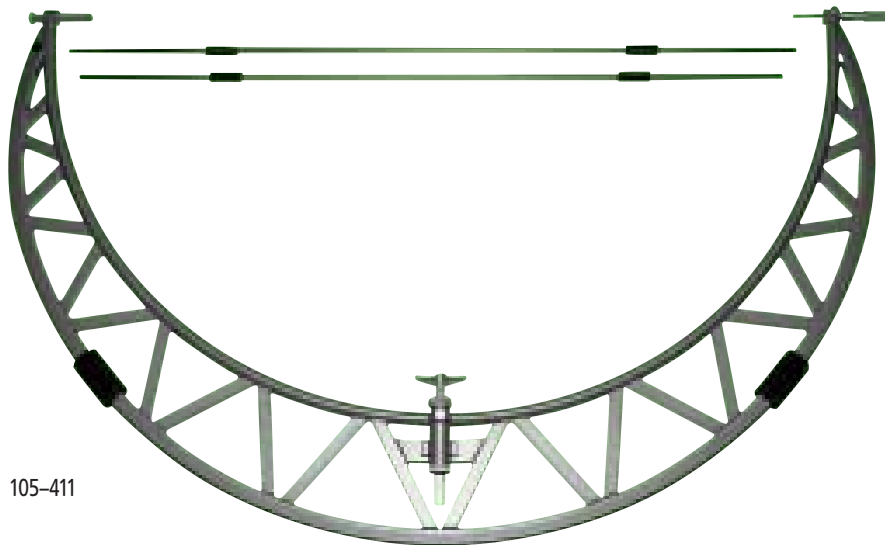
Standards supplied on order.
Control and adjustment of all outside micrometers
with a minimum measuring range of 1000 mm
see page 65

Outside Micrometer

- Stable and rugged light-weight construction of rectangular tube.
- The measuring of the outside micrometer is 50 mm.

Series 105

with adjustable anvil



Measuring range mm	No.	Mass kg
1000–1100	105-408	6,37
1100–1200	105-409	7,08
1200–1300	105-410	7,79
1300–1400	105-411	8,50
1400–1500	105-412	9,21
1500–1600	105-413	10,17
1600–1700	105-414	11,13
1700–1800	105-415	12,09
1800–1900	105-416	13,05
1900–2000	105-417	14,01

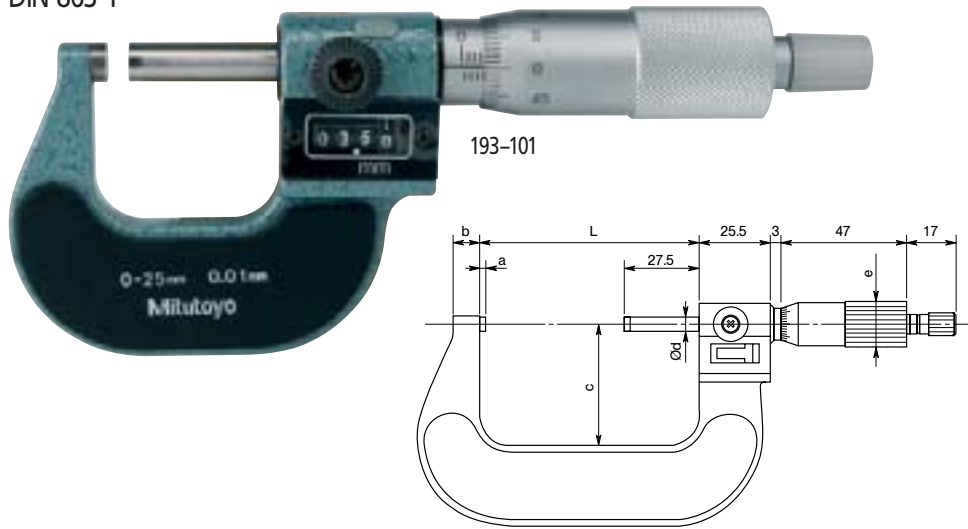


Outside Micrometer with Mechanical Counter

- Direct-reading outside micrometer for quick and easy reading.

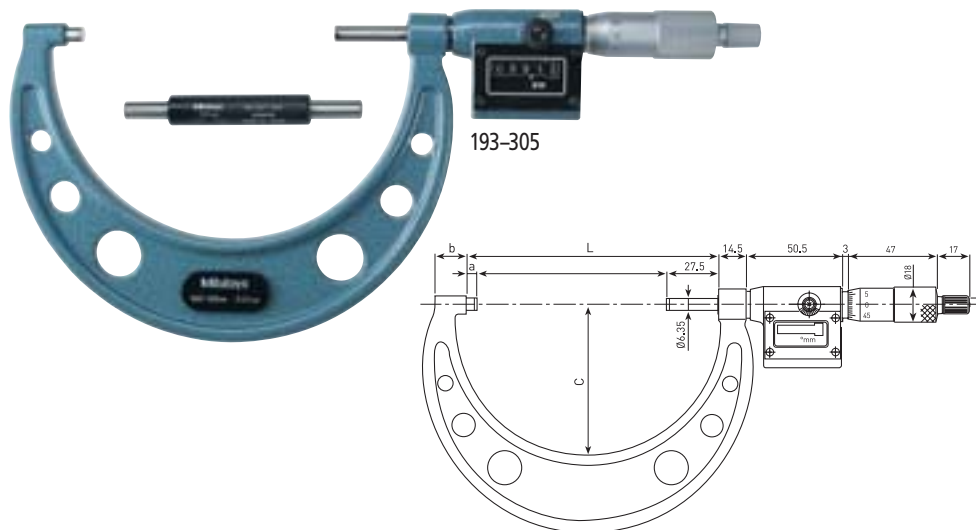
Series 193

DIN 863-1



Measuring range mm	No.	L mm	a mm	b mm	c mm	d Ø mm	e Ø mm	Mass g
0- 25	193-101	30,0	2,5	5	26	6,35	18	224
25- 50	193-102	55,0	2,5	8	32	6,35	18	275
50- 75	193-103	80,0	2,5	9	45	6,35	18	379
75-100	193-104	105,0	2,5	9	57	6,35	18	489

Series 193



Measuring range mm	No.	L mm	a mm	b mm	c mm	Mass g
100-125	193-305	132,8	5,3	17	79	670
125-150	193-306	158,2	5,7	19	94	825
150-175	193-307	183,6	6,1	19	106	885
175-200	193-308	208,8	6,3	18	118	1045
200-225	193-309	234,2	6,7	17	130	1175
225-250	193-310	259,0	5,5	18	143	1325

Outside micrometers as a set

Measuring range mm	No.	Set combination	Mass g
0- 75	193-901	3 outside micrometers, 2 gauge blocks	878
0-100	193-902	4 outside micrometers, 3 gauge blocks	1367
0-150	193-908	6 outside micrometers, 5 gauge blocks	2862

Specifications

Accuracy:	DIN 863-1
Graduation:	0,01 mm
Numerical increment	
Register:	0,01 mm
Scales:	thimble and sleeve satin chrome finish
Measuring spindle:	spindle pitch 0,5 mm with spindle lock
Measuring surfaces:	carbide-tipped, precision ground and micro-lap finish
Frame:	forged, enamelled
Measuring force:	5-15 N

Including box, gauge block from 25 mm, key

Series 193

As a set



193-901

Spline Micrometer Special version

- With stepped measuring surfaces.
- For measuring grooves, splined shafts, recesses, shaped parts etc.

Series 111

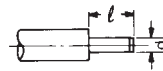
DIN 863, Form D3

Specifications

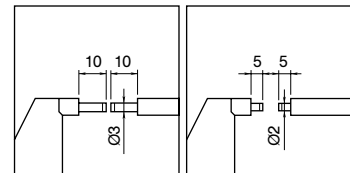
Accuracy: DIN 863-1
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring spindle: Ø 6,35 mm, spindle pitch 0,5 mm, with spindle lock
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish, stepped
 Frame: enamelled
 Measuring force: 5–10 N
 Including box, gauge block (25–100 mm), key



111-115



Measuring range mm	No.	l/d mm	Mass g
0– 25	111-115	10/3	205
25– 50	111-116	10/3	305
50– 75	111-117	10/3	370
75–100	111-118	10/3	500
0– 25	111-215	5/2	205



Specifications

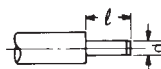
Protection class: IP-65
 Accuracy: DIN 863-1
 Resolution: 0,001 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring spindle: Ø 6,35 mm, spindle pitch 0,5 mm, with spindle lock
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish, stepped
 Frame: enamelled
 Measuring force: 5–10 N
 Including box, gauge block (25–75 mm), key, 1 battery

Series 331

“DIGIMATIC” Type, with data output
 DIN 863, Form D3



331-251



Measuring range mm	No.	l/d mm	Mass g
0– 25	331-251	10/3	330
25– 50	331-252	10/3	470
50– 75	331-253	10/3	625
75–100	331-254	10/3	565
0– 25	331-261	5/2	330
25– 50	331-262	5/2	470
50– 75	331-263	5/2	625
75–100	331-264	5/2	565



Optional accessories

No. 05CZA662 Signal cable (1 m)
 No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Point Type Micrometer Special version

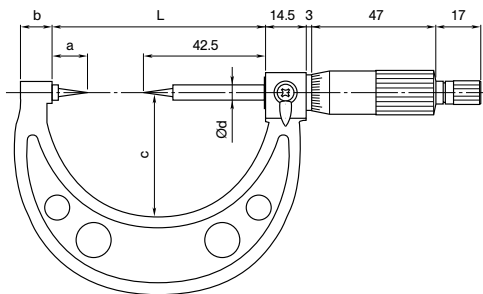
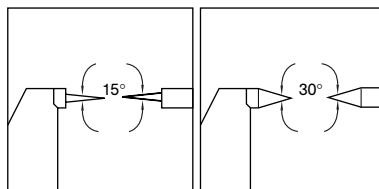
- With pointed spindle.
- For measuring grooves, steps etc.

Series 112

Analogue version



112-201



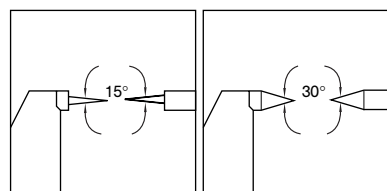
Measuring range mm	No.	L mm	a mm	b mm	c mm	Ød mm	Mass g
Angle: 15°							
0-25	112-153	55,3	12,8	10	38	6,35	205
25-50	112-154	80,3	12,8	12	49	6,35	305
Angle: 30°							
0-25	112-201	55,3	12,8	10	38	6,35	205
25-50	112-202	80,3	12,8	12	49	6,35	305

Series 342

"DIGIMATIC" Type, with data output



342-251



Measuring range mm	No.	Mass g
Angle: 15°		
0- 25	342-251	330
25- 50	342-252	470
50- 75	342-253	625
75-100	342-254	565
Angle: 30°		
0- 25	342-261	330
25- 50	342-262	470
50- 75	342-263	625
75-100	342-264	565



Specifications

- Accuracy: Factory specification
Error limit: $(2 + L/75) \mu\text{m}$
L in mm
- Graduation: 0,01 mm
- Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm
- Measuring spindle: Ø 6,35 mm,
spindle pitch 0,5 mm,
with spindle lock
- Measuring surfaces: hardened and precision ground,
conical spindle and anvil,
measuring point radius 0,3 mm
enamelled
- Frame: Enamelled
- Measuring force: 5-10 N
- Including box, gauge block (25-100 mm), key

Specifications

- Protection class: IP-65
- Accuracy: Factory specification
Error limit: $(2 + L/75) \mu\text{m}$
L in mm
- Resolution: 0,001 mm
- Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm
- Measuring spindle: Ø 6,35 mm,
spindle pitch 0,5 mm,
with spindle lock
- Measuring surfaces: hardened and precision ground,
conical spindle and anvil,
measuring point radius 0,3 mm
enamelled
- Frame: Enamelled
- Measuring force: 5-10 N
- Including box, gauge block (25-75 mm), key,
1 battery

Optional accessories

- No. 05CZA662 Signal cable (1 m)
- No. 05CZA663 Signal cable (2 m)

Consumable Spares

- No. 938882 Battery SR-44

Outside Micrometer Special version

- With V-anvil.
- For 3 fluted measurements on taps, drills, reamers etc.

Specifications

Accuracy: DIN 863-1
 Graduation: 0,01 mm
 Scales: thimble and sleeve
 satin chrome finish,
 Ø 18 mm
 Measuring spindle: Ø 6,35 mm,
 spindle pitch 0,75 mm,
 with spindle lock
 Measuring surfaces: Prism angle 60°
 Frame: enamelled
 Measuring force: 5–10 N
 Including box, gauge block, key

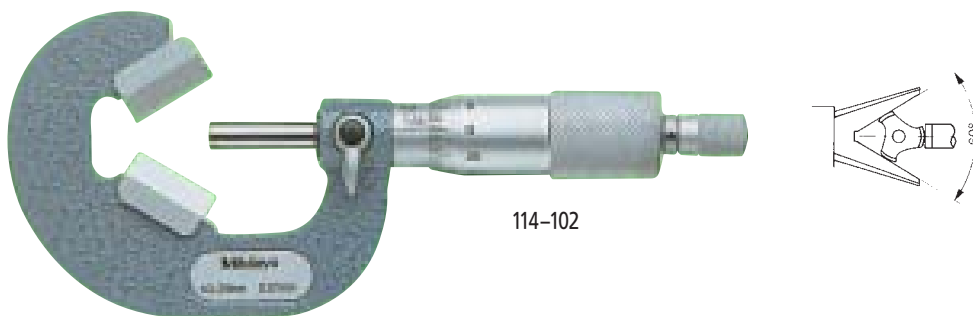


Gauge blocks (Standard accessories)

No. 167-327 Ø 5 mm
 No. 167-328 Ø 10 mm
 No. 167-329 Ø 25 mm

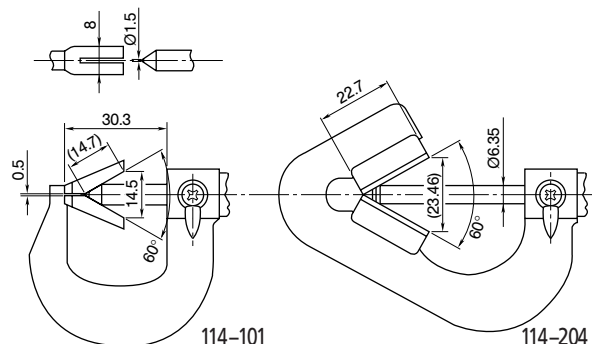
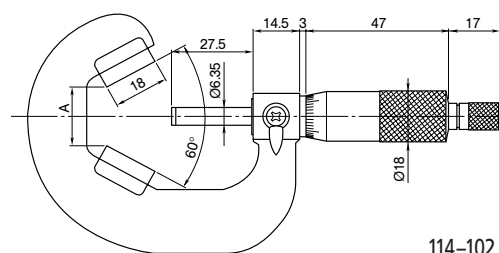
Series 114

DIN 863, Form D 10-3



Measuring range mm	No.	A mm	Mass g
Measuring surfaces with grooves			
1-15	114-101	0,5	120
10-25	114-102	6,2	280
25-40	114-103	19,14	400
2,3-25	114-204*	0,5	290
Measuring surfaces without grooves			
1-15	114-161	0,5	120
10-25	114-162	6,2	280

* Anvil carbide-tipped



Specifications

Accuracy: DIN 863-1
 Resolution: 0,001 mm
 Scales: thimble and sleeve
 satin chrome finish,
 Ø 18 mm
 Measuring spindle: Ø 6,35 mm,
 spindle pitch 0,75 mm,
 with spindle lock
 Measuring surfaces: Prism angle 60°
 Frame: enamelled
 Measuring force: 5–10 N,
 3–8 N (314-251, 314-261)
 Including box, gauge block, key, 1 battery
 (gauge blocks: see above)

Optional accessories

No. 05CZA662 Signal cable (1 m)
 No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Series 314

"DIGIMATIC" Type, with data output
 DIN 863, Form D 10-3



Measuring range mm	No.	Mass g
Measuring surfaces with grooves		
1-15	314-251	275
10-25	314-252	410
25-40	314-253	465
Measuring surfaces without grooves		
1-15	314-261	275
10-25	314-262	410

Outside Micrometer Special version

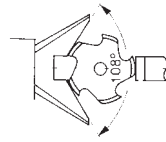
Series 114

DIN 863, Form D 10-5

For 5 fluted measurements on taps, drills, reamers etc.



114-121



Measuring range mm	No.	Mass g
Measuring surfaces with grooves		
5,0-25	114-121	255
25,0-45	114-122	400
2,3-25	114-137*	220
Measuring surfaces without grooves		
5,0-25	114-165	255

* Anvil carbide-tipped

Specifications

Accuracy: DIN 863-1
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring spindle: Ø 6,35 mm, with spindle lock
 Measuring surfaces: Prism angle 108°
 Frame: enamelled
 Measuring force: 5-10 N
 Including box, gauge block, key



Gauge blocks (Standard accessories)

No. 167-327 Ø 5 mm
 No. 167-328 Ø 10 mm
 No. 167-329 Ø 25 mm

Series 115

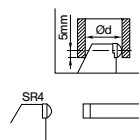
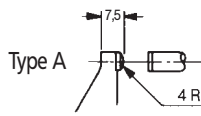
DIN 863, Form D 1 (Type A, Type B) / Form similar to D12 (type C)

For measurements of all curved surfaces and wall thickness of tubes, bearings, rings etc.

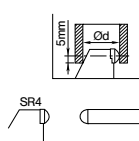
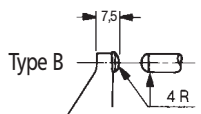


115-215

Measuring range mm	No.	Error limit µm	L mm	min. Ø d mm	Mass g
0- 25	115-115	3	-	10	180
25- 50	115-116	3	-	11	240
50- 75	115-117	3	-	17	315
75-100	115-118	4	-	18	375

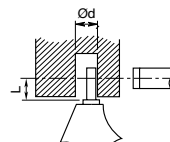
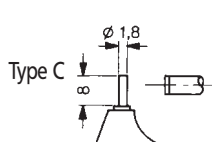


0- 25	115-215	3	-	10	180
25- 50	115-216	3	-	11	240
50- 75	115-217	3	-	17	315
75-100	115-218	4	-	18	375



0- 25	115-302*	3	4	2	180
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* spindle only carbide-tipped



Specifications

Accuracy: DIN 863-1 (Type A, Type B)
 Factory specification
 Error limit: 3 µm (Type C)
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring spindle: Ø 6,35 mm, spindle pitch 0,5 mm, with spindle lock
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish
 Frame: enamelled
 Measuring force: 5-10 N
 Including box, gauge block (from 25-50 mm), key

Tube Micrometer Special version

Specifications

Protection class: IP-65
 Accuracy: DIN 863-1 (Type A, B),
 Factory specification
 Error limit: 3 μm
 (Type C, D, E, F)
 Resolution: 0,001 mm
 Scales: thimble and sleeve
 satin chrome finish,
 \varnothing 18 mm
 Measuring spindle: \varnothing 6,35 mm,
 spindle pitch 0,5 mm,
 with spindle lock
 Measuring surfaces: carbide-tipped,
 precision ground,
 micro-lap finish
 enamelled
 Frame:
 Measuring force: 5–10 N*, 3–8 N**
 Including box, gauge block (from 25–100 mm),
 key, 1 battery

Optional accessories

No. 05CZA662 Signal cable (1 m)
 No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Series 395

“DIGIMATIC” Type, with data output

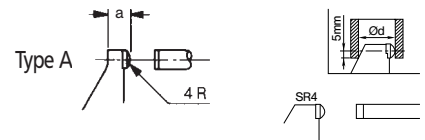
DIN 863, Form D 1 (Type A, B), Form similar to D12 (types C, D, E, F)

For measurements of all curved surfaces and wall thickness of tubes, bearings, rings etc.

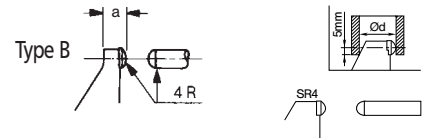


395-251

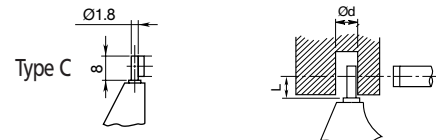
Measuring range mm	No.	Error limits μm	L mm	min. \varnothing d mm	a mm	Mass g
0– 25	395-251*	2	–	15	9	270
25– 50	395-252*	2	–	15	9,8	330
50– 75	395-253*	2	–	19	12,6	470
75–100	395-254*	3	–	20	14	625



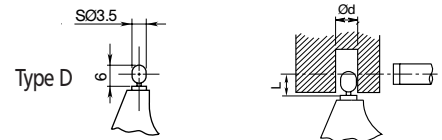
0– 25	395-271*	2	–	15	9	270
25– 50	395-272*	2	–	15	9,8	330
50– 75	395-273*	2	–	19	12,6	470
75–100	395-274*	3	–	20	14	625



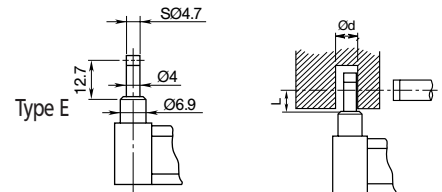
0– 25	395-261**	3	4	2	–	270
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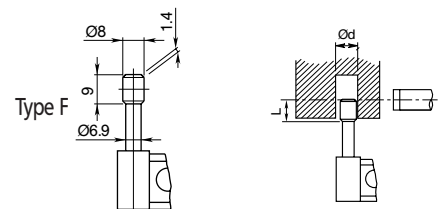
0– 25	395-262**	3	4	3,6	–	270
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0– 25	395-263**	3	12	4,8	–	310
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0– 25	395-264**	3	22	8,2	–	310
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Outside Micrometer Special version

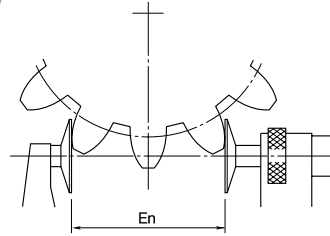
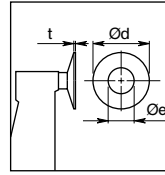
- With disc-shaped measuring surfaces.
- For measuring base tangent length, module 0,5 to 6, and to measure recess distances

Series 123

DIN 863, Form D 7



123-101



EN = tooth width over 3 teeth

Measuring range mm	No.	Parallelism μm	Error limit μm	$\varnothing d$ mm	$\varnothing e$ mm	t mm	Mass g
0- 25	123-101	4	4	20	8	0,7	200
25- 50	123-102	4	4	20	8	0,7	250
50- 75	123-103	6	6	20	8	0,7	300
75-100	123-104	6	6	20	8	0,7	375
100-125	123-105	7	7	30	12	1,0	520
125-150	123-106	7	7	30	12	1,0	570
150-175	123-107	7	8	30	12	1,0	730
175-200	123-108	8	8	30	12	1,0	890
200-225	123-109	8	8	30	12	1,0	1000
225-250	123-110	8	9	30	12	1,0	1200
250-275	123-111	9	9	30	12	1,0	1410
275-300	123-112	9	9	30	12	1,0	1680

Specifications

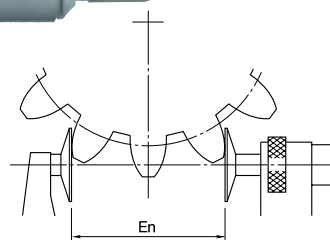
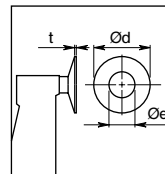
Accuracy: Factory specification
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, $\varnothing 18$ mm
 Measuring spindle: $\varnothing 6,35$ mm, spindle pitch 0,5 mm, with spindle lock
 Frame: enameled
 Measuring force: 5-10 N
 Including box, gauge block (25-300 mm), insulation, key

Series 323

"DIGIMATIC" Type, with data output
 DIN 863, Form D 7



323-250



EN = tooth width over 3 teeth

Measuring range mm	No.	Parallelism μm	Error limit μm	$\varnothing d$ mm	$\varnothing e$ mm	t mm	Mass g
0- 25	323-250	4	4	20	8	0,7	290
25- 50	323-251	4	4	20	8	0,7	355
50- 75	323-252	6	6	20	8	0,7	555
75-100	323-253	6	6	20	8	0,7	610

Specifications

Protection class: IP-65
 Accuracy: Factory specification
 Resolution: 0,001 mm
 Scales: thimble and sleeve satin chrome finish, $\varnothing 18$ mm
 Measuring spindle: $\varnothing 6,35$ mm, spindle pitch 0,5 mm, with spindle lock
 Frame: enameled
 Measuring force: 3-8 N
 Including box, gauge block (25-100 mm), insulation, key, 1 battery

Optional accessories

No. 05CZA662 Signal cable (1 m)
 No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

ABSOLUTE Quick Outside Micrometer
 see page 33



Outside Micrometer Special version

- With non-rotating spindle and disc-shaped measuring surfaces.
- For measuring felt, rubber, cardboard, fabric etc.

Series 169

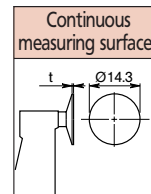
DIN 863, Form D 6

Specifications

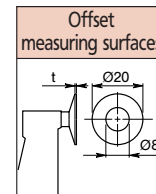
Accuracy: DIN 863-1
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, \varnothing 18 mm
 Measuring spindle: \varnothing 8 mm, spindle pitch 0,5 mm, with spindle lock
 Frame: enamelled
 Measuring force: 5–10 N
 Including box, insulation, key



169-201



169-101

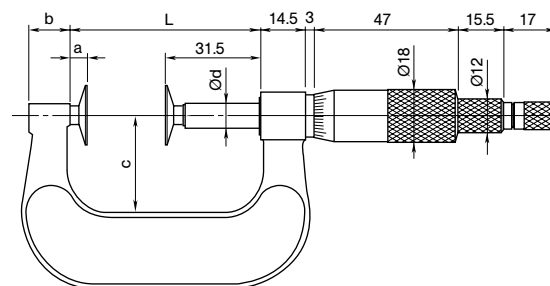


169-201

Measuring range mm	No.	L mm	a mm	b mm	c mm	\varnothing d mm	t mm	Mass g
With continuous measuring surfaces								
0–25	169-101	37,5	6	14	25	8	0,4	230
With offset measuring surfaces								
0–25	169-201	37,5	6	14	25	8	0,7	230



169-101 with holohedral measuring surfaces



Specifications

Accuracy: DIN 863-1
 Resolution: 0,001 mm
 Scales: thimble and sleeve satin chrome finish, \varnothing 18 mm
 Measuring spindle: \varnothing 6,35 mm, spindle pitch 0,5 mm, with spindle lock
 Frame: enamelled
 Measuring force: 3–8 N
 Including box, gauge block (25–100 mm), insulation, key, 1 battery

Optional accessories

No. 05CZA662 Signal cable (1 m)
 No. 05CZA663 Signal cable (2 m)

Consumable Spares

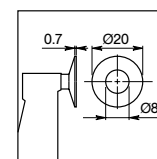
No. 938882 Battery SR-44

Series 369

"DIGIMATIC" Type, with data output
 DIN 863, Form D 6



369-250



Measuring range mm	No.	Mass g
0– 25	369-250	340
25– 50	369-251	480
50– 75	369-252	635
75–100	369-253	775

ABSOLUTE Quick Outside Micrometer
 see page 33

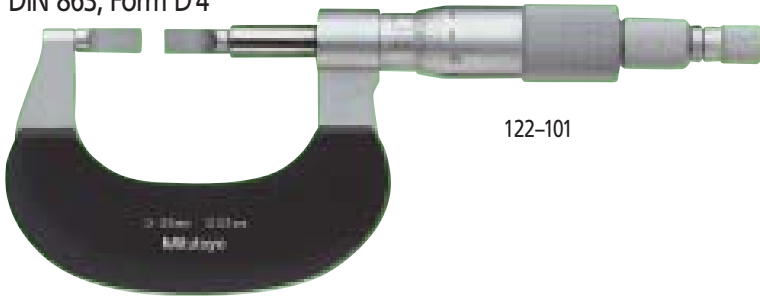


Blade Micrometer Special version

- With small measuring surfaces.
- For measuring small external grooves.
- Non-rotating spindle.

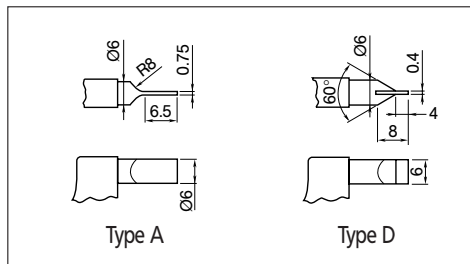
Series 122

DIN 863, Form D 4



122-101

Measuring range mm	No.	Mass g
Type A		
0- 25	122-101	260
25- 50	122-102	300
50- 75	122-103	360
75-100	122-104	525
100-125	122-105	-
125-150	122-106	-
150-175	122-107	-
175-200	122-108	-
Type D, with carbide-tipped measuring faces		
0- 25	122-141	275
25- 50	122-142	315



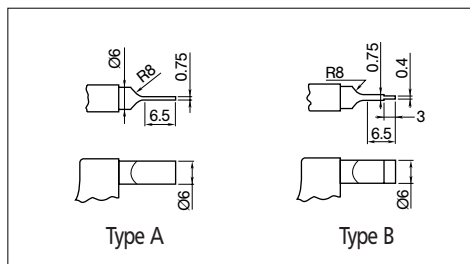
Series 422

"DIGIMATIC" Type, with data output
DIN 863, Form D 4



422-230

Measuring range mm	No.	Mass g
Type A		
0- 25	422-230	365
25- 50	422-231	565
50- 75	422-232	465
75-100	422-233	580
Type B		
0- 25	422-260	365
25- 50	422-261	565



Specifications

Accuracy: DIN 863-1
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring spindle: Ø 6,35 mm, spindle pitch 0,5 mm
 Frame: enamelled
 Measuring force: 5-10 N
 Including box, gauge block (from 25 mm), insulation, key

Specifications

Accuracy: DIN 863-1
 Resolution: 0,001 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring spindle: Ø 6,35 mm, spindle pitch 0,5 mm
 Frame: enamelled
 Measuring force: 3-8 N
 Including box, gauge block (from 25 mm), insulation, key, 1 battery

Optional accessories

- No. 05CZA662 Signal cable (1 m)
- No. 05CZA663 Signal cable (2 m)

Consumable Spares

- No. 938882 Battery SR-44

ABSOLUTE Quick Micrometer
see page 34



Point Type Micrometer Special version

- With pointed spindle.
- For measuring crimp heights.

Series 112 Analogue version

Specifications

Accuracy: Factory specification
Error limit: 3 µm

Graduation: 0,01 mm

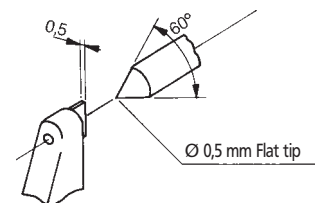
Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm

Measuring spindle: Ø 6,35 mm,
spindle pitch 0,5 mm,
with spindle lock

Measuring surfaces: hardened and
precision ground
enamelled

Frame: 5-10 N

Including box



Measuring range mm	No.	Mass g
0-25	112-401	165

Specifications

Protection class: IP-65

Accuracy: DIN 863-1
Error limit: 3 µm

Resolution: 0,001 mm

Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm

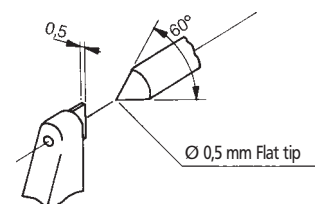
Measuring spindle: Ø 6,35 mm,
spindle pitch 0,5 mm,
with spindle lock

Measuring surfaces: hardened and
precision ground
enamelled

Frame: 3-8 N

Including box, 1 battery

Series 342 "DIGIMATIC" Type, with data output for measuring crimp heights



Measuring range mm	No.	Mass g
0-20	342-271	270

Optional accessories

No. 05CZA662 Signal cable (1 m)
No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

ABSOLUTE Quick Micrometer
see page 34



Screw Thread Micrometer Special version

• For measuring the pitch diameter of threads.

Series 126

DIN 863, Form D 18



126-125

Measuring range mm	No.	Mass g
0- 25	126-125	240
25- 50	126-126	290
50- 75	126-127	390
75-100	126-128	450
100-125	126-129	530
125-150	126-130	620

Measuring inserts

Length	No. 55°	No. 60°
	(Optional accessories)	(Standard accessories)
25 mm	167-272	167-261
50 mm	167-273	167-262
75 mm	167-274	167-263
100 mm	167-275	167-264
125 mm	167-276	167-265

Series 326

"DIGIMATIC" Type, with data output
DIN 863, Form D 18



326-251



Measuring range mm	No.	Mass g
0- 25	326-251	350
25- 50	326-252	380
50- 75	326-253	470
75-100	326-254	510

Measuring inserts

Length	No. 55°	No. 60°
	(Optional accessories)	(Standard accessories)
25 mm	167-272	167-261
50 mm	167-273	167-262
75 mm	167-274	167-263
100 mm	167-275	167-264

Series 126 / 326

Optional accessories measuring inserts



No.	Metric pitch	UNF turns / inch
Individual measuring inserts		
126-801	0,4-0,50	64,0-48,0
126-802	0,6-0,90	44,0-28,0
126-803	1,0-1,75	24,0-14,0
126-804	2,0-3,00	13,0- 9,0
126-805	3,5-5,00	8,0- 5,0
126-806	5,5-7,00	4,5- 3,5

Measuring insert set

126-800 (consists of No. 126-801 to 126-806)

No.	Whitworth turns / inch	No.	Whitworth turns / inch
Individual measuring inserts			
126-811	60-48	126-816	18,0-14,0
126-812	48-40	126-817	14,0-10,0
126-813	40-32	126-818	10,0- 7,0
126-814	32-24	126-819	7,0- 4,5
126-815	24-18	126-820	4,5- 3,5

Measuring insert set

126-810 (consists of No. 126-811 to 126-820)

Specifications

Accuracy: DIN 863-1
Graduation: 0,01 mm
Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm

Measuring spindle: Ø 6,35 mm,
spindle pitch 0,5 mm,
with spindle lock

Frame: enamelled
Measuring force: 5-10 N

Including box, gauge block (60°), insulation, key

Measuring inserts not included

Specifications

Protection class: IP-65
Accuracy: DIN 863-1
Resolution: 0,001 mm
Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm

Measuring spindle: Ø 6,35 mm,
spindle pitch 0,5 mm,
with spindle lock

Frame: enamelled
Measuring force: 5-10 N

Including box, gauge block (60°), insulation,
key, 1 battery

Measuring inserts not included

Optional accessories

No. 05CZA662 Signal cable (1 m)
No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44



"DIGIMATIC" Gear Micrometer Special version

- With exchangeable ball inserts.
- For measuring divided circles or indirect tooth thickness on straight or helical teeth.

Series 324

"DIGIMATIC" Type, with data output
DIN 863, Form D 1



324-251

Specifications

Protection class: IP-65
Accuracy: DIN 863-1
Resolution: 0,001 mm
Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm
Measuring spindle: Ø 6,35 mm
Frame: enamelled
Measuring force: 5-10 N
Including box, key, 1 battery
Measuring inserts not included

Optional accessories

No. 05CZA662 Signal cable (1 m)
No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Measuring range mm	No.	Mass g
0- 25	324-251	400
25- 50	324-252	490
50- 75	324-253	530
75-100	324-254	600

Series 324

Optional accessories (measuring inserts)

No.	Ball Ø mm	Module
124-801	0,8	0,50-0,55
124-802	1,0	0,60-0,65
124-821	1,5	0,90-1,00
124-805	2,0	1,25
124-822	2,5	1,50
124-807	3,0	1,75
124-823	3,5	2,00
124-810	4,0	2,25
124-824	4,5	2,50
124-812	5,0	2,75
124-814	6,0	3,50
124-816	7,0	4,00
124-819	8,0	4,75



◀ Further inserts see page 52

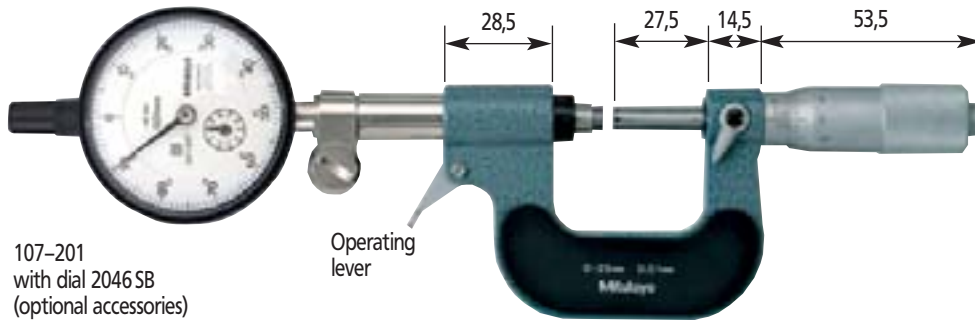
Outside Micrometer Special version

• For series tests.

Series 107

DIN 863, Form D14

Measuring process: an basic dimension is set on the micrometer. Then the spindle is locked and the workpiece inserted. The moveable anvil transmits the plus-minus tolerance which can then be read from the dial indicator.



107-201
with dial 2046SB
(optional accessories)

Measuring range mm	No. without dial	Mass g
0-25	107-201	480
25-50	107-202	520

Optional accessories (At user's discretion)



Specifications

Accuracy: DIN 863-1
 Graduation: 0,01 mm on micrometer
 Scales: thimble and sleeve
 satin chrome finish,
 \varnothing 18 mm
 Measuring spindle: \varnothing 6,35 mm
 spindle pitch 0,5 mm,
 with spindle lock
 Measuring surfaces: carbide-tipped,
 micro-lap finish
 Frame: enamelled
 anvil: 3 mm abhebbar
 Measuring force: 5-10 N
 Including box, gauge block (from 25-50 mm),
 insulation, key



Specifications

Accuracy: Factory specification
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish, \varnothing 8 mm
 Including box, workpiece rest

Optional accessories (At user's discretion)

No. 543-250 B DIGIMATIC Dial Indicator ID-C
 No. 543-690 B DIGIMATIC Dial Indicator ID-S
 No. 542-144 Linear Gage Probe
 Resolution 0,1 μ m
 No. 2972 Analogue Dial Indicator
 No. 2900 SB-10 Analogue Dial Indicator
 No. 2110 SB-10 Analogue Dial Indicator
 No. 524-501 Dial Indicator
 No. 524-500 Dial Indicator
 See page 54

Passameter

• Passameters are adjustable snap gauges, applicable for serial measurements of rotational symmetric workpieces such as shafts, axes, bolts, etc. as well as for thickness and length measurements.

Series 523

Passmeter with dial indicator
 Return motion lever in a handy position



523-141

Sample application: 523-141 + 543-250 B

Measuring range	No.	Free lift	Flatness	Parallelism	Error limits (Transmission element)	Measuring force	Mass
mm		mm	μ m	μ m	μ m	N	g
0- 25	523-141	2	0,3	0,6	0,4	5-10	710
25- 50	523-142	2	0,3	0,6	0,4	5-10	810
50- 75	523-143	2	0,3	1,0	0,4	5-10	920
75-100	523-144	2	0,3	1,0	0,4	5-10	1050

Specifications

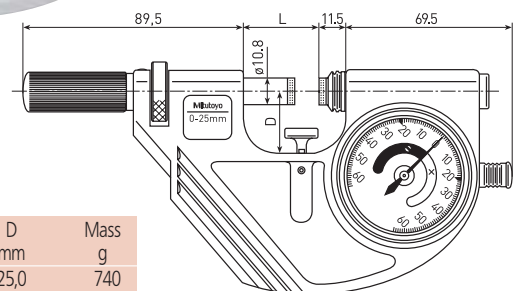
Accuracy: Factory specification
 Error limit dial indicator: 1 μ m
 Graduation dial indicator: 0,001 mm
 Indication dial indicator: \pm 0,06 mm
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish
 Flatness: 0,3 μ m
 Measuring force: 5-10 N
 Protection class: IP-54
 Including box, workpiece support

Series 523

Passmeter with dial indicator
 Incl. tolerance markings for serial measurements
 With anvil retraction button in handy position



523-121



Measuring range	No.	Parallelism	L	D	Mass
mm		μ m	mm	mm	g
0- 25	523-121	0,6	31	25,0	740
25- 50	523-122	0,6	56	35,0	840
50- 75	523-123	1,0	81	47,5	950
75-100	523-124	1,0	106	60,0	1080

Micrometer stands
 see pages 68 and 69



Indicating Micrometer Special version

- Fine pointer micrometer.
- For series tests.

Series 510

DIN 863, Form D 13

Large size dial indicator for easy reading
Featuring Zero setting, tolerance marks for GO/NG measurements
Retracting button easy to operate



510-121



510-141

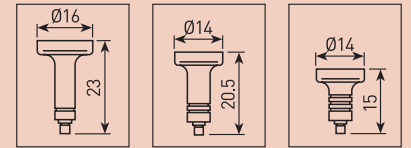


Specifications

Accuracy:	Factory specification
Graduation dial indicator:	0,001 mm
Graduation micrometer:	0,001 mm (Nonius)
Error limit dial indicator:	1 μm
Error limit micrometer:	3 μm
Indication range dial indicator:	± 0,06 mm
Scales:	thimble and sleeve satin chrome finish
Measuring surfaces:	carbide-tipped, precision ground, micro-lap finish
Flatness:	0,3 μm
Measuring force:	5–10 N
Protection class:	IP-54
Including box, gauge block (from 25 mm), key	

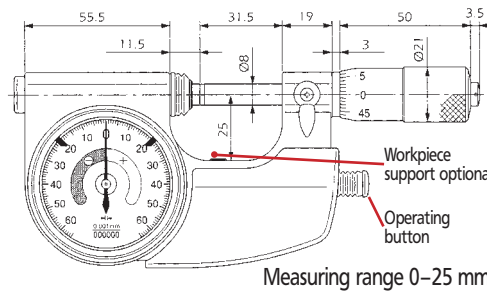
Optional accessories

- No. 04AZA124 Workpiece support A
- No. 04AZA125 Workpiece support B
- No. 04AZA126 Workpiece support C

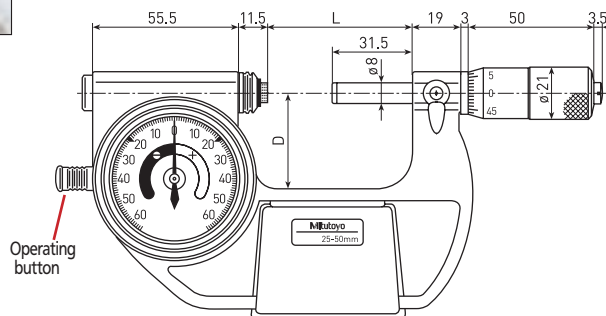


No. 04AZA124 No. 04AZA125 No. 04AZA126

Measuring range mm	No.	Function-key	Parallelism μm	L mm	D mm	Mass g
0– 25	510-121	right	0,6	31,5	25	520
0– 25	510-141	left	0,6	31,5	25	520
25– 50	510-122	left	0,6	38,0	56	670
50– 75	510-123	left	1,0	50,0	81	820
75–100	510-124	left	1,0	63,0	106	970



Measuring range 0–25 mm



Measuring range 25–100 mm

Measuring range mm	No.	Fits diameter Workpiece support		
		A Ø mm	B Ø mm	C Ø mm
0– 25	510-121	–	4–16	15– 25
25– 50	510-122	25–37	30–42	41– 50
50– 75	510-123	50–61	54–66	65– 75
75–100	510-124	75–87	80–92	91–100

Micrometer stands see pages 68 and 69

Limit Micrometer Special version

Series 113

for tolerance comparison

To be used as OK and reject evaluations

Specifications

- Accuracy: Factory specification
Error limit: 3 μm
- Graduation: 0,01 mm
- Scales: thimble and sleeve
satin chrome finish,
 \varnothing 18 mm
- Measuring spindle: \varnothing 6,35 mm
spindle pitch 0,5 mm,
with spindle lock
- Measuring surfaces: carbide-tipped,
with clamping device
micro-lap finish
- Frame: enamelled
- Including box, gauge block (from 25–50 mm), key



113-102

Measuring range mm	No.	Mass g
0–25	113-102	340
25–50	113-103	380

Limit Micrometer Special version

• With non-rotating spindle and exchangeable measuring inserts.

Series 116

DIN 863, Form D 16

Specifications

- Accuracy: DIN 863-1
- Graduation: 0,01 mm
- Scales: thimble and sleeve
satin chrome finish,
 \varnothing 18 mm
- Measuring spindle: \varnothing 8 mm
spindle pitch 0,5 mm,
with spindle lock
- Frame: enamelled
- Measuring force: 5–10 N
- Including box, gauge block (from 25–50 mm),
insulation, key
- Measuring inserts not included



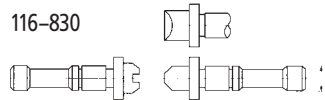
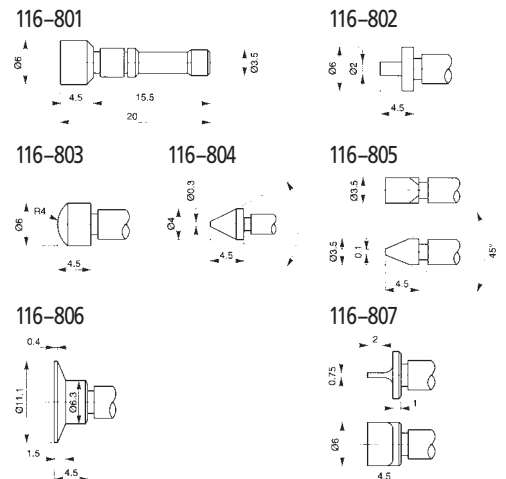
116-101

Measuring range mm	No.	Mass g
0–25	116-101	250
25–50	116-102	300

Series 116

Optional accessories (measuring inserts)

No.	Comment
Individual measuring inserts	
116-801	Measuring insert, flat type (pair)
116-802	Measuring insert with stepped measuring surfaces
116-803	Measuring insert, semis-circular type (pair)
116-804	Measuring insert, pointed type (pair)
116-805	Measuring insert, spline type (pair)
116-806	Measuring insert, disc-type (pair)
116-807	Measuring insert, knife-edge type (pair)
Measuring insert sets	
116-800	7 Pairs of measuring inserts No. 116-801 to -807
116-830	6 Pairs of inserts for measuring threads metric, pitch 0,4–7 mm



With holohedral measuring surfaces

Micrometer Special version

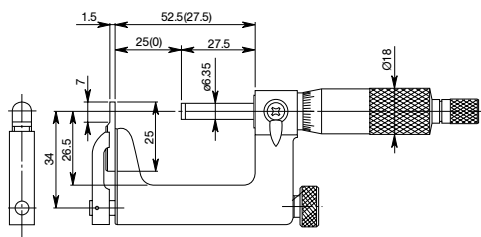
- With replaceable anvil.
- For measuring wall thickness of cylinders and tubes as well as openings and slots from edge to edge and hard-to-reach locations.

Series 117

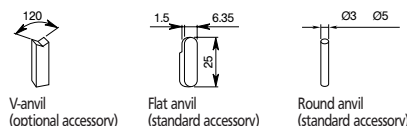
Analogue version



117-101



Dimension of 117-102 (117-101)



V-anvil (optional accessory) Flat anvil (standard accessory) Round anvil (standard accessory)

Measuring range mm	No.	Composition
0-25	117-101	Anvil No. 201217 Ø 3 mm Anvil No. 201216 flat
25-50	117-102	Anvil No. 201379 Ø 5 mm Anvil No. 201216 flat

Specifications

Accuracy: Factory specification
Error limit: 4 µm
Graduation: 0,01 mm
Scales: thimble and sleeve satin chrome finish
Measuring spindle: Ø 6,35 mm, spindle pitch 0,5 mm with spindle lock
Measuring surfaces: carbide-tipped
Frame: steel, satin chrome finish
Measuring force: 5-10 N
Including box, gauge block (25-50 mm), key

Optional accessories

No. 201218 V-anvil
No. 950758 Round dial
Only for measuring range 0-25 mm



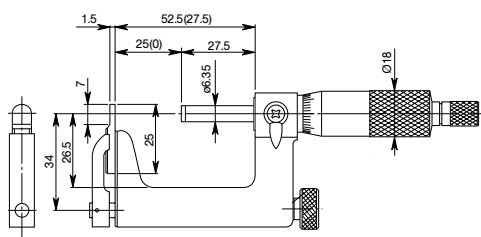
117-101 with 950758

Series 317

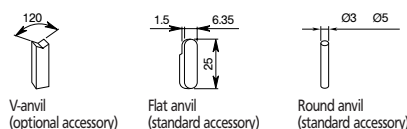
"DIGIMATIC" Type, with data output



317-251



Dimension of 317-252 (317-251)



V-anvil (optional accessory) Flat anvil (standard accessory) Round anvil (standard accessory)

Measuring range mm	No.	Composition
0-25	317-251	Anvil No. 201217 Ø 3 mm Anvil No. 201216 flat
25-50	317-252	Anvil No. 201379 Ø 5 mm Anvil No. 201216 flat



Specifications

Protection class: IP-65
Accuracy: Factory specification
Error limit: 4 µm
Resolution: 0,001 mm
Scales: thimble and sleeve satin chrome finish
Measuring spindle: Ø 6,35 mm, spindle pitch 0,5 mm with spindle lock
Measuring surfaces: carbide-tipped
Frame: steel, satin chrome finish
Measuring force: 5-10 N
Including box, gauge block (25-50 mm), key, 1 battery

Optional accessories

No. 201218 V-anvil
No. 950758 Round dial
Only for measuring range 0-25 mm
No. 05CZA662 Signal cable (1 m)
No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Outside Micrometer Special version

- With deep throat.
- For measuring semi-finished products with a large surface area.

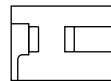
Series 118

DIN 863, Form D 8

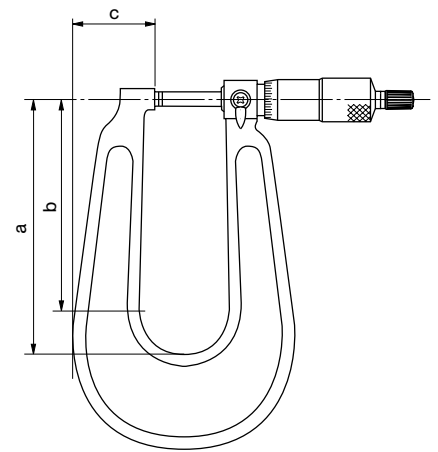


118-102

Measuring range mm	No.	Throat depth			Mass g
		a mm	b mm	c mm	
0-25	118-102	160	150	48	740
0-25	118-103	330	300	84	2650



118-102 / 118-103



Specifications

Accuracy: DIN 863-1
(throat depth 160 mm)
Factory specification
Error limit: 5 μm
(throat depth 330 mm)

Graduation: 0,01 mm

Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm bzw. Ø 21 mm

Measuring spindle: throat depth up to 150 mm:
Ø 6,35 mm
throat depth up to 300 mm:
Ø 8 mm
spindle pitch 0,5 mm,
with spindle lock

Measuring surfaces: carbide-tipped,
precision ground,
micro-lap finish

Frame: enamelled

Measuring force: 5-10 N

Including box, key

Series 389

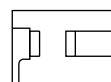
"DIGIMATIC" Type, with data output
DIN 863, Form D 8



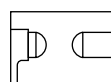
389-251

Measuring range mm	No.	Throat depth			Mass g
		a mm	b mm	c mm	
0-25	389-251	160	150	48	840
0-25	389-271*	160	150	48	840

* (with spherical measuring surfaces)



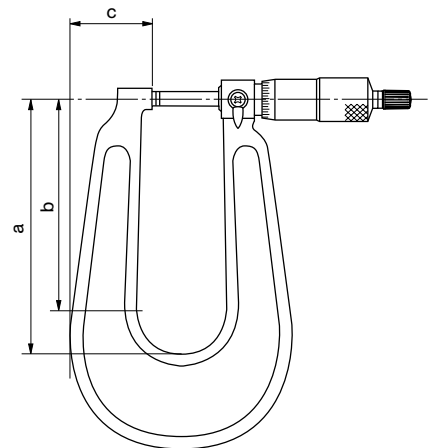
389-251



389-271



IP65



Specifications

Protection class: IP-65

Accuracy: DIN 863-1

Resolution: 0,001 mm

Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm

Measuring spindle: Ø 6,35 mm,
spindle pitch 0,5 mm,
with spindle lock

Measuring surfaces: carbide-tipped,
precision ground,
micro-lap finish

Frame: enamelled

Measuring force: 3-8 N

Including box, key, 1 battery

Optional accessories

No. 05CZA662 Signal cable (1 m)
No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Micrometer Special version

• For measuring sheet and strip metal.

Series 119

DIN 863, Form D 9



119-202

Measuring range mm	No.	Throat depth mm	Mass g
0-25	119-202	50	305



Specifications

Accuracy: DIN 863-1
Graduation: 0,01 mm
Scales: thimble and sleeve
satin chrome finish,
Measuring spindle: Ø 6,35 mm,
with spindle lock
Measuring surfaces: Convex anvil and level spindle
Frame: enamelled

Outside Micrometer Special version

- Bench Micrometer.
- Rugged, stable cast iron base for vertical and horizontal placing.
- The display with operation keys can be turned for optimum reading.

Series 121

"DIGIMATIC" Type, with data output
DIN 863, Form D 19



121-145

Measuring range mm	Opening mm	No.	Mass g
0-50	25	121-145	2300

Specifications

Accuracy: Factory specification
Error limit: 2 μm

Resolution: 0,001 mm

Scales: thimble and sleeve
satin chrome finish,
 \varnothing 18 mm

Measuring spindle: \varnothing 6,35 mm,
spindle pitch 0,5 mm

Measuring force: 5-10 N

Including 2 interchangeable anvils for measuring ranges 0-25 mm and 25-50 mm, gauge block, 2 batteries

Optional accessories

No. 937387 Signal cable (1 m)
No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Outside Micrometer Special version

- With measuring jaws.
- This type of micrometer has been especially designed for measuring hard-to-reach places.

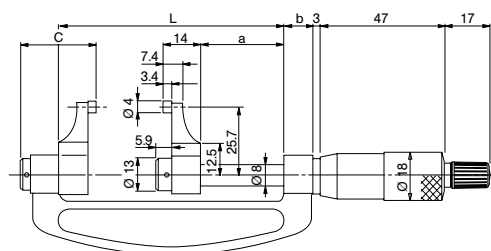
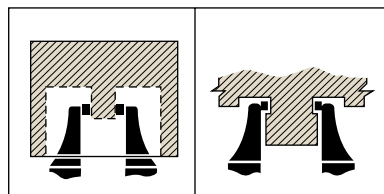
Series 143

Analogue version



143-101

Measuring range mm	No.	L mm	a mm	b mm	c mm	Mass g
0- 25	143-101	59,8	31,8	10,6	28,6	210
25- 50	143-102	84,8	31,8	10,6	28,6	230
50- 75	143-103	109,8	31,8	10,6	28,6	280
75-100	143-104	134,8	31,8	10,6	28,6	330



For the "DIGIMATIC" Type, refer next pages

Specifications

Accuracy: Factory specification
Error limit:
0- 25 mm: 5 μm ;
25- 50 mm: 6 μm ;
50- 75 mm: 7 μm ;
75-100 mm: 8 μm

Graduation: 0,01 mm

Scales: thimble and sleeve
satin chrome finish,
 \varnothing 18 mm

Measuring spindle: \varnothing 6,35 mm,
spindle pitch 0,5 mm

Measuring surfaces: carbide-tipped,
precision ground,
micro-lap finish
enamelled

Frame: enamelled

Including box, gauge block (from 25-50 mm), key

Outside Micrometer Special version

- With measuring jaws.
- This type of micrometer has been especially designed for measuring hard-to-reach places.

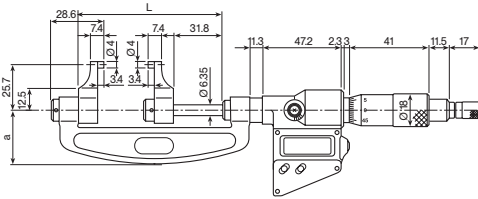
Series 343

"DIGIMATIC" Type, with data output



343-250

Measuring range mm	No.	L mm	a mm	Mass g
0- 25	343-250	59,8	27,5	320
25- 50	343-251	84,8	30,0	340
50- 75	343-252	109,8	32,5	390
75-100	343-253	134,8	35,0	440



Specifications

- Accuracy: Factory specification
Error limit:
0- 25 mm: 5 μm;
25- 50 mm: 6 μm;
50- 75 mm: 7 μm;
75-100 mm: 8 μm
- Resolution: 0,001 mm
Scales: thimble and sleeve
satin chrome finish, Ø 18 mm
- Measuring spindle: Ø 6,35 mm,
spindle pitch 0,5 mm
- Measuring surfaces: carbide-tipped,
precision ground,
micro-lap finish
enamelled
- Frame:
Including box, gauge block (from 25-50 mm),
key, 1 battery

Optional accessories

- No. 05CZA662 Signal cable (1 m)
No. 05CZA663 Signal cable (2 m)

Consumable Spares

- No. 938882 Battery SR-44

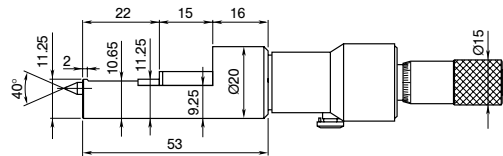
Can Seam Micrometer Special version

Series 147

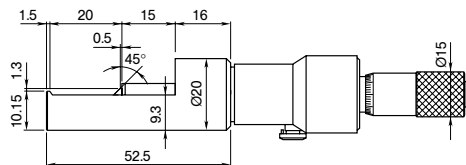
- For accurate control of depth and thickness of seams on cans.



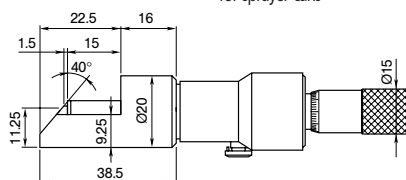
147-103



147-105



147-202



Measuring range mm	No.	Mass g
0-13	147-103	65
0-13	147-105	65
0-13	147-202	65

Specifications

- Accuracy: Factory specification
Error limit: 3 μm
Graduation: 0,01 mm
Scales: thimble and sleeve
satin chrome finish

Including box, key



Hub Micrometer Special version

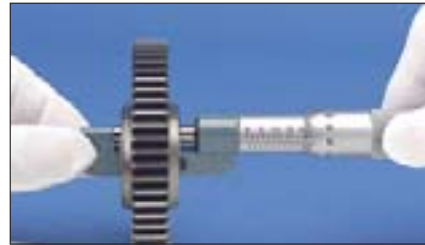
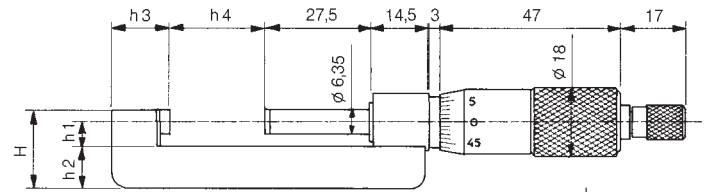
- With extra flat throat.
- For measuring bearing bushings etc.

Series 147

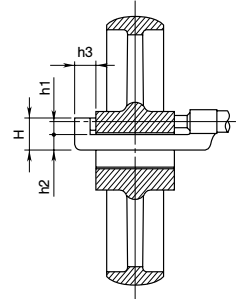


147-302

Measuring range mm	No.	H mm	h1 mm	h2 mm	h3 mm	h4 mm	Mass g
0- 25	147-301	17,5	6,0	8,5	13,5	0	135
25- 50	147-302	20,5	6,5	11,0	14,0	25	150
50- 75	147-303	20,5	6,5	11,0	13,0	50	170
75-100	147-304	20,5	6,5	11,0	13,0	75	185



Sample application



Specifications

Accuracy: Factory specification
 Error limit:
 0- 25 mm: 2 μ m;
 25- 50 mm: 2 μ m;
 50- 75 mm: 2 μ m;
 75-100 mm: 3 μ m

Graduation: 0,01 mm

Scales: thimble and sleeve
 satin chrome finish

Measuring spindle: spindle pitch 0,5 mm

Measuring surfaces: carbide-tipped,
 precision ground,
 micro-lap finish

Frame: enamelled

Measuring force: 5-10 N

Including box, gauge block (from 25-50 mm),
 key

Wire Micrometer Special version

- With little throat.
- For measuring wire and ball.

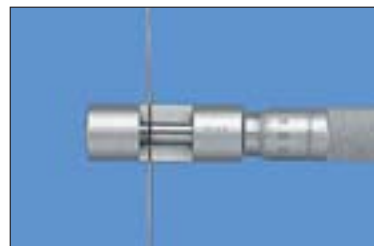
Series 147

DIN 863, Form D 2

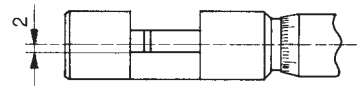
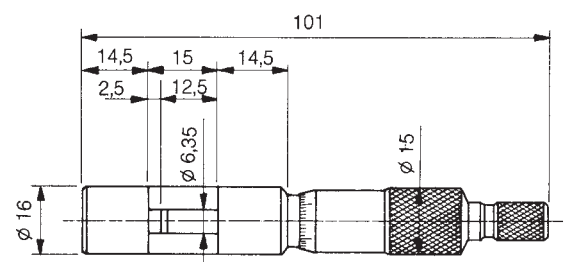


147-401

Measuring range mm	No.	Mass g
0-10	147-401	65



Sample application



Specifications

Accuracy: DIN 863-1

Graduation: 0,01 mm

Scales: thimble and sleeve
 satin chrome finish

Measuring spindle: spindle pitch 0,5 mm

Measuring surfaces: carbide-tipped,
 precision ground,
 micro-lap finish

Measuring force: 5-10 N

Including box, key

Internal Groove Micrometer

• For measuring internal cross grooves, steps in bores etc.

Series 146

With rotating spindle

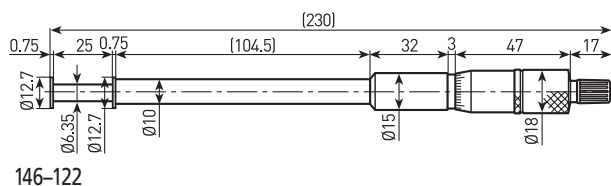
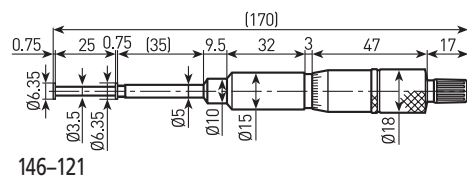


146-121



146-123

Measuring range external mm	Measuring range internal mm	No.	Diameter of measuring plate mm	Thickness of measuring plate mm	Mass g
0- 25	1,6- 26,5	146-121	6,35	0,75	135
0- 25	1,6- 26,5	146-122	12,70	0,75	185
25- 50	26,5- 51,5	146-123	12,70	0,75	175
50- 75	51,5- 76,5	146-124	12,70	0,75	165
75-100	76,5-101,5	146-125	12,70	0,75	160



Specifications

Accuracy: Factory specification
Error limit: 10 μm
Graduation: 0,01 mm
Scales: thimble and sleeve satin chrome finish, Ø 18 mm
Measuring spindle: spindle pitch 0,5 mm
Measuring surfaces: hardened
Ratchet: Can be used in both directions

Including box, key

Internal Groove Micrometer

• For measuring internal cross grooves, steps in bores etc.

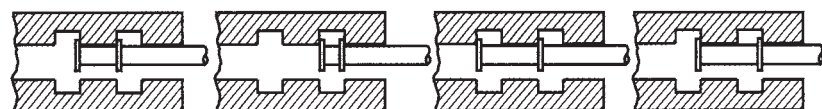
Series 146

With non-rotating spindle



146-222

No.	Measuring range external mm	Measuring range internal mm	Diameter of measuring plate mm	Thickness of measuring plate mm	Mass g
146-221	0- 25	1,6- 26,5	6,35	0,75	135
146-222	0- 25	1,6- 26,5	12,70	0,75	185
146-223	25- 50	26,5- 51,5	12,70	0,75	175
146-224	50- 75	51,5- 76,5	12,70	0,75	165
146-225	75-100	76,5-101,5	12,70	0,75	160



Specifications

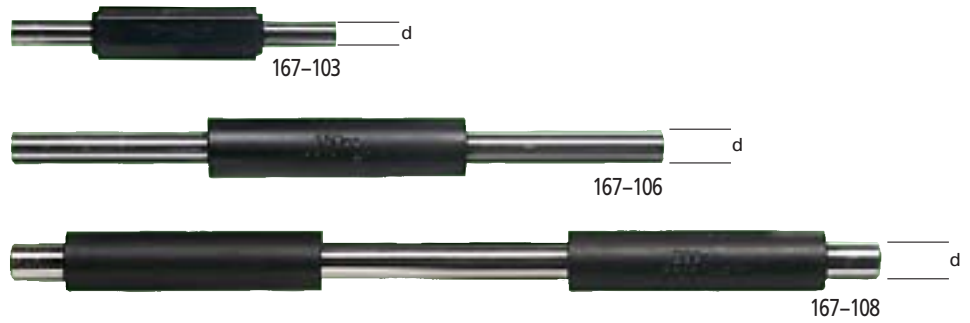
Accuracy: Factory specification
Error limit: 10 μm
Graduation: 0,01 mm
Parallelism: 10 μm
Scales: thimble and sleeve satin chrome finish, Ø 18 mm
Measuring spindle: spindle pitch 0,5 mm
Measuring surfaces: hardened
Ratchet: Can be used in both directions
Measuring force: 5-10 N

Including box, key

Standards for Outside Micrometers

- Control and adjustment of all outside micrometers with a minimum of 25 mm measuring range.

Series 167



Specifications

Accuracy: Factory specification
Error limit: $(1 + \frac{L}{50}) \mu\text{m}$;
L in mm

Measuring surfaces: micro-lap finish

Flatness: 0,3 μm

Parallelism: 2 μm

With indication of true value

Including insulation

Nominal value mm	d mm	No.	Nominal value mm	d mm	No.	Nominal value mm	d mm	No.	Nominal value mm	d mm	No.
25	6,35	167-101	525	11,9	167-121	1025	11,9	167-365	1525	11,9	167-385
50	6,35	167-102	550	11,9	167-122	1050	11,9	167-366	1550	11,9	167-386
75	6,35	167-103	575	11,9	167-123	1075	11,9	167-367	1575	11,9	167-387
100	7,9	167-104	600	11,9	167-124	1100	11,9	167-368	1600	11,9	167-388
125	7,9	167-105	625	11,9	167-125	1125	11,9	167-369	1625	11,9	167-389
150	7,9	167-106	650	11,9	167-126	1150	11,9	167-370	1650	11,9	167-390
175	7,9	167-107	675	11,9	167-127	1175	11,9	167-371	1675	11,9	167-391
200	9,4	167-108	700	11,9	167-128	1200	11,9	167-372	1700	11,9	167-392
225	9,4	167-109	725	11,9	167-129	1225	11,9	167-373	1725	11,9	167-393
250	9,4	167-110	750	11,9	167-130	1250	11,9	167-374	1750	11,9	167-394
275	9,4	167-111	775	11,9	167-131	1275	11,9	167-375	1775	11,9	167-395
300	9,4	167-112	800	11,9	167-132	1300	11,9	167-376	1800	11,9	167-396
325	9,4	167-113	825	11,9	167-133	1325	11,9	167-377	1825	11,9	167-397
350	9,4	167-114	850	11,9	167-134	1350	11,9	167-378	1850	11,9	167-398
375	9,4	167-115	875	11,9	167-135	1375	11,9	167-379	1875	11,9	167-399
400	9,4	167-116	900	11,9	167-136	1400	11,9	167-380	1900	11,9	167-400
425	9,4	167-117	925	11,9	167-137	1425	11,9	167-381	1925	11,9	167-401
450	9,4	167-118	950	11,9	167-138	1450	11,9	167-382	1950	11,9	167-402
475	9,4	167-119	975	11,9	167-139	1475	11,9	167-383	1975	11,9	167-403
500	11,9	167-120	1000	11,9	167-140	1500	11,9	167-384	2000	11,9	167-404

Sets

No. 167-902 Nominal value 25–125 mm

No. 167-903 Nominal value 25–275 mm

Test set for outside micrometers

- Micrometer test sets for testing the deviation of outside micrometers in accordance with DIN 863.
- Micrometers with a measuring range in excess of 25 mm are tested by adding a gauge block of 25, 50 or 75 mm to these tests.

Series 516



516-156-10

No.	Degree of accuracy	Material
516-156-10	0	Ceramic
516-157-10	1	Ceramic
516-106-10	0	Steel
516-107-10	1	Steel
516-108-10	2	Steel

516-607

Additional accessories for micrometers
see pages 66–69

Specifications

Dimension : 2,5 5,1 7,7 10,3 12,9
15,0 17,6 20,2 22,8 25,0

Number per set: 10

Including 1 optical glass parallel 12 mm thick,
diameter 30 mm

Optional accessories

No. 516-607 Gauge block holder for testing
external screw type micrometers

3-Wire Unit

- The measuring wires are hardened and precision lapped. They are placed onto spindle and anvil of the outside micrometer.
- The three-wire measuring process is applied to determine the pitch diameter of threads and considered as one of the most accurate measuring procedures.

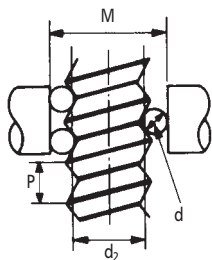
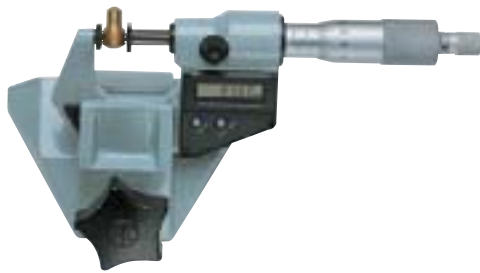
Series 313



313-101

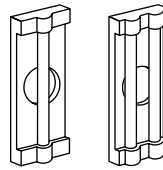
3-Wire Unit Sets

No.	Supporter diameter mm	Contents
313-101	6,35	18 pairs of tips (see right)
313-102	8,00	18 pairs of tips (see right)



P = thread pitch
 d_0 = measuring wire \varnothing
 d_2 = pitch diameter
 M = theoretical dimension at measuring pressure δ
 α = pitch angle
 δ = Correction factor

Thread measuring wires (pair)



Contents No. 313-101 (\varnothing 6,35 mm) No.	Contents No. 313-102 (\varnothing 8,00 mm) No.	Measuring wire \varnothing mm
952131	952149	0,170
952132	952150	0,195
952133	952151	0,220
952134	952152	0,250
952135	952153	0,290
952136	952154	0,335
952137	952155	0,390
952138	952156	0,455
952139	952157	0,530
952140	952158	0,620
952141	952159	0,725
952142	952160	0,895
952143	952161	1,100
952144	952162	1,350
952145	952163	1,650
952146	952164	2,050
952147	952165	2,550
952148	952166	3,200

$$M = d_2 + \frac{d_0}{\sin \frac{\alpha}{2}} - \frac{P}{2 \tan \frac{\alpha}{2}} + d_0 + \delta$$

$$\delta = \frac{d_0}{2} \cdot \frac{p^2}{\pi^2} \cdot \frac{\cos \frac{\alpha}{2} \cdot \cot \frac{\alpha}{2}}{d_2^2}$$

Metric Threads DIN 13 Page 1

Nominal	Thread pitch P	Pitch \varnothing d_2	Measuring wire \varnothing d_0	Outside dim. M	M- d_2
M 1	0,25	0,838	0,170	1,133	0,295
M 1,2	0,25	1,038	0,170	1,332	0,294
M 1,4	0,30	1,205	0,170	1,456	0,251
M 1,7	0,35	1,473	0,220	1,831	0,358
M 2	0,40	1,740	0,250	2,145	0,405
M 2,3	0,40	2,040	0,250	2,444	0,404
M 2,6	0,45	2,308	0,290	2,789	0,481
M 3	0,50	2,675	0,290	3,113	0,438
M 3,5	0,60	3,110	0,335	3,596	0,486
M 4	0,70	3,545	0,455	4,305	0,760
M 5	0,80	4,480	0,455	5,153	0,673
M 6	1,00	5,350	0,620	6,346	0,996
M 8	1,25	7,188	0,725	8,282	1,094
M 10	1,50	9,026	0,895	10,414	1,388
M 12	1,75	10,863	1,100	12,650	1,787
M 14	2,00	12,701	1,350	15,021	2,320
M 16	2,00	14,701	1,350	17,021	2,320
M 20	2,50	18,376	1,650	21,163	2,787
M 22	2,50	20,376	1,650	23,163	2,787
M 24	3,00	22,051	2,050	25,606	3,555
M 27	3,00	25,051	2,050	28,605	3,554
M 30	3,50	27,727	2,050	30,848	3,121
M 33	3,50	30,727	2,050	33,848	3,121
M 36	4,00	33,402	2,550	37,591	4,189
M 39	4,00	36,402	2,550	40,590	4,188
M 42	4,50	39,077	2,550	42,832	3,755
M 45	4,50	42,077	2,550	45,832	3,755
M 48	5,00	44,752	3,200	50,025	5,273
M 52	5,00	48,752	3,200	54,024	5,272
M 56	5,50	52,428	3,200	57,267	4,839
M 60	5,50	56,428	3,200	61,267	4,839

Specifications

Tolerance of measuring wires: $\pm 1 \mu\text{m}$
 Contents: 18 pairs of tips
 \varnothing 0,170 mm
 up to \varnothing 3,200 mm

Including wooden box

Optical Parallel

Series 157

- For testing surface flatness and parallelism of measuring surfaces of outside micrometers.

Specifications

Flatness: 0,1 μm
 Parallelism: 0,2 μm
 Diameter: 30 mm



157-101

Range of outside micrometer mm	No.	Contents	Nominal mm
0-25	157-903	157-101	12,00
		157-102	12,12
		157-103	12,25
		157-104	12,37
		157-105	25,00
25-50	157-904	157-106	25,12
		157-107	25,25
		157-108	25,37



Optical Glas flat

Series 158

- For testing surface flatness.

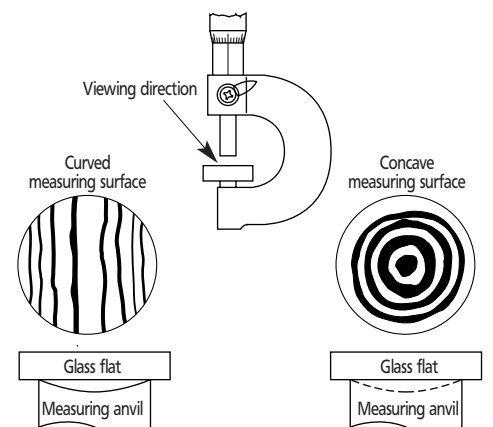
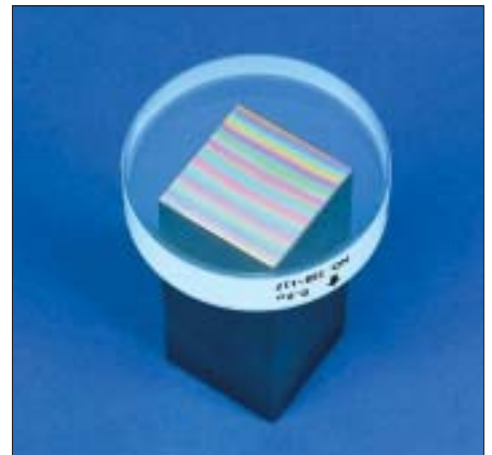
Specifications

Flatness: 0,1 μm



158-118

No.	Nominal mm	Diameter mm
158-118	12	45
158-120	15	60

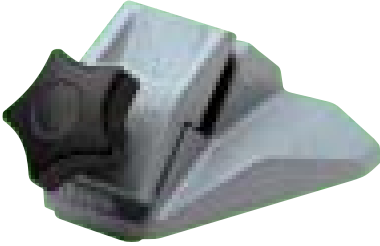


Micrometer Stand for Outside Micrometers

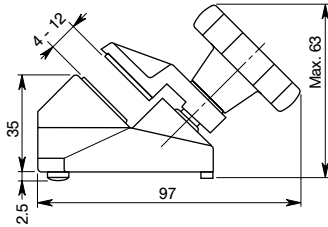
- Keeps both hands free for operating the micrometer and positioning the workpieces.
- Designed for serial measurements in manufacturing and quality assurance.

Series 156

For holding outside micrometers up to 50 mm measuring range.
With fixed 45° inclination



156-105 M



Specifications
No. 156-105 M
Mass: 700 g

Micrometer Stand for Outside Micrometers

- Keeps both hands free for operating the micrometer and positioning the workpieces.
- Designed for serial measurements in manufacturing and quality assurance.

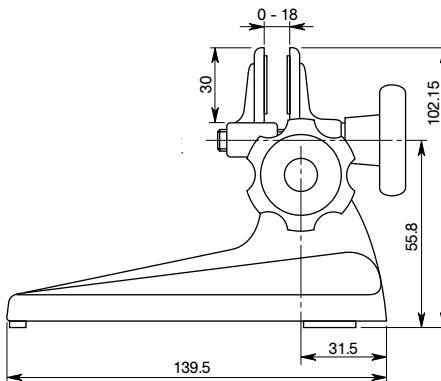
Series 156

For holding outside micrometers up to 100 mm measuring range.

Cast iron construction with adjustable angles



156-101 M



Specifications
No. 156-101 M
Mass: 1100 g

Micrometer Stand for Outside Micrometers

- Keeps both hands free for operating the micrometer and positioning the workpieces.
- Designed for serial measurements in manufacturing and quality assurance.

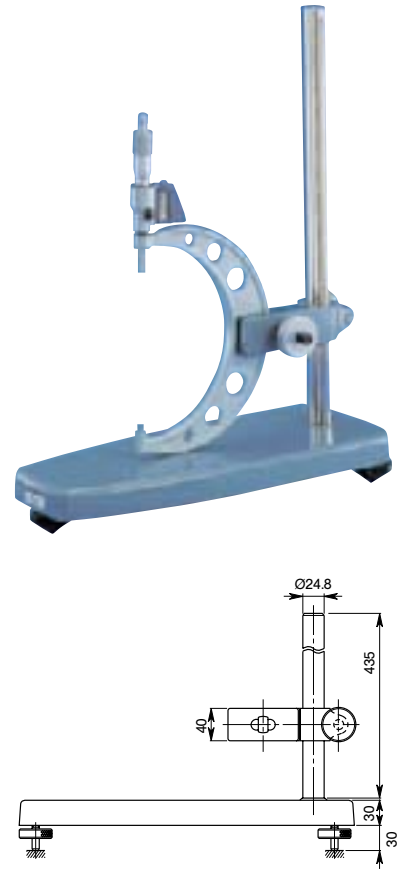
Series 156

For holding outside micrometers from 100 mm through 300 mm measuring range.

Specifications

No. 156-102

Adjustable range of the clamping system: approx. 400 mm



Holder for "DIGIMATIC"-Holtest Three-Point Internal Micrometer

- Designed for serial measurements in manufacturing and on the measuring stand.

Specifications

No. 982693 Holder for Holtest Three-Point Internal Micrometer

Optional accessories

No. 156-101 M Recommended base



982693 +
156-101 M
(optional accessories)



Depth Micrometer

Series 128

Fixed version without exchangeable measuring inserts



128-101

Measuring range mm	No.	Base mm	Error limits Micrometers
0-25	128-101	60 x 16	3 μm
0-25	128-102	100 x 16	3 μm

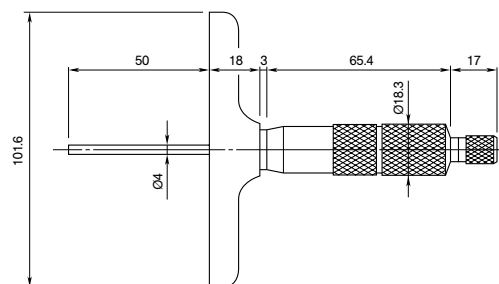
Series 129

Version with exchangeable measuring inserts
Rods hardened



129-112

Measuring range mm	No.	Base mm	Number of rods	Error limits Micrometers
0- 50	129-109	60 x 16	2	3 μm
0- 75	129-110	60 x 16	3	3 μm
0-100	129-111	60 x 16	4	3 μm
0-150	129-112	60 x 16	6	3 μm
0-300	129-152	60 x 16	12	3 μm
0- 50	129-113	100 x 16	2	3 μm
0- 75	129-114	100 x 16	3	3 μm
0-100	129-115	100 x 16	4	3 μm
0-150	129-116	100 x 16	6	3 μm
0-300	129-153	100 x 16	12	3 μm



Specifications

Accuracy: DIN 863-2
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring span: 25 mm
 Rod: Ø 4 mm
 spindle pitch: 0,5 mm, with spindle lock
 Measuring surfaces: hardened, precision ground, micro-lap finish
 Base: hardened tool steel
 Flatness: 60 mm: 1,3 μm
 100 mm: 2 μm
 Measuring force: 5-10 N
 Including box, key

Specifications

Accuracy: DIN 863-2
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring span: 25 mm
 Rod: Ø 4 mm
 spindle pitch: 0,5 mm, with spindle lock
 Measuring surfaces: hardened, precision ground, micro-lap finish
 Base: hardened tool steel
 Flatness: 60 mm: 1,3 μm
 100 mm: 2 μm
 Measuring force: 5-10 N
 Including box, key

Depth Micrometer

Series 329

"DIGIMATIC" version with data output and exchangeable measuring inserts

Specifications

Accuracy: Factory specification
 Resolution: 0,001 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm

Measuring span: 25 mm
 Rod: Ø 4 mm
 spindle pitch: 0,5 mm, with spindle lock

Measuring surfaces: hardened, precision ground, micro-lap finish
 Base: hardened tool steel
 Flatness Base: 2 µm
 Tolerance of interchangeable measuring inserts: $\pm (2 + L/75) \mu\text{m}$
 L = measuring length in mm

Error limit with "zero" measuring insert: 5 µm
 Measuring force: 5–10 N
 Including box, key, battery

Optional accessories

No. 05CZA662 Signal cable (1 m)
 No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44



329-250



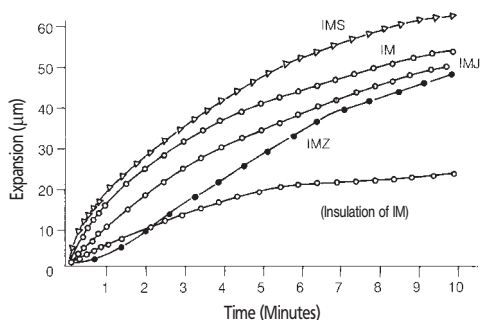
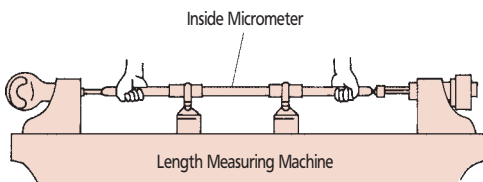
Measuring range mm	No.	Base mm	Number of rods	Error limits Micrometers
0–150	329-250	100 x 16	6	3 µm
0–300	329-251	100 x 16	12	3 µm



Basic Information

Inside Micrometers

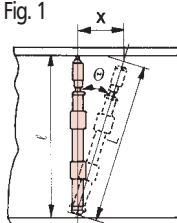
Thermal expansion of inside micrometers due to heat from hand (models with measuring range of 1000 mm or more)



- IMS: Interchangeable rod type inside micrometer (Series 141)
- IM: Single rod type inside micrometer (Series 133)
- IMJ: Extension tube type inside micrometer (Series 139, 140, 339)
- IMZ: Extension rod type inside micrometer (Series 137, 337)

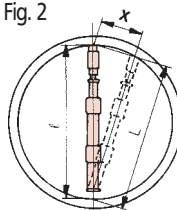
Measurement errors due to incorrect positioning (inclination) of inside micrometers

Fig. 1



l : Inside diameter of the tube
 L : Measured length
 X : Inclination
 Measurement error, Δl , given
 $\Delta l = L - l = \sqrt{l^2 + x^2} - l$

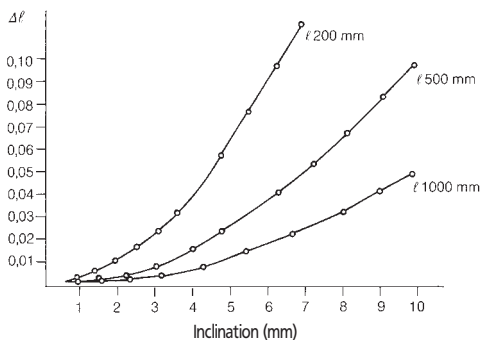
Fig. 2



l : Inside diameter of the tube
 L : Measured length
 X : Inclination
 Measurement error, Δl , given as follows:
 $\Delta l = L - l = \sqrt{l^2 - x^2} - l$

In case the micrometer is inclined in the direction of the tube axis (see fig. 1), positive errors will result, as shown in the graph below.

In case the micrometer is tilted sideways (in the lateral direction) as shown in fig. 2 the results will be negative, as approximated by the graph below.



Tubular Inside Micrometer

• Light-weight design due to tubular construction.

Series 133

Fixed construction

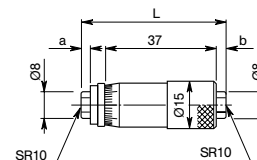
Specifications

Accuracy: DIN 863/4
 Graduation: 0,01 mm
 Scales: thimble and sleeve
 satin chrome finish,
 Ø 18 mm
 Measuring spindle: spindle pitch 0,5 mm
 with spindle lock
 Measuring surfaces: carbide-tipped,
 precision ground,
 crowned lapped
 Including box, insulation (from 100 mm), key

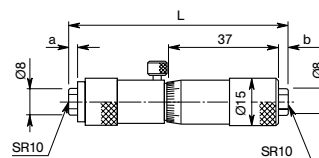


133-146

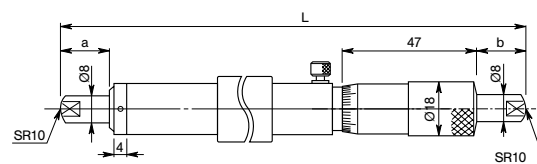
Measuring range mm	No.	L mm	a mm	b mm	Mass g
50-75	133-143	50	3,5	3	50
75-100	133-144	75	3,5	3	75
100-125	133-145	100	14,0	13	130
125-150	133-146	125	14,0	13	160
150-175	133-147	150	14,0	13	170
175-200	133-148	175	14,0	13	180
200-225	133-149	200	16,5	13	200
225-250	133-150	225	16,5	13	210
250-275	133-151	250	16,5	13	235
275-300	133-152	275	16,5	13	245



133-143



133-144



133-145 ~ 133-152

Series 133

As a set



133-901

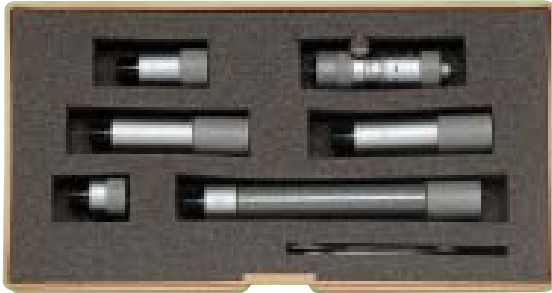
Measuring range mm	No.	Contents Set
50-150	133-901	4 micrometers
50-300	133-902	10 micrometers

Inside Micrometers

Series 137

Analogue

Extension Rod Type



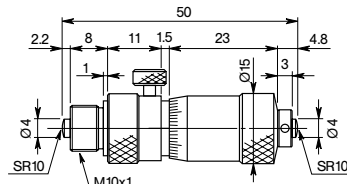
137-202

Measuring range mm	No.	Number and size of extensions	Mass g
Accessories: Inside micrometer No. 137-011 (Standard in the set)			
50- 150	137-201	3 (13, 25, 50 mm)	145
50- 300	137-202	5 (13, 25, 50, 50, 100 mm)	305
50- 500	137-203	6 (13, 25, 50, 50, 100, 200 mm)	460
50-1000	137-204	8 (13, 25, 50, 50, 100, 200, 200, 300 mm)	845
50-1500	137-205	10 (13, 25, 50, 50, 100, 200, 200, 200, 300, 300 mm)	1225

with carbide-tipped measuring surface

Accessories: Inside micrometer No. 137-013 (Standard in the set)

50- 150	137-206	3 (13, 25, 50 mm)	145
50- 300	137-207	5 (13, 25, 50, 50, 100 mm)	305
50- 500	137-208	6 (13, 25, 50, 50, 100, 200 mm)	460
50-1000	137-209	8 (13, 25, 50, 50, 100, 200, 200, 300 mm)	845
50-1500	137-210	10 (13, 25, 50, 50, 100, 200, 200, 200, 300, 300 mm)	1225



137-011

Series 337

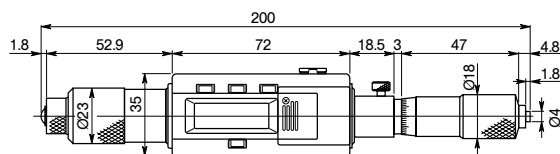
"DIGIMATIC" Type, with data output

Extension Rod Type



337-201

Measuring range mm	No.	Number and size of extensions	Mass g
Accessories: Inside micrometer No. 337-001 (Standard in the set)			
200-1000	337-201	6 (25, 50, 100, 100, 200, 300 mm)	780
200-1500	337-202	7 (25, 50, 100, 200, 300, 300, 300 mm)	1150



337-001

Micrometer series 337

Functions	337-201	337-202
PRESET function	●	●
Zero-setting	●	●
DATA/HOLD	●	●
Data output	●	●

Specifications

Accuracy:	Factory specification Error limit: $(3 + V + \frac{L}{50}) \mu\text{m}$; L in mm, V=number of extensions
Graduation:	0,01 mm
Scales:	thimble and sleeve satin chrome finish, Ø 15 mm
Measuring spindle:	spindle pitch 0,5 mm
Measuring span:	13 mm
Measuring surfaces:	hardened
Extensions:	Ø 12,5 mm
Including box, key	



137-011

Specifications

Accuracy:	Factory specification Error limit: $(3 + V + \frac{L}{50}) \mu\text{m}$; L in mm, V=number of extensions
Resolution:	0,001 mm, LCD display
Scales:	thimble and sleeve satin chrome finish, Ø 18 mm
Measuring spindle:	spindle pitch 0,5 mm
Measuring span:	25 mm
Measuring surfaces:	hardened
Extensions:	Ø 12,5 mm
Including box, key, 1 battery	

Optional accessories

- No. 937387 Signal cable (1 m)
- No. 965013 Signal cable (2 m)

Consumable Spares

- No. 938882 Battery SR-44

Inside Micrometers

Series 139

Analogue

Extension Rod Type

Specifications

Accuracy: Factory specification
Error limit: $(3 + V + \frac{L}{50}) \mu\text{m}$;
L in mm,
V = number of extensions

Graduation: 0,01 mm

Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm

Measuring spindle: spindle pitch 0,5 mm

Measuring span: 25 mm

Measuring surfaces: carbide-tipped,
precision ground,
micro-lap finish

Extensions: Ø 17 mm

Including box, key

Accessories (Standard in the set):

No. 139-001 Inside micrometer for 139-17x
No. 139-003 Inside micrometer for 139-203
No. 139-005 Inside micrometer for 139-204

Specifications for 139-203 / 139-204

As above, but:

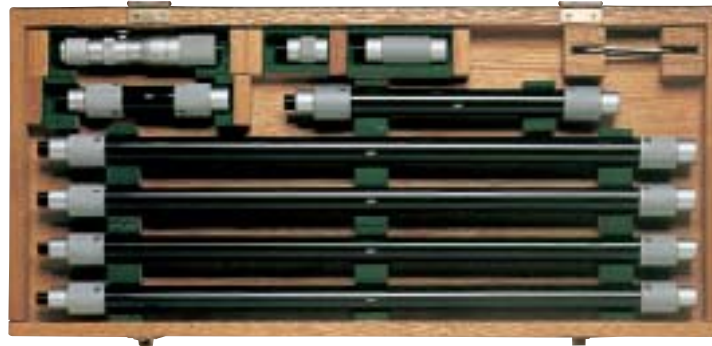
Accuracy: Factory specification
Error limit: $(6 + \frac{L}{50}) \mu\text{m}$;
L in mm

Scales: Ø 13 mm

Measuring span: 10 mm (No. 139-203)
25 mm (No. 139-204)

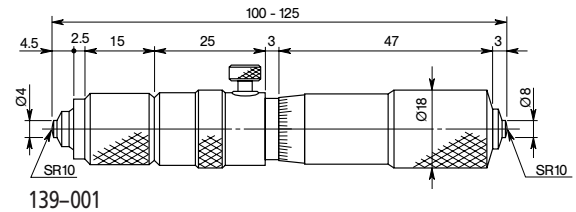
Measuring surfaces: hardened,
precision ground,
micro-lap finish

Extensions: Ø 10 mm



139-177

Measuring range mm	No.	Number and size of extensions	Mass g
100- 500	139-173	4 (25, 50, 100, 200 mm)	490
100- 900	139-174	5 (25, 50, 100, 200, 400 mm)	790
100-1300	139-175	6 (25, 50, 100, 200, 400, 400 mm)	1090
100-1700	139-176	7 (25, 50, 100, 200, 400, 400, 400 mm)	1390
100-2100	139-177	8 (25, 50, 100, 200, 400, 400, 400, 400 mm)	1690
40- 300	139-203	8 (10, 20, 30, 60, 90, 110, 120, 130 mm)	240
100-1000	139-204	10 (25, 50, 75, 150, 225, 300, 350, 400, 425, 450 mm)	770



139-001

Series 339

"DIGIMATIC" Type, with data output

Extension Rod Type

Specifications

Accuracy: Factory specification
Error limit: $(3 + V + \frac{L}{50}) \mu\text{m}$;
L in mm,
V = number of extensions

Resolution: 0,001 mm, LCD display

Scales: thimble and sleeve
satin chrome finish,
Ø 18 mm

Measuring spindle: spindle pitch 0,5 mm

Measuring span: 25 mm

Measuring surfaces: carbide-tipped,
precision ground,
micro-lap finish

Extensions: Ø 17 mm

Including box, key, 1 battery

Accessories (Standard in the set):

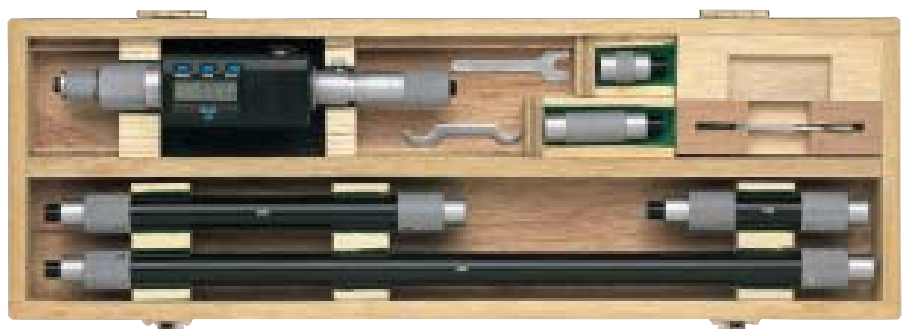
No. 339-001 Inside micrometer for 339-291
Inside micrometer for 339-292

Optional accessories

No. 937387 Signal cable (1 m)
No. 965013 Signal cable (2 m)

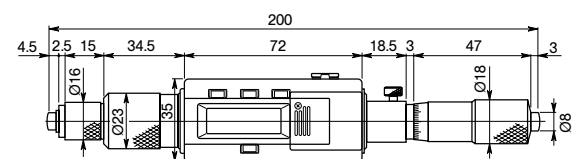
Consumable Spares

No. 938882 Battery SR-44



339-291

Measuring range mm	No.	Number and size of extensions	Mass g
200-1000	339-291	5 (25, 50, 100, 200, 400 mm)	1100
200-2000	339-292	8 (25, 50, 100, 200, 200, 400, 400, 400 mm)	1850



339-001

Micrometer series 339

Inside Micrometers

Series 140

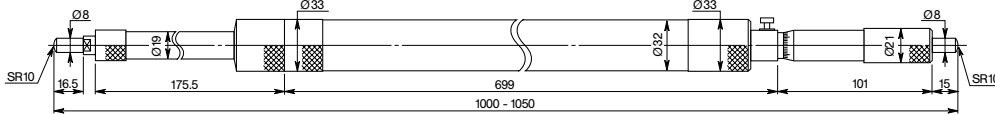
For large measuring ranges

Extension Rod Type



140-158

Measuring range mm	No.	Number and size of extensions	Mass g
1000-2000	140-157	5 (50, 100, 100, 200, 500 mm)	3700
1000-3000	140-158	6 (50, 100, 100, 200, 500, 1000 mm)	5200
1000-4000	140-159	7 (50, 100, 100, 200, 500, 1000, 1000 mm)	6700
1000-5000	140-160	8 (50, 100, 100, 200, 500, 1000, 1000, 1000 mm)	8260



Micrometer series 140

Series 141

With interchangeable measuring inserts for different measuring ranges.
Practical handle for measuring deep bores.

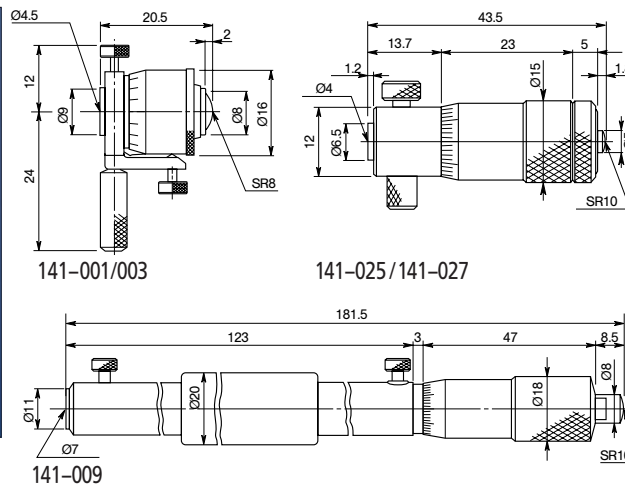


141-205

Measuring range mm	No.	Stroke Screw mm	Measuring inserts	No. of tips	Accessories: Inside micrometer Standard in the set No.	Mass g
25- 50	141-101	7	2 (12 mm)	1 (6 mm)	141-001	60
50- 200	141-205	13	3 (50 mm)	2 (12,25 mm)	141-025	125
50- 300	141-206	13	5 (50 mm)	2 (12,25 mm)	141-025	275
200- 500	141-117	25	3 (100 mm)	2 (25/50 mm)	141-009	520
200-1000	141-118	25	8 (100 mm)	2 (25/50 mm)	141-009	1940

with carbide-tipped measuring surface

25- 50	141-103	7	2 (12 mm)	1 (6 mm)	141-003	60
50- 200	141-211	13	3 (50 mm)	2 (12,25 mm)	141-027	125
50- 300	141-212	13	5 (50 mm)	2 (12,25 mm)	141-027	275



Specifications

Accuracy: Factory specification
Error limit: $(7 + V + \frac{L}{50}) \mu\text{m}$;
L in mm,
V=number of extensions

Graduation: 0,01 mm
Scales: thimble and sleeve
satin chrome finish,
Ø 21 mm

Measuring spindle: spindle pitch 0,5 mm
Measuring span: 50 mm
Measuring surfaces: carbide-tipped,
precision ground,
micro-lap finish
Ø 32 mm

Extensions: Ø 32 mm
Including box, key

Specifications

Accuracy: Factory specification
Error limit: $(6 + \frac{L}{50}) \mu\text{m}$;
L in mm

Graduation: 0,01 mm
Scales: thimble and sleeve
satin chrome finish
spindle lock

Measuring spindle: spindle pitch 0,5 mm
with spindle lock
Measuring surfaces: hardened
Including box, key

Inside Micrometers

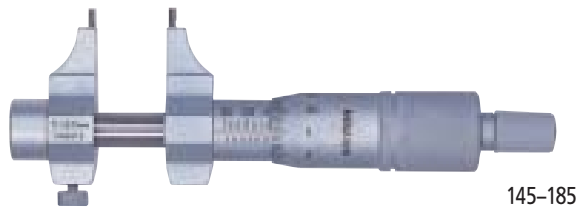
• With measuring jaws.

Series 145

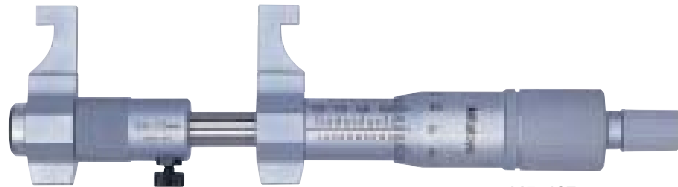
Analogue

Specifications

Accuracy: Factory specification
 Graduation: 0,01 mm
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring spindle: spindle pitch 0,5 mm with spindle lock
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish
 Measuring force: 1–6 N
 Including box, key

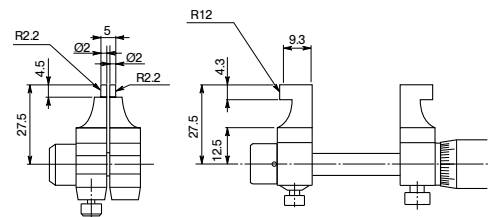


145-185

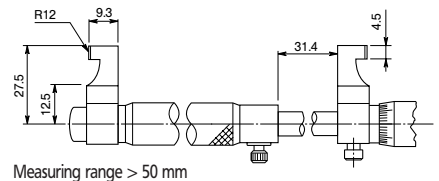


145-187

Measuring range mm	No.	Error limit μm	Mass g
5– 30	145-185	5	130
25– 50	145-186	6	140
50– 75	145-187	7	160
75–100	145-188	8	180
100–125	145-189	9	210
125–150	145-190	9	230



Measuring range 5–30 mm Measuring range 25–50 mm



Measuring range > 50 mm

Series 345

"DIGIMATIC" Type, with data output

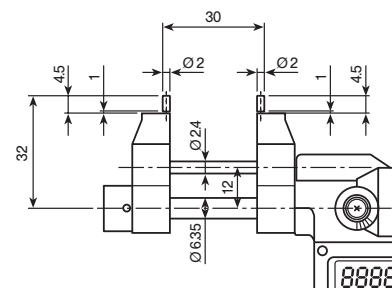
Specifications

Accuracy: Factory specification
 Resolution: 0,001 mm, LCD display
 Scales: thimble and sleeve satin chrome finish, Ø 18 mm
 Measuring spindle: spindle pitch 0,5 mm with spindle lock
 Measuring surfaces: carbide-tipped, precision ground, micro-lap finish
 Measuring force: 1–6 N
 Including box, key, 1 battery

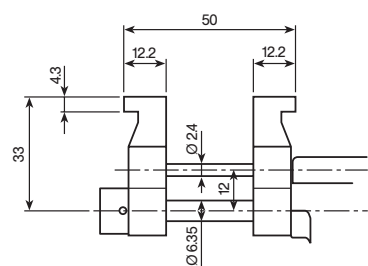


345-250

Measuring range mm	No.	Error limit μm	Mass g
5–30	345-250	5	305
25–50	345-251	6	310



345-250 (Measuring range 5–30 mm)



345-251 (Measuring range 25–50 mm)

Optional accessories

No. 05CZA662 Signal cable (1 m)
 No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

"Setting Rings" made of steel and ceramic

- The actual size, which can deviate from the nominal value (for rings with diameters 1 through 45 mm) by $\pm 0,01$ mm respectively by $\pm 0,02$ mm (for rings with diameters over 50 mm) is marked on the setting ring with 3 decimal digits.
- These setting rings are used for the adjustment of Mitutoyo inside micrometers.

Series 177

micro-lap finish, steel and ceramic



177-146

Nominal size Ø mm	Steel No.	Ceramic No.	Cylindricity (Factory specification) µm	Nominal size Ø mm	Steel No.	Ceramic No.	Cylindricity (Factory specification) µm
1,00	177-220		1	16,00	177-177	177-427	1
1,10	177-222		1	20,00	177-286	177-429	1
1,20	177-225		1	25,00	177-139	177-430	1
1,30	177-227		1	30,00	177-288	177-431	1
1,40	177-230		1	35,00	177-140	177-432	1
1,75	177-236		1	40,00	177-290	177-433	1
2,00	177-239		1	45,00	177-178	177-434	1
2,25	177-242		1	50,00	177-146		1
2,50	177-208		1	60,00	177-292		1
2,75	177-246		1	62,00	177-314		1,5
3,00	177-248		1	70,00	177-147		1,5
3,25	177-250		1	80,00	177-294		1,5
3,50	177-252		1	87,00	177-318		1,5
3,75	177-255		1	90,00	177-148		1,5
4,00	177-204		1	100,00	177-296		2
4,50	177-257		1	125,00	177-298		2
5,00	177-205		1	150,00	177-300		2
5,50	177-263		1	175,00	177-302		2,5
6,00	177-267	177-420	1	200,00	177-304		2,5
6,50	177-271		1	225,00	177-306		2,5
7,00	177-275		1	250,00	177-308		3
8,00	177-125	177-423	1	275,00	177-310		3
10,00	177-126	177-424	1	300,00	177-312		3
12,00	177-284	177-425	1				

Please order setting rings with factory certificate with suffix -12 after the item no.

Inside Micrometer "Mini-Holtest"

- For fast direct measuring of small bores Mitutoyo developed the "Mini-Holtest".
- The device features two built-in springs, that allow for precise measurements in extremely small bores. All measuring surfaces are carbide-tipped to protect against wear.

Series 368

Specifications

Accuracy: Factory specification
Error limit: 2 μm

Graduation: 0,001 mm

Scales: thimble and sleeve
satin chrome finish,
 \varnothing 17 mm

Measuring spindle: spindle pitch 0,5 mm

Measuring surfaces: carbide-tipped

Measuring force: 5–10 N

Including box, key



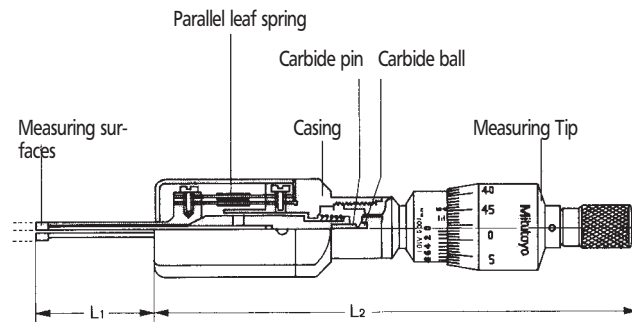
368-906

Separate instruments

Measuring range mm	No.	L1 mm	L2 mm	Mass g
2 -2,5	368-001	12	93	88
2,5-3	368-002	12	93	88
3 -4	368-003	22	93	91
4 -5	368-004	22	93	91
5 -6	368-005	22	93	91

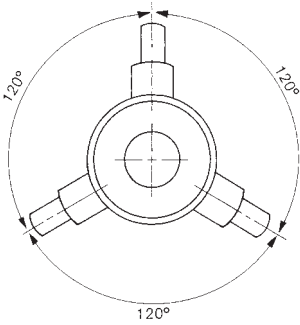
Sets

Measuring range mm	Set No.	Contents Instruments No.	Setting ring No.	Mass g
2-3	368-906	368-001 368-002	177-208	310
3-6	368-907	368-003 368-004 368-005	177-204 177-205	505



Three-Point Inside Micrometer "Holtest"

- The instrument contacts the wall of the bore to be measured at three points.
- This system facilitates operation and increases, thanks to the measuring pins arranged at a distance of 120°, the accuracy of measurement compared to traditional two-point devices.
- By turning the ratchet the "Holtest" automatically centers in the bore which makes measurement fast and easy to perform without loss in precision.



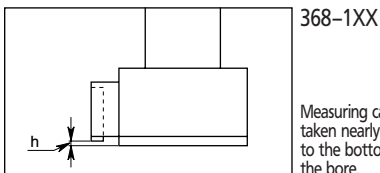
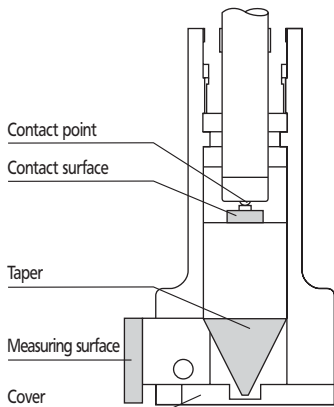
Series 368
Standard
Type
Analogue



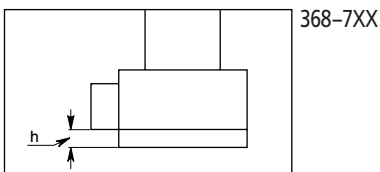
Series 468
"DIGIMATIC"
Type



Series 568
"BOREMATIC"
Type



Measuring can be taken nearly down to the bottom of the bore.



Measuring range mm	Dimension „h“ mm	Dimension „h“ mm
6- 12	2,0	-
12- 30	0,3	2,6
30-100	0,3	3,4
100-300	12,4	19,6



Key to symbols

- Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.
- Measuring surfaces and tapers, hardened steel. Contact surfaces and points are carbide-tipped.

Three-Point Inside Micrometer "Holtest"

• Delivered with factory certificate.

Specifications

Accuracy: DIN 863/4*


* The given precision values require close contact of the measuring surfaces.


Graduation: up to
12 mm: 0,001 mm
over 12 mm: 0,005 mm

Scales: thimble and sleeve
satin chrome finish,
up to
12 mm: Ø 17 mm
over 12 mm: Ø 23 mm

Measuring spindle: spindle pitch 0,5 mm

Including box, key, factory certificate

 Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.

 Measuring surfaces and tapers, hardened steel. Contact surfaces and points are carbide-tipped.


Series 368 Analogue




368-1XX



368-7XX

Measuring range mm	No. 	Depth without extension mm	Depth with extension mm	Mass g
Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.				
6- 8	368-101-10*	59	159	60
8- 10	368-102-10*	59	159	60
10- 12	368-103-10*	59	159	60
12- 16	368-164	80	230	150
16- 20	368-165	80	230	160
20- 25	368-166	90	240	260
25- 30	368-167	90	240	280
30- 40	368-168	98	248	290
40- 50	368-169	98	248	330
50- 63	368-170	105	255	440
62- 75	368-171	105	255	450
75- 88	368-172	105	255	570
87-100	368-173	105	255	580
100-125	368-174	158	308	1030
125-150	368-175	158	308	1120
150-175	368-176	158	308	1210
175-200	368-177	158	308	1320
200-225	368-178	158	308	1430
225-250	368-179	158	308	1550
250-275	368-180	158	308	1700
275-300	368-181	158	308	1870

* Measuring surfaces up to 12 mm carbide

Measuring range mm	No. 	Depth without extension mm	Depth with extension mm	Mass g
Measuring surfaces and tapers, hardened steel. Contact surfaces and points are carbide-tipped.				
12- 16	368-764	80	230	150
16- 20	368-765	80	230	150
20- 25	368-766	90	240	260
25- 30	368-767	90	240	280
30- 40	368-768	98	248	290
40- 50	368-769	98	248	330
50- 63	368-770	105	255	440
62- 75	368-771	105	255	450
75- 88	368-772	105	255	560
87-100	368-773	105	255	570
100-125	368-774	158	308	1020
125-150	368-775	158	308	1110
150-175	368-776	158	308	1200
175-200	368-777	158	308	1300
200-225	368-778	158	308	1420
225-250	368-779	158	308	1540
250-275	368-780	158	308	1690
275-300	368-781	158	308	1860

Extensions for Series 368 / 468 / 568



952623

No.	Length mm	For measuring range	Mass g
952322	100	6- 12 mm	13
952621	150	12- 20 mm	100
952622	150	20- 50 mm	238
952623	150	50-300 mm	264



Three-Point Inside Micrometer "Holtest"

- Analogue in Sets.
- Delivered with factory certificate.

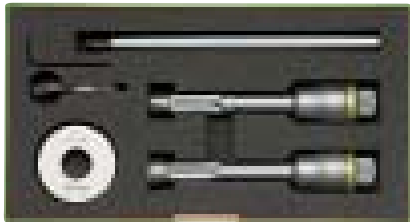
Series 368



368-901-10

Measuring range mm	Set No.	Contents Device No.	Setting ring No.	Setting ring Ø mm	Extensions No.	Length of the extensions mm
Measurement surfaces as well as other parts well as other wearing parts are carbide-tipped.						
6-12	368-901-10	368-101-10/368-102-10/368-103-10	177-125/177-126	8/10	952322	100

Series 368



368-912

Measuring range mm	Set No.	Contents Device No.	Setting ring No.	Setting ring Ø mm	Extensions No.	Length of the extensions mm
Measuring surfaces titanium coated as well as other wearing parts are carbide.						
12-20	368-912	368-164/368-165	177-177	16	952621	150
Measuring surfaces and taper, hardened steel. Contact surfaces and points are carbide-tipped.						
12-20	368-991	368-764/368-765	177-177	16	952621	150


Series 368




368-913

Measuring range mm	Set No.	Contents Device No.	Setting ring No.	Setting ring Ø mm	Extensions No.	Length of the extensions mm
Measuring surfaces titanium coated as well as other wearing parts are carbide.						
20-50	368-913	368-166/368-167 368-168/368-169	177-139/177-290	25/40	952622	150
Measuring surfaces and taper are hardened steel. Contact surfaces and points are carbide-tipped.						
20-50	368-992	368-766/368-767 368-768/368-769	177-139/177-290	25/40	952622	150

Specifications

 Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.


 Measuring surfaces and tapers, hardened steel. Contact surfaces and points are carbide-tipped.


Three-Point Inside Micrometer "Holtest"

- Analogue in Sets.
- Delivered with factory certificate.

Series 368

Specifications

 Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.

 Measuring surfaces and tapers, hardened steel. Contact surfaces and points are carbide-tipped.



368-914

Measuring range mm	Set No.	 Contents Device No.	Setting ring No.	Setting ring Ø mm	Extensions No.	Length of the extensions mm
Measuring surfaces titanium coated as well as other wearing parts are carbide.						
50-100	368-914	368-170 / 368-171 368-172 / 368-173	177-314 / 177-318	62 / 87	952623	150

Measuring range mm	Set No.	 Contents Device No.	Setting ring No.	Setting ring Ø mm	Extensions No.	Length of the extensions mm
Measuring surfaces and taper are hardened steel. Contact surfaces and points are carbide-tipped.						
50-100	368-993	368-770 / 368-771 368-772 / 368-773	177-314 / 177-318	62 / 87	952623	150

Series 368



368-915

Measuring range mm	Set No.	 Contents Device No.	Setting ring No.	Setting ring Ø mm	Extensions No.	Length of the extensions mm
Measuring surfaces titanium coated as well as other wearing parts are carbide.						
100-200	368-915	368-174 / 368-175 368-176 / 368-177	177-298 / 177-302	125 / 175	952623	150

Measuring range mm	Set No.	 Contents Device No.	Setting ring No.	Setting ring Ø mm	Extensions No.	Length of the extensions mm
Measuring surfaces and taper are hardened steel. Contact surfaces and points are carbide-tipped.						
100-200	368-994	368-774 / 368-775 368-776 / 368-777	177-298 / 177-302	125 / 175	952623	150


Three-Point Internal Micrometer "DIGIMATIC-Holtest"

• Delivered with factory certificate.

Series 468

with data output



Measuring range mm	No.		Depth without extension mm	Depth with extension mm	Mass g
Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.					
6- 8	468-131*		45	145	400
8- 10	468-132*		45	145	400
10- 12	468-133*		45	145	400
12- 16	468-134-10		76	226	430
16- 20	468-135-10		76	226	430
20- 25	468-136-10		88	238	500
25- 30	468-137-10		88	238	510
30- 40	468-138-10		102	252	510
40- 50	468-139-10		102	252	530
50- 63	468-140-10		105	255	650
62- 75	468-141-10		105	255	660
75- 88	468-142-10		105	255	990
87-100	468-143-10		105	255	1000
100-125	468-144-10		151	301	970
125-150	468-145-10		151	301	1060
150-175	468-146-10		151	301	1150
175-200	468-147-10		151	301	1240
200-225	468-148-10		151	301	1330
225-250	468-149-10		151	301	1420
250-275	468-150-10		151	301	1510
275-300	468-151-10		151	301	1600

* Measuring surfaces up to 12 mm carbide

Extensions for Series 368 / 468 / 568

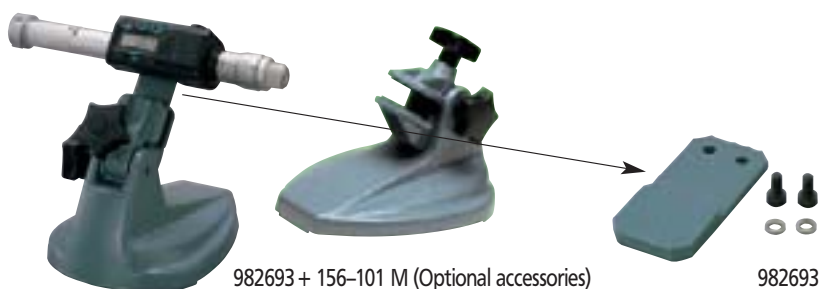


952623

No.	Length mm	For measuring range	Mass g
952322	100	6- 12 mm	13
952621	150	12- 20 mm	100
952622	150	20- 50 mm	238
952623	150	50-300 mm	264






Holder for "DIGIMATIC"-Holtest Three-Point Internal Micrometer

Series 468



982693 + 156-101 M (Optional accessories)

982693

Functions	Series 468
PRESET function	
Zero-setting	
DATA/HOLD	
Weak battery alarm	
Automatic switch off	

Specifications

Accuracy: DIN 863/4*

* The given precision values require close contact of the measuring surfaces.

Resolution: 0,001 mm

6 digit LCD display

Including box, key, 1 battery SR-44, factory certificate

Optional accessories

No. 937387 Signal cable (1 m)

No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44



Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.

Specifications

No. 982693 Plate

Optional accessories

No. 156-101 M Recommended base

Three-Point Internal Micrometer "DIGIMATIC-Holtest"

• Digital, in Sets.

Series 468 with data output



468-963-10

Measuring range mm	Set No.	Contents Device No.	Setting ring No.	Setting ring Ø mm
Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.				
6- 12	468-961*	468-131 / 468-132 / 468-133	177-125 / 177-126	8 / 10
12- 25	468-962-10	468-134-10 / 468-135-10 / 468-136-10	177-177 / 177-286	16 / 20
25- 50	468-963-10	468-137-10 / 468-138-10 / 468-139-10	177-288 / 177-290	30 / 40
50- 75	468-964-10	468-140-10 / 468-141-10	177-314	62
75-100	468-965-10	468-142-10 / 468-143-10	177-318	87

* Measuring surfaces up to 12 mm carbide

Series 468

With interchangeable measuring probe heads, with data output



468-953-10

Measuring range mm	Set No.	Individual ranges mm	Setting ring No.	Setting ring Ø mm	Extensions No.	Length of the extensions mm
Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.						
6- 12	468-951*	6-8, 8-10, 10-12	177-125 / 177-126	8 / 10	952322	100
12- 20	468-952-10	12-16, 16-20	177-177	16	952621	150
20- 50	468-953-10	20-25, 25-30, 30-40, 40-50	177-139 / 177-290	25 / 40	952622	150
50-100	468-954-10	50-63, 62-75, 75-88, 87-100	177-314 / 177-318	62 / 87	952623	150
100-200	468-955-10	100-125, 125-150, 150-175, 175-200	177-298 / 177-302	125 / 175	952623	150

* Measuring surfaces up to 12 mm carbide

Functions	Series 468
PRESET function	●
Zero-setting	●
DATA/HOLD	●
Weak battery alarm	●
Automatic switch off	●

Specifications

Accuracy: DIN 863/4*

* The given precision values require close contact of the measuring surfaces.

Resolution: 0,001 mm

6 digit LCD display

Including box, key, 1 battery SR-44, setting ring, extensions (only 468-953, 468-954), factory certificate

Optional accessories

No. 937387 Signal cable (1 m)


No. 965013 Signal cable (2 m)

Extensions see page 84

Holder for in turn measurements see page 84

Consumable Spares

No. 938882 Battery SR-44

 Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.

ABSOLUTE BOREMATIC

Three-Point Internal Micrometer

- Worldwide unique electronic three-point internal micrometer with built-in absolute scale.
- Delivered with factory certificate.

Series 568
with data output



568-339-10

ABSOLUTE™
Absolute System Patented by MITUTOYO

Measuring range mm	No.	L mm	a mm	b mm	c mm	Mass g
6-8	568-331*	83,0	58	2,5	2,0	480
8-10	568-332*	83,0	58	2,5	2,0	485
10-12	568-333*	83,0	58	2,5	2,0	485
12-16	568-334-10	52,6	58	6,3	0,3	475
16-20	568-335-10	52,6	58	6,3	0,3	480
20-25	568-336-10	58,2	58	8,8	0,3	540
25-30	568-337-10	58,2	58	8,8	0,3	555
30-40	568-338-10	67,3	58	14,0	0,3	565
40-50	568-339-10	67,3	58	14,0	0,3	610

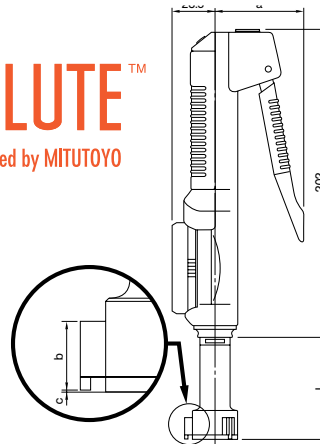
* Measuring surfaces up to 12 mm carbide

Series 568
with data output,
with interchangeable measuring tips



568-347-10

ABSOLUTE™
Absolute System Patented by MITUTOYO



Measuring range mm	No.	L mm	a mm	b mm	c mm	Mass g
50-63 / 62-75	568-346-10	74,8	67	17,0	0,3	780
75-88 / 87-100	568-347-10	74,8	67	17,0	0,3	850
100-113 / 112-125	568-348-10	74,8	67	17,0	0,3	970

Extensions for Series 368 / 468 / 568



952623

No.	Length mm	For measuring range	Mass g
952322	100	6-12 mm	13
952621	150	12-20 mm	100
952622	150	20-50 mm	238
952623	150	50-300 mm	264

™ Patent numbers see page 464

Functions	Series 568
ON/OFF	●
ZERO/ABS-switching	●
PRESET	●
Input of tolerance limits	●
Data output	●

Specifications

6 digit LDC display, may be rotated by 330° for convenient position

Resolution: 0,001 mm
Accuracy: Factory specification
Error limit:
0,005 mm
(Measuring range 6-20 mm)
0,006 mm
(Measuring range 20-125 mm)
The indicated data for accuracy require close contact of all measuring surfaces.

Measuring surfaces: Up to 12 mm measuring range carbide,
from 12 mm measuring range titanium coated

Power supply: 1 battery SR-44

Optional accessories

No. 937387 Signal cable (1 m)

No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44



Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.

ABSOLUTE BOREMATIC Three-Point Internal Micrometer

- Digital, in Sets.
- Delivered with factory certificate.

Functions	Series 568
ON/OFF	●
ZERO/ABS-switching	●
PRESET	●
Input of tolerance limits	●
Data output	●

Specifications

6 digit LDC display, may be rotated by 330° for convenient position

Resolution: 0,001 mm

Accuracy: Factory specification

Error limit:

0,005 mm

(Measuring range 6–20 mm)

0,006 mm

(Measuring range 20–125 mm)

The indicated data for accuracy require close contact of all measuring surfaces.

Measuring

surfaces: Up to 12 mm measuring range
carbide,
from 12 mm measuring range
titanium coated

Power supply: 1 battery SR-44




Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.

Series 568 with data output

ABSOLUTE™
Absolute System Patented by MITUTOYO

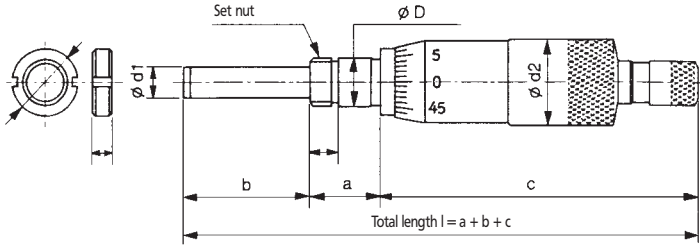
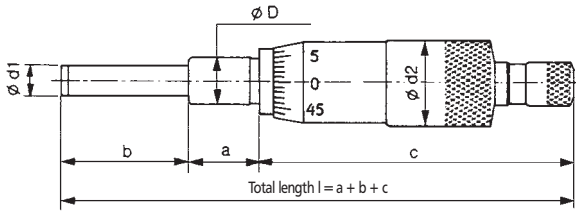


568-973-10

Measuring range mm	Set No.	 Mass kg	Individual ranges mm	Setting ring No.	Setting ring Ø mm
Measuring surfaces titanium-coated or carbide. Carbide taper and contact point.					
6– 12	568-971*	0,6	6–8, 8–10, 10–12	177–125 / 177–126	8 / 10
12– 25	568-972-10	0,8	12–16, 16–20, 20–25	177–177 / 177–286	16 / 20
25– 50	568-973-10	1,3	25–30, 30–40, 40–50	177–288 / 177–290	30 / 40
with interchangeable measuring tips					
50–100	568-975-10	3,5	50–63, 62–75, 75–88, 87–100	177–314 / 177–318	62 / 87

* Measuring surfaces up to 12 mm carbide

Survey of Micrometer Heads

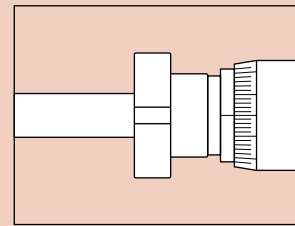


Measuring range	without set nut No.	with set nut No.	1)	2)	3)	4)	5)	6)	7)	Graduation	Ø D	Ø d1	a	b	c	Ø d2
0- 1		110-105					•	•		0,001	12	8	12,7	25	62,5	21
0- 1		110-106					•	•		0,0001	12	8	12,7	25	62,5	21
0- 1		110-107	•				•	•		0,001	12	8	12,7	25	62,5	21
0- 1		110-108	•				•	•		0,0001	12	8	12,7	25	62,5	21
0- 2,5		110-101					•	•		0,001	12	8	12,7	25	70	21
0- 2,5		110-102					•	•		0,0001	12	8	12,7	25	70	21
0- 5	148-215	148-216	•							0,02	3,5	2	5	6,5	20,5	6
0- 6,5	148-142	148-143	•							0,002	9,5	5	9,5	14	31,5	13
0- 6,5	148-242	148-243	•							0,002	6	3,5	6	9	21,9	9,3
0- 6,5	148-342	148-343	•							0,002	9,5	6,35	9,5	9	23,5	15
0- 6,5	148-201	148-203								0,01	6	3,5	6	9	21,7	9
0- 6,5	148-205	148-207	•							0,01	6	3,5	7,5	7,5	21,7	9
0- 6,5	148-301	148-302								0,01	9,5	6,35	9,5	9	23,5	15
0- 6,5	148-303	148-304								0,01	9,5	6,35	9,5	9	23,5	20
0- 6,5	148-305	148-306								0,01	9,5	6,35	9,5	9	23,5	29
0-13		110-502	•				•			0,0005	9,5	5	15	15	67	13
0-13	148-104	148-103								0,01	9,5	5	9,5	17,5	31,5	13
0-13	148-121	148-120		•						0,01	9,5	5	9,5	17,5	40,1	13
0-13	148-307	148-308								0,01	9,5	6,35	9,5	15,5	30	15
0-13	148-309	148-310								0,01	9,5	6,35	9,5	15,5	30	20
0-13	148-311	148-312								0,01	9,5	6,35	9,5	15,5	30	29
0-13	148-503	148-508								0,01	9,5	5	9,5	15,5	37	13
0-13	148-506	148-504		•						0,01	9,5	5	9,5	15,5	45,6	13
0-13	148-801	148-802	•							0,01	9,5	5	9,5	17,5	31,5	13
0-13	148-803	148-804	•	•						0,01	9,5	5	9,5	17,5	40,1	13
0-13	148-853		•							0,01	9,5	5	9,5	15,5	37	13
0-13		148-854	•	•						0,01	9,5	5	9,5	15,5	45,5	13
0-15	149-132	149-131						•		0,01	9,5	6,35	15	17	43,5	15
0-15	149-183	149-184		•				•		0,01	9,5	6,35	9,5	17	49	15
0-15	149-801	149-802	•					•		0,01	9,5	6,35	15	17	43,5	15
0-15	152-101							•		0,01	12	8	16	18	60	30
0-15	153-101						•	•		0,01	9,5	6,35	10	17	59,5	13,3
0-25	150-190	150-189					•	•		0,001	10	6,35	15	27	67	18
0-25	150-192	150-191					•	•		0,01	10	6,35	15	27	67	18
0-25	150-196	150-195					•	•		0,01	10	6,35	15	27	54	18
0-25	150-209	150-210		•			•	•		0,01	10	6,35	15	27	78,5	18
0-25	150-211	150-212		•			•	•		0,01	10	6,35	15	27	65	18
0-25	150-801	150-802	•				•	•		0,01	10	6,35	15	27	67	18
0-25	151-222	151-221					•	•		0,001	12	8	29	34	70	21
0-25	151-224	151-223					•	•		0,01	12	8	29	34	70	21
0-25	151-225	151-226		•			•	•		0,01	12	8	19	34,5	66	21
0-25	152-102							•		0,01	12	8	16	28	69	30
0-25-0	152-348			•			•	•		0,002	12	8	29	34	66	49
0-25	152-401			•			•	•		0,001	18	8	14	41,7	84,2	49
0-25	152-402			•			•	•		0,001	18	8	14	41,7	84,2	49
0-25-0	152-389				•		•	•		0,005	18	6,35	14	38,7	66,3	49
0-25-0	152-390				•		•	•		0,005	18	6,35	14	38,7	66,3	49

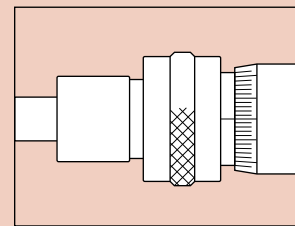
- 1) spherical measuring surface
- 2) with lock
- 3) reversal reading
- 4) with ratchet
- 5) with non-rotating spindle
- 6) carbide-tipped
- 7) non-rotating measuring surface

Continued on next page ▶

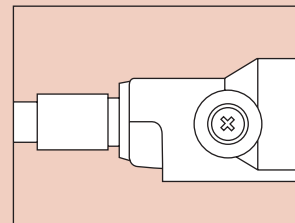
Description of built-in micrometers



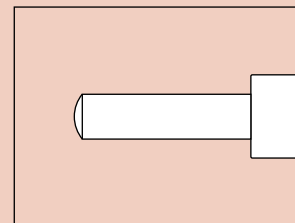
Shaft with clamping screw



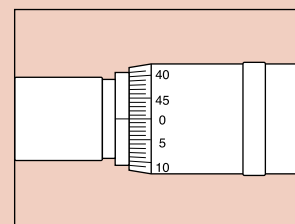
With clamping device



With clamping device
250-301 / 350-5xx



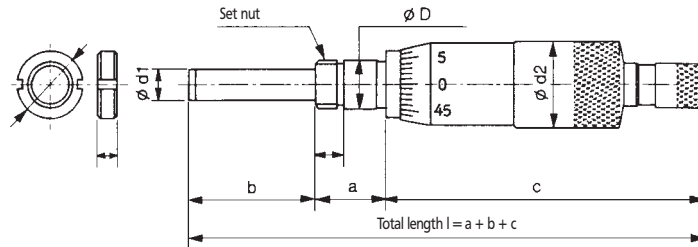
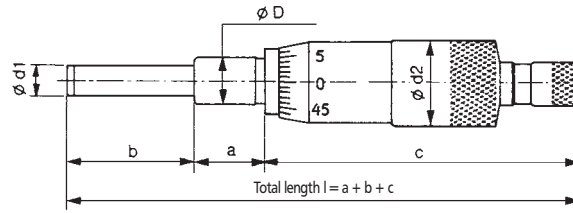
With spherical measuring surface



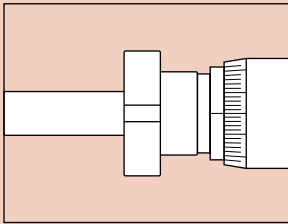
With reversible scale

Survey of Micrometer Heads

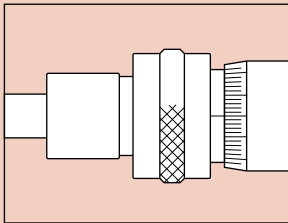
continued



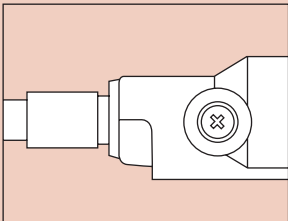
Description of built-in micrometers



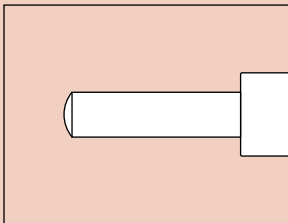
Shaft with clamping screw



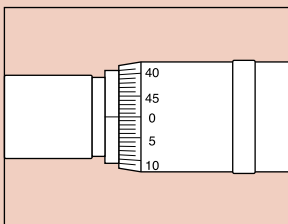
With clamping device



With clamping device
250-301 / 350-5xx



With spherical measuring surface



With reversible scale

Measuring range	without set nut No.	with set nut No.	1)	2)	3)	4)	5)	6)	7)	Graduation	Re-solution	ØD	Ød1	a	b	c	Ød2
0 -15	227-241						●	●		-	0,001	12	6,35	15	17	141,7	245
0 -15	227-242						●	●		-	0,001	12	6,35	15	17	141,7	245
0 -25	153-201					●	●	●		0,01	-	12	8	10	27	88	18
0 -25	153-202					●	●	●		0,001	-	12	8	10	27	88	18
0 -25	153-203						●	●		0,01	-	12	8	10	27	71	18
0 -25	153-204						●	●		0,001	-	12	8	10	27	71	18
0 -25	164-171						●	●		-	0,001	18	8	14	2	104,5	27
0 -25	250-301			●		●		●		0,01	-	10	6,35	15	27	94	18
0 -25	350-261			●					●	0,01	0,001	12	6,35	14	38,7	101	18
0 -25	350-271			●					●	0,01	0,001	12	6,35	16	27	112,5	18
0 -25		350-272		●		●		●		0,01	0,001	12	6,35	16	27	112,5	18
0 -50	151-256	151-255				●		●		0,01	-	12	8	29	59	103	21
0 -50	151-260	151-259						●		0,01	-	12	8	29	59	90	21
0 -50	152-103							●		0,01	-	12	8	16	53	94	30
0 -50-0	152-380				●			●		0,002	-	12	8	29	34	66	49
0 -50	164-122		●					●		-	0,001	12	8	18	60	133	56
0 -50	164-161							●	●	-	0,001	18	11	14	15	143	49
0 -50	197-101							●	●	0,005	-	18	8	14	65	64	49
6,5- 0	148-209	148-211				●				0,01	-	6	3,5	7,5	7,5	21,7	9
13 - 0	148-821	148-822				●				0,01	-	9,5	5	9,5	17,5	31,5	13
13 - 0	148-823	148-824			●	●				0,01	-	9,5	5	9,5	17,5	40,1	13
13 - 0	148-863				●	●				0,01	-	9,5	5	9,5	15,5	37	13
13 - 0		148-864			●	●			●	0,01	-	9,5	5	9,5	15,5	45,6	13
15 - 0	149-821	149-822			●			●		0,01	-	9,5	6,35	15	17	43,5	15
25 - 0	150-821	150-822			●	●		●		0,01	-	10	6,35	15	27	84	18

1) spherical measuring surface
6) carbide-tipped

2) with lock
7) non-rotating measuring surface

3) reversal reading

4) with ratchet

5) with non-rotating spindle

Micrometer Heads

Series 110

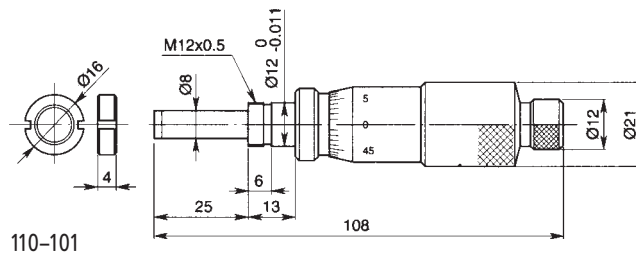
- Micrometer heads with non-rotating spindle, especially suited for fine adjustments.



110-102

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-1	110-105	0,001	0,003	150	
	110-107	0,001	0,003	150	Spherical measuring surface
	110-106	0,0001	0,003	150	
	110-108	0,0001	0,003	150	Spherical measuring surface
0-2,5	110-101	0,001	0,005	150	
	110-102	0,0001	0,005	150	

Dimensions of all devices see page 88 and 89



110-101

Series 110

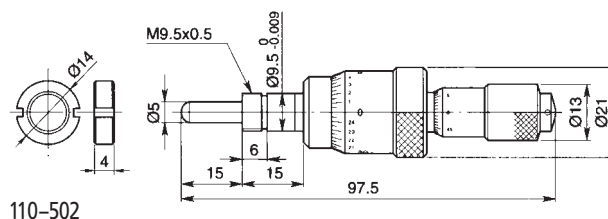
- Micrometer heads with non-rotating spindle and double thimble scale.
- Graduation 0,5 μ m, especially suited for fine adjustments.



110-502

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-13	110-502	0,0005	0,003	100	Spherical measuring surface

Dimensions of all devices see page 88 and 89



110-502

Specifications

Accuracy: Factory specification
Stem: with adjusting nut
Measuring surfaces: carbide-tipped

Specifications

Accuracy: Factory specification
Fine adjustment: 0,2 mm
Stem: with adjusting nut

Micrometer Heads

Specifications

Accuracy: Factory specification
Stem: with / without adjustment nut

Series 148

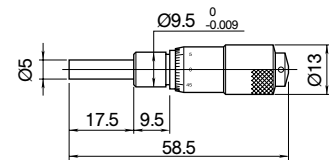
• Micrometer heads especially suited for fine adjustments.



148-103

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-13	148-103	0,01	0,002	35	with adjusting nut
	148-104	0,01	0,002	35	without adjusting nut
	148-801	0,01	0,002	35	spherical measuring surface, without adjusting nut
13-0	148-802	0,01	0,002	35	spherical measuring surface, with adjusting nut
	148-821	0,01	0,002	35	reversible scale, without adjusting nut
	148-822	0,01	0,002	35	reversible scale, with adjusting nut

Dimensions of all devices see page 88 and 89



148-104

Specifications

Accuracy: Factory specification
Stem: with / without adjustment nut

Series 148

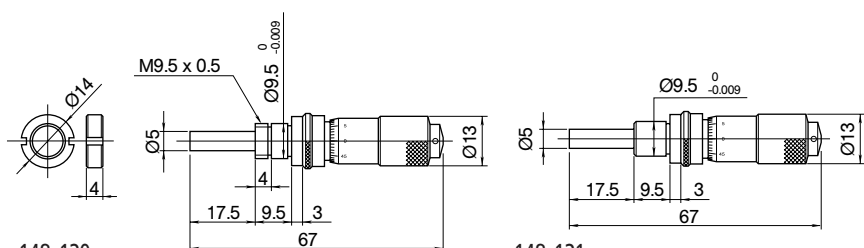
• Micrometer heads with lock, especially suited for fine adjustments.



148-120

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-13	148-120	0,01	0,002	40	with adjusting nut
	148-121	0,01	0,002	40	without adjusting nut
	148-803	0,01	0,002	50	spherical measuring surface, without adjusting nut
13-0	148-804	0,01	0,002	50	spherical measuring surface, with adjusting nut
	148-823	0,01	0,002	50	reversible scale, without adjusting nut
	148-824	0,01	0,002	50	reversible scale, with adjusting nut

Dimensions of all devices see page 88 and 89



148-120

148-121

Micrometer Heads

Series 148

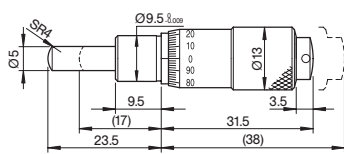
Small size micrometer heads with extremely small pitch 0.1 mm



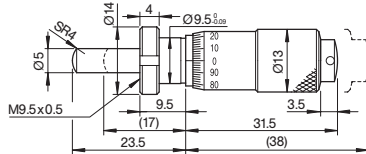
148-242

148-243

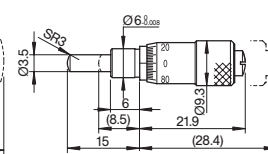
Measuring range mm	No.	Graduation mm	Error limit μm	Mass g	Comments
0-6,5	148-142	0,002	2	31	9,5 mm shaft
	148-143	0,002	2	34	9,5 mm shaft and adjusting nut
	148-242	0,002	5	10	6 mm shaft
	148-243	0,002	5	10	6 mm shaft and adjusting nut
	148-342	0,002	2	29	9,5 mm shaft
	148-343	0,002	2	31	9,5 mm shaft and adjusting nut



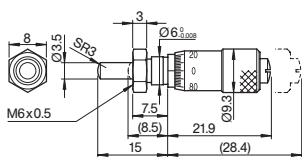
148-142



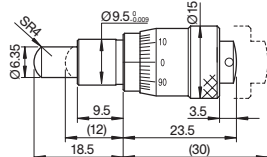
148-143



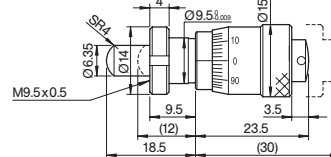
148-242



148-243



148-342



148-343

Series 148

Small size micrometer heads

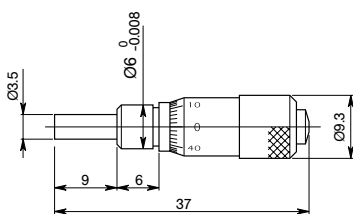


148-216

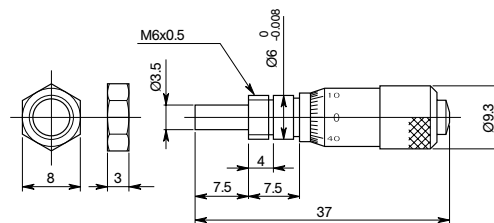
148-201

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-5	148-215	0,02	0,005	4	spherical measuring surface, without adjusting nut
	148-216	0,02	0,005	5	spherical measuring surface, with adjusting nut
0-6,5	148-201	0,01	0,002	10	without adjusting nut
	148-203	0,01	0,002	10	with adjusting nut
	148-205	0,01	0,002	10	spherical measuring surface, without adjusting nut
	148-207	0,01	0,002	10	spherical measuring surface, with adjusting nut
6,5-0	148-209	0,01	0,002	10	reversible scale, without adjusting nut
	148-211	0,01	0,002	10	reversible scale, with adjusting nut

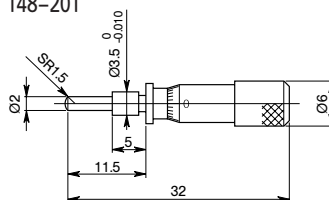
Dimensions of all devices see page 88 and 89



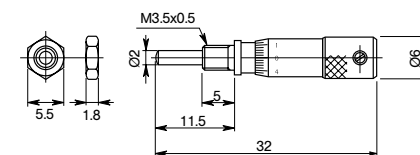
148-201



148-203



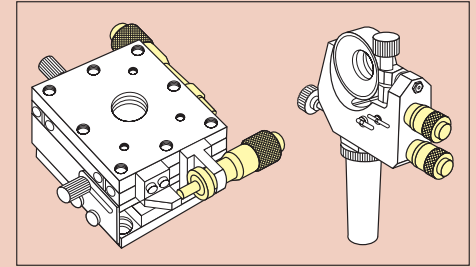
148-215



148-216

Specifications

Accuracy: Factory specification
 Stem: with / without adjustment nut
 Pitch: 0,1 mm
 Measuring surfaces: carbide-tipped



Ideal for extremely fine positioning due to the extremely fine pitch of 0.1 mm

Specifications

Accuracy: Factory specification
 Stem: with / without adjustment nut



Micrometer Heads

Series 148

- Small size micrometer with large scale thimble.

Specifications

Accuracy: Factory specification
Stem: with / without adjustment nut



148-302



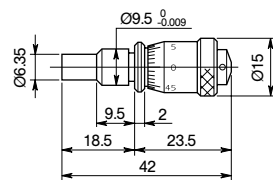
148-303



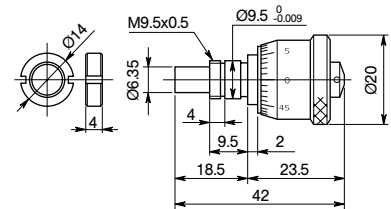
148-311

Measuring range mm	No.	Graduation mm	Error limit mm	Thimble Ø mm	Mass g	Comments
0-6,5	148-301	0,01	0,005	15	26	without adjusting nut
	148-302	0,01	0,005	15	26	with adjusting nut
	148-303	0,01	0,002	20	39	without adjusting nut
	148-304	0,01	0,002	20	39	with adjusting nut
	148-305	0,01	0,002	29	71	without adjusting nut
	148-306	0,01	0,002	29	71	with adjusting nut
0-13	148-307	0,01	0,002	15	35	without adjusting nut
	148-308	0,01	0,002	15	35	with adjusting nut
	148-309	0,01	0,002	20	55	without adjusting nut
	148-310	0,01	0,002	20	55	with adjusting nut
	148-311	0,01	0,002	29	103	without adjusting nut
	148-312	0,01	0,002	29	103	with adjusting nut

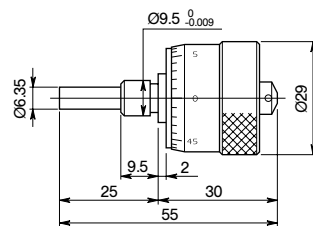
Dimensions of all devices see page 88 and 89



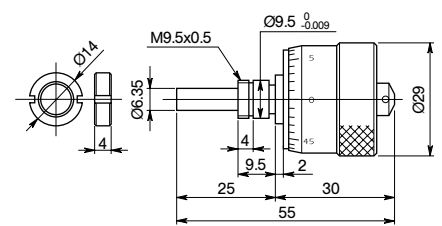
148-301



148-304



148-311



148-312

Micrometer Heads

Series 148

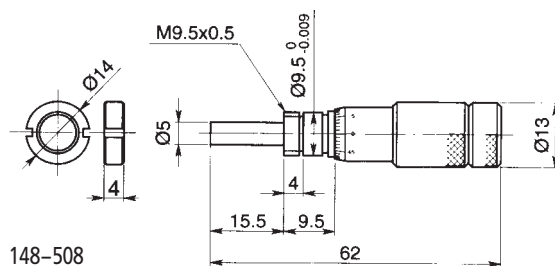
- Micrometer heads with variable zero-setting.
- By loosening the (headless) screw on the thimble the origin may be set to random positions.



148-503

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-13	148-503	0,01	0,002	40	without adjusting nut
	148-508	0,01	0,002	40	with adjusting nut
	148-853	0,01	0,002	40	spherical measuring surface, without adjusting nut
13-0	148-863	0,01	0,002	40	reversible scale, without adjusting nut

Dimensions of all devices see page 88 and 89



148-508

Series 148

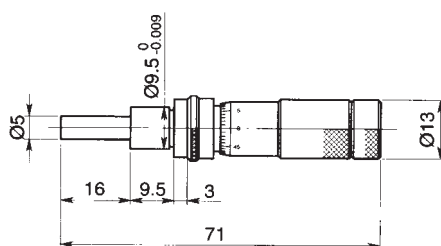
- Micrometer heads with variable zero-setting.
- By loosening the (headless) screw on the thimble the origin may be set to random positions.



148-504

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-13	148-504	0,01	0,002	40	with adjusting nut
	148-506	0,01	0,002	40	without adjusting nut
	148-854	0,01	0,002	40	spherical measuring surface, with adjusting nut
13-0	148-864	0,01	0,002	40	reversible scale, with adjusting nut

Dimensions of all devices see page 88 and 89



148-506

Specifications

Accuracy: Factory specification

Stem: with / without adjustment nut

Specifications

Accuracy: Factory specification

Stem: with / without adjustment nut

Micrometer Heads

Specifications

Accuracy: Factory specification
 Stem: with / without adjustment nut
 Measuring surfaces: carbide-tipped

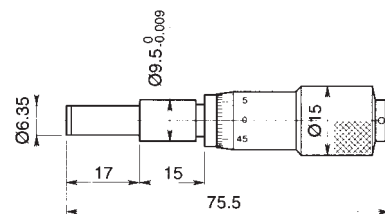
Series 149



149-131

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-15	149-131	0,01	0,002	55	with adjusting nut
	149-132	0,01	0,002	55	without adjusting nut
	149-801	0,01	0,002	55	spherical measuring surface, without adjusting nut
	149-802	0,01	0,002	55	spherical measuring surface, with adjusting nut
15-0	149-821	0,01	0,002	55	reversible scale, without adjusting nut
	149-822	0,01	0,002	55	reversible scale, with adjusting nut

Dimensions of all devices see page 88 and 89



149-132

Specifications

Accuracy: Factory specification
 Stem: with / without adjustment nut
 Measuring surfaces: carbide-tipped

Series 149

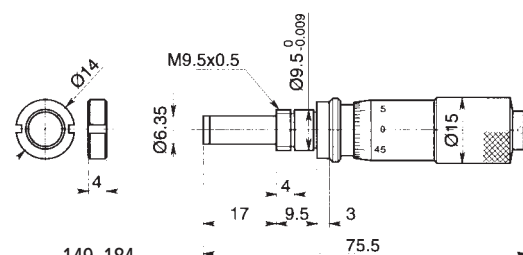
- Micrometer head with clamping device.



149-183

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-15	149-183	0,01	0,002	60	without adjusting nut
	149-184	0,01	0,002	60	with adjusting nut

Dimensions of all devices see page 88 and 89



149-184

Micrometer Heads

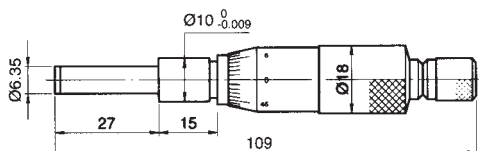
Series 150



150-192

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-25	150-189	0,001	0,002	90	with adjusting nut, with ratchet
	150-190	0,001	0,002	90	without adjusting nut, with ratchet
	150-191	0,01	0,002	90	with adjusting nut, with ratchet
	150-192	0,01	0,002	90	without adjusting nut, with ratchet
	150-195	0,01	0,002	90	without ratchet, with adjusting nut
	150-196	0,01	0,002	90	without ratchet, without adjusting nut
	150-801	0,01	0,002	90	spherical measuring surface, without adjusting nut, with ratchet
	150-802	0,01	0,002	90	spherical measuring surface, with adjusting nut, with ratchet
25-0	150-821	0,01	0,002	90	reversible scale, without adjusting nut, with ratchet
	150-822	0,01	0,002	90	reversible scale, with adjusting nut, with ratchet

Dimensions of all devices see page 88 and 89



150-192

Specifications

Accuracy: Factory specification
 Stem: with / without adjustment nut
 Measuring surfaces: carbide-tipped

Series 150

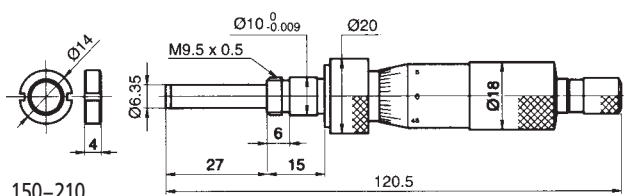
- Micrometer head with clamping device.



150-209

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-25	150-209	0,01	0,002	125	without adjusting nut, with ratchet
	150-210	0,01	0,002	125	with adjusting nut, with ratchet
	150-211	0,01	0,002	115	without ratchet, without adjusting nut
	150-212	0,01	0,002	115	without ratchet, with adjusting nut

Dimensions of all devices see page 88 and 89



150-210

Specifications

Accuracy: Factory specification
 Stem: with / without adjustment nut
 Measuring surfaces: carbide-tipped

Micrometer Heads

Specifications

Accuracy: Factory specification
 Stem: with / without adjustment nut
 Measuring surfaces: carbide-tipped

Series 151

- Micrometer head with/without ratchet and 8 mm spindle diameter.
- Heavy duty.



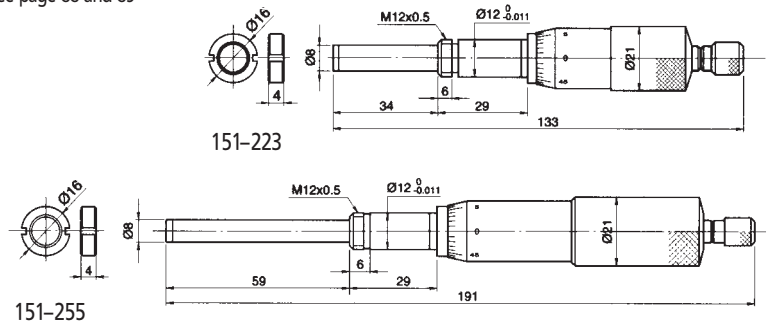
151-223



151-256

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-25	151-221	0,001	0,002	160	with adjusting nut, with ratchet
	151-222	0,001	0,002	150	without adjusting nut, with ratchet
	151-223	0,01	0,002	160	with adjusting nut, with ratchet
	151-224	0,01	0,002	150	without adjusting nut, with ratchet
0-50	151-255	0,01	0,004	250	with adjusting nut, with ratchet
	151-256	0,01	0,004	240	without adjusting nut, with ratchet
	151-259	0,01	0,004	250	without ratchet, with adjusting nut
	151-260	0,01	0,004	240	without ratchet, without adjusting nut

Dimensions of all devices see page 88 and 89



Series 151

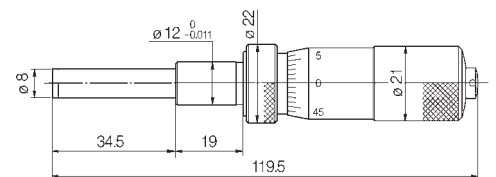
- Micrometer head with clamping device and 8 mm spindle diameter.
- Heavy duty.



151-225

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-25	151-225	0,01	0,002	165	without adjusting nut, without ratchet
	151-226	0,01	0,002	165	with adjusting nut, without ratchet

Dimensions of all devices see page 88 and 89



151-225

Specifications

Accuracy: Factory specification
 Stem: with / without adjustment nut
 Measuring surfaces: carbide-tipped

Micrometer Heads

Series 152

- Micrometer head with 1 mm spindle pitch to avoid errors in reading.
- Measurement value can be read from the 100 step graduation thimble without calculation of 1/2 mm values.



152-101



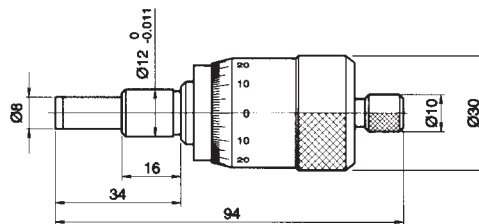
152-102



152-103

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g
0-15	152-101	0,01	0,002	205
0-25	152-102	0,01	0,002	230
0-50	152-103	0,01	0,004	355

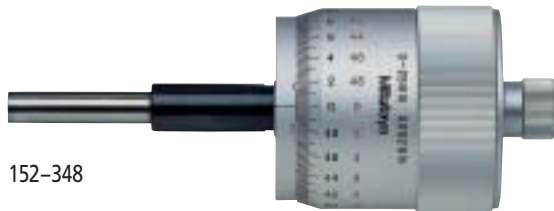
Dimensions of all devices see page 88 and 89



152-101

Series 152

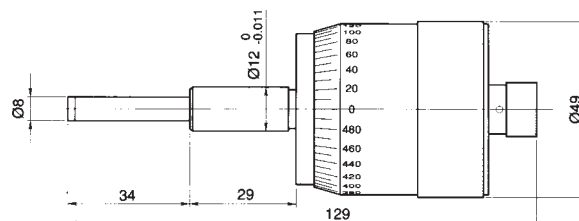
- Micrometer head with large thimble and bi-direction reading.
- Black and red scaling for both directions.



152-348

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g
0-25-0	152-348	0,002	0,002	310
0-50-0	152-380	0,002	0,004	460

Dimensions of all devices see page 88 and 89



152-348

Specifications

Accuracy: Factory specification
 Stem: without adjusting nut
 Measuring surfaces: carbide-tipped

Specifications

Accuracy: Factory specification
 Stem: without adjusting nut
 Measuring surfaces: carbide-tipped

Micrometer Heads For x/y travel

Specifications

Accuracy: Factory specification

Series 152

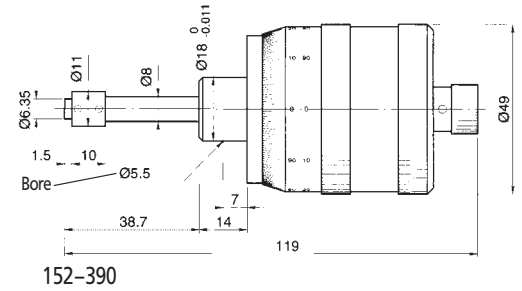
- Micrometer heads with rotating spindle, non-rotating measuring surface and bi-directional reading.
- Reading in both directions of graduation engraved in black and red.
- The measurement values can be read directly from the 100 step graduation without having to add the $\frac{1}{2}$ mm values.



152-389

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-25-0	152-389	0,005	0,002	270	for Y-axis
	152-390	0,005	0,002	270	for X-axis

Dimensions of all devices see page 88 and 89



152-390

Specifications

Accuracy: Factory specification
 Measuring surfaces: carbide-tipped
 Zero-setting can be performed directly using the sleeve.

Series 152

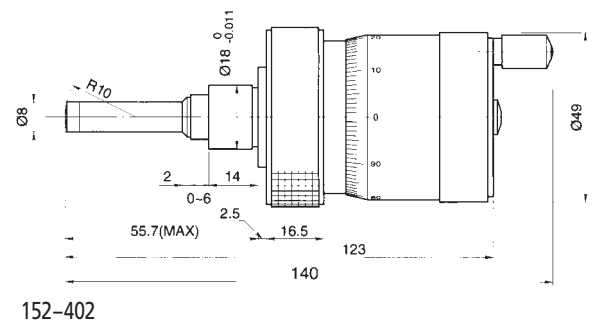
- Micrometer head with extra large thimble Floating ZERO adjustment.
- The measurement values can be read directly from the 100 step graduation without having to add the $\frac{1}{2}$ mm values.



152-402

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-25-0	152-401	0,001	0,002	460	for Y-axis
	152-402	0,001	0,002	460	for X-axis

Dimensions of all devices see page 88 and 89



152-402

Micrometer Heads

Series 153

- Micrometer head with non-rotating spindle.



153-101



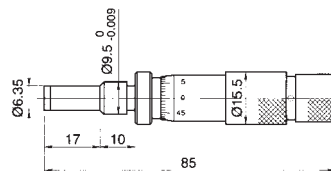
153-201



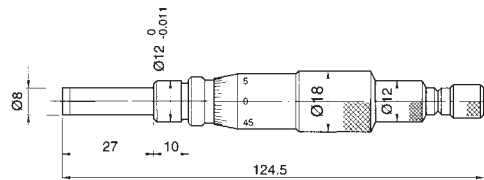
153-204

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g	Comments
0-15	153-101	0,01	0,003	70	
0-25	153-201	0,01	0,003	122	with ratchet
	153-202	0,001	0,003	122	with ratchet
	153-203	0,01	0,003	117	
	153-204	0,001	0,003	117	

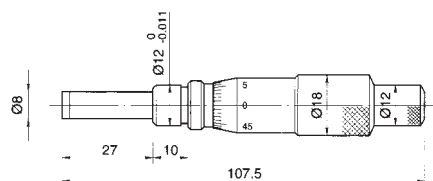
Dimensions of all devices see page 88 and 89



153-101



153-201 + 153-202



153-203 + 153-204

Specifications

Accuracy: Factory specification
 Measuring surfaces: carbide-tipped

Micrometer Heads

Specifications

Accuracy: Factory specification
 Measuring surfaces: carbide-tipped

Series 197

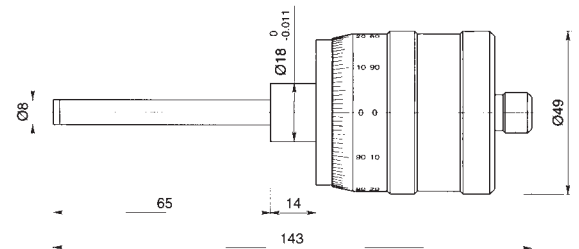
- Micrometer head with double-threaded non-rotating spindle and 1 mm spindle pitch.
- The measurement values can be read directly from the 100 step gradutation without having to add the 1/2 mm values.
- The scale can be reset by turning the scale shell.



197-101

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g
0-50	197-101	0,005	0,005	360

Dimensions of all devices see page 88 and 89



197-101

Specifications

Accuracy: Factory specification
 Measuring surfaces: carbide-tipped

Series 250

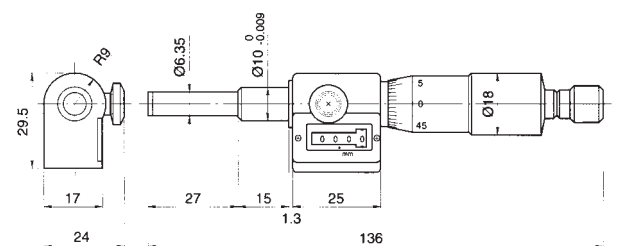
- Micrometer with counter and ratchet.



250-301

Measuring range mm	No.	Graduation mm	Error limit mm	Mass g
0-25	250-301	0,01	0,002	165

Dimensions of all devices see page 88 and 89



250-301

"DIGIMATIC" Micrometer Heads

Series 164

- Display and operating unit may be rotated by 330° for convenience (164-161 only)
- For integration into machinery and measuring facilities.
- Digital micrometer head with non-rotating spindle.
- Direct reading of 0,001 mm from clear digital display.
- Accurate and error free measurement.

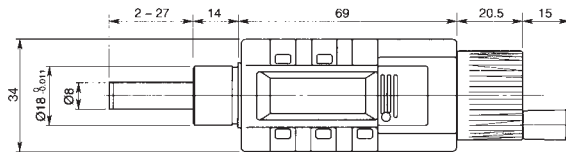


164-171

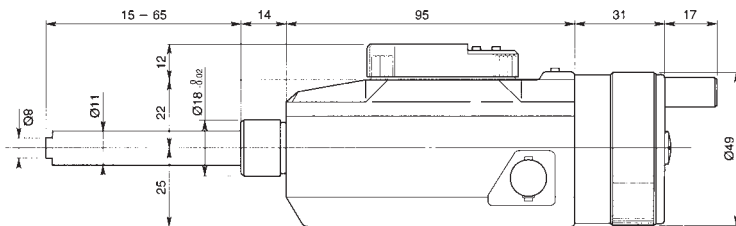


164-161

Measuring range mm	No.	Resolution mm	Error limit mm	Mass g
0-25	164-171	0,001	0,002	160
0-50	164-161	0,001	0,003	500



164-171



164-161

Functions	Series 164
ON/OFF	●
PRESET	●
+/- Revers measuring direction	●
ZERO/ABS	●
Data output	●

Specifications

Accuracy: Factory specification
 Measuring surfaces: carbide-tipped
 Including battery 164-171 (1 x)
 and 164-161 (2 x)

Optional accessories

No. 937387 Signal cable (1 m)
 No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

"DIGIMATIC" Micrometer Heads

Functions	Series 350
PRESET	●
ZERO/ABS	●
HOLD	●
Data output	●

Specifications

Protection class: IP-65

Accuracy: Factory specification

Including battery, key, bushing \varnothing 18 mm (350-261, 350-271)

Optional accessories

No. 05CZA662 Signal cable (1 m)

No. 05CZA663 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Series 350

- For integration into machinery and measuring facilities.
- Digital micrometer head.
- Direct reading of clearly displayed 0,001 mm step measurement values.
- Accurate and error-free measuring.

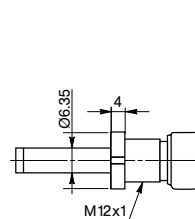


350-271

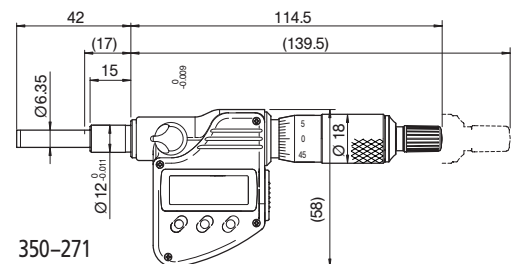


350-272

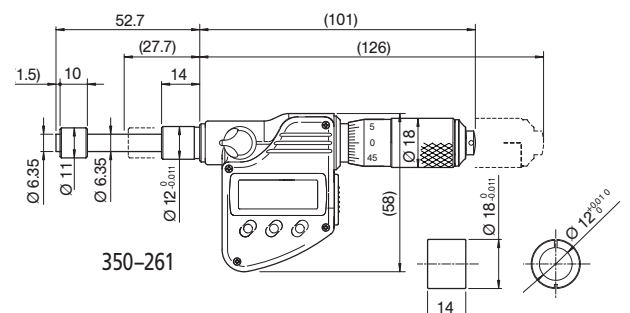
Measuring range mm	No.	Resolution mm	Error limit mm	Mass g	Comments
0-25	350-261	0,001	0,002	235	rotating spindle, non-rotating measuring surface
	350-271	0,001	0,002	230	with ratchet, measuring surfaces carbide-tipped
	350-272	0,001	0,002	230	with adjusting nut, with ratchet, measuring surfaces carbide-tipped



350-261 / 350-272



350-271



350-261

ABSOLUTE Micrometer Heads

• Large figures, long battery life

The digital display is very easy to read with its 7.5 mm high figures. The battery life is approx. 3 years, which corresponds approximately to 3 times the battery life of traditional digital external screw type micrometers

• Precise measurement at high travel speed

The measuring system is an absolute linear scale with an numerical increment of 1 μm .

The absolute scale means that there can be no error displays due to excessive travel speed; the travel speed is unlimited.

This micrometer has a newly-developed spindle mechanism that enables a spindle thrust of 10 mm/rev.

The thrust rate is therefore 20x higher than with traditional micrometers.

• Exact measurements on sensitive surfaces

As the micrometer has a non-rotating spindle, measurements can also be carried out on sensitive surfaces.

Series 227

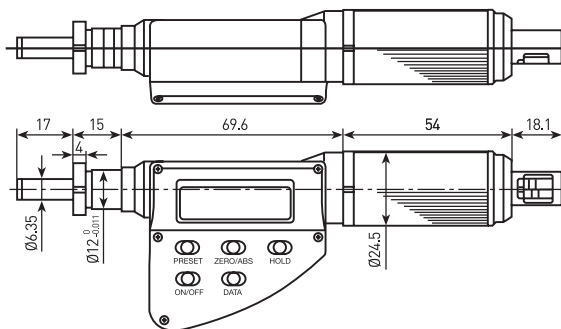
Quick built-in micrometer with non-rotating spindle and adjustable measuring force 0,5– 2,5 N (at 227–241), 2,0–10,0 N (at 227–242)

ABSOLUTE™
Absolute System Patented by MITUTOYO



227-241

Measuring range mm	No.	Adjustment range for measuring force	Measuring force (N) Scale	Error limits of measuring force (pre-adjusted measuring force)	Error limit μm	Mass g
0–15	227-241	0,5– 2,5 N	0,5; 1,0; 1,5; 2,0; 2,5	0,1 + (adjusted measuring force / 10) N	2	260
0–15	227-242	2,0–10,0 N	2; 4; 6; 8; 10	0,4 + (adjusted measuring force / 10) N	2	260



Functions	Series 227
ON/OFF	●
ORIGIN	●
DATA/HOLD	●
ZERO/ABS	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,001 mm
Flatness: $\leq 0,3 \mu\text{m}$
Measuring direction: horizontal *
Including box, 1 battery

* = a change in the direction of measurement affects the measuring force; the guaranteed tolerances only apply to horizontal measuring (± 3 degrees).

Optional accessories

No. 937387 Signal cable (1 m)

No. 965013 Signal cable (2 m)

Consumable Spares

No. 938882 Battery SR-44

Electronic Micrometer Heads

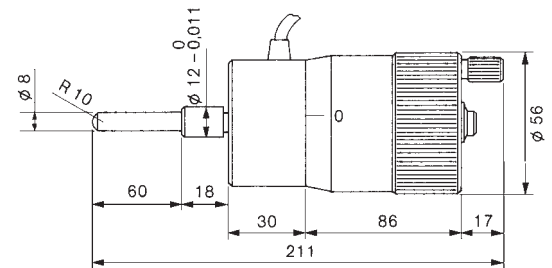
Series 164

- With rotating spindle.
- Electronic micrometer head for integration into machinery and measuring facilities in connection with KA counter of the series 174.



164-122

Measuring range mm	No.	Resolution mm	Error limit mm	Mass g
0-50	164-122	0,001	0,002	760



164-122

Digital Display Unit for No. 164-122

Series 174

KA-Counter

User-friendly multifunctional display unit



174-173 D

No.	Axes	Dimensions (W x H x D) mm	Mass kg
174-173 D	2	260 x 167 x 80	1,1
174-175 D	3	260 x 167 x 80	1,2

Functions	Series 174
Zero-setting	●
Polarity switch	●
mm/inch switch	●
Preset/ZERO-setting	●
1/2 key	●
ABS/INC-coordinate switch	●

Specifications

Accuracy: Factory specification
Measuring surfaces: carbide-tipped

Optional accessories

No. 09CAB231 Adapter for micrometer heads 164-122 (1 piece) for connection to display unit KA counter

Specifications

Resolution: 0,005 mm, 0,001 mm
Display: 8 Digits, Denominator (-)
Operation temperature: 0 °C up to 45 °C

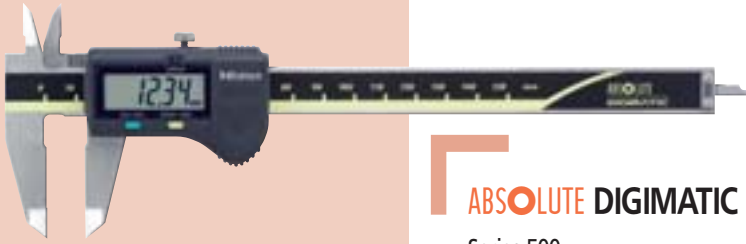
Optional accessories

No. 09CAB217 RS-232 C port

No. 011418 Foot switch for KA counter for data output No. 09CAB217

No. 09CAB231 Adapter for micrometer heads 164-122 (1 piece)

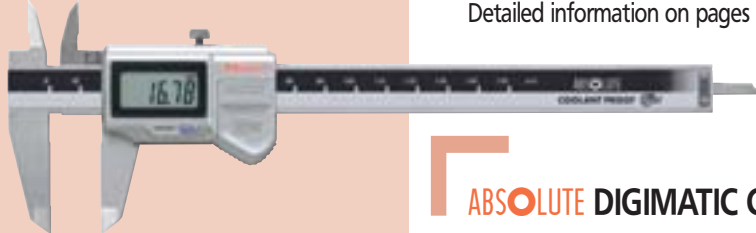
PRODUCT NEWS



ABSOLUTE DIGIMATIC Caliper – Standard design

Series 500

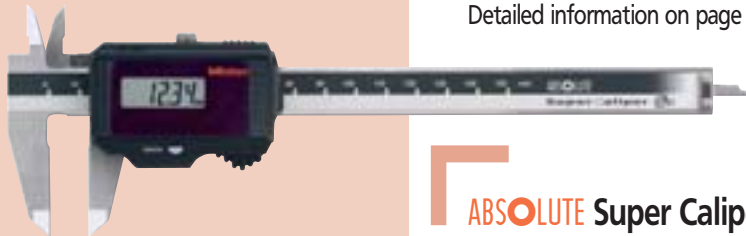
Detailed information on pages 111 and 112.



ABSOLUTE DIGIMATIC Caliper acc. to protection rating IP-66 and IP-67

Series 500

Detailed information on page 110.



ABSOLUTE Super Caliper

Series 500

Detailed information on page 113.



ABSOLUTE Depth Gauges acc. to protection rating IP-67

Series 571

Detailed information on page 148.



Linear Height Gauge LH-600 C / CG „Linear Height“

Series 518

Detailed information on page 158.

ABSOLUTETM

Absolute System Patented by MITUTOYO

IP66

IP67

ABSOLUTETM

Absolute System Patented by MITUTOYO

IP67

ABSOLUTETM

Absolute System Patented by MITUTOYO

IP67

ABSOLUTE Calipers



Pages 110–116

ABSOLUTE Special Purpose Calipers



Pages 117–134

Dial Calipers



Page 135

Nonius Calipers



Pages 136–143

ABSOLUTE Depth Gauges



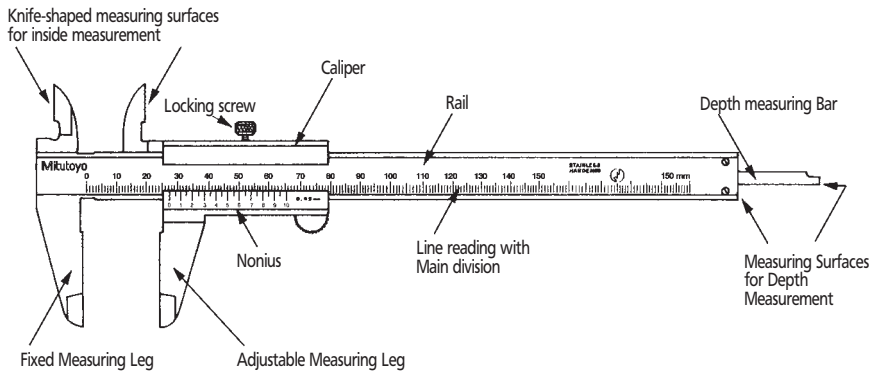
Pages 145–148

Height Gauges



Pages 149–161

Basic information Caliper



Special Function keys

- ON / OFF
- ORIGIN = Preset origin of measuring range
- ZERO = Display to "0.000"
- ZERO / ABS = Display to "0.000" for comparison measurement / display back to actual measuring position in relation to the preset origin of the measuring range (standard mode).
- OFFSET = same as ZERO / ABS
- INCH / MM = imperial / metric
- PRESET = presetting option for starting value or random value for comparison measurement.
- HOLD = to hold the measurement value indicated last.



IP-67-Display

Super Caliper

"QUADRI"-Type

Four basic types of measurements: outside, inside, step and depth measurement may be executed.

1. Outside Measurement



2. Inside Measurement



3. Step Measurement (Height)



4. Depth Measurement



Caliper

Mitutoyo's calipers of the series 500, 550, 551, 552 and 573 are manufactured with IP-40 protection as a standard (see table below). Exception: IP 66 IP 67 versions.

IP40

IP65

IP66

IP67

International Protection	Index of degree of protection according to DIN EN 60 529 (approximate)	International Protection	Index of degree of protection according to DIN EN 60 529 (approximate)
Protection against foreign substances and dust		Protection against wetness	
Particles > 50,0 mm	IP 1 x	Drip-water vertical	IP x 1
Particles > 12,5 mm	IP 2 x	Drip-water oblique	IP x 2
Particles > 2,5 mm	IP 3 x	Spray-water	IP x 3
Particles > 1,0 mm	IP 4 x	Splash-water	IP x 4
Dust residue	IP 5 x	Hose-water	IP x 5
Dust intrusion	IP 6 x	Strong hose water	IP x 6
		Temporarily immersed	IP x 7
		Permanently immersed (immersion depth in m)	IP x 8

Example:

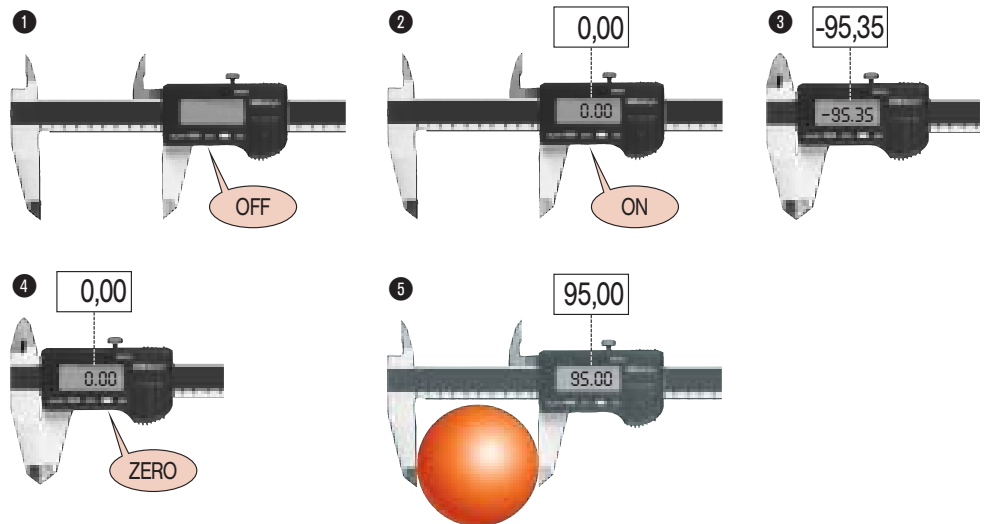
IP-65 = "Dust intrusion" and "hose-water"
(More detailed information can be obtained from our IP protection leaflet).

ABSOLUTE

Conventional measuring methods

ABSOLUTE™

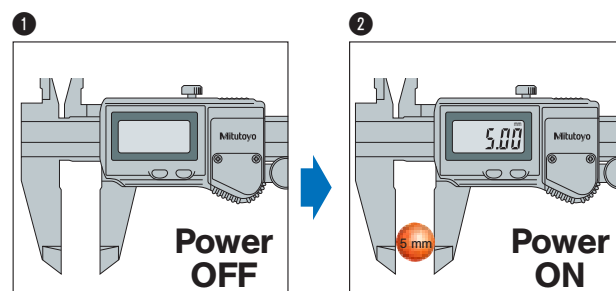
Absolute System Patented by MITUTOYO



ABSOLUTE measuring methods

Absolutely safe, absolutely ingenious: The ABSOLUTE system

All Mitutoyo measuring instruments with this logo have the ingenious ABSOLUTE system. Their built-in absolute scale only needs to be have the zero position set once, which from this moment is used for all future measurements. This guarantees maximum measuring precision even at maximum travel speed. Absolutely certain! Absolutely without complication!



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Caliper

acc. to protection rating IP-66 and IP-67

Characteristics:

- Spray-water protected for heavy-duty work with coolants and lubricants.
- ABSOLUTE system for reliable measurement.
- Extremely resistant to coolants and lubricants.
- Optimum caliper sliding properties.

Digital caliper IP-66

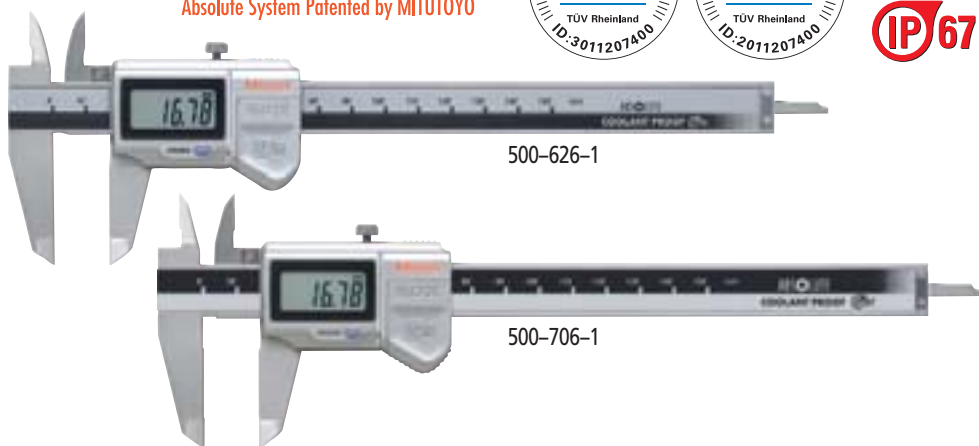
- The IP 66 digital calliper with integrated absolute scale meets the most stringent safety specifications according to DIN EN 60 529 against dust and strong hose water. For example, it will easily withstand a strong water jet flowing at a rate of 100 litres per minute from any direction, for at least three minutes.

Digital caliper IP-67

- The IP-67 digital calliper extends the moisture protection of the IP-66 version with a further feature: it will even withstand temporary complete immersion in water or coolant, without suffering any damage.

Series 500

ABSOLUTE™
Absolute System Patented by MITUTOYO



500-626-1

500-706-1

Measuring range mm	No.	Resolution mm	Error limits	Depth gauge	Data output	Mass g
IP-66						
0-150	500-626-1	0,01	DIN 862	Flat		164
0-200	500-627-1	0,01	DIN 862	Flat		194
0-300*	500-628	0,01	DIN 862	Flat		345
0-150	500-637-1	0,01	DIN 862	Flat	●	164
0-200	500-638-1	0,01	DIN 862	Flat	●	194
0-300*	500-639	0,01	DIN 862	Flat	●	345
0-150	500-657-1	0,01	DIN 862	Round Ø 1,9 mm		164
IP-67						
0-150	500-706-1	0,01	DIN 862	Flat		164
0-200	500-707-1	0,01	DIN 862	Flat		194
0-150	500-716-1	0,01	DIN 862	Flat	●	164
0-200	500-717-1	0,01	DIN 862	Flat	●	194
0-150	500-709-1	0,01	DIN 862	Round Ø 1,9 mm		164

* without TÜV certification

Specifications

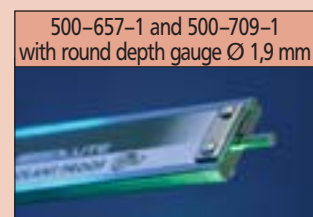
Accuracy: DIN 862
 Protection: IP-66, IP-67 (DIN EN 60 529)
 Resolution: 0,01 mm
 Delivered in soft case, including 1 or 2 batteries and factory certificate

Optional accessories

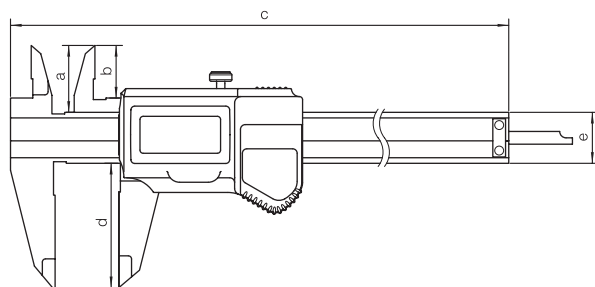
- No. 05CZA624 Signal cable with data switch (1 m)
- No. 05CZA625 Signal cable with data switch (2 m)
- Extension for depth measurement see page 144

Consumables Spares

- No. 938882 Battery (SR 44)



500-657-1 and 500-709-1 with round depth gauge Ø 1,9 mm



Measuring range mm	a mm	b mm	c mm	d mm	e mm
0-150	21,0	16,5	231	40	16
0-200	24,5	20,0	288	50	16
0-300	28,0	21,8	408	64	20

™ Patent numbers see page 464



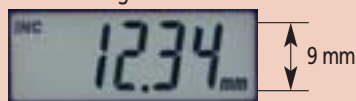
Functions	Series 500
ON / OFF	●
ZERO setting	●
ORIGIN	●

ABSOLUTE DIGIMATIC Caliper

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement.
- Extra large display digits with character height 9 mm.
- Optimum caliper sliding properties.

Specifications

Accuracy: DIN 862
Resolution: 0,01 mm
Character height: 9 mm



Illustrated to original scale

Delivered in soft case,
including 1 battery and factory certificate

Optional accessories

- No. 050083 Extension for depth measurement (see page 144)
No. 050084 Extension for depth measurement (see page 144)

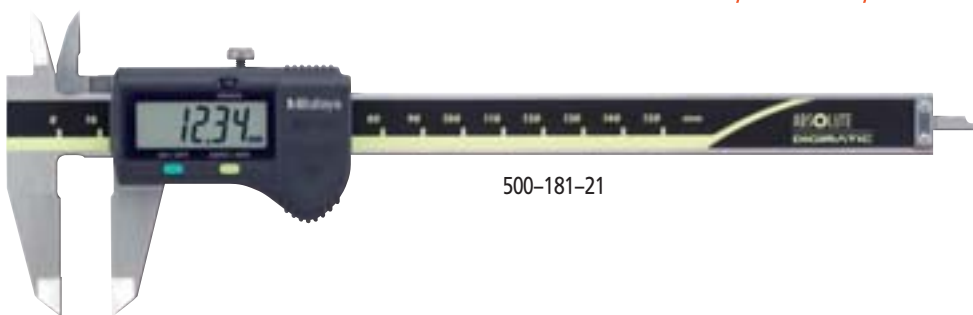
Consumables Spares

- No. 938882 Battery (SR 44)

Series 500

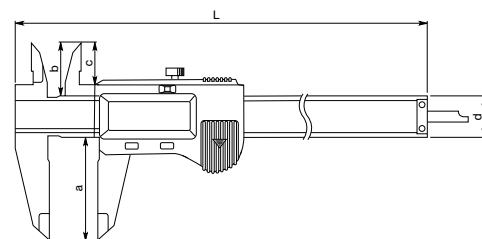
DIN 862 Standard design, without data output

ABSOLUTE™
Absolute System Patented by MITUTOYO



500-181-21

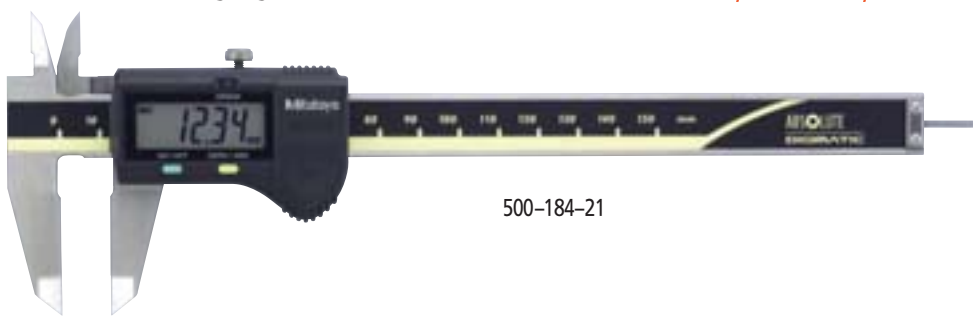
Measuring range mm	No.	Comments	L mm	a mm	b mm	c mm	d mm	Mass g
0-150	500-181-21	with extension for depth measurement	231	40	21,0	16,5	16	164
0-200	500-182-21	with extension for depth measurement	288	50	24,5	20,0	16	194



Series 500

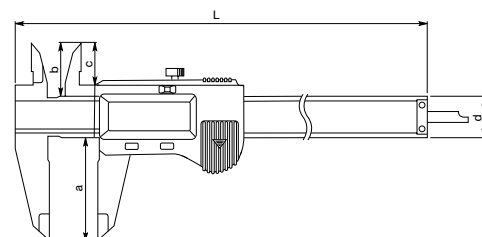
DIN 862 Standard design, without data output,
with round depth gauge

ABSOLUTE™
Absolute System Patented by MITUTOYO



500-184-21

Measuring range mm	No.	Comments	L mm	a mm	b mm	c mm	d mm	Mass g
0-150	500-184-21	with round depth gauge \varnothing 1,9 mm	231	40	21	16,5	16	164



With round depth gauge for small bores

™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Caliper

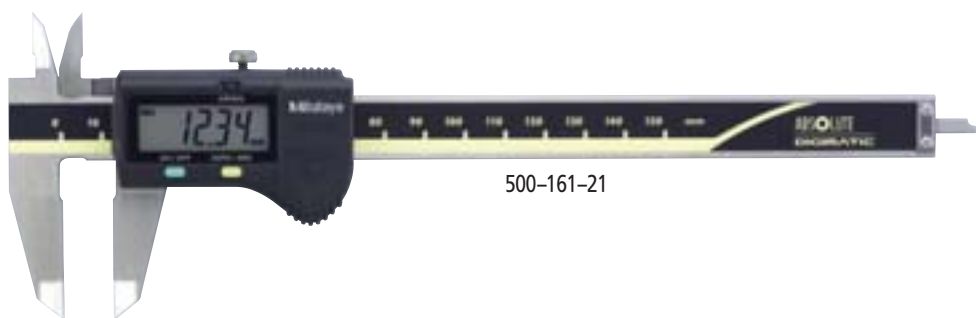
- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement.
- Extra large display digits with character height 9 mm.
- Optimum caliper sliding properties.

Series 500

DIN 862, Standard design in a great many versions, with data output

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Absolute System Patented by MITUTOYO



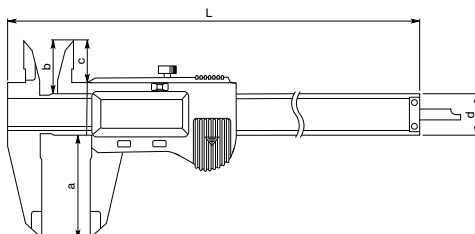
500-161-21

Measuring range	No.	Drive roller	Depth gauge	Round extension (depth measuring Ø 1,9 mm)	mm/inch conversion	carbide-tipped measuring surfaces for outside measurement	carbide-tipped measuring surfaces for inside measurement	Mass
mm								g
0-100	500-150-20	●		●				137
0-150	500-161-21		●					164
0-150	500-151-21	●	●					164
0-150	500-158-20	●		●				164
0-150	500-171-21	●	●		●			164
0-150	500-154-20	●	●			●		164
0-150	500-155-20	●	●			●	●	164
0-200	500-162-21		●					194
0-200	500-152-21	●	●					194
0-200	500-172-21	●	●		●			194
0-200	500-156-20	●	●			●		194
0-200	500-157-20	●	●			●	●	194
0-300	500-153	●	●					350

Measuring range mm	L	a	b	c	d
	mm	mm	mm	mm	mm
0-100	180	40	21,0	16,5	16
0-150	231	40	21,0	16,5	16
0-200	288	50	24,5	20,0	16
0-300	403	64	27,5	21,8	20



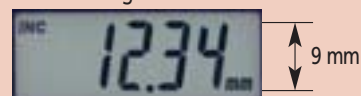
Sample application Hold-Unit



Functions	Series 500
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: DIN 862
Resolution: 0,01 mm
Character height: 9 mm



Illustrated to original scale

Delivered in soft case, including 1 battery and factory certificate

Optional accessories

No. 959149 Signal cable with data switch (1 m)

No. 959150 Signal cable with data switch (2 m)

No. 959143 Hold-Unit

No. 050083 Extension for depth measurement (see page 144)

No. 050084 Extension for depth measurement (see page 144)

No. 050085 Extension for depth measurement (see page 144)

Consumables Spares

No. 938882 Battery (SR 44)



500-150-20 and 500-158-20 with round depth gauge Ø 1,9 mm for small bores

Functions	500-772-1	500-773-1	500-778-1	500-779-1	500-444	500-445	500-457	500-458
ORIGIN	●	●	●	●	●	●	●	●
Data output			●	●	●	●	●	●

Specifications

Accuracy: DIN 862
Resolution: 0,01 mm
Level of illumination (operation): 60 Lux
Delivered in soft case, incl. factory certificate

Optional accessories

Super Caliper

No. 05CZA624 Signal cable (1 m)

No. 05CZA625 Signal cable (2 m)

Solar Caliper with data output

No. 959149 Signal cable with data switch (1 m)

No. 959150 Signal cable with data switch (2 m)

No. 959143 Hold-Unit (only 500-444 / -445)

All types

No. 050083 Extension for depth measurement (see page 144)

No. 050084 Extension for depth measurement (see page 144)

ABSOLUTE DIGIMATIC Solar Caliper

- Digital measurement without battery.
- ABSOLUTE system for reliable measurement.
- Optimum caliper sliding properties.

Series 500

Super Caliper DIN 862

- Protection IP-67
- Extremely resistant to coolants and lubricants
- Impact-resistant design



500-772-1

ABSOLUTE™

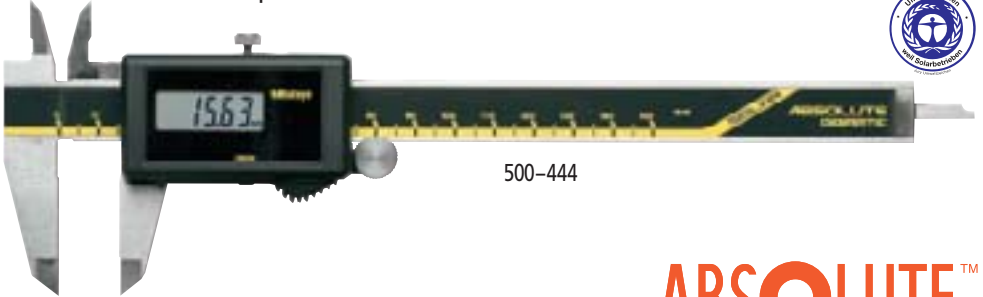
Absolute System Patented by MITUTOYO

IP67



Series 500

DIN 862 with data output



500-444

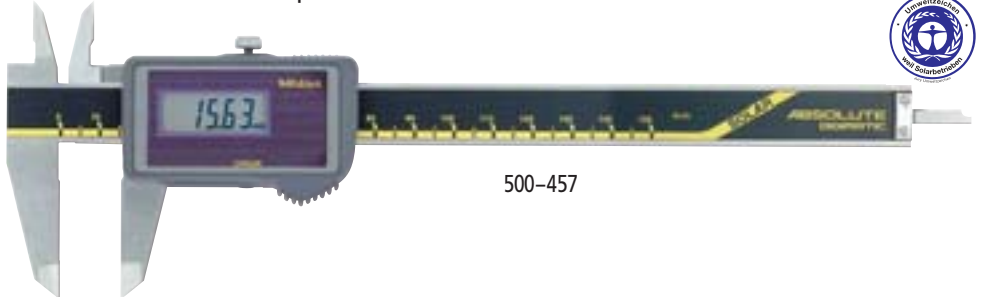
ABSOLUTE™

Absolute System Patented by MITUTOYO



Series 500

DIN 862 without data output



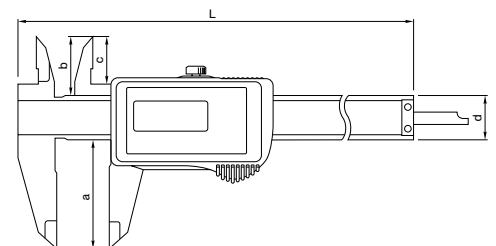
500-457

ABSOLUTE™

Absolute System Patented by MITUTOYO



Measuring range mm	No.	Comments	Protection IP-67	Data output	L mm	a mm	b mm	c mm	d mm	Mass g
0-150	500-772-1	-	●		233	40	21,0	16,5	16	176
0-200	500-773-1	-	●		290	50	24,5	20,0	16	206
0-150	500-778-1	-	●	●	233	40	21,0	16,5	16	176
0-200	500-779-1	-	●	●	290	50	24,5	20,0	16	206
0-150	500-444	with drive roller		●	231	40	21,0	16,5	16	170
0-200	500-445	with drive roller		●	288	50	24,5	20,0	16	200
0-150	500-457	-			231	40	21,0	16,5	16	150
0-200	500-458	-			288	50	24,5	20,0	16	180



™ Patent numbers see page 464

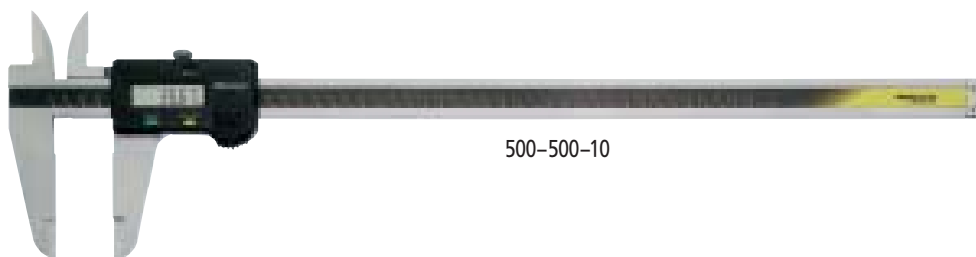
ABSOLUTE DIGIMATIC Caliper

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement. Large display digits are easy to read.
- Optimum caliper sliding properties.

Series 500

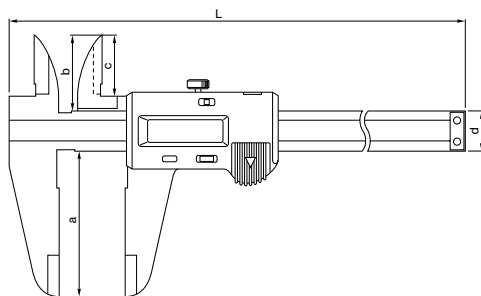
Robust design for large measuring ranges, with data output

ABSOLUTE™
Absolute System Patented by MITUTOYO



500-500-10

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	Mass g
0- 450	500-500-10	0,05	630	90	47	38	25	1170
0- 600	500-501-10	0,05	780	90	47	38	25	1350
0-1000	500-502-10	0,07	1240	130	60	50	32	3300



Functions	Series 500
ON / OFF	●
ZERO / ABS	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm
Delivered in soft case, including 1 battery

Optional accessories

- No. 959149 Signal cable with data switch (1 m)
- No. 959150 Signal cable with data switch (2 m)
- No. 959143 Hold-Unit

Consumables Spares

- No. 938882 Battery (SR 44)

	551-201-20	551-231-10	551-204-10	551-206-10	551-207-10
Functions					
ON / OFF	●	●	●	●	●
ZERO / ABS	●	●	●	●	●
ORIGIN	●	●	●	●	●
OFFSET		●			
PRESET (two values)		●			
Data output	●	●	●	●	●

ABSOLUTE DIGIMATIC Caliper

Specifications

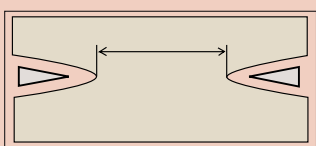
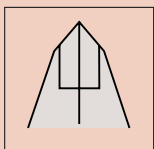
Accuracy: Factory specification
 Resolution: 0,01 mm
 Delivered in soft case,
 including 1 battery

Optional accessories

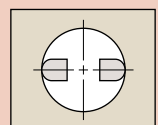
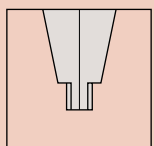
- No. 959149 Signal cable with data switch (1 m)
- No. 959150 Signal cable with data switch (2 m)
- No. 959143 Hold-Unit

Consumables Spares

- No. 938882 Battery (SR 44)



Knife-shaped measuring surfaces for outside measurement



Rounded measuring surfaces for measuring inside dimensions

Series 551

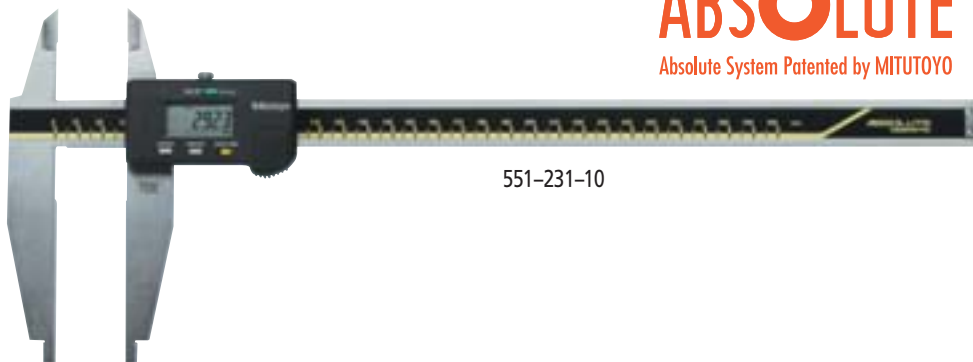
With knife-shaped measuring surfaces for outside measurement and with rounded measuring surfaces for the measurement of inside dimensions.

With data output

ABSOLUTE™
 Absolute System Patented by MITUTOYO



551-201-20

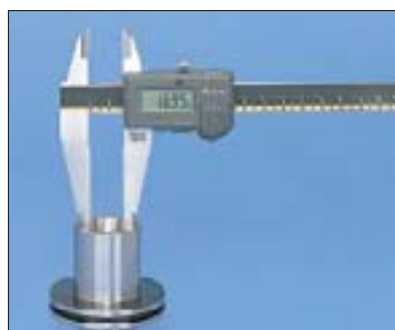


551-231-10

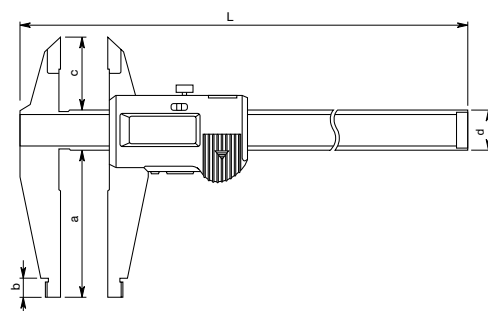
ABSOLUTE™
 Absolute System Patented by MITUTOYO

Measuring range mm	No.	Inside measurements mm	Error limits mm	L mm	a mm	b mm	c mm	d mm	Mass g
0- 200	551-201-20	10	0,03	290	60	8	30	16	196
0- 300	551-231-10*	10	0,04	403	90	10	40	20	420
0- 500	551-204-10	20	0,06	680	150	18	56	25	1060
0- 750	551-206-10	20	0,06	963	150	18	56	25	1410
0-1000	551-207-10	20	0,07	1230	150	20	56	32	3430

* With OFFSET function for direct reading in the case of inside measurements
 With PRESET function for storing 2 preset values



Sample application



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Caliper

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement. Large display digits are easy to read.
- Best caliper sliding properties.

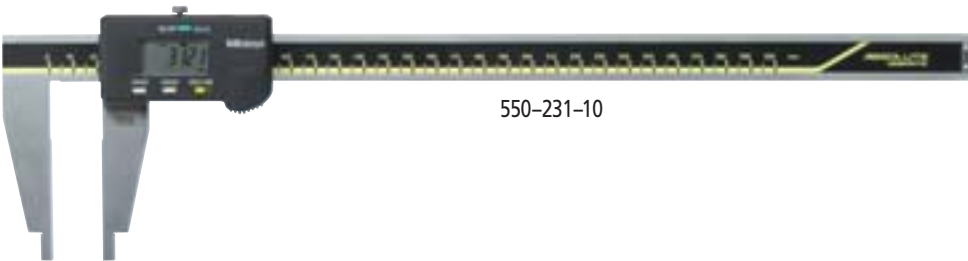
Series 550

With rounded measuring surfaces for the measurement of inside dimensions.
With data output



550-201-20

ABSOLUTE™
Absolute System Patented by MITUTOYO

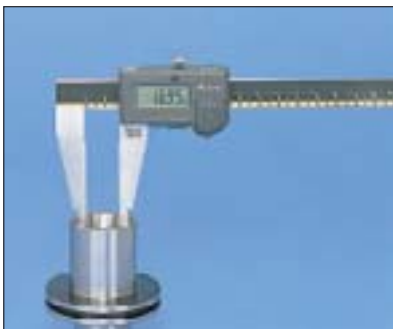


550-231-10

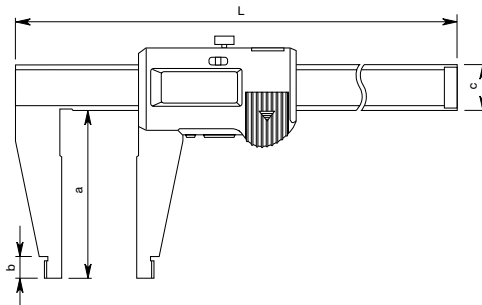
ABSOLUTE™
Absolute System Patented by MITUTOYO

Measuring range mm	No.	Inside measurements mm	Error limits mm	L mm	a mm	b mm	c mm	Mass g
0- 200	550-201-20	10	0,03	290	60	8	16	186
0- 300	550-231-10*	10	0,03	403	75	12	20	380
0- 450	550-203-10	20	0,05	630	100	18	25	1110
0- 600	550-205-10	20	0,05	780	100	18	25	1290
0-1000	550-207-10	20	0,07	1240	140	24	32	3350

* With OFFSET function for direct reading in the case of inside measurements
With PRESET function for the storage of 2 preset values



Sample application



Functions	550-201-20	550-231-10	550-203-10	550-205-10	550-207-10
ON / OFF	●	●	●	●	●
ZERO / ABS	●	●	●	●	●
ORIGIN	●	●	●	●	●
OFFSET		●			
PRESET (two values)		●			
Data output	●	●	●	●	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm

Delivered in soft case,
including 1 battery

Optional accessories

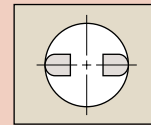
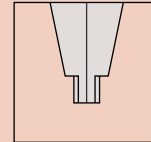
No. 959149 Signal cable
with data switch (1 m)

No. 959150 Signal cable
with data switch (2 m)

No. 959143 Hold-Unit

Consumables Spares

No. 938882 Battery (SR 44)



Rounded measuring surfaces
for the measurement of inside dimensions

ABSOLUTE DIGIMATIC Special Purpose Calipers

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
 Resolution: 0,01 mm
 Measuring force: 0,5–1 N

Delivered in soft case,
 including 1 battery

Optional accessories

No. 959149 Signal cable
 with data switch (1 m)

No. 959150 Signal cable
 with data switch (2 m)

No. 959143 Hold-Unit

Consumables Spares

No. 938882 Battery (SR 44)

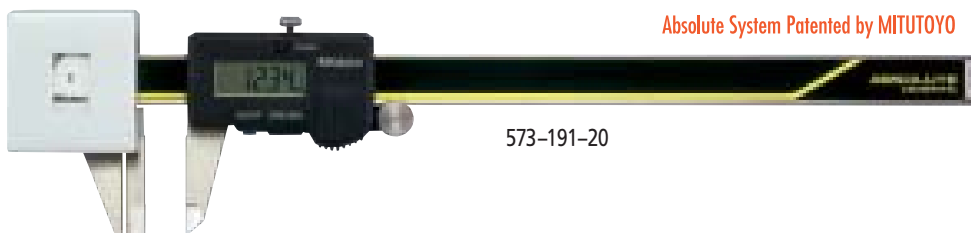
Measuring method:



The measured value is read off when the pointer is between the 2 lines of the measuring force indication.

Series 573

Caliper with constant measuring force with drive roller, for the measurement of flexible materials

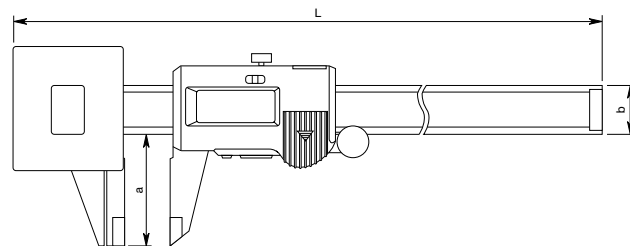


ABSOLUTE™
 Absolute System Patented by MITUTOYO

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	Mass g
0–180	573-191-20	0,05	299	40	16	253



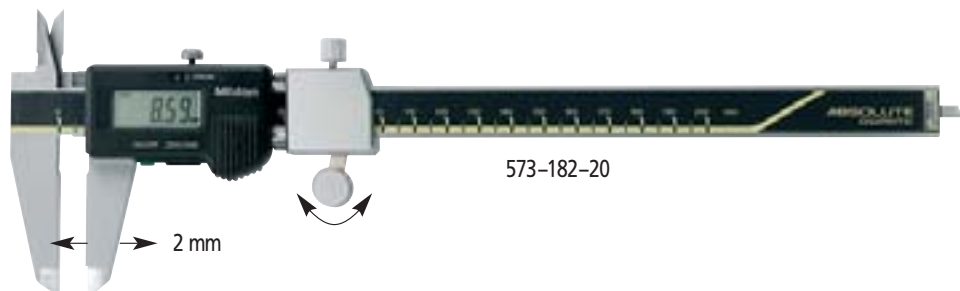
Sample application



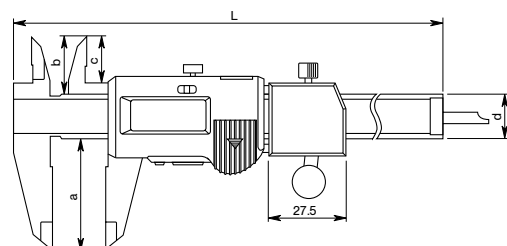
Series 573

Caliper for tolerance measurement with depth gauge, for the series/input test

ABSOLUTE™
 Absolute System Patented by MITUTOYO



Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	Mass g
0–150	573-182-20	0,03	290	50	24,5	20	16	233



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Special Purpose Calipers

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement. Large display digits are easy to read.
- Optimum caliper sliding properties.

Series 573

Scribe Caliper with carbide tipped measuring surfaces, depth gauge and drive roller

ABSOLUTE™
Absolute System Patented by MITUTOYO



573-171-20

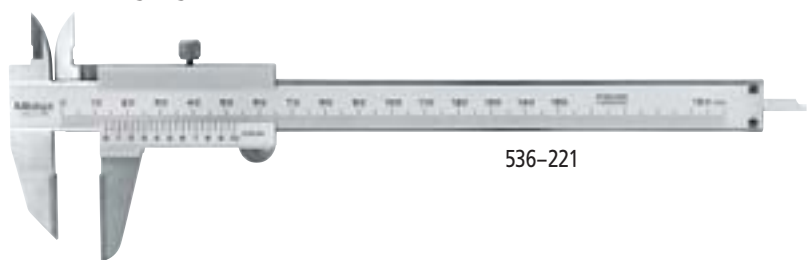
Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	573-171-20	0,03	233	40	21,0	16,5	16	33	166
0-200	573-172-20	0,03	290	50	24,5	20,0	16	43	196
0-300	573-173-10	0,04	403	64	27,5	22,0	20	54	400



Sample application

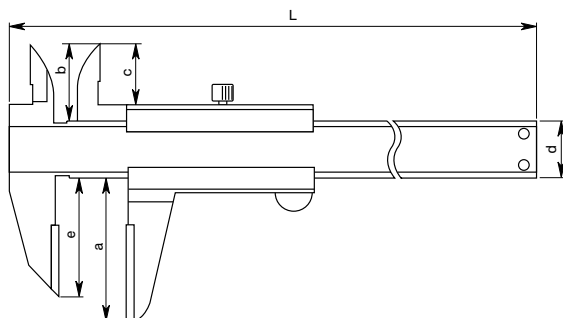
Series 536

Scribe Caliper with carbide tipped measuring surfaces and depth gauge



536-221

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	536-221	0,05	229	40	21,5	17,0	16	33	150
0-200	536-222	0,05	288	50	25,0	20,5	16	43	180
0-300	536-223	0,08	403	64	27,5	22,0	20	54	400



™ Patent numbers see page 464

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm

Delivered in soft case,
including 1 battery

Optional accessories

No. 959149 Signal cable
with data switch (1 m)

No. 959150 Signal cable
with data switch (2 m)

No. 959143 Hold-Unit

Consumables Spares

No. 938882 Battery (SR 44)

Specifications

Nonius value: 0,05 mm

Delivered in soft case

ABSOLUTE DIGIMATIC Special Purpose Calipers

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
 Resolution: 0,01 mm
 Delivered in soft case,
 including 1 battery

Optional accessories

- No. 959149 Signal cable with data switch (1 m)
- No. 959150 Signal cable with data switch (2 m)
- No. 959143 Hold-Unit

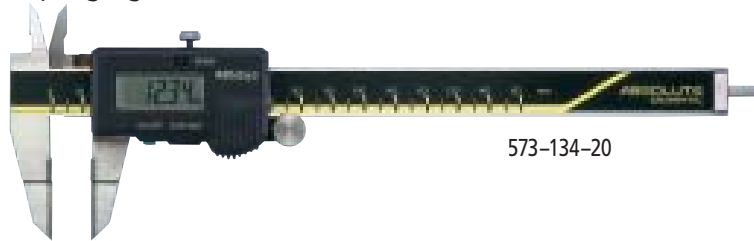
Consumables Spares

- No. 938882 Battery (SR 44)

Series 573

Inside groove caliper
 Carbide-tipped measuring surfaces,
 depth gauge and driver roller

ABSOLUTE™
 Absolute System Patented by MITUTOYO



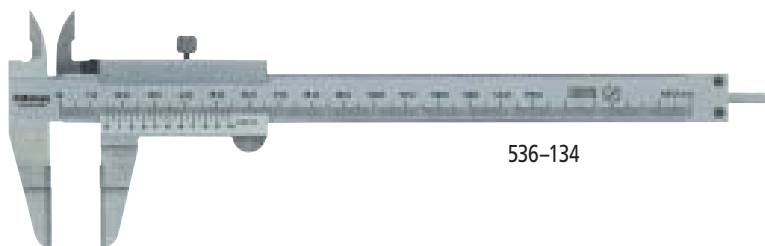
Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	573-134-20	0,03	233	20	40	0,75	16	3	168



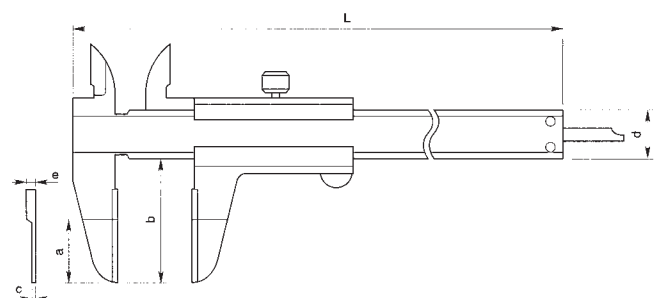
Sample application

Series 536

Inside groove caliper
 Carbide-tipped measuring surfaces and depth gauge



Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	536-134	0,05	229	20	40	0,75	16	3	140
0-200	536-135	0,05	286	25	50	0,75	16	3	180



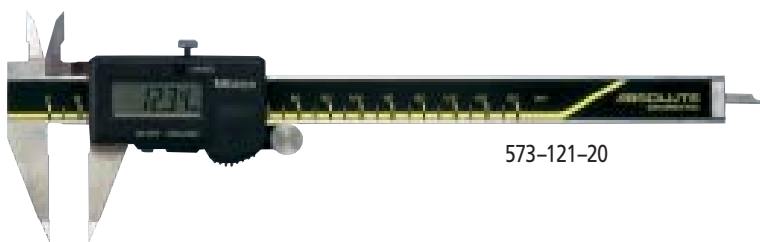
™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Special Purpose Calipers

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement. Large display digits are easy to read.
- Optimum caliper sliding properties.

Series 573

Pointed caliper with depth gauge and drive roller



573-121-20

ABSOLUTE™
Absolute System Patented by MITUTOYO

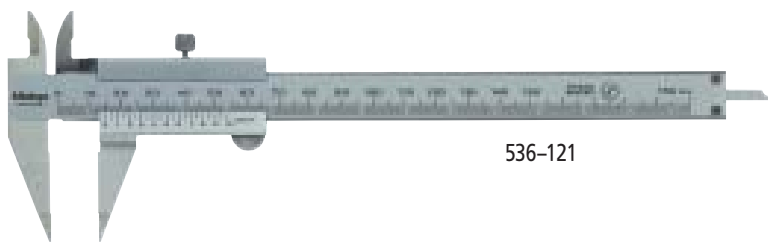
Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	573-121-20	0,03	233	40	21,5	17	16	0,3	163



Sample application

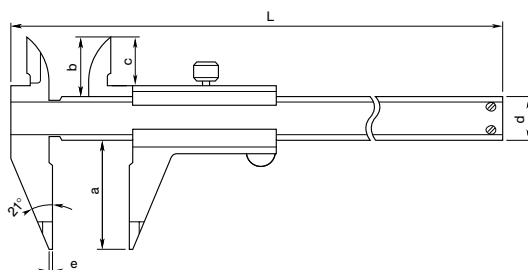
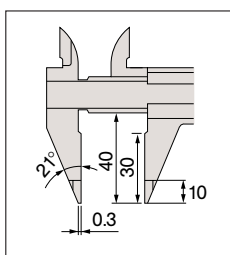
Series 536

Pointed caliper with depth gauge



536-121

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	536-121	0,05	229	40	21,5	17	16	0,3	150



™ Patent numbers see page 464

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm

Delivered in soft case,
including 1 battery

Optional accessories

No. 959149 Signal cable
with data switch (1 m)

No. 959150 Signal cable
with data switch (2 m)

No. 959143 Hold-Unit

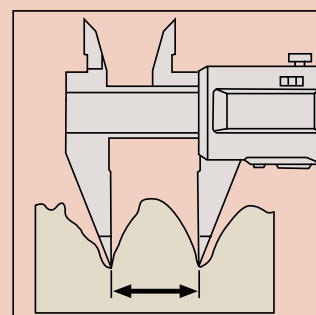
Consumables Spares

No. 938882 Battery (SR 44)

Specifications

Nonius value: 0,05 mm

Delivered in soft case



ABSOLUTE DIGIMATIC Special Purpose Calipers

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

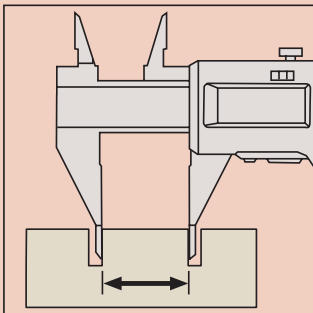
Accuracy: Factory specification
 Resolution: 0,01 mm
 Delivered in soft case,
 including 1 battery

Optional accessories

- No. 959149 Signal cable
with data switch (1 m)
- No. 959150 Signal cable
with data switch (2 m)
- No. 959143 Hold-Unit

Consumables Spares

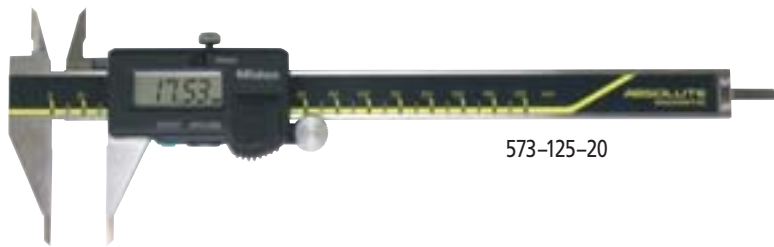
- No. 938882 Battery (SR 44)



Series 573

Caliper with pointed measuring jaw and depth gauge
 and drive roller

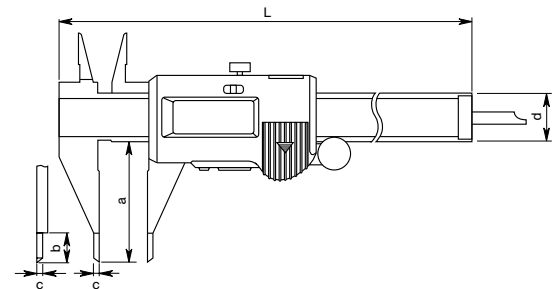
ABSOLUTE™
 Absolute System Patented by MITUTOYO



Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	Mass g
0-150	573-125-20	0,03	233	40	10	2	16	163



Sample application



ABSOLUTE DIGIMATIC Special Purpose Calipers

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement. Large display digits are easy to read.
- Optimum caliper sliding properties.

Series 573

Caliper with adjustable measuring jaw, depth gauge and driver roller

ABSOLUTE™
Absolute System Patented by MITUTOYO



573-101-20

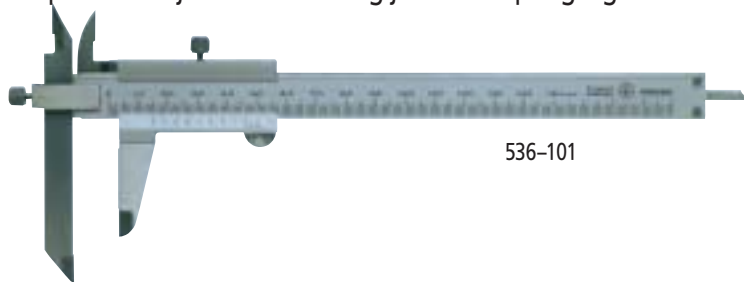
Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	573-101-20	0,03	234	95	40	10	16	7,5	168
0-200	573-102-20	0,03	291	95	50	10	16	8,5	198
0-300	573-103-10	0,04	403	135	64	15	20	12,0	370



Sample application

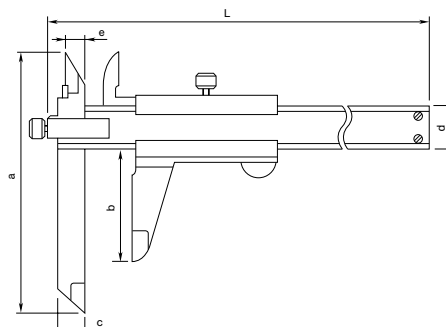
Series 536

Caliper with adjustable measuring jaw and depth gauge



536-101

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	536-101	0,05	229	95	40	10	16	7,5	150
0-200	536-102	0,05	286	95	50	10	16	8,5	200
0-300	536-103	0,08	403	135	64	15	20	12,0	400



™ Patent numbers see page 464

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

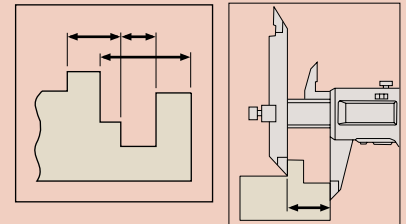
Accuracy: Factory specification
Resolution: 0,01 mm
Delivered in soft case, including 1 battery

Optional accessories

- No. 959149 Signal cable with data switch (1 m)
- No. 959150 Signal cable with data switch (2 m)
- No. 959143 Hold-Unit

Consumables Spares

- No. 938882 Battery (SR 44)



Specifications

Nonius value: 0,05 mm
Delivered in soft case

Special Purpose Calipers

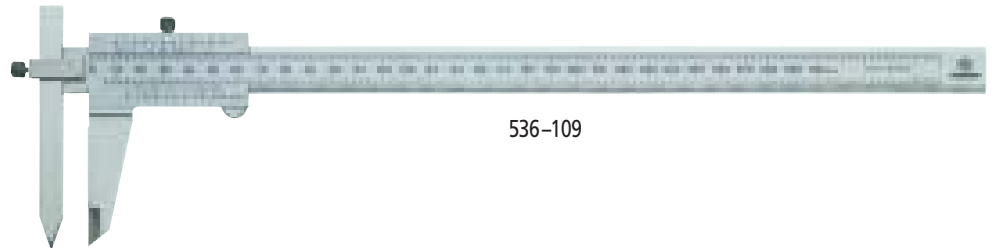
Series 536

Caliper for measuring distance between edge and bore

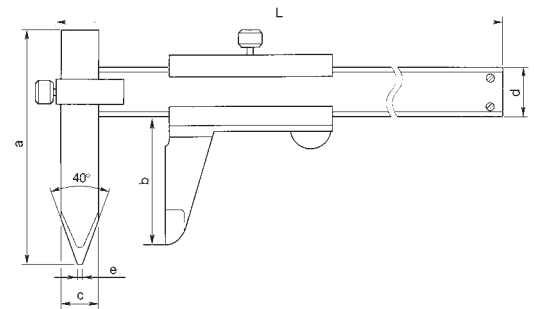
Specifications

Nonius value: 0,05 mm

Delivered in soft case



Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e Ø mm	Mass g
5-300	536-109	0,05	393	100	64	10	20	1	320



ABSOLUTE DIGIMATIC Special Purpose Calipers

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement. Large display digits are easy to read.
- Optimum caliper sliding properties.

Series 573

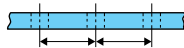
Caliper with adjustable measuring jaws for distance between bores

ABSOLUTE™
Absolute System Patented by MITUTOYO



573-105-20

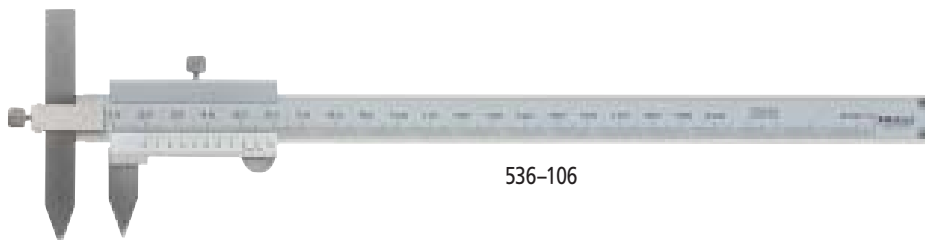
Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
10-150	573-105-20	0,03	230	75	30	10	16	1	153
10-200	573-106-20	0,03	285	75	30	10	16	1	173



Sample application

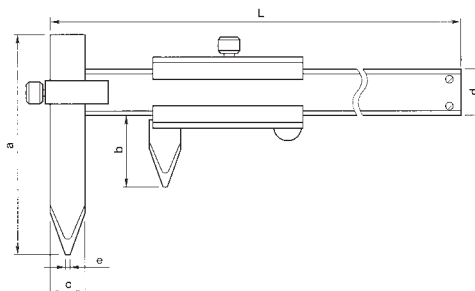
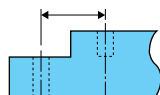
Series 536

Caliper with adjustable measuring jaws for distance between bores



536-106

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
10-150	536-105	0,05	229	75	30	10	16	1	140
10-200	536-106	0,05	282	75	30	10	16	1	160
10-300	536-107	0,08	383	100	30	10	20	1	320



™ Patent numbers see page 464

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm

Delivered in soft case,
including 1 battery

Optional accessories

No. 959149 Signal cable
with data switch (1 m)

No. 959150 Signal cable
with data switch (2 m)

No. 959143 Hold-Unit

Consumables Spares

No. 938882 Battery (SR 44)

Specifications

Nonius value: 0,05 mm

Delivered in soft case

ABSOLUTE DIGIMATIC Special Purpose Calipers

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
 Resolution: 0,01 mm
 Delivered in soft case,
 including 1 battery

Optional accessories

- No. 959149 Signal cable
with data switch (1 m)
- No. 959150 Signal cable
with data switch (2 m)
- No. 959143 Hold-Unit

Consumables Spares

- No. 938882 Battery (SR 44)

Series 573

Caliper with inside angled measuring tips

ABSOLUTE™
 Absolute System Patented by MITUTOYO



Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	573-152-20	0,03	243	38	5	5	16	2	153



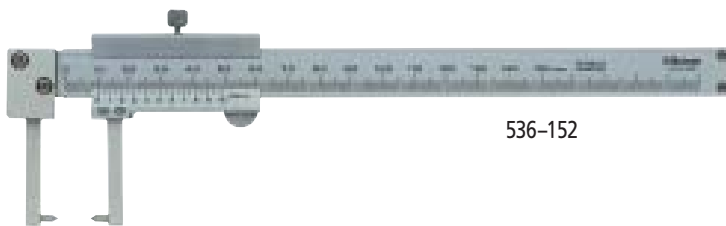
Sample application

Series 536

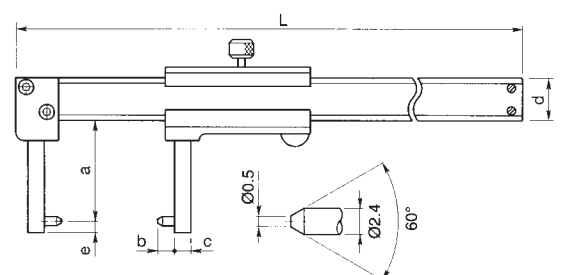
Caliper with inside angled measuring tips

Specifications

Nonius value: 0,05 mm
 Delivered in soft case



Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	536-152	0,05	229	38	5	5	16	2	140



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Special Purpose Calipers

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement. Large display digits are easy to read.
- Optimum caliper sliding properties.

Series 573

Caliper with inside angled tips

ABSOLUTE™
Absolute System Patented by MITUTOYO



573-151-20

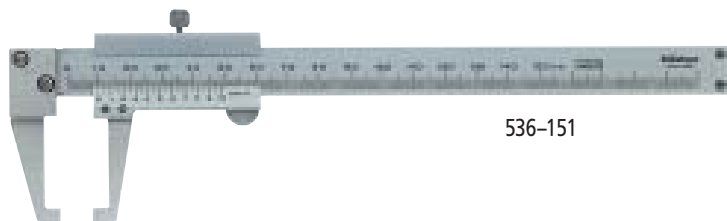
Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	573-151-20	0,03	233	35	5	5	16	3,5	153



Sample application

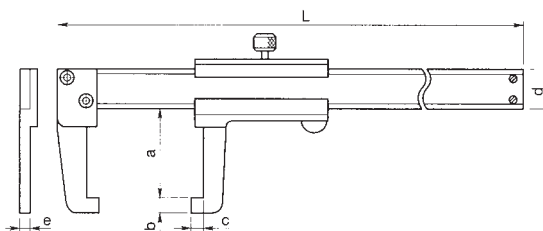
Series 536

Caliper with inside angled tips



536-151

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	536-151	0,05	229	35	5	5	16	3	140



™ Patent numbers see page 464

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm
Delivered in soft case,
including 1 battery

Optional accessories

- No. 959149 Signal cable with data switch (1 m)
- No. 959150 Signal cable with data switch (2 m)
- No. 959143 Hold-Unit

Consumables Spares

- No. 938882 Battery (SR 44)

Specifications

Nonius value: 0,05 mm
Delivered in soft case

ABSOLUTE DIGIMATIC Special Purpose Calipers

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm

Delivered in soft case,
including 1 battery

Optional accessories

No. 959149 Signal cable
with data switch (1 m)

No. 959150 Signal cable
with data switch (2 m)

No. 959143 Hold-Unit

Consumables Spares

No. 938882 Battery (SR 44)

Series 573 Caliper with outside angled tips

ABSOLUTE™
Absolute System Patented by MITUTOYO



573-146-20

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	Mass g
20-150	573-146-20	0,03	233	40	38	10	16	153



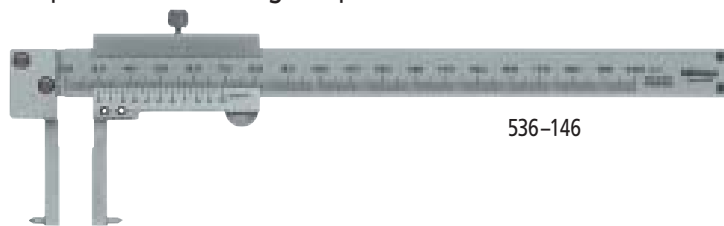
Sample application

Series 536 Caliper with outside angled tips

Specifications

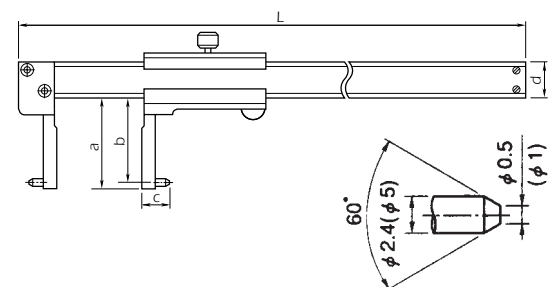
Nonius value: 0,05 mm

Delivered in soft case



536-146

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	Mass g
20-150	536-146	0,05	229	40	38	10	16	140
30-300	536-147	0,08	403	100	98	15	20	370
70-450	536-148	0,10	610	150	145	35	25	1250
70-600	536-149	0,12	750	150	145	35	25	1430



() = 536-148 / 149

™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Special Purpose Calipers

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement. Large display digits are easy to read.
- Optimum caliper sliding properties.

Series 573

Caliper with outside angled tips

ABSOLUTE™
Absolute System Patented by MITUTOYO



573-145-20

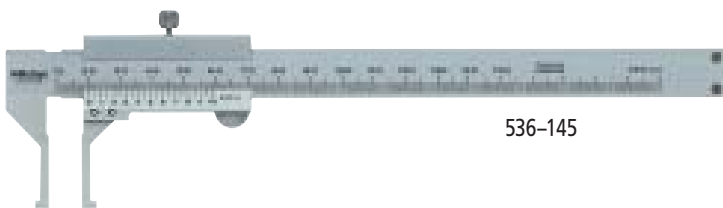
Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	f mm	Mass g
10-150	573-145-20	0,05	233	35	20	3	16	5	3	143



Sample application

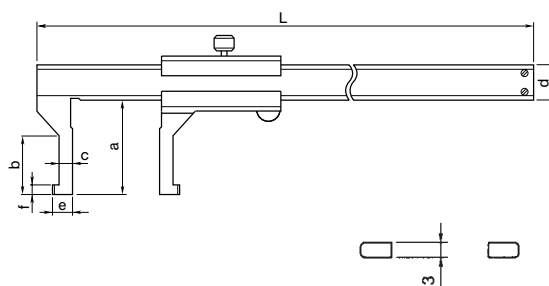
Series 536

Caliper with outside angled tips



536-145

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	f mm	Mass g
10-150	536-145	0,05	229	35	20	3	16	5	3	130



™ Patent numbers see page 464

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm
Delivered in soft case, including 1 battery

Optional accessories

- No. 959149 Signal cable with data switch (1 m)
- No. 959150 Signal cable with data switch (2 m)
- No. 959143 Hold-Unit

Consumables Spares

- No. 938882 Battery (SR 44)

Specifications

Nonius value: 0,05 mm
Delivered in soft case

ABSOLUTE DIGIMATIC Special Purpose Calipers

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm

Delivered in soft case,
including 1 battery

Optional accessories

No. 959149 Signal cable
with data switch (1 m)

No. 959150 Signal cable
with data switch (2 m)

No. 959143 Hold-Unit

Consumables Spares

No. 938882 Battery (SR 44)

Series 573 Wall thickness measuring caliper

ABSOLUTE™
Absolute System Patented by MITUTOYO



573-161-20

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c Ø mm	d mm	Mass g
0-150	573-161-20	0,05	235	40	32	3	16	163



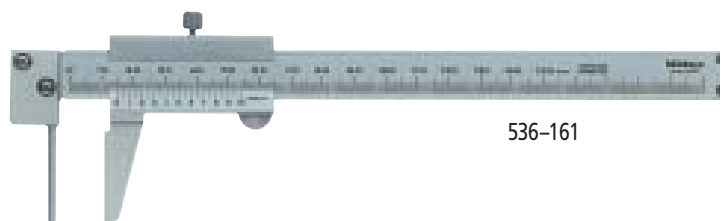
Sample application

Series 536 Wall thickness measuring caliper

Specifications

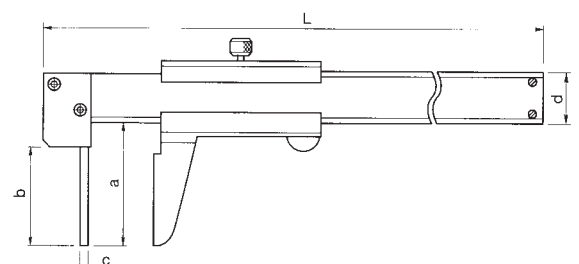
Nonius value: 0,05 mm

Delivered in soft case



536-161

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c Ø mm	d mm	Mass g
0-150	536-161	0,05	229	40	32	3	16	150



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Special Purpose Calipers

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement. Large display digits are easy to read.
- Optimum caliper sliding properties.

Series 573

Caliper for Inside measurement with long narrow jaws

ABSOLUTE™
Absolute System Patented by MITUTOYO

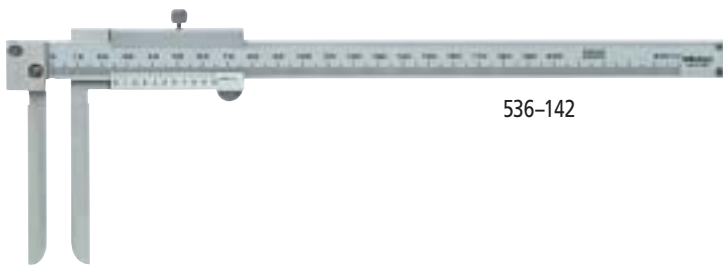


573-142-20

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	Mass g
10-200	573-142-20	0,05	290	70	8	16	223

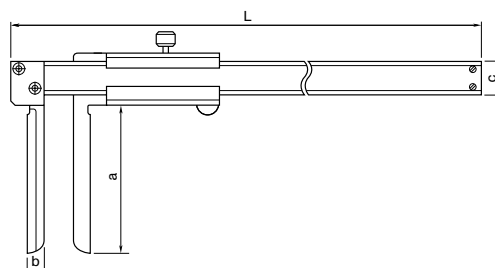
Series 536

Caliper for Inside measurement with long narrow jaws



536-142

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	Mass g
10-200	536-142	0,12	288	70	8	16	210



™ Patent numbers see page 464

Functions	Series 573
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm

Delivered in soft case, including 1 battery

Optional accessories

No. 959149 Signal cable with data switch (1 m)

No. 959150 Signal cable with data switch (2 m)

No. 959143 Hold-Unit

Consumables Spares

No. 938882 Battery (SR 44)

Specifications

Nonius value: 0,05 mm

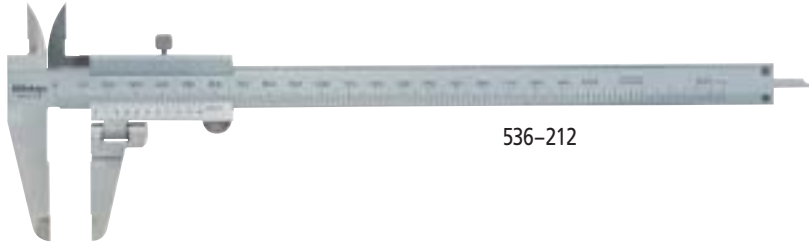
Delivered in soft case

	536-212	536-171	536-172
Functions			
Fine adjustment			●

Special Purpose Calipers

Series 536

Caliper with swivelling jaw and depth gauge

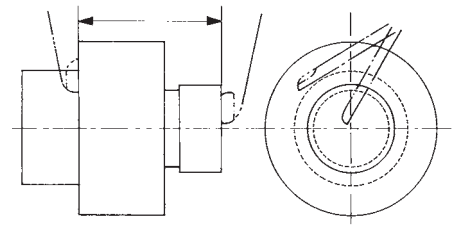


536-212

Measuring range mm	No.	Error limits mm	Nonius value mm	Rotation of	Mass g
0-200	536-212	0,05	0,05	± 90°	190

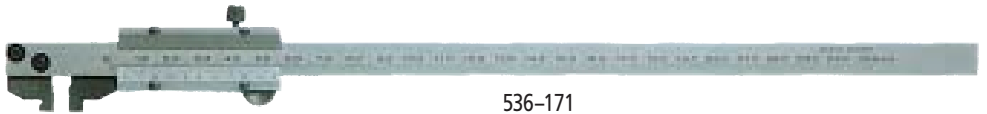


Sample application



Series 536

Inside cross-groove caliper

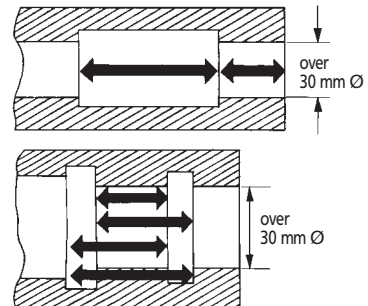


536-171

Measuring range mm	No.	Error limits mm	Nonius value mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
Outside 0-200 Inside 10-200	536-171	0,03	0,02	320	12	28	4	11	5	170

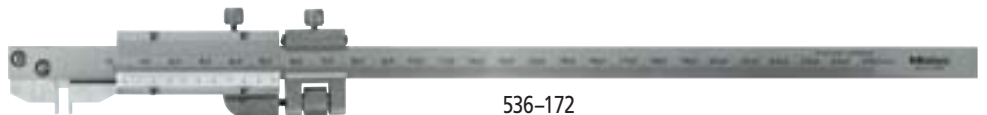


Sample application



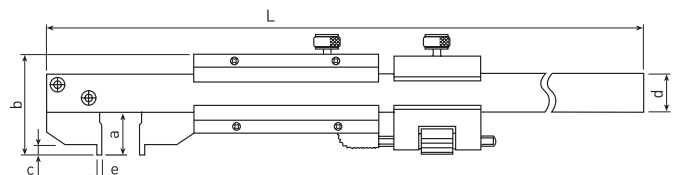
Series 536

Caliper with short hooked jaws and fine adjustment



536-172

Measuring range mm	No.	Error limits mm	Nonius value mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
Outside 0-200 Inside 2-200	536-172	0,03	0,02	320	12	28	4	11	1	200



Specifications

Nonius value: 0,02 mm
Delivered in soft case

Specifications

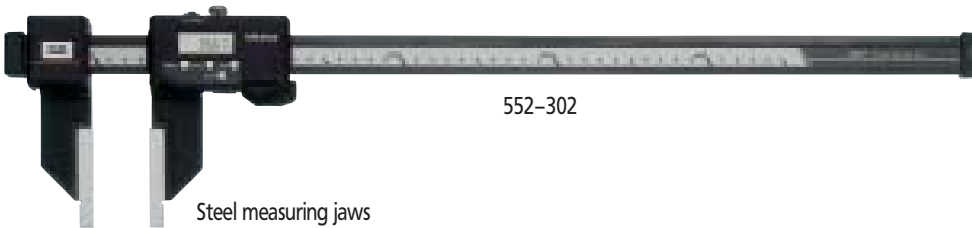
Nonius value: 0,02 mm
Delivered in soft case

DIGIMATIC Workshop Caliper

- The ultra light-weight design (with carbon fiber reinforced material) saves up to 50 % of total weight.
- Exchangeable measuring jaws available as optional accessories.
- Large digits allow for easy reading.
- Capacitance measuring system with dustwiper on the slide, power supply with battery SR-44.
- OFFSET function for direct reading in the case of inside measurements.

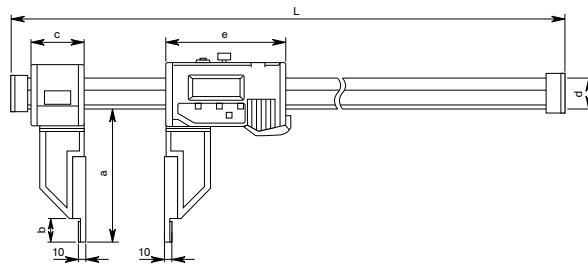
Series 552

Ultra light-weight composite design

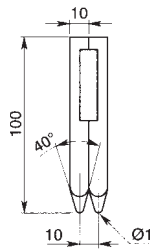


Steel measuring jaws

Measuring range mm	No.	Jaw length mm	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0- 300	552-301	100	0,04	490	100	18	41,2	25	91,8	530
0- 450	552-302	100	0,05	640	100	18	41,2	25	91,8	600
0- 600	552-303	100	0,05	790	100	18	41,2	25	91,8	670
0-1000	552-304	150	0,07	1240	150	24	62,8	32	113,8	2100
0-1500	552-305	150	0,09	1740	150	24	62,8	32	113,8	2400



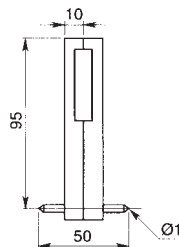
914055



914055



914057



914057

Functions	Series 552
ON / OFF	●
ZERO	●
PRESET	●
OFFSET	●
DATA / HOLD	●
Data output	●

Specifications

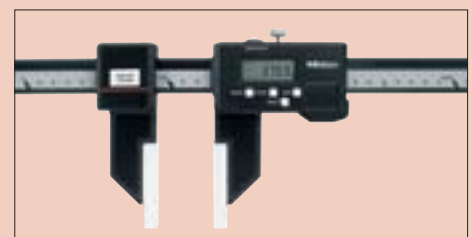
Accuracy: Factory specification
 Resolution: 0,01 mm
 Distance of measuring surfaces for inside measurement: 20 mm
 Max. drive speed: 1600 mm/s
 Delivered in soft case, including 1 battery

Optional accessories

- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)
- No. 914055 Pair of jaws for measuring distance of bores
- No. 914057 Pair of jaws for measuring inside grooves
- No. 914053 Holders (pair) for special measurement jaws up to a measuring range of 600 mm
- No. 914054 Holders (pair) for special measurement jaws for range over 1000 mm

Consumables Spares

- No. 938882 Battery (SR 44)



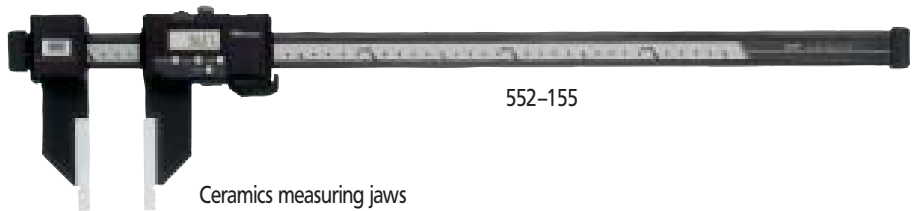
Application: displacement of both sides is possible

DIGIMATIC Workshop Caliper

- The ultra light-weight design (with carbon fiber reinforced material) saves up to 50 % of total weight. Workshop type with large measuring range of up to 600 mm.
- Measuring surfaces made of ceramic, equipped with data output.
- Exchangeable measuring jaws available as optional accessory.
- Large digit display for easy reading.
- Capacitance measuring system with dustwiper on slide.

Series 552

Ultra light-weight composite design with ceramics measuring surfaces

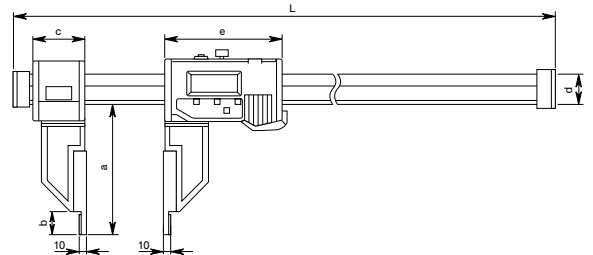


Ceramics measuring jaws

Measuring range mm	No.	Jaw length mm	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-450	552-155	100	0,05	640	100	18	41,2	25	91,8	600
0-600	552-156	100	0,05	790	100	18	41,2	25	91,8	670



Sample application



Functions	Series 552
ON / OFF	●
ZERO	●
PRESET	●
OFFSET	●
DATA / HOLD	●
Data output	●

Specifications

Accuracy: Factory specification
 Resolution: 0,01 mm
 Distance of measuring surfaces for inside measurement: 20 mm
 Max. drive speed: 1600 mm/s
 Delivered in soft case, including 1 battery

Optional accessories

- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)
- No. 914055 Pair of jaws for measuring distance of bores
- No. 914057 Pair of jaws for measuring inside grooves
- No. 914053 Holders (pair) for special measurement jaws up to a measuring range of 600 mm

Consumables Spares

- No. 938882 Battery (SR 44)

Specifications

Accuracy: Factory specification
 Resolution: 0,01 mm
 Distance of measuring surfaces for inside measurement: 20 mm
 Max. drive speed: 1600 mm/s
 Delivered in soft case, including 1 battery

Optional accessories

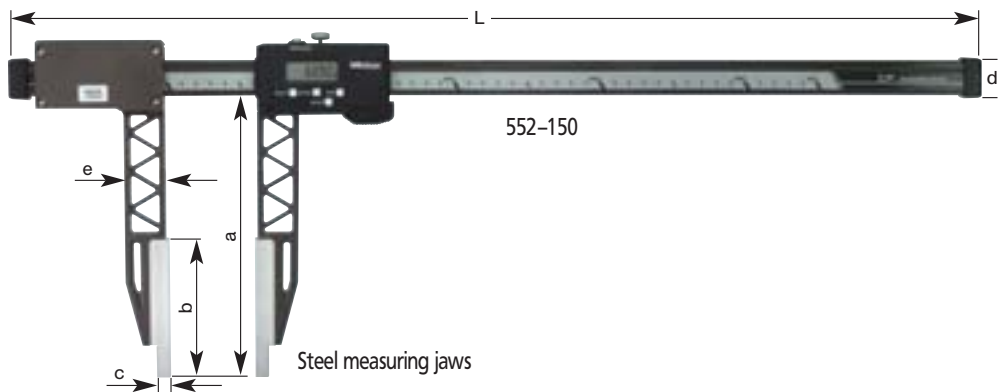
- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)

Consumables Spares

- No. 938882 Battery (SR 44)

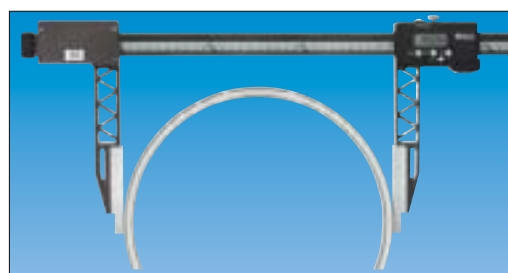
Series 552

Ultra light-weight composite design with extra long jaws



Steel measuring jaws

Measuring range mm	No.	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-450	552-150	0,07	680	200	100	10	25	30	1170
0-600	552-151	0,07	830	200	100	10	25	30	1370



Sample application

DIGIMATIC Workshop Caliper

- The ultra light-weight design (with carbon fiber reinforced material) saves up to 50 % of total weight. Workshop type with large measuring range of up to 600 mm.
- Measuring surfaces made of ceramic, equipped with data output.
- Exchangeable measuring jaws available as optional accessory.
- Large digit display for easy reading.
- Capacitance measuring system with dustwiper on slide.

Series 552

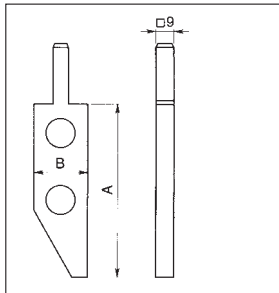
Ultra light-weight composite design with exchangeable measuring tips



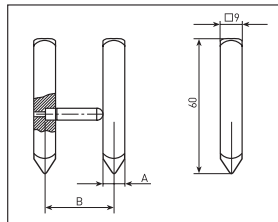
552-181

Measuring range mm	No.	Error limits mm	Mass g
0-450	552-181	0,05	730
0-600	552-182	0,05	770

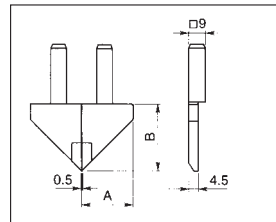
Exchangeable measuring tips



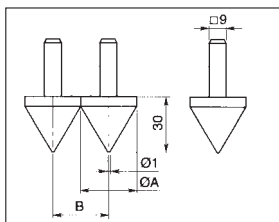
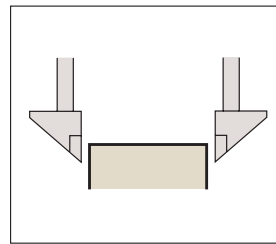
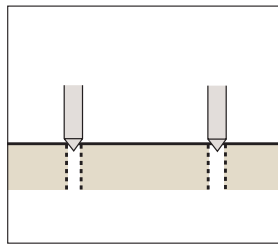
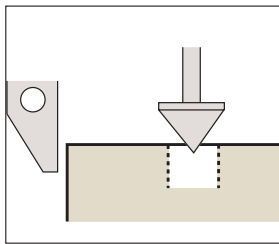
No.	A mm	B mm
07CZA044	90	28



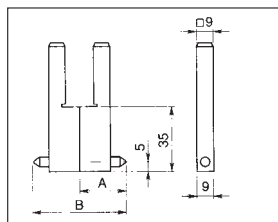
No.	A mm	B mm
07CZA055	8	30



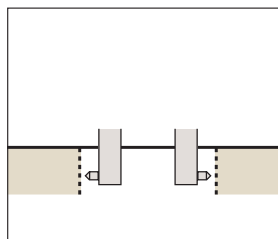
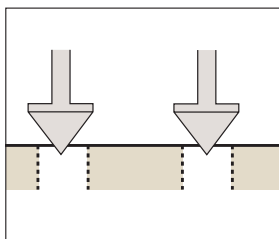
No.	A mm	B mm
07CZA056	28	30



No.	A mm	B mm
07CZA057	30	30



No.	A mm	B mm
07CZA058	25	50



Functions	Series 552
ON / OFF	●
ZERO	●
PRESET	●
OFFSET	●
DATA / HOLD-Taste	●
Data output	●

Specifications

Accuracy: Factory specification
 Resolution: 0,01 mm
 Max. drive speed: 1600 mm/s

Delivered in soft case, including 1 battery

Standard accessory

No. 05GZA033 Clamp holders for measuring tips, U-shaped version, metal (2 pieces)



Optional accessories

- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)
- No. 07CZA044 Insert for flats
- No. 07CZA055 Scribe insert (pair)
- No. 07CZA056 Knife edge (pair)
- No. 07CZA057 Inserts for bore measuring (pair)
- No. 07CZA058 Inserts for inside groove (pair)
- No. 07GZA002 Clamp holders for measuring tips (1 piece)

Consumables Spares

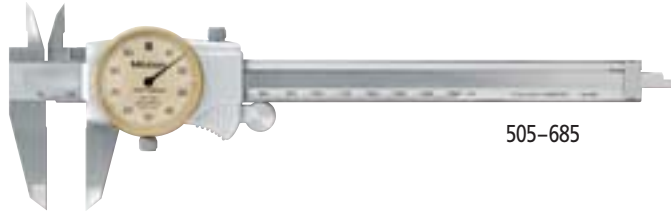
No. 938882 Battery (SR 44)

Functions	Series 505
Drive roller	●
Depth gauge	●
Locking screw	●

Dial Caliper

- Guidance titanium coated. Wear resistant and easy moving (up to measuring range 200 mm).
- High precision.
- Easy to read.
- Measuring scale satin chrome finished.
- All parts made from corrosion-free steel.

Series 505



505-685

Specifications

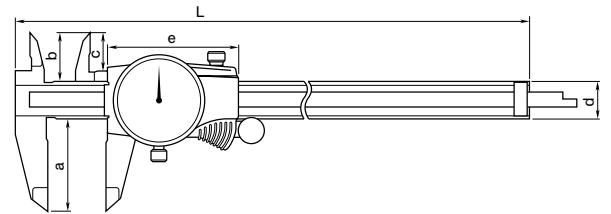
Accuracy: Factory specification
 Delivered in soft case and up to 200 mm with factory certificate

Optional accessories

Extension for depth measurement see page 144

Measuring range mm	No.	Graduation mm	Jaw length mm	Error limits mm	L mm	a mm	b mm	c mm	d mm	e mm	Mass g
0-150	505-685	0,01	40	0,03	231	40	21,0	16,5	16	57,2	176
0-150	505-671	0,02	40	0,03	231	40	21,0	16,5	16	57,2	175
0-150	505-711	0,02	40	0,03	231	40	21,0	16,5	16	57,2	175
0-200	505-686	0,01	50	0,03	288	50	24,5	20,0	16	57,2	186
0-200	505-672	0,02	50	0,03	288	50	24,5	20,0	16	57,2	185
0-300	505-673	0,02	64	0,04	403	64	27,5	22,0	20	70,2	370

No.	1 dial rotation = 1 mm, Easy reading of 0,01 mm increments	Sliding titanium coated	Measuring surfaces for outside measurement carbide-tipped	Measuring surfaces for inside measurement carbide-tipped
505-685	●	●		
505-671		●		
505-711		●	●	●
505-686	●	●		
505-672		●		
505-673				



505-671



505-711



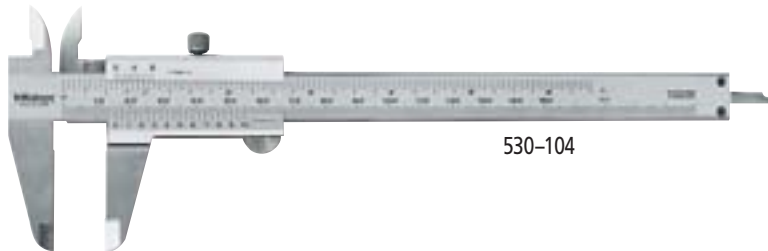
505-673

Caliper

- With depth gauge.
- Caliper and slide made of hardened, corrosion-free steel.
- Measuring surface and nonius satin chrome finished.
- Raised sliding surfaces.

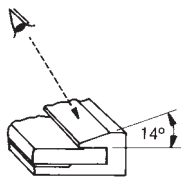
Series 530

with upper locking screw

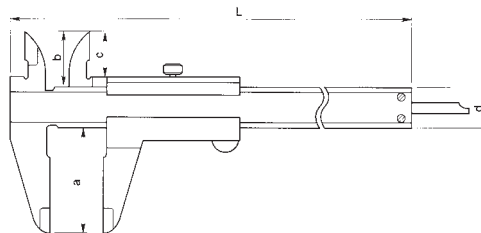


530-104

Measuring range mm	No.	Jaw length mm	Nonius		L mm	a mm	b mm	c mm	d mm	Mass g
			top	bottom						
0-150	530-104	40	1/128"	0,05 mm	231	40	21,0	16,5	16	143
0-200	530-114	50	1/128"	0,05 mm	288	50	24,5	20,0	16	180
0-300	530-115	64	1/128"	0,05 mm	403	64	27,5	22,0	20	355
0-150	530-312	40	1/1000"	0,02 mm	231	40	21,0	16,5	16	143
0-200	530-118	50	1/1000"	0,02 mm	288	50	24,5	20,0	16	180
0-300	530-119	64	1/1000"	0,02 mm	403	64	27,5	22,0	20	355
0-150	530-102	40	-	0,05 mm	231	40	21,0	16,5	16	144

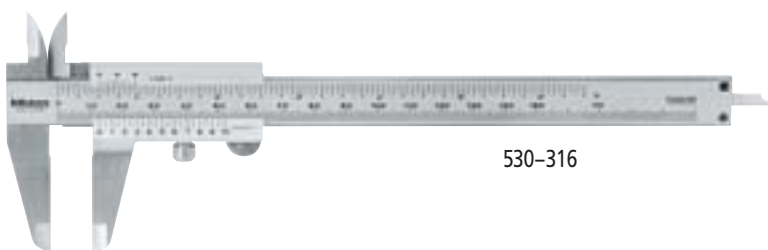


Easy reading due to nonius scale inclined by 14 degrees



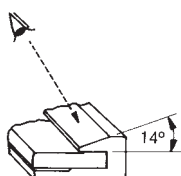
Series 530

with lower locking screw

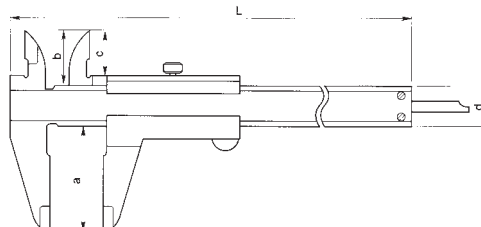


530-316

Measuring range mm	No.	Jaw length mm	Nonius		L mm	a mm	b mm	c mm	d mm	Mass g
			top	bottom						
0-150	530-316	40	1/128"	0,05 mm	231	40	21	16,5	16	145
0-150	530-319	40	-	0,05 mm	231	40	21	16,5	16	145



Easy reading due to nonius scale inclined by 14 degrees



Functions

Depth gauge

Series 530

Specifications

Accuracy: DIN 862

Delivered in soft case

Optional accessories

Extension for depth measurement see page 144

530-102
with round depth gauge Ø 1,9 mm



Specifications

Accuracy: DIN 862

Delivered in soft case

Optional accessories

Extension for depth measurement see page 144

Metr. ISO-Gew			
Nenn- est. extr. φ mm	Stig. Passo Pas mm	Kern- fend. nucleo φ mm	Bohr- trag- meche broca φ mm
3	0,5	2,46	2,9
4	0,7	3,24	3,8
5	0,8	4,13	4,2
6	1	4,92	5
8	1,25	6,65	6,8
10	1,5	8,38	8,5
12	1,75	10,11	10,2
16	2	13,84	14
20	2,5	17,57	17,5
Whitworth			
φ in	Gg/in	φ mm	φ mm
1/4	20	4,72	5,0
5/16	18	6,35	6,4
3/8	16	7,43	7,7
1/2	12	9,99	10,25
5/8	11	12,92	13,25
3/4	10	15,8	16,25
7/8	9	18,61	19
1	8	21,34	21,75
		101995	

With Thread table
No. 101995 D
on the back side,
530-316 only

Functions	Series 531	Series 532
Depth gauge	●	●

Caliper

- With depth gauge.
- Caliper and slide made of hardened, corrosion-free steel.
- Measuring surface and nonius satin chrome finished.
- Raised sliding surfaces.

Specifications

Accuracy: DIN 862
Delivered in soft case

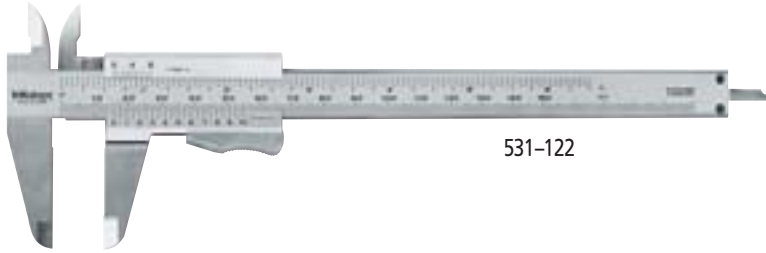
Optional accessories

Extension for depth measurement see page 144

Metr. ISO-Gew			
Nenn- est. ext. φ mm	Stg. Passo Pas mm	Kern- fond int. nucleo φ mm	Bohr- trap meche broca φ mm
3	0,5	2,46	2,5
4	0,7	3,24	3,3
5	0,8	4,13	4,2
6	1	4,92	5
8	1,25	6,65	6,8
10	1,5	8,38	8,5
12	1,75	10,11	10,2
16	2	13,54	14
20	2,5	17,99	17,5
Whitworth			
φ in	G9/in	φ mm	φ mm
5/16	18	6,19	6,4
3/8	16	7,49	7,7
1/2	12	9,99	10,25
5/8	11	12,92	13,25
3/4	10	15,8	16,25
7/8	9	18,61	19
1	8	21,34	21,75
		101935	

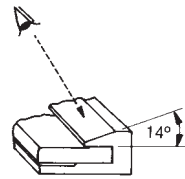
With Thread table
No. 101995 D
on the back side,
531-122 only

Series 531 with moment adjustment

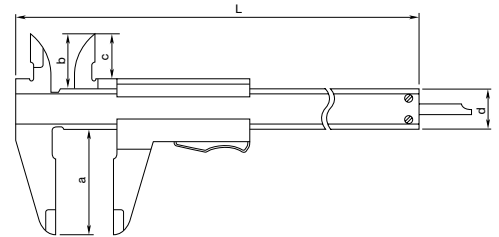


531-122

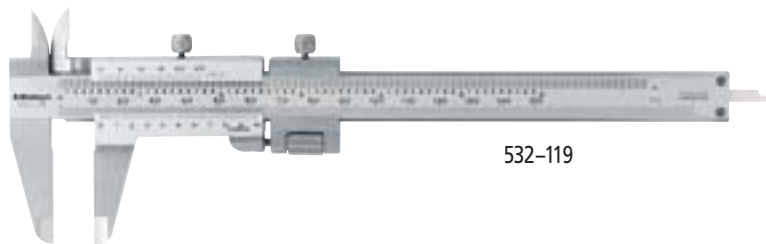
Measuring range mm	No.	Jaw length mm	Nonius		L mm	a mm	b mm	c mm	d mm	Mass g
			top	bottom						
0-150	531-122	40	1/128"	0,05 mm	231	40	21,0	16,5	16	142
0-200	531-108	50	1/128"	0,05 mm	288	50	24,5	20,0	16	175
0-300	531-109	64	1/128"	0,05 mm	403	64	27,5	22,0	20	350



Easy reading due to nonius
scale inclined by 14 degrees

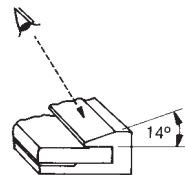


Series 532 with fine adjustment

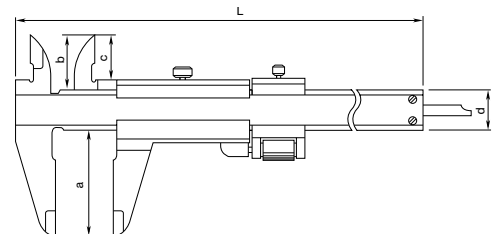


532-119

Measuring range mm	No.	Jaw length mm	Nonius		L mm	a mm	b mm	c mm	d mm	Mass g
			top	bottom						
0-130	532-119	40	1/1000"	0,02 mm	231	40	21,0	16,5	16	165
0-180	532-120	50	1/1000"	0,02 mm	288	50	24,5	20,0	16	202
0-280	532-121	64	1/1000"	0,02 mm	403	64	27,5	22,0	20	395



Easy reading due to nonius
scale inclined by 14 degrees

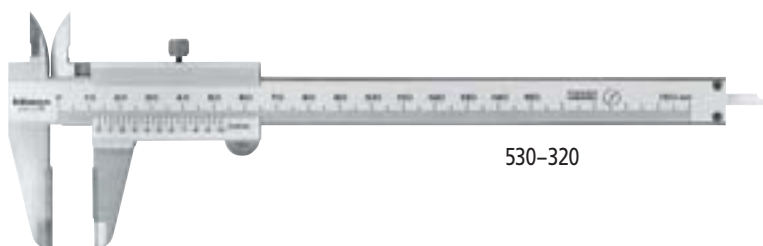


Caliper

- With depth gauge.
- Caliper and slide made of hardened, corrosion-free steel.
- Measuring surface and nonius satin chrome finished.
- Raised sliding surfaces.

Series 530

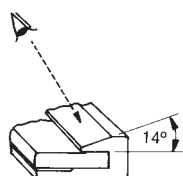
Caliper with carbide-tipped measuring surfaces



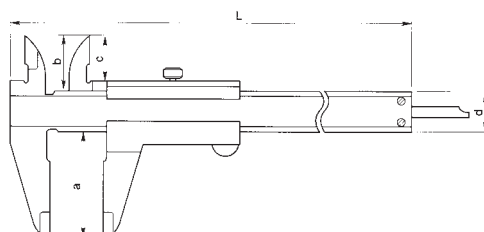
530-320

Measuring range mm	No.	Jaw length mm	Nonius	L mm	a mm	b mm	c mm	d mm	Mass g
0-150	530-320	40	0,05 mm	231	40	21,0	16,5	16,0	145
0-200	530-321	50	0,05 mm	288	50	24,5	20,0	16,0	181
0-300	530-322	64	0,05 mm	403	64	27,5	22,0	20,0	355
0-150	530-335	40	0,05 mm	231	40	21,0	16,5	16,0	145

No.	Measuring surfaces for outside measurement carbide-tipped	Measuring surfaces for inside measurement carbide-tipped
530-320	●	
530-321	●	
530-322	●	
530-335	●	●

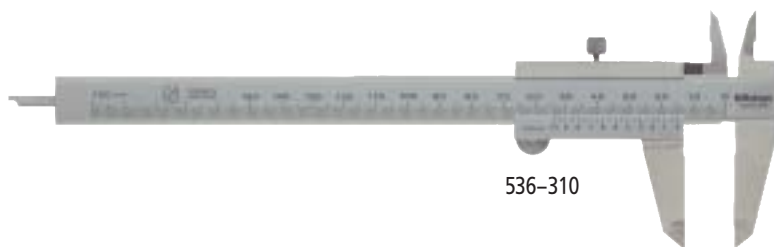


Easy reading due to nonius scale inclined by 14 degrees



Series 536

Lefthander Caliper with depth gauge



536-310

Measuring range mm	No.	Jaw length mm	Error limits mm	Nonius mm	Mass g
0-150	536-310	40	0,05	0,05	150

Functions	Series 530	Series 536
Depth gauge	●	●

Specifications

Accuracy: DIN 862

Delivered in soft case

Optional accessories

Extension for depth measurement see page 144

Specifications

Nonius value: 0,05 mm

Delivered in soft case

Characteristics:

- The rounded vernier allows for parallax free reading
- Slide and caliper made of hardened, corrosionfree steel
- Scale and nonius with satin chrome finish
- Lapped measuring surfaces
- Upper locking screw

Functions
Depth gauge

Series 560

Calipers

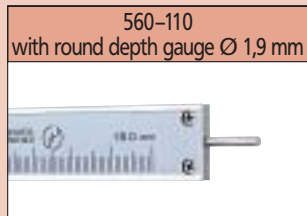
- With depth gauge.
- Caliper and slide made of hardened, corrosion-free steel.
- Measuring surface and nonius satin chrome finished.
- Raised sliding surfaces.

Specifications

Accuracy: DIN 862
Delivered in soft case

Optional accessories

Extension for depth measurement see page 144



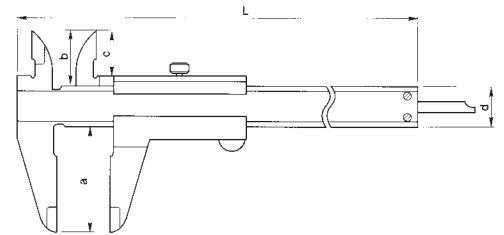
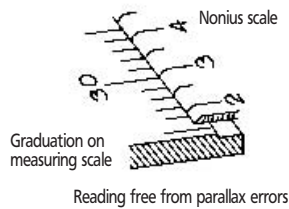
Series 560

with upper locking screw
reading free from parallax



560-101

Measuring range mm	No.	Jaw length mm	Nonius		L mm	a mm	b mm	c mm	d mm	Mass g
			top	bottom						
0-100	560-110	40	-	0,05 mm	180	40	21,0	16,5	16	133
0-150	560-101	40	-	0,05 mm	231	40	21,0	16,5	16	152
0-150	560-122	40	-	0,02 mm	231	40	21,0	16,5	16	150
0-150	560-312	40	1/1000"	0,02 mm	231	40	21,0	16,5	16	150
0-200	560-108	50	-	0,05 mm	288	50	24,5	20,0	16	190
0-200	560-118	50	1/1000"	0,02 mm	288	50	24,5	20,0	16	190
0-300	560-109	64	-	0,05 mm	403	64	27,5	22,0	20	374
0-300	560-119	64	1/1000"	0,02 mm	403	64	27,5	22,0	20	374



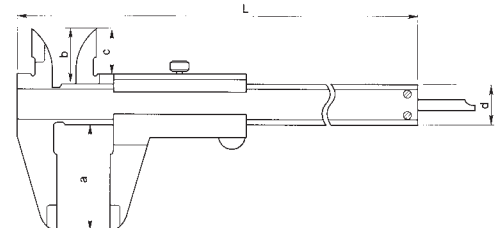
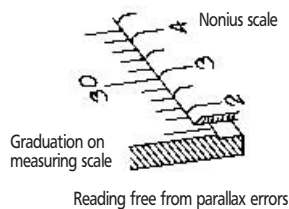
Series 560

with upper locking screw
reading free from parallax



560-104

Measuring range mm	No.	Jaw length mm	Nonius		L mm	a mm	b mm	c mm	d mm	Mass g
			top	bottom						
0-150	560-104	40	1/128"	0,05 mm	231	40	21	16,5	16	150



"DIAMOND" Caliper

- With double prism guide, line scale and nonius are on one level so that reading is free from parallax.
- Caliper and slide made of hardened, corrosion-free steel.
- Measuring scale and nonius satin chrome finished.

Series 522

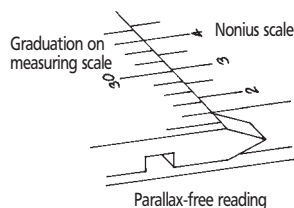
Parallax-free, nonius 0,05 mm



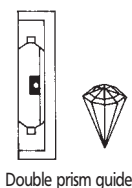
522-601

Measuring range mm	No.	Jaw length mm	Nonius		a mm	b mm	c mm	d mm	e mm	f mm	g mm	h mm	Mass g
			top	bottom									
0-150	522-600	40	-	0,05 mm	229	77,5	17	40,5	53,5	30	15	21	145
0-150	522-601*	40	1/128"	0,05 mm	229	77,5	17	40,5	53,5	30	15	21	145

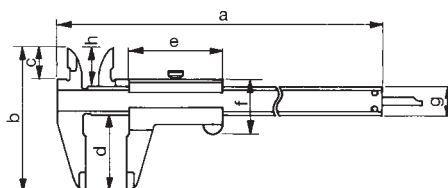
* with thread table No. 101995 D



Parallax-free reading

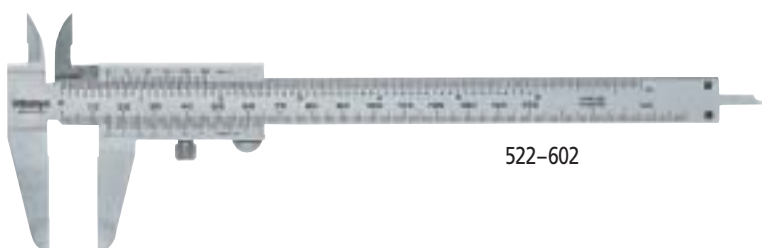


Double prism guide



Series 522

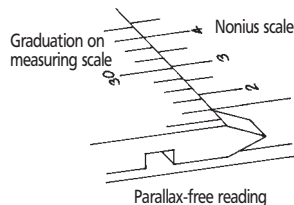
Parallax-free, nonius 0,02 mm



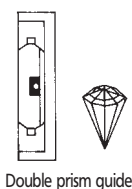
522-602

Measuring range mm	No.	Jaw length mm	Nonius		a mm	b mm	c mm	d mm	e mm	f mm	g mm	h mm	Mass g
			top	bottom									
0-150	522-602*	40	1/1000"	0,02 mm	229	77,5	17	40,5	53,5	30	15	21	145
0-150	522-606	40	-	0,02 mm	229	77,5	17	40,5	53,5	30	15	21	145

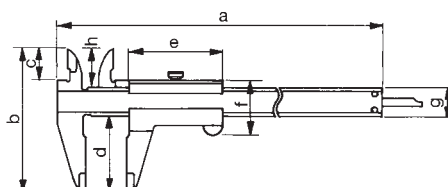
* with thread table No. 101995 D



Parallax-free reading



Double prism guide



Functions

Depth gauge

Series 522

Specifications

Accuracy: DIN 862

Delivered in soft case

Optional accessories

Extension for depth measurement see page 144

Metr. ISO-Gew			
Nenn- est. extr. φ mm	Stg. Paso mm	Kern- fond. núcleo φ mm	Bohr- trap. mecha broca φ mm
3	0,5	2,46	2,5
4	0,7	3,24	3,3
5	0,8	4,13	4,2
6	1	4,92	5
8	1,25	6,65	6,8
10	1,5	8,38	8,5
12	1,75	10,11	10,2
16	2	13,84	14
20	2,5	17,29	17,5
Whitworth			
φ in	Gg/in	φ mm	φ mm
1/4	20	4,72	5,0
5/16	18	6,13	6,4
3/8	16	7,43	7,7
1/2	12	9,99	10,25
5/8	11	12,62	13,25
3/4	10	15,3	16,25
7/8	9	18,11	19
1	8	21,34	21,75
		101995	

With Thread table
No. 101995 D
on the back side,
522-601 only

Specifications

Accuracy: DIN 862

Delivered in soft case

Optional accessories

Extension for depth measurement see page 144

Metr. ISO-Gew			
Nenn- est. extr. φ mm	Stg. Paso mm	Kern- fond. núcleo φ mm	Bohr- trap. mecha broca φ mm
3	0,5	2,46	2,5
4	0,7	3,24	3,3
5	0,8	4,13	4,2
6	1	4,92	5
8	1,25	6,65	6,8
10	1,5	8,38	8,5
12	1,75	10,11	10,2
16	2	13,84	14
20	2,5	17,29	17,5
Whitworth			
φ in	Gg/in	φ mm	φ mm
1/4	20	4,72	5,0
5/16	18	6,13	6,4
3/8	16	7,43	7,7
1/2	12	9,99	10,25
5/8	11	12,62	13,25
3/4	10	15,3	16,25
7/8	9	18,11	19
1	8	21,34	21,75
		101995	

With Thread table
No. 101995 D
on the back side,
522-601 only

Workshop Caliper

- With top offset nonius for direct reading during inside measurement without addition of the jaw blade thickness.
- Measuring surface and nonius satin chrome finished.
- Caliper and slide made of hardened, corrosion-free steel.
- Raised sliding surfaces.
- With rounded measuring surfaces for measuring inside dimensions.

Series 160

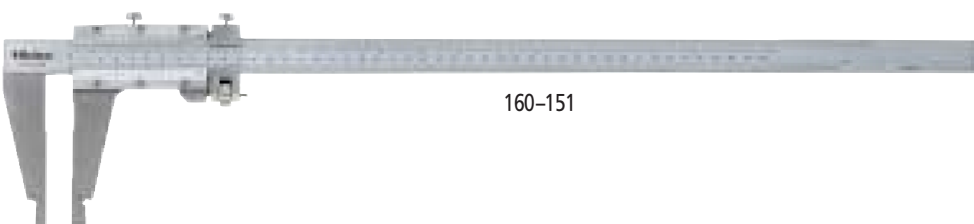
Specifications

Accuracy: Factory specification

Delivered in soft case



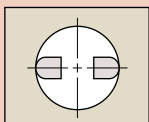
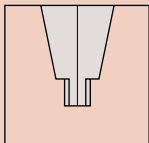
160-170



160-151

Measuring range mm	No.	Nonius	Error limits mm	L mm	a mm	b mm	d mm	Inside measuring from mm	Mass g
without fine adjustment									
0- 200	160-170*	0,02 mm	0,03	288	60	8	16	10	200
0- 300	160-180*	0,02 mm	0,04	445	75	12	20	10	350
with fine adjustment									
0- 300	160-127*	0,02 mm	0,04	445	75	12	20	10	450
0- 450	160-128	0,02 mm	0,05	632	100	18	25	20	1200
0- 600	160-101	0,02 mm	0,05	780	100	18	25	20	1400
0-1000	160-104	0,02 mm	0,07	1240	140	24	32	20	3500
0-1500	160-110	0,02 mm	0,09	1800	180	30	32	20	4850
0-2000	160-113	0,02 mm	0,12	2300	180	30	40	20	10200
with fine adjustment									
0- 300	160-150*	1/1000" x 0,02 mm	0,04	445	75	12	20	10	450
0- 450	160-151	1/1000" x 0,02 mm	0,05	632	100	18	25	20	1200
0- 600	160-153	1/1000" x 0,02 mm	0,05	780	100	18	25	20	1400
0-1000	160-155	1/1000" x 0,02 mm	0,07	1240	140	24	32	20	3500
0-1500	160-157	1/1000" x 0,02 mm	0,09	1800	180	30	32	20	4850
0-2000	160-159	1/1000" x 0,02 mm	0,12	2300	180	30	40	20	10200

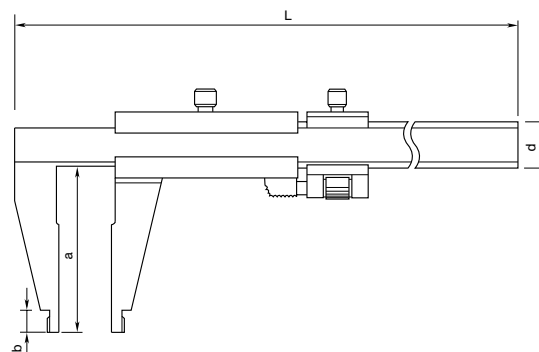
* up to 300 mm parallax-free design



Rounded measuring surfaces for measuring inside dimensions



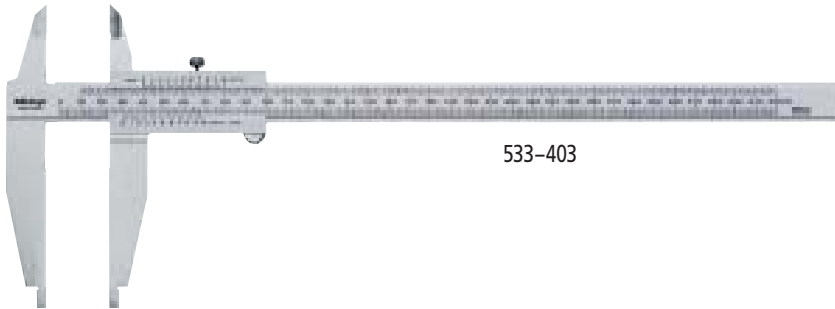
Sample application



Workshop Caliper

- With top offset nonius for direct reading during inside measurement without addition of the jaw blade thickness.
- Caliper and slide made of hardened, corrosion-free steel.
- Measuring surface and nonius satin chrome finished.
- With rounded measuring surfaces for measuring inside dimensions.
- With knife-shaped measuring surfaces for outside measurement.

Series 533



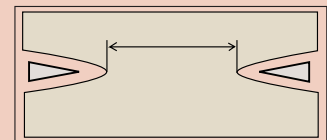
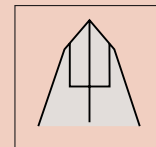
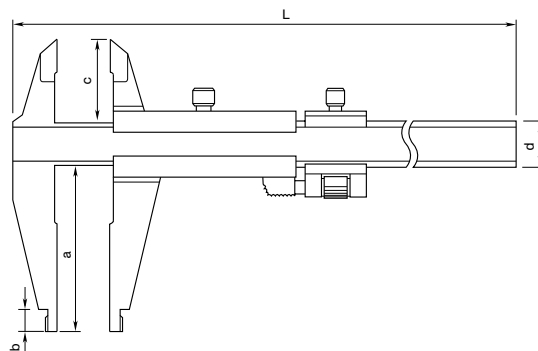
533-403

Measuring range mm	No.	Nonius	Error limits mm	L mm	a mm	b mm	c mm	d mm	Inside measuring from mm	Mass g
0- 200	533-401*	0,05	0,05	294	60	8	30	16	10	220
0- 300	533-403*	0,05	0,08	410	90	10	40	20	10	370
0- 500	533-404	0,05	0,10	680	150	15	56	25	20	1200
0- 750	533-405	0,05	0,12	963	150	15	56	25	20	1500
0-1000	533-406	0,05	0,15	1230	150	20	56	32	20	3300
with fine adjustment										
0- 280	533-503*	0,02	0,04	410	90	10	40	20	10	405
0- 500	533-504	0,02	0,06	680	150	15	56	25	20	1250
0- 750	533-505	0,02	0,07	963	150	15	56	25	20	1550
0-1000	533-506	0,02	0,08	1230	150	20	56	32	20	3450

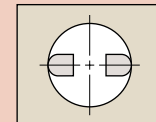
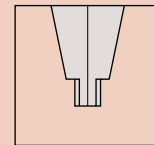
* up to 300 mm parallax-free design



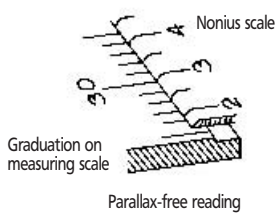
Sample application



Knife-shaped measuring surfaces for outside measurement



Rounded measuring surfaces for measuring inside dimensions



Functions
Fine adjustment

Series 534

Workshop Caliper

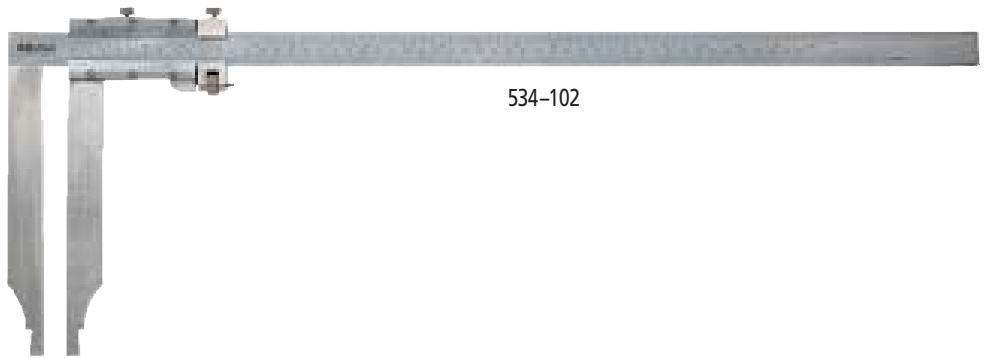
- Measuring surface and nonius satin chrome finished.
- Caliper and slide made of hardened, corrosion-free steel.
- Raised sliding surfaces.

Specifications

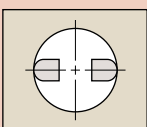
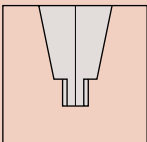
Accuracy: Factory specification
Delivered in soft case

Series 534

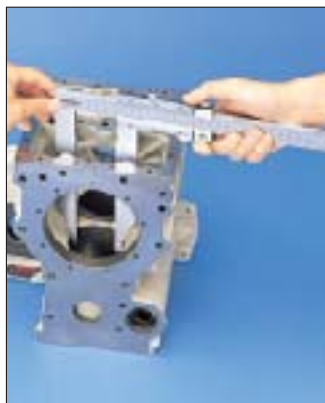
with extra long measuring jaw
with fine adjustment



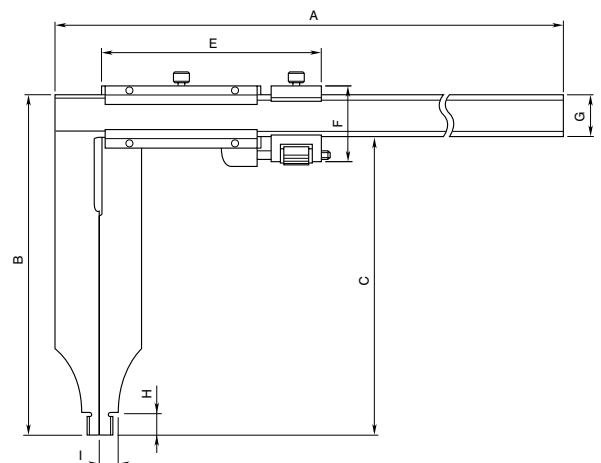
Measuring range	No.	Nonius	Error limits	Jaw length	Inside measuring from	A	B	C	E	F	G	H	I	Mass
mm			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	g
with fine adjustment														
0- 300	534-101	1/128" x 0,05 mm	0,07	90	10	445	110	90	103	38,0	20	12,0	7	460
0- 500	534-102	1/128" x 0,05 mm	0,13	200	20	682	225	200	112	51,0	25	18,5	12	1500
0- 750	534-103	1/128" x 0,05 mm	0,16	200	20	995	232	200	150	62,5	32	18,5	12	3100
0-1000	534-104	1/128" x 0,05 mm	0,20	200	20	1230	232	200	150	62,5	32	18,5	12	3700
0- 300	534-113	0,02 mm	0,04	90	10	445	110	90	103	38,0	20	12,0	7	460
0- 500	534-114	0,02 mm	0,06	200	20	682	225	200	112	51,0	25	18,5	12	1500
0- 750	534-115	0,02 mm	0,08	200	20	995	232	200	150	62,5	32	18,5	12	3100
0-1000	534-116	0,02 mm	0,10	200	20	1230	232	200	150	62,5	32	18,5	12	3700
0- 300	534-105	1/100" x 0,02 mm	0,04	90	10	445	110	90	103	38,0	20	12,0	7	460
0- 500	534-106	1/100" x 0,02 mm	0,06	200	20	682	225	200	112	51,0	25	18,5	12	1500
0- 750	534-107	1/100" x 0,02 mm	0,08	200	20	995	232	200	150	62,5	32	18,5	12	3100
0-1000	534-108	1/100" x 0,02 mm	0,10	200	20	1230	232	200	150	62,5	32	18,5	12	3700



Rounded measuring surfaces
for measuring inside dimensions



Sample application



Test Set for Calipers

- Calibration set for testing error limits of calipers according to DIN 862 or VDI/VDE/DGQ 2618.
- Consisting of 3 gauge blocks (tolerance grade 1) and two setting rings of steel or ceramics.
- Incl. factory certificate.

Series 516

Delivered in soft case



516-124-10



516-150-10

No.	Dimensions mm	Material
516-124-10	30 mm, 41,3 mm and 131,4 mm setting rings Ø 4 mm and 25 mm including glove	Steel
516-150-10	30 mm, 41,3 mm and 131,4 mm setting rings Ø 4 mm and 25 mm including glove	Ceramics

Additional equipment for testing calipers
see page 312

Contents:

516-124-10 (Material: steel)

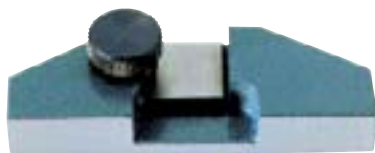
- No. 611673-031 Gauge block 30 mm
- No. 611857-031 Gauge block 41,3 mm
- No. 611858-031 Gauge block 131,4 mm
- No. 177-204 Setting ring Ø 4 mm
- No. 177-139 Setting ring Ø 25 mm
- No. 600009 Glove

516-150-10 (Material: ceramics)

- No. 613673-031 Gauge block 30 mm
- No. 613857-031 Gauge block 41,3 mm
- No. 613858-031 Gauge block 131,4 mm
- No. 177-418 Setting ring Ø 4 mm
- No. 177-430 Setting ring Ø 25 mm
- No. 600009 Glove

Extensions for Depth Measurement for Calipers

- To fit all DIGIMATIC caliper gauges, dial caliper gauges and analogue caliper gauges with depth gauge and measuring range 150, 200, 300 mm.



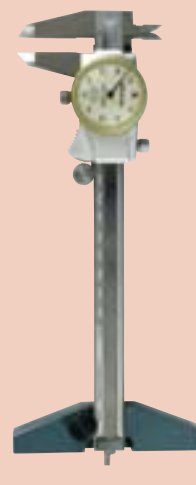
050083



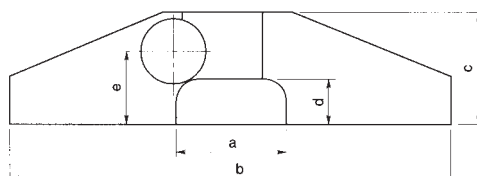
050084



050084



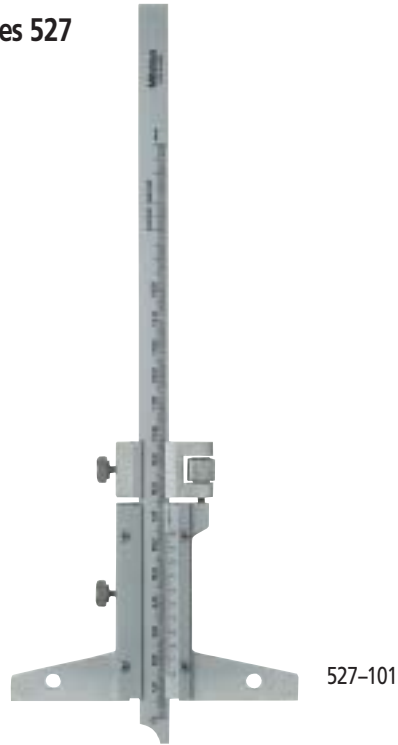
No.	Dimensions of supporting surface mm	a mm	b mm	c mm	d mm	e mm
050083	75 x 12 (for measuring range 100 mm, 150 mm and 200 mm)	25	75	24,5	9,0	16
050084	100 x 12 (for measuring range 100 mm, 150 mm and 200 mm)	25	100	24,5	9,0	16
050085	125 x 14 (for measuring range 300 mm)	30	125	28,5	11,5	20



Depth Gauges

- To measure the depth of bores, recesses and steps.
- The measuring surfaces and guideways are hardened and micro-lap finished.
- Stainless.

Series 527



527-101

Specifications

Accuracy: Factory specification

Optional accessories

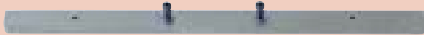
Interchangeable bases*



No. 900370 base length 180 mm



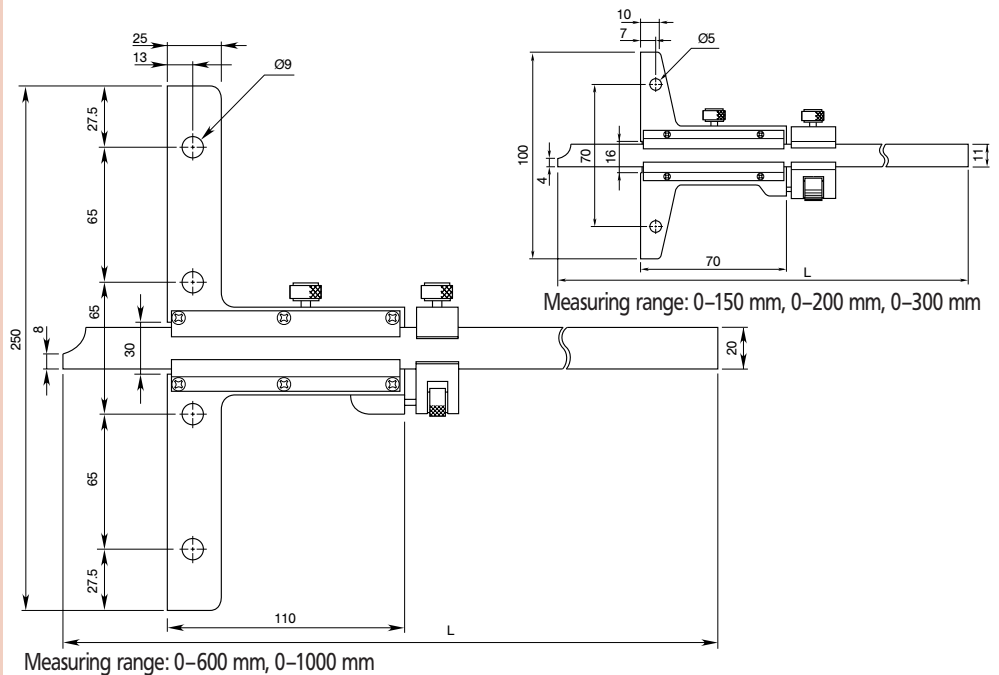
No. 900371 base length 260 mm



No. 900372 base length 320 mm

* (not for measuring range 0-600, 0-1000 mm)

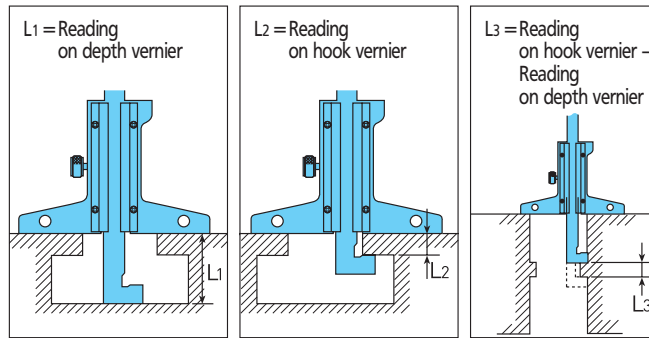
Measuring range mm	No.	Nonius value mm	Error limits mm	L mm
with fine adjustment				
0- 150	527-101	0,02	0,03	260
0- 200	527-102	0,02	0,03	310
0- 300	527-103	0,02	0,04	410
0- 600	527-104	0,02	0,05	800
0-1000	527-105	0,02	0,07	1200
without fine adjustment				
0- 150	527-201	0,05	0,05	260
0- 200	527-202	0,05	0,05	310
0- 300	527-203	0,05	0,08	410
0- 600	527-204	0,05	0,10	800
0-1000	527-205	0,05	0,15	1200



Depth Gauges

- To measure the depth of bores, recesses and steps.
- The measuring surfaces and guideways are hardened and micro-lap finished.
- Stainless.

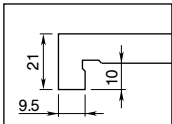
Series 527 with hooks



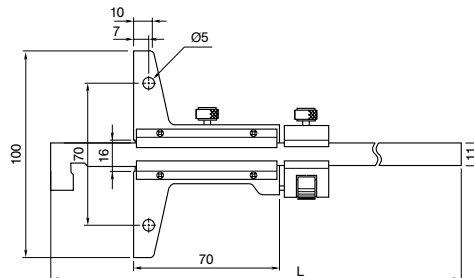
Reading on hook vernier and depth vernier

527-401

Measuring range mm	No.	Nonius value mm	Error limits mm	L mm
with fine adjustment				
0-150	527-411	0,02	0,03	260
0-200	527-412	0,02	0,03	310
0-300	527-413	0,02	0,04	410
without fine adjustment				
0-150	527-401	0,05	0,05	260
0-200	527-402	0,05	0,05	310
0-300	527-403	0,05	0,08	410



Hook detail



Measuring range: 0-150 mm, 0-200 mm, 0-300 mm

Specifications

Accuracy: Factory specification

Optional accessories

Interchangeable bases



No. 900370 base length 180 mm



No. 900371 base length 260 mm



No. 900372 base length 320 mm

Depth Gauges

- To measure the depth of bores, recesses and steps.
- The measuring surfaces and guideways are hardened and micro-lap finished.
- Stainless.

Series 527 with dial gauge

Specifications

Accuracy: Factory specification

Optional accessories

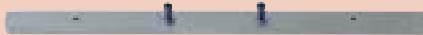
Interchangeable bases



No. 900370 base length 180 mm



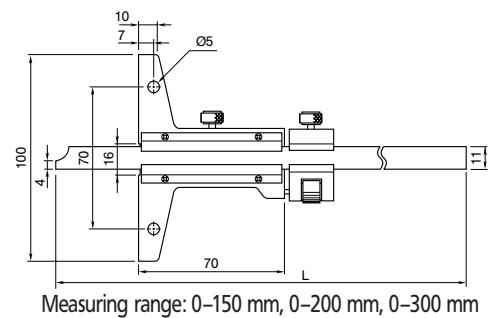
No. 900371 base length 260 mm



No. 900372 base length 320 mm



Measuring range mm	No.	Nonius value mm	Error limits mm	L mm
with fine adjustment				
0- 150	527-301-50	0,05	0,05	260
0- 200	527-302-50	0,05	0,05	310
0- 300	527-303-50	0,05	0,08	410



ABSOLUTE DIGIMATIC Depth Gauges

- Electronic caliper with built-in absolute scale.
- One-time setting of origin that remains as the absolute zero position until the battery has to be changed.
- Extraordinary precision even with high speed movement.
Large display digits are easy to read.
- Optimum caliper sliding properties.

ABSOLUTE™

Absolute System Patented by MITUTOYO

IP67

Series 571
with data output



571-201-10

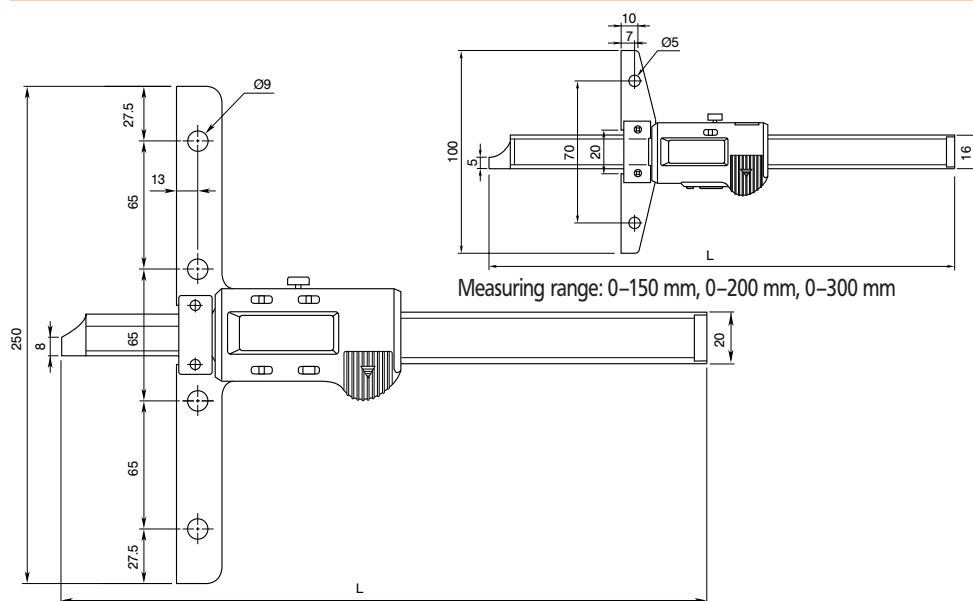


571-251

Measuring range mm	No.	Error limits mm	L mm	Mass g
0- 150	571-201-10	0,03	237	200
0- 200	571-202-10	0,03	287	220
0- 300	571-203-10	0,04	403	260
0- 450	571-204-10	0,05	635	1270
0- 600	571-205-10	0,05	785	1400
0- 750	571-206-10	0,06	935	1530
0-1000	571-207-10	0,07	1200	1760

IP-67

0- 150	571-251	0,03	237	365
0- 200	571-252	0,03	287	408



Measuring range: 0-450 mm, 0-600 mm, 0-750 mm, 0-1000 mm

™ Patent numbers see page 464

Functions	Series 571
ON / OFF	●
ZERO setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification

Resolution: 0,01 mm

5 digit LCD display

Optional accessories

No. 959149 Signal cable with data switch (1 m)

No. 959150 Signal cable with data switch (2 m)

No. 05CZA624 Signal cable (1 m)
for IP-67 type

No. 05CZA625 Signal cable (2 m)
for IP-67 type

Interchangeable bases*



No. 900370 base length 180 mm



No. 900371 base length 260 mm



No. 900372 base length 320 mm

* (not for measuring range 0-450, 0-600, 0-750, 0-1000 mm)

Consumables Spares

No. 938882 Battery SR-44

Functions
Fine adjustment

Series 506

Vernier Height Gauges

- Accurate and fast reading from scale and vernier with satin chrome finish.
- Hardened and precision ground scale.
- Cranked, carbide-tipped scribe.

Specifications

Accuracy: Factory specification
Nonius value: 0,02 mm
Delivered including scriber
and scriber holder

Scriber and Scriber holder see page 157

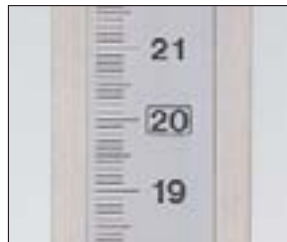
Series 506

Light version
with fine adjustment



506-207

Measuring range mm	No.	Error limits mm	Mass kg
0-200	506-207	0,03	1,4



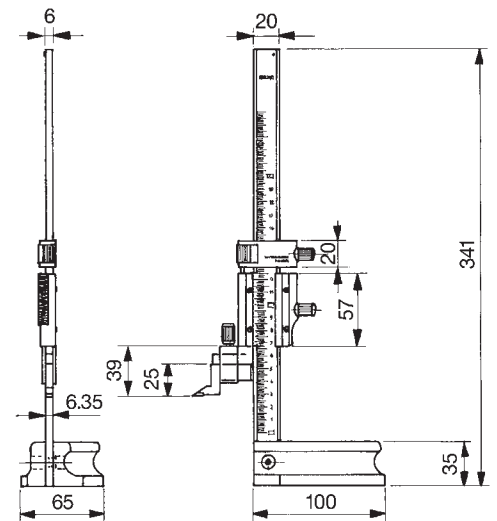
Large digit



Fine adjustment



Scribing position



Vernier Height Gauges

- Accurate and fast reading from scale and vernier with satin chrome finish.
- Hardened and precision ground scale.
- Cranked, carbide-tipped scribe.

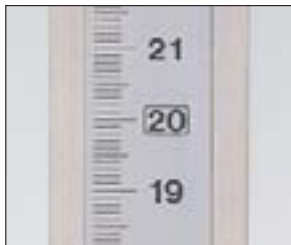
Series 514



with fine adjustment
Scale adjustment

514-102

Measuring range	No.	Error limits	Scale adjustment	A	B	C	D	H	h	Mass
mm		mm	mm	mm	mm	mm	mm	mm	mm	kg
0- 300	514-102	0,04	15	32	20	70	28	525	45	3,1
0- 600	514-106	0,05	15	32	24	85	35	870	54	7,4
0-1000	514-108	0,07	25	42	30	110	45	1340	65	20,0



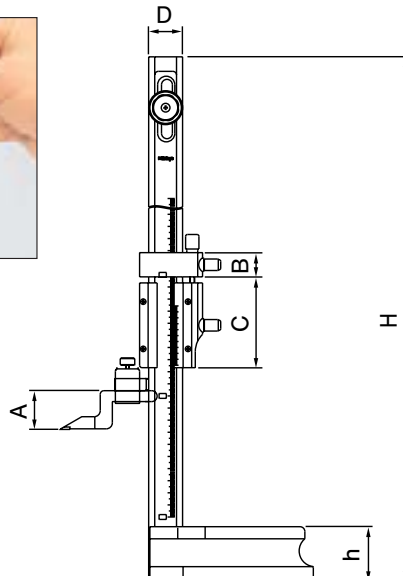
Large digit



Fine adjustment



Ergonomic grip



Functions

Fine adjustment

Series 514

Specifications

Accuracy: Factory specification
Nonius value: 0,02 mm

Delivered including scriber
and scriber holder

Optional accessories:

No. 07GZA003 Magnifier reading glass
for 514-102, 514-106

No. 07GZA015 Magnifier reading glass
for 514-108

Scriber and Scriber holder see page 157

ABSOLUTE DIGIMATIC-HDS Height Gauges

Functions	Series 570	
	570-227	570-230
ORIGIN (ABS zero point setting)	●	●
PRESET	●	●
ABS (absolute measurement)	●	●
Inc (incremental)	●	●
Measuring function	●	●
HOLD	●	●
Reversal of counting direction	●	●
Alarm when battery power is low	●	●
Data output	●	●

Specifications

Accuracy: Factory specification
Delivered including 1 battery, scriber
and scriber holder

Optional accessories

No. 905338 Signal cable (1 m)
No. 905409 Signal cable (2 m)

Optional accessories for 570-230

No. 900321 Clamping device (with dovetail
guidance and holder dia. 8 and 4 mm)
No. 953638 Holder (9 x 9 mm) for securing dial
indicators or probe gauges to the
height gauge and scriber devices,
length: 50 mm



Clamping device
(with dovetail guidance)



Holder

Consumables Spares

No. 938882 Battery SR-44

Scriber and Scriber holder see page 157

Series 570



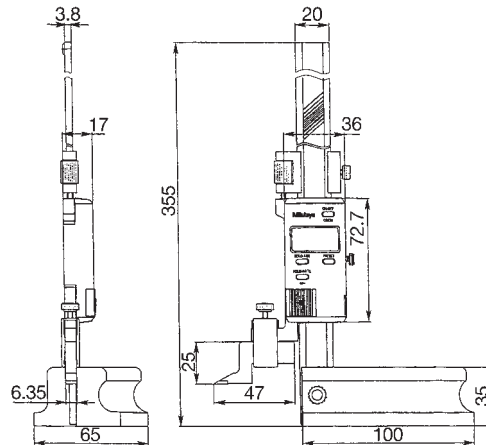
570-227

ABSOLUTE™
Absolute System Patented by MITUTOYO

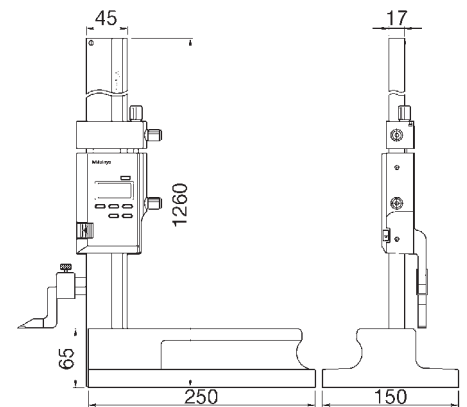


Measurement with dial test indicator

Measuring range mm	No.	Resolution mm	Error limits mm	Mass kg
0- 200	570-227	0,01	0,04	1,3
0-1000	570-230	0,01	0,08	16,8



570-227



570-230

™ Patent numbers see page 464

ABSOLUTE DIGIMATIC-HDS Height Gauges

Series 570



570-302

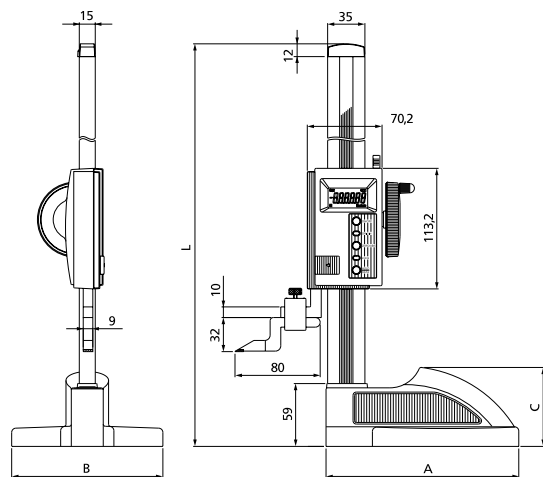


Measurement with dial test indicator

ABSOLUTE™

Absolute System Patented by MITUTOYO

Measuring range mm	No.	Resolution mm	Error limits mm	L mm	A mm	B mm	C mm	Mass kg
0- 300	570-302	0,01	0,04	507	160	122	72,6	4,6
0- 600	570-304	0,01	0,06	812	181	142	74,1	6,4



570-302 / 570-304

™ Patent numbers see page 464

Functions	Series 570	
	570-302	570-304
ORIGIN (ABS zero point setting)	●	●
ABS (absolute measurement)	●	●
Inc (incremental) Measuring function	●	●
HOLD	●	●
Alarm when battery power is low	●	●
Data output	●	●

Specifications

Accuracy: Factory specification
Delivered including 1 battery, scriber
and scriber holder

Optional accessories

- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)
- No. 900321 Clamping device (with dovetail guidance and holder dia. 8 and 4 mm)
- No. 953638 Holder (9 x 9 mm) for securing dial indicators or probe gauges to the height gauge and scriber devices, length: 50 mm



Clamping device
(with dovetail guidance)



Holder

Consumables Spares

No. 938882 Battery SR-44

Scriber and Scriber holder see page 157

Caliper adjustment wheel

The hand wheel enables precise movement of the caliper over the measuring range.



Large clamping lever

This lever ensures secure fixing of the caliper.



Large display

- Character height: 10 x 3,8 mm
- Also easily legible in darkened rooms



Illustrated to original scale

Digit Height Gauges

- Most simple and accurate reading.
- Zero point setting is possible in any position.
- Carbide-tipped scribe.
- The digit height gauge with double counter and dial gauge allows for fast and accurate measurements.
- One of the counters works in the plus direction, the other in the minus direction, so that the desired position can be reached by either upward or downward movement. Millimeters are read off the counters, tenths and hundredths off the dial gauge.

Series 192

with double counter and dial gauge

Specifications

Accuracy: Factory specification

Delivered including scriber, scriber holder, and cover

Optional accessories

No. 900321 Clamping device (with dovetail guidance and holder dia. 8 and 4 mm)

No. 953638 Holder (9 x 9 mm) for securing dial indicators or probe gauges to the height gauge and scriber devices, length: 50 mm

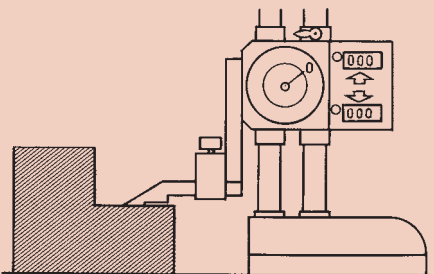


Clamping device (with dovetail guidance)

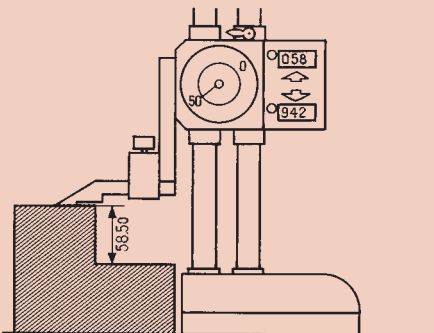


Holder

Scriber and Scriber holder see page 157



Zero setting of counter and dial gauge



Measurement

Reading of

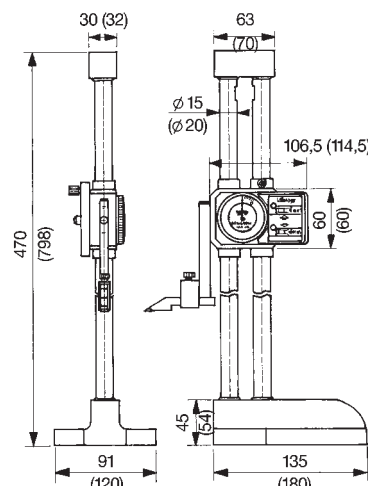
Counter	58.00 mm
Dial Gauge	0.50 mm
Result	58.50 mm



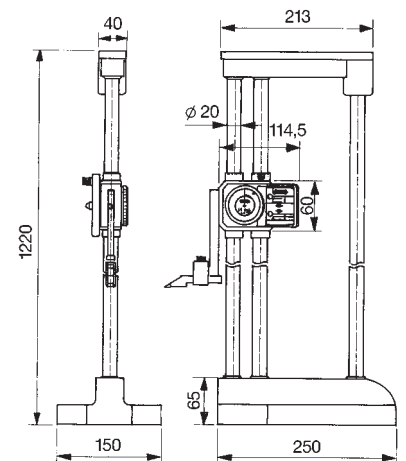
192-130



Measuring range mm	No.	Resolution mm	Error limits mm	Column diameter mm	Mass kg
0- 300	192-130	0,01	0,03	15	4,2
0- 600	192-132	0,01	0,05	20	9,8
0-1000	192-133	0,01	0,07	20	17,0



192-130 / Dimensions in brackets = 192-132



192-133

„DIGIMATIC“ HD-A Height Gauges

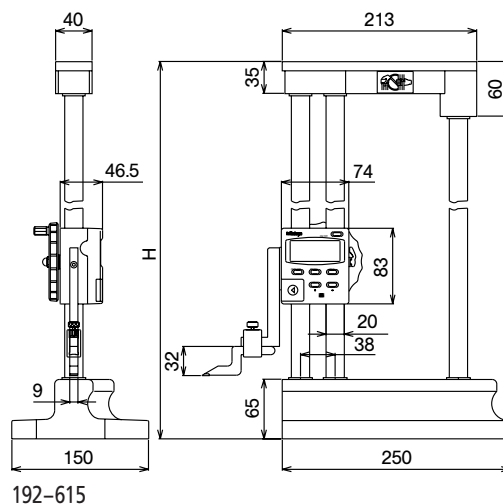
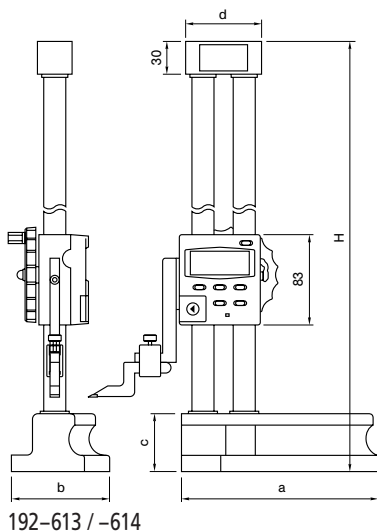
- Standard type in column form without data output.
- Zero-setting by simple button operation in any position.
- By means of the PRESET key, the first digital character (= hundredth) can be set to any value.

Series 192



192-613

Measuring range mm	No.	Resolution mm	Error limits mm	a mm	b mm	c mm	d mm	H mm	Mass kg
0- 300	192-613	0,01	0,02	135	91	45	63	475	4,7
0- 600	192-614	0,01	0,05	180	120	54	70	802	9,5
0-1000	192-615	0,01	0,07	250	150	65	213	1228	19,8



Functions	Series 192
ZERO	●
HOLD	●
PRESET	●

Specifications

Accuracy: Factory specification

Protection: IP-40

Display: 6 digit LCD display plus sign (-), Character height 10 mm

Delivered including scriber, scriber holder, 1 battery and cover

Optional accessories

No. 900321 Clamping device (with dovetail guidance and holder dia. 8 and 4 mm)

No. 953638 Holder (9 x 9 mm) for securing dial indicators or probe gauges to the height gauge and scriber devices, length: 50 mm



Clamping device
(with dovetail guidance)



Holder

Consumables Spares

No. 055AA217D Battery CR 2032

No. 450291 Cover (300 mm)

No. 450292 Cover (600 mm)

No. 450290 Cover (1000 mm)

Scriber and Scriber holder see page 157

„DIGIMATIC“ HDM-A Height Gauges

- Robust type in column form with data output and connection facility for a signal contact (optional accessory).

Series 192



192-663



Height gauge with electronic probe

Functions	Series 192
ZERO	●
HOLD	●
PRESET	●
ABS (absolute measurement)	●
Battery control	●
Data output	●

Specifications

Accuracy: Factory specification
 Protection: IP-40
 Display: 6 digit LCD display plus sign (-),
 Character height 10 mm

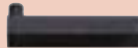
Delivered including scriber, scriber holder,
 1 battery and cover

Optional accessories

- No. 192-007 Electronic probe
- No. 192-005 Scribing probe
- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)
- No. 900321 Clamping device (with dovetail guidance and holder dia. 8 and 4 mm)
- No. 953638 Holder (9 x 9 mm) for securing dial indicators or probe gauges to the height gauge and scriber devices, length: 50 mm
- No. 900209 Holder (9 x 9 mm) for securing dial indicators or probe gauges to the height gauge and scriber devices, length: 100 mm



Clamping device
(with dovetail guidance)



Holder

Consumables Spares

- No. 055AA217D Battery CR 2032
- No. 450291 Cover (300 mm)
- No. 450292 Cover (600 mm)
- No. 450290 Cover (1000 mm)

Scriber and Scriber holder see page 157

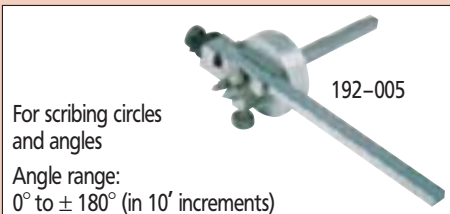


No. 953638

No. 900321

Ball Ø: 3 mm

No. 192-007 electronic probe (set with holder
 No. 953638 and clamping device with dovetail
 guidance No. 900321)

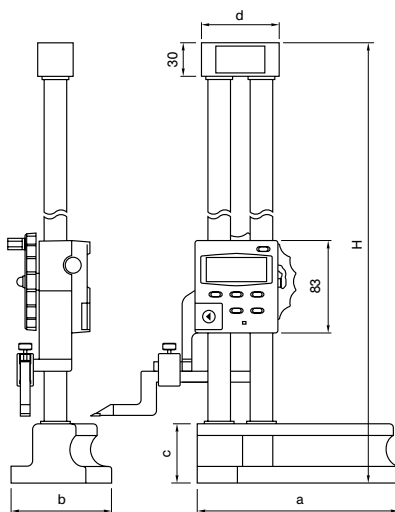


192-005

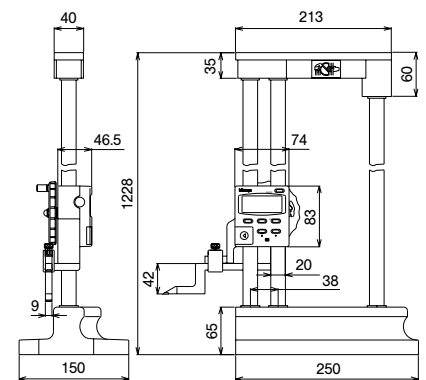
For scribing circles
 and angles

Angle range:
 0° to ± 180° (in 10' increments)

Measuring range mm	No.	Resolution mm	Error limits mm	a mm	b mm	c mm	d mm	H mm	Mass kg
0- 300	192-663	0,01	0,02	149	100	48	70	510	6,5
0- 600	192-664	0,01	0,04	180	120	54	70	802	9,5
0-1000	192-665	0,01	0,06	250	150	65	213	1228	19,8



192-663 / -664



192-665

Optional accessories for Height Gauges

Depth measurement attachment

- This attachment enables to measure depth of bores, shoulder steps and other workpieces.
- The depth measurement stopper is provided with a steel ball as contact point.
- The holding arm has a cross section of 9 x 9 mm.
- Replaceable probe points.



900764



Sample application

Specifications

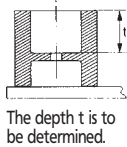
Minimum bore diameter: 5,5 mm
Maximum measuring depth: 80 mm

Electrical contact probe

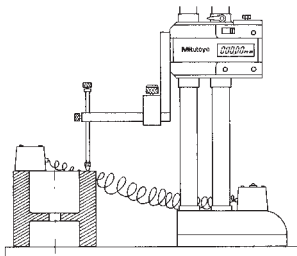
- For measuring and scribing on hard stone plates.
- The red control lamp lights up when the scriber or feeler has touched the workpiece. This prevents damages of the workpiece surface and increases the measuring accuracy.



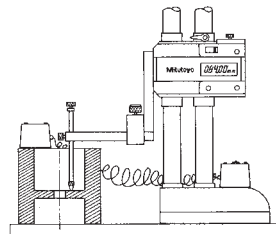
900872



The depth t is to be determined.



Probing of the upper surface. Reset the display when the control lamp lights up.



Probing the lower surface. Read the value when the control lamp lights up.

Specifications

2 magnetic feet: \varnothing 35 mm
Power supply: Battery H-2 D or 2 x PR 44; 1,4 V (optional accessory)
Cable length: 1,5 m (\varnothing 1 mm)
Mass: 60 g

Optional accessories:

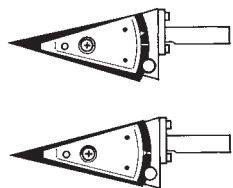
No. 011372 Battery PR 44; 1,4 V
No. 905353 Battery Adapter

Center master

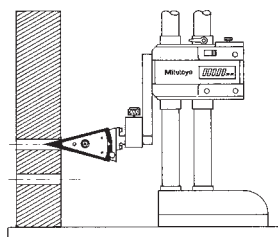
- Center probe to determine the center distance between bores. The bore is centered when the pointer matches the white line.



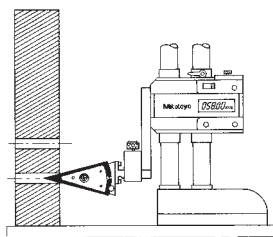
951144



The center distance between the bores is to be determined.



Centering of the first bore and zero-setting of the display.



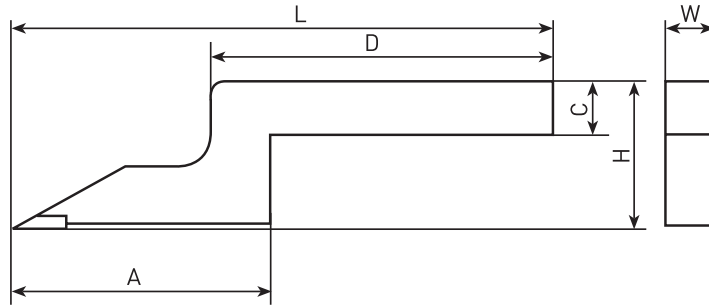
Centering of the second bore. The center distance of the bore can be read from the display.

Specifications

Maximum bore to be measured: \varnothing 38 mm
Minimum bore to be measured: \varnothing 1 mm
Stem: 9 x 9 mm

Optional accessories for Height Gauges

Selection
of scribers and scriber holders.



Scriber No.	L mm	H mm	A mm	C mm	D mm	W mm	Scriber holder No.	Height Gauges No.
07GZA000	80	32 ± 0,1	43	9 ± 0,1	47	9 ⁰ _{0,03}	07GZA002 or 05GZA033	192-130 192-132 192-133 192-613 192-614 192-615 514-102 514-106 (570-228) (570-229) 570-302 570-304
900173	47	25 ± 0,1	22	12,7 ⁰ _{0,05}	32	6,35 ⁰ _{0,03}	07GZA004 or 901338	506-207 570-227
905200	150	42 ± 0,1	58	9 ± 0,1	105	9 ⁰ _{0,03}	07GZA002 or 05GZA033	192-663 192-664 192-665 514-108 570-230

Scriber holder plastic



07GZA002

Scriber holder Metal u-shaped design



05GZA033

Linear height gauge LH-600 C / CG "Linear Height"

- Excellent accuracy.
- Pneumatic drive mechanism.
- Self-explanatory control pad with menu control in display.
- Easy to read LCD-Display allows.
- Automatic sequences of pre-learnt part programs.
- GO/NG-display at each measurement.
- Mains-independent operation with rechargeable battery.
- Simple handling with low weight.
- RS-232 C data output port.
- DIGIMATIC data input for digital indicators e.g. for perpendicularity.

Series 518



(1.3 + 0.6 L/600) μm



Holding grip

518-331D-21 without grip
518-332D-21 with grip



No.	Measuring range mm	Stroke mm	Measuring force N	Mass kg
518-331 D-21	0-972	600	1	24
518-332 D-21*	0-972	600	1	24

* with grip

Specifications

Measuring range:	0-972 mm
Travel range:	600 mm
Resolution (selectable):	0,0001/0,001/0,01/0,1 mm
Accuracy	
Measuring accuracy:	(1,3 + 0,6L/600) μm L = measuring length in mm
Repeatability (2 σ):	plane: 0,5 μm bore: 1 μm
Squareness :	6 μm
Straightness :	4 μm
Drive method:	manual/motor-driven (5-40 mm, 7 steps)
Carriage weight compensation:	compensation weights
Method of movement:	suspension/semi-suspension; air bearing
Air supply:	built-in compressor
LCD-Display:	graphic LCD, 320 x 240 dots (with backlight)
Display language:	english / german / french / portuguese / italian / dutch / spanish / swedish / japanese / czech / slovenian / hungarian / polish / traditional chinese / korean
Number of programs:	50 (maximum)
Number of data:	60.000 (maximum)
Power supply:	AC adapter/rechargeable battery (Ni-MH)
Operation time:	approx. 5 hours

Functions for 1D/ 2D measurement/calculation

- Height measurement (upper/lower surface)
- Diameter (bore/shaft)
- Width measurement (internal/external)
- Max./min. height measurement (top/bottom surface)
- Angle calculation
- Distance calculation
- 2D element calculation:
- Angle calculation (element/element)
- Angle calculation (element/X-axis)
- 2D distance calculation (element/element)
- 2D distance calculation (element/reference point)
- Pitch circle calculation
- 2D coordinate system setting
- Polar coordinate system support
- Squareness, straightness, inclination and flatness determination
- Arithmetical calculations
- DIGIMATIC data input

Tolerance judgement

- Tolerance/nominal value setting
- Tolerance judgement result output
- Alarm for out of tolerance

Probe operation

- Probe type setting
- Probe tip diameter measurement
- Probe data registration/recall
- Probe position change

Statistic processing

- Basic statistical processing
- Histogram

Optional accessories for "Linear Height"

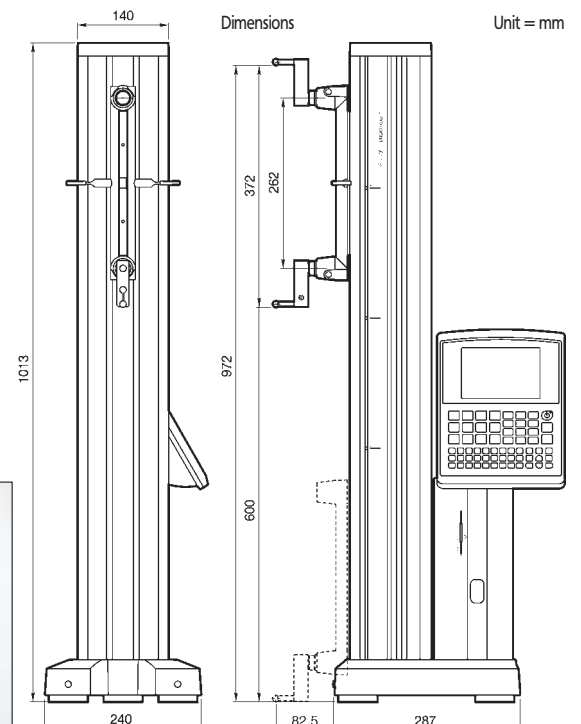
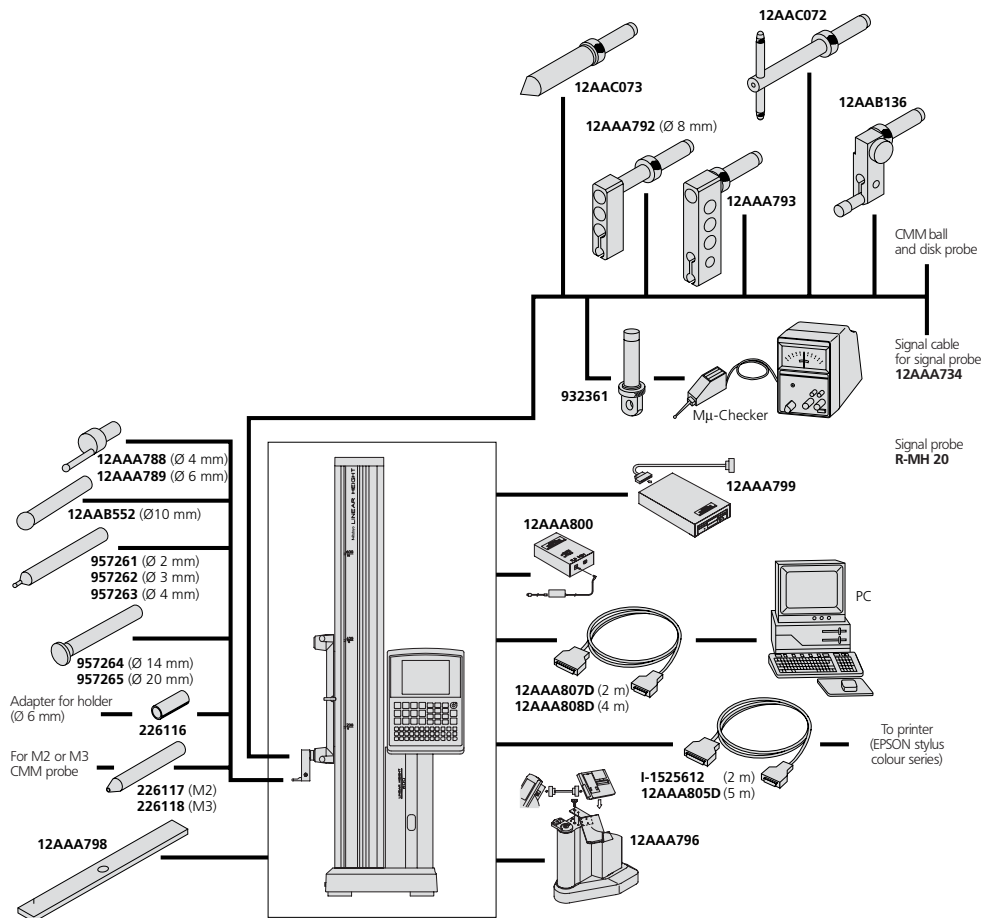
Standard accessories

- No. 12AAC080 Ball probe \varnothing 5 mm with receptacle
- No. 12AAA715 Setting block
- No. 357651 Mains adapter
- No. 223587 Cover
- No. 12AAA786 Spare battery pack

Optional accessories

Bestell-No.	Description
12AAA787	Setting block (also for conical probes)
12AAF666	Ball probe \varnothing 1 mm
957261	Ball probe \varnothing 2 mm
12AAF667	Ball probe \varnothing 2 mm (with ruby ball)
957262	Ball probe \varnothing 3 mm
957263	Ball probe \varnothing 4 mm
12AAF672	Ball offset probe \varnothing 1 mm (eccentric type)
12AAF673	Ball offset probe \varnothing 3 mm (eccentric type)
12AAA788	Ball offset probe \varnothing 4 mm (eccentric type)
12AAA789	Ball offset probe \varnothing 6 mm (eccentric type)
12AAF670	Disk probe \varnothing 5 mm
12AAF671	Disk probe \varnothing 10 mm
957264	Disk probe \varnothing 14 mm
957265	Disk probe \varnothing 20 mm
226116	Adapter for holder of probes with \varnothing 6 mm
12AAB552	Ball probe \varnothing 10 mm (coaxial type)
12AAF668	Ball probe \varnothing 10 mm (coaxial type), stem length 82 mm
12AAF669	Ball probe \varnothing 10 mm (coaxial type), stem length 120 mm
226117	Adapter for Renishaw probes with M2 thread
226118	Adapter for Renishaw probes with M3 thread
12AAB136	Cylindrical probe \varnothing 10 mm with receptacle
12AAC072	Depth probe
12AAC073	Taper probe \varnothing 20 mm
12AAA793	Probe extension holder
12AAA792	Dial indicator (stem \varnothing 8 mm) holder
932361	M μ -Checker lever head holder
12AAF674	Compensation weight
12AAA796	Thermal receipt printer (230 V)
12AAA802	Thermal print paper (10 rolls)
Printer	Page printer recommended: EPSON Stylus Color Series
I-1525612	Connecting cable for printer (2 m)
12AAA805D	Connecting cable for printer (5 m)
12AAA799	Floppy disk drive unit The floppy disk drive allows for storage and retrieval of measuring programs, measurement results, and measuring conditions
12AAA800	Battery charger
12AAF675	Spare battery pack
12AAA807 D	RS-232 C cable (2 m)
12AAA808 D	RS-232 C cable (5 m)
12AAA879	Workpiece for training (plastics)

Series 518



ABSOLUTE Linear height gauge „QM-Height“

- The QM-Height achieves maximum accuracy and offers all data processing functions necessary for height measurement and its analysis.
- It is just as easy to use as conventional height gauges.
- For a wide range of measurement tasks, various size models are available as are a large selection of special accessories.
- With the new ABSOLUTE scale, positional data is retained even when the instrument is switched off and then on again. The zero point does not have to be reset after switching on.
- Unlimited travel speed.
- Icons on the keys facilitate function selection. Frequently-used calculations of inside diameters, outside diameters and distances are integrated into the keypad as icons.
- Measurement of inside/outside diameters in a single measurement process (determination of maximum point on the circle and processing with scribing measurement).
- Easy-to-read display with large figures.
- The results of the tolerance evaluation are numerically and visually displayed by the red and green background illumination and with “-NG, GO” or “+NG”.
- With the slide lifting device in combination with unlimited travel speed, even long travel distances are quick and effortless to reset.
- Both DIGIMATIC and RS-232 C outputs are standard.

Series 518

ABSOLUTE™
Absolute System Patented by MITUTOYO

No.	Measuring range Stroke mm	Perpendicularity *2	
		μm	kg
518-224	0-350	8	22
518-226	0-600	13	27

*2 When using the inductive probe (519-321) and Mμ-Checker (519-411).



Grip (standard accessories)

518-226



Inside measurement



Height measurement



DIGIMATIC- and RS-232 C data output port (standard)

Specifications

Permitted length deviations:	(2,8 + 0,5 L/100) μm
Resolution:	0,001/0,005 mm
Repeatability *1:	1,8 μm (2 σ)
Guiding method:	Rolling bearing
Driving method:	Manual
Measuring system:	Electrostatic capacitance linear encoder
Measuring force:	1,6 ± 0,5 N
Display:	LCD
Battery:	LR6 x 4 / AC adapter (optional)
Battery life:	Appr. 800 hours (depending on measuring mode)
Temperatur (operation):	10 – 30 °C
Humidity (operation):	20 – 90 %
Temperature (storage):	-10 – 50 °C
Humidity (storage):	5 – 90 %

*1 When using the standard Ø 5 mm stepped probe in normal mode (display 1 μm).

Optional Accessories for „QM-Height“

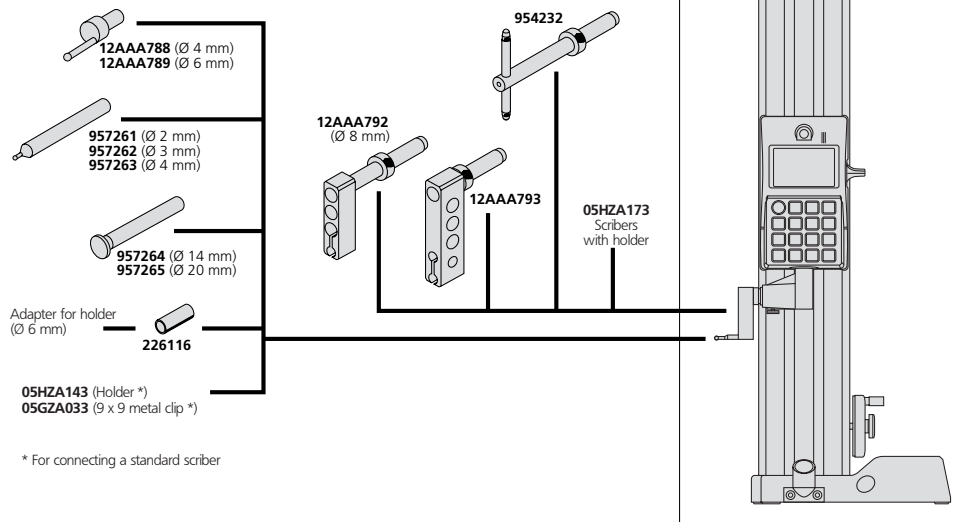
Series 518

Standard accessories

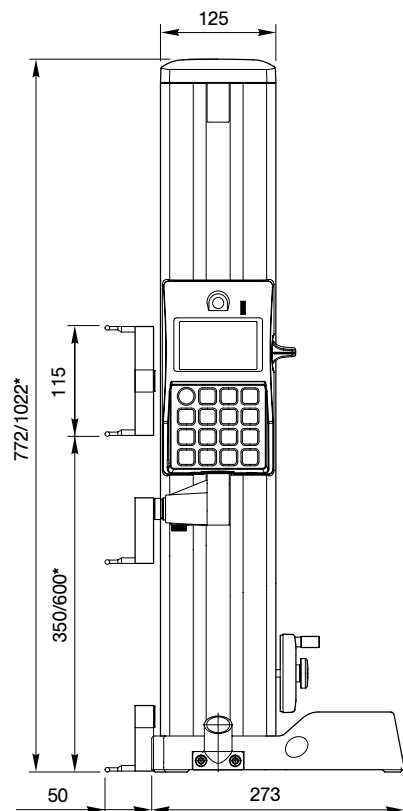
- No. 12AAA715 Setting block
- No. 05HZA148 Ball probe Ø 5 mm with receptacle
- No. 011037 Batteries 4 x LR6
- Grip
- Rubber cap

Optional accessories

Bestell-No.	Description
957261	Ball probe Ø 2 mm
957262	Ball probe Ø 3 mm
957263	Ball probe Ø 4 mm
12AAA788	Ball contact point Ø 4 mm (eccentric type)
12AAA789	Ball contact point Ø 6 mm (eccentric type)
957264	Disk probe Ø 14 mm
957265	Disk probe Ø 20 mm
226116	Adapter for holder for probe with 6 mm diameter
12AAC072	Depth probe
12AAA793	Probe extension holder
12AAA792	Dial indicator holder
05HZA173	Scriber with holder
05HZA143	Holder for securing scribers 9 x 9 mm
05GZA033	Scriber holder (metal clip) to secure scribers 9 x 9 mm
936937	DIGIMATIC cable (1 m)
965014	DIGIMATIC cable (2 m)
264-504 D	DIGIMATIC Mini Processor DP-1VR
526688 D	AC adapter

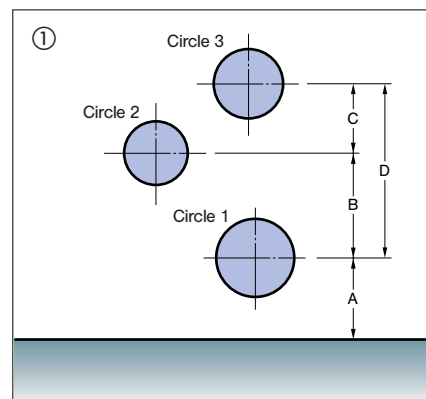


* For connecting a standard scriber

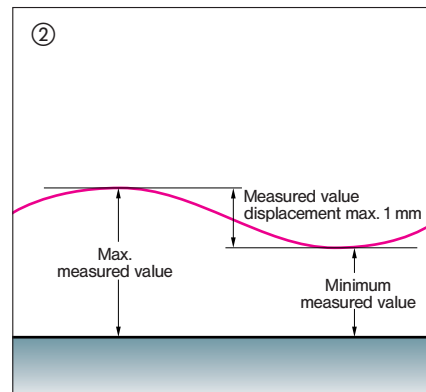


Function selection:

- ① Distances A, B, C and D can be outputted by calling up the internal memory.



- ② Max. - min or difference measurement



PRODUCT NEWS



DIGIMATIC Dial Indicator ID-H

Series 543

Detailed information on page 176.



ABSOLUTE™
Absolute System Patented by MITUTOYO



ABSOLUTE DIGIMATIC Dial Indicators ID-B and ID-N

Series 543

Detailed information on page 177.



Dial Gauges

Series 2

Detailed information on pages 183 to 185.



Dial Gauge with Base for Depth Measurement

Series 7

Detailed information on page 215.

DIGIMATIC Dial Gauges



Pages 167–178

Analogue Dial Gauges



Pages 179–197

Dial Caliper Gauges



Pages 216–219

Lever gauges



Pages 220–228

Calibration Testers



Pages 242–244

**Linear Gage Measuring Probe
Linear Gage Counter**



Pages 245–262

Inductive Measuring Probe



Pages 263–264

Basic Information of Dial Indicators

Mechanical Dial Indicators



Testing

For dial indicators with a rotating scale, the zero point should be set as precisely as possible to the beginning of the measuring span. For dial indicators of type F, the initial value of the measuring span is taken as the starting point. When testing, it is useful to line up the pointer and the graduation mark on the round scale and to read the deviation of the measuring bolt position on a test instrument, because when reading the deviation of the display from the nominal value on the dial indicator, fractions of the scale interval must be estimated.

Plotting the deviation diagram is performed in steps of 0,1 mm for f_e , f_{ges} and f_u and in steps of 0,01 mm for f_t in the range of the largest difference between two consecutive measurements. The span of error f_t can also be measured at any position of the measuring span.

Note: Testing of f_{ges} and f_u is significant in applications where measurements are performed with measuring bolts which move in and out (e.g. concentricity and axial eccentricity tests).

Spans of error f_e , f_t , f_{ges} :

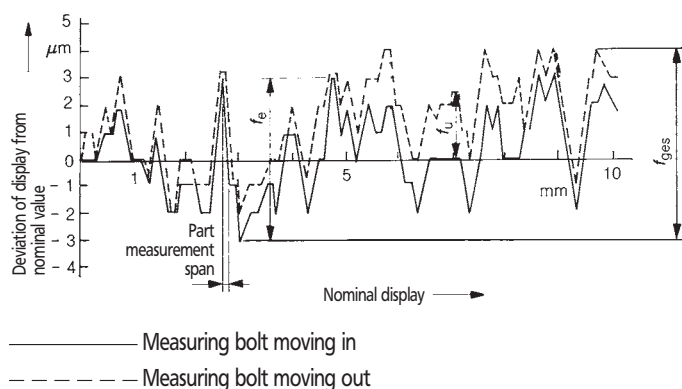
Hysteresis f_u

To determine the individual spans of error f_e , f_t , f_{ges} and the Hysteresis f_u , a deviation diagram should be plotted.

Repeatability f_w

Repeatability f_w is tested at any point in the measuring span. At least 5 measurements should be performed, whereby the difference between the measurements must not be larger than the value indicated in the DIN specifications.

Diagram for spans of error f_e , f_{ges} and hysteresis f_u (example)



Basic Information of Dial Indicators

Digital Dial Indicators



543-270 B

Testing

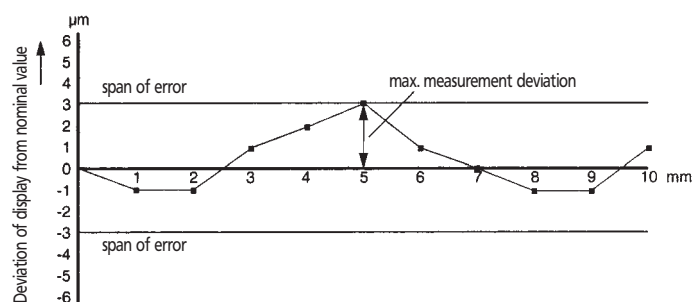
Digital dial indicators are tested in an analogous manner to the testing of mechanical dial indicators with a round scale, but with one significant difference:

1. Fixed values (nominal values) are set on the dial indicator testing device and the monitored display of the dial indicator is read. The deviation of the display from the set value of the testing instrument is entered in the deviation diagram.
2. Testing direction: measuring bolt moving in.
3. Accuracy: ± 1 digit.

Accuracy:

The measuring deviations may not exceed the allowable spans of error. If the amount of measuring deviation of a measuring instrument is smaller or equal to the allowable span of error, the measuring instrument meets the requirements.

Diagram of measurement deviations



Functions of digital dial indicators



Dial Indicator functions	ID-S	Standard IDC Types with low measuring force Types with higher measuring force Dust-proofed Types	ID-C with Max/Min hold mode	ID-C for inside micro- meters	Signal ID-C	Calculator ID-C	ID-U	ID-F	ID-H	ID-B	ID-N
Signal output (open collector)	—	—	—	—	●	—	—	—	—	—	—
Signal input (contact)	—	—	—	—	●	—	—	—	—	—	—
On / off	●	●	●	●	●	●	●	●	●	●	●
Switch mm / inch	on request										
Switch mm / without unit	—	—	—	—	—	●	—	—	—	—	—
Switch counting direction	●	●	●	—	●	○	●	●	●	●	●
Selection of numerical increment	—	—	—	—	—	●	—	●	●	●*	●*
Selection of analogue display range	—	—	—	●	—	—	—	●	●	—	—
Resetting (in INC Mode)	—	●	●	—	●	●	—	●	●	—	—
ABS / INC Switch	—	●	●	—	●	●	—	●	—	●	●
Input of tolerance limits	—	—	●	●	●	—	—	●	●	●	●
Preset (preselection or origin)	—	●	●	●	●	●	—	●	●	●	●
Origin	●	—	—	—	—	—	●	—	—	—	—
Storage of reference values	—	—	—	●	—	—	—	—	—	—	—
Calculation function	—	—	—	—	—	●	—	—	—	—	—
Keypad lock	—	—	—	●	●	●	—	●	●	—	—
Modes: Max. Hold mode / Min Hold mode / Max - Min Mode (TIR)	—	—	●	—	●	—	—	●	●	—	—
Modes: Max. Hold mode / Min Hold mode	—	—	—	—	—	●	—	—	—	—	—
Data (measured value transmission if signal cable is connected)	—	—	—	●	—	●	—	—	●	●	●
Hold (Hold value when no signal cable is connected)	—	—	—	●	—	●	—	—	●	●	●
DIGIMATIC data output	●	●	●	●	—	●	—	●	●	●	●
DIGIMATIC signal input	—	—	—	—	—	—	—	—	—	●	●
Data output RS-232 C	—	—	—	—	—	—	—	—	—	●	—
Data input RS-232 C	—	—	—	—	—	—	—	—	—	●	—
Alarm „B“ Battery	●	●	●	●	—	●	—	—	—	●	●
Alarm „E-SE“ Tolerance setting error	—	●	●	●	●	●	—	●	●	●	●

● = yes — = no ○ = Parameter input
●* = Devices with a resolution of 0.001 mm can be switched to 0.01 mm

ABSOLUTE DIGIMATIC Dial Indicator ID-S

- The zero-position is set only once, and is stored until the next battery replacement.
- Measuring precision even at highest speed. Large display characters for easy reading.

Functions	Series 543
ON / OFF	●
ORIGIN-setting	●
Counting direction switching	●
Data output	●

Specifications

6 digit LCD-display.

Accuracy: Factory specification
 Probe: Carbide ball,
 thread M 2,5 x 0,45 mm

Power supply: 1 battery SR-44

Optional accessory

- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)
- No. 903424 Lift lever
- No. 540774 Cable release
- No. 02ACB420 Lid with eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Consumable Spares

- No. 938882 Battery SR-44

Series 543

Electronical dial indicator with absolute capacitive scale, with data output

ABSOLUTE™

Absolute System Patented by MITUTOYO

IP42

IP53

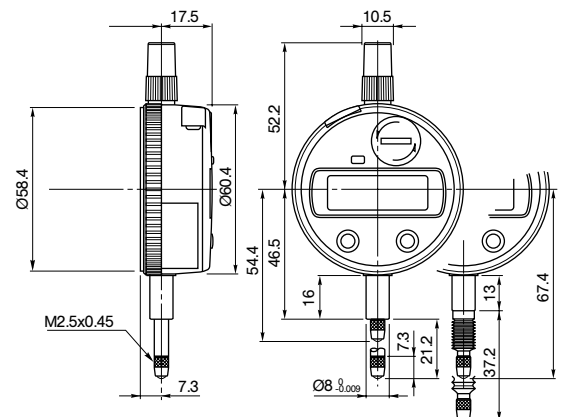


543-690 B



543-681 B

Resolution mm	Measuring range mm	No.	Error limits mm	Measuring force N	Mass g
Protection IP-42					
0,01	12,7	543-681 B	0,03	≤ 2,0	120
0,001	12,7	543-690 B	0,004	≤ 2,0	150
Protection IP-53					
0,001	12,7	543-694 B	0,004	≤ 2,0	150



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Dial Indicator ID-C

- The zero-position is set only once, and is stored until the next battery replacement.
- Measuring precision even at highest speed. Large display characters for easy reading.
- Tolerance-“Good” / “NG” display:



Graphic display of the tolerance (Mode 2)

Mode 1: The current measurement value with graphic display of the tolerance of position is shown.

Mode 2: The graphic display of the tolerance of position is visible on the entire display.

Series 543

Standard types

Worldwide unique electronical multi-function dial indicator with absolute capacitive scale, with data output



543-250 B



543-450 B

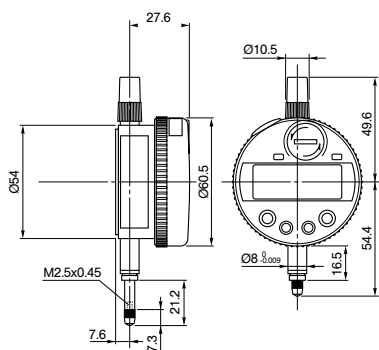
ABSOLUTE™

Absolute System Patented by MITUTOYO

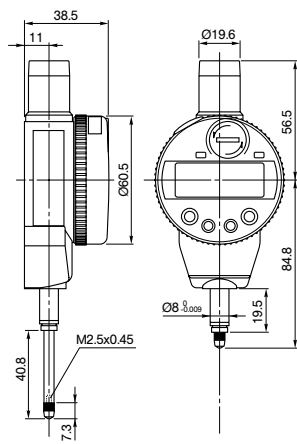


543-460 B

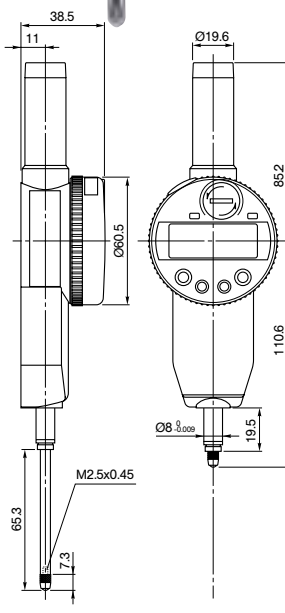
Resolution mm	Measuring range mm	No.	Error limits mm	Measuring force N	Mass g
0,001	12	543-250 B	0,003	≤ 1,2	160
0,001	25	543-450 B	0,003	≤ 1,8	190
0,001	50	543-460 B	0,006	≤ 2,3	280
0,01	12	543-270 B	0,02	≤ 0,9	160
0,01	25	543-454 B	0,03	≤ 1,8	190
0,01	50	543-464 B	0,04	≤ 2,3	280



Measuring range 12 mm



Measuring range 25 mm



Measuring range 50 mm

™ Patent numbers see page 464

Functions	Series 543
ON / OFF	●
ZERO/ABS-switching	●
PRESET	●
Input of tolerance limits	●
Counting direction switching	●
Data output	●

Specifications

The 7 digit LCD-display can be rotated by up to 330° to guarantee an optimum reading position.

Accuracy: Factory specification
 Probe: Carbide ball, thread M2,5 x 0,45 mm
 Power supply: 1 battery SR-44

Optional accessory

- No. 905338 Signal cable (1 m)
 - No. 905409 Signal cable (2 m)
 - No. 902011 Lift lever for measuring range 12 mm
 - No. 540774 Cable release, moving measuring range 12 mm
 - No. 101040 Lid with eyelet
 - No. 02ACA571 Additional spring* for measuring range 25 mm
 - No. 02ACA773 Additional spring* for measuring range 50 mm
- * Required to increase the measuring force during overhead operation.

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Consumable Spares

- No. 938882 Battery SR-44

ABSOLUTE DIGIMATIC Dial Indicator ID-C

- The zero-position is set only once, and is stored until the next battery replacement.
- Measuring precision even at highest speed. Large display characters for easy reading.
- Tolerance-“Good” / “NG” display:



Graphic display of the tolerance (Mode 2)

Mode 1: The current measurement value with graphic display of the tolerance of position is shown.

Mode 2: The graphic display of the tolerance of position is visible on the entire display.

Series 543

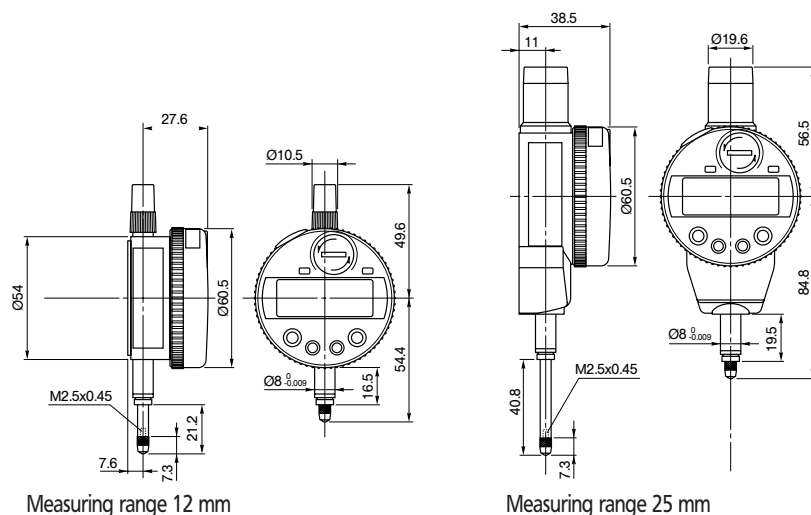
Type with low measuring force
Type with higher precision than standard type

Worldwide unique electronical multi-function dial indicator with absolute capacitive scale, with data output



543-254 B

Resolution mm	Measuring range mm	No.	Error limits mm	Measuring force N	Mass g
low measuring force					
0,001	12	543-254 B	0,003	0,4-0,7	160
0,01	12	543-274 B	0,02	0,2-0,5	160
higher precision than standard type					
0,01	12	543-290 B	0,005	≤ 1,2	160
0,01	25	543-457 B	0,005	≤ 1,8	190



Measuring range 12 mm

Measuring range 25 mm

™ Patent numbers see page 464

Functions	Series 543
ON / OFF	●
ZERO/ABS-switching	●
PRESET	●
Input of tolerance limits	●
Counting direction switching	●
Data output	●

Specifications

The 7 digit LCD-display can be rotated by up to 330° to guarantee an optimum reading position.

Accuracy: Factory specification
Probe: Carbide ball, thread M2,5 x 0,45 mm

Power supply: 1 battery SR-44

Optional accessory

- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)
- No. 902011 Lift lever for measuring range 12 mm
- No. 540774 Cable release, moving measuring range 12 mm
- No. 101040 Lid with eyelet
- No. 02ACA571 Additional spring* for measuring range 25 mm

* Required to increase the measuring force during overhead operation.

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Consumable Spares

- No. 938882 Battery SR-44

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Absolute System Patented by MITUTOYO



ABSOLUTE DIGIMATIC Dial Indicator ID-C

- The zero-position is set only once, and is stored until the next battery replacement.
- Measuring precision even at highest speed. Large display characters for easy reading.
- Tolerance-“Good” / “NG” display:



Graphic display of the tolerance (Mode 2)

Mode 1: The current measurement value with graphic display of the tolerance of position is shown.

Mode 2: The graphic display of the tolerance of position is visible on the entire display.

Series 543

Dust-proofed type

Worldwide unique electronical multi-function dial indicator with absolute capacitive scale, with data output



543-257 B

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Absolute System Patented by MITUTOYO



Functions

Functions	Series 543
ON / OFF	●
ZERO/ABS-switching	●
PRESET	●
Input of tolerance limits	●
Counting direction switching	●
Data output	●

Specifications

The 7 digit LCD-display can be rotated by up to 330° to guarantee an optimum reading position

Accuracy: Factory specification
Probe: Carbide ball, thread M2,5 x 0,45 mm

Power supply: 1 battery SR-44

Optional accessory

- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)
- No. 902011 Lift lever
- No. 540774 Cable release, moving measuring range 12 mm
- No. 101040 Lid with eyelet

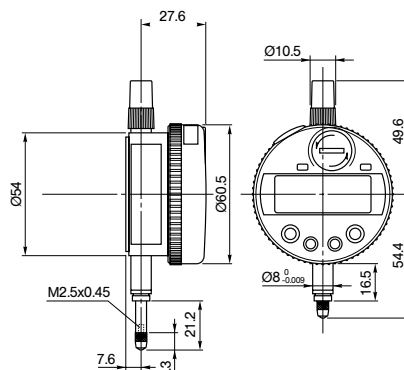
For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Consumable Spares

- No. 938882 Battery SR-44

Resolution mm	Measuring range mm	No.	Error limits mm	Measuring force N	Mass g
0,001	12	543-257 B	0,003	≤ 2,0	160
0,01	12	543-277 B	0,02	≤ 2,0	160



Measuring range 12 mm

ABSOLUTE DIGIMATIC Dial Indicator ID-C

- The zero-position is set only once, and is stored until the next battery replacement.
- Measuring precision even at highest speed. Large display characters for easy reading.

Series 543

Type with max/min hold mode

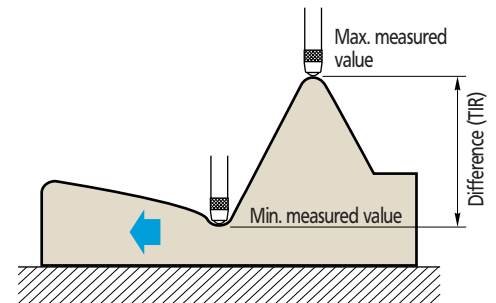
Worldwide unique electronical multi-function dial indicator with absolute capacitive scale, with data output

ABSOLUTE™
Absolute System Patented by MITUTOYO

IP42



543-260 B



Resolution	Measuring range	No.	Error limits	Measuring force	Mass
mm	mm		mm	N	g
0,001	12,7	543-260 B	0,003	≤ 1,5	160

Series 543

Digital dial indicator with data output. For use, e.g. in 2-point inside micrometers

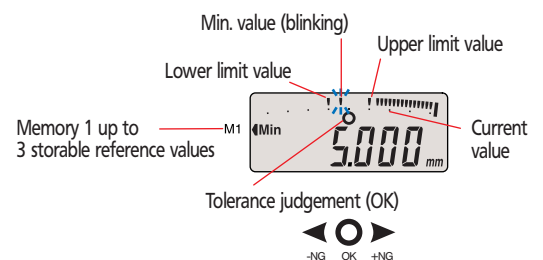
When using the dial indicator in connection with inside micrometers for measuring bores, the "reversal point" (diameter in question) can be detected easily during the "oscillation". The real value is hold and displayed by the Peakhold-function. (see page 239, too).

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Absolute System Patented by MITUTOYO

IP42



543-264 B



Resolution	Measuring range	No.	Error limits	Measuring force	Mass
mm	mm		mm	N	g
0,001	12,7	543-264 B	0,003	≤ 1,5	160

™ Patent numbers see page 464

Functions	Series 543	
	543-260 B	543-264 B
ON / OFF	●	●
ZERO/ABS-switching	●	●
PRESET	●	●
Input of tolerance limits	●	●
Modes*: Max. function	●	
Min. function	●	
TIR function	●	
DATA / HOLD		●
Key-Interlock	●	
Counting direction switching	●	
Data output	●	●

* At a speed of $\geq 50 \mu\text{m}/\text{sec}$, the peak value may not always be correctly displayed

Specifications

The 7 digit LCD-display can be rotated by up to 330° to guarantee an optimum reading position

Accuracy: Factory specification
Probe: Carbide ball, thread M2,5 x 0,45 mm
Power supply: 2 batteries SR-44

Optional accessory

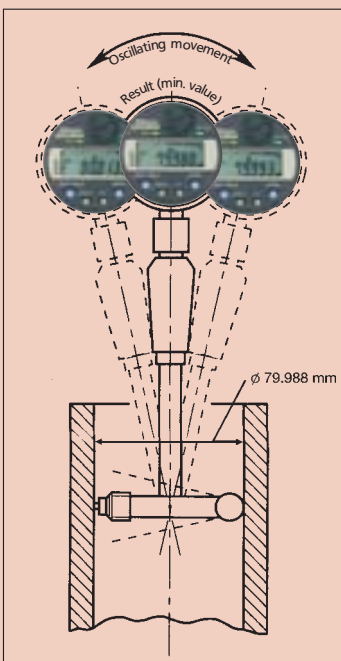
- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)
- No. 902011 Lift lever
- No. 540774 Cable release, moving measuring range 12 mm
- No. 101040 Lid with eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Consumable Spares

- No. 938882 Battery SR-44



Finding the reversal point with 2-point inside micrometers

ABSOLUTE DIGIMATIC Dial Indicator ID-C

• Electronical multi-function dial indicator with absolute capacitive scale.

The zero-position is set only once and is stored as the absolute zero-position until the next battery replacement. Measuring precision even at highest speed. Large display characters for easy reading.

Series 543

With signal input "contact" and signal output "open collector"
Dust protection according to IP-54.



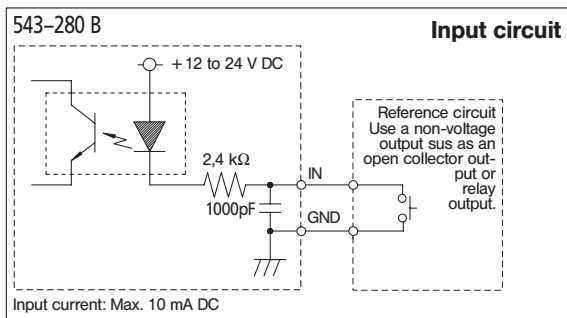
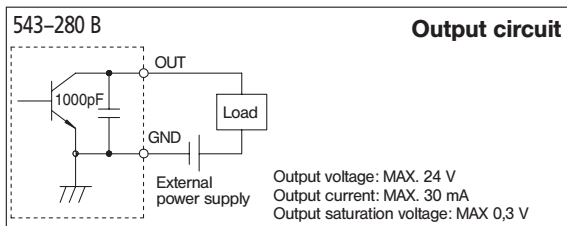
543-280 B

ABSOLUTE™

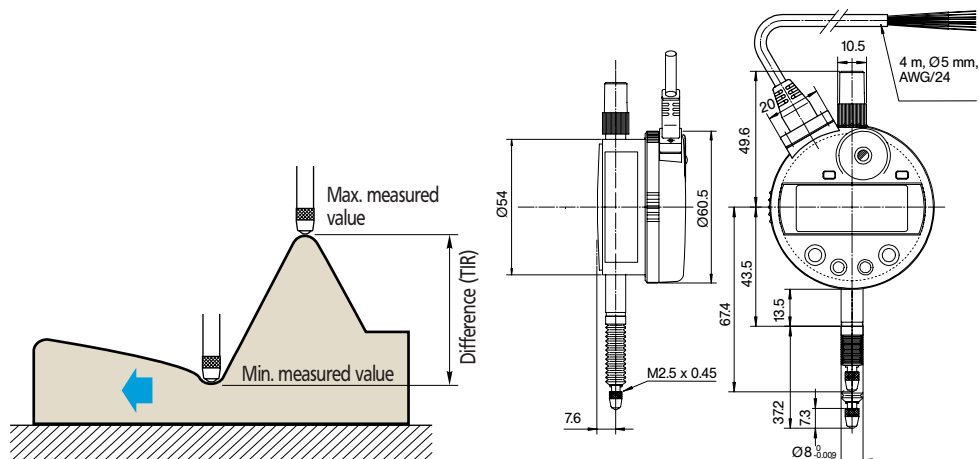
Absolute System Patented by MITUTOYO



Wire color	Signal name	I/O	Description
Black	- V (GND)	-	Connect to the minus (-) terminal.
Red	+ V (plus power voltage)	I	Supply a power voltage between 12 V DC and 24 VDC.
Orange	-NG	O	Tolerance judgment result output terminals (NPN open-collector output): Only the terminal to a judgment result is set to the low level.
Green	OK	O	
Brown	+NG	O	(See the output circuit diagram)
Yellow	PRESET_RECALL/ZERO	I	External input terminals (no-voltage input): If the relevant terminal is set to the low level, its signal becomes true. (See the input circuit diagram.)
Blue	HOLD_RESET	I	
Shield	FG (Frame Ground)	-	Connect to the ground.



Resolution mm	Measuring range mm	No.	Error limits mm	Signal cable m	Mass g
0,001	12,7	543-280 B	0,003	4	175



™ Patent numbers see page 464

Functions	Series 543
Signal output:	
- NG/OK/+ NG (assessment only) via open collector	●
Signal input:	
Zero-setting	●
PRESET	●
Resetting hold mode via contact	●
Other functions:	
ON / OFF	●
ZERO/ABS-switching	●
PRESET	●
Tolerance display	●
Tolerance assessment via LED	●
Counting direction switching	●
Modes*: Max. function	●
Min. function	●
TIR function	●

* At a speed of $\geq 50 \mu\text{m/sec}$, the peak value may not always be correctly displayed

Specifications

7 digit LCD-display.

Accuracy: Factory specification
Probe: Carbide ball, thread M2,5x0,45 mm
Power supply: DC 12-24 V $\pm 10\%$ from outside

Optional accessory

No. 902011 Lift lever
No. 540774 Cable release, moving measuring range 12 mm
No. 101040 Lid with eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

ABSOLUTE DIGIMATIC Dial Indicator ID-C

• **Electronical multi-function dial indicator with absolute capacitive scale.**

The zero-position is set only once and is stored as the absolute zero-position until the next battery replacement. Measuring precision even at highest speed. Large display characters for easy reading.

Series 543

With calculation function $Ax + B + Cx^{-1}$
(x = measurement value)

Multi-functional dial indicator with integrated calculation formula for a variety of applications. Free selectable coefficients A, B and C are available.

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Absolute System Patented by MITUTOYO

IP42

Functions	Series 543
ON / OFF	●
ZERO/ABS-switching	●
PRESET	●
ZERO-set	●
Input of tolerance limits	●
DATA / HOLD	●
Min/Max function*	●
Data output	●

* At a speed of $\geq 10 \mu\text{m/sec}$, the peak value may not always be correctly displayed

Specifications

The resolution can be selected at 12 classes:

Class	mm	Class	mm
1	0,0002	7	0,02
2	0,0005	8	0,05
3	0,001	9	0,1
4	0,002	10	0,2
5	0,005	11	0,5
6	0,01	12	1

7 digit LCD-display.

Accuracy: Factory specification

Rotatable display: 330°

Probe: Carbide ball,
thread M2,5 x 0,45 mm

Power supply: 1 battery SR-44

Optional accessory

No. 905338 Signal cable (1 m)

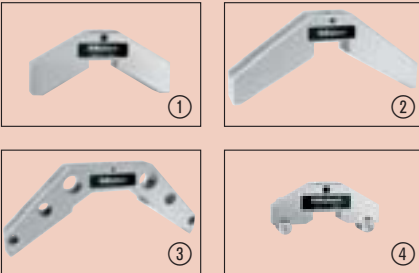
No. 905409 Signal cable (2 m)

No. 902011 Lift lever

No. 540774 Cable release, moving
measuring range 12 mm

No. 101040 Lid with eyelet

Measuring bridges



The accuracy of a radial measurement using the measuring bridges depends on the size of the radius to be measured and the form error of the workpiece

Bore measuring mandrel



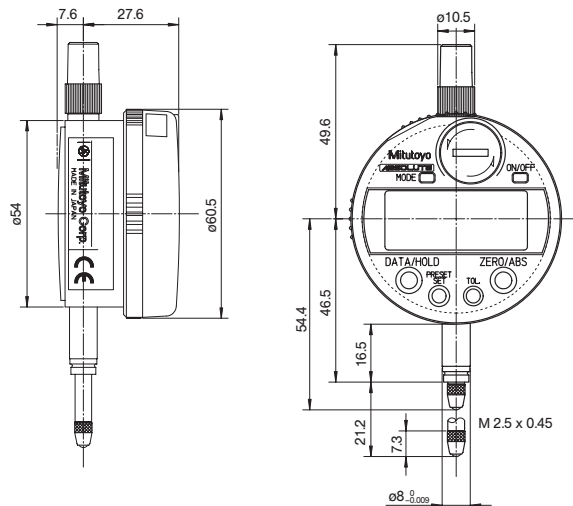
Consumable Spares

No. 938882 Battery SR-44



$Ax + B + Cx^{-1}$

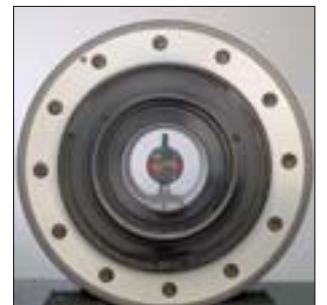
Measuring range mm	No.	Error limits mm	Measuring force N	Mass g
12,7	543-285 B	0,004	1,5	160
25	543-480 B	0,004	1,8	190
50	543-485 B	0,007	2,3	230



543-285 B

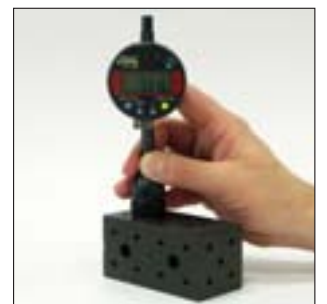
Measuring bridges

- ① No. 21FAJ394
Measuring bridge: R 25-70 mm
- ② No. 011394
Measuring bridge: R 50-100 mm
- ③ No. 011395
Measuring bridge: R 100-200 mm
- ④ No. 21FAJ395
Meas. bridge outside: R 45-140 mm
Meas bridge innen: R 65-100 mm



Bore measuring mandrels

- No. 011445
Measuring range: 0,5-20 mm Ø
Measuring taper: 90°
- No. 011446
Setting standard for 011445
- No. 011447
Measuring range: 20-40 mm Ø
Measuring taper: 90°
- No. 011448
Measuring range: 40-60 mm Ø
Measuring taper: 90°



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Dial Indicator ID-F

• Electronical multi-function dial indicator with absolute capacitive scale.

The zero-position is set only once and is stored as the absolute zero-position until the next battery replacement. Measuring precision even at highest speed. Large display characters for easy reading.

Series 543

With visual tolerance-monitoring and analogue display

The display switches from green to red backlight, if the tolerance function is activated and the upper or lower tolerance limit is exceeded.

Measuring range 25 mm

ABSOLUTE™

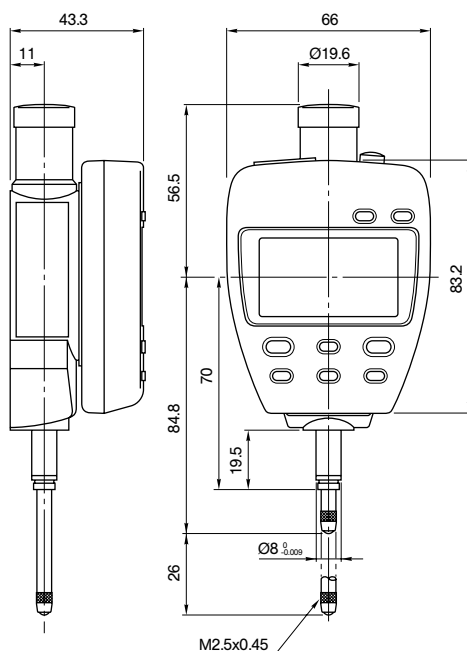
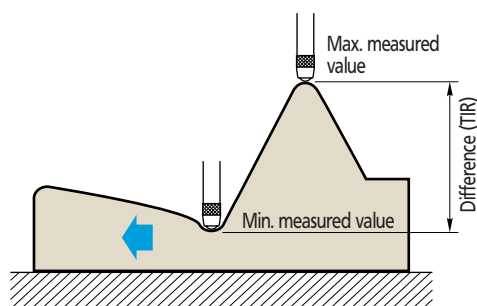
Absolute System Patented by MITUTOYO

IP30



543-551 D

Measuring range mm	No.	Error limits mm	Measuring force N	Mass g
25	543-551 D	0,003	≤ 1,8	240



Functions	Series 543
ON / OFF	●
Modes: Max-Hold	●
Min-Hold	●
TIR function	●
Analogue measuring range switching	●
Zero-setting INC/ABS	●
PRESET	●
Input of tolerance limits	●
Counting direction switching	●
Key lock function (key symbol)	●
Data output	●

Specifications

Accuracy: Factory specification
 Resolution: 0,001/0,01 mm switchable
 Probe: Carbide ball, thread M 2,5 x 0,45 mm
 Power supply: AC adapter

Optional accessory

- No. 936937 Signal cable (1 m)
- No. 965014 Signal cable (2 m)
- No. 540774 Cable release, moving measuring range 12 mm
- No. 02ACA571 Additional spring* for measuring range 25 mm

* Required to increase the measuring force during overhead operation.

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Standard accessory

- No. 526688 D AC adapter
- No. 137693 Lift lever

ABSOLUTE DIGIMATIC Dial Indicator ID-F

- **Electronical multi-function dial indicator with absolute capacitive scale.**

The zero-position is set only once and is stored as the absolute zero-position until the next battery replacement. Measuring precision even at highest speed. Large display characters for easy reading.

Series 543

With visual tolerance-monitoring and analogue display

The display switches from green to red backlight, if the tolerance function is activated and the upper or lower tolerance limit is exceeded.

Measuring range 50 mm

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Absolute System Patented by MITUTOYO

IP30

Functions	Series 543
ON / OFF	●
Modes: Max-Hold	●
Min-Hold	●
TIR function	●
Analogue measuring range switching	●
Zero-setting INC/ABS	●
PRESET	●
Input of tolerance limits	●
Counting direction switching	●
Key lock function (key symbol)	●
Data output	●

Specifications

Accuracy: Factory specification
 Resolution: 0,001/0,01 mm switchable
 Probe: Carbide ball, thread M 2,5 x 0,45 mm
 Power supply: AC adapter

Optional accessory

No. 936937 Signal cable (1 m)
 No. 965014 Signal cable (2 m)
 No. 540774 Cable release, moving measuring range 12 mm
 No. 02ACA773 Additional spring* for measuring range 50 mm

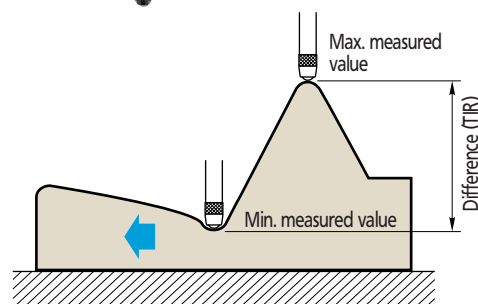
* Required to increase the measuring force during overhead operation.

For various accessories see pages 200 and 201.

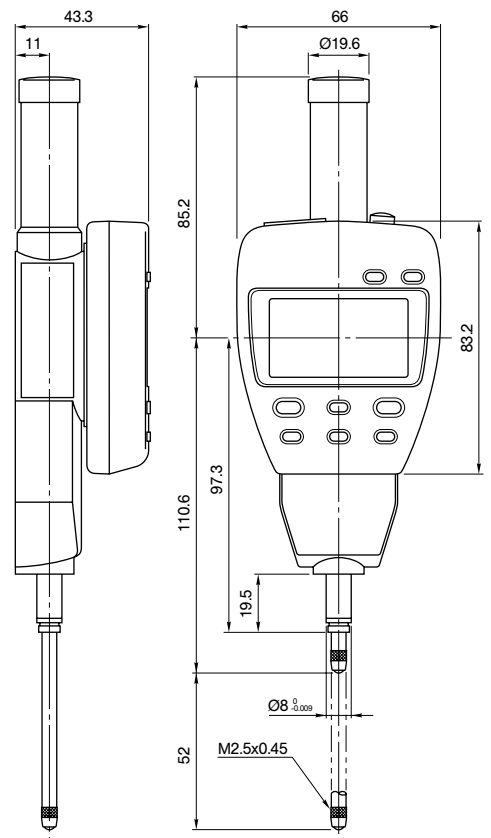
For special measuring inserts see pages 202 and 203.

Standard accessory

No. 526688 D AC adapter
 No. 137693 Lift lever



Measuring range mm	No.	Error limits mm	Measuring force N	Mass g
50	543-553 D	0,006	≤ 2,3	330
Greater accuracy				
50	543-557 D	0,003	≤ 2,3	330



™ Patent numbers see page 464

Dial Indicator ID-H

Superior multifunction dial indicators.

- High accuracy with low resolution.
- DIGIMATIC and RS-232C interface.
- Can be externally controlled and can relay data externally.
- Remote control (optional).
- Lifting mechanism over 30 mm with cable release (optional).

Series 543



Remote control no. 21EZA099 (optional accessory)

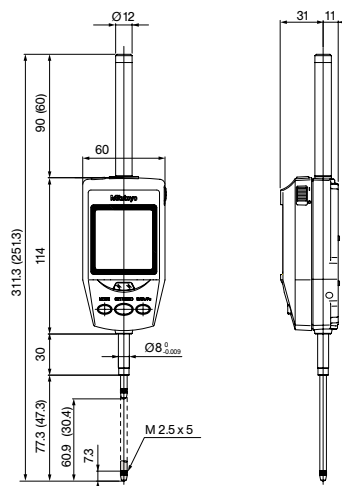
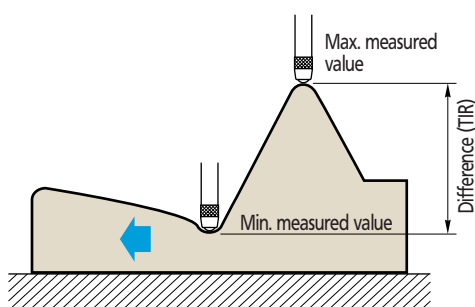


The display switches automatically from green to red backlighting when the tolerance function is set and the tolerance limits are exceeded or fallen below.

543-561 D

543-563 D

Measuring range mm	No.	Error limits μm	Measuring force N	Max. speed mm/sec.	Resolution mm	Mass g
30	543-561 D	2,5	$\leq 2,0$	1100	0,001 / 0,0005	290
60	543-563 D	3,5	$\leq 2,5$	1100	0,001 / 0,0005	305



Measurements in () = 543-561 D

Functions Dial Indicator	Series 543
ON / OFF	●
Modes: Max Hold	●
Min Hold	●
TIR function	●
Selected resolution	●
Analogue measuring range switching	●
Zero-setting INC/ABS	●
PRESET	●
Input of tolerance limits	●
Counting direction switching	●
Key lock function	●
Data output RS-232 C / DIGIMATIC	●
Data input RS-232 C (ASCII command set)	●

Remote control functions	Series 543
Data transmission	●
Resetting after max/min/TIR measurement	●
Switching max/min/TIR	●
Call-up PRESET value (preselection)	●
Set to zero	●

Specifications

Accuracy: Factory specification
 Resolution: 0,001/0,0005 mm switchable
 Probe: Carbide ball, thread M 2,5 x 0,45 mm
 Power supply: AC adapter

Optional accessory

- No. 21EZA099 Remote control (range approx. 6 m)
- No. 540774 Cable release (stroke 30 mm)
- No. 21EZA101 Lifter button
- No. 21EAA130 RS-232 cable (1 m)
- No. 21EAA131 RS-232 cable (2 m)
- No. 936937 Signal cable (1 m)
- No. 965014 Signal cable (2 m)
- No. 215-505 Comparator stand

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Standard accessory

- No. 09EAA119D AC adapter
- No. 137693 Lift lever

Consumable Spares

- No. 011450 Battery for remote control 4 x LR03



Dial Indicator with comparator stand no. 215-505, Remote control no. 21EZA099 and Cable release no. 540774 (optional accessory)

ABSOLUTE DIGIMATIC Dial Indicator ID-B and ID-N

- **Electronical multi-function dial indicator with absolute capacitive scale.**

The zero position is set only once and is retained when the device is switched back on. Measuring precision even at highest speed. Large display characters for easy reading.

Series 543

With visual tolerance-monitoring

- Specially for installation in systems where space is restricted.
- Flexible installation options with switchable display orientation.
- With DIGIMATIC-Signal input and DIGIMATIC-Data output.
- IP-66 protection and oil resistant.

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Absolute System Patented by MITUTOYO

IP66

Functions	Series 543
ON / OFF	●
Zero-setting INC/ABS	●
PRESET	●
Input of tolerance limits	●
Counting direction switching	●
Data output DIGIMATIC	●
Signal input DIGIMATIC (external call-up of PRESET or zero setting)	●

Specifications

Protection class: IP-66
(also with signal cable)
Accuracy: Factory specification
Probe: Carbide ball,
thread M 2,5 x 0,45 mm
Power supply: 1 battery SR-44

Optional accessory

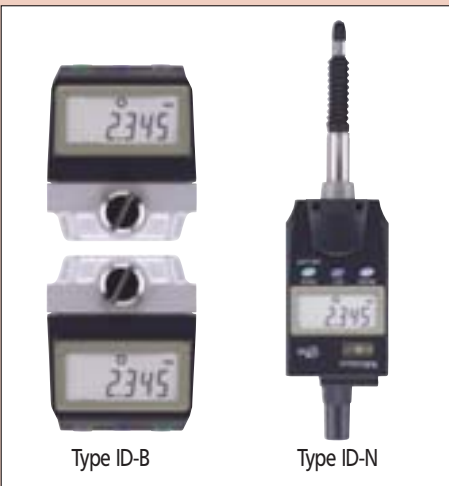
No. 21EAA194 Signal cable (1 m)
No. 21EAA190 Signal cable (2 m)
No. 21EAA143 Rear lid with eyelet
No. 21EZA105 Lifter button for type ID-N
For various accessories see pages 200 and 201.
For special measuring inserts see pages 202 and 203.



543-575 (Type ID-N)



543-580 (Type ID-B)



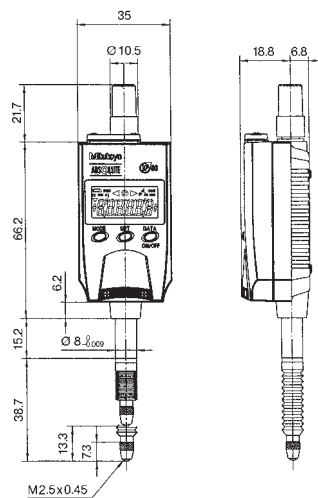
Type ID-B

Type ID-N

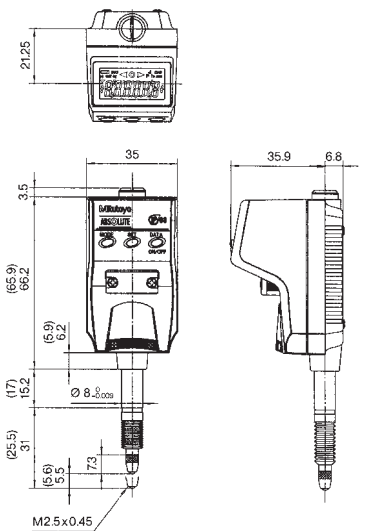
Flexible installation options with switchable display orientation (overhead use).

Resolution mm	Measuring range mm	No.	Version	Error limits mm	Measuring force N
0,01	5,0	543-580*	(Type B) Top reading	0,02	≤ 2
0,001 / 0,01	5,0	543-585*	(Type B) Top reading	0,003 / 0,01	≤ 2
0,01	12,7	543-570*	(Type N) Front reading	0,02	≤ 2
0,001 / 0,01	12,7	543-575*	(Type N) Front reading	0,003 / 0,01	≤ 2

* Available from October 2005



543-570 / 543-575



543-580 / () = 543-585

™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Dial Indicator ID-U

- The zero-position is set only once and is stored as the absolute zero-position until the next battery replacement.
- Measuring precision even at highest speed. Large display characters for easy reading.

Series 575

Slender construction

Electronic dial indicator with absolute capacitive scale, with data output

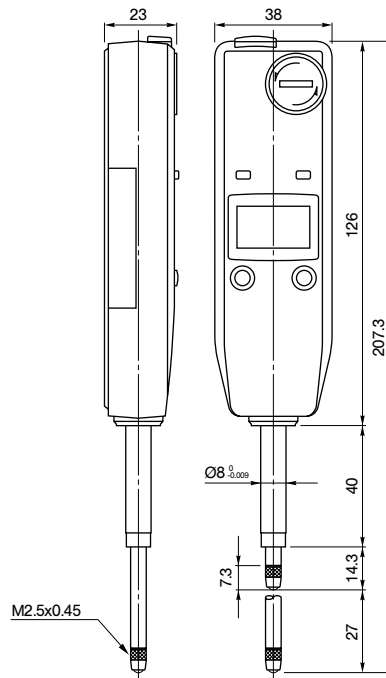
ABSOLUTE™

Absolute System Patented by MITUTOYO



575-121

Resolution mm	Measuring range mm	No.	Error limits mmN	Measuring force g	Mass
0,01	25	575-121	0,021,8	140	



542-007D

Display unit for dial indicators with DIGIMATIC output such as no. 542-007 D see pages 257, 258 and 260

Functions	Series 575
ON / OFF	●
ORIGIN-setting	●
Counting direction switching	●
Data output	●

Specifications

6 digit LCD-display

Accuracy: Factory specification
 Probe: Carbide ball,
 thread M 2,5 x 0,45 mm

Power supply: 1 battery SR-44
 Battery life: approx. 2000 hours

Optional accessory

No. 905338 Signal cable (1 m)

No. 905409 Signal cable (2 m)

No. 540774 Cable release

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Consumable Spares

No. 938882 Battery SR-44

Analogue Dial Indicators

Properties	Series 0	
	1913 B-10	1911 B
Double sided scale		
Jewel bearing		

Specifications

Accuracy: Factory specification
Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Series 0 Miniature version



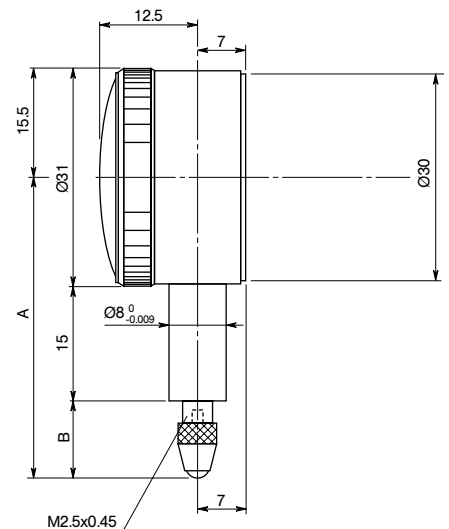
1913 B-10



1911 B

Measuring range mm	Graduation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note	A mm	B mm
0,5	0,002	1913 B-10	0-100-0	0,2	5	8	2	1,8	50		40	9,5
2,5	0,01	1911 B	0-50-0	1,0	10	13	3	1,4	50		42	11,5

No. without „B“ Δ Lid with eyelet supplied



Analogue Dial Indicators




Series 1 Small version



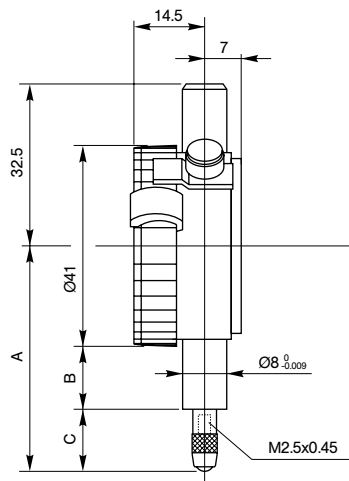
1013 FB












1040 FB

Measuring range mm	Graduation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note	A mm	B mm	C mm
1,0	0,002	1013 FB	0-100-0	0,2	8	10	2	1,5	79	 	49	13	15,5
3,5	0,01	1040 FB	0-50 (50-0)	0,5	12	14	3	1,4	84	 	46	13	12,5

No. without "B" Δ Lid with eyelet supplied



Properties	Series 1	
	1013 FB	1040 FB
 Continuous scale		
 Double sided scale		
 Wide scale spacing		
 Jewel bearing		

Specifications

Accuracy: Factory specification

Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

	1044 FB	1044 FB-10	1044 FB-60
Properties			
Continuous scale	●	●	●
Jewel bearing	●	●	●
DIN Standard	●	●	●
Splash proof			●
Low measuring force		●	

Specifications

Accuracy: Factory specification / DIN
 Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.
 For special measuring inserts see pages 202 and 203.

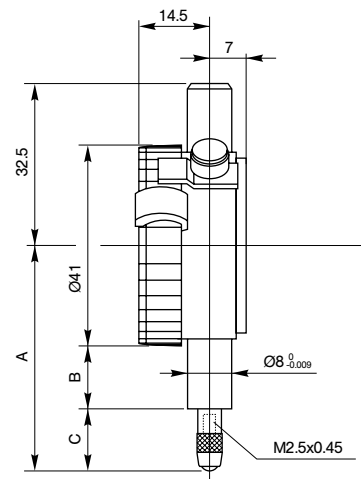
Analogue Dial Indicators

Series 1 Small version



Measuring range mm	Gr- duation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note	A mm	B mm	C mm
5	0,01	1044 FB	0-100 (100-0)	1	12	14	3	1,4	86		47,5	13,0	14
5	0,01	1044 FB-60	0-100 (100-0)	1	12	14	3	2,0	86		57,0	11,5	25
Low measuring force													
5	0,01	1044 FB-10	0-100 (100-0)	1	12	14	3	0,4	86		47,5	13,0	14

No. without "B" Δ Lid with eyelet supplied



Analogue Dial Indicators

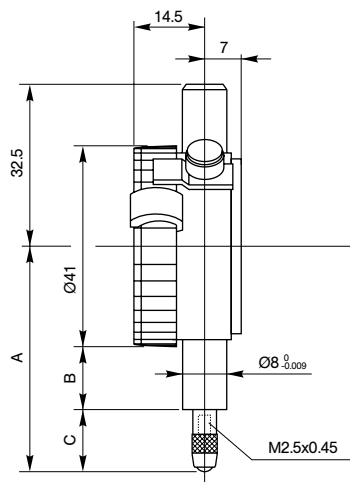
Series 1 Small version



1045 FB

Measuring range mm	Graduation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note	A mm	B mm	C mm
5	0,01	1045 FB	0-50-0	1	12	14	3	1,4	86		47,5	13	14

No. without "B" Δ Lid with eyelet supplied



Properties

Double sided scale

DIN Standard

Series 1
1045 FB

Specifications

Accuracy: Factory specification / DIN

Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Analogue Dial Indicators

Series 2

Standard size with 0.001 mm graduation



Properties	2109 SB-10	2110 SB-10	2110 SB-70
Continuous scale		●	●
Double sided scale	●	●	●
Shock proof	●	●	●
Wide scale spacing		●	●
Splash proof		●	●
Jewel bearing	●	●	●

Specifications

Accuracy: Factory specification
Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

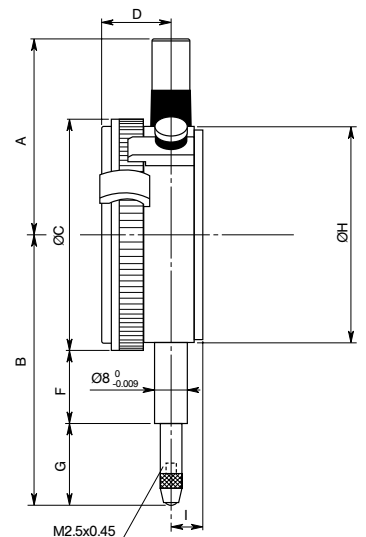


No. 2110 SB-70 in stand no. 7002 M

Measuring range mm	Graduation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
1	0,001	2109 SB-10	0-100-0	0,2	3	5	2	1,5	139	Continuous scale, Double sided scale, Shock proof, Wide scale spacing, Jewel bearing
1	0,001	2110 SB-10	0-100 (100-0)	0,1	3	5	2	1,5	140	Continuous scale, Double sided scale, Shock proof, Wide scale spacing, Jewel bearing
1	0,001	2110 SB-70	0-100 (100-0)	0,1	3	5	2	2,0	141	Continuous scale, Double sided scale, Shock proof, Wide scale spacing, Jewel bearing, Splash proof

No. without "B" Δ Lid with eyelet supplied

No.	A mm	B mm	C mm	D mm	F mm	G mm	H mm	I mm
2109 SB-10	48,8	60,5	57,0	17,7	16,9	15,1	52	7,6
2110 SB-10	48,8	66,5	57,0	17,7	16,9	21,2	52	7,6
2110 SB-70	48,8	67,5	57,0	17,7	12,3	26,7	52	7,6



Analogue Dial Indicators

Series 2

Standard size with 0.001 mm graduation



2113 SB-10



2118 SB-10

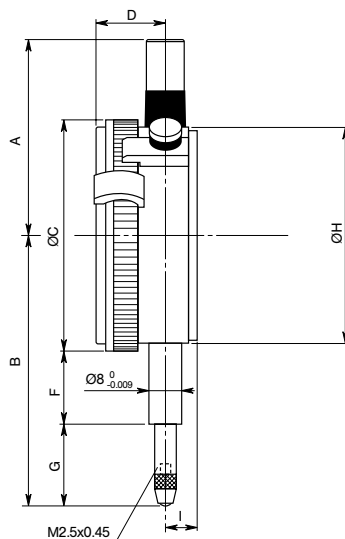


2119 SB-10

Measuring range mm	Graduation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
2	0,001	2113 SB-10	0-100-0	0,2	5	7	2	1,5	139	☑ ☑ ☑
5	0,001	2118 SB-10	0-100-100	0,2	8	10	2	1,5	137	☑ ☑ ☑
5	0,001	2119 SB-10	0-100-0	0,2	8	10	2	1,5	137	☑ ☑ ☑

No. without "B" Δ Lid with eyelet supplied

No.	A mm	B mm	C mm	D mm	F mm	G mm	H mm	I mm
2113 SB-10	48,8	61,0	57	17,7	16,9	15,6	52	7,6
2118 SB-10	48,8	60,3	57	17,7	16,9	14,9	52	7,6
2119 SB-10	48,8	60,3	57	17,7	16,9	14,9	52	7,6



Properties	2113 SB-10	2118 SB-10	2119 SB-10
☑ Continuous scale	☑	☑	☑
☑ Double sided scale	☑	☑	☑
☑ Shock proof	☑	☑	☑
☑ Jewel bearing	☑	☑	☑

Specifications

Accuracy: Factory specification

Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.



No. 2113 SB-10 in stand no. 7002 M

Analogue Dial Indicators

Series 2

Standard size with 0.01 mm graduation

Properties	2044 SB	2045 SB	2046 SB/SYB	2046 SB-09	2046 SB-15	2902 SB	2047 SB
Continuous scale	●	●	●	●	●	●	●
Double sided scale		●					●
Shock proof				●			
Low measuring force					●		
Jewel bearing					●		
DIN Standard	●	●	●	●	●	●	●
Scale graduation counterclockwise						●	

Specifications

Accuracy: DIN

Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.



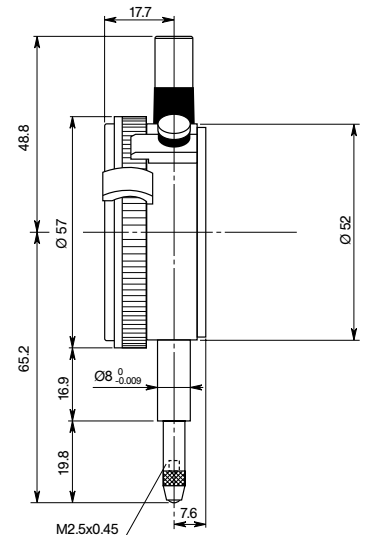
Measuring range mm	Graduation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
5	0,01	2044 SB	0-100 (100-0)	1	10	13	3	1,4	136	
5	0,01	2045 SB	0-50-0	1	10	13	3	1,4	136	
10	0,01	2046 SB*	0-100 (100-0)	1	12	15	3	1,4	135	
10	0,01	2046 SB-09	0-100 (100-0)	1	15	17	3	1,4	137	
10	0,01	2046 SB-15	0-100 (100-0)	1	15	17	3	0,8	136	
10	0,01	2902 SB	100-0	1	12	15	3	1,4	135	
10	0,01	2047 SB	0-50-0	1	12	15	3	1,4	135	

* Also available with yellow dial plate, no. 2046 SYB

No. without "B" Δ Lid with eyelet supplied



No. 2044 SB in stand no. 7002 M



Analogue Dial Indicators

Series 2

Standard size with spray-water protection and 0.01 mm graduation



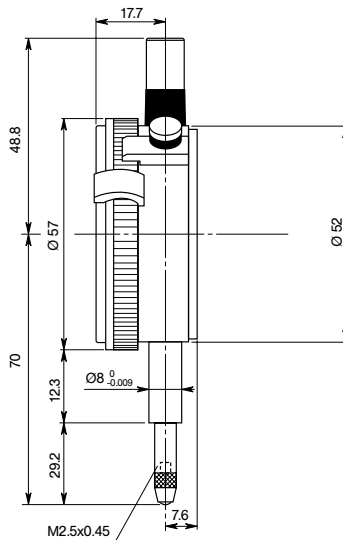
2044 SB-60



2046 SB-60

Measuring range mm	Graduation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
5	0,01	2044 SB-60	0-100 (100-0)	1,0	10	14	3	2,5	138	
10	0,01	2046 SB-60	0-100 (100-0)	1,0	12	17	3	2,5	137	
10	0,01	2046 SB-69	0-100 (100-0)	1,0	15	17	3	2,5	139	

No. without "B" Δ Lid with eyelet supplied



Properties

	2044 SB-60	2046 SB-60	2046 SB-69
Continuous scale			
Shock proof			
Splash proof			

Specifications

Accuracy: Factory specification
Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.



No. 2044 SB-60 in stand no. 7002 M

Analogue Dial Indicators

Series 2

Standard size with 0.01 mm graduation



Properties	2050 SB-19	2052 SB-19	2952 SB
Continuous scale	●	●	●
Shock proof	●	●	●
Damped endpoint	●	●	●
Jewel bearing	●	●	●
Scale graduation counterclockwise			●

Specifications

Accuracy: Factory specification / DIN

Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

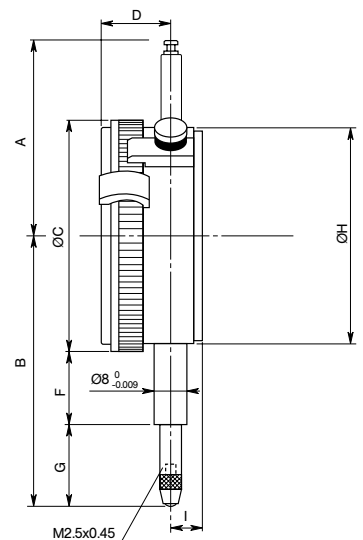


No. 2050 SB-19 in stand no. 7002 M

Measuring range mm	Graduation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
20	0,01	2050 SB-19	0-100 (100-0)	1	25	30	4	2,0	140	● ● ● ●
30	0,01	2052 SB-19	0-100 (100-0)	1	30	35	4	2,5	143	● ● ● ●
30	0,01	2952 SB	100-0	1	30	35	4	2,5	143	● ● ● ●

No. without "B" Δ Lid with eyelet supplied

No.	A mm	B mm	C mm	D mm	F mm	G mm	H mm	I mm
2050 SB-19	38,8	75,2	57	17,7	16,9	29,8	52	7,6
2052 SB-19	38,8	88,7	57	17,7	16,9	43,3	52	7,6
2952 SB	38,8	88,7	57	17,7	16,9	43,3	52	7,6



Analogue Dial Indicators

Series 2

Standard size with 0.01 mm graduation (special design)



	2046 SB-80	2048 SB-10	2940 S
Properties			
Adjustable pointer			
Continuous scale			
Rev counter central			
Jewel bearing			
DIN Standard			
Slave pointer			
Display on both sides			

Specifications

Accuracy: Factory specification / DIN
Delivered with factory certificate

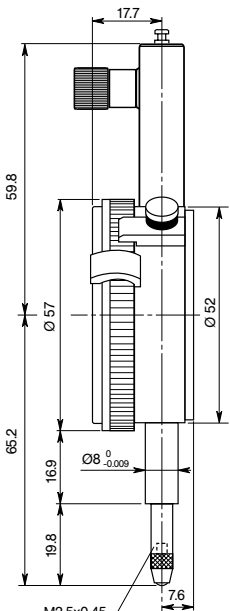
Notation "B" = without eyelet

For various accessories see pages 200 and 201.

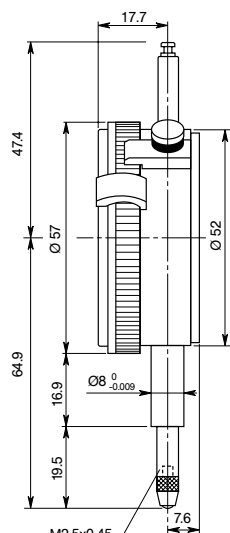
For special measuring inserts see pages 202 and 203.

Measuring range mm	Graduation mm	No.	Scale	1 Pointer rotation mm	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
10	0,01	2046 SB-80	0-100 (100-0)	1,0	12	17	3	5,0	149	
10	0,01	2048 SB-10	0-100 (100-0)	1,0	15	17	3	1,4	135	
10	0,01	2940 S	0-100 (100-0)	1,0	15	17	3	3,0	220	Display on both sides

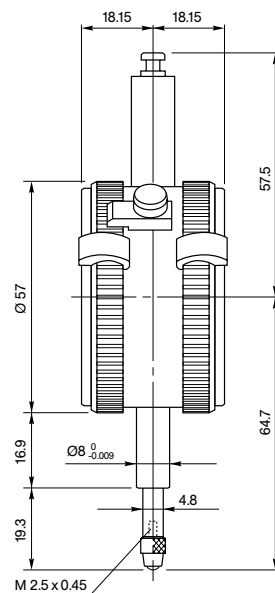
No. without "B" Δ Lid with eyelet supplied



2046 SB-80



2048 SB-10



2940 S

Analogue Dial Indicator with one pointer rotation

• Dial indicator for avoidance of reading errors that occur with dial indicators with continuous readout.

Series 2

Extremely light but robust design with dust protector



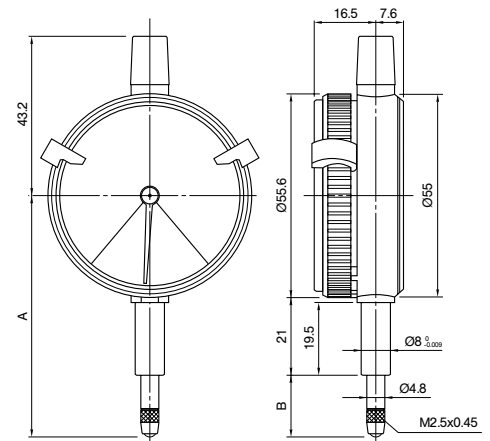
2971



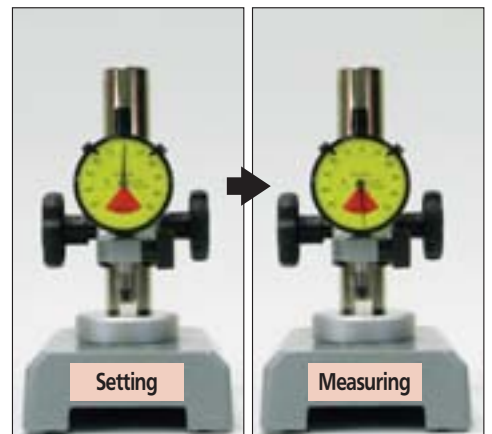
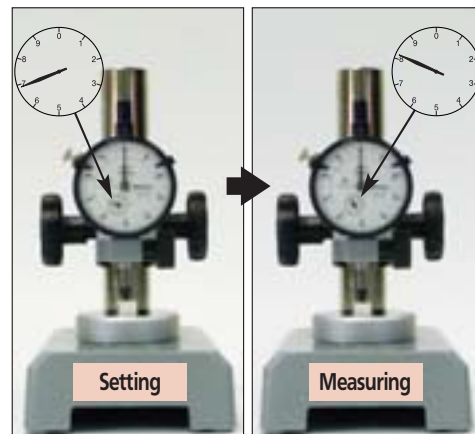
2972

Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
0,5	0,01	2971	25-0-25	8	11	3	1,4	75	☑ ☑ ☑ ☑
1	0,01	2972	50-0-50	10	13	3	1,4	75	☑ ☑ ☑ ☑

No.	A mm	B mm
2971	65,6	16,8
2972	66,0	17,2



• Avoidance of human error increases operating safety



Should the workpiece be approx. 1 mm larger than the nominal dimension, the part is assessed as good if the small pointer is ignored.

Fault-free identification of rejects.

Properties	Series 2	
	2971	2972
☑ Shock proof	☑	☑
☑ One pointer rotation	☑	☑
☑ Dust proof	☑	☑

Specifications

Accuracy: Factory specification
Delivered with factory certificate

Cover cannot be retrofitted

Analogue Dial Indicators with one pointer rotation

- The dial indicators with one pointer rotation eliminate reading errors occurring with dial indicators with continuous reading.

Series 1

Small design with 0.001 mm graduation



Properties	Series 1	
	1900 FB-60	1900 FB-62
Shock proof	●	●
One pointer rotation	●	●
Splash proof	●	●
Jewel bearing	●	●
Dust proof		●

Specifications

Accuracy: Factory specification

Delivered with factory certificate

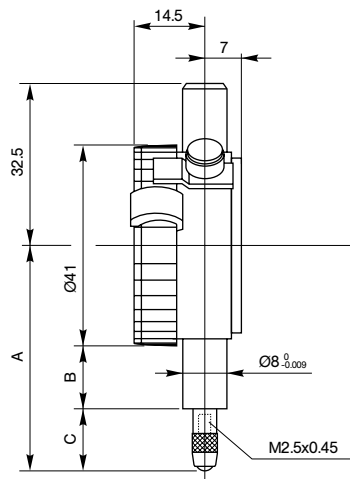
Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_l μm	Measuring force max. N	Mass g	Note	A mm	B mm	C mm
0,1	0,001	1900 FB-60	50-0-50	3	5	2	1,5	85	☐ ☐ ☐	54,5	11,5	22,5
0,1	0,001	1900 FB-62	50-0-50	3	5	2	1,5	85	☐ ☐ ☐	53,5	16,0	17,0

No. without "B" Δ Lid with eyelet supplied

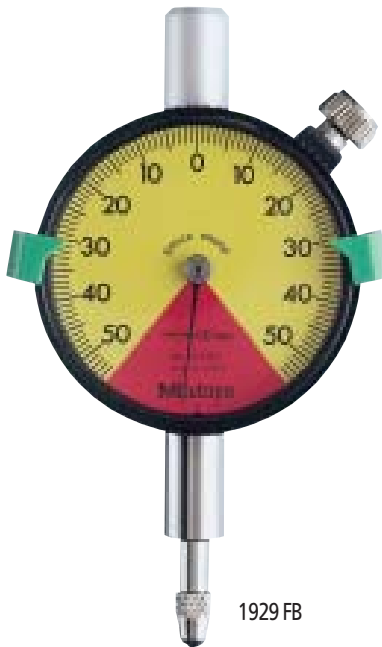


Analogue Dial Indicators with one pointer rotation

- The dial indicators with one pointer rotation eliminate reading errors occurring with dial indicators with continuous reading.

Series 1

Small design with 0.01 mm graduation



1929 FB



1929 FB-60

Properties	1929 FB	1929 FB-60	1929 FB-62
Shock proof	●	●	●
One pointer rotation	●	●	●
Splash proof		●	●
Dust proof			●

Specifications

Accuracy: Factory specification
Delivered with factory certificate

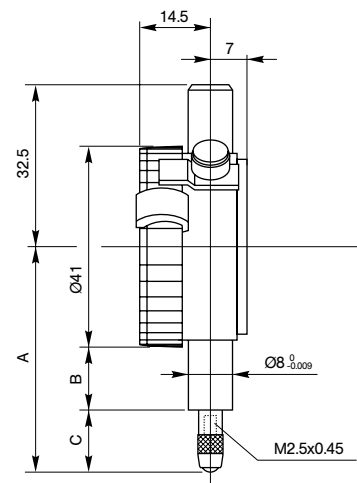
Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_l μm	Measuring force max. N	Mass g	Note	A mm	B mm	C mm
1	0,01	1929 FB	50-0-50	10	13	3	1,4	85	☐ ☐	47,5	13,0	14,0
1	0,01	1929 FB-60	50-0-50	10	13	3	1,4	85	☐ ☐ ●	55,5	11,5	23,5
1	0,01	1929 FB-62	50-0-50	10	13	3	1,4	85	☐ ☐ ● ☐	47,5	13,0	14,0

No. without "B" Δ Lid with eyelet supplied



Analogue Dial Indicators with one pointer rotation

- The dial indicators with one pointer rotation eliminate reading errors occurring with dial indicators with continuous reading.

Series 2

Standard size with 0.001 mm graduation



2900 SB-10

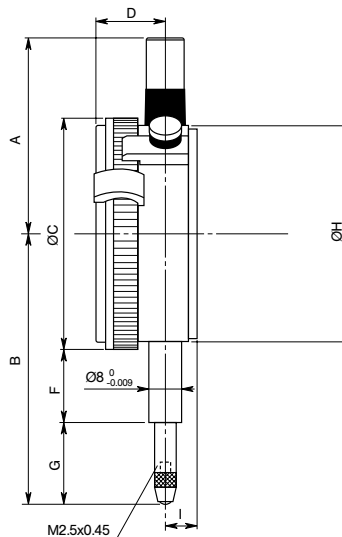


2900 SB-70

Measuring range mm	Gra- duation mm	No.	Scale	f_e	f_{ges}	f_u	Measuring force max. N	Mass g	Note
				μm	μm	μm			
0,08	0,001	2900 SB-10	50-0-50	2	3	1,5	1,4	140	☑ ☑ ☑
0,08	0,001	2900 SB-70	50-0-50	2	3	1,5	1,4	170	☑ ☑ ☑ ☑

No. without "B" Δ Lid with eyelet supplied

No.	A	B	C	D	F	G	H	I
	mm	mm	mm	mm	mm	mm	mm	mm
2900 SB-10	48,8	66	57	17,7	16,9	20,6	52	7,6
2900 SB-70	48,8	67	57	17,7	12,3	26,2	52	7,6



Properties	Series 2	
	2900 SB-10	2900 SB-70
☑ Shock proof	☑	☑
☑ One pointer rotation	☑	☑
☑ Splash proof		☑
☑ Jewel bearing	☑	☑

Specifications

Accuracy: Factory specification

Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Properties	2929 SB	2929 SB-60	2929 SB-62	2928 SB
Shock proof	●	●	●	●
One pointer rotation	●	●	●	●
Splash proof	●	●	●	●
Dust proof	●	●	●	●

Analogue Dial Indicators with one pointer rotation

- The dial indicators with one pointer rotation eliminate reading errors occurring with dial indicators with continuous reading.

Series 2

Standard size with 0.01 mm or 0.1 mm graduation

Specifications

Accuracy: Factory specification

Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.



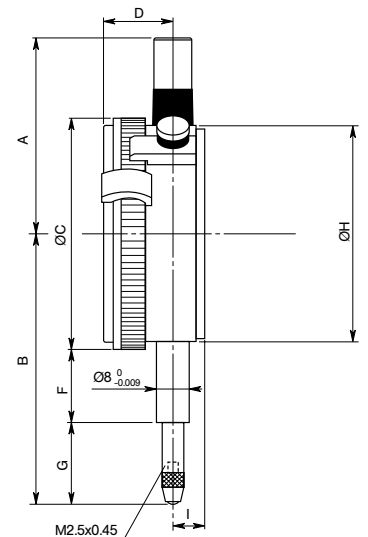
No. 2929 SB in stand no. 7002 M



Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
0,8	0,01	2929 SB	50-0-50	7	10	3	1,4	136	☑☑☑
0,8	0,01	2929 SB-60	50-0-50	7	10	3	2,0	137	☑☑☑☑
0,8	0,01	2929 SB-62	50-0-50	7	10	3	2,0	136	☑☑☑☑
4	0,1	2928 SB	2,5-0-2,5	40	50	10	1,4	136	☑☑☑☑

No. without "B" △ Lid with eyelet supplied

No.	A	B	C	D	F	G	H	I
	mm	mm	mm	mm	mm	mm	mm	mm
2929 SB	48,8	65,2	57	17,7	16,9	19,8	52	7,6
2929 SB-60	48,8	70,0	57	17,7	12,3	29,2	52	7,6
2929 SB-62	48,8	65,2	57	17,7	16,9	19,8	52	7,6
2928 SB	48,8	65,2	57	17,7	16,9	19,8	52	7,6



Analogue Dial Indicators

Series 3

With large scale dia. 78 mm



Properties

	3109 FB	3046 FB	3047 FB
Continuous scale		●	
Shock proof	●		
Double sided scale	●		●
Jewel bearing	●		
DIN Standard		●	●

Specifications

Accuracy: Factory specification / DIN

Delivered with factory certificate

Notation "B" = without eyelet

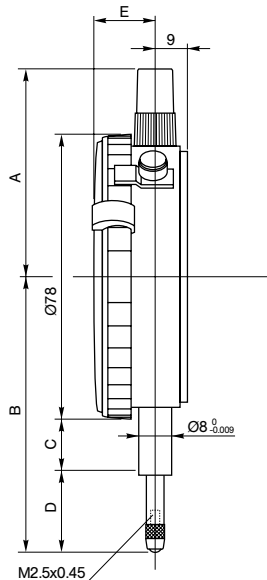
For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
1	0,001	3109 FB	0-100-0	3	5	2	1,5	245	Shock proof, Jewel bearing, Shock proof
10	0,01	3046 FB	0-100 (100-0)	15	17	3	1,4	233	Shock proof, DIN
10	0,01	3047 FB	0-50-0	15	17	3	1,4	238	Shock proof, DIN

No. without "B" Δ Lid with eyelet supplied

No.	A mm	B mm	C mm	D mm	E mm
3109 FB	56	79,0	25,0	15	17,0
3046 FB	56	75,5	15,5	21	16,5
3047 FB	56	75,5	15,5	21	16,5



Analogue Dial Indicators

Series 3

With large scale dia. 78 mm



Properties	3050 FB	3052 FB	3058 FB	3060 FB	3062 FB
Continuous scale	●	●	●	●	●
Shock proof	●	●	●	●	●
Rev counter central	●	●	●	●	●
Jewel bearing	●	●	●	●	●

Specifications

Accuracy: Factory specification
Delivered with factory certificate

Notation "B" = without eyelet

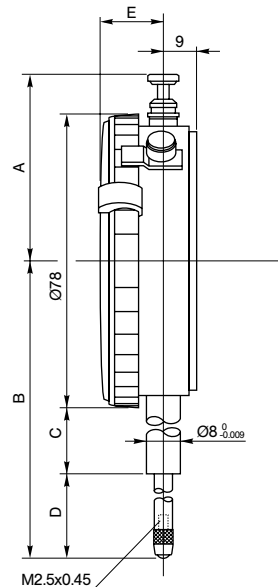
For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
20	0,01	3050 FB	0-100 (100-0)	25	29	4	2,0	246	Continuous scale, Shock proof, Rev counter central, Jewel bearing
30	0,01	3052 FB	0-100 (100-0)	30	34	4	2,5	250	Shock proof, Rev counter central, Jewel bearing
50	0,01	3058 FB	0-100 (100-0)	50	55	5	3,0	265	Continuous scale, Shock proof, Rev counter central, Jewel bearing
80	0,01	3060 FB	0-100 (100-0)	50	60	11	3,0	300	Continuous scale, Shock proof, Rev counter central, Jewel bearing
100	0,01	3062 FB	0-100 (100-0)	60	70	15	3,2	300	Continuous scale, Shock proof, Rev counter central, Jewel bearing

No. without "B" Δ Lid with eyelet supplied

No.	A mm	B mm	C mm	D mm	E mm
3050 FB	49	93	25	29	16,5
3052 FB	73	104	25	40	17,0
3058 FB	82	142	43	60	17,0
3060 FB	112	202	74	91	16,0
3062 FB	132	243	94	110	16,0



Analogue Dial Indicators

Series 4

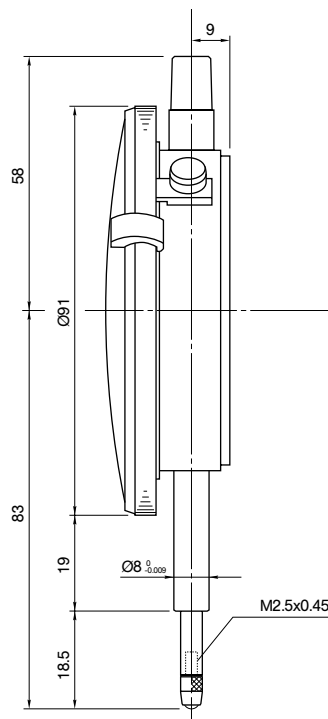
With extra large scale dia. 91 mm



4046 FB

Measuring range mm	Grada- tion mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
10	0,01	4046 FB	0-100 (100-0)	15	17	3	1,4	350	

No. without "B" Δ Lid with eyelet supplied



Properties

Continuous scale

DIN Standard

Series 4
4046 FB

Specifications

Accuracy: Factory specification / DIN

Delivered with factory certificate

Notation "B" = without eyelet

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Analogue Dial Indicators

Series 1

Dial indicators with rear spindle

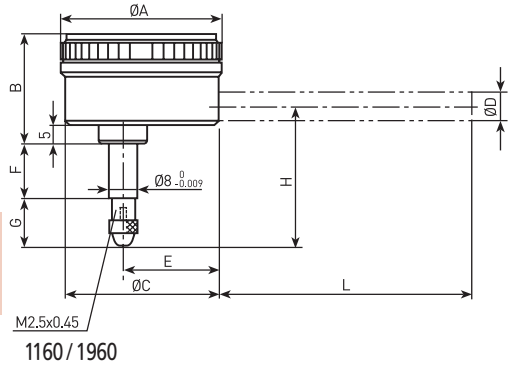


1960



1160

Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
1,0	0,01	1960	50-0-50	12	15	3	1,4	85	
5,0	0,01	1160	0-100	15	19	4	1,4	85	



No.	A mm	B mm	C mm	E mm	F mm	G mm	H mm
1960	39	21,5	36	22	25,0	13,8	43,3
1160	39	21,5	36	22	28,7	12,8	45,5

Properties	1960	1160	2990	2960 F
Continuous scale				
Shock proof				
One pointer rotation				
Jewel bearing				

Specifications

Delivered with factory certificate

Optional accessory

- No. 136568 Stem
Ø D: 8 mm L: 81 mm
- No. 21AAA168 Stem
Ø D: 8 mm L: 42 mm

For special measuring inserts see pages 202 and 203.

Series 2

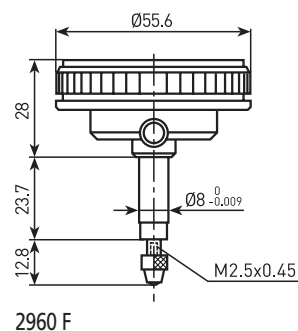
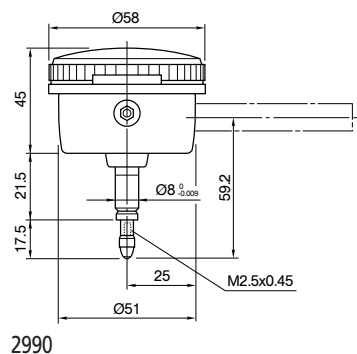


2990



2960 F

Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force max. N	Mass g	Note
0,1	0,001	2990	50-0-50	3	5	2	1,5	220	
1,0	0,01	2960 F	50-0-50	12	15	3	1,4	115	



Specifications

Delivered with factory certificate

Optional accessory

- No. 136568 Stem
Ø D: 8 mm L: 81 mm
- No. 21AAA168 Stem
Ø D: 8 mm L: 42 mm

For special measuring inserts see pages 202 and 203.

Dial Indicator "HICATOR"

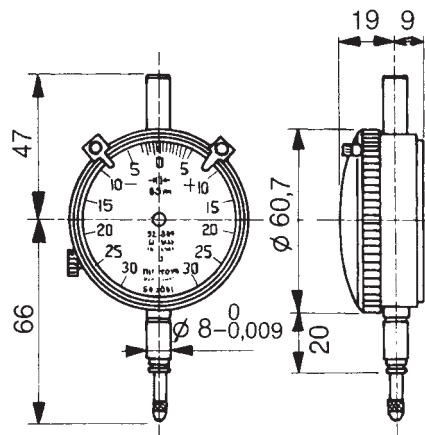
- High accuracy dial indicator with precision jewel bearing and large dial plate, shock proof.

Series 524



524-501

Graduation μm	No.	Measuring range μm	Error limits μm	Repeatability μm	Hysteresis error μm	Mass g
0,5	524-500	± 30	0,5	0,2	0,5	162
1,0	524-501	± 50	1,0	0,3	0,5	162



Specifications

Accuracy: Factory specification
 Stem: $\varnothing 8 \text{ h6}$
 Free lift: 3 mm
 Measuring force: 1,2 N

Standard accessory

No. 139462 Cable release

For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.

Dial Indicator "Signal-HICATOR"

Series 524

Specifications

Accuracy: Factory specification
 Stem: $\varnothing 8\ h6$
 Free lift: 3 mm
 Measuring force: 1,2 N

Standard accessory

No. 139404 Signal cable (2 m)
 No. 139462 Cable release

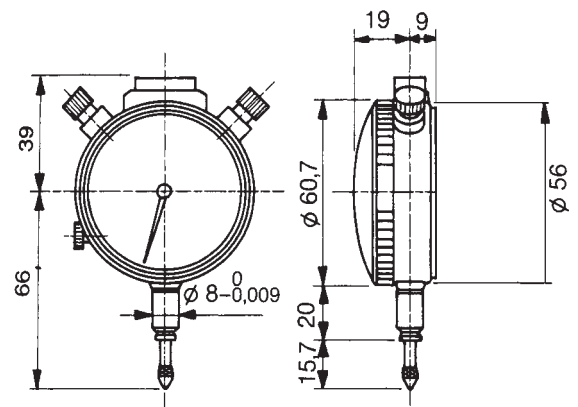
For various accessories see pages 200 and 201.

For special measuring inserts see pages 202 and 203.



524-601

Graduation μm	No.	Measuring range μm	Error limits μm	Repeatability μm	Hysteresis error μm	Mass g
1	524-601	± 50	1	0,3	0,5	140
10	524-603	± 500	5	2,0	2,0	140



Optional accessory for Dial Indicators analogue / digital

Lift lever



No. 21BZA205



No. 21AZB149



No. 902011



No. 903424

No. 21AZB150

Plastic cover (Series 2 No. 902066)

10 pieces per set, protection against oil and splash water



Tolerance markings

10 pieces per set



For Dial Indicators, series 2 Ø 55,6 mm

red: No. 136420

green: No. 136421

yellow: No. 136422



Example:
Dial indicator
with 3 stuck on
tolerance markings

Assorted color caps

for dial indicators with Measuring span ≤ 10 mm

With the exception of 2971/2972/2973 for identification

white: No. 115749

red: No. 128153

black: No. 128154

green: No. 128155

blue: No. 128156

yellow: No. 128157



Lift lever

(for all dial indicators)

Lift lever No. 137693

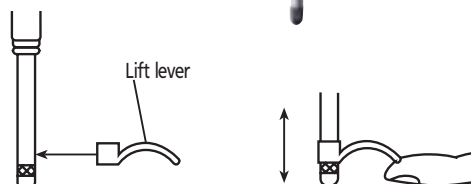


Tabelle Lift lever

For series	No.	Lift action mm	Art. No. Dial Indicator
1	21BZA205	5	1013 F(B), 1040 F(B), 1044 F(B), 1044 F(B)-10, 1044 F(B)-60*, 1045 F(B), 1900 F(B)-60*, 1900 F(B)-62**, 1929 F(B), 1929 F(B)-60*, 1929 F(B)-62**
2	21AZB149	10	2044 S(B), 2044 S(B)-60*, 2045 S(B), 2046 S(B), 2046 S(B)-09, 2046 S(B)-15, 2046 S(B)-60*, 2046 S(B)-69*, 2046 SY(B), 2047 S(B), 2109 S(B)-10, 2110 S(B)-10, 2110 S(B)-70*, 2113 S(B)-10, 2118 S(B)-10, 2119 S(B)-10, 2900 S(B)-10, 2900 S(B)-70*, 2902 S(B), 2928 S(B), 2929 S(B), 2929 S(B)-60*, 2929 S(B)-62**
2	21AZB150	20	2048 S(B)-10, 2050 S(B)-19, 2052 S(B)-19
3 + 4	903424	25	3046 S(B), 3047 F(B), 3109 F(B), 4046 S(B)
ID-C	902011	10	
ID-S	903424	10	

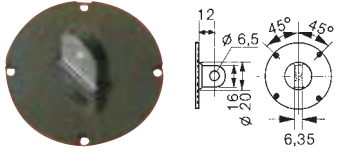
* When splash-waterproof dial indicators are used with lift levers, the dial indicator is not to be considered as splash-waterproof

** When dustproof dial indicators are used with lift levers, the dial indicator is not to be considered dust proof

Optional accessory for Dial Indicators

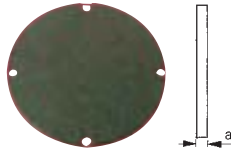
Lids for dial indicators without splash-waterproofing

with eyelet



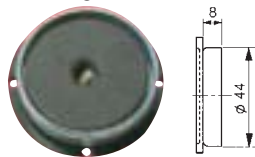
for Series 0	for Series 1	for Series 2	for Series 3 + 4	for ID-C + ID-F	for ID-S
No. 190561	No. 101210	No. 101040	No. 100691	No. 101040	No. 02ACB420

flat



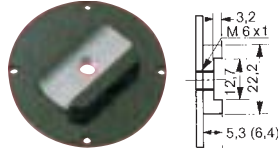
for Series 0	for Series 1	for Series 2	for Series 3 + 4	for ID-C + ID-F	for ID-S
No. 191559	No. 101211	No. 101039	No. 100836	No. 101039	No. 02ACB440
—	a = 2,2 mm	a = 2,5 mm	a = 3 mm	a = 2,5 mm	a = 2,5 mm

with magnet



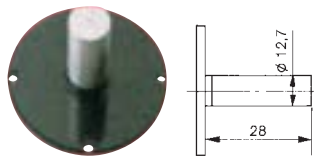
for Series 0	for Series 1	for Series 2	for Series 3 + 4	for ID-C + ID-F	for ID-S
—	—	No. 900928	No. 900929	No. 900928	No. 02ACB650

with adjustable stem



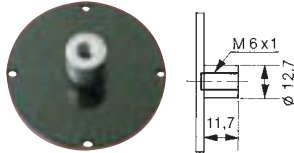
for Series 0	for Series 1	for Series 2	for Series 3 + 4	for ID-C + ID-F	for ID-S
—	No. 136025	No. 136026	No. 136027	No. 136026	No. 02ACB630

with bolt



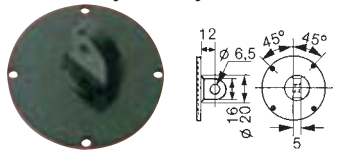
for Series 0	for Series 1	for Series 2	for Series 3 + 4	for ID-C + ID-F	for ID-S
—	No. 193172	No. 101169	No. 100839	No. 101169	No. 02ACB610

with threaded ring



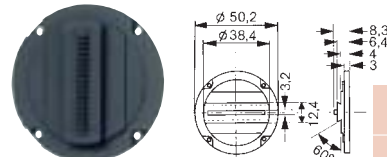
for Series 0	for Series 1	for Series 2	for Series 3 + 4	for ID-C + ID-F	for ID-S
—	No. 193173	No. 136023	No. 136024	No. 136023	No. 02ACB670

with laterally offset eyelet



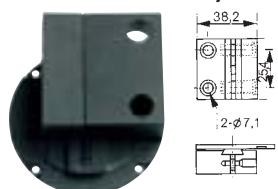
for Series 0	for Series 1	for Series 2	for Series 3 + 4	for ID-C + ID-F	for ID-S
—	—	No. 101167	No. 100837	No. 101167	No. 02ACB640

with rack



for Series 0	for Series 1	for Series 2	for Series 3 + 4	for ID-C + ID-F	for ID-S
—	—	No. 129902	—	No. 129902	—

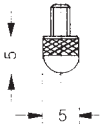
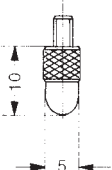
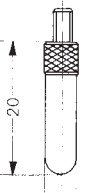
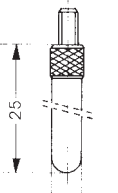
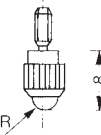
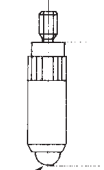
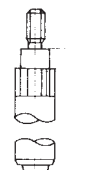
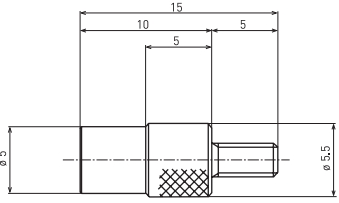
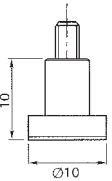
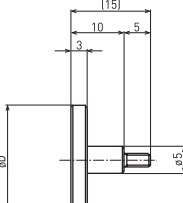
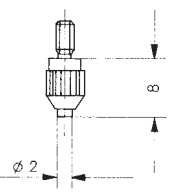
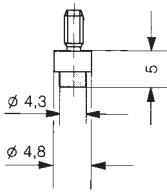
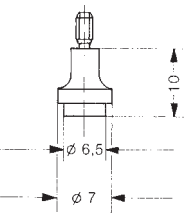
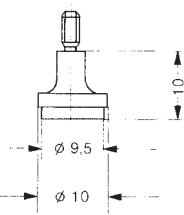
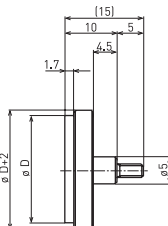
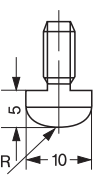
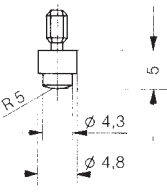
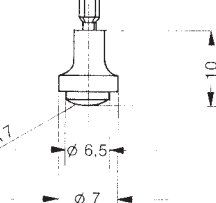
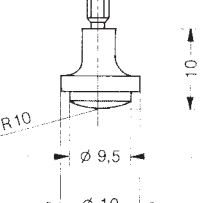
Set, including:
Rear lid with rack and adjustable stem



for Series 0	for Series 1	for Series 2	for Series 3 + 4	for ID-C + ID-F	for ID-S
—	—	No. 901963	—	No. 901963	No. 02ACB680

Special Probe Tips

• For dial indicators, depth gauges and dial test indicators. Thread: M2,5 x 0,45 mm.

<p>No. 101386 Steel</p>  <p>R = 2,5 mm</p>	<p>No. 101118 Steel</p>  <p>R = 2,5 mm</p>	<p>No. 101387 Steel</p>  <p>R = 2,5 mm</p>	<p>No. 101388 Steel</p>  <p>R = 2,5 mm</p>	
<p>No. 120045 Carbide No. 120046 Sapphire No. 120047 Ruby</p>  <p>R = 1,5 mm</p>	<p>No. 120049 Carbide No. 120050 Sapphire No. 120051 Ruby</p>  <p>R = 1,5 mm</p>	<p>No. 120053 Carbide No. 120054 Sapphire No. 120055 Ruby</p>  <p>R = 1,5 mm</p>		
<p>No. 21AAA340 Steel</p> 	<p>No. 101117 Steel</p>  <p>Ø10</p>	<p>No. 21AAA341 lapped ØD=15 mm No. 21AAA342 lapped ØD=20 mm No. 21AAA343 lapped ØD=25 mm No. 21AAA344 lapped ØD=30 mm</p> 		
<p>No. 120056 Carbide</p>  <p>Ø 2</p>	<p>No. 120041 Carbide</p>  <p>Ø 4,3 Ø 4,8</p>	<p>No. 120042 Carbide</p>  <p>Ø 6,5 Ø 7</p>	<p>No. 120043 Carbide</p>  <p>Ø 9,5 Ø 10</p>	<p>No. 21AAA345 Carbide ØD=15 mm No. 21AAA346 Carbide ØD=20 mm No. 21AAA347 Carbide ØD=25 mm No. 21AAA348 Carbide ØD=30 mm</p> 
<p>No. 101119 Steel</p>  <p>R = 7 mm</p>	<p>No. 120058 Carbide</p>  <p>R 5 Ø 4,3 Ø 4,8</p>	<p>No. 120059 Carbide</p>  <p>R 7 Ø 6,5 Ø 7</p>	<p>No. 120060 Carbide</p>  <p>R 10 Ø 9,5 Ø 10</p>	

Special Probe Tips

No. 120064
Carbide

No. 120065 Carbide $d=1,00$ mm
No. 120066 Carbide $d=0,45$ mm

No. 21AAA329 Carbide $\varnothing D=0,45$ mm
No. 21AAA330 Carbide $\varnothing D=1,00$ mm

No. 21AAA331 Carbide $L=8$ mm
No. 21AAA332 Carbide $L=10$ mm
No. 21AAA333 Carbide $L=20$ mm
No. 21AAA334 Carbide $L=40$ mm

No. 21AAA335 Carbide $L=8$ mm
No. 21AAA336 Carbide $L=10$ mm
No. 21AAA337 Carbide $L=20$ mm
No. 21AAA338 Carbide $L=40$ mm

No. 21AAA339
Carbide

No. 101122
Steel

No. 21AAA349 Carbide $\varnothing D=1,0$ mm
No. 21AAA350 Carbide $\varnothing D=1,5$ mm
No. 21AAA351 Carbide $\varnothing D=2,5$ mm
No. 21AAA352 Carbide $\varnothing D=4,0$ mm

No. 101385
Steel

Tip radius: 0,03 mm

No. 101120
Steel

Tip radius: 0,03 mm

No. 101121
Steel

No. 120057
Carbide

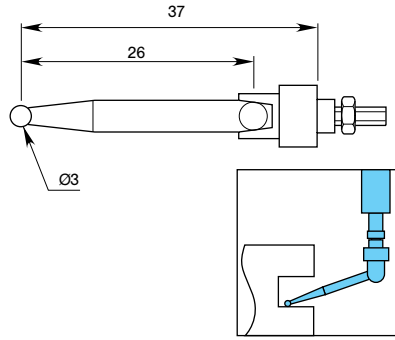
No. 120068
Carbide

No. 120067
Carbide

No. 120061 Carbide $t=0,4$ mm / $D=2$ mm
No. 120062 Carbide $t=0,6$ mm / $D=2$ mm
No. 120063 Carbide $t=1,0$ mm / $D=4$ mm

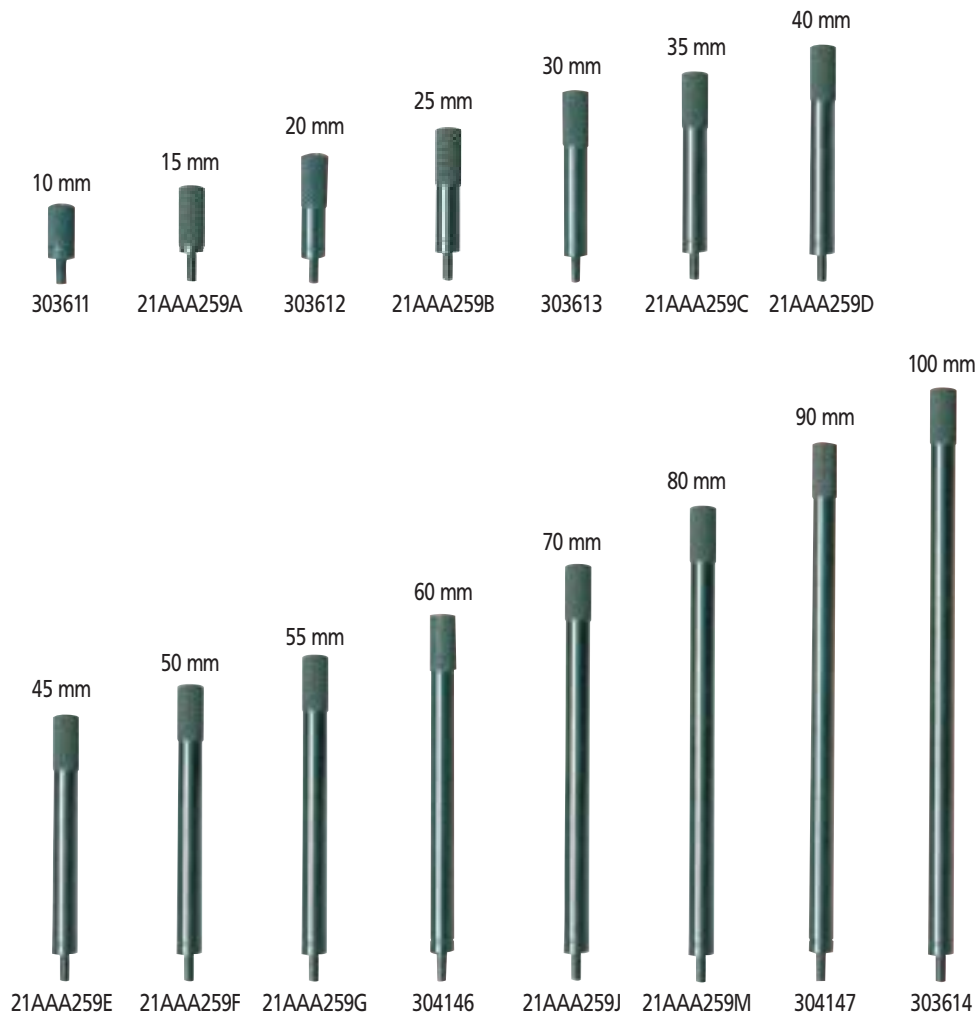
No. 901954
Steel

Universal-probe tip for dial indicators



No. 900391 Universal probe tip for dial indicators

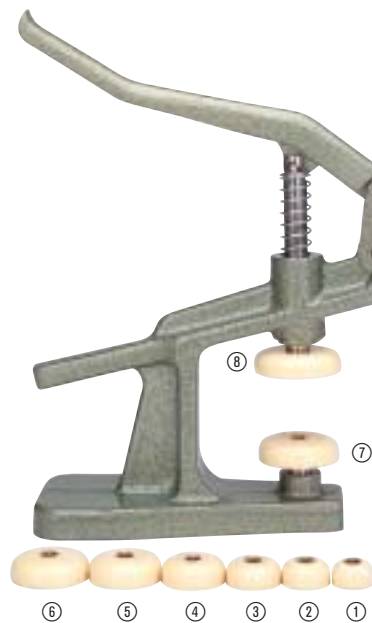
Interchangeable Extensions Ø 5 mm



Repair Tools for Dial Indicator

Crystal setter and assorted thrust pads

for inserting round dial glasses



No. 7000 Crystal setter and assorted thrust pads

No.	for diameter mm
①	19,5
②	22,5
③	25,5
④	28,5
⑤	32,5
⑥	35,0
⑦	38,0
⑧	50,0

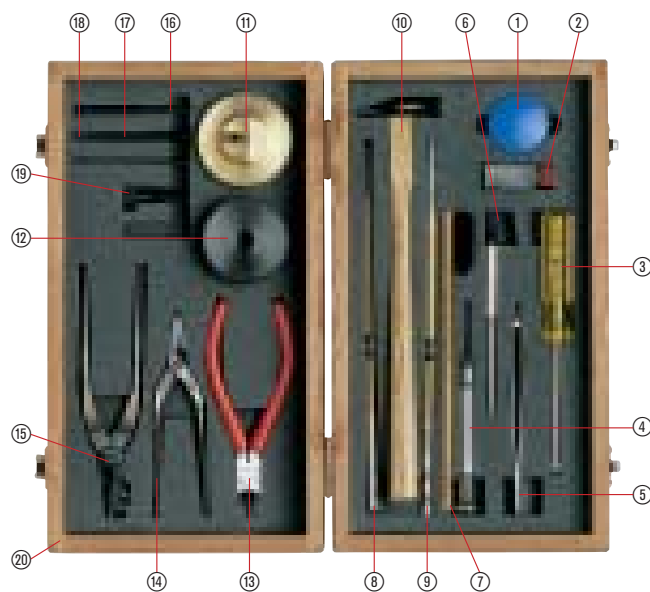
7000

Tool set

for repairing analogue dial indicators

No. 7823 Tool set

No.	Description
①	"Moly-Kote" lubricant grease
②	"Molub-Alloy" lubricant oil
③	Screwdriver
④	Screwdriver
⑤	Tweezers
⑥	Reamer holder
⑦	Brush
⑧	Paintbrush
⑨	Paintbrush
⑩	Hammer
⑪	Anvil, spindle resetting
⑫	Anvil spindle adjustment
⑬	Side cutting pliers
⑭	Flat pliers
⑮	Special flat pliers, Pointer drawer with pin 0.5 mm dia.
⑯	Pin punches
⑰	Hollow punch
⑱	Reamer
⑲	Anvil pinion
⑳	Wooden case

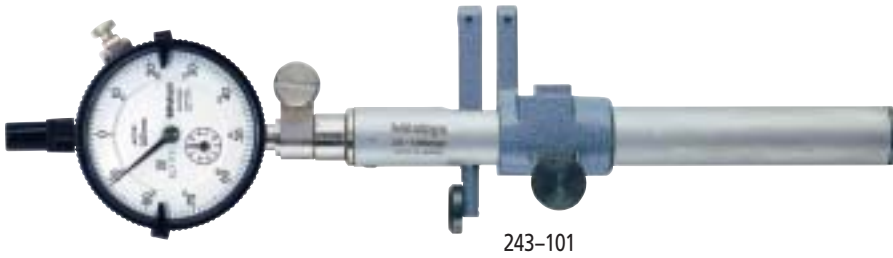


7823

Universal Female Thread Dial Indicator

- Interchangeable inserts for measuring of the pitch diameter in the case of female threads.
- Adjustable measuring jaws for different measuring ranges, Quick adjustment of one measuring jaw by spring pressure.

Series 243

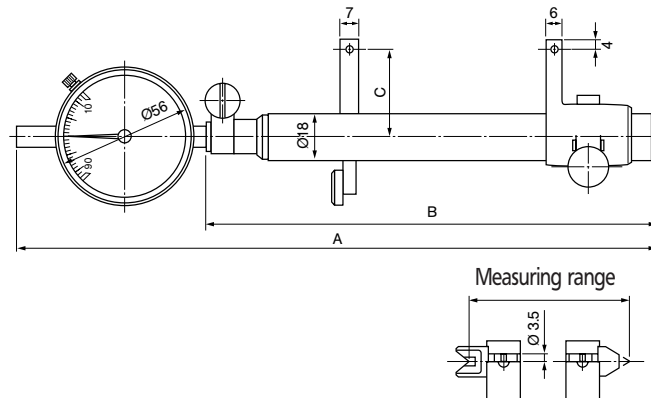


243-101

Specifications

Dial Indicator: No. 2046 SB, see page 185
 Graduation: 0,01 mm
 Measuring span: 10 mm
 Supplied without measuring inserts

No.	Measuring range	Jaw length	Holder bore in shank Ø mm	A	B	C	Mass
	mm	mm		mm	mm	mm	g
243-101	25-100	20	3,5	265	185	35	530
243-102	25-200	25	3,5	365	285	40	700
243-103	25-300	30	3,5	465	385	45	870



Optional accessory for Universal Female Thread Dial Indicator

Series 243

Interchangeable inserts for metric thread



243-800

No.	Pitch
Individual measuring sets	
243-801	0,4-0,5
243-802	0,6-0,9
243-803	1 -1,75
243-804	2 -3,0
243-805	3,5-5,0
243-806	5,5-7,0
Measuring sets (consisting of 243-801 to 243-806)	
243-800	0,4-7,0

Vertical Measuring Stage

- Compact, reasonably combination unit consisting of dial indicator and measuring stage.
- Suitable for testing small parts in the workshop.

Series 7

With ball probe tip $\varnothing 3$ mm

Specifications

No. 7051 with disk probe tip
 $\varnothing 6$ mm

No. 7050*, 7052*, 7053* with ball probe tip
R = 1,5 mm

* When using disk measuring faces (optional accessory) as a probe, parallelism between disk probe and table is not guaranteed.



7050

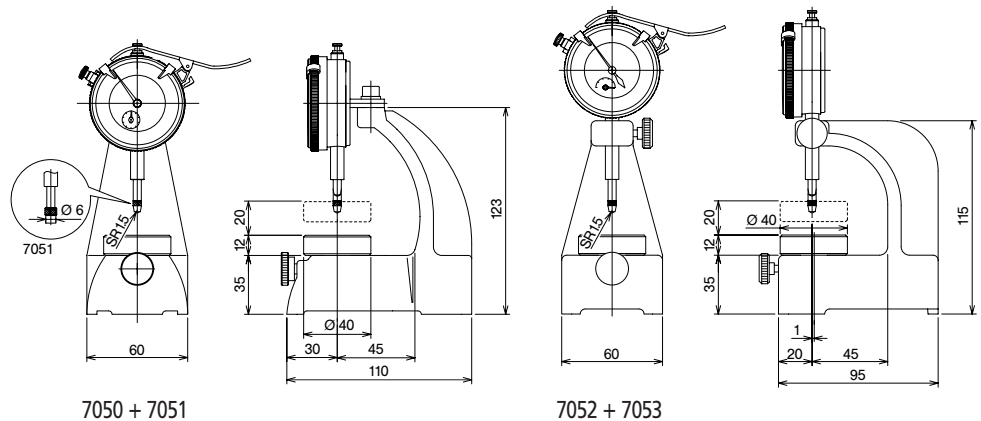


7052



7053

No.	Graduation mm	with dial indicator	Measuring range mm	f_e μm	f_{ges} μm	f_u μm	Stage- \varnothing mm	max. workpiece height mm	Mass g
7050	0,01	2046 S	10	12	15	3	40	21	1570
7051	0,01	2046 S	10	12	15	3	40	20	1570
7052	0,01	2046 SLB	10	12	15	3	40	35	1180
7053	0,001	2109 SLB-10	1	3	5	2	40	30	1195



7050 + 7051

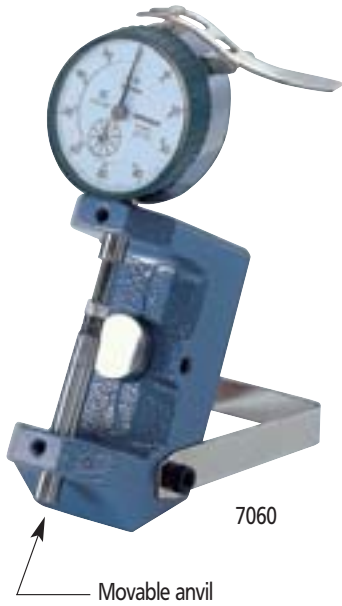
7052 + 7053

Horizontal Measuring Stage

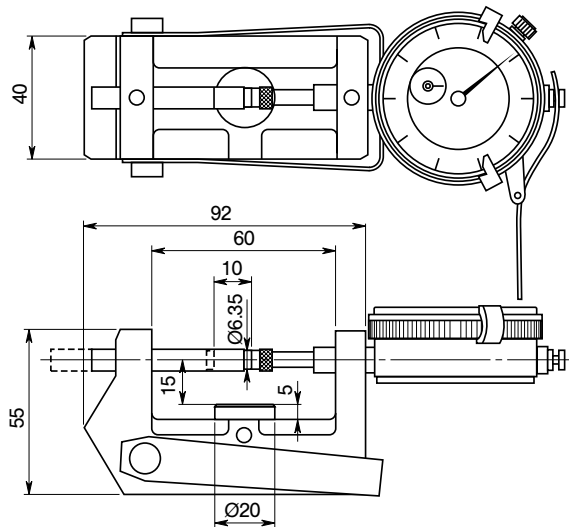
- Compact, reasonably combination unit consisting of dial indicator and measuring stage.
- Suitable for testing small parts in the workshop.

Series 7

With disk probe tip $\varnothing 6,3$ mm



No.	Gra- dation mm	with dial indicator	Measuring range mm	f_e μm	f_{ges} μm	f_u μm	Stage- \varnothing mm	max. workpiece height mm	Mass g
7060	0,01	2046 SB	10	12	15	3	20	20	950



Dial Snap Gauges

- The adjustable snap gauges allow for quick and accurate measurement of all kinds of outer diameters up to 300 mm.
- Good/NG evaluations can also be carried out with great ease.

Series 201

Specifications

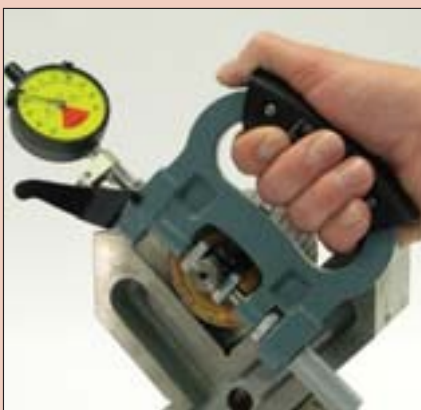
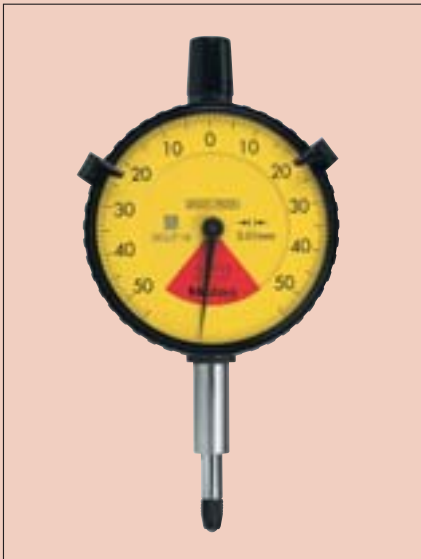
Micro lapped carbide surfaces
 Easy-moving anvil: 2 mm
 Large measuring surfaces
 Adjustable bit stop
 Receiver for dial indicator Ø 8 mm
 Including hand guard

Optional accessory

e.g. no. 2972 Mechanical dial indicator

Specifications see page 189

No. 21DZA000 Protector for analogue dial indicator

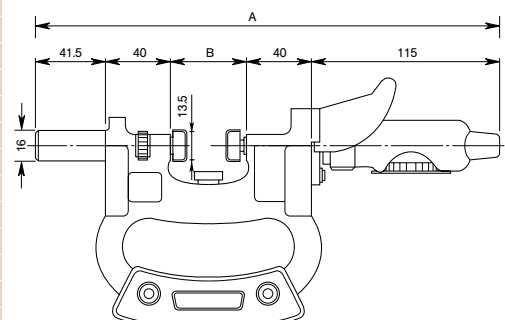


201-101 with holder 156-101 and dial indicator
 Supplied without dial indicator and holder for micrometer



201-101 and digital dial indicator 543-250 B

Measuring range	No.	Measuring force	Parallelism of measuring faces	A	B	Mass
mm		N	μm	mm	mm	g
0- 25	201-101	15 ± 3	5	277	42	680
25- 50	201-102	15 ± 3	5	302	67	730
50- 75	201-103	15 ± 3	5	328	93	780
75-100	201-104	15 ± 3	5	353	118	870
100-125	201-105	15 ± 3	6	379	144	950
125-150	201-106	15 ± 3	6	404	169	1000
150-175	201-107	15 ± 3	6	429	194	1100
175-200	201-108	15 ± 3	6	455	220	1200
200-225	201-109	15 ± 3	7	480	245	1340
225-250	201-110	15 ± 3	7	506	271	1540
250-275	201-111	15 ± 3	7	531	296	1750
275-300	201-112	15 ± 3	7	556	321	2050



ABSOLUTE DIGIMATIC Quick Thickness Gages

- Unique thickness gage equipped with the ABSOLUTE DIGIMATIC Dial Indicator ID-C.
- The origin is set only once and is stored as the absolute origin until the battery is replaced.
- Measuring precision even at highest drive speed.
- Large display characters for easy reading.
- Light-weight construction.

Series 547

Disk probe tips made of ceramics (No. 547-301),
with adjustable anvil (No. 547-313),
with knife-shaped probe tip (No. 547-315)

ABSOLUTE™
Absolute System Patented by MITUTOYO



547-301



547-313



547-315

Description of the dial indicator
refer to page 168

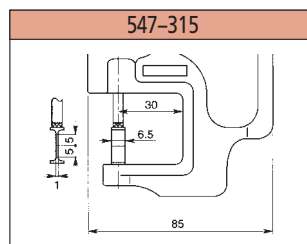
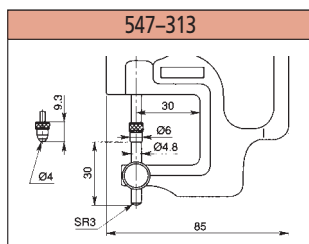
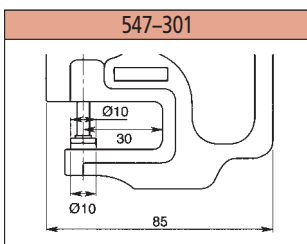
Optional accessory

- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)

Consumable Spares

- No. 938882 Battery SR-44

Measuring range mm	No.	Resolution mm	Max. measuring depth mm	Error limits mm	Parallelism μm	Dial Indicator No.
with disk probe tips made of ceramics						
0-10	547-301	0,01	30	0,02	≤ 5	543-270 B
with adjustable anvil						
0-10	547-313	0,01	30	0,02	≤ 5	543-270 B
with knife-shaped probe tip						
0-10	547-315	0,01	30	0,02	≤ 5	543-270 B



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Quick Thickness Gages

- Unique thickness gage equipped with the ABSOLUTE DIGIMATIC Dial Indicator ID-C.
- The origin is set only once and is stored as the absolute origin until the battery is replaced.
- Measuring precision even at highest drive speed.
- Large display characters for easy reading.
- Light-weight construction.

Series 547

With large jaw capacity and disk probe tips made of ceramics

ABSOLUTE™
Absolute System Patented by MITUTOYO

Description of the dial indicator refer to page 168

Optional accessory

No. 905338 Signal cable (1 m)

No. 905409 Signal cable (2 m)

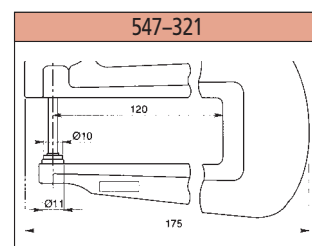
Consumable Spares

No. 938882 Battery SR-44



547-321

Measuring range mm	No.	Resolution mm	Max. measuring depth mm	Error limits mm	Parallelism μm	Dial Indicator No.
with disk probe tips made of ceramics						
0-10	547-321	0,01	120	0,02	≤ 5	543-270 B



ABSOLUTE DIGIMATIC Quick Thickness Gages

- Unique thickness gage equipped with the ABSOLUTE DIGIMATIC Dial Indicator ID-C.
- The origin is set only once and is stored as the absolute origin until the battery is replaced.
- Measuring precision even at highest drive speed.
- Large display characters for easy reading.
- Light-weight construction.

Series 547

For measuring tube wall thicknesses



547-360

ABSOLUTE™
Absolute System Patented by MITUTOYO

Description of the dial indicator refer to page 168

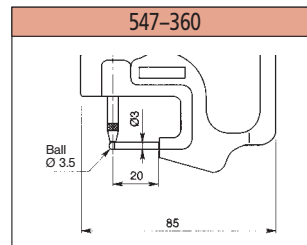
Optional accessory

- No. 905338 Signal cable (1 m)
- No. 905409 Signal cable (2 m)

Consumable Spares

- No. 938882 Battery SR-44

Measuring range mm	No.	Resolution mm	Max. measuring depth mm	Error limits mm	Dial Indicator No.
minimum inside diameter 3,5 mm					
0-10	547-360	0,01	20	0,020	543-270 B



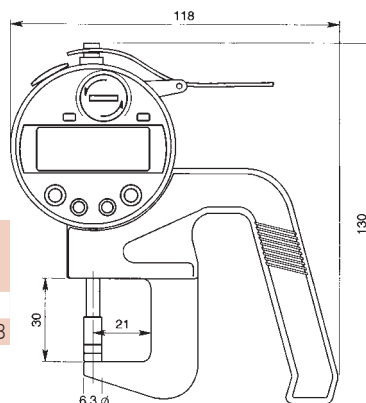
Series 547

For measuring film, paper etc.
with a numerical increment of 0.001 mm



547-401

Measuring range mm	No.	Resolution mm	Max. measuring depth mm	Error limits mm	Parallelism μm	Dial Indicator No.
plastic handle, metal frame						
0-12	547-401	0,001	21	0,005	3	543-250 B



™ Patent numbers see page 464

Quick Thickness Gage

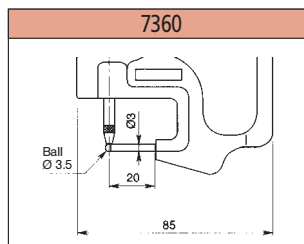
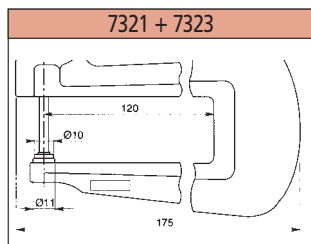
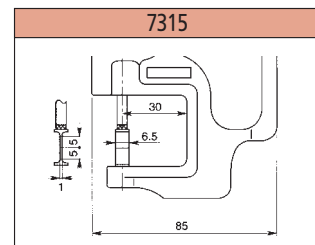
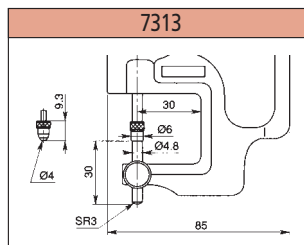
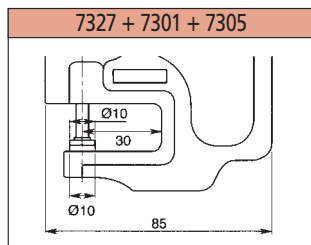
- Light-weight construction, with analogue dial indicator.

Series 7

Description of the dial indicator refer to pages 183, 185 and 187



Measuring range mm	No.	Resolution mm	Max. measuring depth mm	Error limits mm	Parallelism μm	Dial Indicator No.
with disk probe tips made of ceramics						
0-1	7327	0,001	30	0,005	≤ 5	2109SB-10
0-10	7301	0,01	30	0,020	≤ 5	2046SB
0-20	7305	0,01	30	0,025	≤ 5	2050SB
with adjustable anvil (Adjustable range: 12 mm)						
0-10	7313	0,01	30	0,020	—	2046SB
with knife-shaped probe tip						
0-10	7315	0,01	30	0,020	—	2046SB
with large jaw capacity and disk probe tips made of ceramics						
0-10	7321	0,01	120	0,020	≤ 5	2046SB
0-20	7323	0,01	120	0,025	≤ 5	2050SB
minimum inside diameter 3,5 mm						
0-10	7360	0,01	20	0,020	—	2046SB



Quick Thickness Gage "QUICK MINI"

• "Quick Mini" is a Digimatic quick thickness gage without data output.

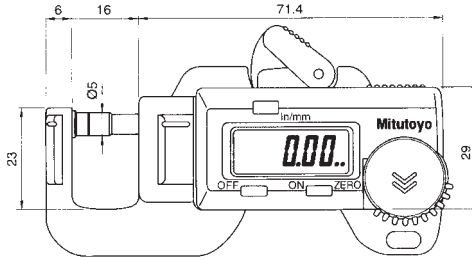
Series 700



700-119

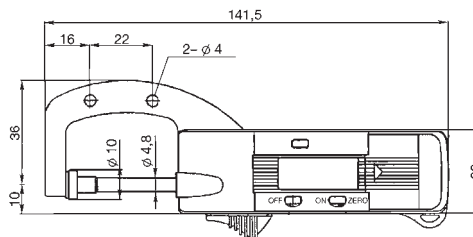


Sample application



700-121

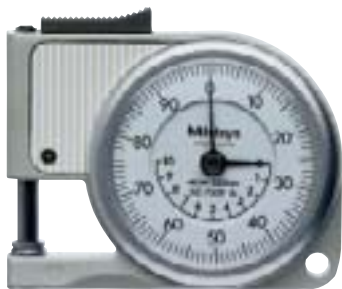
Measuring range mm	No.	Mass g
0-12	700-119	70
0-25	700-121	120



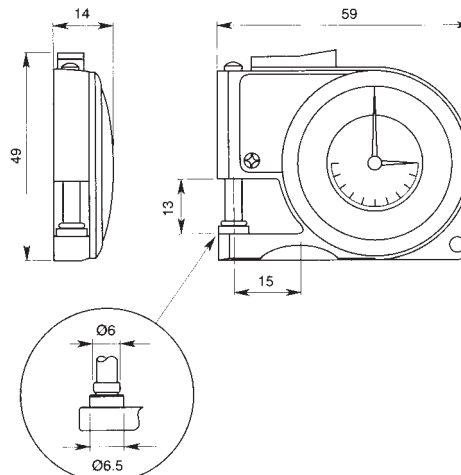
Thickness Gage

• Thickness gage in extra small construction.

Series 7



7309



Measuring range mm	No.	Mass g
0-10	7309	87

Specifications

Resolution: 0,01 mm
 Max. measuring force: 2 N
 Error limits: 0,02 mm
 Repeatability: 0,01 mm
 Display: LCD, 5 digit with sign (-)
 Character height: 7,5 mm
 Power supply: Battery SR-44
 Battery life: appr. 2 years

Including box

Consumable Spares

No. 938882 Battery SR-44

Specifications

Measuring faces: hardened, polished, and micro-lapped
 Graduation: 0,01 mm
 Max. measuring force: 2 N
 Max. measuring depth: 15 mm
 Error limits: 0,02 mm
 Parallelism: $\leq 5 \mu\text{m}$
 Flatness: $\leq 1 \mu\text{m}$
 Including box

ABSOLUTE Dial Gauges with Base for Depth Measurement

• Hardened, precision ground and micro-lap finished support faces.

Series 547

Digital version with ABSOLUTE Dial Gauge with data output



547-251

ABSOLUTE™
Absolute System Patented by MITUTOYO

Specifications

Resolution: 0,001 mm
on dial gauge

Description of dial indicator on page 168
Including box and extensions (see table)

Optional accessory

No. 905338 Signal cable (1 m)

No. 905409 Signal cable (2 m)

See page 204 for further extensions

Consumable Spares

No. 938882 Battery SR-44

Measuring range mm	Measuring span mm	No.	Base size mm	with Dial gauge No.	Extensions mm	Mass g
0-200	10	547-251	60 x 16	543-250 B	10, 20, 30, 30, 100	280
0-200	10	547-252	100 x 16	543-250 B	10, 20, 30, 30, 100	330

Specifications

Graduation: 0,01 mm on dial gauge

Description of dial indicator on page 185 and 187
Including box and extensions (see table)

Optional accessory

See page 204 for further extensions

Series 7

Analogue version



7211

7222

7231

7221



Dial Gauge with Base for Depth Measurement No. 7221 in use

Measuring range mm	Measuring span mm	No.	Base size mm	with Dial gauge No.	Probe tip mm	Extensions mm	Mass g
0-200	10	7211	60 x 16	2902 SB	Ball R = 1,5	10, 20, 30, 30, 100	300
0-200	10	7212	100 x 16	2902 SB	Ball R = 1,5	10, 20, 30, 30, 100	350
0-210	30	7213	60 x 16	2952 SB	Ball R = 1,5	30, 60, 90	320
0-210	30	7214	100 x 16	2952 SB	Ball R = 1,5	30, 60, 90	380
Large measuring bridge 150 mm with optional dial gauge positioning							
0-200	10	7221	150 x 18	2902 SB	Ball R = 1,5	10, 20, 30, 30, 100	820
Circular measuring bridge diameter 16 mm for measuring where space is limited							
0- 10	10	7222	∅ 16	2902 SB	Needle R = 0,2	-	165
Bridge with dial gauge and rear spindle for comfortable measuring from above							
0-200	5	7231	63 x 16	1162	Ball R = 1,5	10, 20, 30, 30, 100	240

™ Patent numbers see page 464

Dial Caliper Gauge for Outside Measurement

Series 209



209-657



209-658

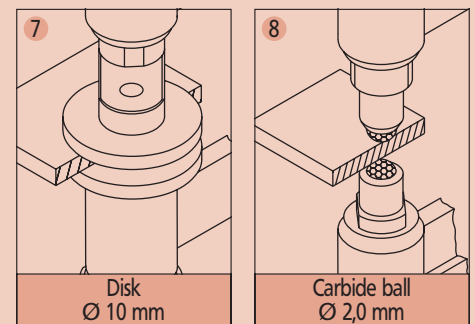
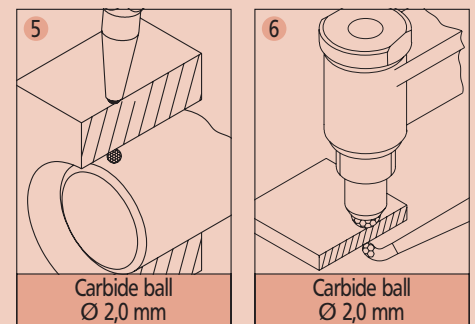
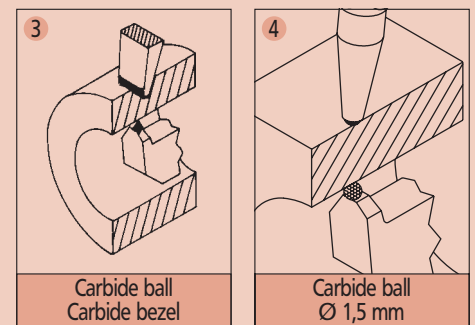
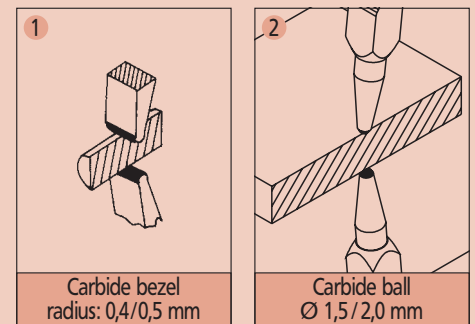
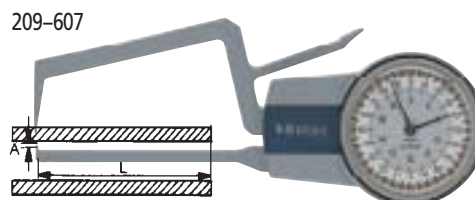
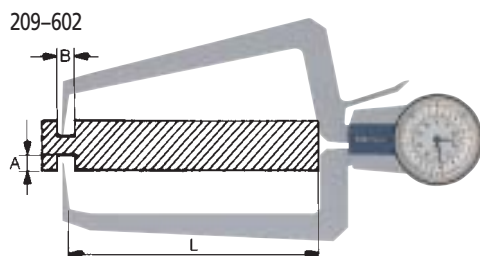


209-604



209-662

No.	Measuring range mm	Gra- duation mm	Error limits mm	Max. measuring depth L mm	Max. groove depth A mm	Min. groove width B mm	Max. measuring force N	Measuring contacts	Measuring contact radius mm	Mass g
Measuring contacts: Carbide bezel										
209-660	0-10	0,01	0,02	59	5,0	3,0	1,3	see figure ①	0,40/0,40	140
209-605	0-20	0,01	0,03	80	7,0	3,5	1,5	see figure ①	0,50/0,50	320
Measuring contacts: Carbide ball Ø 1,5 mm/2 mm										
209-657	0- 5	0,005	0,015	27	5,0	3,0	1,7	see figure ②	0,75/0,75	120
209-659	0-10	0,01	0,02	60	5,0	3,0	1,3	see figure ②	0,75/0,75	140
209-601	0-20	0,01	0,03	80	10,0	3,5	1,5	see figure ②	0,75/0,75	320
209-602	0-50	0,05	0,05	170	10,0	4,5	1,8	see figure ②	1,00/1,00	530
209-661	0-10	0,01	0,02	59	4,8	2,0	1,3	see figure ④	0,75/0,75	140
209-607	0-20	0,01	0,03	80	7,0	3,5	1,5	see figure ④	0,75/0,75	300
Measuring contacts: Carbide ball / carbide bezel										
209-662	0-10	0,01	0,02	59	4,8	2,0	1,3	see figure ③	0,40/0,75	140
209-606	0-20	0,01	0,03	80	7,0	3,5	1,5	see figure ③	0,50/0,75	300
Measuring contacts: Carbide ball Ø 2 mm										
209-843	0-10	0,1	0,1	36	-	-	1,3	see figure ⑧	1,00/1,00	40
209-604	0-50	0,05	0,05	170	10,0	4,5	1,8	see figure ⑤	1,00/1,00	520
Measuring contacts: Disk measuring faces Ø 10 mm										
209-658	0- 5	0,005	0,02	28	-	-	1,7	see figure ⑦	-	120
Measuring contacts: Ball Ø 2 mm / radius 0,5 mm										
209-603	0-10	0,1	0,1	36	-	-	1,3	see figure ⑥	1,00/0,50	40



Dial Caliper Gauge "DIGI-TEST" for Outside Measurement

Functions	Series 209
Mode key	●
SET key	●
DATA key	●
ON / OFF / 0-Preset	●
Tolerance LED (red/green)	●
mm/inch switching	●
Conversion of numerical increment	●
Absolute and relative measurement	●

Measuring program (MODE)	Series 209
Measuring value display	●
Min. measuring value display	●
Max. measuring value display	●
ABS/REL switching	●
HOLD function	●
Tolerance input and monitoring	●

Specifications

Protection class: IP-63
 Measuring force: 0,6–1,5 N
 Including battery and factory certificate

Optional accessory

No. 21JAA300 D DIGIMATIC Signal cable (1,5 m)
 No. 7001 M Comparator stand
 No. 011449 Holder for comparator stand

Consumable Spares

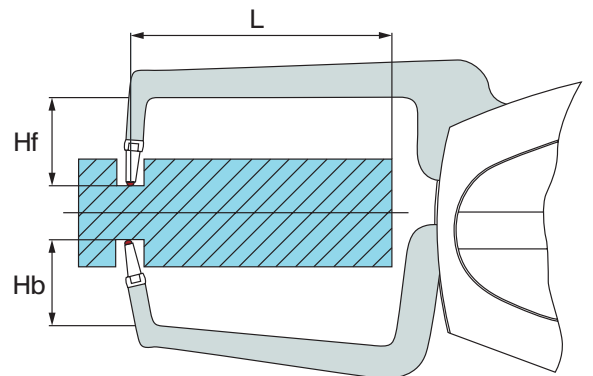
No. 011037 Battery (4 pieces)

Series 209
 With data output

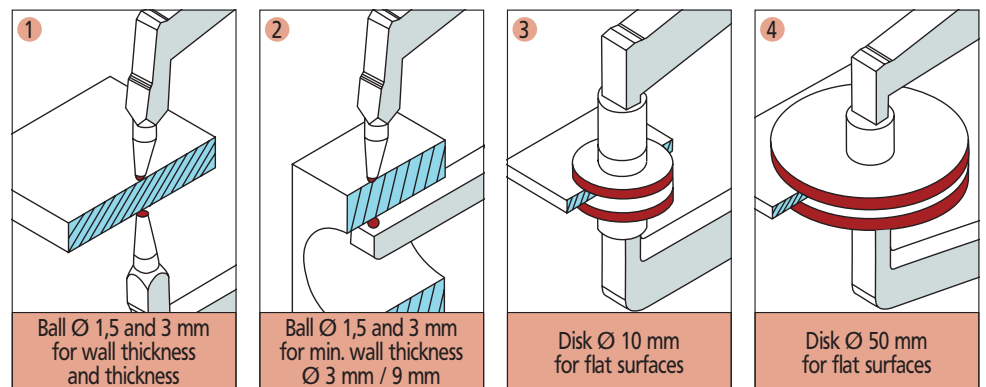


209–521

No.	Measuring range	Resolution	Error limits	Max. measuring depth L	Measuring contact length Hb	Measuring contact length Hf	Measuring contacts	Measuring contacts radius	Mass
	mm	mm	mm	mm	mm	mm		mm	g
Measuring contacts: Carbide ball Ø 1,5 mm									
209-520	0–10	0,005	0,01	18	10	10	see figure ①	0,75/0,75	290
209-521	0–20	0,01	0,02	50	15	15	see figure ①	0,75/0,75	290
209-522	0–20	0,01	0,02	50	15	0,9	see figure ②	0,75/0,75	290
Measuring contacts: Carbide ball Ø 3,0 mm									
209-531	0–40	0,02	0,04	115	22	22	see figure ①	1,5/1,5	380
209-532	0–40	0,02	0,04	115	22	1	see figure ②	1,5/1,5	380
Measuring contacts: Disk measuring faces Ø 10 mm									
209-530	0–10	0,005	0,01	18	12	8	see figure ③	–	270
Measuring contacts: Disk measuring faces Ø 50 mm									
209-533	0–40	0,02	0,04	115	22	18	see figure ④	–	380



Dial caliper gauge no. 209–521 with comparator stand no. 7001 M and holder no. 011449 (optional accessory)



Dial Caliper Gauge for Inside Measurement

Series 209



209-608



209-896

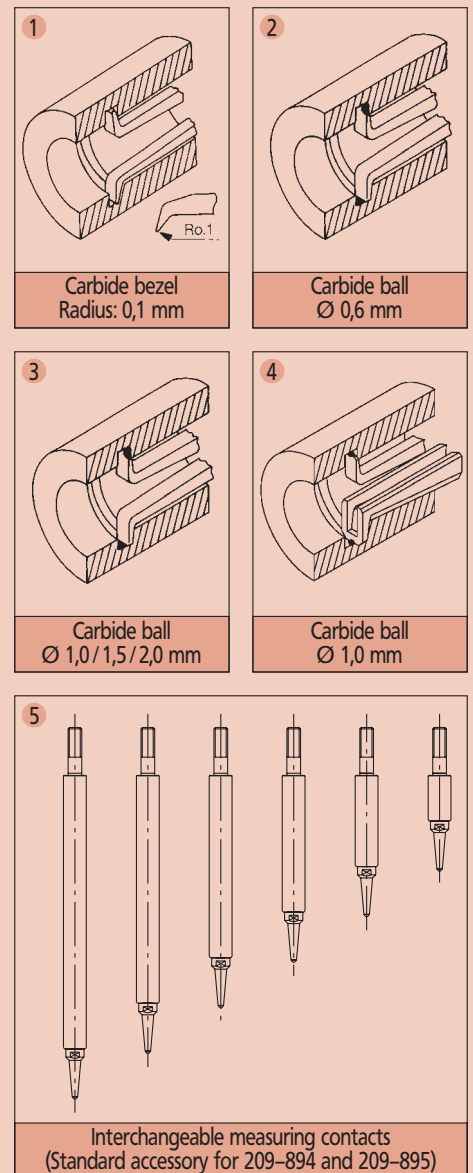
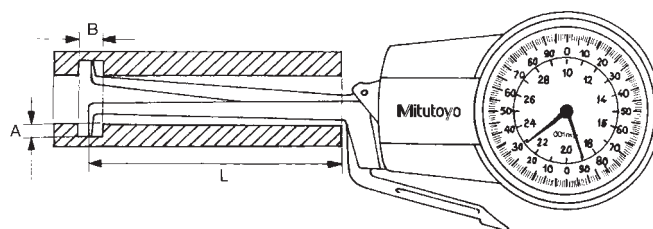


209-894



Measuring contacts for 209-894

No.	Measuring range mm	Gr- aduation mm	Error limits mm	Max. measuring depth L mm	Max. groove depth A mm	Min. groove width B mm	Measuring contacts	Measuring contacts radius mm	Mass g
Measuring contacts: Carbide bezel (radius 0,1 mm)									
209-650	2,5- 7,5	0,005	0,015	10	0,7	0,6	see figure ①	0,10/0,10	120
Measuring contacts: Carbide ball Ø 0,6 mm									
209-651	5,0- 10,0	0,005	0,015	22	2,2	1,4	see figure ②	0,30/0,30	120
209-652	5,0- 15,0	0,01	0,02	60	1,7	1,1	see figure ②	0,30/0,30	140
Measuring contacts: Carbide ball Ø 1,0 mm									
209-608	10,0- 30,0	0,01	0,03	80	4,5	1,7	see figure ③	0,50/0,50	240
209-609	20,0- 40,0	0,01	0,03	80	6,0	2,3	see figure ③	0,50/0,50	260
209-655	30,0- 40,0	0,01	0,02	58	4,5	2,0	see figure ③	0,50/0,50	140
209-656	40,0- 50,0	0,01	0,02	58	4,5	1,8	see figure ③	0,50/0,50	140
209-884	40,0- 60,0	0,01	0,03	80	6,0	2,3	see figure ③	0,50/0,50	300
209-885	50,0- 70,0	0,01	0,03	80	6,0	3,8	see figure ③	0,50/0,50	300
209-886	60,0- 80,0	0,01	0,03	80	6,0	2,3	see figure ③	0,50/0,50	310
209-887	70,0- 90,0	0,01	0,03	80	6,0	3,9	see figure ③	0,50/0,50	310
209-888	80,0-100,0	0,01	0,03	80	6,0	2,3	see figure ③	0,50/0,50	310
209-653	10,0- 20,0	0,01	0,02	50	4,5	1,8	see figure ④	0,50/0,50	140
209-654	20,0- 30,0	0,01	0,02	52	4,5	2,0	see figure ④	0,50/0,50	140
Measuring contacts: Carbide ball Ø 1,5 mm									
209-896	15,0- 65,0	0,05	0,05	175	4,5	2,1	see figure ③	0,75/0,750	400
Measuring contacts: Carbide ball Ø 2,0 mm									
209-897	40,0- 90,0	0,05	0,05	175	8,0	3,8	see figure ③	1,00/1,00	440
209-898	70,0-120,0	0,05	0,05	175	8,0	3,8	see figure ③	1,00/1,00	450
Measuring contacts: interchangeable, Carbide ball Ø 1 mm									
209-894	60,0-130,0	0,01	0,03	80	-	-	see figure ⑤	0,50/0,50	310
209-895	120,0-190,0	0,01	0,04	80	-	-	see figure ⑤	0,50/0,50	330



Interchangeable measuring contacts
(Standard accessory for 209-894 and 209-895)

Dial Caliper Gauge "DIGI-TEST" for Inside Measurement

Series 209
With data output



209-502

No.	Measuring range	Resolution	Error limits	Max. measuring depth L	Max. groove depth A	Min. groove width B	Measuring contacts radius	Mass
	mm	mm	mm	mm	mm	mm	mm	g
Measuring contacts: Edge R 0,1 mm								
209-500	2,5- 12,5	0,005	0,01	10	0,7	0,6	0,10/0,10	270
Measuring contacts: Carbide ball Ø 0,6 mm								
209-501	5,0- 25,0	0,01	0,02	29	2,2	1,8	0,30/0,30	290
Measuring contacts: Carbide ball Ø 1,0 mm								
209-502	10,0- 30,0	0,01	0,02	49	4,0	2,0	0,50/0,50	290
209-503	20,0- 40,0	0,01	0,02	53	4,0	2,0	0,50/0,50	290
209-504	30,0- 50,0	0,01	0,02	54	7,5	4,0	0,50/0,50	290
209-510	40,0- 60,0	0,01	0,02	54	7,5	4,0	0,50/0,50	290
209-506	50,0- 70,0	0,01	0,02	54	7,5	4,0	0,50/0,50	290
209-512	60,0- 80,0	0,01	0,02	54	7,5	4,0	0,50/0,50	290
209-507	70,0- 90,0	0,01	0,02	54	7,5	4,0	0,50/0,50	290
Measuring contacts: Carbide ball Ø 1,5 mm								
209-505	15,0- 55,0	0,02	0,04	114	4,5	2,5	0,75/0,75	360
Measuring contacts: Carbide ball Ø 2,0 mm								
209-511	35,0- 75,0	0,02	0,04	114	8,0	4,0	1,00/1,00	380
209-513	55,0- 95,0	0,02	0,04	114	8,0	4,0	1,00/1,00	380
209-514	75,0-115,0	0,02	0,04	114	8,0	4,0	1,00/1,00	380
209-515	95,0-135,0	0,02	0,04	114	8,0	4,0	1,00/1,00	380

Functions	Series 209
Mode key	●
SET key	●
DATA key	●
ON / OFF / 0-Preset	●
Tolerance LED (red/green)	●
mm/inch switching	●
Conversion of numerical increment	●
Absolute and relative measurement	●

Measuring program (MODE)	Series 209
Measurement value display	●
Min. measurement value display	●
Max. measurement value display	●
ABS/REL switching	●
HOLD function	●
Tolerance input and monitoring	●

Specifications

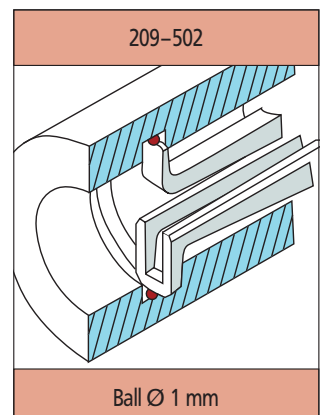
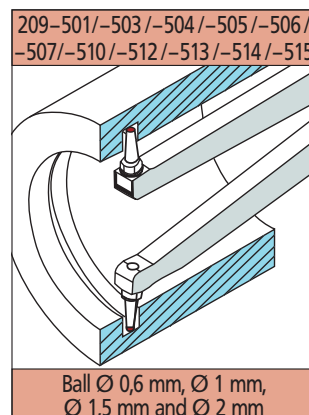
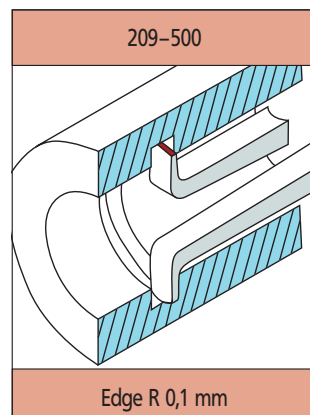
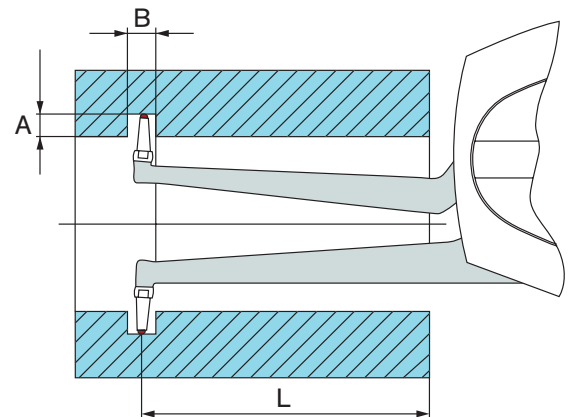
Protection class: IP-63
Measuring force: 0,7-1,7 N
Including battery and factory certificate

Optional accessory

- No. 21JAA300 D DIGIMATIC Signal cable (1,5 m)
- No. 7001 M Comparator stand
- No. 011449 Holder for comparator stand

Consumable Spares

- No. 011037 Battery (4 pieces)

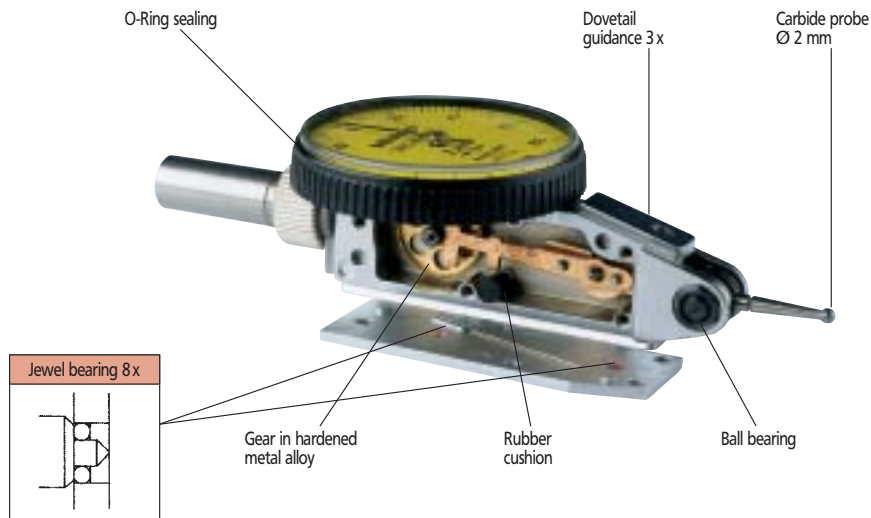


Dial caliper gauge no. 209-521 with comparator stand no. 7001 M and holder no. 011449 (optional accessory)

Lever gauges

- Lever gauges in various versions for comparative measurements.

Series 513



Specifications

Accuracy: Factory specification / DIN Standard

Description

Contact is possible in both directions of measurement

Turnable outer ring for ZERO-setting,

Precision jewel bearing

Thread for probe tip M 1,7 x 0,35

Including clamping shaft (Ø 8 mm) and box

Lever gauge Set

Series 513



Specifications

Accuracy: Factory specification

Mass: 222 g

Set No. 513-404 T

Content:

No. 513-404 E Lever gauge*

No. 103013 Carbide probe tip Ø 1 mm

No. 103006 Carbide probe tip Ø 2 mm

No. 103014 Carbide probe tip Ø 3 mm

No. 190322 Union nut

No. 190318 Clamping shaft Ø 4 mm

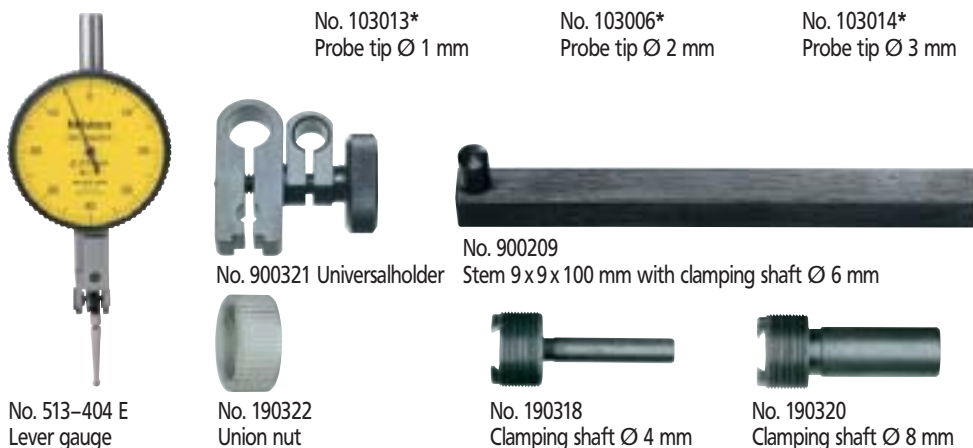
No. 190320 Clamping shaft Ø 8 mm (thread M10)

No. 900321 Universalholder

No. 900209 Stem 9 x 9 x 100 mm

* Specifications see page 221

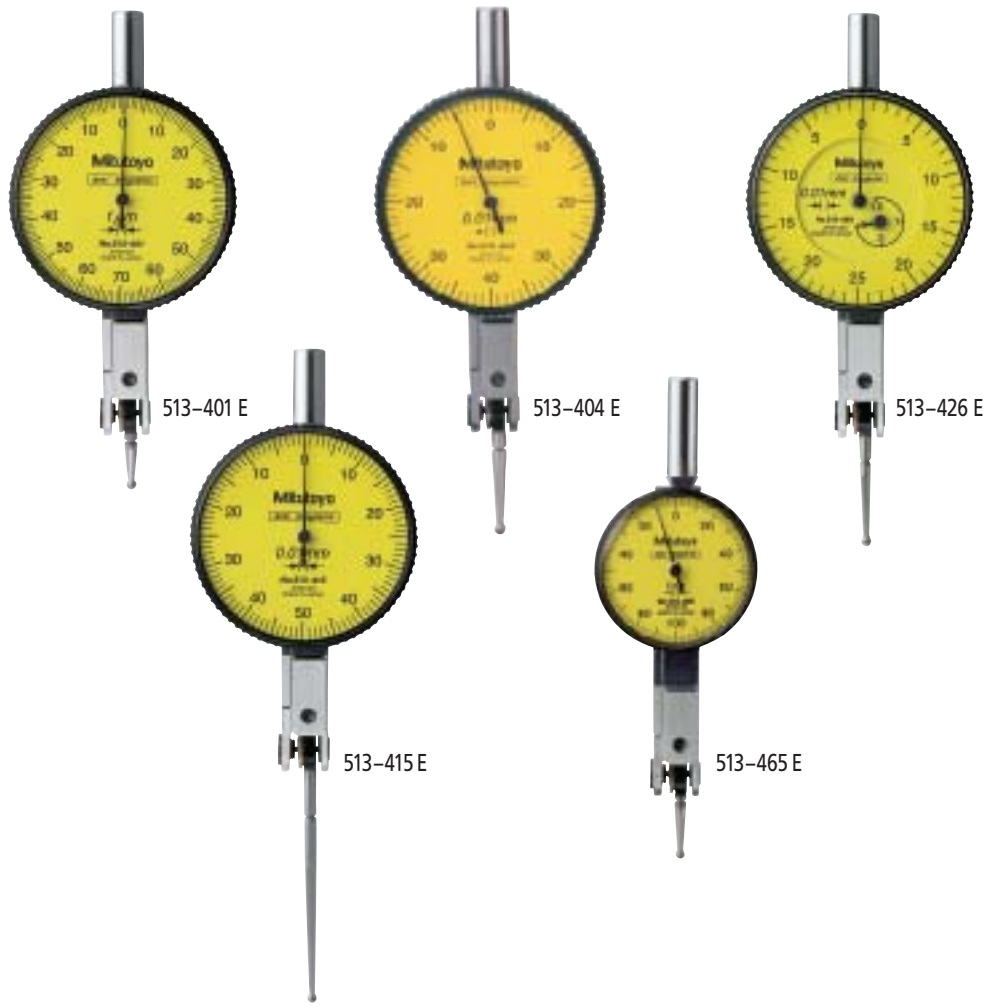
Contents:



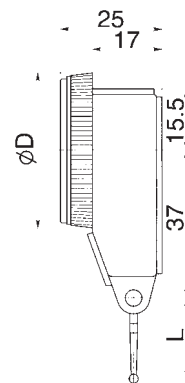
* Probe tips see page 228

Lever gauges

Series 513 Horizontal version



Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force N	Mass g	Carbide probe tip \varnothing 2 mm No.	Note	\varnothing D mm	L mm
0,14	0,001	513-401 E	0-70-0	3	4	2	0,3	42	21CZA036		39	12,8
0,20	0,002	513-465 E	0-100-0	3	4	2	0,3	39	103010		28	14,7
0,20	0,002	513-405 E	0-100-0	3	4	2	0,3	42	103010		39	14,7
0,60	0,002	513-425 E	0-100-0	6	11	3	0,4	42	103010		39	14,7
0,50	0,01	513-466 E	0-25-0	5	10	3	0,3	39	137557		28	22,3
0,50	0,01	513-424 E	0-25-0	5	10	3	0,3	42	137557		39	22,3
0,50	0,01	513-414 E	0-25-0	10	13	4	0,2	42	129949		39	36,8
0,80	0,01	513-464 E	0-40-0	8	13	3	0,4	39	103006		28	20,9
0,80	0,01	513-404 E	0-40-0	8	13	3	0,3	42	103006		39	20,9
1,00	0,01	513-415 E	0-50-0	10	13	4	0,2	42	136013		39	44,5
1,50	0,01	513-426 E	0-25-0	8	13	3	0,4	42	137557		39	22,3



For Probe tips
see page 228

Properties	513-401 E	513-465 E	513-405 E	513-425 E	513-466 E	513-424 E
High precision type						
Compact design						
Long probe tip						
Double scales						
Revolution counter						
Jewel bearing						
Nonmagnetic						
DIN Standard						

Properties	513-414 E	513-464 E	513-404 E	513-415 E	513-426 E
High precision type					
Compact design					
Long probe tip					
Double scales					
Revolution counter					
Jewel bearing					
Nonmagnetic					
DIN Standard					

Specifications

Accuracy: Factory specification / DIN Standard

Description

Contact is possible in both directions of measurement,

Turnable outer ring for ZERO-setting,
precision jewel bearing,

Thread for probe tip M 1,7x0,35

Including clamping shaft (\varnothing 8 mm) and box

Lever gauge

Series 513 Parallel version



Properties	Series 513 513-284 GE
Jewel bearing	
DIN Standard	

Specifications

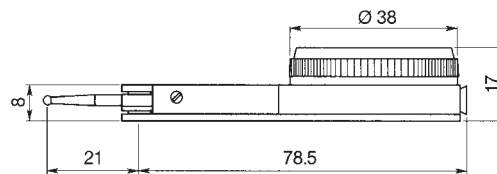
Accuracy: Factory specification / DIN Standard

Description

Contact is possible in both directions of measurement,
Turnable outer ring for ZERO-setting,
recision jewel bearing,
Thread for probe tip M 1,7 x 0,35
Including clamping shaft (Ø 8 mm), nut and box





Measuring range mm	Gra- duation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force N	Mass* g	Carbide probe tip Ø 2 mm No.	Note
0,8	0,01	513-284 GE	0-40-0	8	13	3	0,3	68	103006	

* incl. clamping shaft, without holder



For Probe tips
see page 228

Lever gauge

Properties		Series 513
		513-304 GE
 Jewel bearing		
 DIN Standard		

Specifications

Accuracy: Factory specification / DIN Standard

Description

Contact is possible in both directions of measurement,

Turnable outer ring for ZERO-setting,
precision jewel bearing,

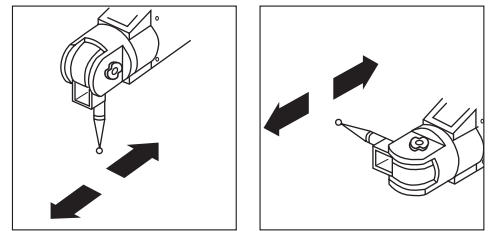
Thread for probe tip M 1,4 x 0,3



Including clamping shaft (Ø 8 mm) and box

Series 513 Universal version

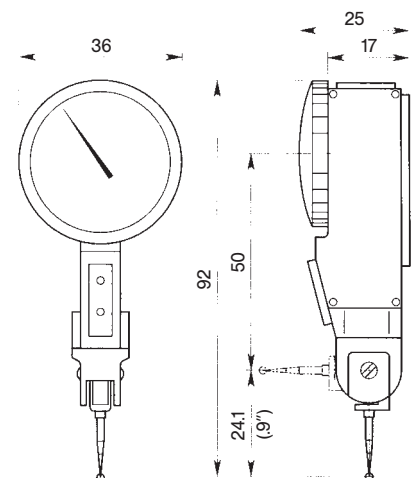


Universal use in any direction



Measuring range mm	Grada- tion mm	No.	Scale	f_e μm	f_{ges} μm	f_{li} μm	Measuring force N	Mass* g	Carbide probe tip Ø 2 mm No.	Note
0,8	0,01	513-304 GE	0-40-0	8	13	3	0,3	80	102825	 

* incl. damping shaft, without holder



For Probe tips
see page 228

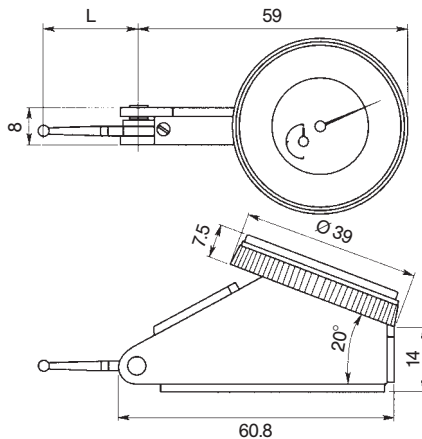
Lever gauge

Series 513

Inclined design



513-444 E



Measuring range mm	Gr- aduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force N	Mass* g	Carbide probe tip \varnothing 2 mm No.	Note	L mm
1,6	0,01	513-444 E	0-40-0	10	13	3	0,3	48	103006		20,9
0,4	0,002	513-445 E	0-100-0	5	10	3	0,3	48	103010		14,7

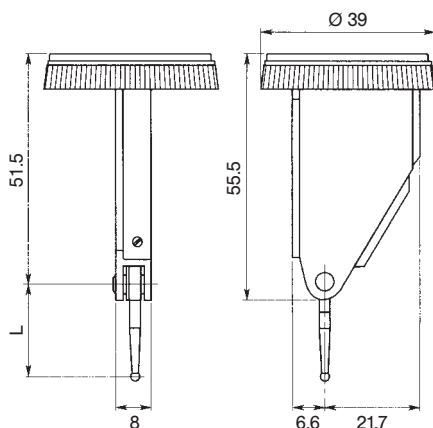
* incl. clamping shaft, without holder

Series 513

Vertical version



513-455 E



Measuring range mm	Gr- aduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force N	Mass* g	Carbide probe tip \varnothing 2 mm No.	Note	L mm
0,8	0,01	513-454 E	0-40-0	8	13	3	0,3	50	103006		20,9
0,2	0,002	513-455 E	0-100-0	3	6	2	0,3	50	103010		14,7

* incl. clamping shaft, without holder

Properties

	513-444 E	513-445 E	513-454 E	513-455 E
Revolution counter				
Jewel bearing				
Nonmagnetic				

Specifications

Accuracy: Factory specification / DIN Standard

Description

Contact is possible in both directions of measurement, Turnable outer ring for ZERO-setting, precision jewel bearing, Thread for probe tip M 1,7 x 0,35 Including clamping shaft (\varnothing 8 mm) and box

Specifications

Accuracy: Factory specification / DIN Standard

Description

Contact is possible in both directions of measurement, Turnable outer ring for ZERO-setting, precision jewel bearing, Thread for probe tip M 1,7 x 0,35 Including clamping shaft (\varnothing 8 mm) and box

For Probe tips see page 228

Lever gauge

Series 513

Small version
with switch lever for changing the measuring direction

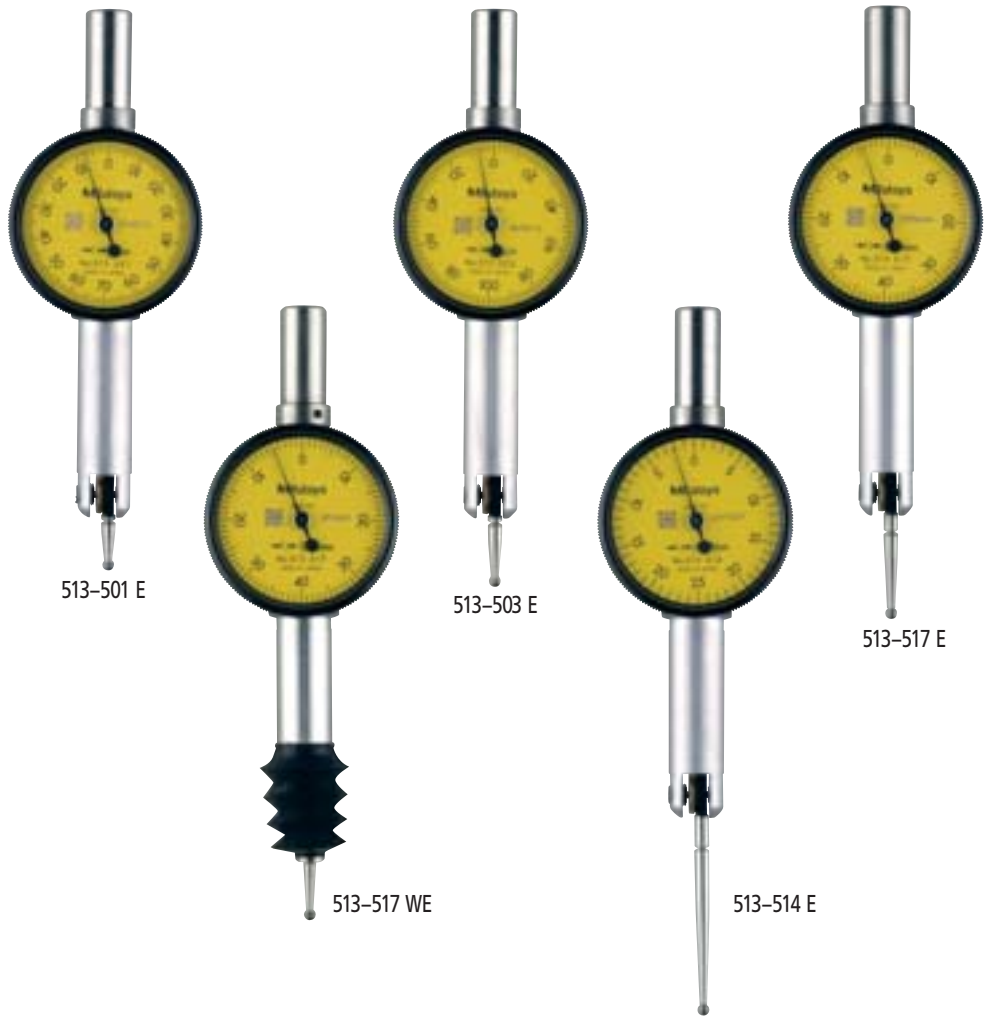
Properties	513-501 E	513-503 E	513-514 E	513-517 E	513-517 WE
High precision type	●				
Long probe tip			●		
Splash proof					●
Jewel bearing	●	●	●	●	●
DIN Standard			●	●	

Specifications

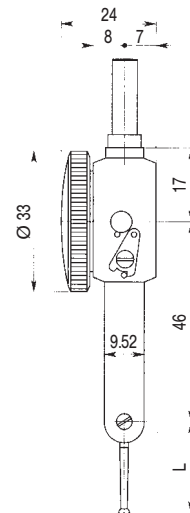
Accuracy: Factory specification / DIN Standard

Description

Contact is possible in both directions of measurement,
Turnable outer ring for ZERO-setting,
recision jewel bearing,
Thread for probe tip M 1,7 x 0,35
Including clamping shaft (Ø 8 mm) and box



Measuring range mm	Graduation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force N	Mass g	Note	L mm
0,14	0,001	513-501 E	0-70-0	3	4	2	0,4	41	High precision type, Jewel bearing	12,1
0,20	0,002	513-503 E	0-100-0	3	4	2	0,3	41	Jewel bearing	14,7
0,50	0,01	513-514 E	0-25-0	10	13	4	0,3	41	Long probe tip, Jewel bearing, DIN Standard	36,8
0,80	0,01	513-517 E	0-40-0	8	13	3	0,3	41	Jewel bearing, DIN Standard	21,0
0,80	0,01	513-517 WE	0-40-0	8	13	3	0,3	41	Jewel bearing, Splash proof, DIN Standard	21,0



For Probe tips
see page 228

Lever gauge

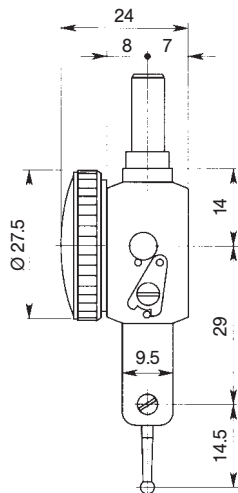
Series 513

Small version
with switch lever for changing the measuring direction
and fixed clamping shaft dia. 8 mm



513-527 E

Measuring range mm	Gra- duation mm	No.	Scale	f_e μm	f_{ges} μm	f_u μm	Measuring force N	Mass g	Note
0,8	0,01	513-527 E	0-40-0	8	13	3	0,3	36	



For Probe tips
see page 228

Properties	Series 513 513-527 E
Compact design	
Jewel bearing	
DIN Standard	

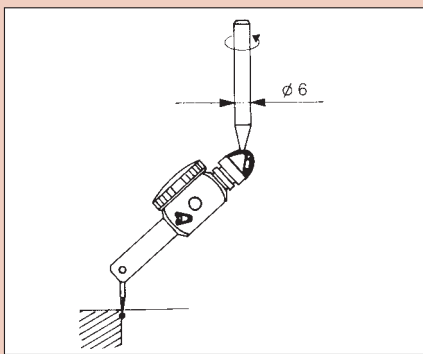
Specifications

Accuracy: Factory specification / DIN Standard

Description

Contact is possible in both directions of measurement,
Turnable outer ring for ZERO-setting,
recision jewel bearing,
Thread for probe tip M 1,7 x 0,35
Including clamping shaft (Ø 8 mm) and box

Optional accessory for Lever gauge



Series 513

For small versions with switch lever

Clamping shafts



No. 102036 \varnothing 4 mm

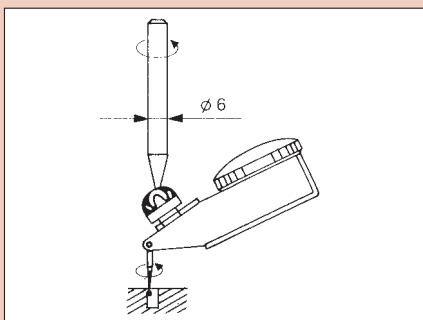


No. 102822 \varnothing 8 mm

Universal holder



No. 901917 \varnothing 8,00 mm



Series 513

For horizontal version, parallel version, universal version, inclined version, vertical version.

Clamping shafts for dovetail guidings



No. 190318 \varnothing 4 mm



No. 190320 \varnothing 8 mm

Union nut



No. 190322

Universal holder with dovetail stem



No. 901461 \varnothing 6,00 mm

No. 901459 \varnothing 6,35 mm

No. 901916 \varnothing 8,00 mm

For all lever gauges

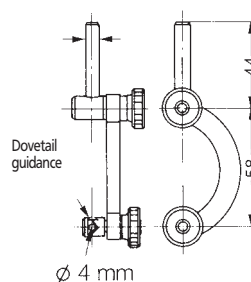
Holder for \varnothing 4/8 mm



No. 900321

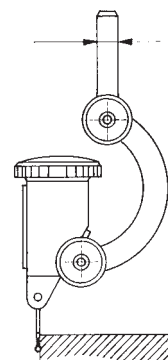
Dovetail guidance

Centering holder



No. 901997 clamping shaft \varnothing 6,35 mm

No. 901959 clamping shaft \varnothing 8,00 mm



Holder (9 x 9 mm) with clamping shaft \varnothing 6 mm



No. 953638 Length 50 mm

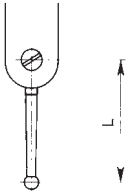
No. 900209 Length 100 mm

Holder (\varnothing 8 mm) with clamping shaft \varnothing 6 mm



No. 900211 Length 115 mm

Probe tip for lever gauges



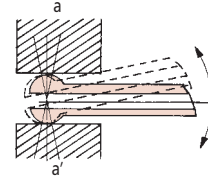
Length (L) mm	Diameter					Suitable dial test indicators	
	0,5 mm	0,7 mm	1,0 mm Carbide	2,0 mm Carbide	3,0 mm Carbide	No.	
Thread: M 1,7 x 0,35							
12,1	–	–	136756	136104	136758	513-501 E (513-101-1)	
12,8	–	–	21CZA044	21CZA036	21CZA045	513-401 E	
14,7	190547	190548	103017	103010	103018	513-405 E 513-445 E 513-465 E 513-527 E (513-127-1)	513-425 E 513-455 E 513-503 E (513-103-1)
20,9	190549	190550	103013	103006	103014	513-284 E 513-444 E 513-464 E	513-404 E 513-454 E 513-517 E (513-117-1)
20,9			21CZA098	21CZA097	21CZA099	513-517 WE (513-117W-1)	
22,3	190654	190653	137558	137557	137559	513-424 E 513-466 E	513-426 E
36,8	–	–	137746	129949	137747	513-414 E (513-114-1)	513-514 E
44,5	190656	190655	136235	136013	136236	513-415 E	
Thread: M 1,4 x 0,3							
24,1			102824	102825	102826	513-304 GE	

() = instruments of older design

Positioning of Bore Gauges

Since Mitutoyo bore gauges for small holes feature contact points with a large curvature they can be easily positioned to measure the true diameter (in the direction a - a') of a hole.

Mitutoyo Bore Gauges (except those for small bores) are equipped to be centered for easy alignment of the axis for the diameter to be measured.



Precision Bore Gauges

- These precision bore gauges allow for quick and accurate measurements of small bores.

Specifications

Measuring range: 0,95–18 mm
Plastics cover for dial indicator including dial indicator and box

Optional accessory

No. 215–120 M Comparator stand

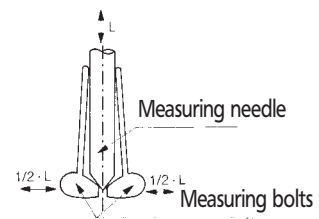
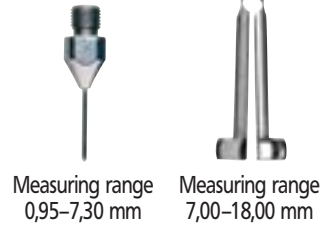
Series 526



21DZA000 Cover for dial indicator



Measuring head



Dial indicator No. 2109 SB-10

Dial indicator No. 2046 SB



Dial indicator No. 543-264 B

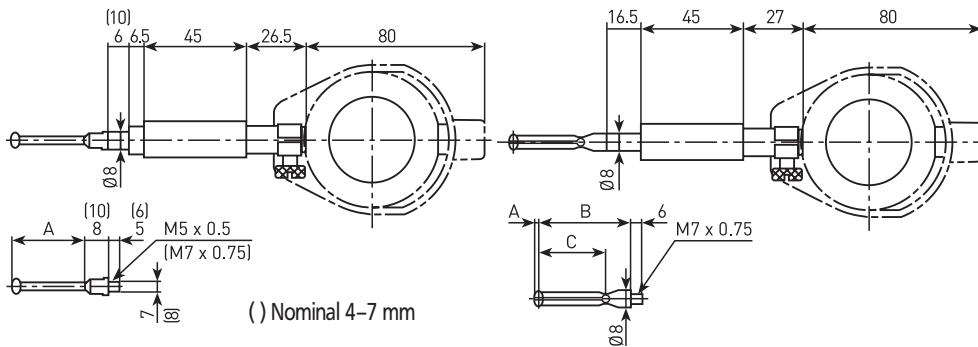
Measuring range mm	No.	Graduation mm	Number of measuring heads	Bore depth mm
With dial indicator No. 2109 SB-10				
0,95– 1,55	526-172-1*	0,001	5	11,5
1,50– 4,00	526-162-1*	0,001	9	17,5 (for 1,50–2,25) 22,5 (for 2,25–4,00)
3,70– 7,30	526-152-1*	0,001	7	32
7,00–10,00	526-124	0,001	6	56
10,00–18,00	526-125	0,001	8	62
With dial indicator No. 2046 SB				
0,95– 1,55	526-173-1*	0,01	5	11,5
1,50– 4,00	526-163-1*	0,01	9	17,5 (for 1,50–2,25) 22,5 (for 2,25–4,00)
3,70– 7,30	526-153-1*	0,01	7	32
7,00–10,00	526-126	0,01	6	56
10,00–18,00	526-127	0,01	8	62

* Measuring heads for a measuring range from 0,95 to 7,30 mm hard chrome plated

Precision bore gauges

Dimensions

Series 526



() Nominal 4-7 mm

Marking on the measuring insert (engraved)	Measuring range mm	A mm
1,0	0,95 ~ 1,15	11,5
1,1	1,07 ~ 1,25	11,5
1,2	1,17 ~ 1,35	11,5
1,3	1,27 ~ 1,45	11,5
1,4	1,37 ~ 1,55	11,5
1,75	1,50 ~ 1,90	17,5
2,0	1,80 ~ 2,20	17,5
2,25	2,05 ~ 2,45	17,5
2,5	2,25 ~ 2,75	22,5
2,75	2,50 ~ 3,00	22,5
3,0	2,75 ~ 3,25	22,5
3,25	3,00 ~ 3,50	22,5
3,5	3,25 ~ 3,75	22,5
3,75	3,50 ~ 4,00	22,5
4,0	3,70 ~ 4,30	32,0
4,5	4,20 ~ 4,80	32,0
5,0	4,70 ~ 5,30	32,0
5,5	5,20 ~ 5,80	32,0
6,0	5,70 ~ 6,30	32,0
6,5	6,20 ~ 6,80	32,0
7,0	6,70 ~ 7,30	32,0

Marking on the measuring insert (engraved)	Measuring range mm	A mm	B mm	C mm
1	7,0 ~ 7,5	1,8	40	29,2
2	7,5 ~ 8,0	1,8	40	29,2
3	8,0 ~ 8,5	1,8	40	29,2
4	8,5 ~ 9,0	1,8	40	29,2
5	9,0 ~ 9,5	1,8	40	29,2
6	9,5 ~ 10,0	1,8	40	29,2
1	10,0 ~ 11,0	2,1	46	38,0
2	11,0 ~ 12,0	2,7	46	38,0
3	12,0 ~ 13,0	2,7	46	38,0
4	13,0 ~ 14,0	2,7	46	38,0
5	14,0 ~ 15,0	2,7	46	38,0
6	15,0 ~ 16,0	2,7	46	38,0
7	16,0 ~ 17,0	2,7	46	38,0
8	17,0 ~ 18,0	2,7	46	38,0

Sample Application

For measurement with an Inside Micrometer Series 526 and a digital Dial Indicator Series 543.

- When using the dial indicator in connection with inside micrometers for measuring bores, the "reversal point" (diameter in question) can be detected easily during the "oscillation".
- The real value is hold and displayed by the Peakhold-function.
- 3 real values can be stored: M1, M2, M3.



Series 526 with dial indicator 543-264 B



ABSOLUTE DIGIMATIC BORE GAGE

• The precision bore comparison gage "BORE GAGE" for diameter measurement in deep bores without any loss of accuracy.

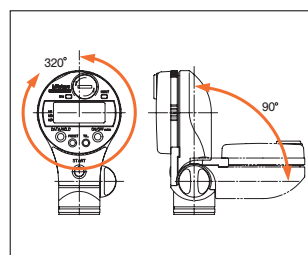
ABSOLUTE™
Absolute System Patented by MITUTOYO

IP53

Series 511 with data output

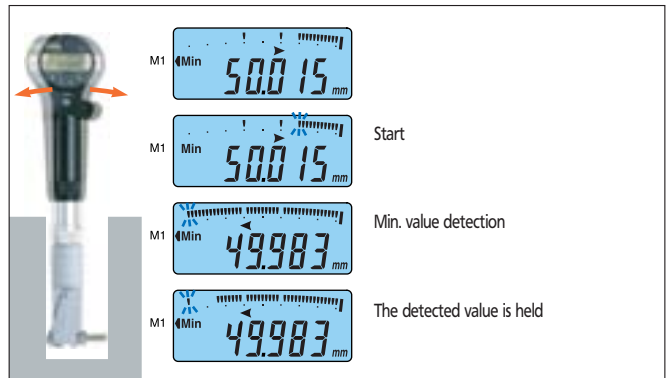


511-501

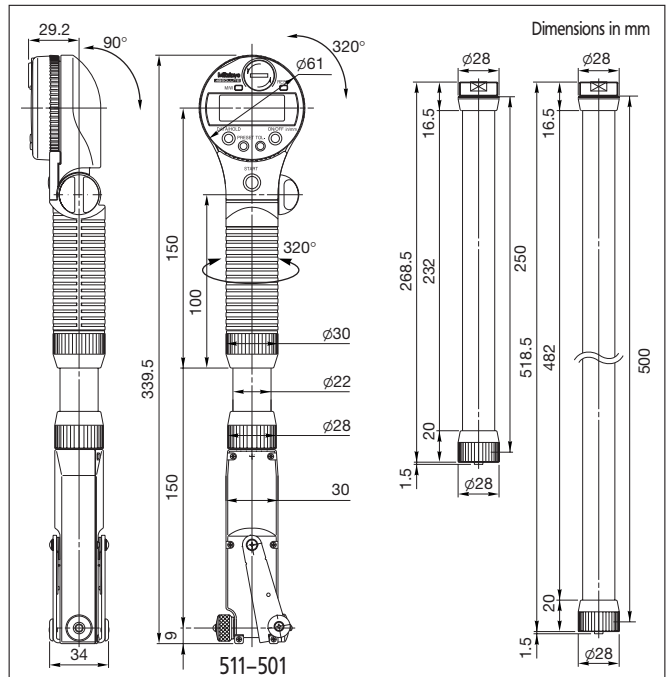


The display can be turned 320° and 90°.
The handle can also be turned 320°.

Measuring range mm	No.	Number of adjustable measuring bolt span	Mass g
45-100	511-501	12	500
100-160	511-502	13	570



The DIGIMATIC Bore Gage detects the minimum value (diameter) and holds it automatically.



Functions	Series 511
ON / OFF	●
PRESET	●
Input of tolerance limits	●
DATA / HOLD	●
Key-Interlock	●
Data output	●

At a speed of $\geq 50 \mu\text{m}$ per second, the diameter may not always be correctly displayed

Specifications

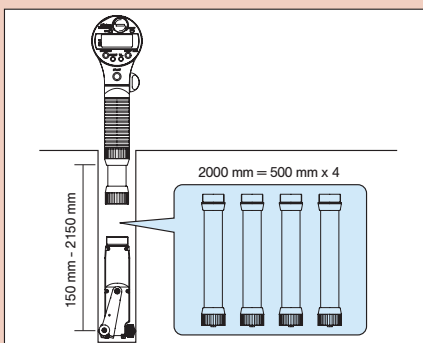
Measuring bolt span: 1,2 mm
Resolution: 0,001 mm
Error limits: 0,003 mm / 0,004 mm
Repeatability: ± 1 Digit
Measuring force: ≤ 5 N
Display: 7 digit LCD display, tolerance judgement display, analogue display
Power supply: Battery SR-44 (2 pcs.)
Battery life: approx. 9 months (normal operation)
Protection class: IP 53
Operation temperature: 5° C to 40° C

Standard accessory

No. 938882 Battery SR-44 (2 Stück)

Optional accessory

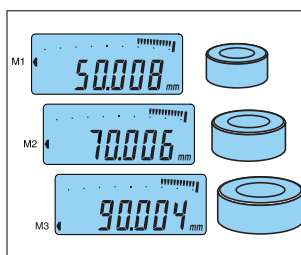
No. 21DZA089 Extensions 250 mm
No. 21DZA081 Extensions 500 mm
No. 905338 DIGIMATIC-Signal cable, 1 m
No. 905409 DIGIMATIC-Signal cable, 2 m



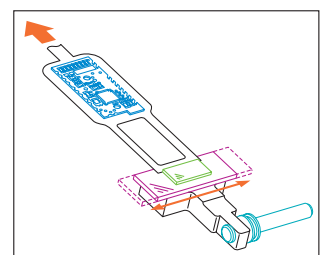
The four extensions (500 mm each) can be connected to one another.

Consumable Spares

No. 938882 Battery SR-44



Up to three reference values can be preset, including top/bottom tolerance limits.



Even during measurement with the 2 m extension, accuracy is guaranteed as measured-value transmission is electronic.

™ Patent numbers see page 464

Bore gauges

- With single-sided fixed gauge pin made from steel or carbide-tipped.
- Movable probe pin with carbide ball.
- Centering base swivelling (minimum range 160 mm).

Series 511

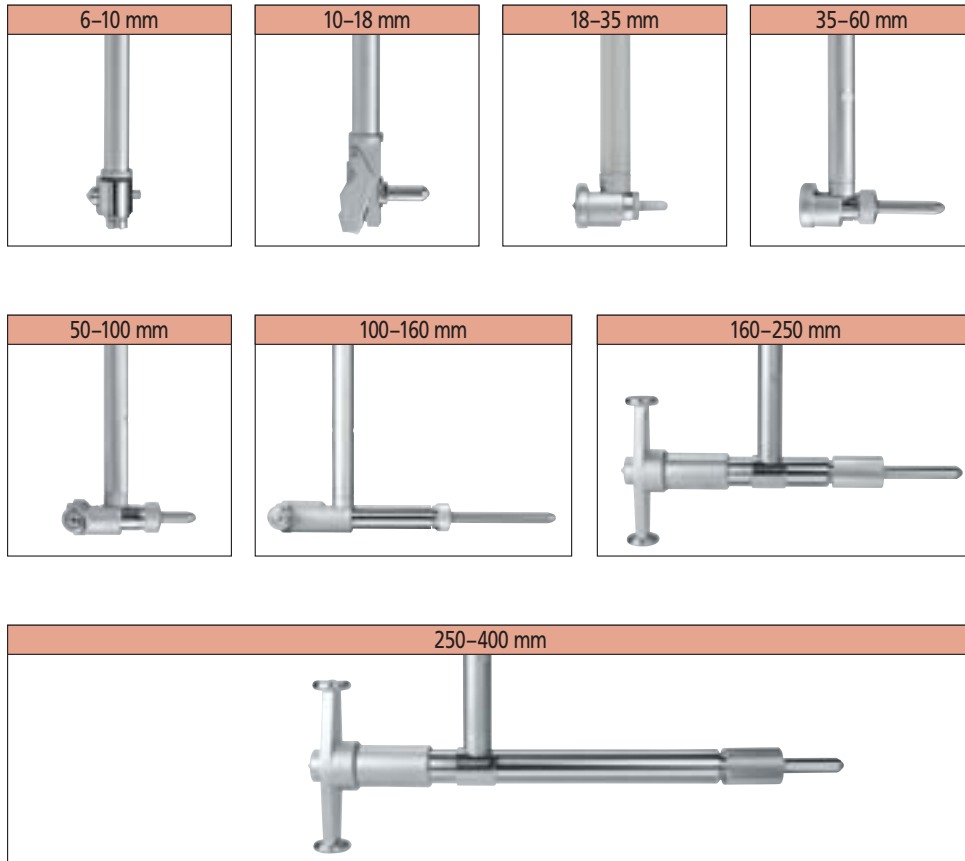


511-170

Specifications

Measuring range: 6–400 mm

Plastics cover for dial indicator including dial indicator and box.



Inside Microchecker No. 515-590
Specifications see page 239

Bore gauges Individual instruments

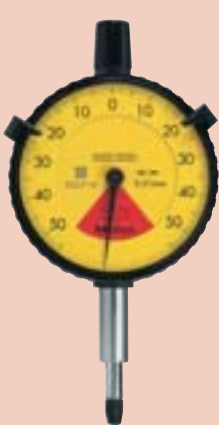
Series 511

Optional accessory

- No. 543-264 B** Dial indicator digital
(techn. specifications see page 171)
- No. 2972** Dial indicator analogue,
Graduation: 0,01 mm
(techn. specifications see page 189)
- No. 2900 SB-10** Dial indicator analogue,
Graduation: 0,001 mm
(techn. specifications see page 192)



543-264 B



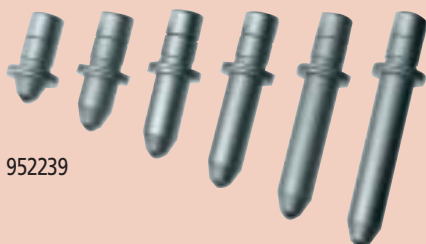
2972



2900 SB-10

Optional accessory

- Carbide tipped measuring bolts in sets
- No. 951266** for measuring range 18- 35 mm 9 pcs.
- No. 952239** for measuring range 35- 60 mm 6 pcs.
- No. 952240** for measuring range 50-150 mm 11 pcs.
- No. 952241** for measuring range 100-160 mm 13 pcs.
- No. 951274** for measuring range 160-250 mm 6 pcs.
- No. 902349** for measuring range 250-400 mm 5 pcs.



952239

Measuring range mm	No.	Graduation mm	Number of measuring bolts	Measuring depth mm
With dial indicator No. 2109 FB Fixed steel gauge pin				
6- 10	511-210	0,001	9	47
10- 18	511-203	0,001	9	100
18- 35	511-167	0,001	9	100
35- 60	511-168	0,001	6	150
50-150	511-170	0,001	11	150
100-160	511-178	0,001	13	150
160-250	511-179	0,001	6	250
250-400	511-180	0,001	5	250
With dial indicator No. 2046 FEB Fixed steel gauge pin				
6- 10	511-211	0,01	9	47
10- 18	511-204	0,01	9	100
18- 35	511-171	0,01	9	100
35- 60	511-172	0,01	6	150
50-150	511-174	0,01	11	150
100-160	511-175	0,01	13	150
160-250	511-176	0,01	6	250
250-400	511-177	0,01	5	250

Measuring range mm	No.	Graduation mm	Measuring depth mm
With dial indicator No. 2109 FB Fixed carbide-tipped gauge pin			
18- 35	511-167-05	0,001	100
35- 60	511-168-05	0,001	150
50-150	511-170-05	0,001	150
100-160	511-178-05	0,001	150
160-250	511-179-05	0,001	250
250-400	511-180-05	0,001	250
With dial indicator No. 2046 FEB Fixed carbide-tipped gauge pin			
18- 35	511-171-05	0,01	100
35- 60	511-172-05	0,01	150
50-150	511-174-05	0,01	150
100-160	511-175-05	0,01	150
160-250	511-176-05	0,01	250
250-400	511-177-05	0,01	250

Inside Microchecker No. 515-590
Specifications see page 239

Extensions for Series 511



953549



953552



953557

Measuring range mm	Length				
	125 mm	250 mm	500 mm	750 mm	1000 mm
18- 35	953549	953550	953551	-	-
35-160	953552	953553	953554	953555	953556
160-400	953557	952361	953558	953559	953560

Bore gauges Sets

Series 511

With analogue dial indicator, graduation 0,01 mm



511-901



With dial indicator
No. 2046 SB

With analogue dial indicator, graduation 0,001 mm



511-902



With dial indicator
No. 2109 SB-10

With digital dial indicator, resolution 0,001 mm



511-905



With dial indicator
No. 543-264 B

Specifications

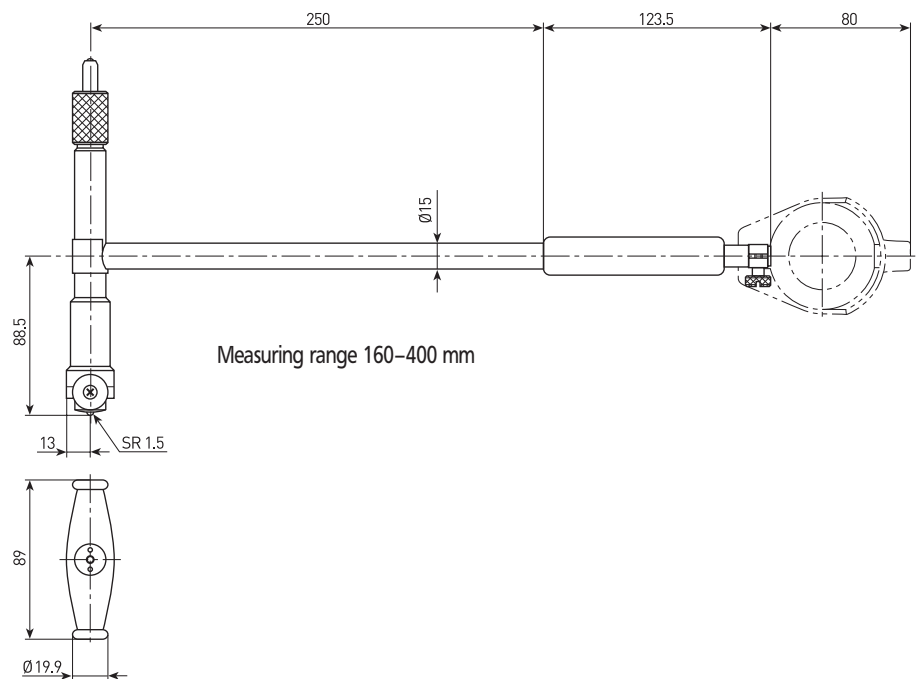
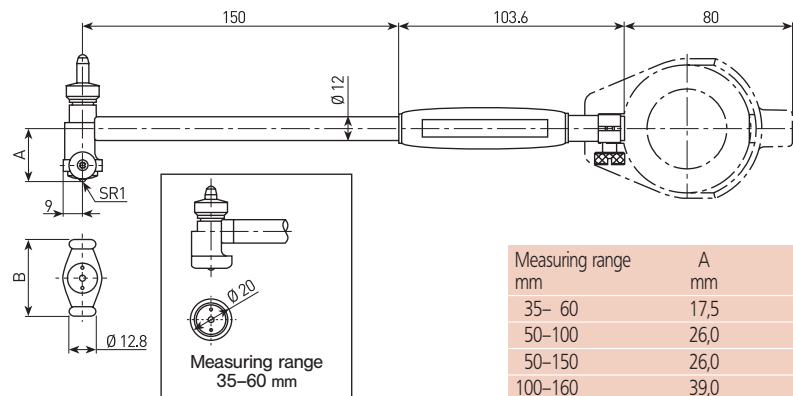
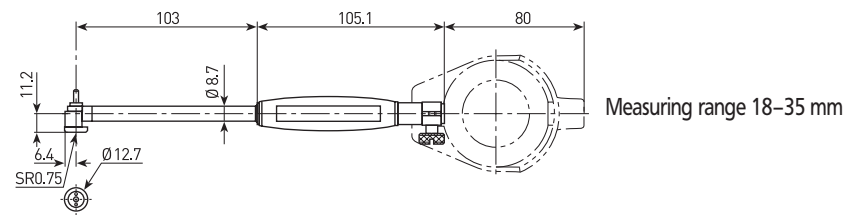
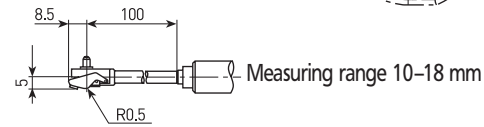
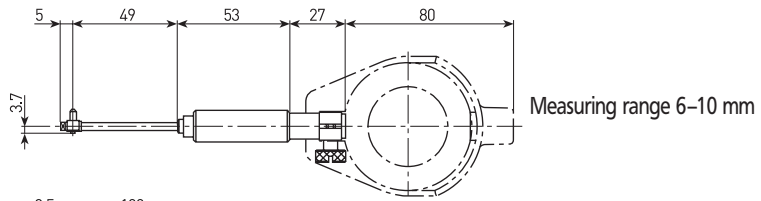
Measuring range: 18-150 mm
Mass: 954 g

◀ Specifications of Dial indicator
see pages 171, 183, 185

▶ For sample application see page 239

Bore gauges Dimensions

Series 511



Bore gauges

- These bore gauges do not require a continuous changing of the measuring bolts thanks to the integrated micrometer head.
- The probe bolt with carbide ball guarantees a long service life.

Series 511

with micrometer head



511-344



511-314



Measuring range	No.	Graduation	Micrometer head measuring span	Extension
mm		mm	mm	mm
With dial indicator No. 2109 SB-10				
35- 60	511-343	0,001	5	5, 10, 15, 20
60-100	511-333	0,001	10	10, 20
100-160	511-311	0,001	13	10, 20, 20
150-250	511-313	0,001	25	25, 50
250-400	511-315	0,001	50	50, 50
400-600	511-317	0,001	50	50, 100
600-800	511-327	0,001	50	50, 100

Measuring range	No.	Graduation	Micrometer head measuring span	Extension
mm		mm	mm	mm
With dial indicator No. 2046 SB				
35- 60	511-344	0,01	5	5, 10, 15, 20
60-100	511-334	0,01	10	10, 20
100-160	511-312	0,01	13	10, 20, 20
150-250	511-314	0,01	25	25, 50
250-400	511-316	0,01	50	50, 50
400-600	511-318	0,01	50	50, 100
600-800	511-328	0,01	50	50, 100

Inside Microchecker No. 515-590
Specifications see page 239

Extensions for Series 511

Measuring range	Length				
	125 mm	250 mm	500 mm	750 mm	1000 mm
18- 35	953549	953550	953551	-	-
35-160	953552	953553	953554	953555	953556
160-400	953557	952361	953558	953559	953560

Specifications

Measuring range: 35-800 mm

Plastics cover for dial indicator including dial indicator and softbox.

Optional accessory

- No. 543-264 B Dial indicator digital (technical specifications see page 171)
- No. 2972 Dial indicator analogue, Graduation: 0,01 mm (technical specifications see page 189)
- No. 2900SB-10 Dial indicator analogue, Graduation: 0,001 mm (technical specifications see page 192)



543-264 B



2972



2900SB-10

Bore gauges

- Special design for measurement of pocket hole bores.

Specifications

Measuring range: 15–150 mm

Plastics cover for dial indicator including dial indicator and softbox.

Series 511

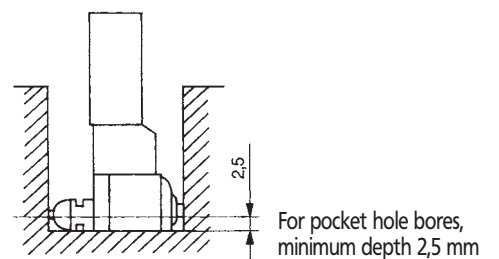


511-412



Measuring range mm	No.	Graduation mm	Measuring depth mm
With dial indicator No. 2109 SB-10			
15– 35	511-421	0,001	150
35– 60	511-422	0,001	150
50–150	511-424	0,001	150

Measuring range mm	No.	Graduation mm	Measuring depth mm
With dial indicator No. 2046 SB			
15– 35	511-411	0,01	150
35– 60	511-412	0,01	150
50–150	511-414	0,01	150



Bore gauges

- Handy design.
- Special design for small measuring depths.

Series 511



511-474



Measuring range mm	No.	Graduation mm	Measuring depth mm
With dial indicator No. 2109 SB-10			
18- 35	511-471	0,001	50
35- 60	511-472	0,001	50
50-150	511-474	0,001	50

Measuring range mm	No.	Graduation mm	Measuring depth mm
With dial indicator No. 2046 SB			
18- 35	511-461	0,01	50
35- 60	511-462	0,01	50
50-150	511-464	0,01	50

Specifications

Measuring range: 18-150 mm

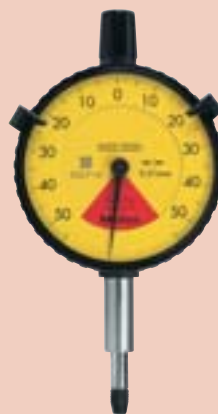
Plastics cover for dial indicator including dial indicator and softbox.

Optional accessory

- No. 543-264 B Dial indicator digital (technical specifications see page 171)
- No. 2972 Dial indicator analogue, Graduation: 0,01 mm (technical specifications see page 189)
- No. 2900SB-10 Dial indicator analogue, Graduation: 0,001 mm (technical specifications see page 192)



543-264 B



2972



2900SB-10

Inside Microchecker

• For setting 2-point inside micrometers series 511.

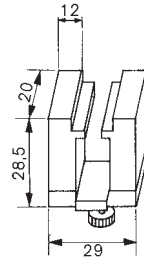
Series 515

Specifications

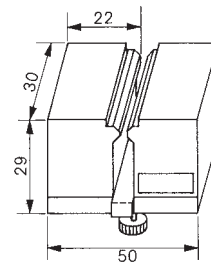
No. 515-590 Inside Microchecker
Delivery as complete set in soft box.



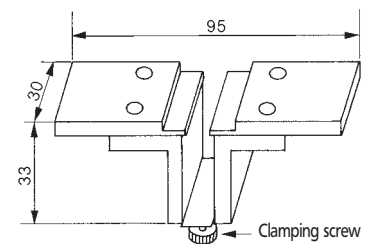
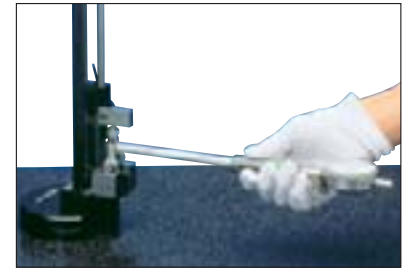
No. 515-590	consisting of: 1 Stand
No. 940088	1 receiver Type A for measuring range 18- 35 mm, 35- 60 mm
No. 940089	1 receiver Type B for measuring range 50-100 mm, 100-160 mm
No. 940090	1 receiver Type C for measuring range 100-250 mm, 250-400 mm
No. 630030	2 flat jaws



940088



940089



940090

515-590 +
Parallel gauge block
(optional accessory)

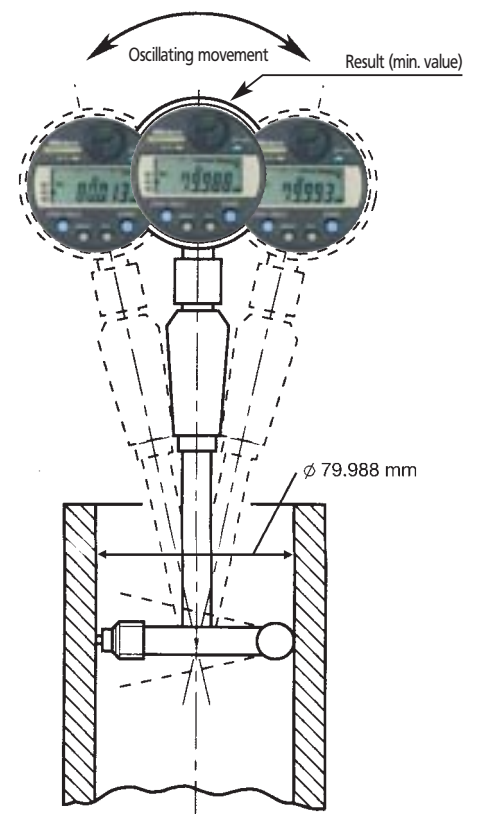
Sample Application

For measurement with an Inside Micrometer Series 511 and a digital Dial Indicator Series 543

- When using the dial indicator in connection with inside micrometers for measuring bores, the "reversal point" (diameter in question) can be detected easily during the "oscillation".
- The real value is hold and displayed by the Peakhold-function.
- 3 real values can be stored: M1, M2, M3.



543-264 B



Specifications
see page 171

Small Hole Indicators

- Extra long version for measuring blind holes.
- Can be fixed by means of locking screw. Measurement with micrometer via the two highest points.

Series 154

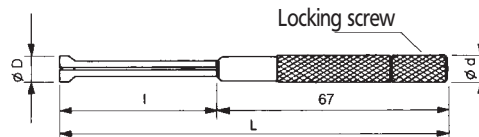
for measuring small bores



154-902

Set 154-902:

Measuring range mm	ØD mm	L mm	Ød mm	l mm
3 - 5	2,8- 5,2	90,0	5,5	22,5
5 - 7,5	4,8- 7,8	97,6	5,5	30,0
7,5-10	7,3-10,3	102,8	8,5	35,0
10 -13	9,8-13,2	108,0	8,5	40,0



Telescopic Gauges

- Self centering and satin chrome finish.
- Constant spring pressure onto the measuring surface. Fixing by locking screw.

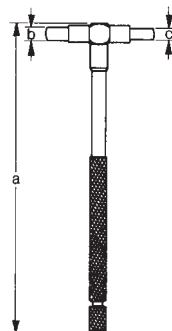
Series 155



155-905

Satz 155-905:

Measuring range mm	Individual- No.	a mm	b mm	c mm
8 - 12,7	155-127	105	4,0	3,0
12,7- 19	155-128	110	5,0	3,5
19 - 32	155-129	110	5,0	3,5
32 - 54	155-130	150	7,5	6,0
54 - 90	155-131	150	7,5	6,0
90 -150	155-132	150	7,5	6,0



Specifications

Mass: 125 g

Including plastics softbox

Specifications

Including plastics softbox

Spring Balance

- For setting micro switches, relay springs and valves, for testing the measuring force of dial indicators and for adjusting tension and compression springs.

Specifications

Accuracy: Factory specification

Error limits: $\frac{1}{2}$ Graduation

Mass: 56 g

Divided dial plate for measurement in both directions.

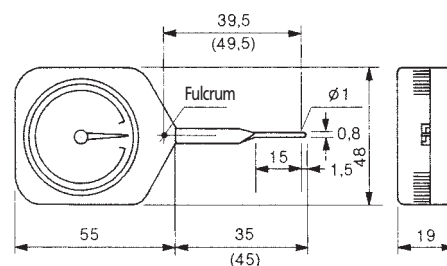
Including softbox

Series 546



546-133

Measuring range	No.	Graduation
without slave pointer		
6– 50 mN	546-112	2 mN
10–100 mN	546-113	5 mN
30–300 mN	546-114	10 mN
0,06–0,5 N	546-115	0,02 N
0,1 – 1 N	546-116	0,05 N
0,15– 1,5 N	546-117	0,05 N
0,3 – 3 N	546-118	0,1 N
0,6 – 5 N	546-119	0,2 N
with slave pointer		
10–100 mN	546-133	5 mN
30–300 mN	546-134	10 mN
0,06–0,5 N	546-135	0,02 N
0,1 – 1 N	546-136	0,05 N
0,15– 1,5 N	546-137	0,05 N
0,3 – 3 N	546-138	0,1 N
0,6 – 5 N	546-139	0,2 N



Dimensions in brackets refer to No. 546-112/-113/-133

Calibration Tester

- This calibration tester is suitable for testing of dial indicators, lever gauges and bore gauges.
- Bore gauges can be supported both horizontally and vertically.

Series 170

for dial indicators, lever gauges and inside micrometers with numerical increments or scale divisions up to 0.01 mm



170-102 M-2



170-102 M-2 with horizon holder No. 951498 M

Specifications

Measuring range: 0–25 mm
Graduation: 0,001 mm
Error limits: 2 μ m
Measuring surfaces: carbide tipped
Mass: 6,9 kg
Including holder for bore gauges 953419

Optional accessory

No. 951498 M Horizont holder

Sample Application



Sample Application



Calibration Tester

- For the calibration of digital and analogue dial indicators, lever gauges, indicating calipers and measuring probes with a maximum measuring span of 5 mm.

Specifications

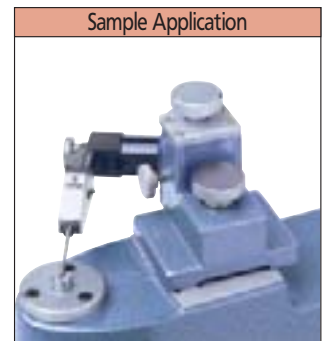
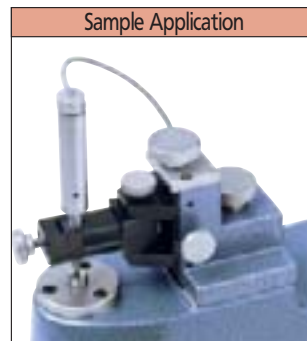
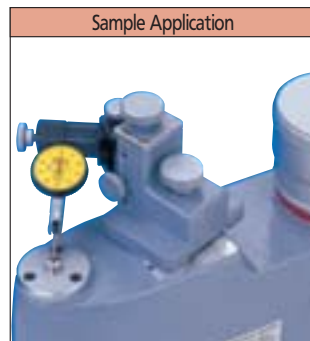
Measuring range: 0–5 mm
Graduation: 0,0002 mm
Error limits: 0,8 μm
Repeatability: 0,2 μm
Mass: 6,9 kg

Series 521

For dial indicators, measuring probes and lever gauges with numerical increments or scale divisions up to 0.001 mm



521-105



Calibration Tester "i-Checker"

- This universal measuring instrument allows for checking all kinds of dial indicators, dial test indicators, and bore gages.
- Provided with test and analysis software i-Pak. For testing and documentation.
- Measuring surfaces carbide tipped.

Series 170



170-302 D-01

Specifications

Measuring range:	100 mm
Resolution:	0,02 μm
Error limits:	
vertical:	$(0,2 + \frac{1}{100}) \mu\text{m}$; L = measuring length
horizontal:	$(0,3 + 2 \frac{1}{100}) \mu\text{m}$ L = measuring length
Drive speed:	max. 4 mm/s
Drive method:	motor-driven
Expansion coefficient:	$(8 \pm 1) \times 10^{-6}/\text{K}$
Dimensions (W x H x D):	184 x 225 x 532 mm
Mass:	20 kg

Sample Application



Sample Application



Sample Application


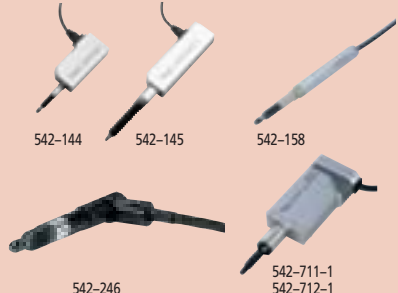


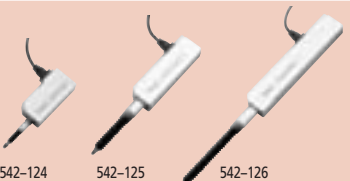
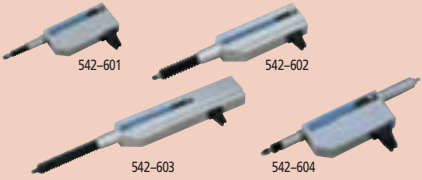
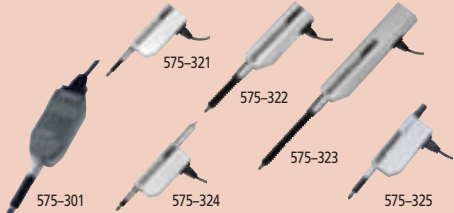


Sample Application



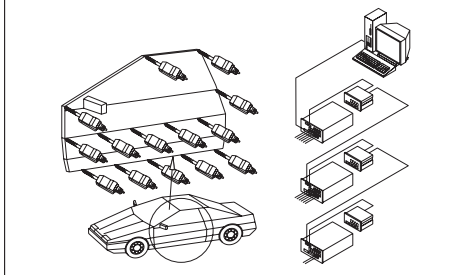
Request our detailed brochure!

Linear Gages Overview

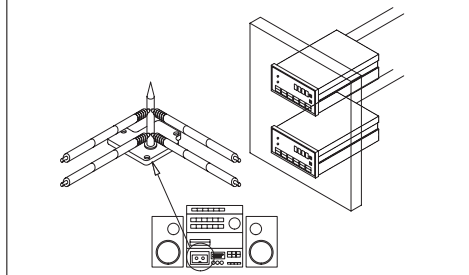
Illustration Probe	No.	Measuring range						Seite	Digital display / Counter		
		5 mm	10 mm	12 mm	25 mm	50 mm	100 mm				
Resolution 0,00001 mm (0,01 μm)											
 542-923-1D 542-924-1D	542-923-1D		●					254	KH-Counter (Standard accessory with probe)		
	542-924-1D		●					254			
Resolution 0,0001 mm											
 542-144 542-145 542-158 542-246 542-711-1 542-712-1	542-144		●					250	EG-Counter 542-015 EF-Counter 542-060 EF-Counter 542-062		
	542-145				●			250			
	542-158		●					251			
	542-246	●						255			
	542-711-1		●					255			
	542-712-1		●					255			
Resolution 0,0005 mm											
 542-157	542-157		●					251	EG-Counter 542-015 EF-Counter 542-060 EF-Counter 542-062 EV-Counter 542-063 with 02ADD400		
Resolution 0,001 mm											
 542-121 542-122 542-123 542-156 542-204 542-222 542-223 542-204 H 542-224 542-224 542-312 542-313 D	542-121		●					250	EG-Counter 542-015 EF-Counter 542-060 EF-Counter 542-062 EV-Counter 542-063 with 02ADD400		
	542-122				●			250			
	542-123					●		250			
	542-156		●					251			
	542-204	●						251			
	542-204H	●						251			
	542-222		●					251			
	542-223		●					251			
	542-224		●					251			
	542-312						●	253			
	542-313 D						●	253			
	Resolution 0,001 mm with reference point										
	 542-124 542-125 542-126	542-124		●						250	EG-Counter 542-017 EF-Counter 542-065 D EF-Counter 542-066 D
542-125					●			250			
542-126						●		250			
Resolution 0,005 mm											
 542-601 542-602 542-603 542-604	542-601		●					252	EG-Counter 542-015 EF-Counter 542-060 EF-Counter 542-062 EV-Counter 542-063 with 02ADD400		
	542-602				●			252			
	542-603					●		252			
	542-604		●					252			
Resolution 0,01 mm											
 575-301 575-321 575-322 575-323 575-324 575-325	575-301			●				249	EC-Counter 542-007 D EG-Counter 542-016 EV-Counter 542-064 with 02ADD400		
	575-321		●					248			
	575-322				●			248			
	575-323					●		248			
	575-324		●					248			
	575-325		●					249			

Linear Gages Sample Applications

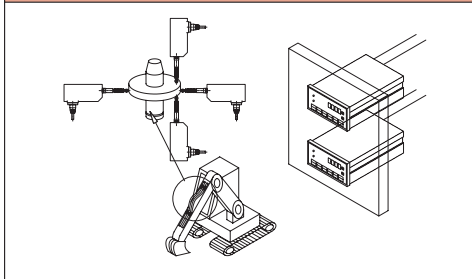
Multi-point measurement on car doors



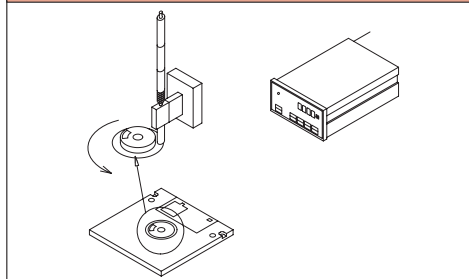
Measurement of cylindrical pin displacement



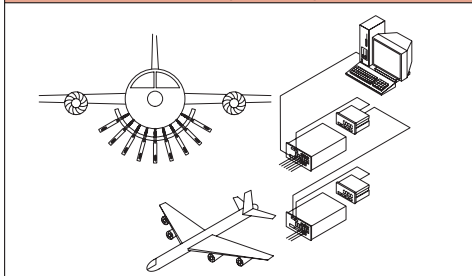
Dimension measurement of fluid flywheels



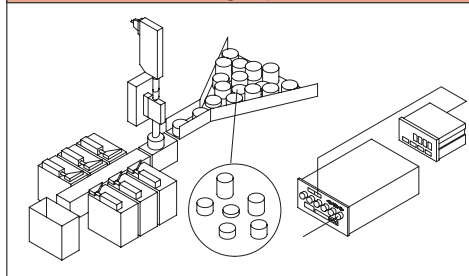
Concentricity measurement on metal hubs of floppy discs



Measurement of aeroplane body deformation



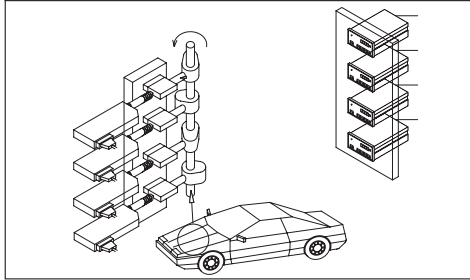
Sorting of parts



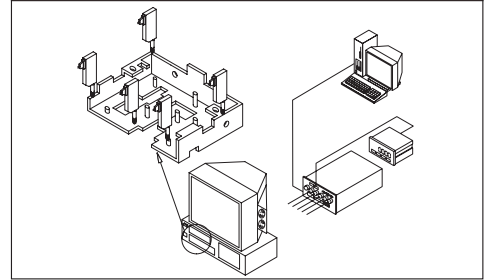
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Linear Gages Sample Applications

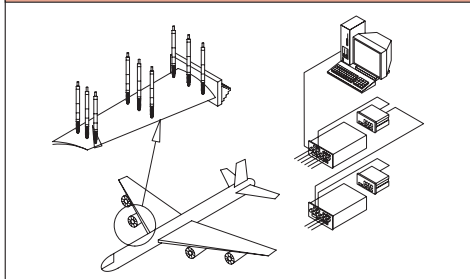
Cam pitch measurement



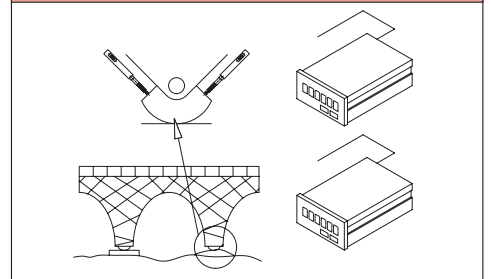
Multi-point measurement on VCR Chassis



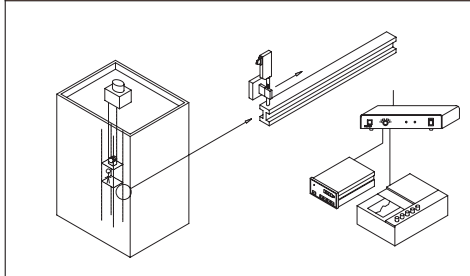
Multi-point measurement on turbine blades



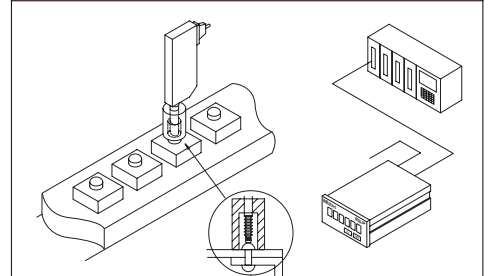
Measurement of bridge pier bearings



Measurement of deflexion of lift guiding rails



Rivet testing



Request our detailed brochure!

ABSOLUTE Linear Gages LGD

- Data output in DIGIMATIC data format; this allows for documentation and determination of measured values as well as statistical evaluation via connected DIGIMATIC data processors.
- Ultra compact ABSOLUTE Linear Gage, designed for very narrow spaces. Measurement is affected referring to the once set reference point.
- The sensor is provided with an "ABSOLUTE" scale so that the reference point setting stays stored even if the power is turned off.
- To ensure a long service life the spindle guidance is equipped with special ball sleeves.

Series 575

Protection Standard: IP-66 / IP-54

ABSOLUTE™

Absolute System Patented by MITUTOYO



Specifications

Protection Standard: IP-66 / IP-54
 Probe tip: Ø 3 mm carbide (fixing thread: M2,5x0,45 mm)
 Bearing: Ballbearing
 Measuring system: Capacitive ABSOLUTE Linear Scale
 Max. speed: Unlimited; measuring by scanning not possible
 Output signal: DIGIMATIC output
 External input: Zero-setting signal
 Cable length: 2 m
 Environmental conditions: 0° C to 40° C (20% to 80% rel. humidity, no condensation)

Standard accessory

Wrench for probes

Optional accessory

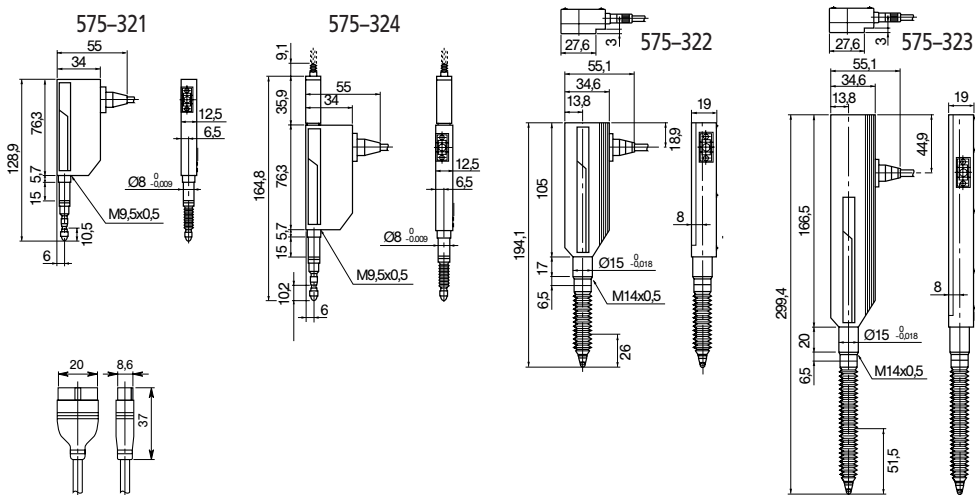
- No. 02ADC730 Fixing set Ø 9,5 mm (four 575-321 / 575-324)
- No. 02ADC740 Fixing set Ø 18 mm (for 575-322 / 575-323)
- No. 02ADF640 Adapter for extension cable



- No. 936937 Extension cable (1 m)
 - No. 965014 Extension cable (2 m)
 - No. 011318 DMX 8/2 transmitter RS-232 C
- For the linear gauge, the necessary voltage supply is available and an ABS zero point key (see DMX-8 page 21 for technical data)

See pages 258–260 for displays
 See page 256 for pneumatic drives

Resolution	No.	Measuring range	Error limits (20 °C)	Measuring force downwards	Measuring force horizontally	Measuring force upwards	Protection Standard	Shaft diameter	Mass
mm		mm	µm	N	N	N		mm	g
0,01	575-321	10	20	≤ 1,2	≤ 1,1	≤ 1,0	IP-66	8	200
0,01	575-322	25	20	≤ 4,6	≤ 4,3	≤ 4,0	IP-66	15	250
0,01	575-323	50	30	≤ 5,7	≤ 5,3	≤ 4,9	IP-66	15	300
Spindle drive pneumatic									
0,01	575-324	10	20	≤ 1,2	≤ 1,1	≤ 1,0	IP-54	8	220



™ Patent numbers see page 464

Specifications

Protection Standard: IP-66
 Direction of counting: plus
 Probe tip: \varnothing 3 mm carbide (fixing thread: M2,5 x 0,45 mm)
 Bearing: Sliding bearing
 Measuring system: Capacitive Incremental Linear Scale
 Max. speed: 1600 mm/s; (measuring by scanning not possible)
 Output signal: DIGIMATIC output
 Cable length: 2 m
 Environmental conditions: 0°C to 40°C (20% to 80% rel. humidity, no condensation)

Optional accessory

No. 02ADF640 Adapter for extension cable



No. 936937 Extension cable (1 m)
 No. 965014 Extension cable (2 m)

See pages 258–260 for displays
 See page 256 for pneumatic drives

Linear Gages LGS

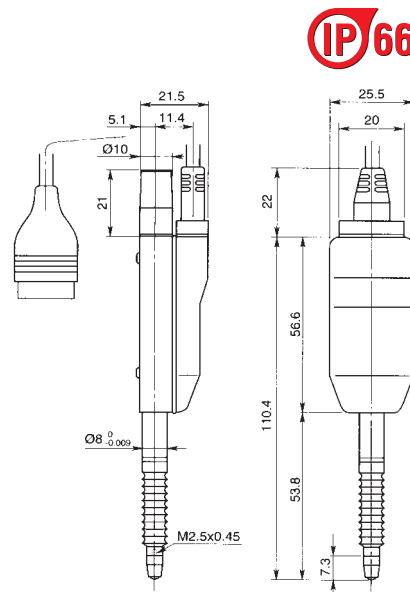
- Data output DIGIMATIC format; this enables documentation and determination of measurement values as well as statistical evaluation via connected DIGIMATIC data processing units.
- Compact length measuring instrument with built-in capacitive measuring system; Dust- and splash-proof; suitable for installation in machines, devices and for multi-position measurements.

Series 575

Protection Standard: IP-66



575-301



IP66

Resolution	No.	Measuring range	Error limits (20 °C)	Measuring force downwards	Measuring force horizontal	Measuring force upwards	Protection Standard	Shaft diameter	Mass incl. cable
mm		mm	μm	N	N	N		mm	g
0,01	575-301	12	20	$\leq 1,96$	$\leq 1,67$	$\leq 1,47$	IP-66	8	170

Specifications

Protection Standard: IP-66
 Direction of counting: plus
 Probe tip: \varnothing 3 mm Carbide (fixing thread: M2,5 x 0,45 mm)
 Bearing: Sliding bearing
 Measuring system: Capacitive ABSOLUTE Linear Scale
 Max. speed: Unlimited (measuring by scanning not possible)
 Output signal: DIGIMATIC output
 Cable length: 2 m
 Environmental conditions: 0°C to 40°C (20% to 80% rel. humidity, no condensation)

Standard accessory

No. 538610 Wrench for probes

Optional accessory

No. 011318 DMX 8/2 transmitter RS-232 C
 For the linear gauge, the necessary voltage supply is available and an ABS zero point key (see DMX-8 page 21 for technical data)

See pages 258–260 for displays
 See page 256 for pneumatic drives

ABSOLUTE Linear Gages LGD-M

- Data output DIGIMATIC format; this enables documentation and determination of measurement values as well as statistical evaluation via connected DIGIMATIC data processing units.
- The LGD-M is a compact ABSOLUTE linear gauge.
- Sliding bearings replace the ball bearing of the original LGD gauge to make the instruments less expensive.
- The use of an absolute scale in the sensor enables the original setting to be retained even when power is switched off.
- The spindle is supported at both ends. This improves the accuracy to 15 μm .

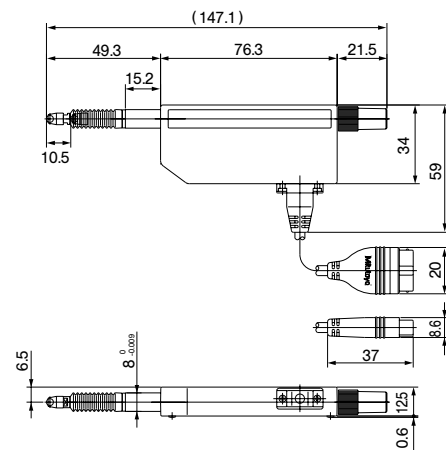
Series 575

Protection Standard: IP-66



575-325

ABSOLUTE™ IP66
 Absolute System Patented by MITUTOYO



Resolution	No.	Measuring range	Error limits (20 °C)	Measuring force downwards	Measuring force horizontal	Measuring force upwards	Protection Standard*	Shaft diameter	Mass
mm		mm	μm	N	N	N		mm	g
0,01	575-325	10	15	≤ 2	$\leq 1,8$	$\leq 1,6$	IP-66	8	182

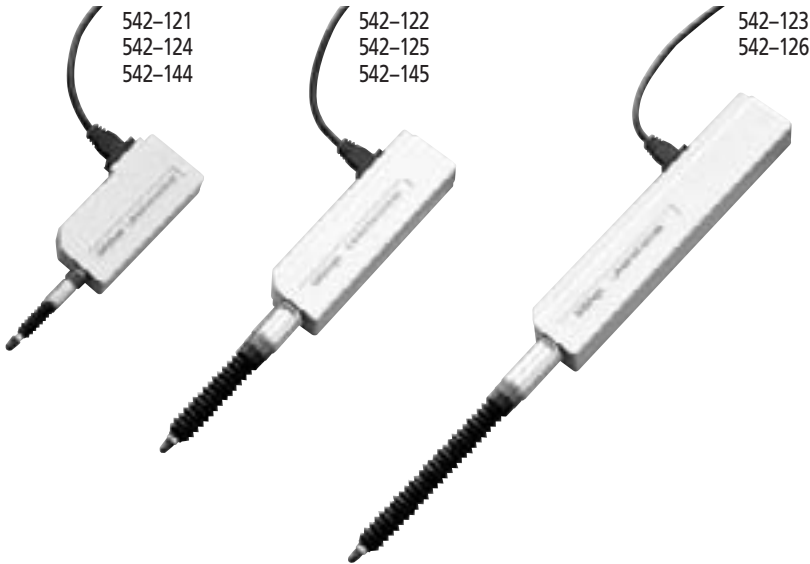
™ Patent numbers see page 464

Linear Gages LGF Electronic Length Measuring Instruments with and without reference point

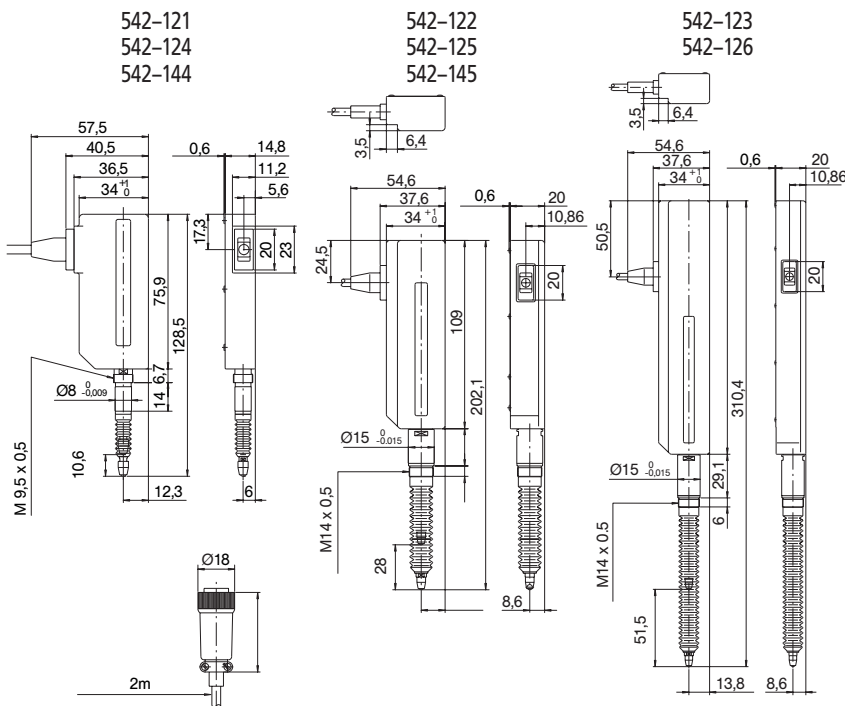
- Differential square-wave signal output for a wide range of application. Longevity due to ball bearings employed in the spindle unit.
- The LGF Linear Gages are Mitutoyo's latest low-cost electronic length measuring probes, especially designed for very narrow spaces. Due to the enhanced construction of the spindle guidance the LGF is very resistant to external shocks and vibrations.
- Outstanding protection against dust and splashing water (IP-66) for operation under severe conditions.

Series 542

Protection Standard: IP-66



Resolution	No.	Measuring range	Error limits (20 °C)	Measuring force downwards	Measuring force horizontally	Measuring force upwards	Shaft diameter	Drive speed max.	Signal graduation	Mass
mm		mm	µm	N	N	N	mm	mm/s	µm	g
0,0001	542-144	10	(0,8 + L/50)	≤ 1,2	≤ 1,1	≤ 1,0	8	400	0,4	250
0,0001	542-145	25	(0,8 + L/50)	≤ 4,6	≤ 4,3	≤ 4,0	15	400	0,4	290
0,001	542-121	10	(1,5 + L/50)	≤ 1,2	≤ 1,1	≤ 1,0	8	1500	4,0	250
0,001	542-122	25	(1,5 + L/50)	≤ 4,6	≤ 4,3	≤ 4,0	15	1500	4,0	290
0,001	542-123	50	(1,5 + L/50)	≤ 5,7	≤ 5,3	≤ 4,9	15	1500	4,0	380
Linear Gage with reference point										
0,001	542-124	10	(1,5 + L/50)	≤ 1,2	≤ 1,1	≤ 1,0	8	1500	4,0	250
0,001	542-125	25	(1,5 + L/50)	≤ 4,6	≤ 4,3	≤ 4,0	15	1500	4,0	290
0,001	542-126	50	(1,5 + L/50)	≤ 5,7	≤ 5,3	≤ 4,9	15	1500	4,0	380



Specifications

- Protection Standard: IP-66
- Probe tip: Ø 3 mm carbide (fixing thread: M 2,5 x 0,45 mm) allbearing, not susceptible to shock
- Bearing: Photoelectric direct light glass scale
- Measuring system: 90° phase shift, differential square-wave signal (equivalent to RS-422 A)
- Output signal: 2 m
- Cable length: 5 V (4,8 V to 5,2 V)
- Power supply: Max. 120 mA
- Power consumption: Environmental conditions: 0 °C to 40 °C (20 % to 80 % rel. humidity, no condensation)

Optional accessory

- No. 02ADF260 Extension cable (5 m) for probes with reference point
- No. 02ADF280 Extension cable (10 m) for probes with reference point
- No. 02ADF300 Extension cable (20 m) for probes with reference point
- No. 902434 Extension cable (5 m) for probes without reference point
- No. 902433 Extension cable (10 m) for probes without reference point
- No. 902432 Extension cable (20 m) for probes without reference point



- No. 238772 10 mm Rubber protection cover (spare part)
- No. 962504 25 mm Rubber protection cover (spare part)
- No. 962505 50 mm Rubber protection cover (spare part)
- No. 02ADB680 Fixing set (for models LGF 10 mm), Ø 9,5 mm
- No. 02ADB690 Fixing set (for models LGF 25 mm/50 mm), Ø 18 mm



See pages 258–260 for displays
See page 256 for pneumatic drives

Linear Gages SLIM HEAD LGB

- Differential square-wave signal output for a wide range of application. Longevity due to ball bearings employed in the spindle unit.
- Extra compact design. Available with an outer diameter of only 8 mm.
- The small photoelectric scale guarantees high precision for the entire stroke range.
- Outstanding longevity due to the ball bearings employed in the spindle unit.

IP 54

Specifications

Protection class:	IP-54
Probe tip:	Ø 3 mm carbide (fixing thread: M 2,5 x 0,45 mm)
Bearing:	Ballbearing
Measuring system:	Photoelectric direct light glass scale
Output signal:	90° phase shift, differential square-wave signal (equivalent to RS-422 A)
Cable length:	2 m
Power supply:	5 V (4,5 V to 5,2 V)
Power consumption:	Max. 80 mA
Environmental conditions:	0 °C to 40 °C (20% to 80% rel. humidity, no condensation)

Optional accessory

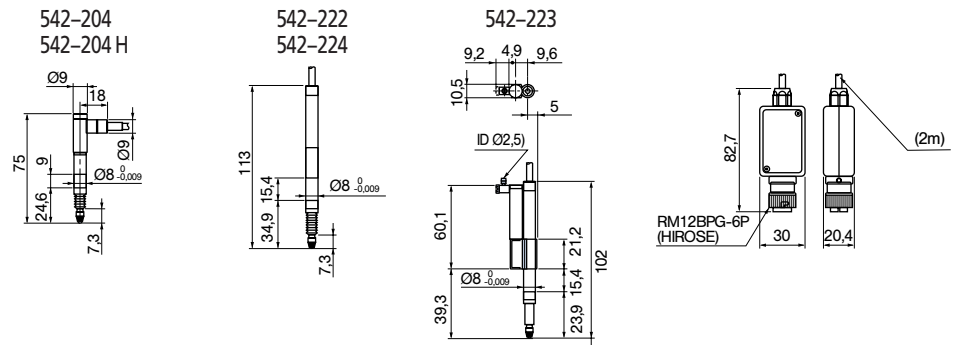
- No. 902434 Extension cable (5 m)
- No. 902433 Extension cable (10 m)
- No. 902432 Extension cable (20 m)
- No. 238773 5 mm Rubber protection cover (spare part)
- No. 238772 10 mm Rubber protection cover (spare part)

Series 542

Protection Standard: IP-54



Resolution	No.	Measuring range	Error limits (20 °C)	Measuring force downwards	Measuring force horizontally	Measuring force upwards	Shaft diameter	Drive speed max.	Signal graduation	Mass
mm		mm	µm	N	N	N	mm	mm/s	µm	g
0,001	542-204	5	2	≤ 0,65	≤ 0,60	≤ 0,55	8	900	4	145
0,001	542-204 H	5	1	≤ 0,65	≤ 0,60	≤ 0,55	8	900	4	145
0,001	542-222	10	2	≤ 0,80	≤ 0,75	≤ 0,70	8	900	4	150
0,001	542-224	10	2	≤ 0,60	≤ 0,55	≤ 0,50	8	900	4	150
Spindle drive pneumatic										
0,001	542-223	10	2	≤ 0,80	≤ 0,75	≤ 0,70	8	900	4	165



Linear Gages SLIM HEAD LGK

- Differential square-wave signal output for a wide range of application. Longevity due to ball bearings employed in the spindle unit.
- Small spatial requirement for installation where space is restricted.
- Special resistance with IP-66 protection class for aggressive working conditions.
- The small photoelectric scale guarantees high precision throughout the measuring span.
- The ball bearings in the spindle unit guarantee very long life.

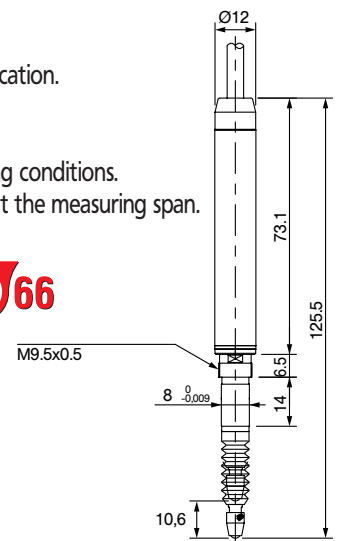
Series 542

Protection class: IP-66



542-156
542-157
542-158

IP 66



Specifications

Protection class:	IP-66
Probe tip:	Ø 3 mm carbide (fixing thread: M 2,5 x 0,45 mm)
Bearing:	Ballbearing
Measuring system:	Photoelectric direct light glass scale
Max. speed:	dynamic
Output signal:	90° phase shift, differential square-wave signal (equivalent to RS-422 A)
Cable length:	2 m
Power supply:	5 V (4,5 V to 5,2 V)
Power consumption:	Max. 80 mA
Environmental conditions:	0 °C to 40 °C (20% to 80% rel. humidity, no condensation)

Optional accessory

- No. 902434 Extension cable (5 m)
- No. 902433 Extension cable (10 m)
- No. 902432 Extension cable (20 m)
- No. 238772 10 mm Rubber protection cover (spare part)

Resolution	No.	Measuring range	Error limits (20 °C)	Measuring force downwards	Measuring force horizontally	Measuring force upwards	Shaft diameter	Drive speed max.	Signal graduation	Mass
mm		mm	µm	N	N	N	mm	mm/s	µm	g
1	542-156	10	(1,5+L/50)	≤ 0,8	≤ 0,75	≤ 0,7	8	1500	4,0	175
0,5	542-157	10	(1,5+L/50)	≤ 0,8	≤ 0,75	≤ 0,7	8	1500	2,0	175
0,1	542-158	10	(0,8+L/50)	≤ 0,8	≤ 0,75	≤ 0,7	8	400	0,4	175

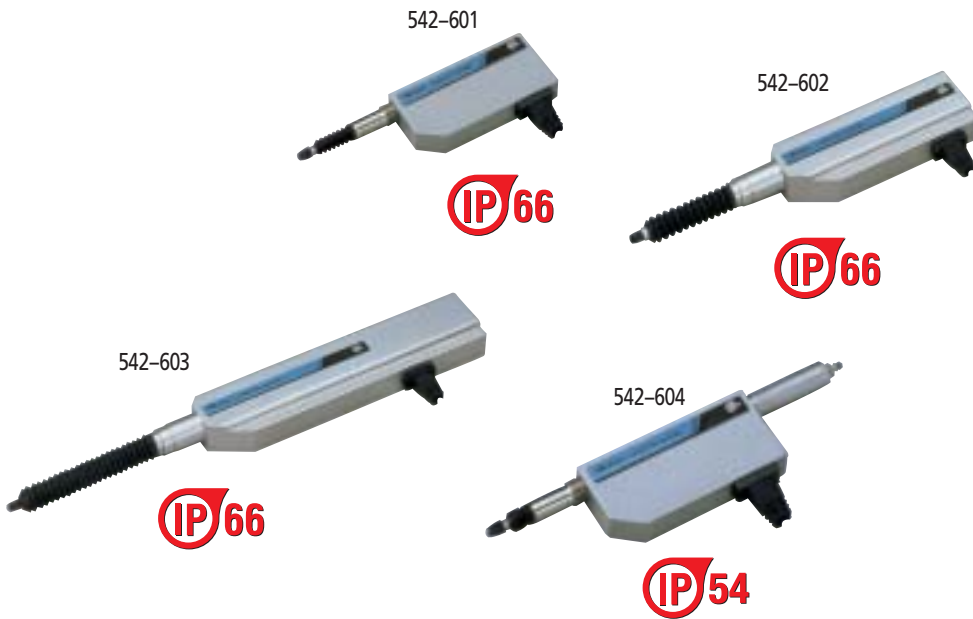
Linear Gages LGE

Electronic Length Measuring Instruments

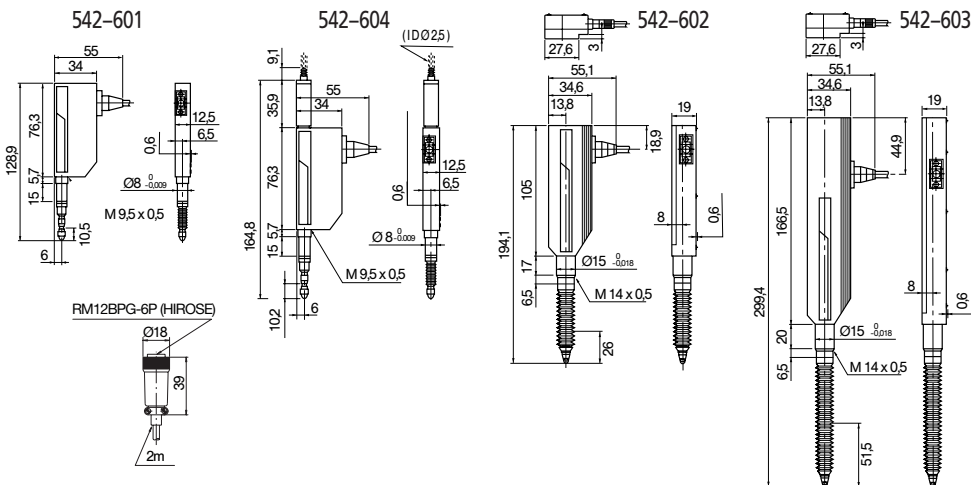
- Differential square-wave signal output for a wide range of application. Longevity due to ball bearings employed in the spindle unit.
- The LGE linear gauges are electronic length measuring probes designed for very restricted spaces. Due to the improved design of the spindle guide, the LGE is highly resistant to shaking and vibrations.
- Excellent protection against dust and spray water (IP-66) in rough workshop conditions.

Series 542

Protection Standard: IP-66 / IP-54



Resolution	No.	Measuring range	Error limits (20 °C)	Measuring force downwards	Measuring force horizontally	Measuring force upwards	Protection Standard	Shaft diameter	Drive speed max.	Signal graduation	Mass
mm		mm	μm	N	N	N		mm	mm/s	μm	g
0,005	542-601	10	20	≤ 1,2	≤ 1,1	≤ 1,0	IP-66	8	1400	20	200
0,005	542-602	25	20	≤ 4,6	≤ 4,3	≤ 4,0	IP-66	15	1400	20	250
0,005	542-603	50	30	≤ 5,7	≤ 5,3	≤ 4,9	IP-66	15	1400	20	300
Spindle drive pneumatic (extendible spindle)											
0,005	542-604	10	20	≤ 1,2	≤ 1,1	≤ 1,0	IP-54	8	1400	20	220



Specifications

Probe tip:	Ø 3 mm carbide (fixing thread: M2,5 x 0,45 mm)
Bearing:	Ballbearing
Measuring system:	Capacitive, incremental linear scale
Max. speed:	static
Output signal:	90° phase shift, differential square-wave signal (equivalent to RS-422 A)
Cable length:	2 m
Power supply:	5 V (4,8 V to 5,2 V)
Power consumption:	100 mA
Environmental conditions:	0 °C to 40 °C (20% to 80% rel. humidity, no condensation)

Standard accessory

Wrench for probes

Optional accessory

- No. 902434 Extension cable (5 m)
- No. 902433 Extension cable (10 m)
- No. 902432 Extension cable (20 m)
- No. 238772 10 mm Rubber protection cover (spare part)
- No. 962504 25 mm Rubber protection cover (spare part)
- No. 962505 50 mm Rubber protection cover (spare part)
- No. 02ADC730 Fixing set Ø 9,5 mm (for 542-601 / 542-604)
- No. 02ADC740 Fixing set Ø 18 mm (for 542-602 / 542-603)

See pages 258-260 for displays
See page 256 for pneumatic drives

Linear Gages LG / LGM

- Differential square-wave signal output for a wide range of application.
- Measuring probe with 100 mm measuring range and a resolution of 0,1 μm .
- "manual" and "motorised" versions.



Specifications

Protection Standard: IP-54
 Probe tip: \varnothing 3 mm carbide (fixing thread: M 2,5 x 0,45 mm)
 Bearing: Ballbearing
 Measuring system: Photoelectric direct light glass scale
 Output signal: 90° phase shift, differential square-wave signal (equivalent to RS-422 A)
 Cable length: 2 m
 Power supply: 5 V (4,8 V to 5,2 V)
 Power consumption: 100 mA
 Environmental conditions: 0 °C to 40 °C (20% to 80% rel. humidity, no condensation)

Series 542



542-312



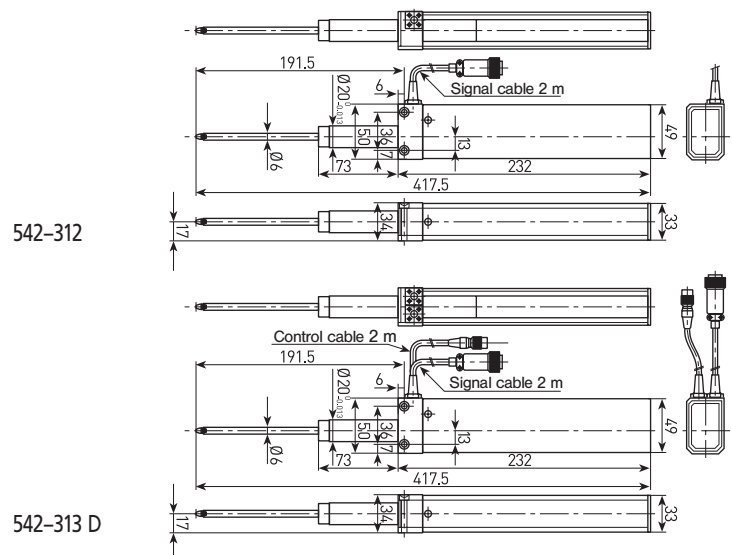
542-313 D

Control unit for 542-313 D (Standard accessory)



For driving the motorised measuring probe

Resolution	No.	Measuring range	Error limits (20 °C)	Measuring force downwards	Measuring force horizontally	Measuring force upwards	Shaft diameter	Drive speed max.	Signal graduation	Mass
mm		mm	μm	N	N	N	mm	mm/s	μm	g
0,0001	542-312	100	2,5	≤ 8	$\leq 6,5$	≤ 5	20	400	0,4	640
0,0001	542-313 D	100	2,5		from control unit		20	400	0,4	780



"Laser Hologage" LGH

- The Mitutoyo "Laser-Hologage" is a highly precise dial gauge using a holographic measuring system which operates on the principle of interference formation of laser light on a grating.
- The measuring head is very compact which means that it can be built into various systems far less expensively than conventional laser technology.
- The "Laser-Hologage" can be employed both as a measuring instrument for measuring extremely precise parts and as a transducer in ultra precise positioning and control systems.

Series 542

Ultra precise measuring instrument, resolution: 0,01 μm

"Laser Hologage" LGH



542-923-1 D

KH display



Functions	KH-Counter
Zero-setting	●
Halving of display value	●
Diameter function	●
ABS / INC coordinates	●
Counting direction switching	●
mm/inch switching	●
Linear error compensation	●
Error reporting	●

Specifications (Measuring probe)

Output signal: Sine waves 90° phase shift
 Environmental conditions: 10 to 30 °C

Standard accessory

KH display with RS-232 C output

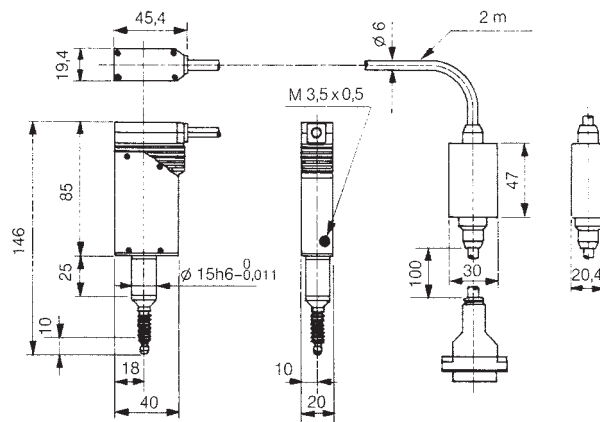
Specifications (Display unit)

Type: KH
 Display range: ± 999.99999 mm
 Power supply: 230 V 50/60 Hz
 Environmental conditions: 0 to 40 °C
 Dimensions (W x H x D): 235 x 107 x 118 mm
 Mass: 2 kg

Optional accessory

No. 971750 Comparator stand
 No. 971753 Cable release

Resolution	No.	Measuring range	Error limits	Repeatability	Measuring force downwards	Type	Drive speed max.	Mass Probe
μm		mm	μm	μm	N		mm/s	g
0,01	542-923-1 D	10	0,1	0,02	$\leq 0,55$	Standard measuring force	250	400
0,01	542-924-1 D	10	0,1	0,02	$0,1 \pm 0,03$	Low measuring force	250	400



"Laser Hologage"

- The Mitutoyo "Laser-Hologage" is a highly precise dial gauge using a holographic measuring system which operates on the principle of interference formation of laser light on a grating.
- The measuring head is very compact which means that it can be built into various systems far less expensively than conventional laser technology; the systems themselves can be kept relatively small.
- The "Laser-Hologage" can be employed both as a measuring instrument for measuring extremely precise parts and as a transducer in ultra precise positioning and control systems.

Specifications (Measuring probe)

Output signal: 90° phase shift, differential square-wave signal (equivalent to RS-422 A)

Environmental conditions: 10 to 30 °C

Optional accessory

No. 971750 Comparator stand
 No. 971753 Cable release
 No. 542-060 D Single display
 No. 542-060 D Double display

Series 542

Ultra precise measuring instrument, resolution: 0,1 μm

"Laser Hologage" LGH

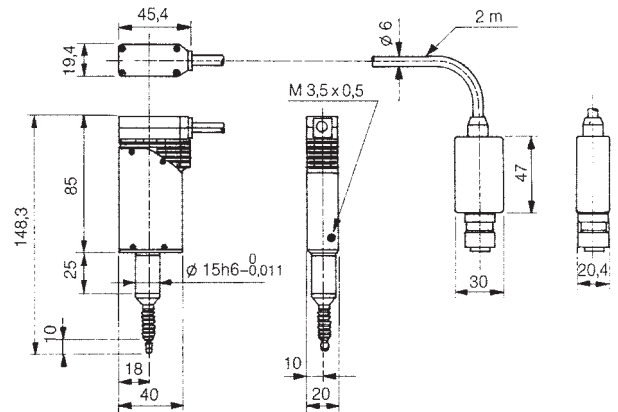


542-711-1

The appropriate display unit No. 542-060 D / 542-062 D (optional accessory) can be found on page 259



Resolution	No.	Measuring range	Error limits	Repeatability	Measuring force downwards	Type	Mass Probe
μm		mm	μm	μm	N		g
0,1	542-711-1	10	0,2	0,1	≤ 0,55	Standard measuring force	410
0,1	542-712-1	10	0,2	0,1	0,1 ± 0,03	Low measuring force	410



Linear Gages LGB Electronic Length Measuring Instrument

- Extremely small dimensions, with an outside diameter of just 8 mm.
- The scale offers high precision over the entire measuring range.
- The straight guided ball spindle ensures a long service life.

Series 542

Ultra precise measuring instrument, resolution: 0,1 μm



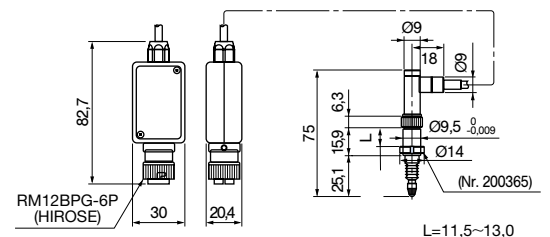
Specifications (Measuring probe)

Protection Standard: IP-54
 Clamping shank: Ø 9,5 mm
 Output signal: 90° phase shift, differential square-wave signal (equivalent to RS-422 A)

Cable length: 2 m
 Power supply: + 5 V (300 mA)
 Environmental conditions: 10 to 30 °C



542-246

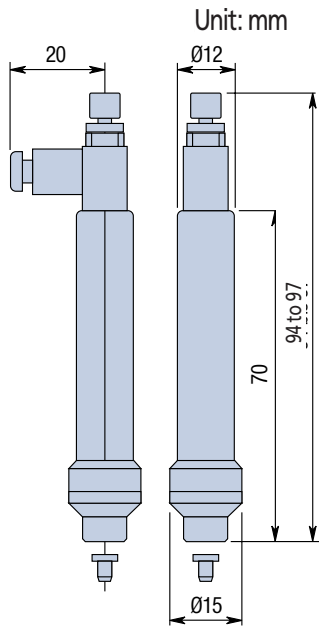


Resolution	No.	Measuring range	Error limits	Measuring force downwards	Drive speed max.	Mass
μm		mm	μm	N	mm/s	g
0,1	542-246	5	0,8	≤ 0,65	380	160

The appropriate display units No. 542-060 D, 542-062 D can be found on page 259

Pneumatic drive

- Lifting and lowering of the spindle of a linear gauge by the supply and drawing off of air.
- The spindle stroke speed can be set using the throttle of the lifting cylinder.
- Automatic measurement using a solenoid valve.



903594

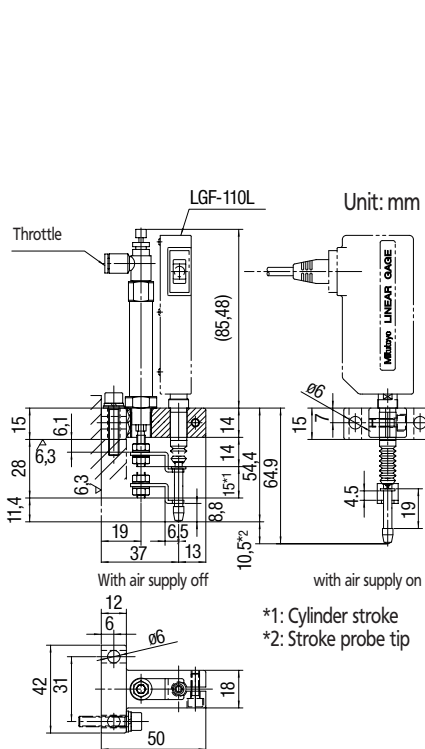


No. 903594 with no. 575-301

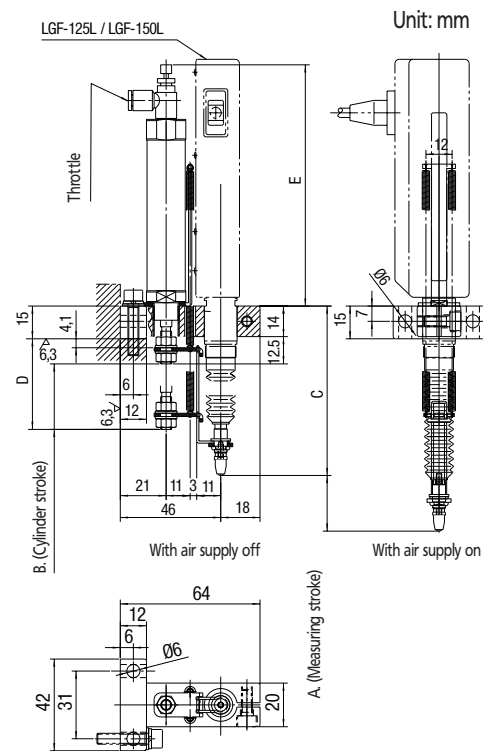
Specifications

Air hose: 2.5 mm inside diameter

No.	Stroke mm	Suitable for gauge model	Air supply MPa	A mm	B mm	C mm	D mm	E mm	Mass g
903594	10	LGS	0,49	-	-	-	-	-	60
02ADE230	10	LGF; LGE; LGD	0,2 to 0,4	-	-	-	-	-	150
02ADE250	25	LGF; LGE; LGD	0,2 to 0,4	25,5	30	77,6	41,5	110,5	250
02ADE270	50	LGF; LGE; LGD	0,2 to 0,4	51,0	50	95,9	66,5	159,5	300



02ADE230



02ADE250 / ADE270

DIGIMATIC EC display

- Can be connected to devices with DIGIMATIC output:
 - Built-in micrometers
 - Dial indicators
 - Measuring probes.
- DIN-compatible compact front panel assembly (96 x 48 mm).

Series 542

With data output and tolerance evaluation function



542-007 D

No.	Dimensions (W x H x D) mm	Mass g
542-007 D	96 x 48 x 84,6	150

Functions	Series 542
ON / OFF	●
PRESET	●
Zero-setting	●
Tolerance limit input	●
Go / ± NG signal output (3 steps) on the display as well as via the I/O interface	●
Counting direction switching	●
Error report	●
Key lock	●
Display of measured value with factor	●
DIGIMATIC Data input	●
DIGIMATIC Data output	●
mm / inch switching	●

Specifications

Display: green LED display,
6-digit, with (-) sign,
character height: 15 mm

Power supply: +9-12 V DC 400 mA
or AC adapter

Standard accessory

No. 526688 D AC adapter

Optional accessory

- No. C 162-155 I/O cable (2 m)
- No. 936937 Signal cable (1 m)
- No. 965014 Signal cable (2 m)
- No. 214938 Adapter for power supply

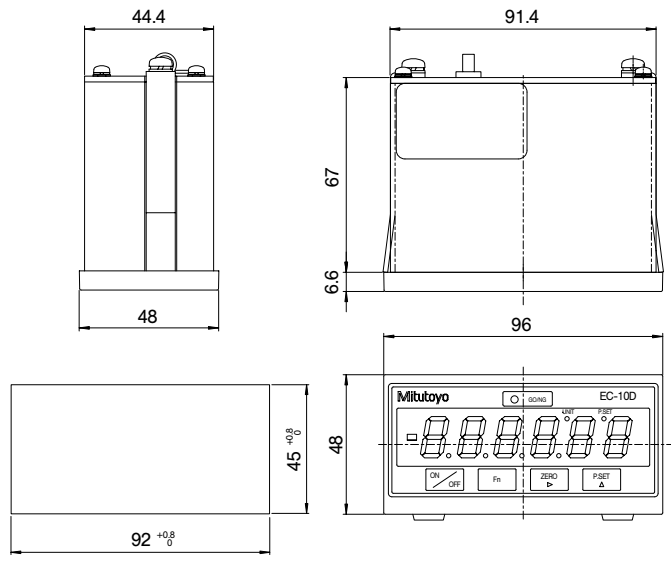
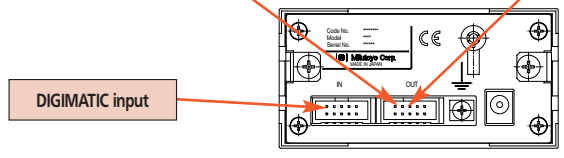


Sample application

I/O interface
1. For relaying 3-level tolerance signals
2. For calling PRESET values or hold function from outside

OR

DIGIMATIC output
for relaying to:
1. SPC printer
2. Transmitter DMX etc.



Linear Gages EG-Counter

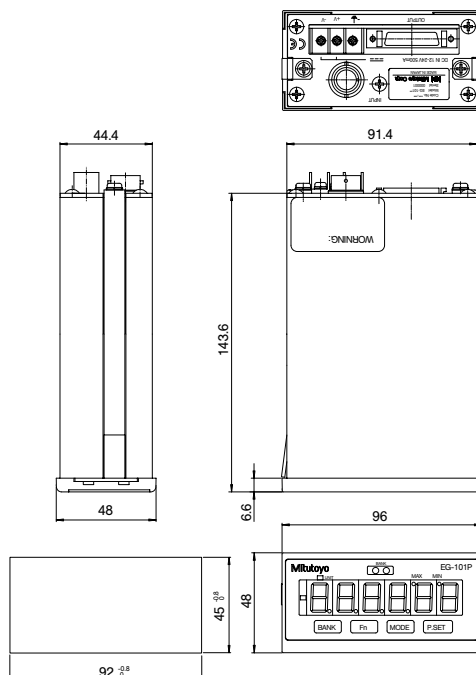
- Compact type with control panel according to DIN (96 x 48 mm).
- With I/O control function such as G / ±NGO evaluation (3/5 steps) or BCD output function.

Serie 542



542-015

No.	Number of inputs	Resolution (depending on the connected Linear Gage)	Mass g
Connectable probes: LGF, LGK, LGB, LGE, LGM, LG			
542-015	1 (single display)	0,0001 mm, 0,0005 mm, 0,001 mm, 0,005 mm, 0,01 mm	400
Connectable probes: LGS, LGD, DIGIMATIC dial indicators, DIGIMATIC built-in caliper			
542-016	1 (single display)	0,001 mm, 0,01 mm	400
Connectable probe: LGF with reference point			
542-017	1 (single display)	0,0001 mm, 0,0005 mm, 0,001 mm, 0,005 mm, 0,01 mm	400



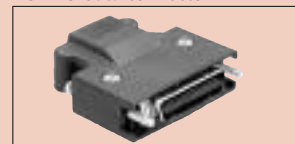
Functions	542-015	542-016	542-017
PRESET	●	●	●
Tolerance limit setting (3 or 5 steps)	●	●	●
G / ± NGO signal output (3 or 5 steps)	●	●	●
Max / MIN / Difference measurement	●	●	●
Counting direction switching	●	●	●
Error report	●	●	●
Key lock	●	●	●
mm / inch switching	●	●	●
Display of measured value with factor	●	●	●

Specifications

Display:	green LED display, 6-digit, with (-) sign, character height: 15 mm
Data output:	I/O: G / ± NGO evaluation (3/5 steps) BCD
External control (Input):	PRESET, Hold, Reset, Max/Min/Difference measurement
Power supply:	Terminal connector (M3 screws), +12 to +24 V DC, 500 mA (max)
Environmental conditions:	0 °C to 40 °C
Dimensions (W x H x D):	96 x 48 x 156 mm

Optional accessory

No. 02ADD440 BCD I/O data connector



No. 02ADB930 Three-wire cable for power supply via AC adapter

No. 527428 AC adapter

Linear Gages EF-Counter

- Suitable, due to its design, for installation in DIN-compatible front panels or as a table-top display.
- The standard RS-232 C interface enables simple communication with an external PC.
- The RS-Link function allows for series connection of several EF Counters (max. 6 units) and in-/output of data via a RS-232 C interface channel.
- Maximum value, minimum value and TIR (total display reading) measurements are possible.
- Devices with 2 probe inputs enable 2-axis displays and complete addition and subtraction calculations between 2 probes.

Serie 542



542-060 D
542-065 D

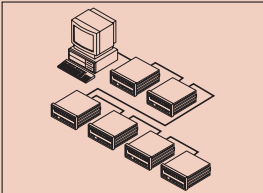


542-062 D
542-066 D



Specifications

- Display:** 8 digits and a negative [-] sign, LED (green)
- Data output:** I/O: G / ± NGO evaluation (3/5 steps), ready for operation
RS-232 C- or DIGIMATIC data: various measurement data
- External control (Input):** I/O: PRESET, DATA/HOLD pulse and error deletion,
RS-232 C: display value output, MAX/MIN/Run switching, ZERO-setting, HOLD value deletion, PRESET value setting, tolerance input and error deletion
- RS-Link:** Up to six EF-Counters can be connected via RS-232 C-Port (bus connection)



Power supply: Via AC adapter (12-24 V DC, 700 mA No. 527428 standard accessory)

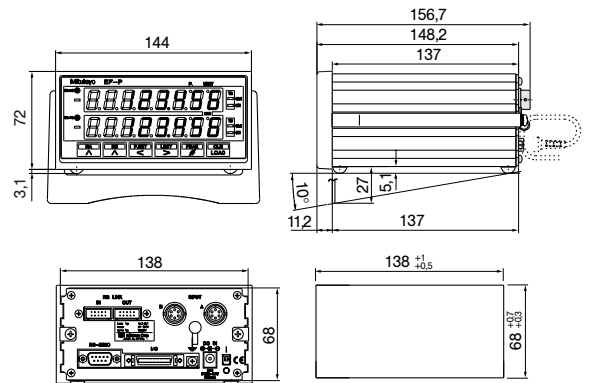
Optional accessory

- No. 936937 RS link cable (1 m)
No. 965014 RS link cable (2 m)
No. 02ADB440 I/O data connector



No.	Number of inputs	Resolution (depending on the connected Linear Gage)	Mass g
Connectable probes: LG, LGB, LGE, LGF, LGK, LGM, LGH (0,1 μm)			
542-060 D	1 (single display)	0,0001 mm, 0,0005 mm, 0,001 mm, 0,005 mm, 0,01 mm	760
542-062 D	2 (double display)	0,0001 mm, 0,0005 mm, 0,001 mm, 0,005 mm, 0,01 mm	800
Connectable probe: LGF with reference point			
542-065 D	1 (single display)	0,0005 mm, 0,001 mm, 0,005 mm, 0,01 mm	800
542-066 D	2 (double display)	0,0005 mm, 0,001 mm, 0,005 mm, 0,01 mm	840

The EF-Counter can be set up and used on the measuring table by using the supplied holder.



Linear Gages EV-Counter

- Up to six probes can be connected. By using the RS-Link function, up to 10 EV-Counter can be connected to one PC. Thus, a multi-point measuring system with a maximum of 60 probes can be configured.
- The following output modes are selectable: I/O output for G/±NGO evaluation (3 steps), BCD data output, and RS-232 C output.
- HOLD/DATA measurement for MAX/MIN, Difference, etc. are possible.
- The display unit is able to calculate a sum, a mean value, Maximum, Minimum, max. difference, etc. between probes connected to the same instrument.

Serie 542

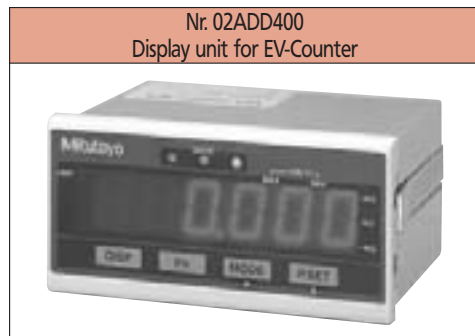


542-063



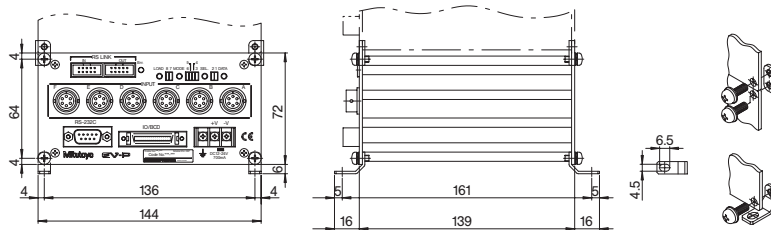
542-064

No.	Number of inputs	Resolution (depending on the connected Linear Gage)	Mass g
Connectable probes: LGB (without 0,1 μm type), LGF (without 0,1 μm type), LGK (without 0,1 μm type), LGE			
542-063	6	0,0005 mm, 0,001 mm, 0,005 mm, 0,01 mm	910
Connectable probes: LGD, LGD-M, LGS			
542-064	6	0,0005 mm, 0,001 mm, 0,005 mm, 0,01 mm	910

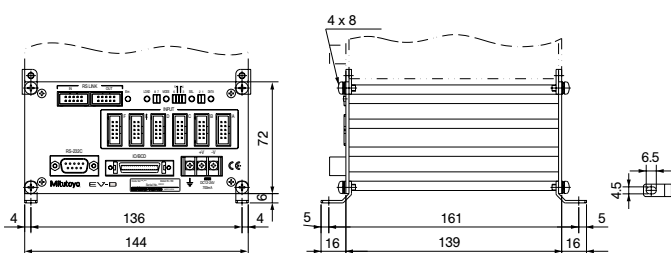


Nr. 02ADD400
Display unit for EV-Counter

For setting the EV counter without PC or other external control unit



542-063



542-064

Functions	542-063	542-064
G/±NGO evaluation	●	●
G/±NGO signal output (3 steps)	●	●
MAX/MIN/Difference measurement	●	●
Counting direction switching	●	●
mm / inch switching	●	●
Sum calculation	●	●
Mean value, maximum value, min. and max. difference between specified probes	●	●
Selection of output mode	●	●
Tolerance limit setting (3 steps)	●	●
Error report	●	●
RS-Link	●	●

Specifications

Data output: I/O:
G / ± NGO evaluation (3 steps)
Measurement data (BCD-Code)
RS-232 C:
various measurement data

External control (Input):

I/O:
Probe selection,
PRESET, Hold, error deletion
RS-232:
Zero-setting,
Preset input,
Tolerance values input,
Reset max., min., max-min value,
Hold value;
Erasing of error report,
Call-up of calculated value
between specified probes

RS-Link:
Up to 10 EV-Counter can be connected t via RS-232 C entry (bus connected).
EV- and EF-Counter can be mixed. (In this case, only 6 counters can be connected).

Power supply: Terminal connector (M3 screws), DC + 12 to + 24 V, 700 mA (max.)

Environmental conditions: 0 °C to 40 °C
(20% to 80% rel. humidity, no condensation)

Optional accessory

- No. 02ADD400 Display unit for EV counter
- No. 02ADB440 BCD I/O data connector



- No. 936937 RS link cable (1 m)
- No. 965014 RS link cable (2 m)
- No. 02ADD930 Three-wire cable for power supply via AC adapter
- No. 527428 AC adapter

"M μ -Checker" Electronic Length Measuring Instruments

Digital Types

Specifications

Analogue output: $\pm 2,0$ V/ \pm entire display range
(Accuracy: $\pm 0,1$ %)
Digital output: "DIGIMATIC" format
Power supply: 230 V, 50 Hz

Series 519

Differential M μ -Checker



519-411

No.	Measuring range*	Resolution*	Error limits	Measuring functions	ZERO setting range*	Dimensions (WxHxD) mm	Mass kg
519-411	L: $\pm 2,0$ H: $\pm 0,2$ ABS/CMP (switchable)	L: 0,001 H: 0,0001	4 Digit	$\pm A, \pm B,$ $\pm A \pm B$	L: 1/3 of the display range H: entire display range	134x210x183	1,7

* L = Low H = High

Specifications

Analogue output: $\pm 2,0$ V/ \pm entire display range
(Accuracy: $\pm 0,1$ %)
Digital output: "DIGIMATIC" format
Power supply: 230 V, 50 Hz

Series 519

Limit value M μ -Checker.



519-413

No.	Measuring range*	Resolution*	Error limits	Measuring functions	ZERO setting range*	Dimensions (WxHxD) mm	Mass kg
519-413	L: $\pm 2,0$ H: $\pm 0,2$ ABS/CMP (switchable)	L: 0,001 H: 0,0001	4 Digit	$\pm A, \pm B,$ $\pm A \pm B$	L: 1/3 of the display range H: entire display range	134x210x183	1,7

* L = Low H = High

Converter

• Analogue-digital converter for connecting the M μ -Checker-series to "DIGIMATIC" mini processors.

Series 519



519-391

"M μ -Checker" Electronic Length Measuring Instruments

Analogue Types

Series 519

Standard M μ -Checker



519-401

Measuring span μm	Graduation μm
± 5	0,1
± 15	0,5
± 50	1,0
± 150	5,0
± 500	10,0
± 1500	50,0

No.	Measuring functions	Connecting sockets	Dimensions (W x H x D) mm	Mass kg
519-401	$\pm A$	1	134x210x183	1,7

Specifications

Analogue output: ± 1 V/entire display range
(Error limits: $\pm 0,1$ %
entire display range)

Power supply: 230 V, 50 Hz

Series 519

Differential M μ -Checker



519-403

Measuring span μm	Graduation μm
± 5	0,1
± 15	0,5
± 50	1,0
± 150	5,0
± 500	10,0
± 1500	50,0

No.	Measuring functions	Connecting sockets	Dimensions (W x H x D) mm	Mass kg
519-403	$\pm A, \pm B, \pm A \pm B$	2	134x210x183	1,8

Specifications

Analogue output: ± 1 V/entire display range
(Error limits: $\pm 0,1$ %
entire display range)

Power supply: 230 V, 50 Hz

"M μ -Checker" Inductive Measuring Probe

Specifications

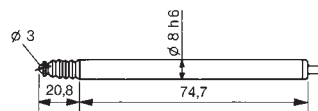
Control voltage: 3,0 Veff
 Control frequency: 5 kHz
 Cable length: 2 m
 Signal cable \varnothing : 4 mm
 Plug type: MAS-5700 (DIN 5-PIN)

Series 519



519-335

No.	Measuring span mm	Pretravel mm	Linearity	Measuring force N
519-335	$\pm 1,5$	$\pm 0,5$	$\pm 0,3\%$	0,59



Specifications

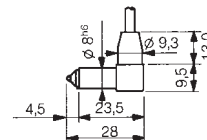
Control voltage: 3,0 Veff
 Control frequency: 5 kHz
 Cable length: 2 m
 Signal cable \varnothing : 4 mm
 Plug type: MAS-5700 (DIN 5-PIN)

Series 519



519-346

No.	Measuring span mm	Pretravel mm	Linearity	Measuring force N
519-346	$\pm 0,25$	$\pm 0,05$	$\pm 0,3\%$	0,65



Specifications

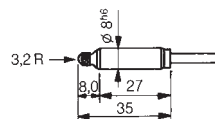
Control voltage: 3,0 Veff
 Control frequency: 5 kHz
 Cable length: 2 m
 Signal cable \varnothing : 4 mm
 Plug type: MAS-5700 (DIN 5-PIN)

Series 519



519-347

No.	Measuring span mm	Pretravel mm	Linearity	Measuring force N
519-347	$\pm 0,5$	$\pm 0,25$	$\pm 0,3\%$	0,6



Specifications

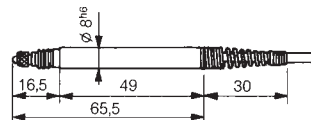
Control voltage: 3,0 Veff
 Control frequency: 5 kHz
 Cable length: 2 m
 Signal cable \varnothing : 4 mm
 Plug type: MAS-5700 (DIN 5-PIN)

Series 519



519-348

No.	Measuring span mm	Pretravel mm	Linearity	Measuring force N
519-348	$\pm 1,0$	$\pm 0,25$	$\pm 0,3\%$	0,7



Specifications

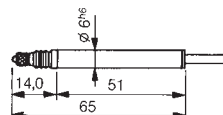
Control voltage: 3,0 Veff
 Control frequency: 5 kHz
 Cable length: 2 m
 Signal cable \varnothing : 4 mm
 Plug type: MAS-5700 (DIN 5-PIN)

Series 519



519-349

No.	Measuring span mm	Pretravel mm	Linearity	Measuring force N
519-349	$\pm 1,0$	$\pm 0,25$	$\pm 0,3\%$	0,7

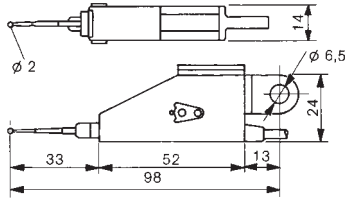


"M μ -Checker" Inductive Measuring Probe

Series 519



519-321



No.	Measuring span mm	Pretravel mm	Linearity	Measuring force N
519-321	$\pm 0,5$	$\pm 0,1$	$\pm 0,5\%$	0,2
519-322	$\pm 0,5$	$\pm 0,1$	$\pm 0,5\%$	0,02

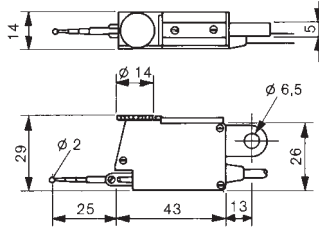
Specifications

Control voltage: 3,0 Veff
 Control frequency: 5 kHz
 Cable length: 2 m
 Signal cable \varnothing : 4 mm
 Plug type: MAS-5700 (DIN 5-PIN)

Series 519



519-326



No.	Measuring span mm	Adjustability of the probe tip	Linearity	Measuring force N
519-326	$\pm 0,5$	$\pm 90^\circ$	$\pm 0,3\%$	0,2

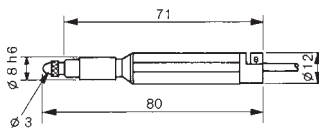
Specifications

Control voltage: 3,0 Veff
 Control frequency: 5 kHz
 Cable length: 2 m
 Signal cable \varnothing : 4 mm
 Plug type: MAS-5700 (DIN 5-PIN)

Series 519



519-331



No.	Measuring span mm	Pretravel mm	Linearity	Measuring force N
519-331	$\pm 0,5$	$\pm 0,15$	$\pm 0,5\%$	0,25

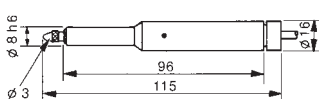
Specifications

Control voltage: 3,0 Veff
 Control frequency: 5 kHz
 Cable length: 2 m
 Signal cable \varnothing : 4 mm
 Plug type: MAS-5700 (DIN 5-PIN)

Series 519



519-333



No.	Measuring span mm	Pretravel mm	Linearity	Measuring force N
519-333	$\pm 1,0$	$\pm 0,2$	$\pm 0,5\%$	1

Specifications

Control voltage: 3,0 Veff
 Control frequency: 5 kHz
 Cable length: 2 m
 Signal cable \varnothing : 4 mm
 Plug type: MAS-5700 (DIN 5-PIN)

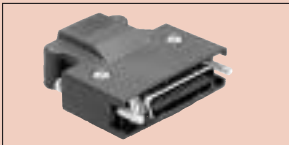
High-accuracy electronic measuring instrument "LITEMATIC" VL-50 A and VL-50 AS

- High-accuracy measuring probe with a measuring force of 0.01 N (1 gf) and a numerical increment of 0.01 μm .
- The constant and low measuring force makes it especially suitable for the measurement of soft materials such as rubber, plastic, film thicknesses or sensitive form parts.
- Motor-driven spindle movement with various spindle speeds.

Functions	Series 318
Motorised spindle movement	●
Zero-setting	●
PRESET	●
Modes: Max. function	●
Min. function	●
TIR function	●
Input of tolerance limits (3 or 5 steps)	●
Counting direction switching	●
mm/inch switching	●
Key-Interlock	●
Data output	●

Optional accessory

- No. 957460 Comparator stand for 318-213 D
- No. 937179T Foot switch
- No. 02ADB440 Data plug for I/O interface (with cover)



- No. 936937 Signal cable (1 m)
- No. 965014 Signal cable (2 m)

See pages 202-203 for further special measuring inserts

Series 318



0.01 N (1 gf)

0.01 μm

318-211 D



318-213 D

No.	318-211 D	318-213 D	318-217 D
Type	VL-50 A	VL-50 AS	VL-50 AH
Measuring range	0-50 mm	0-50 mm	0-50 mm
Resolution		0,01 μm ; 0,1 μm ; 1,0 μm (switchable)	
Measuring force		0,01 N (1 gf)	
Error limits		(0,5 + L/100) μm L = Measurement height	(0,1 + L/200) μm L = Measurement height
Data output		DIGIMATIC, RS-232 C, I/O interface	



PRODUCT NEWS



Universal joint magnetic stand

Detailed information on page 275.



Universal joint magnetic stand

Detailed information on page 275.



Universal joint magnetic stand

Detailed information on page 276.



Dial Gauge Stands



Comparator Stands

Joint Magnetic Stands
Concentricity testers



Pages 268–272

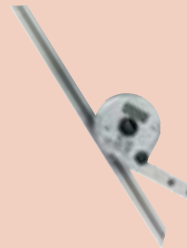


Pages 273–274



Pages 275–280

Angulometers, steel squares



Pages 281–286

Precision vices
and other measuring aids



Pages 286–296

Granite Plates



Pages 297–298

Levels
Digital levels



Page 299



Dial Gauge Stand

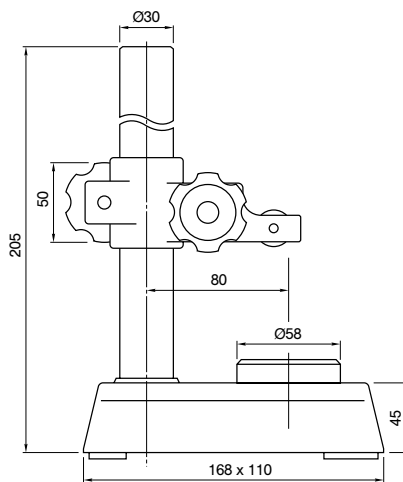
Series 7

Standard version

- Stainless chrom plated steel column.
- Three interchangeable measuring tables, flat, convex and with corrugated tothing.



7001 M



No.	Max. Measuring height mm	Measuring table (No.) (Standard accessory)	Mass kg
7001 M	100	Corrugated tothing (101462)	5,2
7002 M	100	flat (101461)	5,2

Specifications

Column:	Ø 30 mm
Table dimensions:	Ø 58 mm
Base size:	168 x 110 mm
Throat:	65 mm
Bore for dial indicator stem:	Ø 8 mm
Fine adjustment:	1 mm with locking

Optional accessory

- No. 101463 Measuring table, convex
- No. 101461 Measuring table, flat
- No. 101462 Measuring table, corrugated tothing



101463

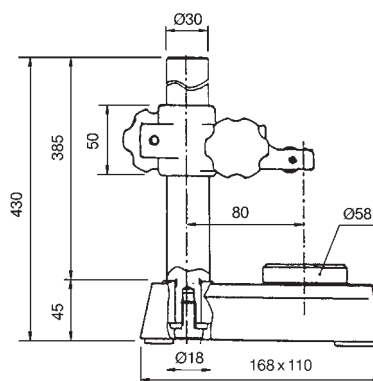


101461

Series 519



519-109 MM



No.	Max. Measuring height mm	Measuring table (No.) (Standard accessory)	Mass kg
519-109 MM	300	Corrugated tothing (101462)	6,5

Specifications

Column:	Ø 30 mm
Table dimensions:	Ø 58 mm
Base size:	168 x 110 mm
Throat:	65 mm
Bore for dial indicator stem:	Ø 8 mm
Fine adjustment:	1 mm with locking

Optional accessory

- No. 101463 Measuring table, convex
- No. 101461 Measuring table, flat
- No. 101462 Measuring table, corrugated tothing



101463



101461

Dial Gauge Stand

Specifications

Column:	Ø 30 mm
Table dimensions:	90 x 90 mm
Base size:	168 x 110 mm
Throat:	65 mm
Bore for dial indicator stem:	Ø 8 mm
Fine adjustment:	1 mm

Series 7

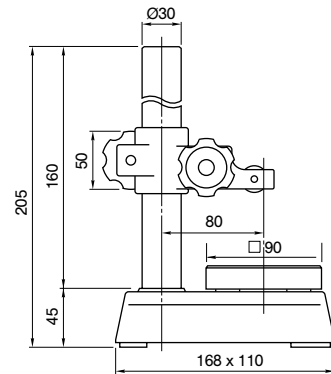
Standard version with large table

- Cast base; measuring table made of hardened steel with lapped surface.



7007 M

No.	Max. Measuring height mm	Mass kg
7007 M	90	5,6



Comparator Stands

- Simple standard version.
- Ground and lapped table surface.
- Hardened and ground column.

Series 913



913-101

No.	Max. Measuring height mm	Measuring table mm	Throat mm
913-101	100	Ø 50	50

Specifications

Column: Ø 22 mm
 Table dimensions: Ø 50 mm
 Throat: 50 mm
 Bore for dial indicator stem: Ø 8 mm

Optional accessory

No. 913-201 Horizontal measuring bow for comprehensive measuring applications
 Center distance: max. 45 mm (see below)

Series 913



913-102

No.	Max. Measuring height mm	Measuring table mm	Throat mm
913-102	100	60 x 70	100

Specifications

Column: Ø 22 mm
 Table dimensions: 60 x 70 mm
 Throat: 100 mm
 Bore for dial indicator stem: Ø 8 mm

Optional accessory

No. 913-201 Horizontal measuring bow for comprehensive measuring applications
 Center distance: max. 45 mm



913-102 with 913-201

Comparator Stands

Series 215



215-631

Specifications

Column: \varnothing 30 mm
 Throat: 80 mm (215-631)
 125 mm (215-641)
 Bore for dial indicator stem: \varnothing 8 mm

Optional accessory

No. 990029 Measuring table with corrugated tooting 38,1x101,6x38,1 mm

No. 990031 Measuring table with convex steel ball \varnothing 30 mm

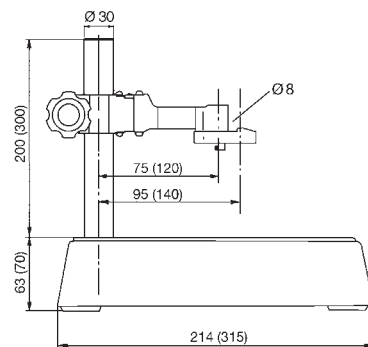
No.	Max. Measuring height mm	Mass kg	consisting of:
215-631	100	8,5	Column 200 mm, \varnothing 30 mm
215-641	200	13,5	Column 300 mm, \varnothing 30 mm



990031



990029



The details in brackets refer to No. 215-641

Quick Stand

• Quick stand for precision bore gauges, for serial inside measuring of small parts.

Series 215



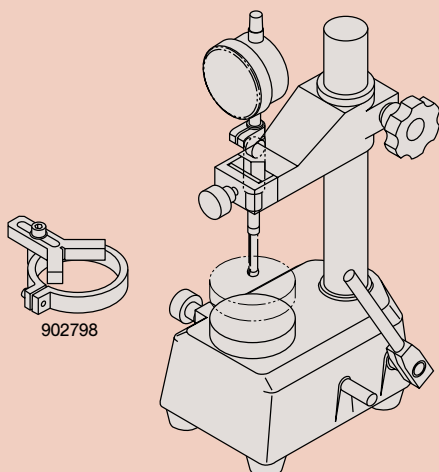
215-120 M

Specifications

Measuring stroke: max. 38 mm

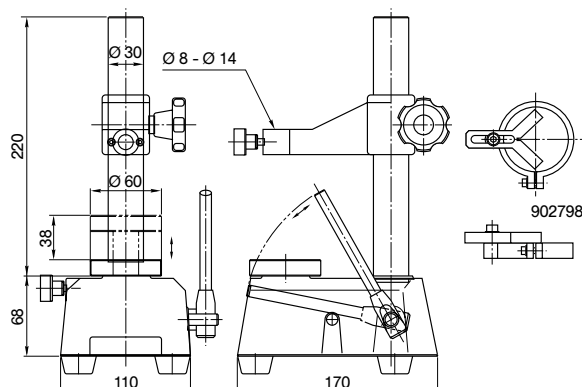
Optional accessory

No. 902798 Detachable angle stop for safe and quick workpiece positioning under the measuring instrument, for \varnothing 8-16 mm



902798

No.	Max. Measuring height mm	Measuring table \varnothing mm	Mass kg
215-120 M	110	60	6,5



902798

Comparator Stand

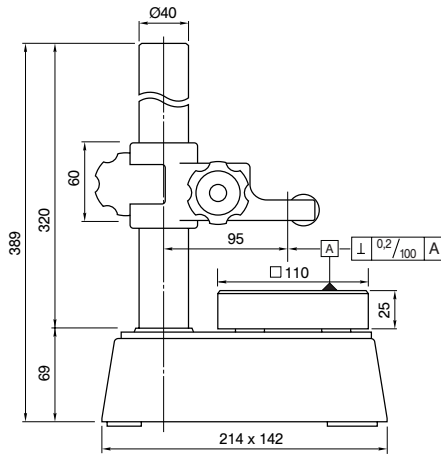
Series 215

Standard version with large table and high column
Table surface ground and lapped, column hardened and precision ground



215-405

No.	Max. Measuring height mm	Measuring table mm	Mass kg
215-405	200	110 x 110	12,5



Specifications

Column:	Ø 40 mm
Table dimensions:	110 x 110 mm
Base size:	214 x 142 mm
Throat:	75 mm
Bore for dial indicator stem:	Ø 8 mm
Fine adjustment:	1 mm

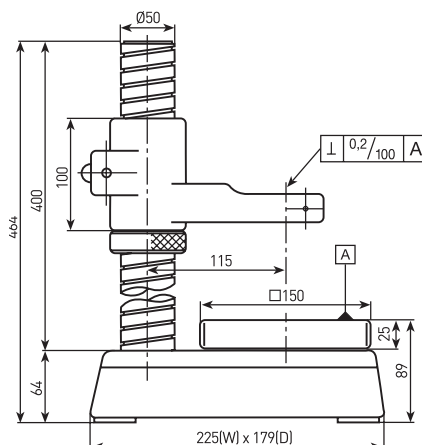
Series 215

Version with large table and high threaded column



215-505

No.	Max. Measuring height mm	Measuring table mm	Mass kg
215-505	260	150 x 150	23



Specifications

Column:	Ø 50 mm
Table dimensions:	150 x 150 mm
Base size:	255 x 179 mm
Throat:	90 mm
Bore for dial indicator stem:	Ø 20 mm (Ø 8/Ø 15 mm over bushing)

Standard accessory

No. 58AAA151 Bushing Ø 8 mm

Optional accessory

No. 58AAA276 Bushing Ø 15 mm

Fine Gauge Stand

Specifications

Column:	Ø 30 mm
Base size:	120 x 180 mm (215-150 M) 150 x 200 mm (215-151 M)
Throat:	65 mm
Bore for dial indicator stem:	Ø 8 mm
Fine adjustment:	1 mm
Table flatness:	3 µm

Series 215

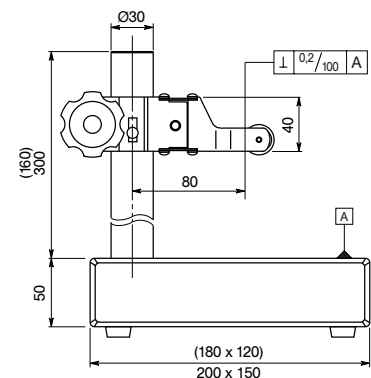
With wear-resistant hard rock table



215-151 M

No.	Max. Measuring height mm	Measuring table mm	Mass kg
215-150 M	120	120 x 180	5,7
215-151 M	260	150 x 200	8,0

The details in brackets relate to No. 215-150 M



Specifications

Threaded column:	Ø 50 mm
Table dimensions:	300 x 150 mm
Base size:	250 x 300 mm
Throat:	90 mm
Bore for dial indicator stem:	Ø 20 mm (Ø 8/Ø 15 mm over bushing)
Table flatness:	6 µm

Standard accessory

No. 58AAA151 Bushing Ø 8 mm

Optional accessory

No. 58AAA276 Bushing Ø 15 mm

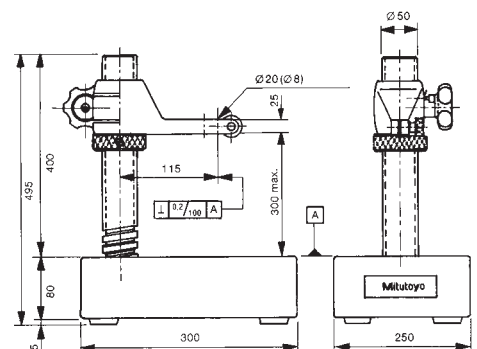
Series 215

Wear-resistant hard rock table
With threaded column, without fine adjustment.



215-156

No.	Max. Measuring height mm	Measuring table mm	Mass kg
215-156	300	300 x 250	29,5



Fine Gauge Stand

Series 912

Hard rock, fine diamond-lapped measuring table
Arm with 120 mm projection



912-105

No.	Max. Measuring height mm	Mass kg
912-105	200	9,5

Series 912

Hard rock base
With cross arm and fine adjustment



912-101

No.	Max. Measuring height mm	Mass kg
912-101	180	2,8

Specifications

Column:	Ø 35 mm
Usable measuring surface:	200 x 140 mm
Base size:	260 x 140 x 50 mm
Throat:	120 mm
Bore for dial indicator stem:	Ø 8 mm
Fine adjustment:	8 mm
Table flatness:	2 µm

Specifications

Column:	Ø 16 mm
Cross arm:	Ø 16 mm
Usable measuring surface:	100 x 100 mm
Base size:	150 x 100 x 40 mm
Throat:	150 mm (adjustable)
Bore for dial indicator stem:	Ø 8 mm
Table flatness:	2 µm

Joint magnetic stand

Specifications

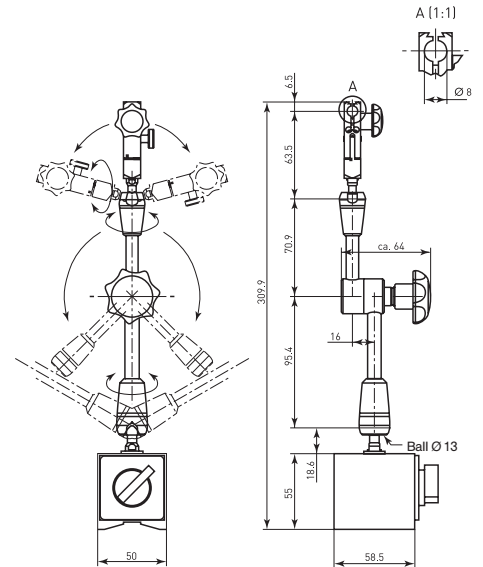
Magnetic force: 750 N vertical retractile force
 Base size: 60 x 50 x 55 mm
 Bore for dial indicator stem: \varnothing 8 mm

Series 7

The dial indicator can be fixed in any position using the clamping



011358



No.	Working radius mm	Total height mm	Mass kg
011358	200	310	1,55

Specifications

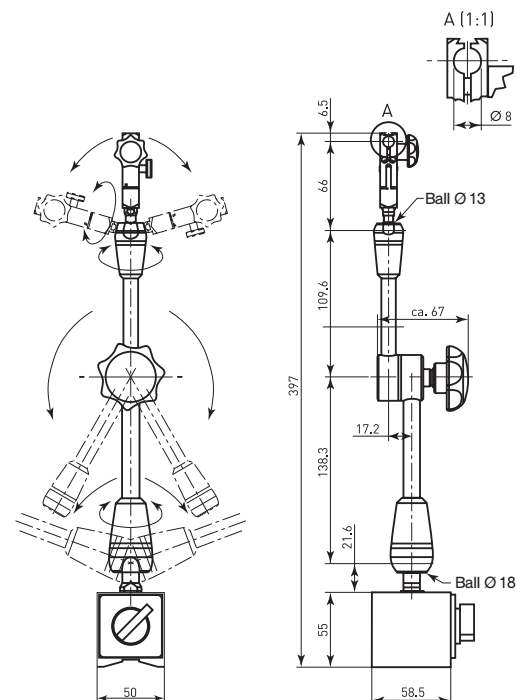
Magnetic force: 750 N vertical retractile force
 Base size: 60 x 50 x 55 mm
 Bore for dial indicator stem: \varnothing 8 mm

Series 7

The dial indicator can be fixed in any position using the clamping



011359

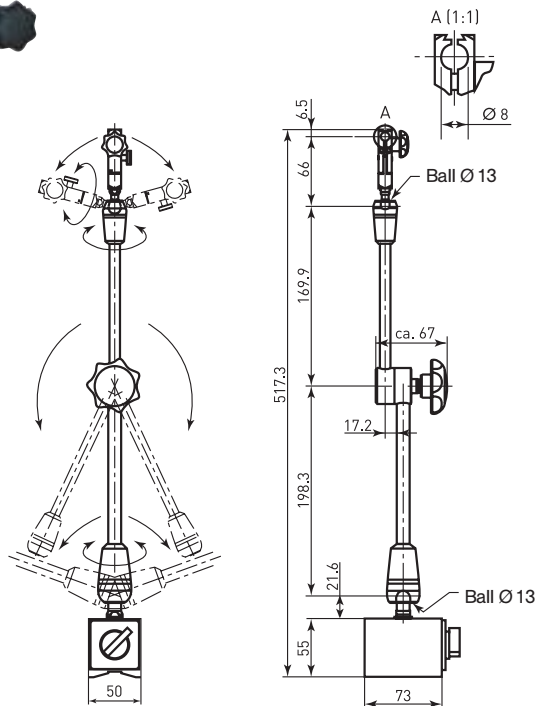


No.	Working radius mm	Total height mm	Mass kg
011359	280	390	1,85

Joint magnetic stand

Series 7

The dial indicator can be fixed in any position using the clamping



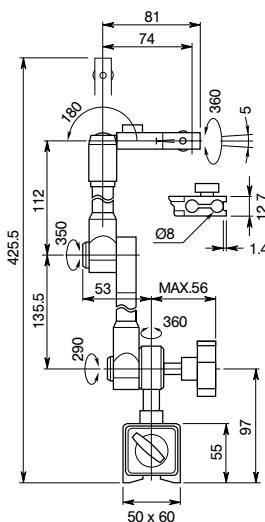
No.	Working radius mm	Total height mm	Mass kg
011360	400	510	2,1

Series 7

The dial indicator can be fixed in any position by means of the hydraulic clamping



No.	Working radius ca. mm	Total height mm	Fine Adjustment	Mass kg
7019 B	320	420	± 5°	1,75



Specifications

Magnetic force: 900 N vertical retractile force
 Base size: 75 x 50 x 55 mm
 Bore for dial indicator stem: Ø 8 mm

Specifications

Magnetic force: 600 N vertical retractile force
 Base size: 50 x 60 x 55 mm
 Bore for dial indicator stem: Ø 8 mm

Flexible Jointarm

Specifications

No. 076360

Working radius: ca. 320 mm
Bore for dial indicator stem: \varnothing 8 mm

No. 011361

Working radius: ca. 200 mm
Bore for dial indicator stem: \varnothing 8 mm

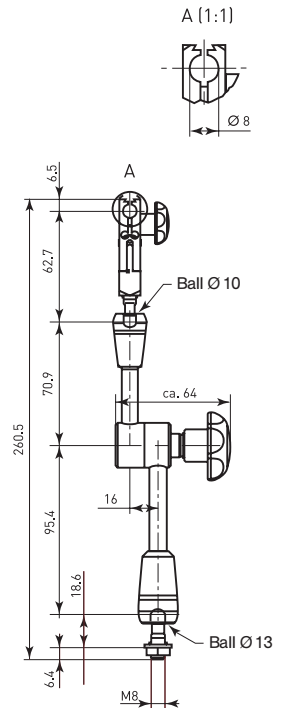
No. 011362

Working radius: ca. 280 mm
Bore for dial indicator stem: \varnothing 8 mm

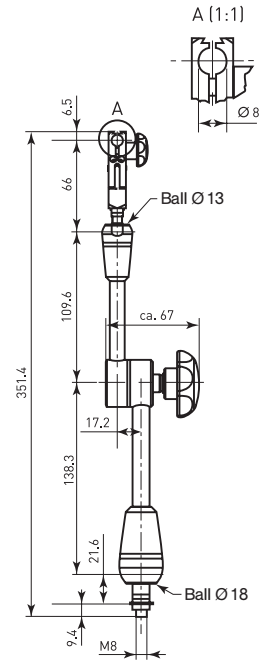
Hydraulic clamping



Mechanical clamping



Mechanical clamping



Magnetic Base

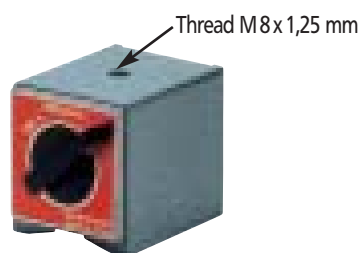
- With measuring V-block

Series 7

Specifications

No. 7013 B

Magnetic force: 600 N vertical retractile force
Base size: 50 x 60 x 55 mm
Threaded bore: M 8 (for flexible link stand)
Mass: 1 kg



7013 B

Magnetic Stands

Series 7

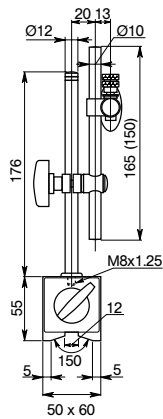
Universal dial indicator holder

- With measuring V-block



7011 SN

No.	Working radius ca. mm	Total height mm	Mass kg
Without fine adjustment			
7010 SN	150	235	1,25
With fine adjustment			
7011 SN	160	235	1,45



Specifications

Magnetic force: 600 N vertical retractile force
 Base size: 50 x 60 x 55 mm
 Bore for dial indicator stem: Ø 9,5 mm

Standard accessory

No. 206983 Bushing for dial indicators with shaft Ø 8 mm

Optional accessory

No. 206979 300 mm cross arm (for No. 7010 SN only)

Series 7

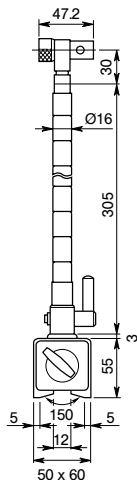
Universal dial indicator holder

- With measuring V-block and flexible column.



7012

No.	Working radius ca. mm	Total height mm	Mass kg
7012	250	393	1,5



Specifications

Magnetic force: 750 N vertical retractile force
 Base size: 50 x 60 x 55 mm
 Bore for dial indicator stem: Ø 9,5 mm

Standard accessory

No. 206983 Bushing for dial indicators with shaft Ø 8 mm

Dial Gauge Stand

Specifications

No. 913-103

Base diameter:	90 mm
Total height:	245 mm
Vertical arm:	200 x Ø 16 mm
Cross arm:	200 x Ø 16 mm
Bore for dial indicator stem:	Ø 8 mm
Mass:	2,3 kg

Series 913

Pneumatic stand

- Also adheres on all smooth surfaces such as Granite slabs etc.



913-103

Specifications

No. 913-104

Bore for dial indicator stem:	Ø 8 mm
Minimum workpiece diameter:	36 mm

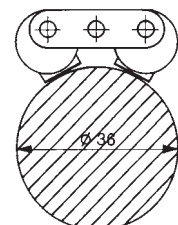
Series 913

Magnetic stand

- Specially suited for mounting on cylindrical parts.
- Magnetic base.



913-104



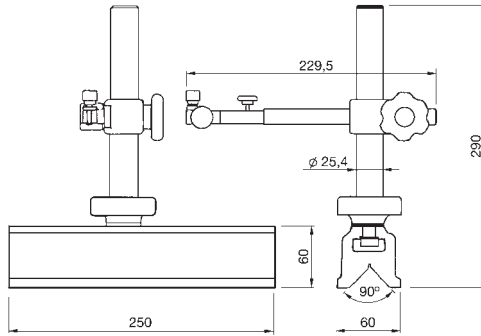
Universal Dial Gauge Stand

- With prismatically ground base and adjustable column.

Series 914



914-101 M



No.	Base size mm	Cross arm length mm
914-101 M	250x60	150

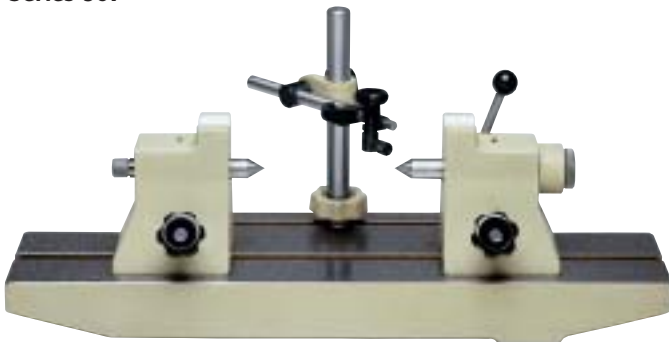
Specifications

Bore for dial indicator stem: \varnothing 8 mm

Precision Bench Centers

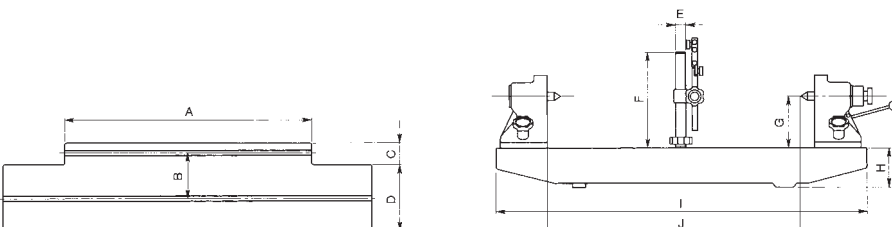
- Bench centers made of aged special cast.
- Quill and lathe centers made of hardened steel, precision ground and calibrated.
- Center bearing consisting of 1 tailstock with fixed quill and 1 tailstock with axially movable quill, adjustable via manual lever.

Series 967



967-101 EM

No.	Stand No.	Max. center distance mm	Center height mm	Dimensions mm	Mass kg	A	B	C	D	E	F	G	H	I	J
967-203 M	068804	150	50	330x120x111	7	178	60	41	70	16	134,5	50	45	310	150
967-201 M	068802	300	75	500x240x115	13	370	60	36	80	16	194,5	75	45	500	300
967-101 EM	063303	350	90	674x209x185	40	400	90	50	140	25	230	90	60	650	350
967-202 M	063303	600	125	900x330x200	70	600	104	50	160	25	230	125	100	900	600



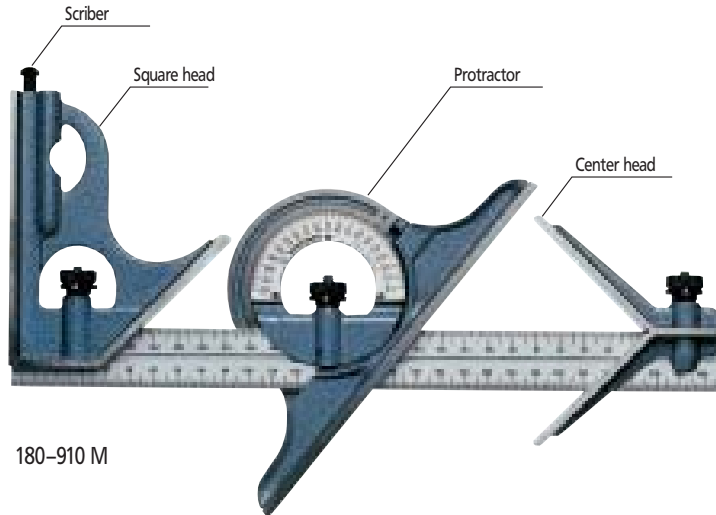
Specifications

Bore for dial indicator stem: \varnothing 8 mm

Combination Square Set

- Three accessory components on one rail, hardened, made of stainless steel with 4 graduations, enable various uses.
- Protractor
Scale satin chrome finished, reversible (front and rear side can be applied).
- Hardened square head, with water level.
- Hardened center head

Series 180

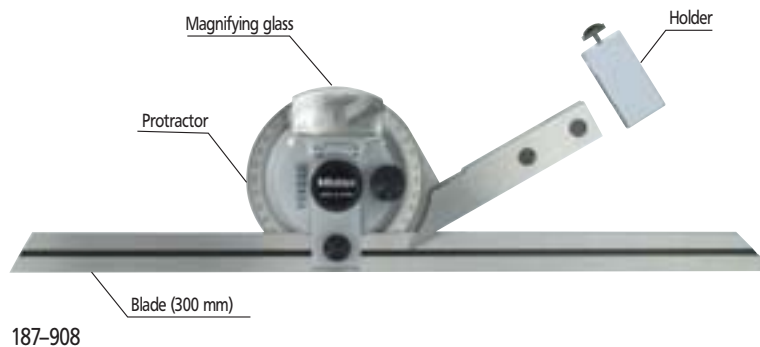


No.	Design
Sets	
180-907 M	Set: 300 mm blade (No. 180-503), protractor, square head and center head
180-910 M	Set: 300 mm blade (No. 180-505), protractor, square head and center head
Individual parts	
180-503	Blade: 300 mm length with 4 graduations of 1 mm, 1/2 mm, 1/32" and 1/64"
180-505	Blade: 300 mm length with 2 graduations of 1 mm and 1/2 mm
180-301 M	Protractor
180-102 M	Square head
180-202 M	Center head

Universal Bevel Protractor

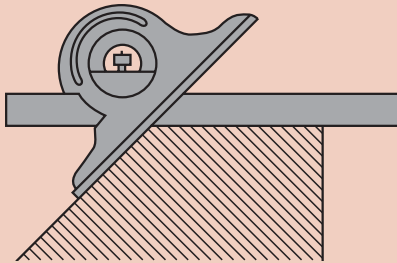
- With fine adjustment, reading free from parallax.
- Including magnifying glass.
- With connection facility for height gauges and tracers of series 192 via holder.

Series 187

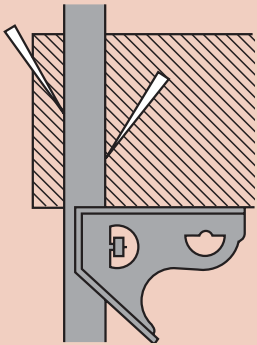


No.	Design
187-907	Universal protractor, blade 150 mm (187-106), magnifying glass, holder (950750)
187-908	Universal protractor, blade 300 mm (187-107), magnifying glass, holder (950750)

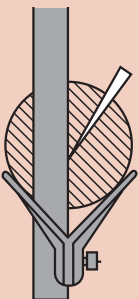
Accessories



No. 180-301 M Protractor



No. 180-102 M Square head



No. 180-202 M Center head

Specifications

Graduation: 5'
Circle division: 4 x 90°
Including softbox

Optional accessory

- No. 187-105 Additional square
- No. 187-106 Blade 150 mm
- No. 187-107 Blade 300 mm
- No. 950750 Holder for height gauges and tracers

"DIGIMATIC" Universal Bevel Protractor

- Digital Universal Bevel Protractor with easy-to-read digital display.
- Automatic turn-off after 10 minutes, fixed reference points for easy adjustment.
- The measuring blade can be slid and clamped over the entire length.
- Fine adjustment for precise adjustment of arbitrary angle dimensions.
- With connection facility for height gauge and tracers of series 192 via holder.

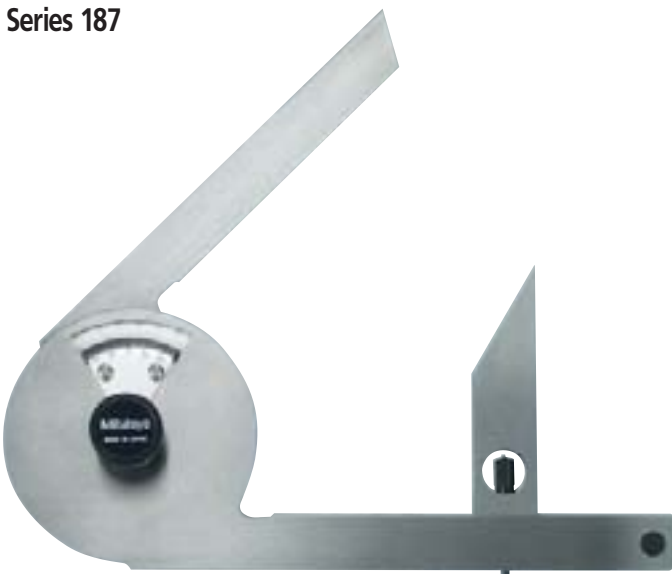
Series 187 with data output



187-502

No.	Design	Mass
187-501	Universal Bevel Protractor, blade 150 mm	624 g
187-502	Universal Bevel Protractor blade 300 mm	662 g

Series 187



187-201

No.	Blade length mm	Graduation
187-201	135	5'

Functions	Series 187
PRESET	●
ZERO-setting	●
Switching of the counting direction	●
DATA / HOLD	●
Angle display decimal/sexadecimal	●
Data output	●

Specifications

Measuring range: -360° to $+360^{\circ}$

Error limits: $2'$ ($0,03^{\circ}$)

Graduation: $1'$ ($0,01^{\circ}$)

Repeatability: $1'$ ($0,01^{\circ}$)

Battery life: 2000 hours

Delivery in box including battery

Standard accessory

No. 950750 Holder for height gauges and tracers

Optional accessory

No. 187-105 Additional angle

No. 187-106 Blade 150 mm

No. 187-107 Blade 300 mm

No. 905338 Signal cable 1 m

No. 905409 Signal cable 2 m

Consumable Spares

No. 055AA217D Battery CR-2032

Specifications

Vernier reading: 5'

Circle division: $4 \times 90^{\circ}$

Fixed blade: 135 mm

Adjustable blade: 150 mm

Including softbox

Optional accessory

No. 952624 for height measurement and tracers series 192

Set with straight edge and precision squares

Series 916

Contents

- Straight edge: 100 mm
- Precision square: 75 x 50 mm
- Cutting square: 40 x 28 mm
- Cutting square: 25 x 20 mm
- Scriber: 9 x 9 x 60 mm
- Including softbox



916-110

Straight Edges

- The straight edges are especially suited for testing the flatness of surfaces.
- Hardened, ground and micro lapped measuring edge.
- Made of special steel. With hand guard.

Series 528

Specifications

- Wedge shape section: 60°
- Accuracy: according to DIN 874



528-101

528-102

528-103

No.	Length mm	Note
528-100	50	
528-101	75	
528-102	100	
528-110	125	
528-103	150	
528-104	200	
528-105	300	Supplied in a wooden case
528-106	400	Supplied in a wooden case
528-107	500	Supplied in a wooden case

90° Steel square / Engineers Square

• Accuracy grade 0.

Series 916

Shifting square



916-302

Standard steel No.	Stainless steel No.	Leg length mm	Cross section mm
916-300	916-310	50 x 40	15 x 4,0
916-301	916-311	75 x 50	15 x 4,0
916-302	916-312	100 x 70	20 x 4,0
916-303	916-313	150 x 100	25 x 5,5
916-304	916-314	200 x 130	30 x 5,5
916-305	916-315	250 x 165	35 x 8,0
916-306	916-316	300 x 200	40 x 8,0
916-307*	916-317*	400 x 250	45 x 10,0
916-308*	916-318*	500 x 330	50 x 10,0

* Including wooden case

Specifications

Accuracy: according to DIN 875

Accuracy grade: 0

Series 916

Flat square



916-202

Standard steel No.	Stainless steel No.	Leg length mm	Cross section mm
916-211	916-201	50 x 40	15 x 4,0
916-212	916-202	75 x 50	15 x 4,0
916-213	916-203	100 x 70	20 x 4,0
916-214	916-204	150 x 100	25 x 5,5
916-215	916-205	200 x 130	30 x 5,5
916-216	916-206	250 x 165	35 x 8,0
916-217	916-207	300 x 200	40 x 8,0
916-218*	916-208*	400 x 250	45 x 10,0
916-219*	916-209*	500 x 330	50 x 10,0

* Including wooden case

Specifications

Accuracy: according to DIN 875

Accuracy grade: 0

90° Steel square / Workshop Square

• Accuracy grade 1/2.

Specifications

DIN 875:
Accuracy: according to DIN 875
Accuracy grade: 1
Precision ground edges

DIN 875:
Accuracy: according to DIN 875
Accuracy grade: 2

Series 916 Shifting square



916-322

DIN 875-1 No.	DIN 875-2 No.	Leg length mm	Cross section mm
916-320	916-330	50 x 40	15 x 5
916-321	916-331	75 x 50	15 x 5
916-322	916-332	100 x 70	20 x 5
916-323	916-333	150 x 100	25 x 5
916-324	916-334	200 x 130	30 x 6
916-325	916-335	250 x 165	35 x 7
916-326	916-336	300 x 200	40 x 8
916-327*	916-337*	400 x 200	45 x 10
916-328*	916-338*	500 x 250	50 x 10

* Including wooden case

Specifications

DIN 875/1:
Accuracy: according to DIN 875
Accuracy grade: 1
Precision ground edges

DIN 875/2:
Accuracy: according to DIN 875
Accuracy grade: 2

Series 916 Flat square



916-223

DIN 875-1 No.	DIN 875-2 No.	Leg length mm	Cross section mm
916-221	916-231	50 x 40	15 x 5
916-222	916-232	75 x 50	15 x 5
916-223	916-233	100 x 70	20 x 5
916-224	916-234	150 x 100	25 x 5
916-225	916-235	200 x 130	30 x 6
916-226	916-236	250 x 165	35 x 7
916-227	916-237	300 x 200	40 x 8
916-228*	916-238	400 x 200	45 x 10
916-229*	916-239	500 x 250	50 x 10

* Including wooden case

90° Steel square / Precision Square

- Accuracy grade 00.
- Edges and support faces ground and lapped, completely hardened and stress relieved.

Series 916

Hairline square



916-102

Standard steel No.	Stainless steel No.	Leg length mm	Cross section mm
916-008*	-	25 x 20	6 x 3,0
916-009*	-	40 x 28	8 x 3,0
916-100	916-105	50 x 40	15 x 6,0
916-101	916-106	75 x 50	15 x 6,0
916-102	916-107	100 x 70	20 x 6,0
916-103	916-108	150 x 100	25 x 7,5
916-104	916-109	200 x 130	30 x 9,0

* Cutting square (for inside measurement only)

Specifications

Accuracy: according to DIN 875
Accuracy grade: 00

Precision Vices

Series 930

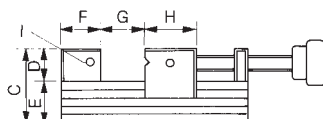
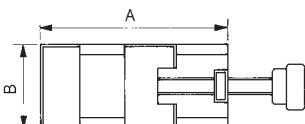
With threaded spindle

- Made of alloyed tool steel, hardened and precision ground.
- With horizontally ground prism in the movable jaws.



930-602

No.	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	Mass kg
930-611	90	60	50	25	25	25	30	30	M 5	1,6
930-601	160	70	62	30	32	33	80	45	M 6	4,0
930-602	210	90	80	40	40	40	120	50	M 6	7,6
930-612	285	120	90	40	50	55	150	70	M 6	17,4



Specifications

Squareness: 0,005 mm/100 mm
Parallelism: 0,002 mm/100 mm

Precision Vices

Specifications

Squareness: 0,005 mm/100 mm
 Parallelism: 0,002 mm/100 mm

Series 930

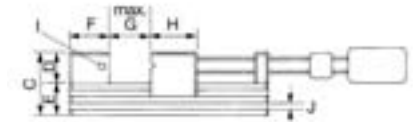
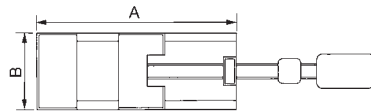
With threaded spindle

- For grinding large workpieces.
- Including one key bar with hydraulic amplification of the clamping force.
- With horizontally ground prism in the movable jaws.



930-616

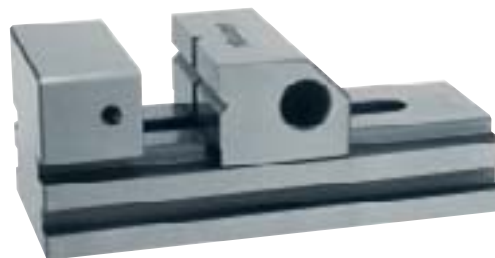
No.	A mm	B mm	C mm	D mm	E mm	F mm	G max. mm	H mm	I	J height x depth mm	Mass kg
930-616	285	120	90	40	50	55	150	70	M6	10x7	17,7



Series 930

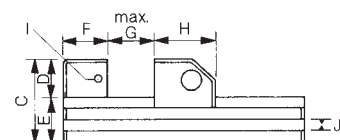
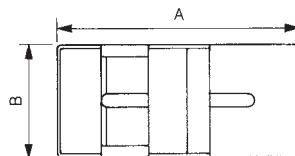
With pull-down system

- High accuracy for precision grinding, milling, measuring and eroding.
- With quick adjustment and vertically and horizontally ground-in prism in the movable jaws.



930-607

No.	A mm	B mm	C mm	D mm	E mm	F mm	G max. mm	H mm	I	J height x depth mm	Mass kg
930-606	160	70	62	30	32	33	80	45	M6	8x7	3,0
930-607	210	90	80	40	40	40	120	50	M6	10x7	5,8



Precision Vices

- High accuracy for precision grinding, milling, measuring and eroding.
- With horizontally ground prism in the movable jaws.

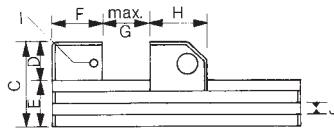
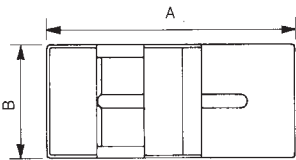
Series 930

With pull-down system



930-632

No.	A mm	B mm	C mm	D mm	E mm	F mm	G max. mm	H mm	I	J height x depth mm	Mass kg
930-630	70	30	35	15	20	20	25	25	M4	-	0,35
930-631	110	45	45	20	25	25	50	35	M5	8 x 6	1,00
930-632	285	120	90	40	50	60	150	70	M6	12 x 7	13,50
930-633	370	175	95	45	50	60	200	110	M8	12 x 10	28,70



Specifications

Squareness: 0,005 mm/100 mm
Parallelism: 0,002 mm/100 mm

Precision Sine Vices

- Made of alloyed tool steel, hardened and precision ground.
- Bearing and holding bolt hardened and ground.
- The clamping device can be locked in any angular position.
- Accurate angle adjustment by gauge blocks, max. 46°.

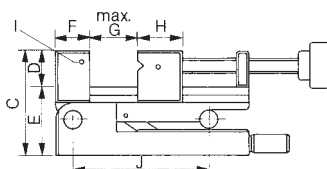
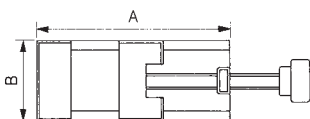
Series 930

With swivelling front axis



930-621

No.	A mm	B mm	C mm	D mm	E mm	F mm	G max. mm	H mm	I	J height x depth mm	Mass kg
930-620	100	50	75	25	50	25	40	30	M5	50	2,7
930-621	160	70	93	30	63	33	80	45	M5	100	5,3
930-622	210	90	113	40	73	40	120	50	M5	150	11,0



Specifications

Angle deviation at 45°: ± 15"
Squareness: 0,005 mm/100 mm
Parallelism: 0,002 mm/100 mm

Precision Sine Vices

- Made of alloyed tool steel, hardened and precision ground.
- Bearing and holding bolt hardened and ground.
- The clamping device can be locked in any angular position.
- Accurate angle adjustment by gauge blocks, max. 46°.

Specifications

Angle deviation at 45°: ± 15"
 Squareness: 0,005 mm/100 mm
 Parallelism: 0,002 mm/100 mm

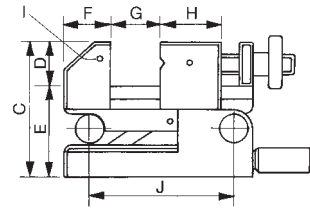
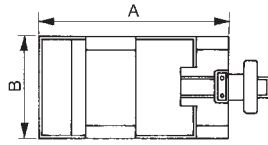
Series 930

With swivelling rear axis



930-623

No.	A mm	B mm	C mm	D mm	E mm	F mm	G max. mm	H mm	I	J mm	Mass kg
930-623	130	70	93	30	63	33	50	40	M5	100	4,5



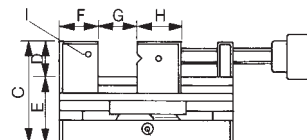
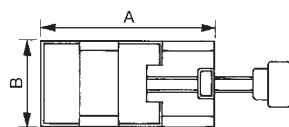
Series 930

With swivelling longitudinal axis



930-624

No.	A mm	B mm	C mm	D mm	E mm	F mm	G max. mm	H mm	I	Mass kg
930-624	160	75	93	30	63	33	80	45	M5	5,9



Specifications

Angle deviation at 45°: ± 15"
 Squareness: 0,005 mm/100 mm
 Parallelism: 0,002 mm/100 mm

Precision Sine Vices

- Made of alloyed tool steel, hardened and precision ground.
- Bearing and holding bolt hardened and ground.
- The clamping device can be locked in any angular position.
- Accurate angle adjustment by gauge blocks, max. 46°.

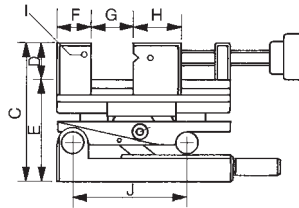
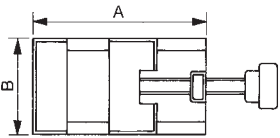
Series 930

With swivelling longitudinal axis and swivelling front axis



930-625

No.	A mm	B mm	C mm	D mm	E mm	F mm	G max. mm	H mm	I	J mm	Mass kg
930-625	160	75	124	30	94	33	80	45	M5	100	7,4



Specifications

Angle deviation at 45°: ± 15"
 Squareness: 0,005 mm/100 mm
 Parallelism: 0,002 mm/100 mm

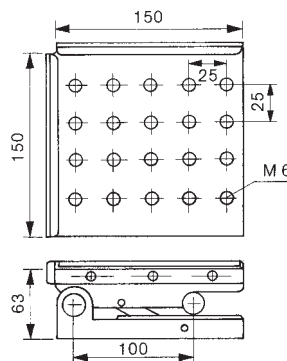
Precision Sine Plates

- Made of alloyed tool steel, hardened and precision ground.
- Bearing and holding bolt hardened and ground.
- The clamping device can be locked in any angular position.
- Accurate angle adjustment by gauge blocks.

Series 930



930-626



Specifications

Angle deviation at 45°: ± 15"
 Squareness: 0,005 mm/100 mm
 Parallelism: 0,002 mm/100 mm
 Mass: 7,6 kg

Precision Sine Plates

- Made of alloyed tool steel, hardened and precision ground.
- Bearing and holding bolt hardened and ground.
- The clamping device can be locked in any angular position.
- Accurate angle adjustment by gauge blocks.

Specifications

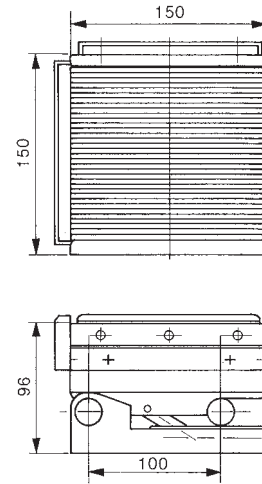
Angle deviation at 45°: $\pm 15''$
 Squareness: 0,005 mm/100 mm
 Parallelism: 0,002 mm/100 mm
 Mass: 16,1 kg

Series 930

With swivelling front axis
 and magnetic chuck switched-on via a lever



930-627



Specifications

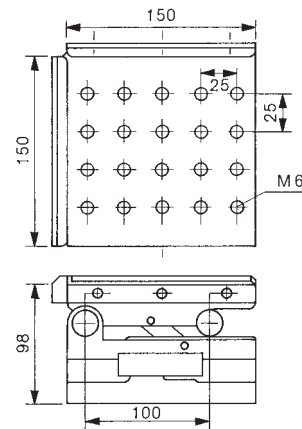
Angle deviation at 45°: $\pm 15''$
 Squareness: 0,005 mm/100 mm
 Parallelism: 0,002 mm/100 mm
 Mass: 11,3 kg

Series 930

With adjustment in 2 axis



930-628



Specifications

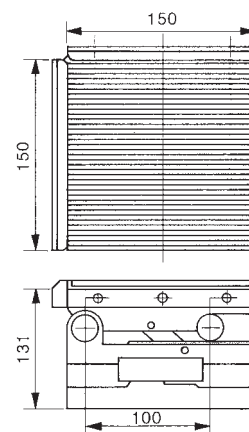
Angle deviation at 45°: $\pm 15''$
 Squareness: 0,005 mm/100 mm
 Parallelism: 0,002 mm/100 mm
 Mass: 20,0 kg

Series 930

With adjustment in 2 axis and magnetic chuck switched-on via a lever



930-629



V-Blocks

- Made of dense special cast iron, highly wear resistant.
- The 90° V-block cutting angle is parallel to the base and isometric in pairs.
- For scribing, adjusting and testing cylindrical parts.

Series 910



910-112

No.	Length mm	Width mm	Height mm	Mass per pair kg	Receiver for workpiece Ø mm
910-111	100	40	30	1,5	6- 40
910-112	150	50	40	3,5	8- 50
910-113	200	70	50	6,5	8- 70
910-114	250	85	60	10,0	12- 85
910-115	300	100	70	15,0	12-100

Specifications

Quality class: 1
 Parallelism: 0,016 mm
 Hardness according to Brinell: 160-190
 Supplied in pairs

Hardened Double V-Blocks

- With 2 supporting surfaces and 2 recesses, angle 90°, as well as a clamping bracket.
- Recesses and supporting surfaces ground and lapped.
- Outer edges ground.

Series 181

With clamp bracket



181-903 M

No.	Length mm	Width mm	Height mm	Mass per pair kg	Receiver for workpiece Ø mm
181-902 M	41	31,8	31,8	0,6	25
181-903 M	75	58,0	58,0	3,4	50



Specifications

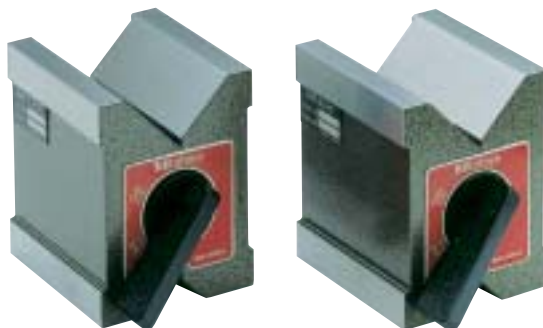
Hardness: HRC 58-62
 Supplied in pairs

Magnetic Double V-Blocks

Specifications

Supplied in pairs

Series 181



181-946

No.	Length mm	Width mm	Height mm	Mass per pair kg	Max. receiver for workpiece Ø mm
181-946	79	58	64	3,5	50,8
181-947	95	70	95	7,3	50,8

Four-recess V-block pair

- Parallel pair.
- Made of dense special cast iron, highly wear resistant.
- With 4 recesses in different sizes, angle 90°, worked in pairs, made of special cast, aged and stress relieved.
- The 90° V block angles notches are parallel to the standing surfaces and paired in identical dimensions.
- For scribing, adjusting and testing cylindrical parts.

Specifications

Quality class: 1

Parallelism: 0,016 mm

Supplied in pairs

Series 911



911-111

No.	Length mm	Width mm	Height mm	Mass per pair kg	Max. receiver for workpiece Ø mm
911-111	60	120	100	6,5	8- 90
911-112	75	150	130	13,5	8-110
911-113	90	200	170	23,0	8-150

Adjustable Parallel Supports

- The adjustable parallel supports are suited for various applications in tool making, general machine construction and control.
- They are well suited as adjustable gauges for groove width and distances, as well as base for machine vices and other devices.

Series 908



908-303



908-305

No.	Adjustable range mm	Length mm
908-301	9,6-12,7	45
908-302	12,7-17,4	54
908-303	17,4-23,8	65
908-304	23,8-33,3	89
908-305	33,3-44,4	110
908-306	44,4-57,0	130
Set with 4 pieces		
908-310	9,6-33,3	-
Set with 6 pieces		
908-312	9,6-57,0	-

Specifications

Individual version

Set with 4 pieces

Set with 6 pieces

Hardened Parallel Supports

- For height equalisation when holding workpieces when drilling, grinding, milling, planing, tracing and measuring.
- Particularly suitable for use in mechanical vices or marking plates.

Specifications

made of steel
 Hardened and lapped surfaces
 worked in pairs
 Tolerance of length and width: $\pm 0,2$ mm

Series 908

Complete set in wooden box

14 pairs



908-901

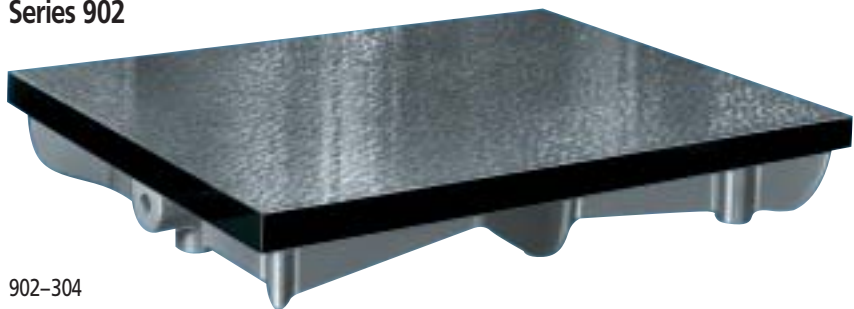
No.	Tolerance mm height parallelism	Number per pair
908-901	$\pm 0,002$	14
908-902	$\pm 0,005$	14

Size	Length mm	Width mm	Height mm	Size	Length mm	Width mm	Height mm
1	150	10	14	8	150	10	28
2	150	10	16	9	150	10	30
3	150	10	18	10	150	10	32
4	150	10	20	11	150	10	36
5	150	10	22	12	150	10	40
6	150	10	24	13	150	10	45
7	150	10	26	14	150	10	50

Scribing and Marking-Off Plates

- In ripped construction made of special cast, with high degree of wear resistance.
- Measuring surfaces finished to DIN 876. Outside edges milled clean.

Series 902



902-304

Size	Dimensions (LxW mm)	Accuracy 1 DIN 876 No.	Accuracy 3 DIN 876 No.	Mass kg
1	300x 300	902-301	902-101	15
2	400x 400	902-302	902-102	35
3	500x 400	902-303	902-103	40
4	600x 500	902-304	902-104	65
5	800x 500	902-305	902-105	95
6	1000x 750	902-306	902-106	210
7	1200x 800	902-307	902-107	230
8	1500x 1000	902-308	902-108	490
9	2000x 1000	902-309	902-109	780

Specifications

Accuracy: according to DIN 876
 DIN 876: Accuracy grade 1
 Fine scraped
 DIN 876: Accuracy grade 3
 Fine planed

Angle Plate with Clamping Slots

Series 906

Angle 90°

- Made from special cast iron with high wear resistance.



906-303

No.	Length mm	Width mm	Height mm	Mass kg ca.
906-301	150	75	100	5
906-302	200	100	150	10
906-303	275	150	200	20
906-304	400	225	300	52
906-305	500	300	400	95

Measuring Angle 90°

- Measuring Angle made of black natural hard stone, two sides precision ground
- Hard and wear resistant

Series 972



972-108

No.	Leg length mm	Width mm	Perpendicularity mm	Mass kg
972-106	300 x 200	50	0,002	6,5
972-107	400 x 250	50	0,003	10,0
972-108	500 x 300	60	0,004	17,0
972-109	600 x 400	70	0,005	30,0

Specifications

Flatness: DIN 876
Accuracy grade: 1
Perpendicularity tolerance: DIN 875
Accuracy grade: 1

Specifications

Flatness: DIN 876
Accuracy grade: 00
Perpendicularity tolerance: DIN 875

Granite Plates

- These granite plates are made of exquisite and fine grained granite.
- Stress relieved, naturally aged over milleniums.
- Harder than steel.
- Non magnetic and electrically non conducting.
- Stainless, therefore easy maintenance.

Series 901



Granite plate and stand

Specifications

Accuracy: according to DIN 876
 Vickers hardness: HV 850–900
 Flexural resistance: 13–22 N/mm²
 Pressure resistance: ca. 280 N/mm²
 Linear co-efficient of expansion: (5 to 7,5) x 10⁻⁶ x K⁻¹
 Supplied with factory certificate

Optional accessory

No. 517–660 P Cleaning and care agents for measuring instruments made from natural stone (5 l canister)

Size	Dimensions LxWxH mm	Accuracy 00 No.	Accuracy 0 No.	Accuracy 1 No.	Accuracy 2 No.	Mass kg
1	400 x 250 x 50	901-131	901-121	901-111	901-101	15
2	400 x 400 x 50	901-132	901-122	901-112	901-102	25
3	630 x 400 x 70	901-133	901-123	901-113	901-103	53
4	630 x 630 x 70	901-134	901-124	901-114	901-104	83
5	1000 x 630 x 100	901-135	901-125	901-115	901-105	189
6	1000 x 1000 x 100	901-136	901-126	901-116	901-106	300
7	1200 x 800 x 160	901-137	901-127	901-117	901-107	460
8	1600 x 1000 x 160	901-138	901-128	901-118	901-108	768
9	2000 x 1000 x 220	901-139	901-129	901-119	901-109	1320

Delivery without support but with steel ball inserts

Accessory for granite plates

Series 901

Individual supports mounting (4 pieces)
 Appropriate for slab sizes 8 and 9



901-921

Size	No.	Mass Support kg
8/9	901-921	20

Accessory for granite plates

Series 901

Profiled steel underframe



901-935 (illustrated with granite slab)

Size	Plate dimensions LxWxH mm	No.	Mass kg
3	630 x 400 x 70	901-931	22
4	630 x 630 x 70	901-932	25
5	1000 x 630 x 100	901-933	28
6	1000 x 1000 x 100	901-934	30
7	1200 x 800 x 160	901-935	30
8	1600 x 1000 x 160	901-936	35
9	2000 x 1000 x 220	901-937	40

Series 901

Tool cabinets



901-941 (illustrated with granite slab)

Size	Plate dimensions LxWxH mm	No.	Number of doors	Number of drawers	Mass kg
3	630 x 400 x 70	901-941	1	1	50
4	630 x 630 x 70	901-942	1	1	55



901-945 (illustrated with granite slab)

Size	Plate dimensions LxWxH mm	No.	Number of doors	Number of drawers	Mass kg
5	1000 x 630 x 100	901-943	2	1	75
6	1000 x 1000 x 100	901-944	2	1	82
7	1200 x 800 x 160	901-945	2	1	82
8	1600 x 1000 x 160	901-946	2	1	100



901-947 (illustrated with granite slab)

Size	Plate dimensions LxWxH mm	No.	Number of doors	Number of drawers	Mass kg
9	2000 x 1000 x 220	901-947	3	2	130

Design

1 door
1 drawer

Design

2 doors
1 drawer

Design

3 doors
2 drawers

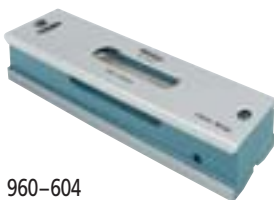
Specifications

Accuracy: Factory specification
 Support angle of prism: 140°
 Length: 200 mm
 Supplied in a wooden case

Levels

- For adjusting and testing of flat and cylindrical surfaces on precision machines.
- Prismatic and flat supporting faces, precision ground.
- Longitudinal and transverse bubble level.
- With graduation adjustable.

Series 960



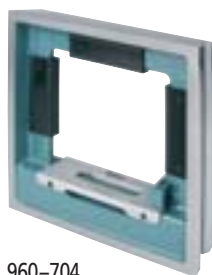
960-604

No.	Graduation / Sensitivity mm/m	Mass kg	Error Limits mm/m
960-604	0,10	1,45	0,050
960-605	0,05	1,45	0,025
960-606	0,02	1,45	0,010

Frame Level

- For adjusting horizontal and vertical surfaces on precision machines.
- 2 prismatic and 2 flat supporting surfaces, precision ground.
- Divided longitudinal and transverse bubble level.
- With graduation adjustable.

Series 960



960-704

No.	Graduation / Sensitivity mm/m	Mass kg	Error Limits mm/m
960-704	0,10	4,0	0,050
960-705	0,05	4,0	0,025
960-706	0,02	4,0	0,015

Specifications

Accuracy: Factory specification
 Support angle of prism: 140°
 Dimensions: 200x200x44 mm
 Supplied in a wooden case

Digital Protractor

- Newly developed instrument for measurement of flatness, squareness and angularity.
- Precision support surface in aluminium frame, high rigidity and low weight.

Series 950



950-317

Specifications

Accuracy: Factory specification
 Power supply: Standard battery (9 V)
 Operation temperature: -5 °C to 50 °C
 Dimensions: 153 x 49 x 31 mm
 Mass: 300 g
 Including box

Optional accessory

No. 64PPP794 Magnetic V block for securing to magnetic workpieces

No.	Model	Measuring range	Resolution / Sensitivity	Error Limits	Repeatability
950-317	Pro 360	360° (4 x 90°)	0,1°	horizontal 0,1° vertical 0,2°	± 0,1°
950-318	Pro 3600	360° (4 x 90°)	0,01° (0° to 9,99°) 0,1° (10° to 90°)	0,05° (0° to 10°) 0,1° (80° to 90°) 0,2° (10° to 80°)	± 0,05°

PRODUCT NEWS



Micrometer gauge block set made of steel

Series 516

Detailed information on page 305.



Gauge Blocks Sets made of steel and ceramics

Series 516

Detailed information on page 309.



Ceramic levels

Series 311

Detailed information on page 317.

Gauge Blocks



Pages 302–311

Calibration instruments



Pages 312–319



Basic information on gauge blocks

• Characteristics of Mitutoyo gauge blocks:

Mitutoyo, at its factory at Miyazaki in Japan, has followed a long tradition in the manufacture of its gauge blocks. The two materials used are steel and ceramic of outstanding quality and durability.

• Characteristics of Mitutoyo ceramic gauge blocks:

- Durability: 10 x greater wear resistance than steel.
- Virtually no corrosion which means particularly easy maintenance and storage.
- Free from "ageing", i.e. the gauge blocks retain their dimensional stability.
- Steel and ceramics have similar expansion coefficients when subjected to high temperatures, which reduces measurement errors when temperatures change.
- Ceramic gauge blocks can also be used without problem against steel gauge blocks.
- No magnetic dirt such as steel cuttings will cling to ceramic during use.

• Characteristics of Mitutoyo steel gauge blocks:

- Outstanding measuring stability because the steel gauge blocks are made exclusively from materials that have been subjected to sophisticated artificial ageing processes.
- High gauge reliability means that the Mitutoyo gauge block can continue to be a useful standard for a long period of time due to its high dimensional stability.
- Compliance with DIN standards.
- The maximum permitted length changes to gauge blocks over a year are set out clearly in DIN EN ISO 3650. Mitutoyo quality gauge blocks easily meet these and all other requirements.
- Steel gauge blocks are excellent for use as setting standards because of the low measurement uncertainty that can be achieved using them.
- Mitutoyo steel gauge blocks have top quality surfaces guaranteeing optimum positioning qualities.

Material characteristic	Zirkon Ceramic	Steel
HV Vickers hardness	1350	800
Coefficient of linear expansion ($10^{-6}/^{\circ}\text{C}$)	$9,3 \pm 1$	$10,9 \pm 1$
Resistance to bending (MPa)	1270	1960
Poisson's number	0,3	0,3
Specific mass (g/cm^3)	6,0	7,8
Modulus of elasticity (N/mm^2)	206000	206000
Thermal conductivity ($\text{W}/\text{m}^{\circ}\text{K}$)	2,9	54,4

Dimensional length tolerance from the nominal dimension at any point on the measuring surface

Nominal dimensional range mm	Length deviation from the nominal dimension at any point			
	Tolerance grade K	Tolerance grade 0	Tolerance grade 1	Tolerance grade 2
	μm	μm	μm	μm
from 0,5 to 10	0,2	0,12	0,2	0,45
over 10 to 25	0,3	0,14	0,3	0,60
over 25 to 50	0,4	0,20	0,4	0,80
over 50 to 75	0,5	0,25	0,5	1,00
over 75 to 100	0,6	0,30	0,6	1,20
over 100 to 150	0,8	0,40	0,8	1,60
over 150 to 200	1,0	0,50	1,0	2,00
over 200 to 250	1,2	0,60	1,2	2,40
over 250 to 300	1,4	0,70	1,4	2,80
over 300 to 400	1,8	0,90	1,8	3,60
over 400 to 500	2,2	1,10	2,2	4,40
over 500 to 600	2,6	1,30	2,6	5,00
over 600 to 700	3,0	1,50	3,0	6,00
over 700 to 800	3,4	1,70	3,4	6,50
over 800 to 900	3,8	1,90	3,8	7,50
over 900 to 1000	4,2	2,00	4,2	8,00



Sample application

Gauge Block Sets made of steel

- Made of high quality alloyed and stress relieved special steel of high stability and with good adhesive power. Carefully heat treated and lapped. Slightly broken edges.
- Each gauge block is provided with an identification number. The gauge block hardness is 800 HV (64 HRC); therefore they are extremely wear resistant.
- The gauge block sets are stored in a wooden box immediately after calibration. The wooden box is included in the price.

Series 516



516-943-10

Specifications

Accuracy: DIN EN ISO 3650

Tolerance grade: K
For laboratories

Tolerance grade: 0
As reference gauge for controlling workshop gauge blocks.
For adjusting high precision measuring instruments.

Tolerance grade: 1
For controlling test gauges, reference gauges, and for adjusting length measuring instruments as well as for accurate test works in the measuring room.

Tolerance grade: 2
Especially suited as workshop and adjusting gauge or for testing of lever gauges, dial indicators and as substitute for fixed snap gauges.

All gauge block sets are supplied with a factory calibration certificate which documents the traceability to national standards. Additionally, the gauge block sets of calibration class K are measured interferometrically by a NKO accredited laboratory.

No.	Calibration-/ Tolerance grade	Number per set	Contents	Nominal size mm	Grading mm
516-596-70	K	122 pcs.	1	1,0005	-
516-597-10*	0		9	1,001-1,009	0,001
516-598-10*	1		49	1,01 -1,49	0,01
			4	1,6 -1,9	0,1
			49	0,5 -24,5	0,5
			8	30 -100	10
			1	25	-
		(5,1 kg)	1	75	-
516-937-70	K	112 pcs.	1	1,0005	-
516-938-10*	0		9	1,001-1,009	0,001
516-939-10*	1		49	1,01 -1,49	0,01
516-940-10*	2		49	0,5 -24,5	0,5
		(3,7 kg)	4	25 -100	25
516-941-70	K	103 pcs.	1	1,005	-
516-942-10*	0		49	1,01 -1,49	0,01
516-943-10*	1		49	0,5 -24,5	0,5
516-944-10*	2	(3,8 kg)	4	25 -100	25
516-945-70	K	87 pcs.	9	1,001-1,009	0,001
516-946-10*	0		49	1,01 -1,49	0,01
516-947-10*	1		19	0,5 -9,5	0,5
516-948-10*	2	(3,3 kg)	10	10 -100	10
516-958-10*	0	47 pcs.	1	1,005	-
516-959-10*	1		9	1,01 -1,09	0,01
516-960-10*	2		9	1,1 -1,9	0,1
			24	1 -24	1
		(2,4 kg)	4	25 -100	25
516-961-70	K	47 pcs.	1	1,005	-
516-962-10*	0		19	1,01 -1,19	0,01
516-963-10*	1		8	1,2 -1,9	0,1
516-964-10*	2		9	1 -9	1
		(2,8 kg)	10	10 -100	10

No.	Calibration-/ Tolerance grade	Number per set	Contents	Nominal size mm	Grading mm
516-995-10*	0	46 pcs.	9	1,001-1,009	0,001
516-996-10*	1		9	1,01 -1,09	0,01
516-997-10*	2		9	1,1 -1,9	0,1
			9	-9	1
		(2,9 kg)	10	10 -100	10
516-965-70	K	32 pcs.	1	1,005	-
516-966-10*	0		9	1,01 ~1,09	0,01
516-967-10*	1		9	1,1 ~1,9	0,1
516-968-10*	2		9	1 ~9	1
		(1,1 kg)	3	10 ~30	10
			1	60	-
516-990-10	0	9 pcs.	9	0,1 ~0,50	0,05
516-991-10	1				
516-992-10	2	(0,2 kg)			
516-981-70	K	9 pcs.	9	1,001-1,009	0,001
516-982-10*	0				
516-983-10*	1				
516-984-10*	2	(0,2 kg)			
516-985-70	K	9 pcs.	9	0,991-0,999	0,001
516-986-10	0				
516-987-10	1				
516-988-10	2	(0,2 kg)			
516-115-10	0	8 pcs.	8	25 ~200	25
516-116-10	1				
516-117-10	2	(3,3 kg)			
516-702-10	0	8 pcs.	3	125, 150, 175	25
516-703-10	1		2	200, 250	50
516-704-10	2	(7,2 kg)	3	300, 400, 500	100

* Factory certificate of inspection with PTB tracing

Individual Gauge Blocks made of steel

- Made of high quality, especially alloyed and stress relieved special steel of high stability and good adhesive power. Carefully hardened and lapped, slightly broken edges.
- The hardness of these gauge blocks is 800 HV (64 HRC) which makes them extremely wear resistant.

Series 516



611675



Each individual gauge block is supplied with factory certificate of inspection.

* Special dimensions for the testing of caliper gauges
 ** Special dimensions for the testing of external screw type micrometers

Nominal size mm	No.	Nominal size mm	No.	Nominal size mm	No.	Nominal size mm	No.	Nominal size mm	No.	Nominal size mm	No.
0,10	611821	0,51	611892	0,92	611933	1,14	611574	2,0	611612	20,0	611672
0,11	611860	0,52	611893	0,93	611934	1,15	611575	2,5**	611642	20,2**	611855
0,12	611861	0,53	611894	0,94	611935	1,16	611576	3,0	611613	20,5	611660
0,13	611862	0,54	611895	0,95	611936	1,17	611577	3,5	611643	21,0	611631
0,14	611863	0,55	611896	0,96	611937	1,18	611578	4,0	611614	21,5	611661
0,15	611822	0,56	611897	0,97	611938	1,19	611579	4,5	611644	22,0	611632
0,16	611864	0,57	611898	0,98	611939	1,20	611580	5,0	611615	22,5	611662
0,17	611865	0,58	611899	0,99	611940	1,21	611581	5,1**	611850	22,8**	611856
0,18	611866	0,59	611900	0,991	611551	1,22	611582	5,5	611645	23,0	611633
0,19	611867	0,60	611901	0,992	611552	1,23	611583	6,0	611616	23,5	611663
0,20	611823	0,61	611902	0,993	611553	1,24	611584	6,5	611646	24,0	611634
0,21	611868	0,62	611903	0,994	611554	1,25	611585	7,0	611617	24,5	611664
0,22	611869	0,63	611904	0,995	611555	1,26	611586	7,5	611647	25,0**	611635
0,23	611870	0,64	611905	0,996	611556	1,27	611587	7,7**	611851	30,0	611673
0,24	611871	0,65	611906	0,997	611557	1,28	611588	8,0	611618	40,0	611674
0,25	611824	0,66	611907	0,998	611558	1,29	611589	8,5	611648	41,3*	611857
0,26	611872	0,67	611908	0,999	611559	1,30	611590	9,0	611619	50,0	611675
0,27	611873	0,68	611909	1,0	611611	1,31	611591	9,5	611649	60,0	611676
0,28	611874	0,69	611910	1,0005	611520	1,32	611592	10,0	611671	70,0	611677
0,29	611875	0,70	611911	1,001	611521	1,33	611593	10,3**	611852	75,0	611801
0,30	611825	0,71	611912	1,002	611522	1,34	611594	10,5	611650	80,0	611678
0,31	611876	0,72	611913	1,003	611523	1,35	611595	11,0	611621	90,0	611679
0,32	611877	0,73	611914	1,004	611524	1,36	611596	11,5	611651	100,0	611681
0,33	611878	0,74	611915	1,005	611525	1,37	611597	12,0	611622	125,0	611802
0,34	611879	0,75	611916	1,006	611526	1,38	611598	12,5	611652	131,4*	611858
0,35	611826	0,76	611917	1,007	611527	1,39	611599	12,9**	611853	150,0	611803
0,36	611880	0,77	611918	1,008	611528	1,40	611600	13,0	611623	175,0	611804
0,37	611881	0,78	611919	1,009	611529	1,41	611601	13,5	611653	200,0	611682
0,38	611882	0,79	611920	1,01	611561	1,42	611602	14,0	611624	250,0	611805
0,39	611883	0,80	611921	1,02	611562	1,43	611603	14,5	611654	300,0	611683
0,40	611827	0,81	611922	1,03	611563	1,44	611604	15,0**	611625	400,0	611684
0,41	611884	0,82	611923	1,04	611564	1,45	611605	15,5	611655	500,0	611685
0,42	611885	0,83	611924	1,05	611565	1,46	611606	16,0	611626	600,0	611840
0,43	611886	0,84	611925	1,06	611566	1,47	611607	16,5	611656	700,0	611841
0,44	611887	0,85	611926	1,07	611567	1,48	611608	17,0	611627	750,0	611842
0,45	611828	0,86	611927	1,08	611568	1,49	611609	17,5	611657	800,0	611843
0,46	611888	0,87	611928	1,09	611569	1,5	611641	17,6**	611854	900,0	611844
0,47	611889	0,88	611929	1,10	611570	1,6	611516	18,0	611628	1000,0	611845
0,48	611890	0,89	611930	1,11	611571	1,7	611517	18,5	611658		
0,49	611891	0,90	611931	1,12	611572	1,8	611518	19,0	611629		
0,50	611506	0,91	611932	1,13	611573	1,9	611519	19,5	611659		

Specifications

Accuracy: DIN EN ISO 3650

Tolerance grade: 0

As reference gauge for controlling workshop gauges. For adjusting high accuracy measuring instruments.

Tolerance grade: 1

For controlling test gauges, reference gauges, and for adjusting length measuring instruments as well as for accurate test works in the measuring room.

Tolerance grade "K" on request.

When ordering, please always state the suffix of the required tolerance grade.

- 021: Tolerance grade 0
- 031: Tolerance grade 1

Example:

No. 611611-021 Gauge block with nominal size 1 mm, tolerance grade 0

Tolerance grade "K" on request.

Special dimensions on request

Gauge blocks from 125 mm nominal size with connector bores (connectors see page 310)

Micrometer gauge block set made of steel

- Gauge block sets with optical glass parallel.
- For adjusting and calibrating micrometers according to DIN 863.

Series 516



516-107-10

Specifications

Accuracy: DIN EN ISO 3650

Delivery in a wooden box

Including 1 piece optical glass parallel no. 157-101, nominal size 12 mm, Ø 30 mm

Optional accessory

516-607 Gauge block holder



No.	Tolerance grade	Number per set	Contents pcs.	Nominal size mm
516-106-10	0	10	1	2,5
516-107-10	1		1	5,1
516-108-10	2		1	7,7
			1	10,3
			1	12,9
			1	15,0
			1	17,6
			1	20,2
			1	22,8
			1	25,0

Steel caliper gauge block set made of steel

- For testing the accuracy of calipers according to DIN 862.
- Including 3 gauge blocks and 2 ring gauges made of steel.

Series 516



516-124-10

Specifications

Gauge blocks: Accuracy according to DIN EN ISO 3650

Delivery in a wooden box and a pair of gloves

No.	Nominal size mm	Tolerance grade	Mass kg
516-124-10	30 mm, 41,3 mm, and 131,4 mm ring gouge Ø 4 mm and 25 mm material: steel	1	1,72

"Cera Block" Gauge Blocks Sets made of ceramics

- Gauge blocks made of ceramics, of high stability, lapped, with good adhesive power.
- Each gauge block is provided with an identification number. The hardness of the gauge blocks is 1.350 HV. They are very stable and extremely wear resistant.
- Each gauge block set is supplied with a factory certificate of calibration which documents the traceability to national standards.
- Additionally, the gauge blocks are measured interferometrically by a NKO accredited laboratory.

Series 516



516-343-10

No.	Calibration/ Tolerance grade	Number per set	Con- tents	Nominal size mm	Grading mm
516-341-70	K	103 pcs.	1	1,005	-
516-342-10	0		49	1,01 -1,49	0,01
516-343-10	1		49	0,5 -24,5	0,5
516-344-10	2		4	25 -100	25
516-345-70	K	87 pcs.	9	1,001-1,009	0,001
516-346-10	0		49	1,01 -1,49	0,01
516-347-10	1		19	0,5 -9,5	0,5
516-348-10	2		10	10 -100	10
516-361-70	K	47 pcs.	1	1,005	-
516-362-10	0		19	1,01 -1,19	0,01
516-363-10	1		8	1,2 -1,9	0,1
516-364-10	2		9	1 -9	1
			10	10 -100	10
No.	Calibration/ Tolerance grade	Number per set	Con- tents	Nominal size mm	Grading mm
516-395-10	0	46 pcs.	9	1,001-1,009	0,001
516-396-10	1		9	1,01 -1,09	0,01
516-397-10	2		9	1,1 -1,9	0,1
			9	1 -9	1
			10	10 -100	10
516-366-10	0	32 pcs.	1	1,005	-
516-367-10	1		9	1,01 -1,09	0,01
516-368-10	2		9	1,1 -1,9	0,1
			9	1 -9	1,0
			3	10 -30	10
			1	60	-
516-732-10	0	8 pcs.	3	125, 150, 175	25
516-733-10	1		2	200, 250	50
			3	300, 400, 500	100

Specifications

Accuracy: DIN EN ISO 3650

Tolerance grade: K
For laboratories

Tolerance grade: 0
As reference gauge for controlling workshop gauge blocks.
For adjusting high precision measuring instruments.

Tolerance grade: 1
For controlling test gauges, reference gauges, and for adjusting length measuring instruments as well as for accurate test works in the measuring room.

Tolerance grade: 2
Especially suited as workshop and adjusting gauge or for testing of lever gauges, dial indicators and as substitute for fixed snap gauges.

All gauge block sets are supplied with a factory calibration certificate which documents the traceability to national standards. Additionally, the gauge block sets of calibration class K are measured interferometrically by a NKO accredited laboratory.

"Cera Block" Individual Gauge Blocks made of ceramics

- Each gauge block is supplied with a factory certificate of inspection.

Series 516

Specifications

Accuracy: DIN EN ISO 3650

Tolerance grade: 0

As reference standard for controlling workshop gauge blocks.

For adjusting high accuracy measuring instruments.

Tolerance grade: 1

For controlling test gauges, reference gauges, and for adjusting length measuring instruments as well as for accurate test works in the measuring room.

When ordering, please always state the suffix of the required tolerance grade.

-021: Tolerance grade 0

-031: Tolerance grade 1

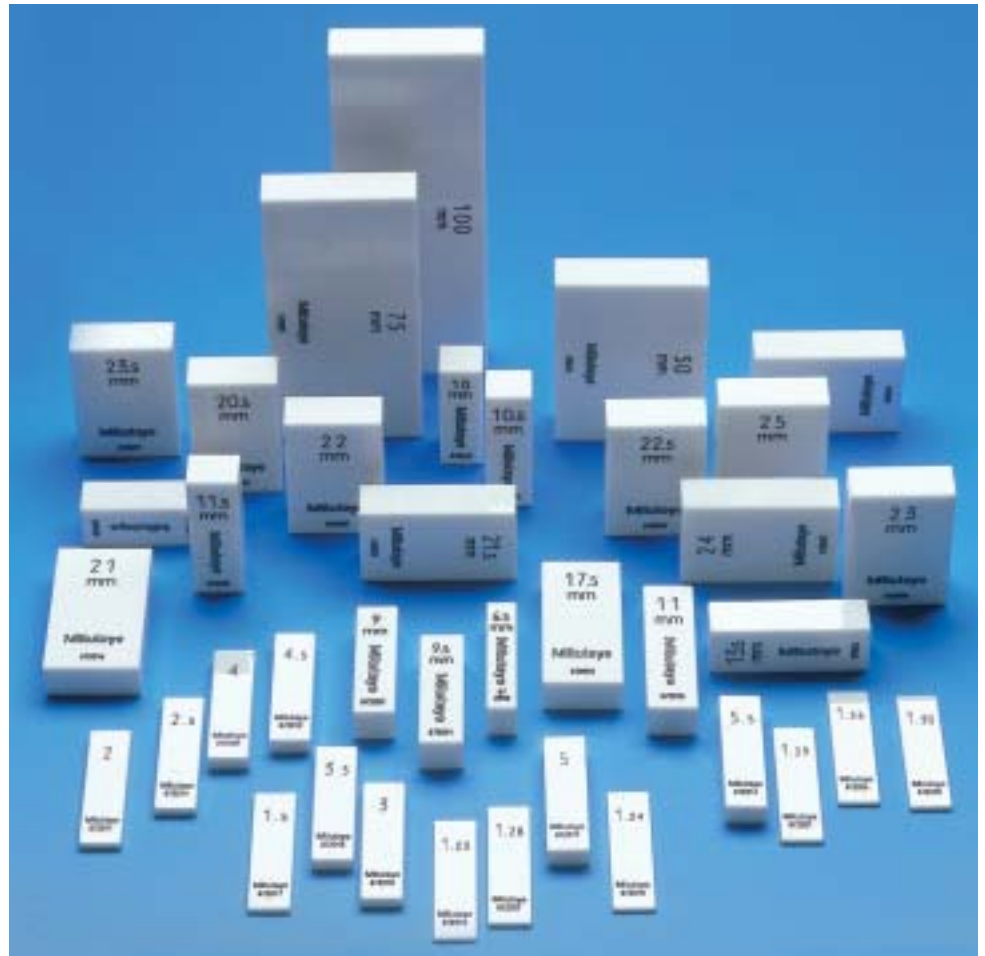
Example:

No. 613611-021 Gauge block with nominal size 1 mm, tolerance grade 0

Tolerance grade "K" on request.

Special dimensions on request

Gauge blocks from 125 mm nominal size with connector bores (connectors see page 310)



* Special dimensions for the testing of caliper gauges

** Special dimensions for the testing of external screw type micrometers

Nominal size mm	No.	Nominal size mm	No.	Nominal size mm	No.	Nominal size mm	No.	Nominal size mm	No.
0,50	613506	1,10	613570	1,40	613600	8,5	613648	21,5	613661
0,991	613551	1,11	613571	1,41	613601	9,0	613619	22,0	613632
0,992	613552	1,12	613572	1,42	613602	9,5	613649	22,5	613662
0,993	613553	1,13	613573	1,43	613603	10,0	613671	22,8**	613856
0,994	613554	1,14	613574	1,44	613604	10,3**	613852	23,0	613633
0,995	613555	1,15	613575	1,45	613605	10,5	613650	23,5	613663
0,996	613556	1,16	613576	1,46	613606	11,0	613621	24,0	613634
0,997	613557	1,17	613577	1,47	613607	11,5	613651	24,5	613664
0,998	613558	1,18	613578	1,48	613608	12,0	613622	25,0**	613635
0,999	613559	1,19	613579	1,49	613609	12,5	613652	30,0	613673
1,0	613611	1,20	613580	1,5	613641	12,9**	613853	40,0	613674
1,0005	613520	1,21	613581	1,6	613516	13,0	613623	41,3*	613857
1,001	613521	1,22	613582	1,7	613517	13,5	613653	50,0	613675
1,002	613522	1,23	613583	1,8	613518	14,0	613624	60,0	613676
1,003	613523	1,24	613584	1,9	613519	14,5	613654	70,0	613677
1,004	613524	1,25	613585	2,0	613612	15,0**	613625	75,0	613801
1,005	613525	1,26	613586	2,5**	613642	15,5	613655	80,0	613678
1,006	613526	1,27	613587	3,0	613613	16,0	613626	90,0	613679
1,007	613527	1,28	613588	3,5	613643	16,5	613656	100,0	613681
1,008	613528	1,29	613589	4,0	613614	17,0	613627	125,0	613802
1,009	613529	1,30	613590	4,5	613644	17,5	613657	131,4*	613858
1,01	613561	1,31	613591	5,0	613615	17,6**	613854	150,0	613803
1,02	613562	1,32	613592	5,1**	613850	18,0	613628	175,0	613804
1,03	613563	1,33	613593	5,5	613645	18,5	613658	200,0	613682
1,04	613564	1,34	613594	6,0	613616	19,0	613629	250,0	613805
1,05	613565	1,35	613595	6,5	613646	19,5	613659	300,0	613683
1,06	613566	1,36	613596	7,0	613617	20,0	613672	400,0	613684
1,07	613567	1,37	613597	7,5	613647	20,2**	613855	500,0	613685
1,08	613568	1,38	613598	7,7**	613851	20,5	613660		
1,09	613569	1,39	613599	8,0	613618	21,0	613631		

Steel micrometer gauge block set made of ceramic

- Gauge block sets with optical glass parallel.
- For adjusting and calibrating micrometers according to DIN 863.

Series 516



516-156-10

No.	Tolerance grade	Number per set	Contents pcs.	Nominal size mm
516-156-10	0	10	1	2,5
516-157-10	1		1	5,1
			1	7,7
			1	10,3
			1	12,9
			1	15,0
			1	17,6
			1	20,2
			1	22,8
			1	25,0

Specifications

Accuracy: DIN EN ISO 3650

Delivery in a wooden box

Including 1 piece optical glass parallel no. 157-101, nominal size 12 mm, Ø 30 mm

Optional accessory

516-607 Gauge block holder



Ceramic caliper testing kit

- For testing the accuracy of calipers according to DIN and/or VDI/VDE/DGQ 2613.
- Including 3 gauge blocks and 2 ring gauges made of ceramics.

Series 516



516-150-10

No.	Nominal size mm	Tolerance grade	Mass kg
516-150-10	30 mm, 41,3 mm, and 131,4 mm ring gauge Ø 4 mm and 25 mm material: ceramic	1	1,72

Specifications

Gauge blocks: Accuracy according to DIN EN ISO 3650

Delivery in a wooden box and a pair of gloves

Ceramics wear gauge block sets

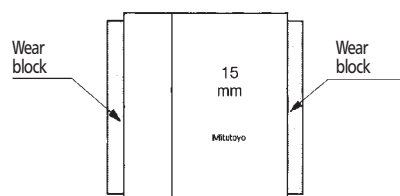
- For protecting measuring surfaces of gauge blocks.

Series 516



516-830-10

No.	Tolerance grade	Contents pcs.	Nominal size mm
516-830-10	0	2	2
516-831-10	1	2	2
516-832-10	0	2	1
516-833-10	1	2	1



Specifications

Accuracy: DIN EN ISO 3650

Gauge block sets made of steel and ceramics

Combination

Gauge block sets made of steel and ceramics

- Intelligent set composition
- Replaces frequently-used steel gauge blocks with ceramic gauge blocks.
- Ceramic gauge blocks included: 1, 2, 3, 4, 5 and 10 mm
- Excellent price/performance ratio
- Outstanding gauge block quality
- Each individual gauge block bears an identification number
- All gauge block sets are supplied with a factory calibration certificate.

Series 516



Gauge blocks made of ceramics
Nominal size:
1, 2, 3, 4, 5 and 10 mm

Specifications

Accuracy: DIN EN ISO 3650

Tolerance grade: K

For laboratories

Tolerance grade: 0

As reference gauge for controlling workshop gauge blocks.

For adjusting high precision measuring instruments.

Tolerance grade: 1

For controlling test gauges, reference gauges, and for adjusting length measuring instruments as well as for accurate test works in the measuring room.

Tolerance grade: 2

Especially suited as workshop and adjusting gauge or for testing of lever gauges, dial indicators and as substitute for fixed snap gauges.

All gauge block sets are supplied with a factory calibration certificate documenting traceability to national standards.



Sample application
Steel and ceramic gauge blocks used together.

No.	Number per set	Calibration-/Tolerance grade
516-962-13	47 pcs.	0
516-963-13	47 pcs.	1
516-964-13	47 pcs.	2
516-966-13	32 pcs.	0
516-967-13	32 pcs.	1
516-968-13	32 pcs.	2

Nuber per set	Mass kg	Contents	Nominal size		Grading
			mm	mm	
47 pcs.	2,8	1	1,005	-	
		21	1,00 - 1,20	0,01	
		8	1,3 - 2,0	0,1	
		8	3 - 10	1	
32 pcs.	1,1	9	20 - 100	10	
		1	1,005	-	
		9	1,01 - 1,09	0,01	
		9	1,1 - 1,9	0,1	
		9	1 - 9	1	
		3	10 - 30	10	
1	60	-			

Carbide wear gauge sets

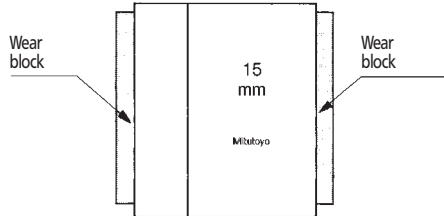
• For protecting the measuring surfaces from gauge blocks.

Series 516



516-803-10

No.	Tolerance grade	Contents pcs.	Nominal size mm
516-803-10	0	2	2,0
516-802-10	1	2	2,0
516-807-10	0	2	1,0
516-806-10	1	2	1,0



Maintenance set

• Contains everything you need for maintaining steel gauge blocks.

Series 516



516-650

No.	including:
516-650	No. 600001 Rust preventive oil in spray spraying can (appr. 100 ml)
	No. 601645 "CERASTON" 100 x 25 x 12 mm
	No. 158-117 Optical flat glas Ø 45 x 12 mm
	No. 600004 Hand tweezers
	No. 600005 Bellow
	No. 600006 Paper cloth
	No. 600007 Leather cloth
	No. 600008 Plastics dropping bottle for cleaning solvent (100 ml)
	No. 600009 Pair of gloves

Connector for long gauge blocks



619031

Specifications

Accuracy: DIN EN ISO 3650

Consumable Spares

No. 601644 "CERASTON"* 150 x 50 x 20 mm

No. 601645 "CERASTON"* 100 x 25 x 12 mm

* Stone for removing burrs on steel gauge blocks



Sample application

No. 619031 Connector

Gauge Block Accessory

- This accessory offers an additional range of application for the representation of cylindrical limit gauges and the direct size transmission onto workpieces.

Series 516

Complete set:

No. 516-601 consisting of 22 parts

No. 516-602 consisting of 14 parts

Delivery in a wooden box



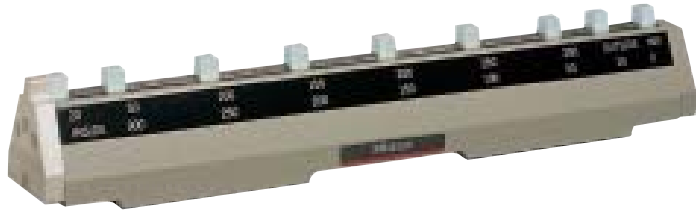
516-601

Part designation	No.	Quantity	No. 516-601 consists of	No. 516-602 consists of	
Holder					
15- 60 mm	619002 P	1	-	●	
5-100 mm	619003 P	1	●	●	
15-160 mm	619004 P	1	●	●	
20-250 mm	619005 P	1	●	●	
Holder base					
35 mm	619009 P	1	●	●	
Semi circular jaws					
Radius 2 mm	619010 P	2	●	●	
Radius 5 mm	619011 P	2	●	●	
Radius 8 mm	619012 P	2	●	●	
Radius 12 mm	619013 P	2	●	-	
Radius 20 mm	619014 P	2	●	-	
Flat jaws					
160 mm	619018 P	2	●	-	
Scriber					
	619019 P	1	●	●	
Centering tip					
	619020 P	1	●	●	
Control tips					
	619021 P	2	●	-	
Straight edges with 3 measuring edges					
100 mm	619022 P	1	●	●	
160 mm	619023 P	1	●	-	
Mass kg	-		5,6	4,6	

Stepped gauge block

- For checking caliper gauges, height gauges and tracers.
- With ceramic gauge blocks.

Series 515



515-555

No.	Measuring range mm	Parallelism μm	Graduations mm	Mass kg
515-555	0-300	2	20, 50, 100, 150, 200, 250 and 300	4,0
515-556	0-600	4	20, 50, 100, 150, 200, 300, 400, 500, 550 and 600	8,5



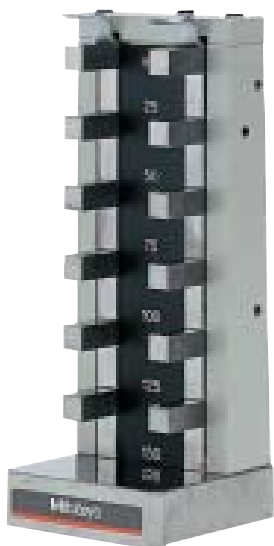
Specifications

Accuracy: Factory specification
 Error limits: 0-300 mm: 5 μm
 300-600 mm: 7 μm

Depth Microchecker

- For testing and calibrating depth micrometers.
- A 25 mm carbide tipped gauge block is provided as reference point.
- The gauge blocks are integrated in a rugged frame in increments of 25 mm and allow for accurate adjustment of the depth micrometer.

Series 515



515-570



No.	Measuring range mm	Graduation mm	Reference element
515-570	0-150	25	25 mm \pm 0,5 μm
515-571	0-300	25	25 mm \pm 0,5 μm

Specifications

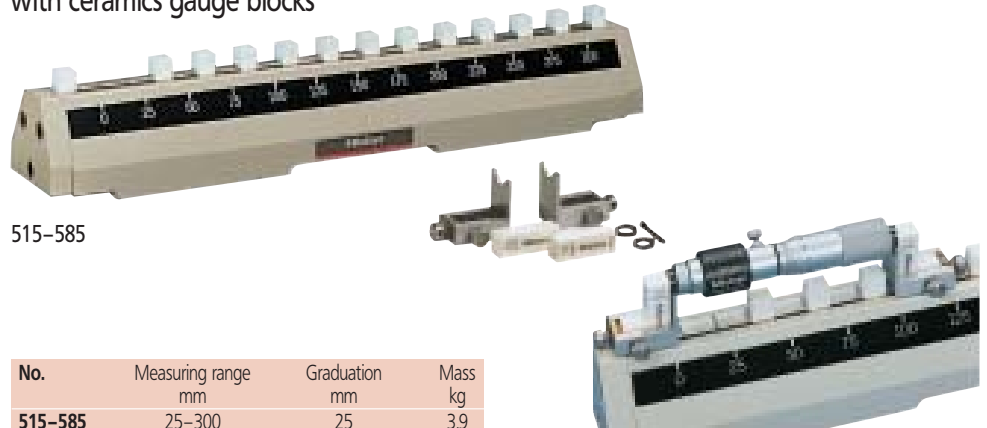
Accuracy: Factory specification
 Error limits: 0-150 mm: 2 μm
 150-300 mm: 3 μm

Inside Microchecker

- For checking, calibrating and setting inside micrometers
- A gauge block is integrated into the rugged frame. This enables the adjustment of inside micrometers in increments of 25 mm. An accessory set with two 10 mm gauge blocks and clamping elements is included. This accessory allows for calibration of an inside micrometer in any position. Furthermore, the instrument is designed for ZERO setting of inside micrometers prior to the measurement.

Series 515

with ceramics gauge blocks



515-585

No.	Measuring range mm	Graduation mm	Mass kg
515-585	25-300	25	3,9
515-586	25-600	25	7,0

For mechanical inside micrometers only

Specifications

Accuracy: Factory specification

Error limits: 25-300 mm: 3 μm

300-600 mm: 5 μm

Delivery with accessory

Inside Microchecker

- For setting 2-point inside micrometers series 511.

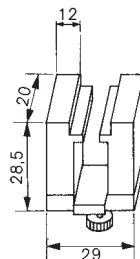
Series 515

Delivery as complete set in soft box

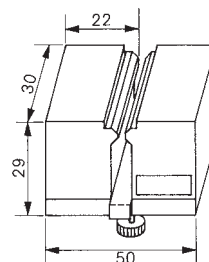


515-590 +
Parallel gauge block
(special accessory)

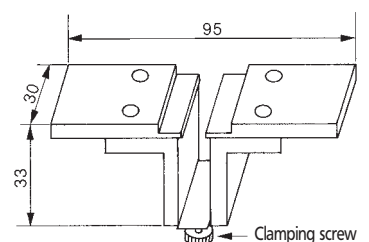
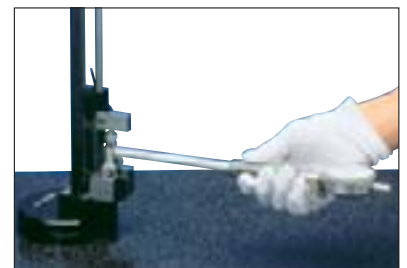
No.	consisting of:
515-590	1 Stand
No. 940088	1 receiver type A for measuring range 18- 35 mm, 35- 60 mm
No. 940089	1 receiver type B for measuring range 50-100 mm, 100-160 mm
No. 940090	1 receiver type C for measuring range 100-250 mm, 250-400 mm
No. 630030	2 flat jaws



940088



940089



940090

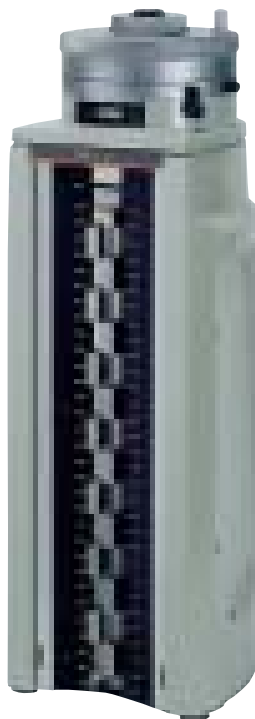
Height Micrometer "Heightmaster"

- For the calibration and setting e.g. of height gauges and tracers.
- Mitutoyo supplies a double gauge block height micrometer with counter which makes reading more rapid, easier and more faultless.
- The gauge blocks of the heightmaster are arranged in two parallel rows, on the left and on the right, with a height distance of 20 mm each.

Series 515



515-354



515-322

No.	Measuring range mm	Resolution mm	Graduation mm	Measuring span/block mm	Spindle accuracy mm	Parallelism μm	Total height mm	Mass kg
515-354	11-310	0,001	0,002	20	0,0020	2,0	469	9,5
515-356	11-460	0,001	0,002	20	0,0020	2,5	619	13,6
515-358	11-610	0,001	0,002	20	0,0025	2,5	769	16,0
515-322	6-310	-	0,001	20	0,0010	1,0	426	21,4

Specifications

Accuracy: Factory specification

Gauge block accuracy:

Error limits: - 300 mm: 1,5 μm
 - 450 mm: 2,5 μm
 - 600 mm: 3,5 μm

No. 515-354 / -356 / -358

With digital reading. Light weight and very handy construction, not only for measuring rooms but also for workshops.

No. 515-322

The lowest block 5 mm instead of 10 mm. This reduces the minimum measuring height to 5 mm.

Height Micrometer "CERA-Heightmaster"

- For calibrating and setting e.g. of height gauges and tracers.
- Integrated, high precision opto-electrical laser measuring system with a resolution of 0,1 μm .
- Gauge blocks made of ceramics, therefore rust proof and extremely resistant against rust and wear.
- Display of the selected gauge block on the LED display for easy operation.
- Two measuring modes: ABS (Absolute) mode, which displays the distance from the measuring plate surface to the surface of the selected gauge block and INC (Incremental) mode. Presetting is also possible (this is useful when using base blocks).

Specifications

Accuracy: Factory specification
 Power supply: via AC adapter
 (9 VDC, 500 mA)
 No. 526688 D

Hand wheel
 for coarse adjustment
 of the gauge blocks: 0,5 mm/revolution
 Hand wheel
 for fine adjustment
 of the gauge blocks: 0,015 mm/revolution

Optional accessory

No. 936937 "DIGIMATIC" Signal cable (1 m)
 No. 965014 "DIGIMATIC" Signal cable (2 m)
 No. 940269 Interface RS-232 C

Series 515

Same accuracy as gauge blocks



515-341

No.	Measuring range mm	Resolution μm	Measuring span/block mm	Error limits μm	Parallellism μm	Graduation mm	Mass kg
515-341	5-310	0,1	20	$0,5 + \frac{L}{200}$ L = mm	0,5	20	18



Function keys



LED display

Optional accessory for Height Micrometer "Heightmaster"

Series 515

For adjusting inside micrometers, inside measuring instruments, etc.



515-112



No.	suited for "Heightmaster"
515-111	515-354/-356/-358
515-112	515-322/515-341

Series 515

Bases for series 515

The measuring range can be extended up to 900 mm by using the bases 150, 300 and 600 mm.



515-113



515-114



515-115



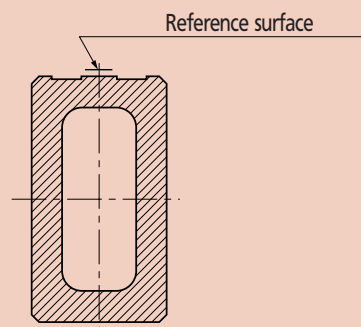
Sample application

No.	Height mm	Error limits μm	Parallelism μm	Mass kg
515-113	150	0,6	0,6	5,7
515-114	300	1,0	0,8	11,3
515-115	600	2,0	1,0	31,0

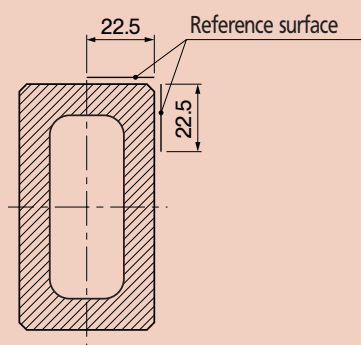
Specifications

Hardness of feet: 88 HRA (Carbide)
Hardness of upper support: 64 HRC

Standard and high-precision version



Double guide



Ceramic level

- For testing measuring instruments and fixtures, and as a reference for machine tools.
- Lightweight ceramic level.
- Dimensionally stable, abrasion-resistant, waterproof and non-corroding.

Series 311



Nominal length mm	No.	Total length mm	Profile mm	Straightness μm	Mass kg
Standard level with factory calibration certificate					
400	311-302-22	440	35x50	0,3	1,8
700	311-305-22	740	35x50	0,5	3,0
1000	311-307-22	1040	45x80	1,0	8,0
1300	311-309-22	1340	45x80	1,5	10,0
High-precision level with factory calibration certificate					
400	311-332-22	440	35x50	0,2	1,8
700	311-335-22	740	35x50	0,4	3,0
1000	311-337-22	1040	45x80	0,5	8,0
1300	311-339-22	1340	45x80	0,7	10,0
Double-guide level with factory calibration certificate					
400	311-352-22	440	45x80	0,3	3,2
700	311-355-22	740	45x80	0,5	5,5
1000	311-357-22	1040	45x80	1,0	8,0
1300	311-359-22	1340	45x80	1,5	10,0

Stepped gauge block "Check-Master"

- This standard is designed for testing 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 10 mm.

Series 515

Standard accuracy, steel



515-722

Measuring range mm	No.	Error limits 0-300 mm	Error limits 300-600 mm	Error limits 600-1000 mm	Error limits 1000-1500 mm	Parallelism μm	Mass kg
		μm	μm	μm	μm		
0- 300	515-720	2,5	-	-	-	1,2	8
0- 450	515-721	2,5	3,5	-	-	1,5	10
0- 600	515-722	2,5	3,5	-	-	1,5	13
0-1000	515-723	2,5	3,5	5,0	-	2,0	22
0-1500	515-724	2,5	3,5	5,0	8,0	2,5	30

Specifications

Accuracy: Factory specification

Hardness: more than 64 HRC

Delivery in a wooden box

Stepped gauge block "Check-Master"

- This standard is designed for testing 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 10 mm.

Series 515

High precision
Made of steel or ceramics



515-742

Specifications

Accuracy: Factory specification

Delivery in a wooden box

Measuring mm	No.	Error limits 0-300 mm μm	Error limits 300-600 mm μm	Error limits 600-1000 mm μm	Error limits 1000-1500 mm μm	Parallelism μm	Mass kg
Gauge block sets made of steel							
0- 300	515-740	1,2	-	-	-	1,0	3,6
0- 450	515-741	1,2	1,8	-	-	1,0	5,4
0- 600	515-742	1,2	1,8	-	-	1,5	7,2
0-1000	515-743	1,2	1,8	2,5	-	1,5	12,0
0-1500	515-744	1,2	1,8	2,5	4,0	2,0	18,0
Gauge block sets made of ceramics							
0- 300	515-760	1,2	-	-	-	1,0	3,4
0- 450	515-761	1,2	1,8	-	-	1,0	5,2
0- 600	515-762	1,2	1,8	-	-	1,5	6,9
0-1000	515-763	1,2	1,8	2,5	-	1,5	11,5
0-1500	515-764	1,2	1,8	2,5	4,0	2,0	17,3

Precision test gauge set

Specifications

Accuracy: DIN 2269
Hardness: HRC 60–62
Finish: very fine ground
from dia. 3 mm inscribed
Roughness: $\leq 0,1 \mu\text{m Ra}$
Length: up to dia. 6 mm = 50 mm
over dia. 6 mm = 70 mm
Made from alloyed tool steel, hardened.
Delivery in a wooden box

Series 926

Accuracy: DIN 2269

Complete measuring set of universal test gauges, consisting of 273 pieces for use in the control room, work on jig drill or in tool and fixture engineering.

From dia. 0.99–10.01 mm, rising by 0.1 mm, each test gauge delimited by test gauges at + 0.01 mm (oversize) and – 0.01 mm (undersize).



926–210

Individual test gauges on request

No.	Degree of accuracy
926–210	1
926–212	2

Specifications

Accuracy: DIN 2269
Hardness: HRC 60–62
Finish: very fine ground
from dia. 3 mm inscribed
Roughness: $\leq 0,1 \mu\text{m Ra}$
Length: up to dia. 6 mm = 50 mm
over dia. 6 mm = 70 mm
Aus legiertem Werkzeugstahl, gehärtet
Delivery in a wooden box

Series 926

Accuracy: DIN 2269

Complete set of test gauge, consisting of 91 pieces

From dia. 1–10 mm, rising by 0.1 mm



926–222

Individual test gauges on request

No.	Degree of accuracy
926–220	1
926–222	2

PRODUCT NEWS



ABSOLUTE™ **IP66**
Absolute System Patented by MITUTOYO

ABSOLUTE DIGIMATIC Built-in Calipers

Series 572

Detailed information on page 325.



DIGIMATIC EC Display

Series 542

Detailed information on page 329.

Coating Thickness Gauges



Pages 322–324

ABSOLUTE DIGIMATIC
Built-in Calipers



Pages 325–328

DIGIMATIC Displays
for Built-in Calipers



Page 329



Coating Thickness Gauges "DIGI-DERM"-1100/2100

- For non-destructive, quick and accurate measurement of layer thickness.
- The great number of measurable coatings on the most different materials is shown in the probe selection table on page 323.
- Measurement values and operating instructions are displayed on a large, easy to read LCD display.

Series 179

DIGI-DERM 1100

This instrument is very easy to operate. Measurement values are not stored. In conjunction with the data processor DP-1 VR (No. 264-504 D and data cable 011230 (optional accessory)), all measurement values can be printed directly.



179-606-11 + probe (optional accessory)

Series 179

DIGI-DERM 2100

This unit is capable of storing the measured data max. 10,000 e. g. for statistical evaluation later on and/or for printing. In conjunction with the data processor DP-1 VR (No. 264-504 D and data cable 011230 (optional accessory)) all measuring values can be printed directly.



179-606-21 + probe (optional accessory)

Probe selection table and optional accessories probes can be found on the next page ▶

Functions	Series 179	
	179-606-11	179-606-21
Statistical evaluation:		
Individual value statistics: \bar{x} , s, kvar, n, max, min		●
Block value statistics: \bar{x} , s, kvar, m, max, min		●
Display and printout of date and time of printout and measurement series record by year, month, day, hour and minute		●
Calibration method:		
Zero-point calibration, calibration using layer thickness standard	●	●
Calibration on the coated surface, if base material is not accessible.	●	●
Measurement on raw surfaces. By averaging the calibration values, the roughness factor can be largely eliminated.	●	●
Data stored when battery is changed.	●	●
Measuring unit can be switched from metric to imperial (inches) system	●	●

Specifications DIGI-DERM 1100

Including box and battery (without probe and Layer thickness standard)

Optional accessories

- No. 011230 Signal cable "DIGIMATIC"
- No. 011283 Interface cable (RS-232 C)
- Probes see page 323

Specifications DIGI-DERM 2100

Including box and battery (without probe and Layer thickness standard)

Optional accessories

- No. 011230 Signal cable "DIGIMATIC"
- No. 011283 Interface cable (RS-232 C)

Optional accessories Probes for DIGI-DERM-1100/2100

Basic material	Coating	Type probes		
		F-probe	N-probe	FN-probe
Iron and steel also alloyed and hardened ferromagnetic steels	Insulating layers: Lacquers, enamel, anodic oxidation, plastics....	●	–	●
	Nonferrous metal coatings: Chromium, copper, zinc, tin currentless nickel..	●	–	●
Nonferrous metals: Aluminium, copper, zinc austenitic steels	Insulating layers: Lacquers, enamel, anodic oxidation, plastics....	–	●	●
	Nonferrous metal coatings: Chromium, copper, zinc, tin currentless nickel..	–	–	–

Specifications

Contents Layer thickness standard

- No. 011335** 1 x Zero-plate / steel
3 films: 50, 100 and 300 μm
- No. 011281** 1 x Zero-plate / steel
3 films: 100, 500 and 1500 μm
- No. 011279** 1 x Zero-plate / steel
1 x Zero-plate / aluminium
3 films: 100, 500 and 1000 μm
- No. 011441** 1 x Zero-plate / aluminium
3 films: 10, 50 and 100 μm

Series 179

No.	Probe	Measuring method	Measuring range	Initial-sensitivity	Error limits (% from measuring values)	Min. bend radius	Min. measuring surface \varnothing mm	Min. thickness of the base material	Calibration film No.
011334	F 05	Magneto electric induction	0– 500 μm	0,1	1 % + 0,7 μm	convex 0,75 mm concave 5 mm	3	0,1 mm	011335
011226	F 3	Magneto electric induction	0–3000 μm	0,2	1 % + 1 μm	convex 1,5 mm concave 10 mm	5	0,5 mm	011281
011228	FN 1,6	Combination probe	0–1600 μm	0,1	1 % + 1 μm	convex 1,5 mm concave 10 mm	5	F = 0,5 mm N = 50 μm	011279
011440	N 02	Eddy current	0– 200 μm	0,1	1 % + 0,5 μm	convex 1 mm concave 5 mm	2	50 μm	011441

Specifications

Dimensions: 220 x 120 x 50 mm

Optional accessories

- No. 179-551** Layer thickness standard 0–50 μm
Nominal dimensions \approx 0, 10, 20, 40 μm
chrome on steel in each case
- No. 179-552** Layer thickness standard 0–400 μm
Nominal dimensions \approx 0, 40, 120, 400 μm
40 μm chrome on steel
120 μm paint on steel
400 μm paint on steel



- No. 011029** Leather box for safe transport of the device at the belt
- No. 527599** Layer thickness standard \approx 25 μm
- No. 527600** Layer thickness standard \approx 50 μm
- No. 527601** Layer thickness standard \approx 100 μm
- No. 527602** Layer thickness standard \approx 250 μm
- No. 527603** Layer thickness standard \approx 500 μm
- No. 527604** Layer thickness standard \approx 1000 μm
- No. 527605** Layer thickness standard \approx 2000 μm

Layer Thickness Measuring Instrument "MINI-DERM"

- For non-destructive measurement of non-magnetic layers as e. g. galvanic layers, zinc, copper, chromium, cadmium, paints, enamels, plastics etc. on steel and iron.

Series 179

No power supply needed



No.	Application for	Measuring range	Error limits (% from measuring values)	Min. measuring surface \varnothing mm	Minimum thickness of the base material mm	Minimum bend radius on the test piece	Mass g
179-503	galvanic layers on steel and iron	0... 100 μm	1 mm (0... 20 μm) 5 %* (20... 100 μm)	20	0,4	5 mm convex 40 mm concave	660
179-504	paint, lacquer on steel and iron	0... 1000 μm	5 mm (0... 100 μm) 5 %* (100... 1000 μm)	30	0,4	8 mm convex 40 mm concave	660

* from the measured value

Coating Thickness Gauges "MINI-DERM-1000"

Series 179



179-571

No.	Measuring method	Application	Including
179-571	magneto-electric induction	measurements on steel	Film Set No. 011316: Contents: Zero-plate Fe, Films 200 μm, 800 μm
179-572	magneto-electric induction and Foucault current principle	measurements on steel and nonferrous metal	Film Set No. 011317: Contents: Zero-plate Fe and Al, Films 200 μm, 800 μm

Functions	Series 179	
	179-571 Type F	179-572 Type FN
Statistical evaluation:		
Individual value statistics: \bar{x} , s, max, min	●	●
Block value statistics: Freely definable number of measured values per block (5-30) \bar{x} , s pro block	●	●
Data storage:		
90 individual measured value, 45 block values	●	
Tolerance input	●	●
Calibration method:		
Zero-point calibration, calibration using layer thickness standard	●	●
Measurement unit metric / inches	●	●
Autoswitch		●
steel/non-ferrous metals		●

Specifications

Measuring range:	0 – 2000 μm
Error limits:	2 μm + 3 % of the measuring value
Initial sensitivity:	0,1 μm
Min. measuring surface:	Ø 20 mm
Min. thickness of the base material:	F = 0,5 mm N = 50 μm
Min. bend radius at the edge of a measured object:	convex: 5 mm concave: 35 mm
Min. bend radius in the center of a measured object:	60 mm
Dimensions:	160 x 35 x 40 mm
Mass:	ca. 200 g

Standard accessories

Main unit with Zero-plate made of steel or aluminium, calibration films, belt leather box

Optional accessories

No. 011282 RS-232 C Cable

Wet-film Thickness Measuring Instrument

for measuring freshly applied, still wet coatings

Series 179



011030



Sample application

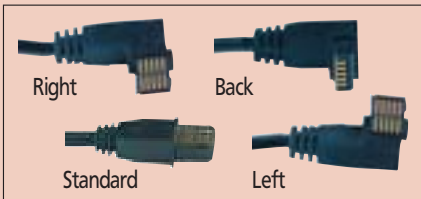
Functions	Series 572
ON / OFF	●
Zero-setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification
 Resolution: 0,01 mm
 Including 1 battery

Optional accessories

- No. 959143 Data Hold Unit
- No. 905338 Signal cable (1 m) Standard
- No. 905409 Signal cable (2 m) Standard
- No. 959149 Signal cable with data key (1 m)
- No. 959150 Signal cable with data key (2 m)
- No. 905689 Signal cable with angle entry-plug (1 m), cable guide rear
- No. 905690 Signal cable with angle entry-plug (2 m), cable guide rear
- No. 905691 Signal cable with angle entry-plug (1 m), cable guide right
- No. 905692 Signal cable with angle entry-plug (2 m), cable guide right
- No. 905693 Signal cable with angle entry-plug (1 m), cable guide left
- No. 905694 Signal cable with angle entry-plug (2 m), cable guide left



Specifications

As above, but protection standard IP-66

Optional accessories

- No. 05CZA624 Signal cable (1 m)
- No. 05CZA625 Signal cable (2 m)

Consumable Spares

- No. 938882 Battery SR-44



ABSOLUTE DIGIMATIC Built-In Caliper

- World-wide unique capacitive electronic built-in caliper with an absolute scale.
- The ZERO point is set only once and is stored as the absolute ZERO point until the next battery replacement.
- Highest measuring precision even at highest drive speed.
- Large display characters for easy reading.
- Capacitive absolute measuring system (patented).

Series 572

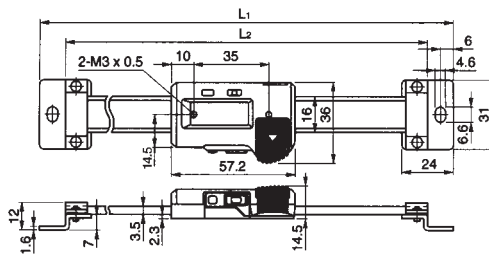
Standard Horizontal Construction with data output

ABSOLUTE™
 Absolute System Patented by MITUTOYO

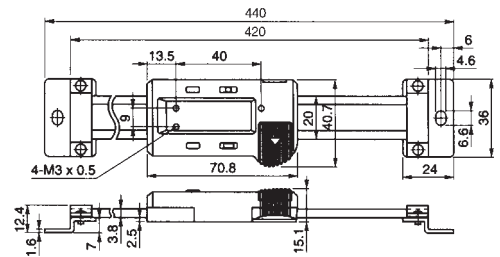


572-200-10

Measuring range mm	No.	Error limits mm	L1 mm	L2 mm	Mass g
100	572-200-10	0,03	209	185	230
150	572-201-10	0,03	259	235	250
200	572-202-10	0,03	311	287	270
300	572-203-10	0,04	440	420	370



572-200-10 ~ 572-202-10



572-203-10

Series 572

Standard Horizontal Construction with data output
 Protection Standard: IP 66

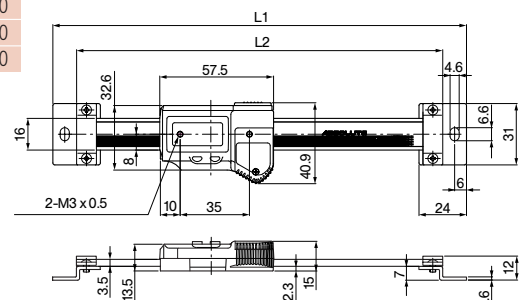


572-600



572-601

Measuring range mm	No.	Error limits mm	L1 mm	L2 mm	Mass g
100	572-600	0,03	209	185	230
150	572-601	0,03	259	235	250
200	572-602	0,03	311	287	270



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Built-In Caliper

- World-wide unique capacitive electronic built-in caliper with an absolute scale.
- The ZERO point is set only once and is stored as the absolute ZERO point until the next battery replacement.
- Highest measuring precision even at highest drive speed.
- Large display characters for easy reading.
- Capacitive absolute measuring system (patented).

Series 572

Standard Vertical Construction with data output



572-302-10

ABSOLUTE™

Absolute System Patented by MITUTOYO

Functions	Series 572
ON / OFF	●
Zero-setting	●
ORIGIN	●
Data output	●

Specifications

Accuracy: Factory specification

Resolution: 0,01 mm

Including battery

Optional accessories

No. 959143 Data Hold Unit

No. 905338 Signal cable (1 m) Standard

No. 905409 Signal cable (2 m) Standard

No. 959149 Signal cable with data key (1 m)

No. 959150 Signal cable with data key (2 m)

No. 905689 Signal cable with angle entry-plug (1 m), cable guide rear

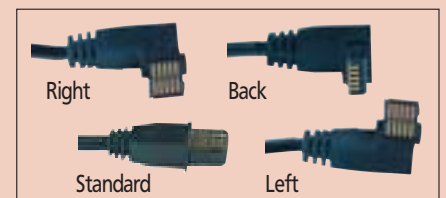
No. 905690 Signal cable with angle entry-plug (2 m), cable guide rear

No. 905691 Signal cable with angle entry-plug (1 m), cable guide right

No. 905692 Signal cable with angle entry-plug (2 m), cable guide right

No. 905693 Signal cable with angle entry-plug (1 m), cable guide left

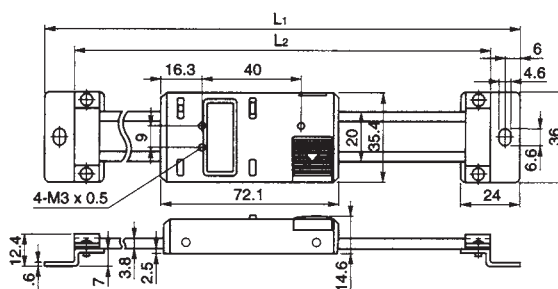
No. 905694 Signal cable with angle entry-plug (2 m), cable guide left



Consumable Spares

No. 938882 Battery SR-44

Measuring range mm	No.	Error limits mm	L1 mm	L2 mm	Mass g
100	572-300-10	0,03	244	220	250
150	572-301-10	0,03	294	270	280
200	572-302-10	0,03	344	320	310
300	572-303-10	0,04	444	420	370



™ Patent numbers see page 464

ABSOLUTE DIGIMATIC Built-In Caliper

- World-wide unique capacitive electronic built-in caliper with an absolute scale.
- The ZERO point is set only once and is stored as the absolute ZERO point until the next battery replacement.
- Highest measuring precision even at highest drive speed.
- Large display characters for easy reading.
- Capacitive absolute measuring system (patented).

Series 572

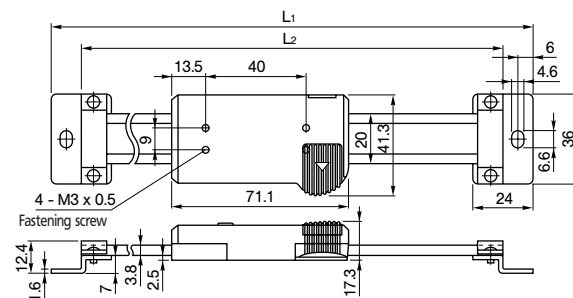
Multifunctional Horizontal Construction with data output

ABSOLUTE™
Absolute System Patented by MITUTOYO

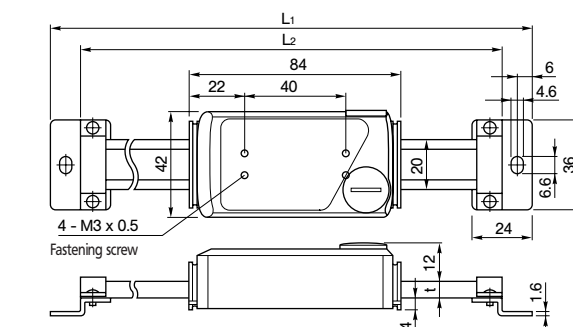


572-460

Measuring span mm	Nr. Error limits	L ₁ mm	L ₂ mm	t mm	Mass mm	g
without diameter function, with reversible counting direction						
100	572-460	0,03	244	220	-	410
150	572-461	0,03	294	270	-	460
200	572-462	0,03	344	320	-	510
300	572-463	0,04	444	420	-	610
450	572-464	0,04	594	570	6	760
600	572-465	0,05	774	750	6	900
800	572-466	0,06	974	950	10	1710
1000	572-467	0,07	1174	1150	10	2040
with diameter function, without reversible counting direction						
100	572-480-10	0,03	244	220	-	410
150	572-481-10	0,03	294	270	-	460
200	572-482-10	0,03	344	320	-	510
300	572-483-10	0,04	444	420	-	610
450	572-484-10	0,04	594	570	6	760
600	572-485-10	0,05	774	750	6	900
800	572-486-10	0,06	974	950	10	1710
1000	572-487-10	0,07	1174	1150	10	2040



572-460~463 / 572-480~483



572-464~467 / 572-484~487

™ Patent numbers see page 464

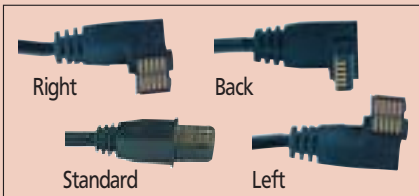
Functions	Series 572	
	572-46x	572-48x-10
ON / OFF	●	●
Zero-setting	●	●
ORIGIN	●	●
PRESET (2 values)	●	●
DATA / HOLD	●	●
Diameter function		●
Reversible counting direction	●	
Data output	●	●

Specifications

Accuracy: Factory specification
Resolution: 0,01 mm
Including battery

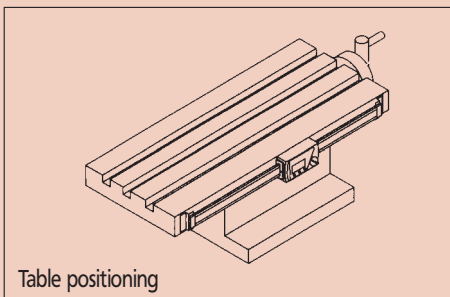
Optional accessories

- No. 905338 Signal cable (1 m) Standard
- No. 905409 Signal cable (2 m) Standard
- No. 905689 Signal cable with angle entry-plug (1 m), cable guide rear
- No. 905690 Signal cable with angle entry-plug (2 m), cable guide rear
- No. 905691 Signal cable with angle entry-plug (1 m), cable guide right
- No. 905692 Signal cable with angle entry-plug (2 m), cable guide right
- No. 905693 Signal cable with angle entry-plug (1 m), cable guide left
- No. 905694 Signal cable with angle entry-plug (2 m), cable guide left



Consumable Spares

- No. 938882 Battery SR-44



ABSOLUTE DIGIMATIC Built-In Caliper

- World-wide unique capacitive electronic built-in caliper with an absolute scale.
- The ZERO point is set only once and is stored as the absolute ZERO point until the next battery replacement.
- Highest measuring precision even at highest drive speed.
- Large display characters for easy reading.
- Capacitive absolute measuring system (patented).

Series 572

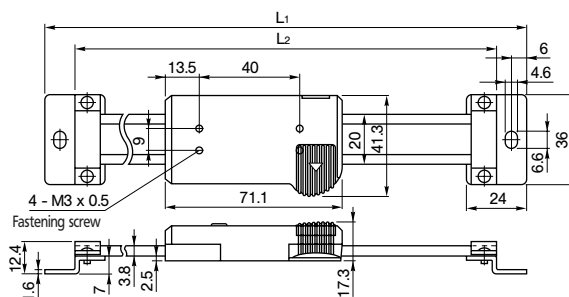
Multifunctional Vertical Construction with data output

ABSOLUTE™
Absolute System Patented by MITUTOYO

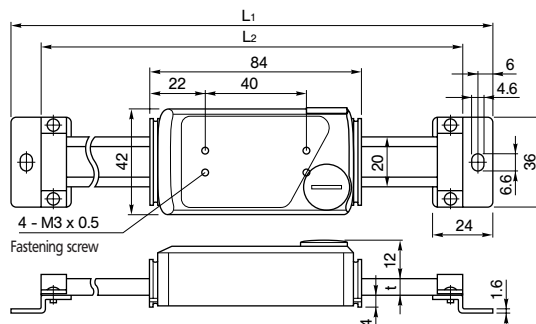


572-560

Measuring span mm	No.	Error limits mm	L ₁ mm	L ₂ mm	t mm	Mass g
without diameter function, with reversible counting direction						
100	572-560	0,03	244	220	-	410
150	572-561	0,03	294	270	-	460
200	572-562	0,03	344	320	-	510
300	572-563	0,04	444	420	-	610
450	572-564	0,04	594	570	6	760
600	572-565	0,05	774	750	6	900
800	572-566	0,06	974	950	10	1710
1000	572-567	0,07	1174	1150	10	2040
with diameter function, without reversible counting direction						
100	572-580-10	0,03	244	220	-	410
150	572-581-10	0,03	294	270	-	460
200	572-582-10	0,03	344	320	-	510
300	572-583-10	0,04	444	420	-	610
450	572-584-10	0,04	594	570	6	760
600	572-585-10	0,05	774	750	6	900
800	572-586-10	0,06	974	950	10	1710
1000	572-587-10	0,07	1174	1150	10	2040



572-560~563 / 572-580~583



572-564~567 / 572-584~587

™ Patent numbers see page 464

Functions	Series 572	
	572-56x	572-58x-10
ON / OFF	●	●
Zero-setting	●	●
ORIGIN	●	●
PRESET (2 values)	●	●
DATA / HOLD	●	●
Diameter function		●
Reversible counting direction	●	
Data output	●	●

Specifications

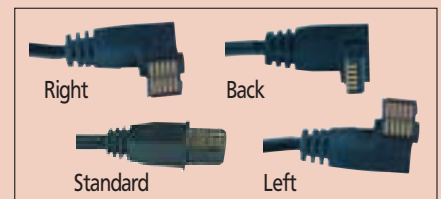
Accuracy: Factory specification

Resolution: 0,01 mm

Including battery

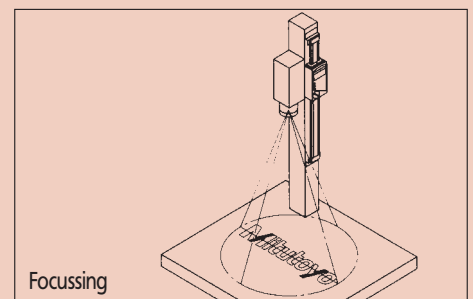
Optional accessories

- No. 905338 Signal cable (1 m) Standard
- No. 905409 Signal cable (2 m) Standard
- No. 905689 Signal cable with angle entry-plug (1 m), cable guide rear
- No. 905690 Signal cable with angle entry-plug (2 m), cable guide rear
- No. 905691 Signal cable with angle entry-plug (1 m), cable guide right
- No. 905692 Signal cable with angle entry-plug (2 m), cable guide right
- No. 905693 Signal cable with angle entry-plug (1 m), cable guide left
- No. 905694 Signal cable with angle entry-plug (2 m), cable guide left

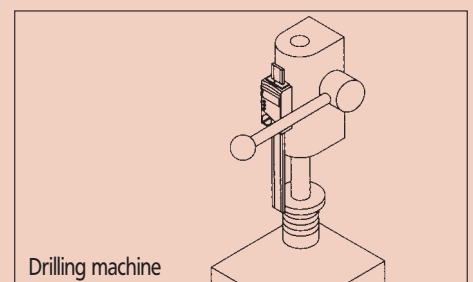


Consumable Spares

- No. 938882 Battery SR-44



Focussing



Drilling machine

DIGIMATIC EC display

- Can be connected to devices with DIGIMATIC output:
 - Built-in micrometers
 - Dial indicators
 - Measuring probes.
- DIN-compatible compact front panel assembly (96 x 48 mm).

Series 542

With data output and tolerance evaluation function



542-007 D

No.	Dimensions (W x H x D) mm	Mass g
542-007 D	96 x 48 x 84,6	150

Functions	Series 542
ON / OFF	●
PRESET	●
Zero-setting	●
Tolerance limit input	●
Go / ± NG signal output (3 steps) on the display as well as via the I/O interface	●
Counting direction switching	●
Error report	●
Key lock	●
Display of measured value with factor	●
DIGIMATIC Data input	●
DIGIMATIC Data output	●
mm / inch switching	●

Specifications

Display: green LED display,
6-digit, with (-) sign,
character height: 15 mm

Power supply: +9-12 V DC 400 mA
or AC adapter

Standard accessory

No. 526688 D AC adapter

Optional accessory

No. C 162-155 I/O cable (2 m)

No. 936937 Signal cable (1 m)

No. 965014 Signal cable (2 m)

No. 214938 Adapter for power supply



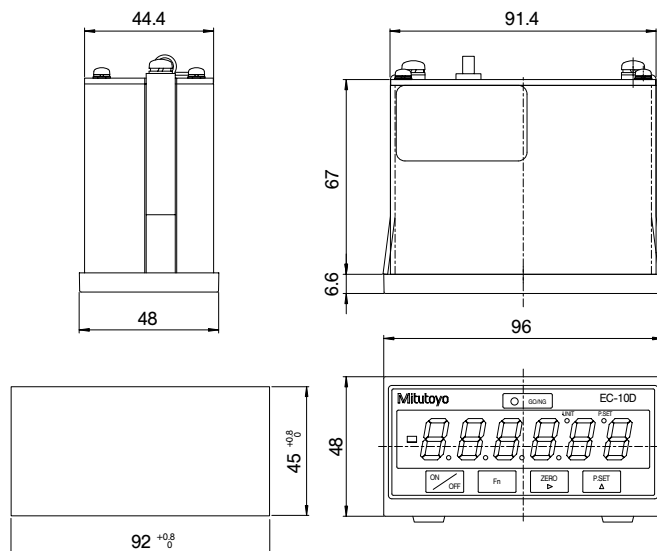
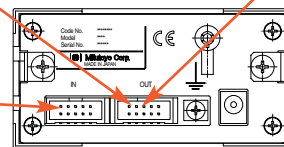
Sample application

I/O interface
1. For relaying 3-level tolerance signals
2. For calling PRESET values or hold
function from outside

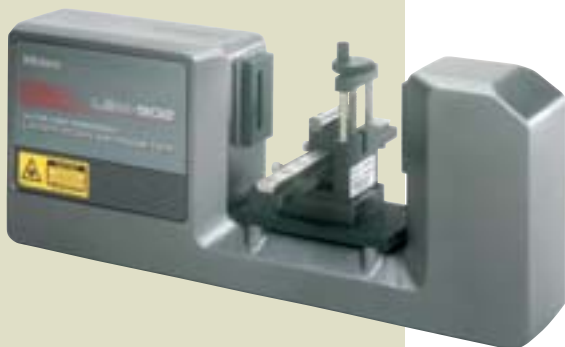
OR

DIGIMATIC output
for relaying to:
1. SPC printer
2. Transmitter DMX etc.

DIGIMATIC input



PRODUCT NEWS



Laser Scan Micrometer LSM-902

Measuring range: 0,1–25 mm
Series 544

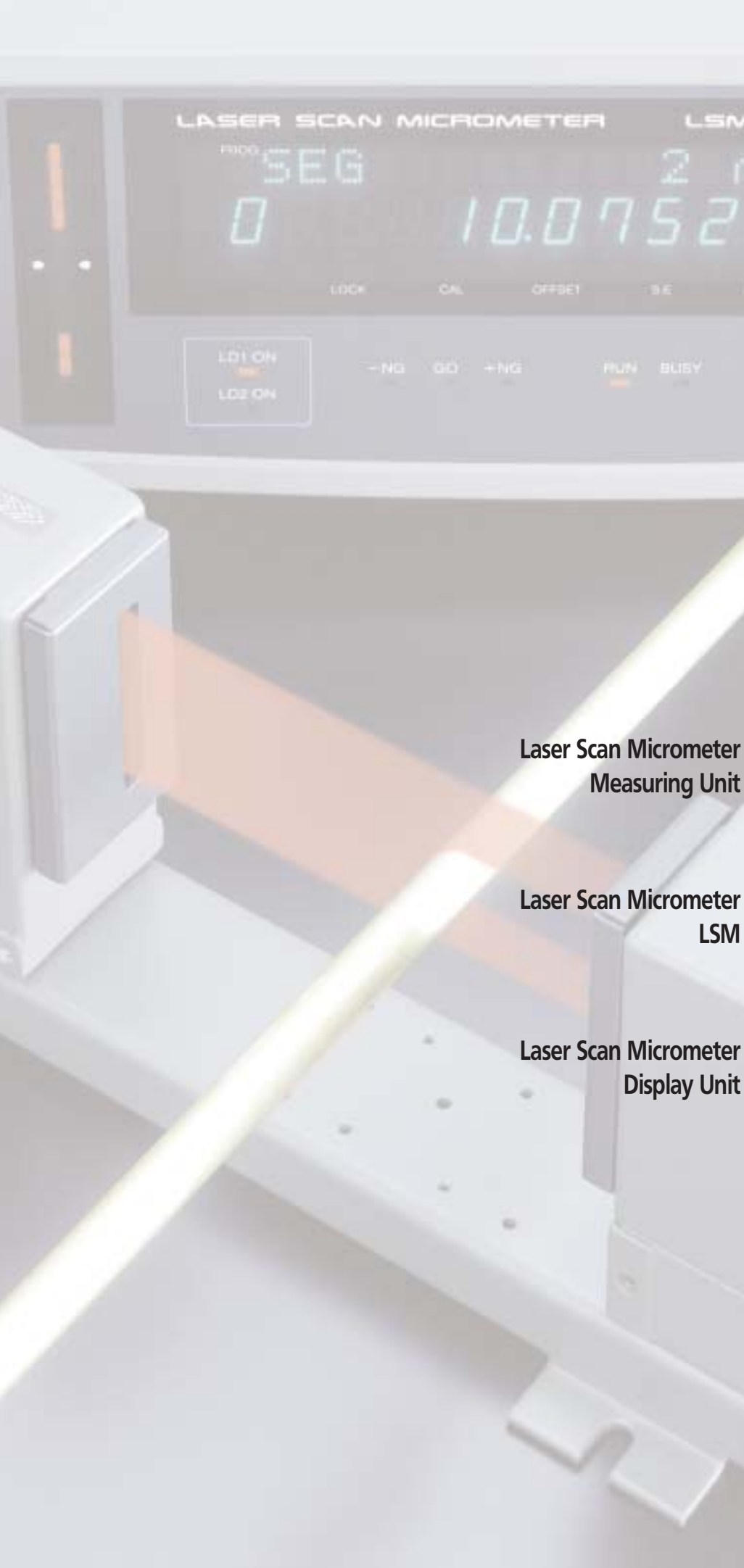
Detailed information on page 346.



Desktop type LSM-6900

Series 544

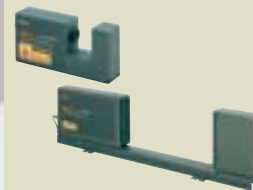
Detailed information on page 346.



Laser Scan Micrometer
Measuring Unit

Laser Scan Micrometer
LSM

Laser Scan Micrometer
Display Unit



Pages 343–344



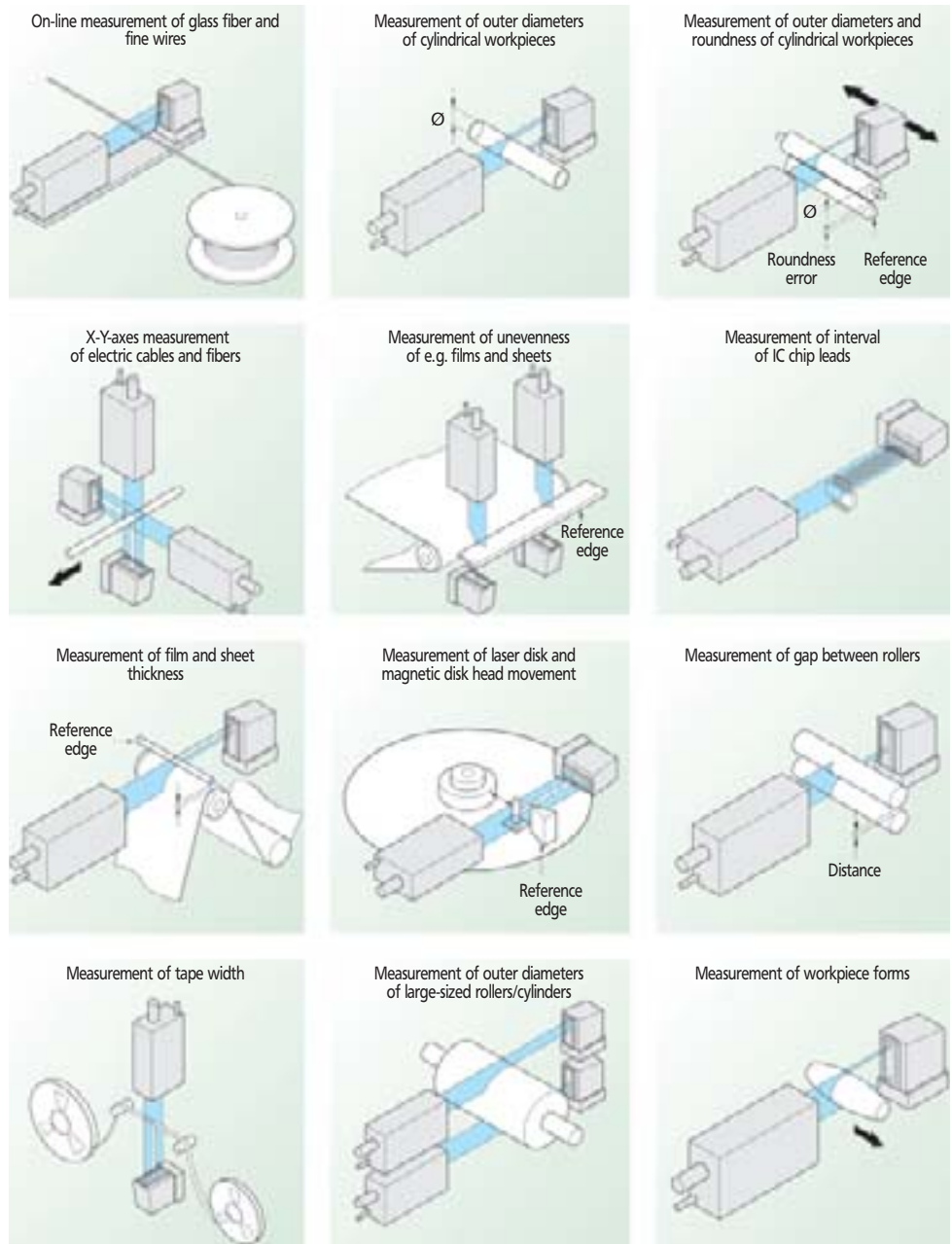
Pages 345–346



Pages 347–348

Laser Scan Micrometer – Sample Application –

Series 544



Laser Scan Micrometer – Application –

The Laser wave measuring instrument is provided with the Mitutoyo Laser measuring systems LSM-503 or LSM-506. Length measurement is executed by a Mitutoyo glass scale. Longitudinal and rotation axis are motor driven. The measuring program enables an easy creation of learning programs by means of the detected part contour. All outside dimensions relevant for lathe works as diameter, distances, runs or approach angle are easily measurable. The stored measuring programs can be repeated in the CNC run. The measuring results can be stored and evaluated statistically by the Mitutoyo analysis software Statpak-WIN.

Series 544

Laser Wave Measuring Instrument



544-032

Specifications

Repeatability for diameter measurement: 1 μm
 Repeatability for distance measurements: 10 μm

Laser Scan Micrometer Measuring Unit



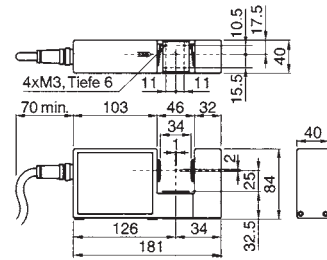
Specifications

Appropriate display unit
for LSM-500 H = LSM-5100 / LSM-6100
see page 347

Series 544 LSM-500 H



544-453



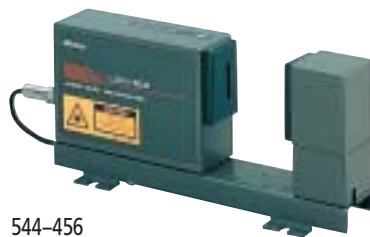
No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-553*	LSM-500 H	Visible (650 nm)	IEC Class 2	0,005-2 mm	0,01 μm-10 μm

* Protection IP-64

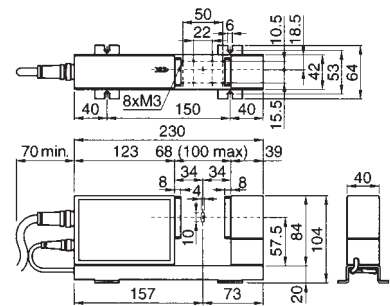
Specifications

Appropriate display unit
for LSM-501 H = LSM-5100 / LSM-6100
see page 347

Series 544 LSM-501 H



544-456



No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-556*	LSM-501 H	Visible (650 nm)	IEC Class 2	0,05-10 mm	0,01 μm-10 μm

* Protection IP-64

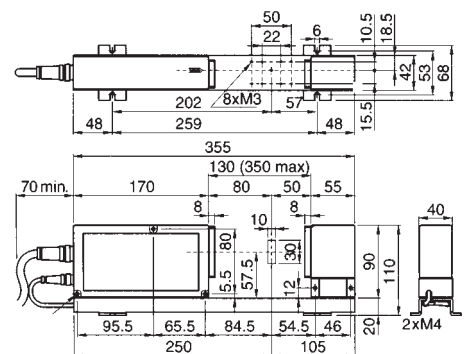
Specifications

Appropriate display unit
for LSM-503 H = LSM-5100 / LSM-6100
see page 347

Series 544 LSM-503 H



544-459



No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-559*	LSM-503 H	Visible (650 nm)	IEC Class 2	0,3-30 mm	0,02 μm-100 μm

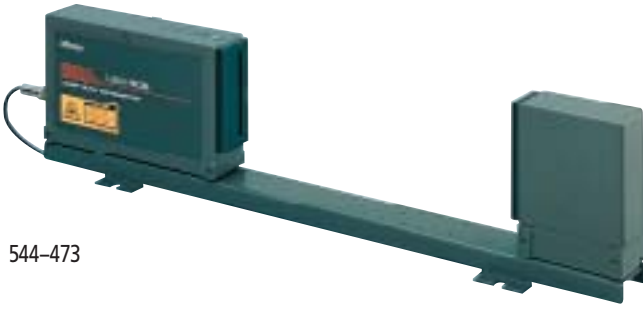
* Protection IP-64

Detailed information on these and other products can be found in the product brochures which you can request on the Internet at www.mitutoyo.de or tel: +49 (0)2137-102-0 and fax: +49 (0)2137-8685.

Laser Scan Micrometer Measuring Unit

Series 544

LSM-506 H



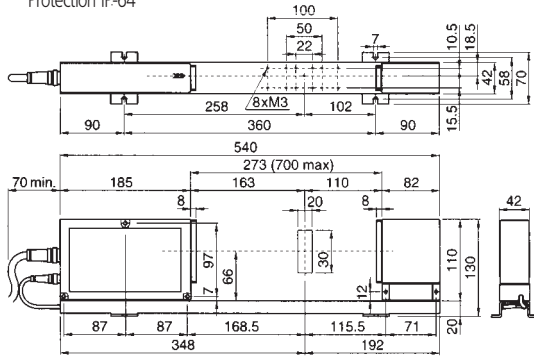
544-473

Specifications

Appropriate display unit
for LSM-506 H = LSM-5100 / LSM-6100
see page 347

No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-573*	LSM-506 H	Visible (650 nm)	IEC Class 2	1-60 mm	0,05 μm-100 μm

* Protection IP-64



Series 544

LSM-512 H



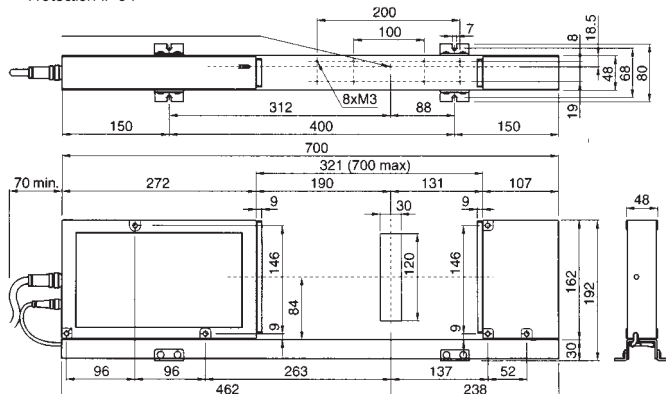
544-476

Specifications

Appropriate display unit
for LSM-512 H = LSM-5100 / LSM-6100
see page 347

No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-576*	LSM-512 H	Visible (650 nm)	IEC Class 2	1-120 mm	0,1 μm-100 μm

* Protection IP-64



Detailed information on these and other products can be found in the product brochures which you can request on the Internet at www.mitutoyo.de or tel: +49 (0) 2137-102-0 and fax: +49 (0) 2137-8685.

Laser Scan Micrometer LSM-9506

Series 544

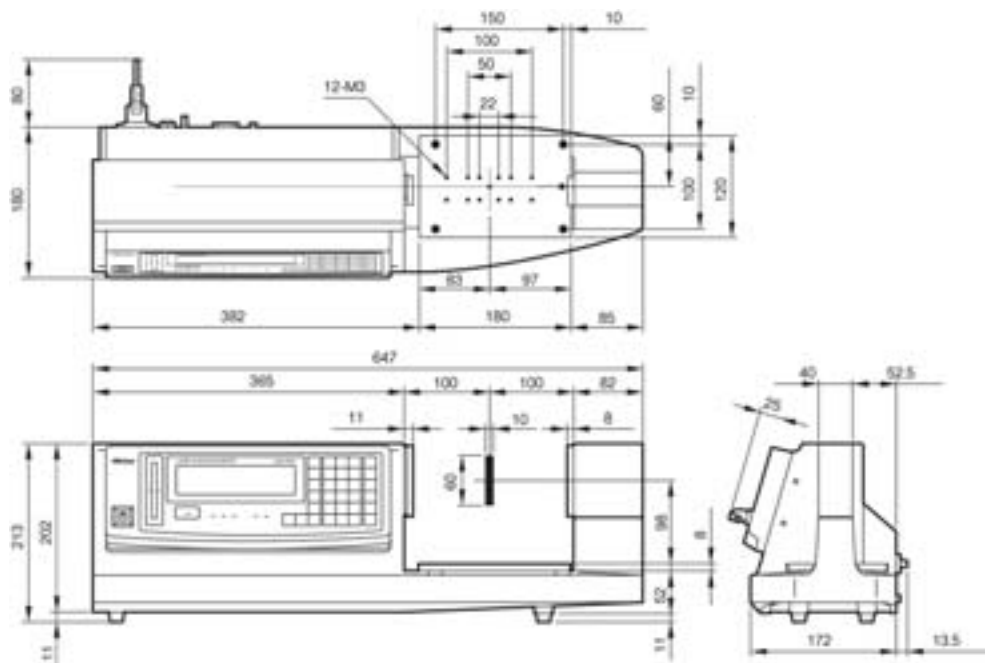
incl. Counter

Sending and receiving unit can not be separated



544-115

No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-115	LSM-9506	Visible (670 nm)	IEC Class 2	0,5-60 mm	0,01 μm -100 μm



Detailed information on these and other products can be found in the product brochures which you can request on the Internet at www.mitutoyo.de or tel: +49 (0)2137-102-0 and fax: +49 (0)2137-8685.

Laser Scan Micrometer LSM-902

Laser scan micrometer with a measuring range of 25 mm.

One of the most accurate laser scan micrometers currently available in its class.

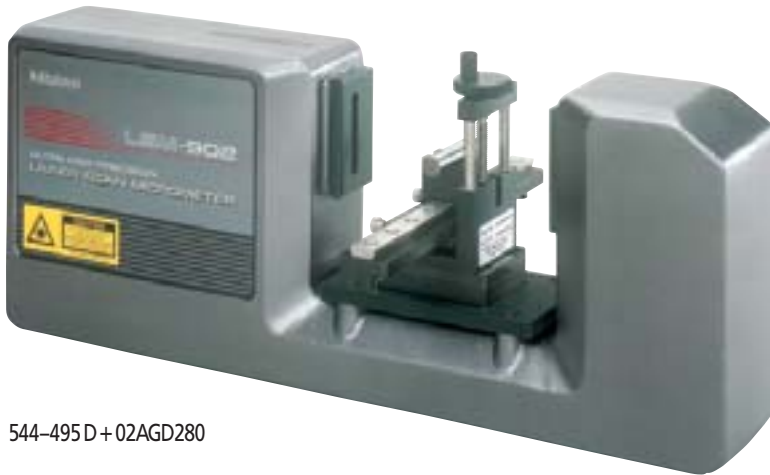
Due to good reproducibility when measuring test gauges, limit plug gauges, roller bearings, shafts and other precise workpieces, the user will be guaranteed satisfaction.

A newly developed laser diode reduces error that may be caused by temperature influences.

A combination of sophisticated lenses and the use of a special compensation method reduces linearity and positional error.

Series 544

incl. Counter LSM-6900 High clock-pulse rate



544-495 D + 02AGD280

No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution
544-495 D	LSM-902 + LSM-6900	Visible (650 nm)	IEC Class 2	0,1-25 mm	0,01 μm

Series 544

LSM-6900

Desktop type (only useable for LSM-902)



LSM-6900

Specifications

Repeatability (2σ): $\pm 0,05 \mu\text{m}$

Linearity

(entire measuring range): $\pm 0,5 \mu\text{m}$

Linearity

(short measuring range): $\pm (0,3 + 0,1\Delta D) \mu\text{m}^*1$

Width of laser beam: $40 \mu\text{m}$

Number of Scans: 800 Scans / second

Measuring field: $\pm 1,5 \text{ mm} \times 25 \text{ mm}$

* 1 diameter difference with the master workpiece

Laser Scan Micrometer Display Unit

Specifications

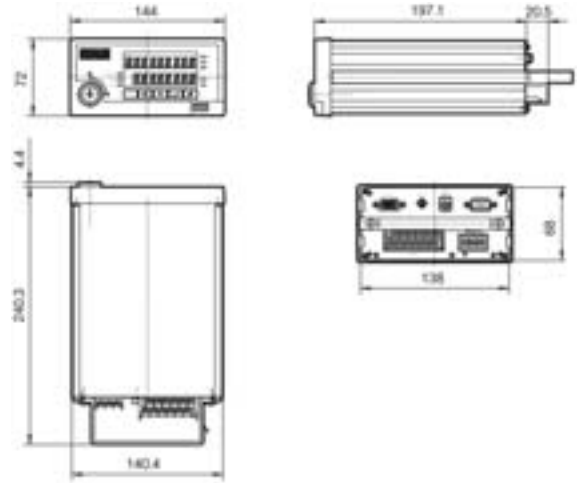
No. 544-039 LSM-5100
 Power supply: + 24 V AC/DC
 Interface / data output: RS-232 C
 I/O
 analogue

Series 544

LSM-5100
 Built-in type



544-039



Specifications

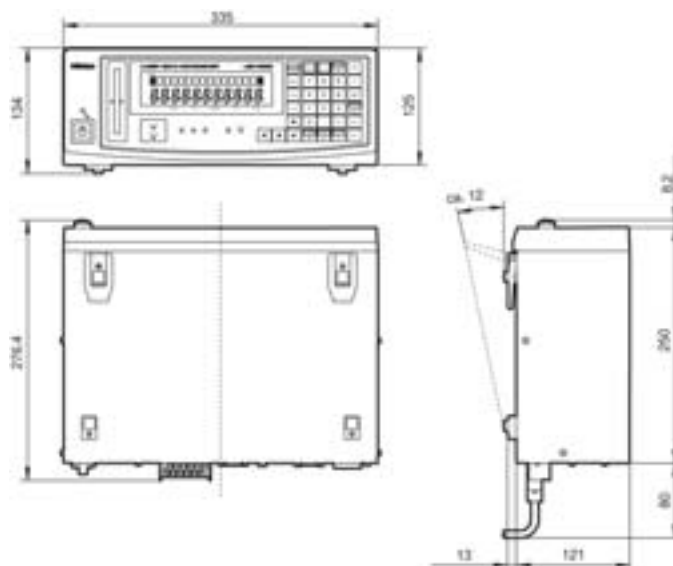
No. 544-069 D LSM-6100
 Power supply: via mains connection
 230 V
 Interface / data output: RS-232 C
 I/O
 analogue

Series 544

LSM-6100
 Desktop type



544-069 D






Detailed information on these and other products can be found in the product brochures which you can request on the Internet at www.mitutoyo.de or tel: +49 (0) 2137-102-0 and fax: +49 (0) 2137-8685.

Laser Scan Micrometer

Function Comparison Chart for Counters

Series 544

	LSM-5100 Built-in type	LSM-6900 LSM-6100 Multifunction type	LSM-9506 Compact type
Functions			
Segment selection (seg. 1 – seg. 7)	●	●	●
Edge selection (1–255 positions)	●	●	●
Arithmetical mean (1–2048 scans)	●	●	●
Mean value displacement (32–2048 scans)	●	●	●
Memory function for measuring conditions (progr. 0 – progr. 9)	—	●	●
GOOD/± NG judgement	●	●	●
Multi tolerance selection (1–6)	—	●	●
Group judgement	—	●	●
GOOD/± NG and analog output signal in standby mode	●	●	—
ZERO setting	●	●	●
Offset function	●	●	●
Setting of reference values	●	●	●
Mastering	●	●	●
Elimination of abnormal data	●	●	●
Automatic workpiece determination	●	●	●
Random sampling (sample 2–999)	●	●	●
Statistical processing (MAX, MIN, range, mean, σ)	□	●	●
Data output interval (1 s – 999 s)	●	●	●
Automatic measurement with edge detection	●	●	●
Measurement of transparent workpieces (seg. 1 – seg. 3)	●	●	●
Simultaneous (DUAL) measurement	—	●	●
Measurement of ultra fine wires (with LSM-500 H)	●	●	—
Measurement with two measuring instruments	—	●	—
Display of workpiece position	●	●	●
Locking button function	●	●	●
Double calibration (HIGH and LOW)	●	●	●
Determination of the model number	●	●	—
Resolution selection	●	●	●
Switching mm/inch	●	●	●
Thousands display by decimal point/comma	●	●	●
Selection of digits after decimal point	●	●	●
Monitoring of laser force	●	●	●
Scanning control signal connector	●	●	●
Remote control	●	●	●
SPC (Digimatic) output	—	▲	●
RS-232 C Interface	●	●	●
I/O Interface	●	●	—
Analog Signal output	●	●	—
2. I/O Interface with analog connection	—	▲	—
BCD Interface	—	▲	—
GP-IB Interface	—	▲	—
Footswitch	—	▲	▲
Thermal printer	▲	▲	▲
Dual Unit	—	▲	—

● Standard accessory

▲ Optional accessory

— not included

□ only if an external PC is connected via RS-232 C Interface

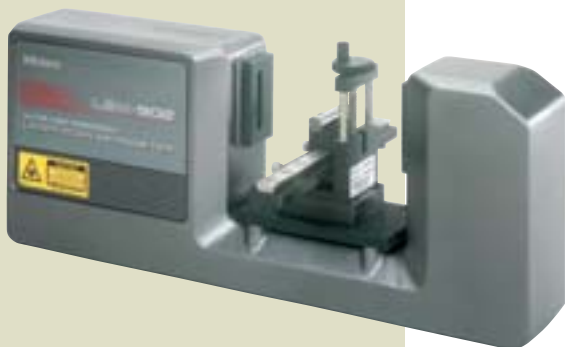
Laser Scan Micrometer Optional Accessory

Series 544

	Order No.	Designation	For application with:
	02AGD110	Calibration set Ø 0,1 mm, Ø 2 mm	LSM-500(H)
	02AGD120	Calibration set Ø 0,1 mm, Ø 10 mm	LSM-501(H)
	02AGD130	Calibration set Ø 1,0 mm, Ø 30 mm	LSM-503(H)
	02AGD140	Calibration set Ø 1,0 mm, Ø 60 mm	LSM-506(H)
	02AGD150	Calibration set Ø 20 mm, Ø 120 mm	LSM-512(H)
	02AGD170	Calibration set Ø 1,0 mm, Ø 60 mm	LSM-9506
	02AGK400	Additional for dual application	LSM-6900/6100
	02AGC840	Digimatic output	LSM-6900/6100
	02AGC880	Additional I/O & analog interface	LSM-6900/6100
	02AGC910	BCD interface	LSM-6900/6100
	02AGC940	GP-IB interface	LSM-6900/6100
	02AGC330A	Output signal cable (5 m)	All LSM models
	02AGC330B	Output signal cable (10 m)	All LSM models
	02AGC150A	Add. connecting cable (1 m)	All LSM models*
	02AGC150B	Add. connecting cable (3 m)	All LSM models*
	02AGC150C	Add. connecting cable (5 m)	All LSM models*
	936937	SPC signal cable (1 m)	LSM-6900/6100 / LSM-9506
	02AGD400	Adjustable workstage	LSM-501(H)
	02AGD490	Adjustable workstage	LSM-503(H)
	02AGD520	Adjustable workstage	LSM-506(H)
	02AGD680	Adjustable workstage	LSM-9506
	02AGD270	Workstage	LSM-902
	02AGD280	Adjustable workstage	LSM-902
	02AGD440	Center support	LSM-501(H) / 503(H)
	02AGD580	Center support	LSM-506(H) / 9506
	02AGD450	Adjustable V-Block	LSM-501(H) / 503(H)
	02AGD590	Adjustable V-Block	LSM-506(H) / 9506
	02AGD200	Wire guide pulley	LSM-500(H)
	02AGD210	Wire guide pulley	LSM-501(H)
	02AGD220	Air blow cover	LSM-500(H)
	02AGD230	Air blow cover/richtung	LSM-501(H)
	02AGD240	Air blow cover	LSM-503(H)
	02AGD250	Air blow cover	LSM-506(H)
	02AGD260	Air blow cover	LSM-512(H)
	957608	Air filter	All LSM models
	02AGD600C	Thermal printer	All LSM models

* except LSM-500/-500 N

PRODUCT NEWS



Laser Scan Micrometer LSM-902

Measuring range: 0,1–25 mm

Series 544

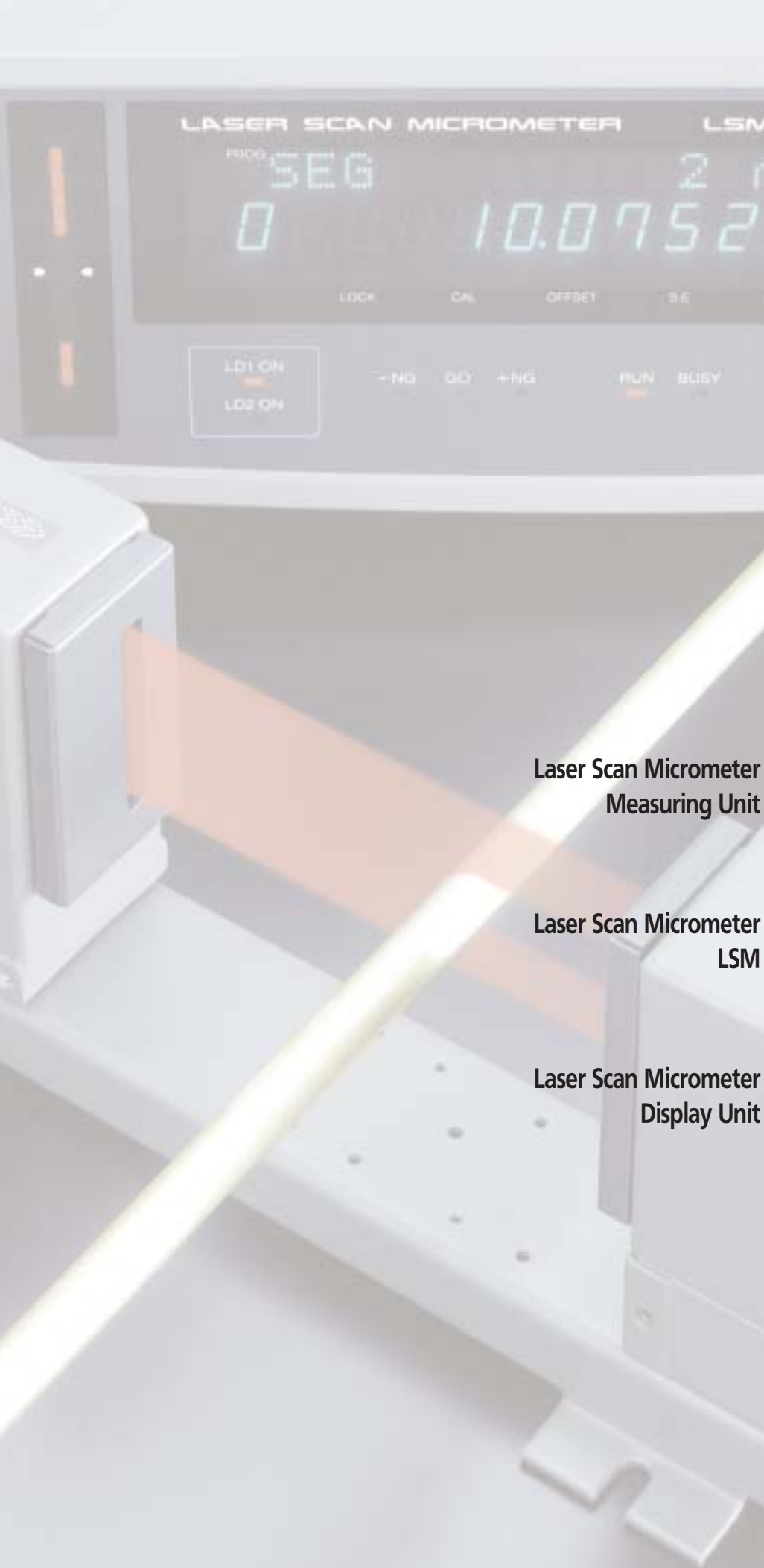
Detailed information on page 346.



Desktop type LSM-6900

Series 544

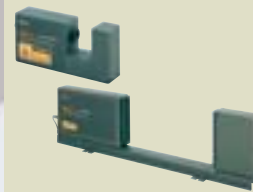
Detailed information on page 346.



Laser Scan Micrometer
Measuring Unit

Laser Scan Micrometer
LSM

Laser Scan Micrometer
Display Unit



Pages 343–344



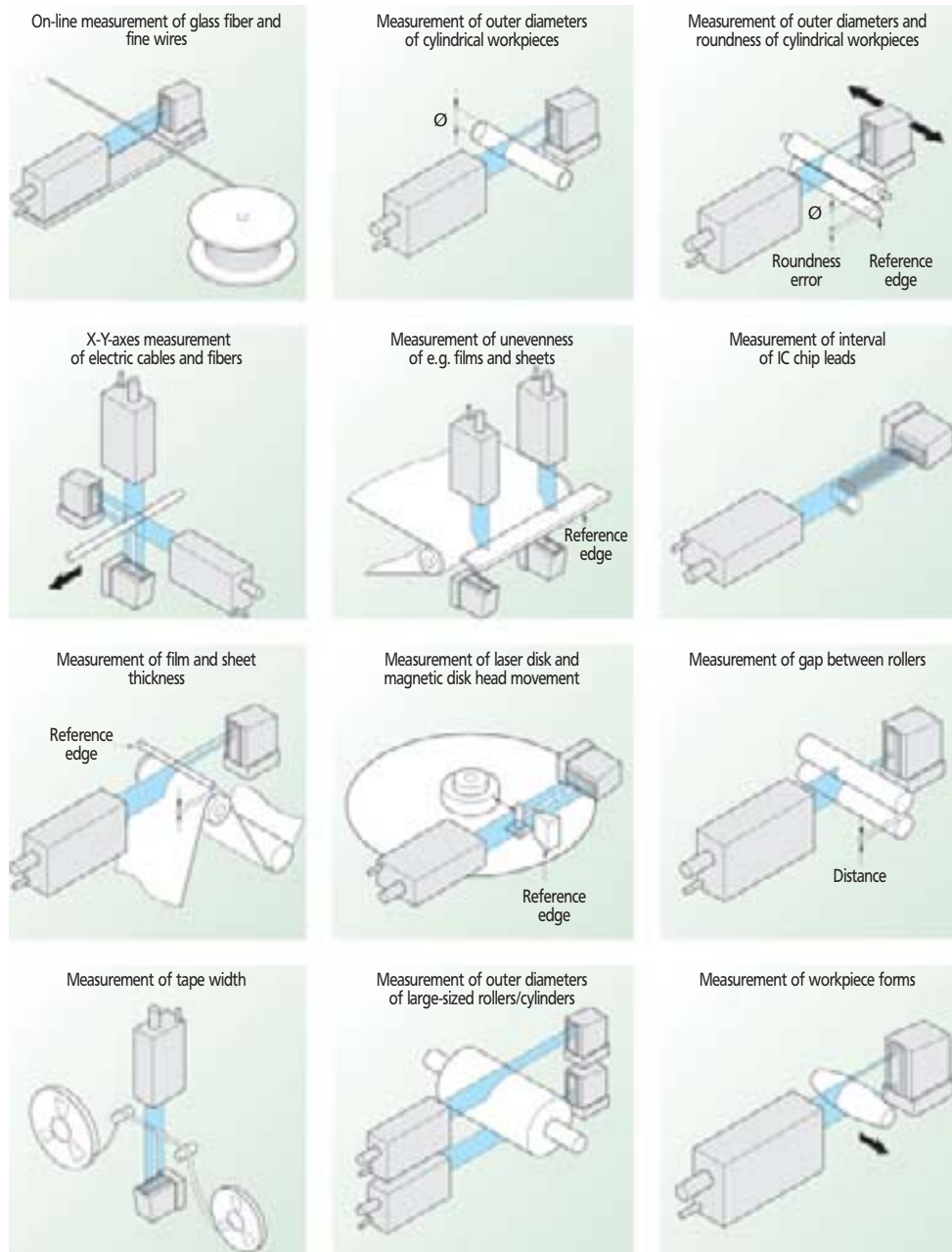
Pages 345–346



Pages 347–348

Laser Scan Micrometer – Sample Application –

Series 544



Laser Scan Micrometer – Application –

The Laser wave measuring instrument is provided with the Mitutoyo Laser measuring systems LSM-503 or LSM-506. Length measurement is executed by a Mitutoyo glass scale. Longitudinal and rotation axis are motor driven. The measuring program enables an easy creation of learning programs by means of the detected part contour. All outside dimensions relevant for lathe works as diameter, distances, runs or approach angle are easily measurable. The stored measuring programs can be repeated in the CNC run. The measuring results can be stored and evaluated statistically by the Mitutoyo analysis software Statpak-WIN.

Series 544

Laser Wave Measuring Instrument



544-032

Specifications

Repeatability for diameter measurement: 1 μm
 Repeatability for distance measurements: 10 μm

Laser Scan Micrometer Measuring Unit



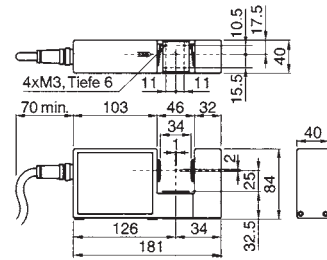
Specifications

Appropriate display unit
for LSM-500 H = LSM-5100 / LSM-6100
see page 347

Series 544 LSM-500 H



544-453



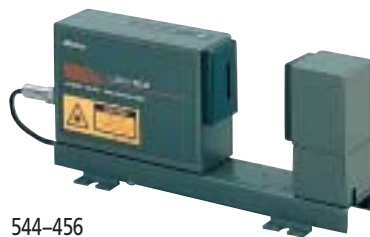
No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-553*	LSM-500 H	Visible (650 nm)	IEC Class 2	0,005-2 mm	0,01 μm-10 μm

* Protection IP-64

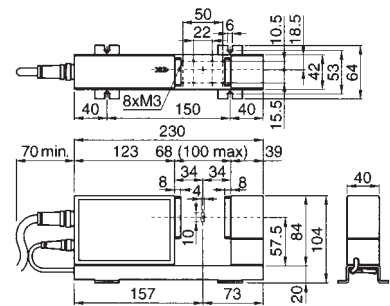
Specifications

Appropriate display unit
for LSM-501 H = LSM-5100 / LSM-6100
see page 347

Series 544 LSM-501 H



544-456



No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-556*	LSM-501 H	Visible (650 nm)	IEC Class 2	0,05-10 mm	0,01 μm-10 μm

* Protection IP-64

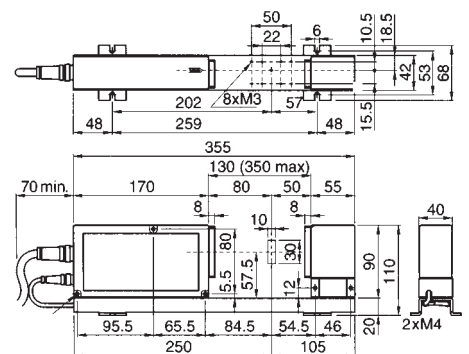
Specifications

Appropriate display unit
for LSM-503 H = LSM-5100 / LSM-6100
see page 347

Series 544 LSM-503 H



544-459



No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-559*	LSM-503 H	Visible (650 nm)	IEC Class 2	0,3-30 mm	0,02 μm-100 μm

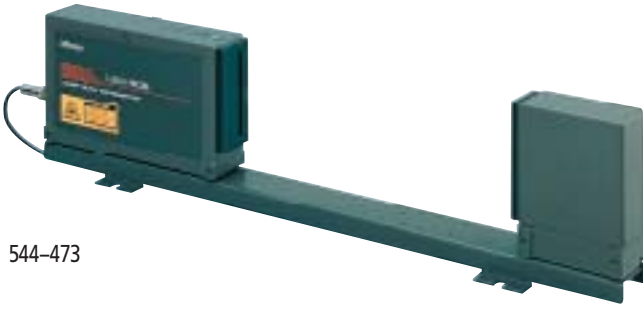
* Protection IP-64

Detailed information on these and other products can be found in the product brochures which you can request on the Internet at www.mitutoyo.de or tel: +49 (0)2137-102-0 and fax: +49 (0)2137-8685.

Laser Scan Micrometer Measuring Unit

Series 544

LSM-506 H



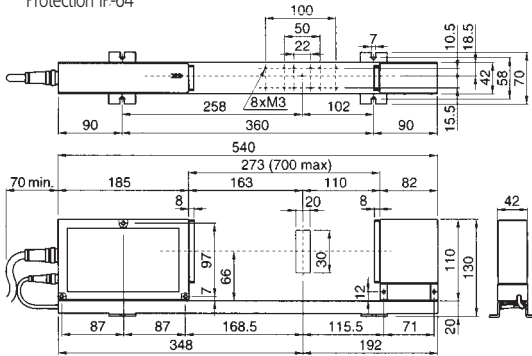
544-473

Specifications

Appropriate display unit
for LSM-506 H = LSM-5100 / LSM-6100
see page 347

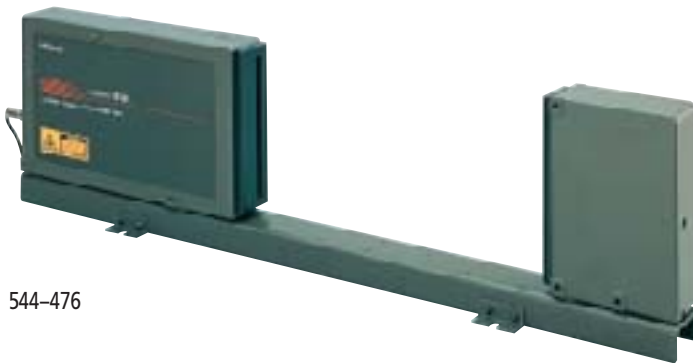
No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-573*	LSM-506 H	Visible (650 nm)	IEC Class 2	1-60 mm	0,05 μm-100 μm

* Protection IP-64



Series 544

LSM-512 H



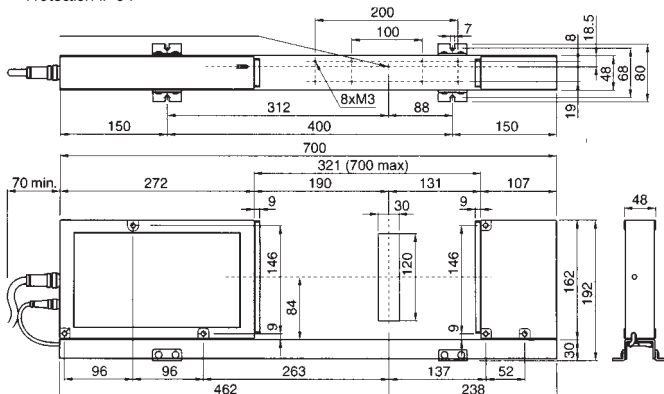
544-476

Specifications

Appropriate display unit
for LSM-512 H = LSM-5100 / LSM-6100
see page 347

No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-576*	LSM-512 H	Visible (650 nm)	IEC Class 2	1-120 mm	0,1 μm-100 μm

* Protection IP-64



Detailed information on these and other products can be found in the product brochures which you can request on the Internet at www.mitutoyo.de or tel: +49 (0) 2137-102-0 and fax: +49 (0) 2137-8685.

Laser Scan Micrometer LSM-9506

Series 544

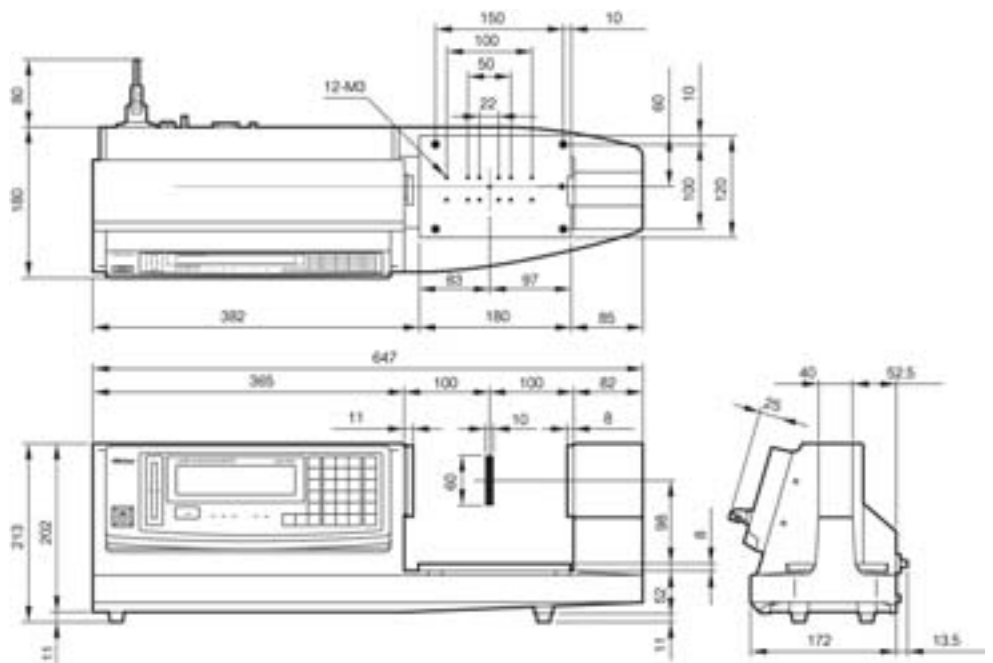
incl. Counter

Sending and receiving unit can not be separated



544-115

No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution (selectable)
544-115	LSM-9506	Visible (670 nm)	IEC Class 2	0,5-60 mm	0,01 μm-100 μm



Detailed information on these and other products can be found in the product brochures which you can request on the Internet at www.mitutoyo.de or tel: +49 (0) 2137-102-0 and fax: +49 (0) 2137-8685.

Laser Scan Micrometer LSM-902

Laser scan micrometer with a measuring range of 25 mm.

One of the most accurate laser scan micrometers currently available in its class.

Due to good reproducibility when measuring test gauges, limit plug gauges, roller bearings, shafts and other precise workpieces, the user will be guaranteed satisfaction.

A newly developed laser diode reduces error that may be caused by temperature influences.

A combination of sophisticated lenses and the use of a special compensation method reduces linearity and positional error.

Series 544

incl. Counter LSM-6900 High clock-pulse rate



544-495 D + 02AGD280

No.	Model	Type of Laser	Protection Standard	Measuring range	Resolution
544-495 D	LSM-902 + LSM-6900	Visible (650 nm)	IEC Class 2	0,1-25 mm	0,01 μm

Series 544

LSM-6900

Desktop type (only useable for LSM-902)



LSM-6900

Specifications

Repeatability (2σ): $\pm 0,05 \mu\text{m}$

Linearity

(entire measuring range): $\pm 0,5 \mu\text{m}$

Linearity

(short measuring range): $\pm (0,3 + 0,1\Delta D) \mu\text{m}^*1$

Width of laser beam: $40 \mu\text{m}$

Number of Scans: 800 Scans / second

Measuring field: $\pm 1,5 \text{ mm} \times 25 \text{ mm}$

* 1 diameter difference with the master workpiece

Laser Scan Micrometer Display Unit

Specifications

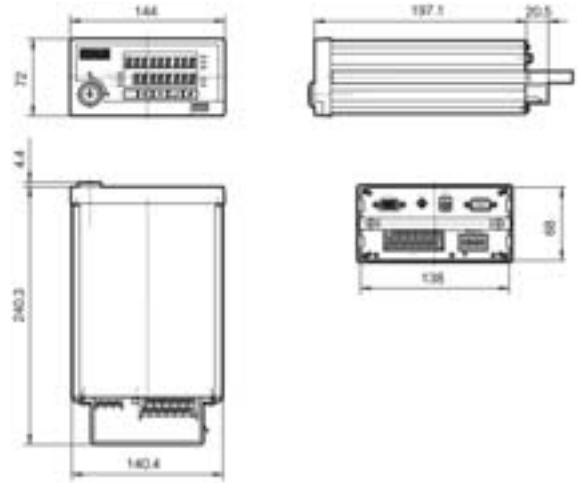
No. 544-039 LSM-5100
 Power supply: + 24 V AC/DC
 Interface / data output: RS-232 C
 I/O
 analogue

Series 544

LSM-5100
 Built-in type



544-039



Specifications

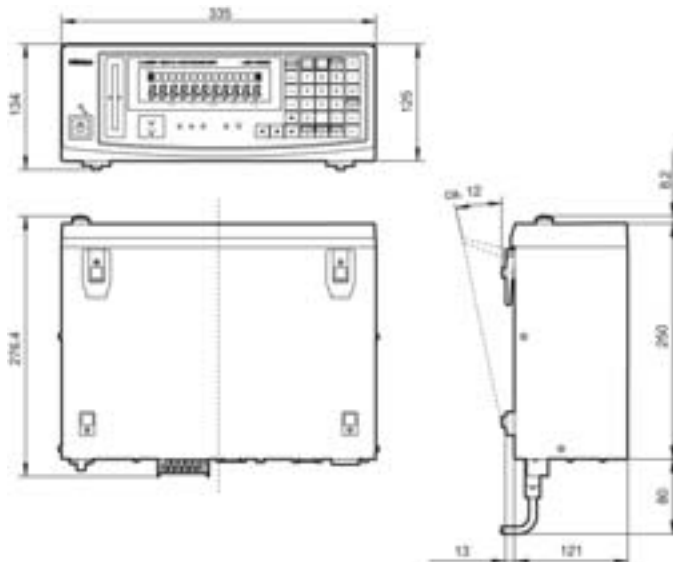
No. 544-069 D LSM-6100
 Power supply: via mains connection
 230 V
 Interface / data output: RS-232 C
 I/O
 analogue

Series 544

LSM-6100
 Desktop type



544-069 D






Detailed information on these and other products can be found in the product brochures which you can request on the Internet at www.mitutoyo.de or tel: +49 (0)2137-102-0 and fax: +49 (0)2137-8685.

Laser Scan Micrometer

Function Comparison Chart for Counters

Series 544

	LSM-5100 Built-in type	LSM-6900 LSM-6100 Multifunction type	LSM-9506 Compact type
Functions			
Segment selection (seg. 1 – seg. 7)	●	●	●
Edge selection (1–255 positions)	●	●	●
Arithmetical mean (1–2048 scans)	●	●	●
Mean value displacement (32–2048 scans)	●	●	●
Memory function for measuring conditions (progr. 0 – progr. 9)	—	●	●
GOOD/± NG judgement	●	●	●
Multi tolerance selection (1–6)	—	●	●
Group judgement	—	●	●
GOOD/± NG and analog output signal in standby mode	●	●	—
ZERO setting	●	●	●
Offset function	●	●	●
Setting of reference values	●	●	●
Mastering	●	●	●
Elimination of abnormal data	●	●	●
Automatic workpiece determination	●	●	●
Random sampling (sample 2–999)	●	●	●
Statistical processing (MAX, MIN, range, mean, σ)	□	●	●
Data output interval (1 s – 999 s)	●	●	●
Automatic measurement with edge detection	●	●	●
Measurement of transparent workpieces (seg. 1 – seg. 3)	●	●	●
Simultaneous (DUAL) measurement	—	●	●
Measurement of ultra fine wires (with LSM-500 H)	●	●	—
Measurement with two measuring instruments	—	●	—
Display of workpiece position	●	●	●
Locking button function	●	●	●
Double calibration (HIGH and LOW)	●	●	●
Determination of the model number	●	●	—
Resolution selection	●	●	●
Switching mm/inch	●	●	●
Thousands display by decimal point/comma	●	●	●
Selection of digits after decimal point	●	●	●
Monitoring of laser force	●	●	●
Scanning control signal connector	●	●	●
Remote control	●	●	●
SPC (Digimatic) output	—	▲	●
RS-232 C Interface	●	●	●
I/O Interface	●	●	—
Analog Signal output	●	●	—
2. I/O Interface with analog connection	—	▲	—
BCD Interface	—	▲	—
GP-IB Interface	—	▲	—
Footswitch	—	▲	▲
Thermal printer	▲	▲	▲
Dual Unit	—	▲	—

● Standard accessory

▲ Optional accessory

— not included

□ only if an external PC is connected via RS-232 C Interface

Laser Scan Micrometer Optional Accessory

Series 544

	Order No.	Designation	For application with:
	02AGD110	Calibration set Ø 0,1 mm, Ø 2 mm	LSM-500(H)
	02AGD120	Calibration set Ø 0,1 mm, Ø 10 mm	LSM-501(H)
	02AGD130	Calibration set Ø 1,0 mm, Ø 30 mm	LSM-503(H)
	02AGD140	Calibration set Ø 1,0 mm, Ø 60 mm	LSM-506(H)
	02AGD150	Calibration set Ø 20 mm, Ø 120 mm	LSM-512(H)
	02AGD170	Calibration set Ø 1,0 mm, Ø 60 mm	LSM-9506
	02AGK400	Additional for dual application	LSM-6900/6100
	02AGC840	Digimatic output	LSM-6900/6100
	02AGC880	Additional I/O & analog interface	LSM-6900/6100
	02AGC910	BCD interface	LSM-6900/6100
	02AGC940	GP-IB interface	LSM-6900/6100
	02AGC330A	Output signal cable (5 m)	All LSM models
	02AGC330B	Output signal cable (10 m)	All LSM models
	02AGC150A	Add. connecting cable (1 m)	All LSM models*
	02AGC150B	Add. connecting cable (3 m)	All LSM models*
	02AGC150C	Add. connecting cable (5 m)	All LSM models*
	936937	SPC signal cable (1 m)	LSM-6900/6100 / LSM-9506
	02AGD400	Adjustable workstage	LSM-501(H)
	02AGD490	Adjustable workstage	LSM-503(H)
	02AGD520	Adjustable workstage	LSM-506(H)
	02AGD680	Adjustable workstage	LSM-9506
	02AGD270	Workstage	LSM-902
	02AGD280	Adjustable workstage	LSM-902
	02AGD440	Center support	LSM-501(H) / 503(H)
	02AGD580	Center support	LSM-506(H) / 9506
	02AGD450	Adjustable V-Block	LSM-501(H) / 503(H)
	02AGD590	Adjustable V-Block	LSM-506(H) / 9506
	02AGD200	Wire guide pulley	LSM-500(H)
	02AGD210	Wire guide pulley	LSM-501(H)
	02AGD220	Air blow cover	LSM-500(H)
	02AGD230	Air blow cover/richtung	LSM-501(H)
	02AGD240	Air blow cover	LSM-503(H)
	02AGD250	Air blow cover	LSM-506(H)
	02AGD260	Air blow cover	LSM-512(H)
	957608	Air filter	All LSM models
	02AGD600C	Thermal printer	All LSM models

* except LSM-500/-500 N



Surface measuring instruments "SURFTEST"

SJ-201 P
SJ-301
SJ-401 / SJ-402
SV-2000
SV-3000
SV-3000 3D



Pages 352–361

Contour measuring instruments "CONTRACER"

CV-1000 / 2000
CV-3000 / 4000



Pages 362–363

Form measuring instruments "ROUNDTTEST"

RA-114 / RA-116
RA-1500
RA-2100
RA-H 5100



Pages 364–366

CNC surface, form and contour measurers

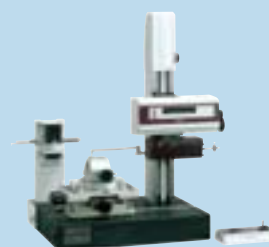
„Surftest SV-3000 CNC“
„Contracer CV-3000 CNC“
„Roundtest RA-2100 CNC“
„Roundtest RA-H 5100 CNC“
„Formtracer SV-C 3000 CNC“
„Formtracer CS-5000 CNC“



Pages 367–369

Combined surface and contour measurer

"FORMTRACER"
SV-C 3000/4000
CS-3000
CS-5000



Page 369

Surface Roughness Tester "Surftest SJ-201 P"

- The portable surface roughness tester "Surftest SJ-201 P" has been designed for fast and easy testing of surface roughness parameters.
- In order to perform a multitude of different measuring tasks a large selection of probes and nosepieces are available.
- The drive unit can be separated from the main measuring unit allowing for measurements in hard to reach narrow spaces, too.
- The SJ-201 P may be operated on AC/DC as well as anywhere on the shop floor independent of stationary power supply on battery.
- The SJ-201 P features RS-232 C interface and DIGIMATIC port as standard equipment. The roughness data collected may therefore be processed immediately with or without external PC and other Mitutoyo hardware. Interfaces and operating panel can be safely locked away under protective coverings when the SJ-201 P is not in use.
- The Auto-Sleep function starts saving battery power after 30 seconds without panel activity.

Series 178



178-930-2 D



Optional accessory

No. 178-420 D External printer



Model	No.	Type
SJ-201 P	178-930-2 D	Basic model
SJ-201 S	178-899-2 D	Transversal scanning see page 356
SJ-201 R	178-995 D	Front lift model (motorised lifting and lowering of the detector)

Note:

The feed units SJ-201 P and SJ-201 S are compatible with one another.



Keyboard (protective covering opened)



Rear view

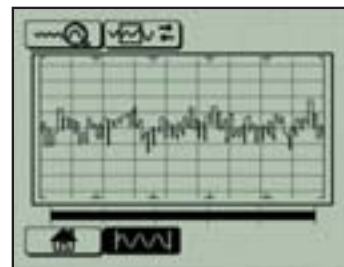
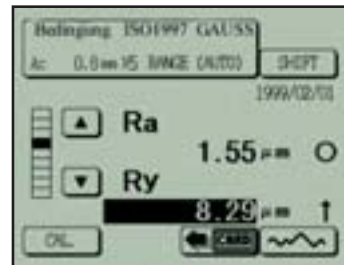
Surface Roughness Tester "Surftest SJ-301"

- Portable Surface Roughness Tester featuring dustprotected, touch-sensitive operation panel and integrated printer.
- The large LCD-window makes it easy to read measurement result and analysis graphs at a glance.
- The profile speed thermal printer prints out clear and fast.
- Designed to increase operability – the large keypads are used for measuring operations, while the touch panel LCD (special operating pen included) is used for setting various measuring conditions.
- Five different measuring conditions can be stored by the SJ-301.
- Measurement data may be downloaded to an external PC.
- Adheres to international standards: DIN, ISO, ANSI and JIS.
- Measurement data may be stored immediately and evaluated at a later point in time and/or printed.
- An optional memory card is available for storing up to 20 sets of measurement conditions, measuring and statistic data.

Series 178

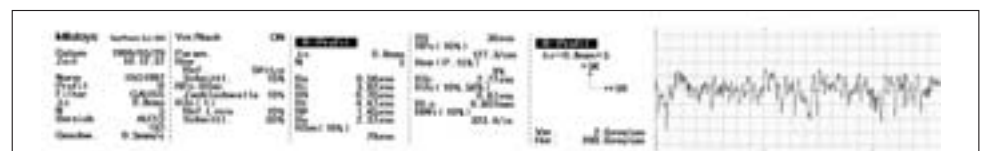
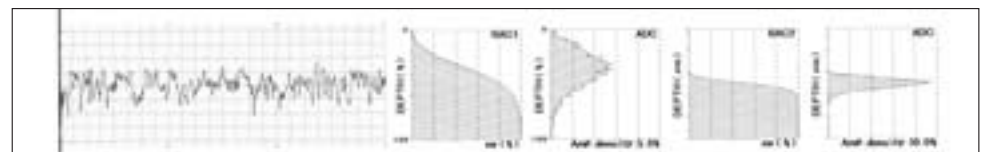


178-952-3 D



Model	No.	Type
SJ-301	178-952-3 D	Basic model
SJ-301 S	178-939-2 D	Transversal scanning see page 357
SJ-301 R	178-990 D	Front lift model (motorised lifting and lowering of the detector)

Note:
The feed units are compatible with one another.



Surface Roughness Tester

"Surftest SJ-201 P" "Surftest SJ-301"

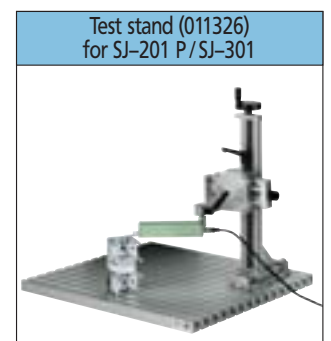
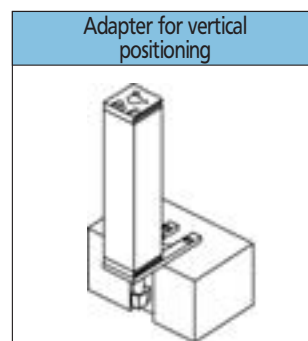
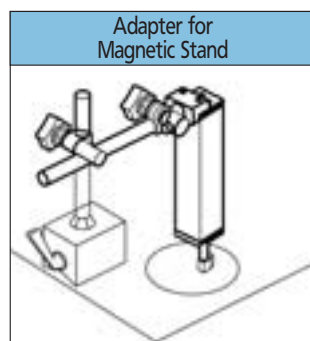
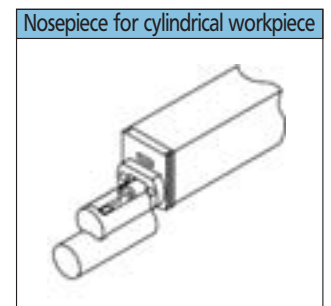
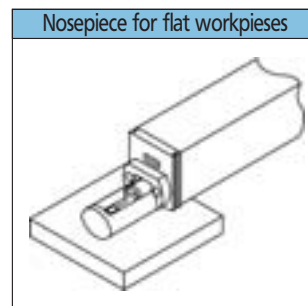
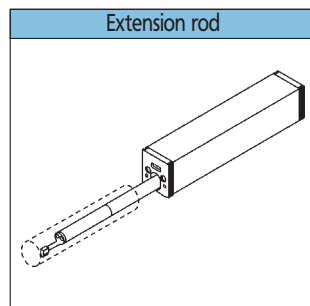
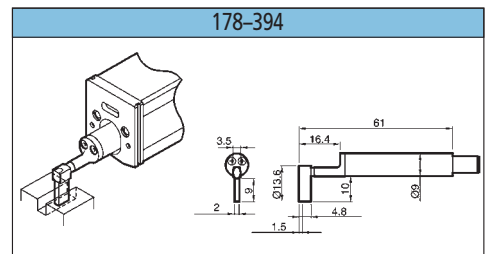
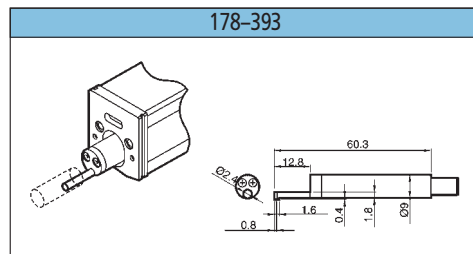
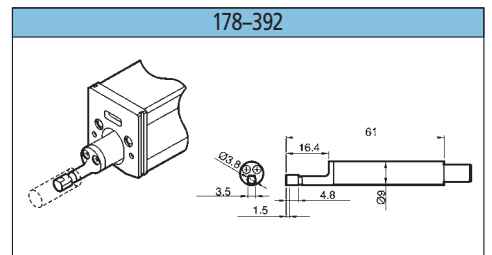
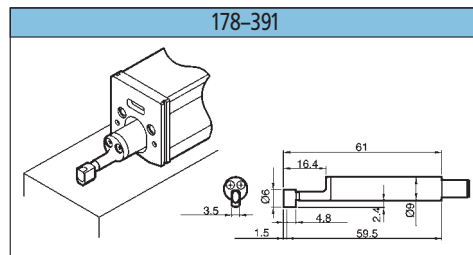
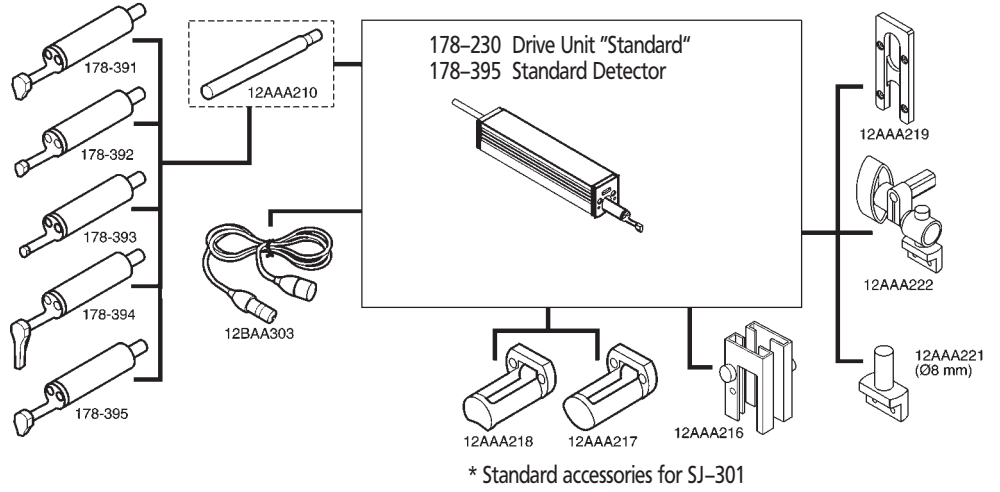
Series 178

Specifications

Model No.	SJ-201 P 178-930-2 D	SJ-301 178-952-3 D
Measuring Range	350 μm	
Z-Axis	12,5 mm	
X-Axis		
Drive Unit		
Speed	Measuring: 0,25 mm/s; 0,5 mm/s Returning: 0,8 mm/s	Measuring: 0,25 mm/s; 0,5 mm/s Returning: 1,0 mm/s
Cable Length	1 m	
Mass	190 g	
Standard Probe (178-395)		
Measuring Method	Induction method	
Measuring Range	350 μm	
Stylus	Diamond Tip	
Radius	2 μm	
Radius Nosepiece	40 mm	
Measuring Force	0,75 mN	
Mass	18 g	
Display Unit		
Profiles	Primary Profile (P), Roughness Profile (R), DIN 4776	Primary Profile (P), Roughness Profile (R), DIN 4776, MOTIF
Parameters	Ra, Ry, Rz, Rt, Rp, Sm, S, Pc, R3z, mr A1, A2, Rq, Rk, Rpk, Rvk, Mr 1, Mr 2, Vo	Ra, Ry, Rz, Rt, Rp, Rq, Rv, Sm, S, Pc, R3z, mr, Rpk, Rvk, δc , Rk, Mr 1, Mr 2, Lo, Ppi, R, AR, Rx, A1, A2
Analysis Graphs	–	BAC 1, BAC 2, ADC
Roughness Standards	DIN, ISO, ANSI, ISO	DIN, ISO, ANSI, JIS
Measuring Length (L)	0,25 mm, 0,8 mm, 2,5 mm	0,08 mm, 0,25 mm, 0,8 mm, 2,5 mm, 8 mm oder Eingabe
Cut-off-Length	λc : 0,25 mm, 0,8 mm, 2,5 mm λs : 2,5 μm , 8 μm	λc : 0,08 mm, 0,25 mm, 0,8 mm, 2,5 mm, 8 mm λs : 2,5 μm , 8 μm , 25 μm
Sampling Length	x 1, x 3, x 5, x L	
Filter	2CR-75%, 2CR-75% (phase corrected), Gauß	2RC-75%, 2RC-75% (phase corrected), Gauß-50%
Display Range	Ra, Rq: 0,01 μm ~ 100 μm Ry, Rz, Rt, R3z, Rvk, Rpk, Rk, Rp: 0,02 μm ~ 350 μm Vo: 0,000 ~ 10,00 (mm^3/cm^2) S, Sm: 2 μm ~ 4000 μm Pc: 2,5/cm ~ 5000/cm Mr 1, Mr 2: 0 ~ 100% mr: 1 ~ 100%	Ra, Rq: 0,01 μm ~ 100 μm Ry, Rz, Rt, Rv, R3z, Rk, Rpk, Rvk, R, Rp, Rx, AR, W, Wx, Wte: 0,02 μm ~ 350 μm S, Sm: 2 μm ~ 4000 μm HSC, Pc: 2,5/cm ~ 5000/cm; Ppi: 6,35 ~ 12700/inch δc : - 350 μm ~ + 350 μm Lo: 0,1 mm ~ 99,999 mm mr, Mr 1, Mr 2: 0 ~ 100% A1, A2: 0 ~ 15000
Display/Magnification		
Vertical:	–	10 x, 20 x, 50 x, 100 x, 200 x, 500 x, 1000 x, 2000 x, 5000 x, 10000 x, 20000 x, 50000 x, 100000 x, AUTO
Horizontal:	–	1 x, 2 x, 5 x, 10 x, 20 x, 50 x, 100 x, 200 x, 500 x, 1000 x, AUTO
Printer	Optional	Thermal Printer (Printing width: 48 mm)
Statistics	–	Max/Min, Mean Value, Standard Deviation (σ), Pass Ratio, Frequency Distribution Table
Tolerance judgement	Upper/lower limit values	Upper/lower limit values for three parameters
Meas. Conditon Storage	–	5 sets of measuring conditions
Auto-sleep (turing off)	Automatically after 30 seconds without operation	Automatically after 5 minutes without operation
Calibrator	Automatic calibration entering the values and measuring of roughness specimen	
Power Supply	Via AC adapter (DC 7,5 V 1,5 W) built-in or rechargeable battery	
Rechargeable Battery	Charging time: 12 hours (for 500 measurements)	Charging time: 15 hours (for 600 measurements without printing)
Data input/output	RS-232 C interface for input/output, DIGIMATIC output	RS-232 C interface for input/output, DIGIMATIC output, Compact flash card
Mass	approx. 290 g	approx. 1200 g

Surface Roughness Tester "Surftest SJ-201 P" "Surftest SJ-301"

Series 178 Special Probes



S drive unit for Surftest SJ-201 P / SJ-301 with transversal scanning

Series 178

Complete set including S drive



No. 178-899-2 D
SJ-201 S

Series 178

Complete set including S drive



No. 178-939-2 D
SJ-301 S

S drive unit for Surfptest SJ-201 P / SJ-301 with transversal scanning

Series 178

S drive with transversal scanning

- The new S drive unit with transversal scanning is compatible with the conventional drive units of the Surfptest SJ-201 S and SJ-301 and is simply connected to the display unit of these drives.

Specification

Measuring range: 5.6 mm
 Measuring rate: 0.25 mm/s, 0.5 mm/s,
 linear travel
 Roughness standard: Ra 1 μm (No. 178-605)



Just set the crankshaft onto the measuring point. The new S drive with transversal scanning will rapidly and reliably measure surface roughness in an axial direction.

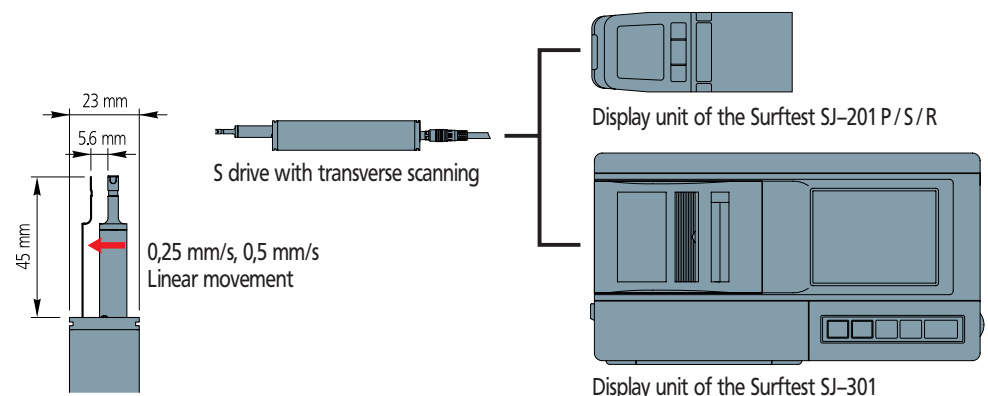
The transversal scanning function simplifies the measurement of surface roughness even in very narrow areas, which has been a problem with conventional measuring instruments with longitudinal scanning.

Combination with a digital height gauge and associated adapter offers the user increased flexibility when positioning the device.

Photo: measurement of a wire-eroded surface in the orthogonal direction.



No. 178-234

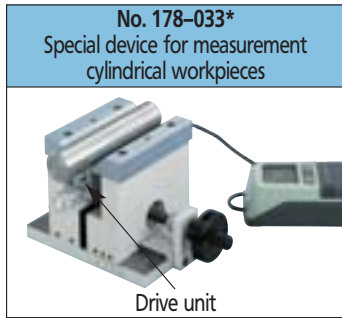


Surface Roughness Tester

"Surftest SJ-201 P" "Surftest SJ-301"

Series 178

Standard- and optional accessory



* Price and delivery time on demand

No.	Designation	Surftest SJ-201 P		Surftest SJ-301	
		Standard accessory	Optional accessory	Standard accessory	Optional accessory
178-390	Detector with tip radius 5 μm		●		●
178-391	Detector for soft materials (stylus tip radius 10 μm)		●		●
178-392	Small hole detector (∅ 4,5 mm)		●		●
178-393	Small hole detector (∅ 2,8 mm)		●		●
178-394	Deep groove detector		●		●
178-395	Detector with tip radius 2 μm	●		●	
178-601	Roughness specimen Ra 3 μm	●		●	
12AAA210	Extension rod (50 mm)		●		●
12AAA216	Height adjustment feet		●	●	
12AAA217	Nosepiece for flat workpieces		●	●	
12AAA218	Nosepiece for cylindrical workpieces		●	●	
12AAA219	Adapter for vertical positioning		●		●
12AAA221	Adapter for magnetic stand		●		●
12AAA222	Height Gage adapter		●		●
12AAA841	Memory card				●
12AAA882	RS-232 C Connection cable				●
12AAA896	Protective film				●
12AAA208	RS-232 C Connection cable		●		
12BAA303	Extension cable (1 m)	●			●
12BAA304	Carry case	●			
270732	Printer papers (5 rolls)			●	
12BAA686	Extension cable (1 m)			●	
12BAA688	Battery			●	
12BAA689	Touch Pen			●	
12BAA690	Touch Panel Protection Sheet			●	
12BAA781	Carry case			●	
178-033	Measuring device for cylindrical workpieces		●		●
178-034	Measuring device as universal fixture		●		●
178-035	Measuring device for measuring in pipes		●		●
178-420D	Printer (with connector cable)		●		
12AAC243	Printer paper (20 rolls)		●		
011326	Measuring stand for SJ-201 P/SJ-301		●		●
011327	Setting slide for X direction		●		●
011328	Adjustment slide for Y direction		●		●
011329	360 degree rotating unit		●		●
011330	V-block for cylindrical parts		●		●
011331	Back square		●		●
011332	Vice		●		●
936937	Signal cable 1 m		●		●
965014	Signal cable 2 m		●		●

Surface Roughness Tester "Surftest SJ-400"

- **High-precision measurements – including with portable models.**
A high-definition sensor head with large measuring range and an optimum straightness feed unit guarantee measurements of outstanding accuracy for its class.
- **Measurement/evaluation of steps and straightness.**
With the skid-free measurement function, ultrafine steps, straightness and ripples may be measured. The integrated functions facilitate evaluation of surface characteristics on the LCD monitor.
- **Measurement of surface roughness of cylinders – transverse to the cylinder axis – including with a compact model.**
The skid-free measurement and surface R compensation functions enable the evaluation of surface roughness of cylinders.
- **Roughness parameters that correspond to international standards.**
The SJ-400 series offers 35 different roughness parameters that correspond both to the latest ISO, DIN and ANSI standards as well as JIS standards (1994/1982).
- **Modern data preparation with an extended analysis programs.**
With the SJ-400 series, data preparation is possible as with higher-end devices. The system is extended with the surface roughness analysis program SUPPAK-SJ and then offers functions for data analysis and the preparation of reports.
- **Checking of calculation result and evaluated profile (without printout) directly on the display.**
On the integrated, large, touch-sensitive LCD monitor (touch panel), the results of the calculations and the evaluated profile are clearly displayed.

Specification

Contact system

Measuring range: 800 μm
Resolution: 0,000125 μm

Drive unit

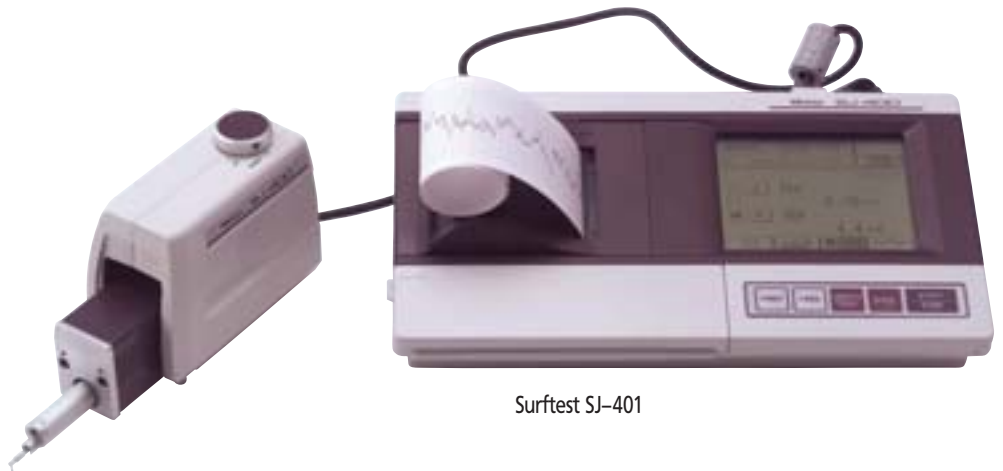
Straightness / feed length
SJ-401: 0,3 $\mu\text{m}/25\text{ mm}$
SJ-402: 0,5 $\mu\text{m}/50\text{ mm}$

Standard accessory

Transport case for Surftest SJ-401
Surftest SJ-402



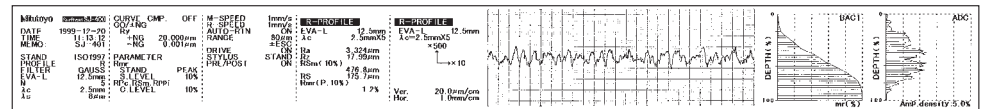
Series 178



Surftest SJ-401

Integrated thermal printer

The measurement results are printed out on a high-quality thermal printer with high output speed. The total result may be issued both as BAC and ADC curve as well as an evaluated profile and calculated result. The results and profiles are printed out in easy-to-understand form.



Granite measuring stand (optional accessory)



Measurement of deep grooves



Measurement with probe directed upwards



Surface R measurement.



Surface Roughness Tester

"Surftest SJ-400"

Series 178

Specifications

Model No.	Surftest SJ-401 178-956-3 D	Surftest SJ-402 178-958-3 D
Measuring method	Skid-free / with skid (switchable)	
Measuring range	800 μm , 80 μm , 8 μm	
Z-Axis		
X-Axis	25 mm	50 mm
Traversing system		
Straightness	0,3 μm / 25 mm	0,5 μm / 50 mm
Response time	0,05, 0,1, 0,5, 1,0 mm/s	
Return speed	0,5, 1,0, 2,0 mm/s	
Height/inclination adjustment		
Inclination adjustment range	$\pm 1,5^\circ$	
Height adjustment	10 mm	
Analysis Profile	P-Profile (P), R-Profile (R), filtered ripple profile (W), DIN 4776, MOTIF (R, W)	
Evaluation Parameters	Ra, Ry, Rz, Rq, Pc, R3z, mr, Rt, Rp, Rv, Sm, S, δ_c , Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, Lo, Ppi, R, AR, Rx, Δa , Δq , Ku, HSC, mrd, Sk, AW, W, Wte	
Analysis Graph	(BAC), Amplitude distribution curve (ADC)	
Number of individual lengths	x 1, x 3, x 5, x L* (* = or any value)	
Adjustable measuring length	0,1 – 25 mm (0,1 mm digits)	0,1 – 50 mm (0,1 mm digits)
Measuring lengths (L)	0,08, 0,25, 0,8, 2,5, 8 mm	
Print width	48 mm / Paper width: 58 mm	
Recording		
Vertical Magnification	10 up to 100.000 x Magnification, Auto	
Horizontal Magnification	1 up to 1000 x Magnification, Auto	
Probe		
Measuring system	Inductive	
Resolution	0,000125 μm depending on resolution	
Probe tip radius	Radius 2 μm , Diamond	
Measuring force	0,75 mN	
Skid radius	40 mm	
Skid measuring force	below 400 mN	
Function		
User-defined	Display/roughness parameters selectable	
Data filter	Surface R, inclination compensation	
Linearity function	Display of coordinate difference between any two points	
D.A.T. function	For levelling during skid-free measurement	
Offset calculation method	Input of probe offset while the feed unit is stopped	
Statistical processing	Max. Min. standard deviation (σ), Histogram	
Tolerance evaluation	Top and bottom limits can be entered	
Storage of measuring conditions	Five data records/measuring conditions(feed unit)	
Printer	Thermal printer	
Cut-Off length	λ_c : 0,08; 0,25; 0,8; 2,5; 8 mm; λ_s : 0,25; 0,8; 2,5; 8; 25 μm	
Digital filter	2CR, PC75 (phase-corrected), Gauss	
Calibration	Ra, step automatic calibration after inputting the standard value	
Power supply	AC power pack, integrated rechargeable battery	
Battery		
Charge time	15 hours	
No. of measurements	Max. 600 (no printout)	
Power consumption	43 W (max.)	
Dimensions		
Display (WxHxD)	307 x 165 x 94 mm	
Levelling unit (WxHxD)	131 x 63 x 99 mm	
Probe system (WxHxD)	128 x 36 x 47 mm	
Standard roughness	JIS (JIS B0601-1994-1982), DIN, ISO, ANSI	
LCD	Touch-sensitive LCD-Monitor	
Data output	Connection to the data processing system (optional accessory)	
External control	RS-232C input/output, DIGIMATIC output	
Weight		
Display	1,2 kg	
Levelling unit	0,4 kg	
Contact system	0,6 kg	

Software SURFPAK-SJ

With the SURFPAK-SJ version there is also a solution for hand-held devices in the SJ-200, SJ-300 and SJ-400 series that lend you the same excellent qualities as stationary test equipment. With the intelligent software, the mobile Mitutoyo form tester itself becomes a part of a high-end desktop evaluation system.

Specification

Sensor stroke: 800 μm
Resolution: 0,0001 μm
Feed (X-axis): 50 mm
Minimum Cut-Off: 0,025 mm
Straightness deviation: 0,3 $\mu\text{m}/50$ mm

55 Parameters

Ra, Rq, Ry, Rz, R3z, Rt, Rp, Rk, Rpk, Rvk, Mr1, Mr2, S, Sm, Pc, mr, A1, A2, Rv, R, Rx, W, Wx, Wte, mrd, HSC, AW, AR, Vo, Δa , Δq , Ku, δc , Lo, Sk, Rti, R3zi, R3y, Rc, Rpmax, Rpi, Rvmax, plateau ratio, λa , λq , Lr, SR, SAR, NR, NCRX, CPM, SW, SAW, NW, Vo

Surface Roughness Tester "Surftest SV-2000"

Penetrating and sophisticated technology – for high-performance surface testing in the test room and laboratory.

- Perfect reference plane measurement in mobile and stationary use.



Surftest SV-2000

Model	Feed	Height adjustment	Baseplate dimension
SV-2000 N2	50 mm	optional	optional
SV-2000 S2	50 mm	300 mm motorised	610 x 450 mm

Specification

Sensor stroke: 800 μm
Resolution: 0,0001 μm
Feed (X-axis): 100 or 200 mm
Minimum Cut-Off: 0,025 mm
Straightness deviation: (0,05 + 1,5L/1000) μm

55 Parameters

Ra, Rq, Ry, Rz, R3z, Rt, Rp, Rk, Rpk, Rvk, Mr1, Mr2, S, Sm, Pc, mr, A1, A2, Rv, R, Rx, W, Wx, Wte, mrd, HSC, AW, AR, Vo, Δa , Δq , Ku, δc , Lo, Sk, Rti, R3zi, R3y, Rc, Rpmax, Rpi, Rvmax, plateau ratio, λa , λq , Lr, SR, SAR, NR, NCRX, CPM, SW, SAW, NW, Vo

Surface Roughness Tester "Surftest SV-3000" and "Surftest SV-3000 3D"

"Surftest SV-3000":

Top performance that leaves others standing: stationary reference plane system that sets the standard for test room and laboratory analysis.

- The high-end solution for top-performance surface testing.

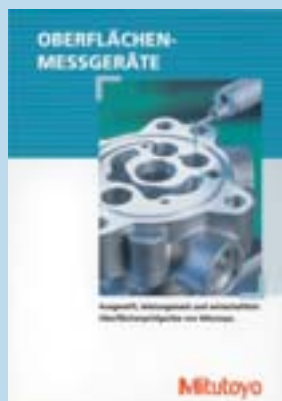
"Surftest SV-3000 3D":

The specialist in precision three-dimensional topographical evaluations.



Surftest SV-3000 / Surftest SV-3000 3D

Model	Feed	Height adjustment	Baseplate dimension
SV-3000 M4	100 mm	300 mm manual	610 x 450 mm
SV-3000 S4	100 mm	300 mm motorised	610 x 450 mm
SV-3000 H4	100 mm	500 mm motorised	610 x 450 mm
SV-3000 W4	100 mm	500 mm motorised	1010 x 450 mm
SV-3000 S8	200 mm	300 mm motorised	610 x 450 mm
SV-3000 H8	200 mm	500 mm motorised	610 x 450 mm
SV-3000 W8	200 mm	500 mm motorised	1010 x 450 mm



Request our detailed brochure!

SURFPAK-SV and SURFPAK-PRO software

SURFPAK-SV evaluates the workpiece surface as a two-dimensional cross-section while SURFPAK-PRO is used in topographical evaluation.

Contour measurer "Contracer CV-1000"

Mobile contour measurement with "stationary" performance profile.

- Sophisticated digital technology for site-independent identification and evaluation of profiles – with the precision and performance of stationary systems.



Contracer CV-1000

Model	Measuring range X-/Z-axis	Height adjustment	Baseplate dimension
CV-1000N2	50/25 mm	optional	optional

Specification

Measuring range:	horizontal 50 mm vertical 25 mm
Resolution:	X-axis 0,2 μm Z-axis 0,4 μm
Length measurement deviation:	X-axis (3,5 + 0,02 L) μm Z-axis $\pm (3,5 + 14HI/25)$ μm
Straightness deviation on the X-axis	3,5 μm / 50 mm

Contour measurer "Contracer CV-2000"

The state of the art in economic measurement.

- Stationary contour measurer with convincing price-performance ratio. For efficient use in production or in the laboratory in every respect.



Contracer CV-2000

Model	Measuring range X-/Z-axis	Height adjustment	Baseplate dimension
CV-2000 M4	100/40 mm	320 mm manual	600x450 mm
CV-2000 S4	100/40 mm	320 mm motorised	600x450 mm

Specification

Measuring range:	horizontal 100 mm vertical 40 mm
Resolution:	X-axis 0,2 μm Z-axis 0,5 μm
Length measurement deviation:	X-axis (3,5 + 0,02 L) μm Z-axis $\pm (3,5 + 14HI/25)$ μm
Straightness deviation on the X-axis	3,5 μm / 100 mm
Feed inclination:	$\pm 45^\circ$



Request our detailed brochure!

Contour measurer "Contracer CV-3000"

Top-notch technology for automatic contour measurement.

- High-performance stationary system for automatic series measurement in test room and laboratory. With motorised Z-column, ceramic straightness guide on X-axis and automatic raising and lowering of the probe tip.



Contracer CV-3000

Model	Measuring range X- / Z-axis	Height adjustment	Baseplate dimension
CV-3000 S4	100 / 50 mm	250 mm motorised	610 x 450 mm
CV-3000 H4	100 / 50 mm	450 mm motorised	610 x 450 mm
CV-3000 W4	100 / 50 mm	450 mm motorised	1000 x 450 mm
CV-3000 S8	200 / 50 mm	250 mm motorised	610 x 450 mm
CV-3000 H8	200 / 50 mm	450 mm motorised	610 x 450 mm
CV-3000 W8	200 / 50 mm	450 mm motorised	1000 x 450 mm

Specification

Measuring range:	X-axis 100 / 200 mm Z-axis 50 mm
Resolution:	X-axis 0,05 μm Z-axis 0,2 μm
Length measurement deviation:	X-axis (1,0 + 2,0 L/100) μm Z-axis $\pm (3,0 + 12HI/25)$ μm
Straightness deviation on the X-axis	(1,0 + 2,0 L/100) μm
Feed inclination:	$\pm 45^\circ$

Contour measurer "Contracer CV-4000"

No compromise: straightness deviation 0.8 μm .

- The stationary high-end system with laser holoscale technology and sensational straightness deviation on the X-axis from just (0,8 + 2,0 L/100) μm . The no-compromise, perfect solution for maximum precision automatic series measurement.



Contracer CV-4000

Model	Measuring range X- / Z-axis	Height adjustment	Baseplate dimension
CV-4000 S4	100 / 50 mm	250 mm motorised	610 x 450 mm
CV-4000 H4	100 / 50 mm	450 mm motorised	610 x 450 mm
CV-4000 W4	100 / 50 mm	450 mm motorised	1000 x 450 mm
CV-4000 S8	200 / 50 mm	250 mm motorised	610 x 450 mm
CV-4000 H8	200 / 50 mm	450 mm motorised	610 x 450 mm
CV-4000 W8	200 / 50 mm	450 mm motorised	1000 x 450 mm

Specification

Measuring range:	X-axis 100 / 200 mm Z-axis 50 mm
Resolution:	X-axis 0,05 μm Z-axis 0,05 μm
Length measurement deviation:	X-axis (0,8 + 2,0 L/100) μm Z-axis $\pm (0,8 + 10,5HI/25)$ μm
Straightness deviation on the X-axis	(0,8 + 2,0 L/100) μm
Feed inclination:	$\pm 45^\circ$



Request our detailed brochure!

FORMPAK software

Measuring, evaluation and full documentation; with FORMPAK, the top-performance software from MITUTOYO. An added bonus with all CONTRACER systems. No extra cost and impressively versatile. For professional contour measurement with optimum results.

"Roundtest RA-114" form measuring instrument

Compact table-top unit for measurement in workshop or production line. With large display and integrated printer.

- Suitable for workshop and ready to use.
- Convenient and cost-conscious.



Roundtest RA-114

"Roundtest RA-116" form measuring instrument

Compact table-top unit for measurement in workshop or production line with PC connection.

- PC connection for versatility.
- Uncomplicated with top-of-the range software.



Roundtest RA-116



Specification

Measurable diameter: 280 mm
Measuring range: $\pm 1000 \mu\text{m}$
Measuring height
outside/inside: 280 mm
Range of travel
of the R-axis: 165 mm
Max. Measuring depth: 100 mm
Rotational accuracy: $(0,07 + 6H/10\,000) \mu\text{m}$

10 analytical features available:

Roundness, coaxiality, concentricity, circular runout, axial runout; perpendicularity, thickness deviation, flatness, parallelism, interrupted workpieces

Specification

Measurable diameter: 280 mm
Measuring range: $\pm 1000 \mu\text{m}$
Measuring height
outside/inside: 280 mm
Range of travel
of the R-axis: 165 mm
Max. Measuring depth: 100 mm
Rotational accuracy: $(0,07 + 6H/10\,000) \mu\text{m}$

12 analytical features available:

Roundness, coaxiality, concentricity, circular runout, axial runout; perpendicularity, thickness deviation, flatness, parallelism, interrupted workpieces, power spectrum, harmonic analysis



Request our detailed brochure!

Specification

Large centring range:	± 3 mm
Large levelling range:	$\pm 1^\circ$
Measurable diameter:	100 mm
Measuring range:	± 400 μ m
Measuring height outside/inside:	150 mm
Range of travel of the R-axis:	75 mm
Max. Measuring depth:	90 mm
Rotational accuracy:	(0,02 + 6H/10 000) μ m
Straightness of precision column:	(Z-axis) 0,3 μ m / 150 mm

Analytical options:

Cylindricity, roundness, concentricity, coaxiality, circular runout, axial runout; perpendicularity, thickness deviation, flatness, parallelism, interrupted workpieces, helix measurement; total circular runout, straightness, inclination, diameter, radial deviation, taper, power spectrum, harmonic analysis

"Roundtest RA-1500" form measuring instrument

Compact table-top model for stringent accuracy requirements in cylindricity testing.

- Uncomplicated manual centring and levelling of the workpiece. High accuracy, wear-free rotation with air-bearing rotary table. For perfect results when the demands are high.



Roundtest RA-1500



Specification

Large centring range:	± 3 mm
Large levelling range:	$\pm 1^\circ$
Measurable diameter:	300 mm
Measuring range:	± 300 μ m
Measuring height outside/inside:	300 mm (DS/AS) or 500 mm (DH/AH)
Range of travel of the R-axis:	175 mm
Max. Measuring depth:	100 mm
Rotational accuracy Radial:	(0,02 + 5H/10 000) μ m
Straightness of precision column:	(Z-axis) 0,25 μ m / 300 mm

Analytical options:

Cylindricity, roundness, concentricity, coaxiality, circular runout, axial runout; perpendicularity, thickness deviation, flatness, parallelism, interrupted workpieces, helix measurement; total circular runout, total axial runout, horizontal and vertical straightness, inclination, diameter, radial deviation, taper, power spectrum, harmonic analysis

"Roundtest RA-2000" form measuring instrument

The stable table-top model with convincing versatility. With manual or automatic centring and levelling of the workpiece.

RA-2000 DS and RA-2000 DH:

- Rapid, simple and precise manual workpiece alignment with digitally adjustable table (Digital Adjustment Table, DAT). The most sophisticated technology for the most discerning users.

RA-2000 AS and RA-2000 AH:

- Convincingly fast rapid, precise, automatic centring and levelling of the workpiece.



Roundtest RA-2100



Request our detailed brochure!

"Roundtest RA-H 5100" form measuring instrument

Top of the range with high accuracy for overall perfection in the measurement of rotationally symmetrical workpieces.

RA-H 5100 AS und RA-H 5100 AH:

- Top technology for 20 possible analyses in form measurement. Absolute precision with maximum measuring speed and infinitely versatile with perfectly matched accessories. For perfect results without the least compromise.



Roundtest RA-H 5100

CNC-Surface Roughness Tester "Surftest SV-3000 CNC"

CNC-controlled reference plane measurement of surface roughness and ripple in test room and laboratory.

- With a travel speed of 200 mm/s and a straightness deviation of $(0.05 + 1.5 L/1000) \mu\text{m}$ and top-quality software as standard.



Surftest SV-3000 CNC

Specification

Large centring range:	$\pm 5 \text{ mm}$
Large levelling range:	$\pm 1^\circ$
Measurable diameter:	400 mm
Measuring range:	$\pm 300 \mu\text{m}$
Measuring height:	350 mm (AS) or 550 mm (AH)
Range of travel of the R-axis:	225 mm
Rotational accuracy:	$(0,02 + 6H/10\,000) \mu\text{m}$
Straightness of precision column:	(Z-axis) $0,14 \mu\text{m} / 350 \text{ mm}$

Analytical options:

Cylindricity, roundness, concentricity, coaxiality, circular runout, axial runout; perpendicularity, thickness deviation, flatness, parallelism, interrupted workpieces, helix measurement; total circular runout, total axial runout, horizontal and vertical straightness, inclination, diameter, radial deviation, taper, power spectrum, harmonic analysis

ROUNDPAK high-end software

ROUNDPAK enables effortless setting of specific measurement programs, displays the entire test sequence and documents the results in impressive, clear diagrams and 3-D graphs.

Specification

Column

Range of travel:	300 mm (Model S8) 500 mm (Model H8)
------------------	--

Rate of travel: 200 mm/s

X-axis:	200 mm
Resolution:	0,05 μm
Straightness:	$(0,05 + 1,5 L/1000) \mu\text{m}$
Rate of travel:	200 mm/s

Detector

Measuring range:	800 μm
Resolution:	max. 0,0001 μm



Request our detailed brochure!

Specification

Column

Range of travel: 300 mm (Model S8)
500 mm (Model H8)

Rate of travel: 200 mm/s

Feed: 200 mm

Resolution: 0,05 μm

Straightness: 2 μm / 200 mm

Rate of travel: 200 mm/s

Detector

Measuring range: 50 mm

Resolution: 0,2 μm

CNC contour measurer "Contracer CV-3000 CNC"

CNC-controlled high-performance system for contour measurement in production and laboratory.

- With ceramic X-axis straightness guide, digital glass scale in the X- and Z-axis and Windows®-based FORMPAK measuring and analysis software.



Contracer CV-3000 CNC

Specification

Column

Range of travel: 300 mm (Model S8)
500 mm (Model H8)

Rate of travel: 200 mm/s

Feed: 200 mm

Resolution: 0,05 μm

Straightness: (0,05 + 1,5 L/1000) μm

Rate of travel: 200 mm/s

Detector

Measuring range: 800 μm

Resolution: max. 0,0001 μm

CNC surface and contour measurer "Formtracer SV-C 3000 CNC"

CNC-controlled reference-plane measurement of surface roughness and ripple in test room and laboratory.

- With a rate of travel of 200 mm/s and a straightness deviation of (0.05 + 1.5L/1000) μm and high-end software as standard.



Contracer SV-C 3000 CNC



Request our detailed brochure!

CNC surface and contour measurer "Formtracer CS-L 5000 CNC"

CNC-controlled reference-plane measurement of surface roughness and ripple in test room and laboratory.

- With a rate of travel of 200 mm/s and a straightness deviation of $(0.05 + 1.5L/1000) \mu\text{m}$ and high-end software as standard.
- Laser-Holoscale in X- and Z-axis.



Formtracer CS-5000 CNC

CNC Roundness tester "Roundtest RA-2000 CNC"

CNC-capable series system with automatic turning and swivelling arm.

- Top technology for up to 20 possible analyses in form measurement.
- With absolutely convincing performance profile, with PC connection including Windows-based measurement and analysis software ROUNDPAK 5.0.
- High rate of travel.
- Detector positionable in 1° increments.



Roundtest RA-2100 CNC

Specification

Column

Range of travel: 300 mm (Model S8)
500 mm (Model H8)

Rate of travel: 200 mm/s

Feed: 200 mm

Resolution: 0,00625 μm

Straightness: $(0,3 + 2 L/1000) \mu\text{m}$

Detector

Measuring range: 12 mm / 24 mm

Resolution: 0,004 μm / 0,008 μm

Specification

Column

Range of travel: 300 mm (Model AS)
500 mm (Model AH)

Straightness: 0,25 μm / 300 mm

Parallelism: 1,0 μm / 300 mm

Radial axis

Range of travel: 175 mm

Straightness: 1,0 μm / 150 mm

Circular table

Measurable diameter: 235 mm

Centring range: ± 3 mm

Levelling range: $\pm 1^\circ$

Rotational deviation

Radial: $(0,02 + 5H/10\,000) \mu\text{m}$

Axial: $(0,02 + 6R/10\,000) \mu\text{m}$



Request our detailed brochure!

CNC Roundness tester "Roundtest RA H-5000 CNC"

Specification

Column

Range of travel: 350 mm (Model AS)
550 mm (Model AH)

Straightness: 0,14 μm / 350 mm

Parallelism: 0,2 μm / 350 mm

Radial axis

Range of travel: 225 mm

Straightness: 0,4 μm / 200 mm

Perpendicularity: 0,5 μm / 200 mm

Circular table

Measurable diameter: 356 mm

Centring range: ± 5 mm

Levelling range: $\pm 1^\circ$

Rotational accuracy

Radial: (0,02 + 4H/10 000) μm

Axial: (0,02 + 6R/10 000) μm

- High rate of travel.
- Detector positionable in 1° increments.



Roundtest RA H-5100 CNC

Combined surface and contour measurer "Formtracer"

Dual-use, half the cost: contour and surface testing in a single test sequence.

- The instruments in Mitutoyo's Formtracer series combine surface and contour measurement technologies in one space-saving system. This ensures that both processes can be carried out even where space is limited.



Formtracer SV-C 3000 S4

Model	Feed	Height adjustment	Accuracy	Baseplate dimension	Resolution
SV-C 3000 S4 / S8	100 mm	250 mm motorised	$\pm (1 + 2L/100)$ μm	610x450 mm	0,05 μm
SV-C 3000 H4 / H8	100 mm	450 mm motorised	$\pm (1 + 2L/100)$ μm	610x450 mm	0,05 μm
SV-C 3000 W4 / W8	100 mm	450 mm motorised	$\pm (1 + 2L/100)$ μm	1000x450 mm	0,05 μm
SV-C 4000 S4 / S8	100 mm	250 mm motorised	$\pm (0,8 + 2L/100)$ μm	610x450 mm	0,05 μm
SV-C 4000 H4 / H8	100 mm	450 mm motorised	$\pm (0,8 + 2L/100)$ μm	610x450 mm	0,05 μm
SV-C 4000 W4 / W8	100 mm	450 mm motorised	$\pm (0,8 + 2L/100)$ μm	1000x450 mm	0,05 μm
CS-3000	100 mm	300 mm motorised	$\pm (1 + 2L/100)$ μm	610x450 mm	0,05 μm
CS-5000	200 mm	450 mm motorised	$\pm (0,3 + 0,2L/100)$ μm	1000x450 mm	0,00625 μm

Specification

Formtracer

Column

Range of travel: 250 mm
300 mm
450 mm

Feed: 100 mm / 200 mm

Straightness: 0,8/100 mm
0,2/100 mm



Request our detailed brochure!

PRODUCT NEWS



Hyper MF / MF-U High End Measuring Microscopes

Detailed information on page 385.



Measuring Projector PV-5110

Series 304

Detailed information on page 400.



Measuring Projector PH-A14

Series 172

Detailed information on page 402.



Edge sensor "OPTOEYE 200"

Series 332

Detailed information on page 408.

Magnifiers
Pocket Magnifiers



Pages 372–373

Centering Microscopes



Pages 374–375

Stereo Microscopes MSM-400

Stereo Microscope DV 4
and Accessories



Pages 376–379

Measuring Microscope TM-500
and Accessories

Measuring Microscope Hyper MF / MF-U

Measuring Microscope MF-A Model



Pages 380–387

Measuring Projector PJ-A3000
and Accessories

Measuring Projector PJ-H3000
and Accessories



Pages 388–399

Measuring Projector PV-5110

Measuring Projector PH-A14

Measuring Projector PH-3515 F



Pages 400–405

Accessories for Projectors

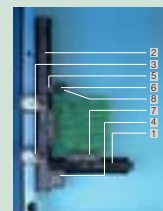
Data processor QM-Data 200

Edge sensor "OPTOEYE 200"



Pages 406–408

Clamping system "OPTI-FIX"



Pages 412–413

Precision Magnifier

- For measuring length, angles, diameters, line thickness, thread pitches, etc.
- Quick replacement of the measuring plates.
- Easy measurement.

Series 183

Magnifier

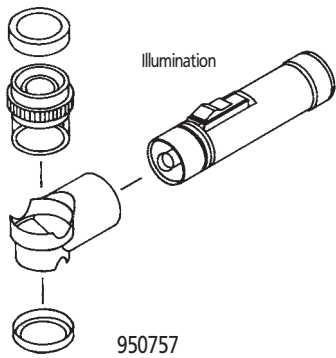


183-101

No.	Magnification	Image field mm	Mass g	Dimensions mm
183-101	8 x	24,5	40	Ø 37x48
183-131	10 x	24,5	42	Ø 37x45

Sets (including magnifier and measuring plates)

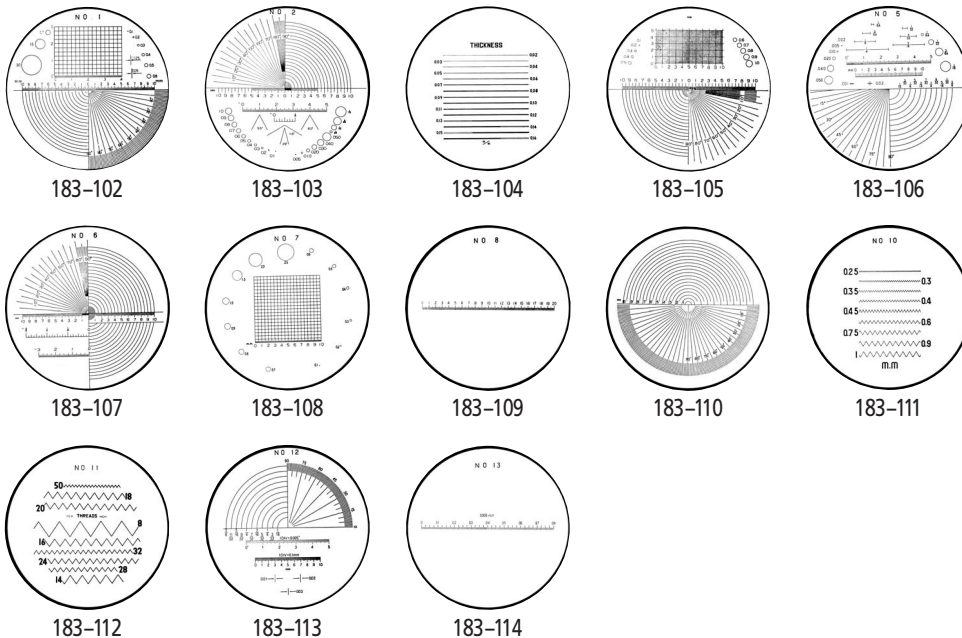
No.	Set combination
183-902	183-101, 183-102, 183-106, 183-107, 183-112, 183-113, 183-114
183-903	183-101, 183-102, 183-106, 183-107, 183-109, 183-113, 183-115
183-904	183-101, 183-102



950757

Series 183

Measuring plates



Specifications

Measuring plate diameter: 30 mm
Including box

Optional accessories

No. 950757 Magnifier holder with illumination
(without battery)
No. 353489 Battery LR14

- No. 183-102 Polar net, angle, radius
- No. 183-103 Angle, radius, length, bores
- No. 183-104 Thickness
- No. 183-105 Angle, radius, bores, length, polar net in mm
- No. 183-106 Angle, radius, bores, length
- No. 183-107 Angle, radius, length
- No. 183-108 Polar net, bores

- No. 183-109 Length in mm
- No. 183-110 Angle, radius
- No. 183-111 Thread pitches (metric)
- No. 183-112 Thread pitches (inch)
- No. 183-113 Angle, radius, length
- No. 183-114 Length in inch
- No. 183-115 ISO- thread pitches
0,25/0,3/0,35/0,4/0,45/0,5/0,7/0,8/1,0

Pocket Magnifier

- Stable design, safe hold.
- Easy handling.
- Including box and cleaning cloth.

Series 183

Pin version



183-201

No.	Magnification	Image field mm	Mass g	Dimensions mm
183-201	25 x	3,4	17	Ø 14,5x125

Series 183

Stand version

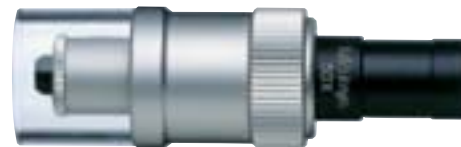


183-202

No.	Magnification	Image field mm	Mass g	Dimensions mm
183-202	25 x	3,3	90	Ø 31,5x115

Series 183

Stand version



183-203

No.	Magnification	Image field mm	Mass g	Dimensions mm
183-203	50 x	1,6	82	Ø 31,5x100

Pocket Magnifier

- Draw tube enables clear imaging of the workpiece.

Series 183



183-301

No.	Magnification	Image field-Ø mm	Mass g	Dimensions mm
183-301	7 x	25	17	Ø 32x43

Series 183



183-302

No.	Magnification	Image field-Ø mm	Mass g	Dimensions mm
183-302	10 x	24	18	Ø 32x40

Series 183



183-303

No.	Magnification	Image field-Ø mm	Mass g	Dimensions mm
183-303	15 x	10	23	Ø 32x30

Including box and cleaning cloth

Centering Microscope CF 10

Series 375

Centering microscope CF 10 base body in set



375-101

Specifications

Cylindrical stem receiver: \varnothing 14 mm

Contents:

- No. 375-021 Eyepiece 10x, integrated reticle with cross lines and radius
- No. 939080 Incident illumination
- No. 02AKD500 Transformator

Lens systems not included in the set.

Series 375

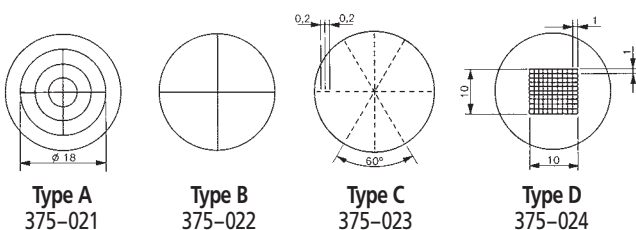
Lens systems



Objective	No.	Working distance mm	Image field- \varnothing mm	Magnification
1 x	375-031	40	22,0	10 x
2 x	375-032	60	11,0	20 x
3 x	375-033	45	7,3	30 x
5 x	375-034	26	4,4	50 x
10 x	375-035	11	2,2	100 x

Series 375

Eyepieces with integrated reticle



Specifications

Magnification: 10 x
Image field: \varnothing 22 mm

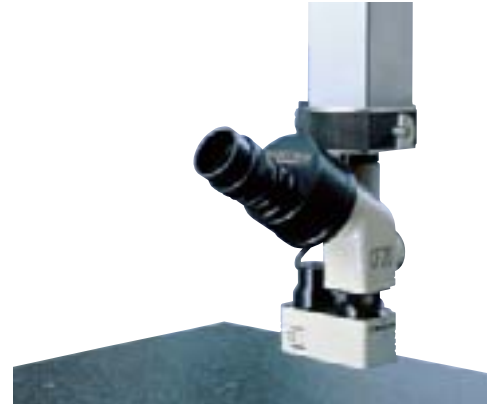
Centering Microscope CF20

Series 375

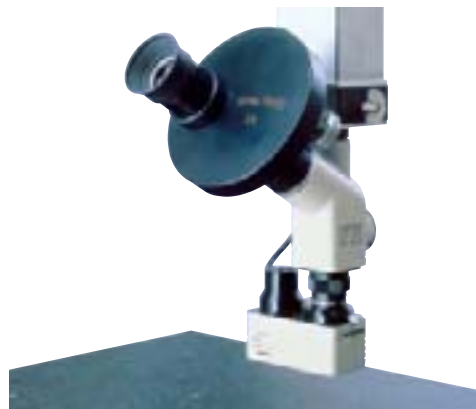
Sets



375-202



375-204



375-205

Set consisting of	375-012	375-041	375-042	375-043	375-044	375-045	02AKD500	939080
No. 375-201	●	●					●	●
No. 375-202	●		●				●	●
No. 375-203	●			●			●	●
No. 375-204	●				●		●	●
No. 375-205	●					●	●	●

No. 375-031 to

No. 375-035 for objectives, see above.

No. 375-012 Centering microscope with cylindrical stem receiver \varnothing 14 mm

No. 375-011 Centering microscope without cylindrical stem receiver

Lens systems not included in the set.

No. 375-041 Eyepiece 10x

No. 375-042 Binocular 10x, pupillary distance: 51-76 mm

No. 375-043 Protractor eyepiece 10x, rotation: 360° , graduation: scale 1° , nonius $5'$

No. 375-044 Double image eyepiece 10x

No. 375-045 Eyepiece with rotatable reticle (for use with objective 3x only)

No. 375-041
Eyepiece 10x
(No. 375-201)

No. 375-042
Binocular 10x
(No. 375-202)

No. 375-043
Protractor eyepiece 10x
(No. 375-203)

No. 375-044
Double image
eyepiece 10x
(No. 375-204)

No. 375-045
Eyepiece with
rotatable reticle
(for use with
3x objective only)
(No. 375-205)

No. 939083
C Mount adapter

No. 375-012

1 x No. 375-031
2 x No. 375-032
3 x No. 375-033
5 x No. 375-034
10 x No. 375-035

No. 02AKD500

No. 939080

Stereo Microscope MSM-400

- Bright, sharp images with real depth are recreated with high resolution and excellent faithfulness to color, thus minimizing eye fatigue while increasing inspection efficiency and productivity.
- The magnification can be adjusted depending on type of instrument with a user-friendly magnification switch (MSM-412, -465) or a zoom objective (MSM-Z414L) to the appropriate requirements.
- Continuous zooming, a standard feature, allows you to enlarge the object by 10 to 40 times in total magnification.
- Using the horizontal focusing handles mounted on both sides of the unit, you can quickly bring the object into focus regardless of whether you're right- or left-handed. The handles are also used for coarse and fine focusing controls. The MSM-465 comes with a focusing-torque adjustment mechanism.
- The microscopes can be connected to a digital camera or CCD camera to save captured images of the object or for simultaneous observation through different media.

Standard accessory

Two eye shades, dust cover

Series 377



377-925 K (MSM-412)



377-946 D (MSM-Z414 L)

Model No.	MSM-412 377-925 K	MSM-Z414 L 377-946 D
Optical System	Greenough Type, erect, unreversed image, inward inclination angle 12°	
Optical Tube	Binocular, viewing angle 45°, adjustable interpupillary distance between 54 and 76 mm, adjustable dioptre balancing (left eyepiece only)	Binocular, viewing angle 45°, adjustable interpupillary distance between 54 and 76 mm, adjustable dioptre balancing (right and left eyepieces)
Magnification switch system	Turret, two stage	Magnification variation by zoom
Lens systems	1x, 2x (turret)	1x to 4x (zoom ratio: 4)
Auxiliary lens systems (optional)	-	0,5x, 0,75x, 1,5x
Eye-piece	WF10x (Visual field no.: 20, standard), WF5x (Visual field no.: 22), WF15x (Visual field no.: 13), WF20x (Visual field no.: 10)	
Total magnification	10x, 20x (with 10x Standard eyepiece)	10x to 40x (with 10x Standard eyepiece)
Working distance	95 mm	80 mm
Height adjustment range	44 mm	
Transmitted illumination	Light source: Halogen lamp (12 V, 10 W), with color filter	
Reflected illumination	Light source: Halogen lamp (12 V, 15 W)	
Power supply	220 V AC, 50/60 Hz	
Power consumption	20 W	
Total weight	4,7 kg	5,1 kg

Consumable Spares

No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

More detailed information on these and other products can be found in the product brochures.

Stereo Microscope MSM-400

Series 377

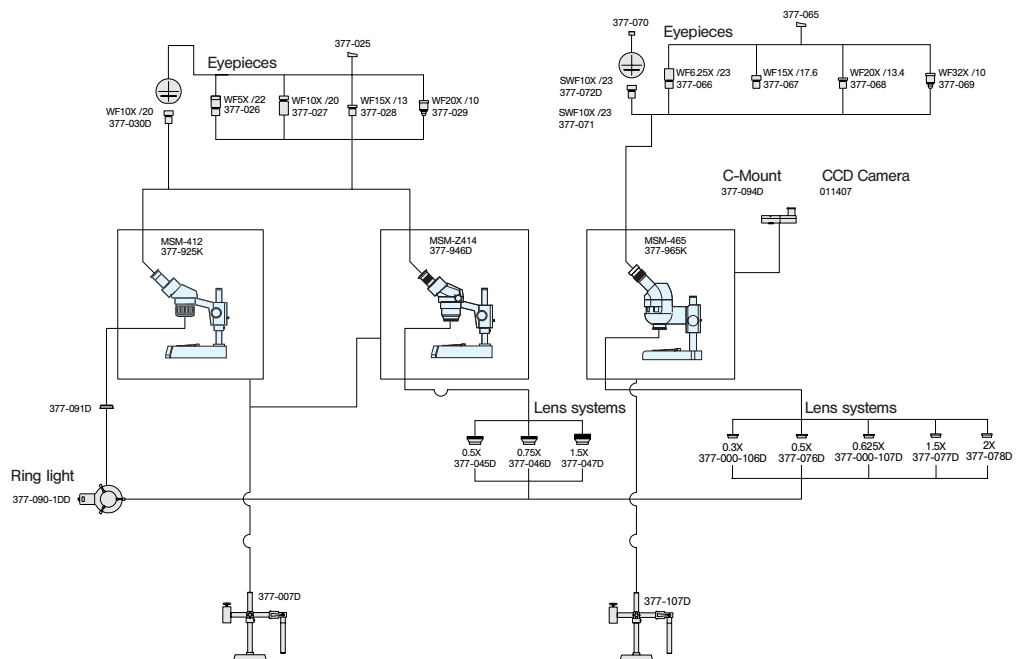
Standard accessory

Two eye shades, dust cover



377-965 K (MSM-465)

Model	MSM-465
No.	377-965 K
Optical System	Parallel System, erect, unreversed image
Optical Tube	Binocular, viewing angle 45°, adjustable interpupillary distance between 54 and 76 mm, adjustable dioptre balancing (left eyepiece only)
Magnification switch system	Turret, four stage
Lens systems	0,6x, 1,2x, 2,5x, 5x (turret)
Auxiliary lens systems (optional)	0,5x, 1,5x, 2x
Eyepiece	WF10x (Visual field no.: 23, standard), WF6,25x (Visual field no.: 23), WF15x (Visual field no.: 17,6), WF20x (Visual field no.: 13,4), WF32x (Visual field no.: 10)
Total magnification	6x, 12x, 25x, 50x (with 10x Standard eyepiece)
Working distance	89 mm
Height adjustment range	50 mm
Total weight	6,3 kg

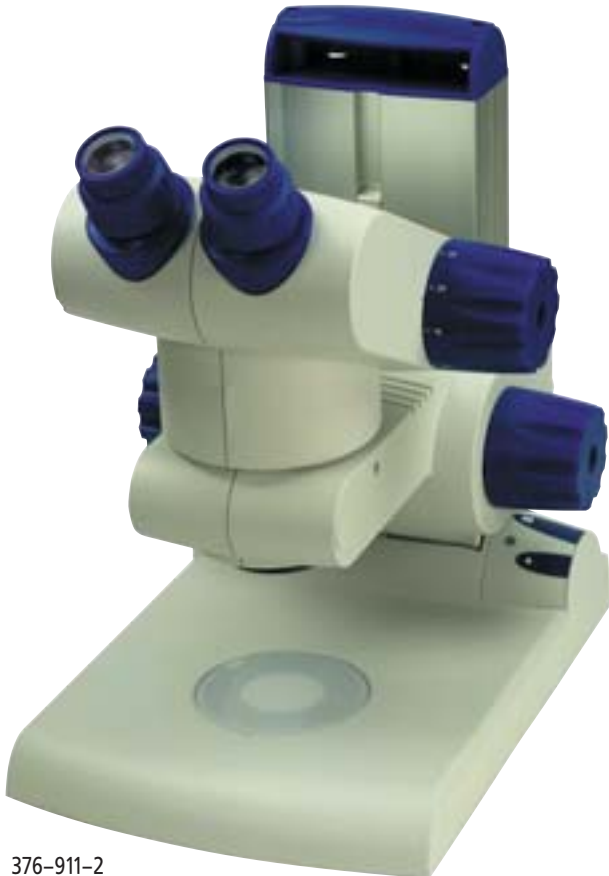


Stereo Microscope "DV 4"

- Stereo Microscope with stepless magnification changer.
- For the use in laboratories and workshop control.
- Built-in, adjustable eyepieces W 10x/20 Br foc.
- Viewing is no problem for spectacle wearers.

Series 376

Inspection microscope



376-911-2

Specifications

Magnification range: 8x to 32x (main unit)
Incident light: 12 V, 20 W
Transmitted light: 12 V, 10 W
Mixed light
Mass: 5 kg
Stepless lighting adjustment

Standard accessory

Stereo microscope DV 4 with eyepieces 10x/20 Br foc
Eyecup

No. 011381 Halogen lamp 12 V, 20 W

No. 011382 Halogen lamp 12 V, 10 W

Consumable Spares

No. 011298 MC Special cleaner for laboratory and
photo optics, microscopes (120 ml)



011298

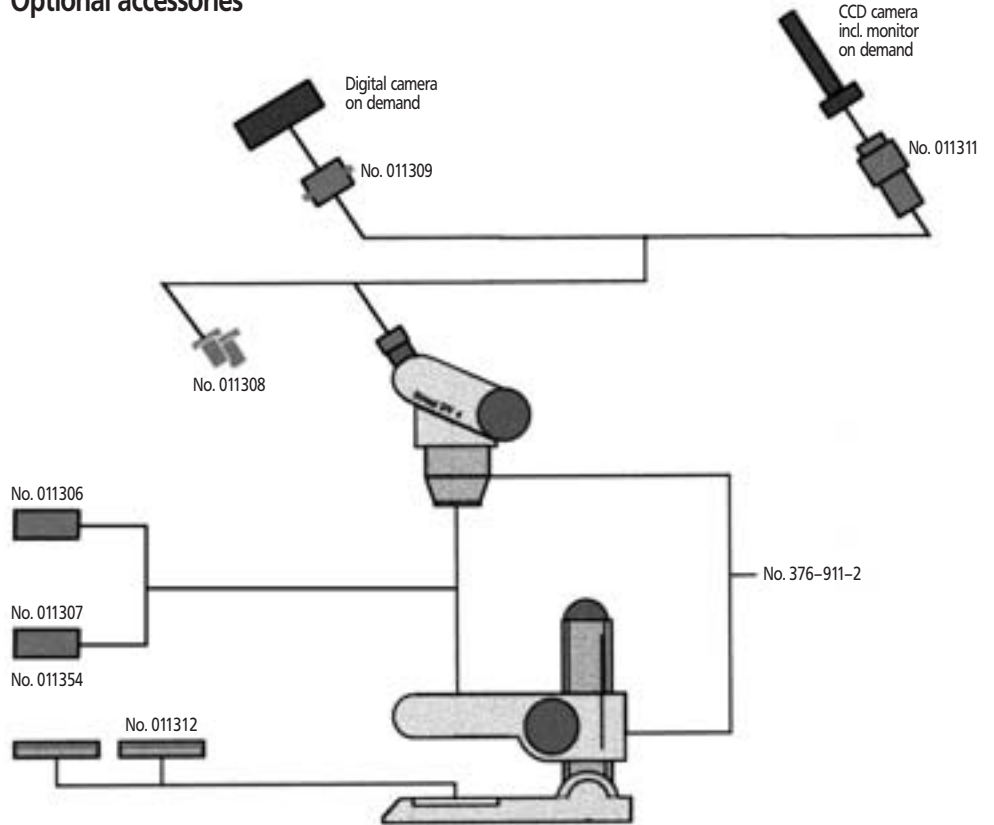
Stereo Microscope "DV 4"

Optional accessories

- No. 011306 Auxiliary lens system 5x ... 20,2x
- No. 011307 Auxiliary lens system 16x ... 64x
- No. 011308 Eyepiece graticule 8x ... 32x
- No. 011309 Eyepiece adapter video M37 / M 52 x 0,75 for digital camera
- No. 011311 Eyepiece adapter video Video C 0,8x for video camera
- No. 011312 Supplement for transmitted light DF on stand
- No. 011354 Opal glass dia $\varnothing = 84$ mm with diaphragm 40 mm

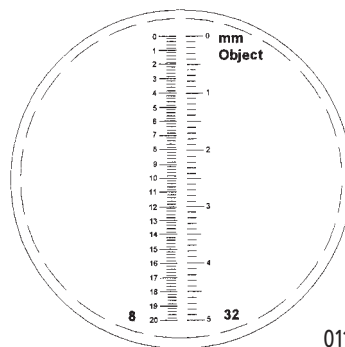
Series 376

Optional accessories



Series 376

Auxiliary lens systems for variation of working distance and magnification range (Optional accessory)



No. 011306 Auxiliary lens system 0,63x (FFA: 130 mm)

No. 011307 Auxiliary lens system 2x (FFA: 31 mm)

No.	Eyepiece	Auxiliary lens systems mm	Manification mm	Working distance mm	Image field
Eyepiece graticul					
011308	10x/20 Br foc	without	8x ... 32x	92	25.0 ... 6.3
Auxiliary lens systeme					
011306	10x/20 Br foc	0,63x	5x ... 20,2x	130	40.0 ... 9.9
011307	10x/20 Br foc	2x	16x ... 64x	31	12.5 ... 3.1

Br = Eyepiece for spectacle wearers, large distance between exit pupil and eye lens
foc = Focusable, for reception of eyepiece graticules

Measuring Microscope "TM-500"

Series 176



176-811 CED
with integrated micrometers
(152-390/152-389 Optional accessories)
(see page 99, 102 onwards for other integrated micrometers)

Model	TM-505	TM-510
No.	176-811 CED	176-812 CED
XY measuring range	50x50 mm	100x50 mm
Measuring system	Integrated micrometers	
Max. workpiece height	115 mm	107 mm
Max. workpiece weight	5 kg	
Angle reading	360° (Graduation 6' via nonius)	
Eyeiece	15x	
Objective	2x	
Magnification	30x	
Transillumination	24 V, 2 W intensity adjustable	
Incident illumination	24 V, 2 W intensity adjustable	
Dimensions	210x333x391 mm	240x333x391 mm
Mass	13,5 kg	14,5 kg

Standard accessory

- No. 176-116 Eyepiece 15x
- No. 176-138 Objective 2x
- No. 176-206 Cross slide table 50x50 (176-811 CED)
- No. 176-207 Cross slide table 100x50 (176-812 CED)

Pre-installed cross slide table, without integrated micrometers

Optional accessories

see page 381-383

Consumable Spares

- No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

Series 176

Objective

Objective	Eyeiece 10x (176-115)	Eyeiece 15x (176-116)*	Eyeiece 20x (176-117)
2x (176-138)*	20x (6,5 mm)	30x (6,5 mm)	40x (5,0 mm)
5x (176-139)	50x (2,6 mm)	75x (2,6 mm)	100x (2,0 mm)
10x (176-137)	100x (1,3 mm)	150x (1,3 mm)	200x (1,0 mm)

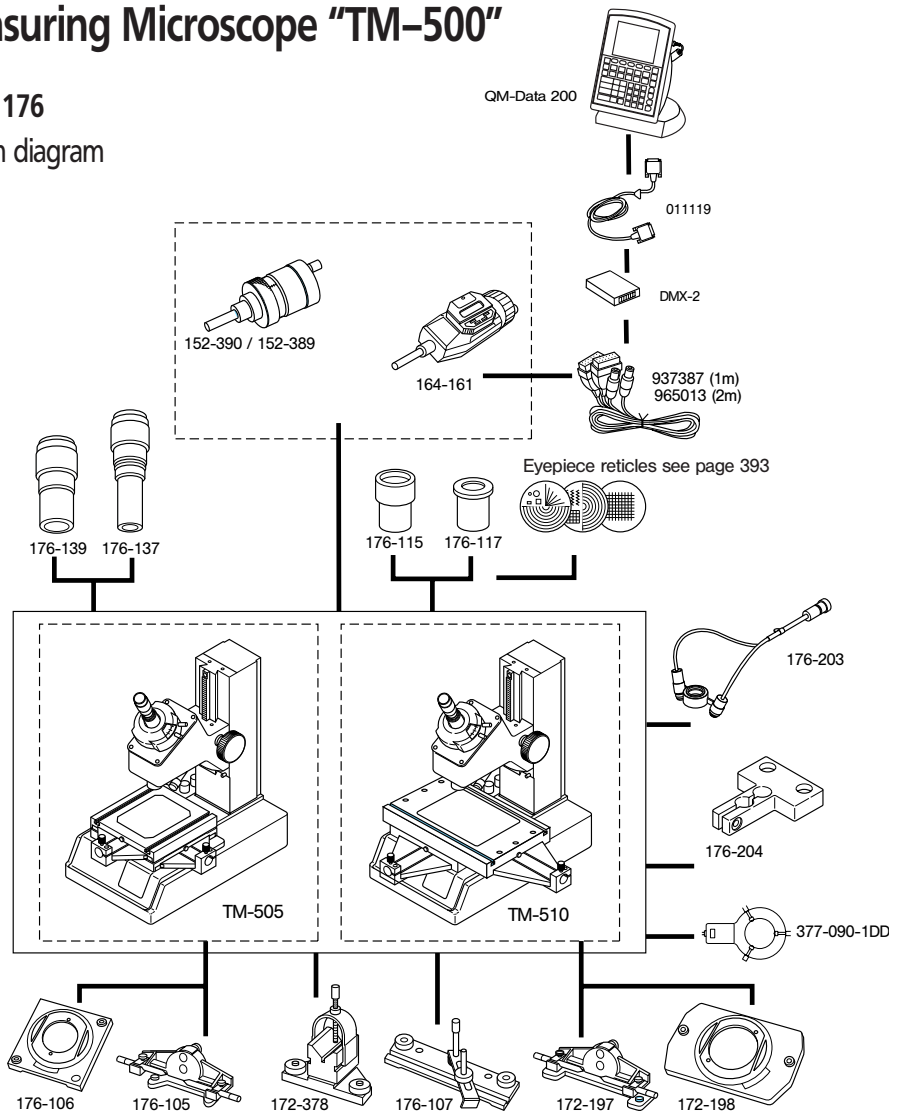
* = Standard accessory

The values in brackets refer to the field size.

Please order our brochure about the Fixture System "optifix".

Measuring Microscope "TM-500"

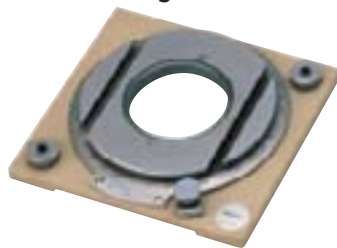
Series 176
System diagram



Measuring Microscope "TM-500" Optional accessories

Series 176

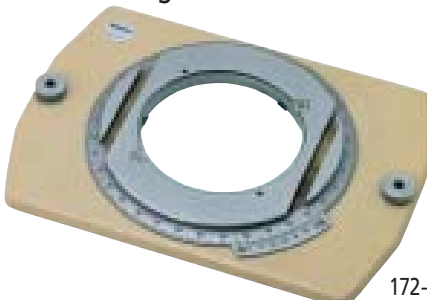
Optional accessory for TM-505
Rotatable stage



176-106

Series 176

Optional accessory for TM-510
Rotatable stage



172-198

Please order our brochure about the Fixture System "optifix".

Specifications

Rotation: 360°
Graduation: 1°
Nonius: 6'
Stage size: Ø 112 mm
Effective Ø 66 mm glass (No. 200662)
Height: 22 mm
Mass: 1,7 kg

Specifications

Rotation: 360°
Graduation: 1°
Nonius: 2'
Stage size: Ø 146 mm
Effective Ø 100 mm glass (No. 200667)
Height: 20,5 mm
Mass: 2,5 kg

Measuring Microscope "TM-500"

Optional accessories

Series 176

Optional accessory for TM-505
Swivel center support



176-105

Series 176

Optional accessory for TM-510
Swivel center support



172-197

Series 176

Holder with clamp



176-107

Series 176

V-block and clamp



172-378

Series 176

Vertical measuring device



176-204

Please order our brochure about the Fixture System "optifix".

Specifications

Angular adjustment: $\pm 10^\circ$
Graduation: 1°
Max. workpiece size: Vertical:
 $\varnothing 70 \text{ mm} \times 140 \text{ mm}$
at $\pm 10^\circ$ inclination:
 $\varnothing 45 \text{ mm} \times 140 \text{ mm}$
Mass: 2,4 kg

Specifications

Angular adjustment: $\pm 10^\circ$
Graduation: 1°
Max. workpiece size: Vertical:
 $\varnothing 80 \text{ mm} \times 140 \text{ mm}$
at $\pm 10^\circ$ inclination:
 $\varnothing 65 \text{ mm} \times 140 \text{ mm}$
Mass: 2,5 kg

Specifications

Max. workpiece height: 35 mm
T-slot length: 152 mm
Bore distance: 84 mm and 120 mm
Mass: 0,42 kg

Specifications

Max. workpiece size: $\varnothing 25 \text{ mm}$
Dimensions: $90 \times 65 \times 100 \text{ mm}$
Mass: 0,8 kg

Specifications

Receiver bore: $\varnothing 8 \text{ mm}$ for dial indicators

Measuring Microscope "TM-500"

Optional accessories

Series 176

Micrometer head with rotating spindle and data output



350-271

Series 176

Micrometer head with stationary spindle and data output



350-272

Series 176

Micrometer head with stationary measuring surface



152-389 / -390 (Y- and X-axis)

Series 176

Micrometer head with non-rotating spindle and data output



164-161

Micrometer heads

- Mechanical micrometer heads
- Elektronical micrometer heads
- "DIGIMATIC" micrometer heads

Refer to page 99 and 102

Series 176

Eyepiece reticles

- No. 176-109 Metric thread
pitch 0,25 – 1,0 mm
- No. 176-110 Metric thread
pitch 1,25 – 2,0 mm
- No. 176-111 Circles \varnothing 0,05 – \varnothing 4,00 mm
- No. 176-112 Involute module 0,1–1,0 mm
Pressure angle 20°
- No. 176-113 Angle 55°
- No. 176-114 Angle 60°
- No. 176-120 Whitworth thread
60 turns/inch – 26 turns/inch
- No. 176-121 Whitworth thread
24 turns/inch – 18 turns/inch
- No. 176-122 Whitworth thread
16 turns/inch – 11 turns/inch
- No. 176-123 UNC thread
80 turns/inch – 28 turns/inch

- No. 176-124 UNC thread
24 turns/inch – 14 turns/inch
- No. 176-125 UNC thread
13 turns/inch – 10 turns/inch
- No. 176-126 Cross lines (standard accessory)
- No. 176-127 NF thread
80 turns/inch – 28 turns/inch
- No. 176-128 NF thread
24 turns/inch – 14 turns/inch
- No. 176-129 F thread
13 turns/inch – 10 turns/inch
- No. 176-130 Involute module 0,1 – 1,0 mm
Pressure angle 14° 30'
- No. 176-140 ISO thread
pitch 0,075 – 0,7 mm
- No. 176-141 ISO thread
pitch 0,75 – 2,0 mm

Please order our brochure about the Fixture System "optifix".

Cold-light Illuminator

Cold-light Illuminator



011079-1
with 011080-1

Specifications

No. 011079-1	Cold-light Illuminator
Power consumption:	50 VA
Output:	35 W
Light brightness control:	stepless
Filter insertion:	lateral
Dimensions:	168 x 120 x 268 mm
Mass:	1,3 kg

Consumable Spares

No. 011315 Lamp 8 V, 30 W

Swan neck light conductor



011080-1

Specifications

No. 011080-1	Swan neck light
Swan neck light conductor:	with 2 arms, with focusing attachment
Arm length:	550 mm
Arm diameter:	4 mm

Flexible light conductor



011336

Specifications

No. 011336	Light conductor
Flexible light conductor:	one arm
Arm length:	1200 mm
Light conductor diameter:	7 mm

Hyper MF / MF-U High End Measuring Microscope

Very low uncertainty of length measurement.

- All 3 axes motor-driven.
- Max. workpiece weight 30 kg.
- Eyepiece with visual field no. 24.
- Large selection of objectives and accessories.

Specifications

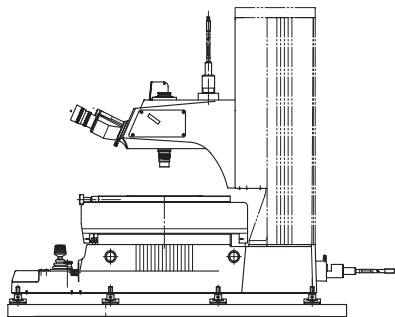
Length measurement tolerance: X – Y (0,9 + 0,3L/100) μ m
Z (with LAF) (1,5 + L/100) μ m
Scale resolution: 0,00001 mm
Measuring range: 250 x 150 x 150 mm



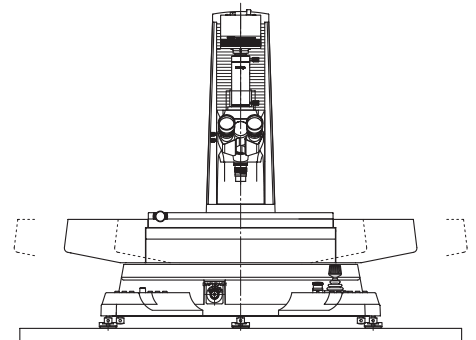
Hyper MF-U



Hyper MF with VISION UNIT and PC



Hyper MF side view



Hyper MF-U front view

Specifications

Model		Hyper MF	Hyper MF-U
Measuring range (mm)		250 (X-axis) x 150 (Y-axis) x 150 (Z-axis)	
Resolution		0,00001 mm	
Uncertainty of length measurement	X – Y-axis	(0,9 + 0,3L/100) μ m	
	Z-axis	(1,5 + L/100) μ m	
Axial movement		Motor driven	
Max. workpiece weight		30 kg	
Illumination	Transmitted light	12 V 50 W Cold light fibreoptic with integral aperture	
	Incident light	12 V 100 W Cold light fibreoptic with integral aperture	
Objective		1, 3, 5, 10, 20, 50, 100x	1, 2, 5, 10, 20, 50, 100x
Eyepieces		10, 15, 20 x	
Method of viewing		Bright field	Bright / dark field

Please order our brochure about the Fixture System "optifix".

Measuring Microscopes Model MF-A

- The Mitutoyo measuring microscopes series MF-A provide an outstanding image quality combined with high ease-of-operation based on ergonomics.
- The newly developed optical system minimizes the flare thus improving image quality.
- The absolute magnification from 10x up to 2000x allows for clear images over an extraordinary large view field. The operating elements, such as hand wheels, have been arranged to make operation easier. This reduces fatigue and allows for comfortable operation even for an extended period of time.
- TV-System/Photomicrography: Connectable to all models (C-Mount Adapter)
- Coarse and fine adjustment for quick and precise focussing
- Aperture stop: Unique for measuring microscopes in this price category
- Wide range of accessories: Fibre-optic ring light for difficult-to-view workpieces such as rubber and plastics. Wide angle adapter unit with a 0,5x magnification to widen the video camera range when using a TV- or photosystem.
- H models with 3-axis display.

Series 176



MF-A 1720 H

Model	MF-A1010 / H	MF-A1020 / H	MF-A1720 / H	MF-A1730 / H
No.	176-522 D / 176-526 D	176-529 D / 176-530 D	176-523 D / 176-527 D	176-524 D / 176-528 D
XY adjusting range of stage	100x100 mm	200x100 mm	200x170 mm	300x170 mm
Eyepiece	At the user's discretion: Monocular or binocular			
Resolution XY display	Switchable 0,001 mm, 0,0005 mm, 0,0001 mm			
Number of axis display	2 (H models with 3-axis display)			
Display functions	Zero-setting, resolution, counting direction, data output via RS-232 C interface			
Uncertainty of length measurement	XY: $(3 + 0,02 L) \mu\text{m}$ / Z: $(5 + 0,04 L) \mu\text{m}$ for model H L = measuring length (mm)			
Focussing range	150 mm	150 mm	220 mm	220 mm
		Coarse and fine focussing by hand wheel		
Measuring stage dimensions	280x280 mm	350x280 mm	410x342 mm	510x342 mm
Effective size of stage glass	180x180 mm	250x150 mm	270x240 mm	370x240 mm
Rotation range	-	-	$\pm 5^\circ$	$\pm 5^\circ$
Max. workpiece height	150 mm	150 mm	220 mm	220 mm
Max. workpiece weight	5 kg	10 kg	20 kg	20 kg
Total dimensions (WxDxH)	555x741x630 mm	618x741x630 mm	626x887x750 mm	676x887x750 mm
Mass	55 kg	59 kg	130 kg	138 kg

Please order our brochure about the Fixture System "optifix".

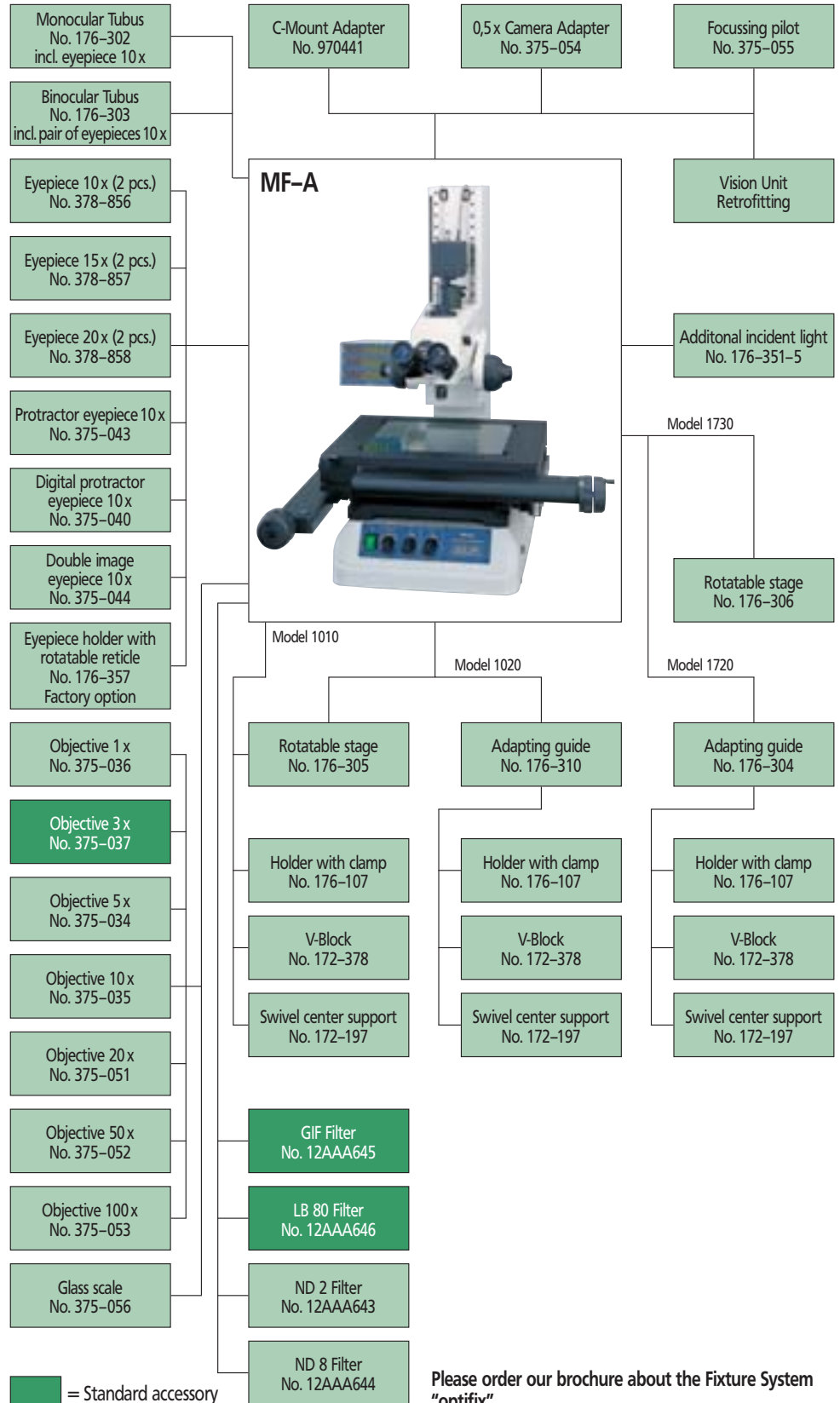
Specifications

Model:	MF-A Model
Optical Tubus Type:	Monocular or binocular (optional accessories)
Image:	Non reversed (with crosshair reticle angle 25°)
Camera mount:	Provided
Objectives Magnification:	3 x (standard accessory), 1 x, 5 x, 10 x, 20 x, 50 x, 100 x
Eyepiece Magnification:	At the user's discretion: Monocular 1 piece 10 x, Binocular 2 pcs. 10 x, optional accessory included optical tube
Image field:	24 mm (View field \varnothing 8 mm when using 3 x objective)
Transmitted light Illumination method:	Koehl lighting
Light illuminator:	Halogen (12 V, 50 W), Lamp life appr. 50 hours (513667)
Light intensity:	Dimming adjustable
Remarks:	With aperture diaphragm, green filter (938905)
Incident light Illumination method:	Telecentric
Light illuminator:	Halogen (12 V, 50 W), Lamp life appr. 50 hours (513667)
Light intensity:	Dimming adjustable
Remarks:	With aperture diaphragm

More detailed information on these and other products can be found in the product brochures.

Measuring Microscopes MF-A Model

Series 176 System diagram



Profile Projector PJ-A3000

- Table instrument for testing small and medium sized workpieces.
- Vertical, rotatable cross lines screen.
- Easy to operate coordinate measuring stage with coarse and fine adjustment.
- Direct and clear, easy to read XY digital display at eye level ensures safe and faultless measurement.
- Halogen transillumination and incident illumination are integrated into the housing.
- Provided with a protractor as standard.

Series 302



302-701 D

Direct reading of measurement data on the 6 digit digital display enables safe and faultless measuring. Built in protractor, switchable for reading in degrees or decimal reading. Resolution: 1' or 0,01°.

Model	PJ-A3000 Series	
Screen	Diameter	315 mm
	Protractor	Switchable degree/decimal, Resolution: switchable 0,01°/ 1'
		Display range: ± 360° (count up to ± 370°)
Functions	ABS/INC switch, ZERO	
Uncertainty of Magnification	0,1 % transillumination, 0,15 % incident illumination	
Illumination	Lamps	Halogen lamp (24 V, 150 W)
	Illumination system	Telecentric
Power supply	230 V, 50/60 Hz	
Mass	PJ-A3005 F-150: 116 kg; PJ-A3010 F-200: 140 kg	

Specifications Coordinate measuring stage

Model	PJ-A3005 F-150	PJ-A3010 F-200
		
No.	302-702 D	302-701 D
Measuring range XY axes	150 x 50 mm	200 x 100 mm
Resolution	0,001 mm	
Measuring system	Built in glass scale	
Stage size	280 x 152 mm	380 x 250 mm
Max. workpiece height	up to 103,5 mm	up to 92,5 mm
Max. workpiece weight	5 kg	
Functions	ZERO setting +/- direction choice RS-232 C interface	
	X axes displacement	XY axes displacement

Please order our brochure about the Fixture System "optifix".

Standard accessory

- No. 172-202 10 x Objectives
- No. 12AAD990 Measuring stage (PJ-A3005 F-150)
- No. 319-225-1 Measuring stage (PJ-A3010 F-200)
- No. 515530 3 x Halogen lamps (24 V/150 W)
- No. 383876 Protective hood
- No. 930919 Light shield

Consumable Spares

- No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



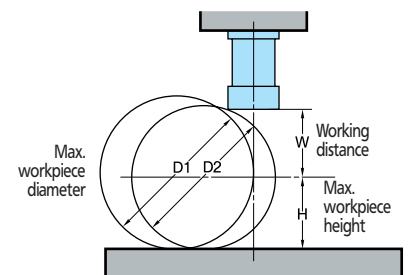
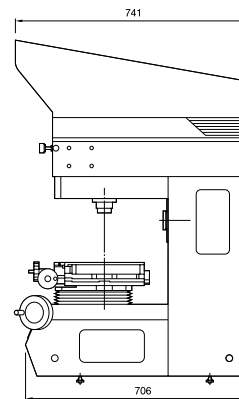
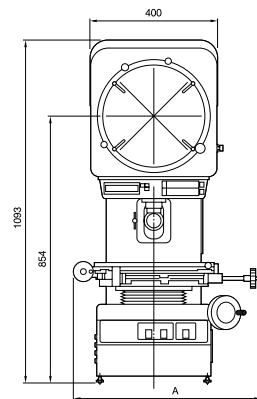
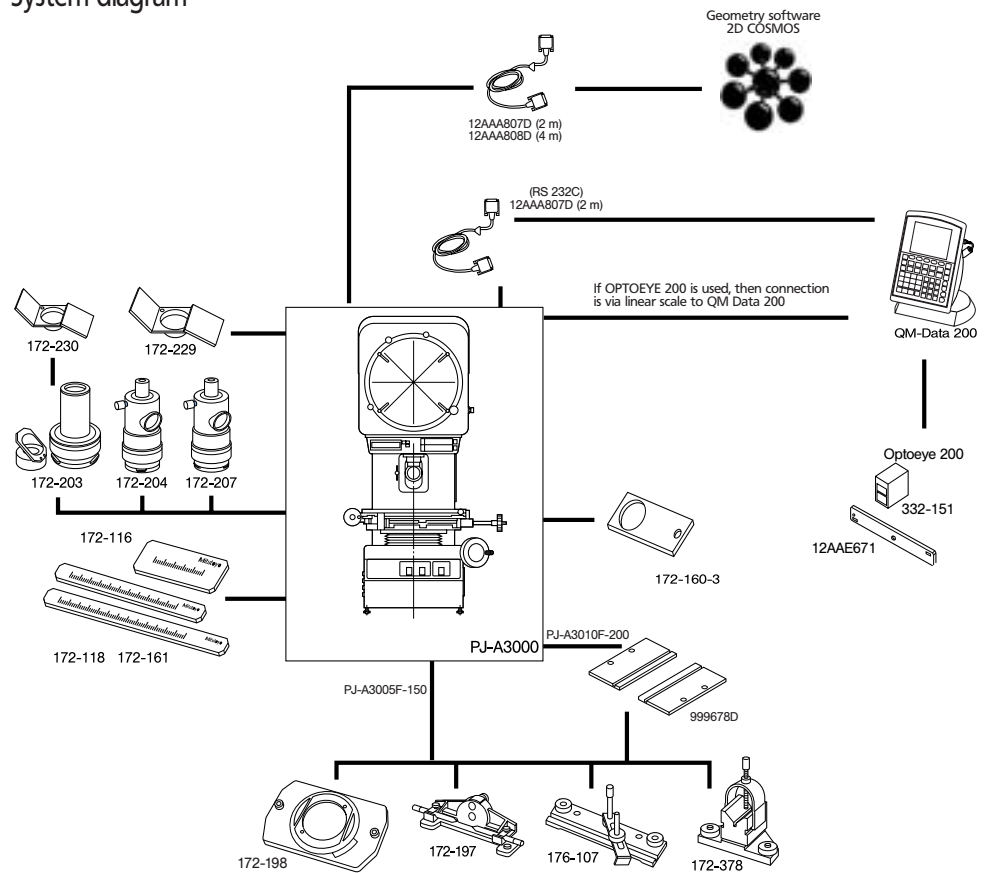
011298

Profile Projectors PJ-A3000

Series 302 System diagram

Standard accessory

No. 172-202 Objectives 10x



Magnification	Transillumination				Incident illumination			
	10x	20x	50x	100x	10x	20x	50x	100x
Image field (mm)								
PJ-A3005F-150								
PJ-A3010F-200	31,5	15,7	6,3	3,1	31,5	15,7	6,3	3,1
W (mm)								
PJ-A3005F-150	66	32,5	12,6	5	20	2	12,6	5
PJ-A3010F-200								
H (mm)								
PJ-A3005F-150	103,5	103,5	103,5	103,5	103,5	103,5	103,5	103,5
PJ-A3010F-200	92,5	92,5	92,5	92,5	92,5	92,5	92,5	92,5
D1 (mm)								
PJ-A3005F-150	207	87	27	10	198	61	27	10
PJ-A3010F-200	185	87	27	10	185	61	27	10
D2 (mm)								
PJ-A3005F-150	154	69	25	10	120	23	25	10
PJ-A3010F-200								

Profile Projectors PJ-A3000

Optional accessories

Series 172

Objectives for PJ-A3000 Series

All objectives are supplied with a semitransmitting mirror.
The reflectors are integrated into the 50x and 100x lens systems



10x
172-202
(standard
accessory)

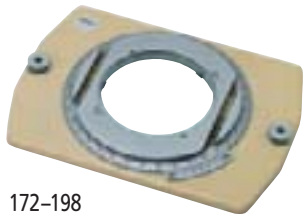
20x
172-203

50x
172-204

100x
172-207

Series 176 / Series 172

Rotatable stage

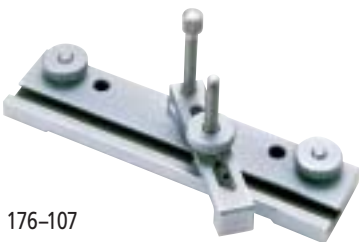


172-198

No.	Rotation mm	Graduation	Vernier reading	Contact surface Ø mm	Effective Ø mm	Height mm	Mass kg
172-198	360°	1°	2'	146	100	20,5	2,5

Series 176

Clamping holder



176-107

Standard accessory

No. 172-292 Semitransmitting mirror
for 10x objectives

No. 172-293 Semitransmitting mirror
for 20x objectives

Specifications

Max. workpiece height: 35 mm
T-slot length: 152 mm
Bore distance: 84 mm and 120 mm
Mass: 0,42 kg

Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-A3000

Optional accessories

Series 172

Swivel center support



172-197

No.	Angular adjustment	Graduation	Max. workpiece Ø mm	Max. workpiece length mm	Mass kg
172-197	± 10°	1°	80 (65)	140	2,5

() If angle adjustment 10°

Specifications

Mass: 2 kg

Adapter plates

Adapter plate for fixing the rotatable stage, clamping holder and center support (only for PJ-A3010 F-200)



999678D

Specifications

Max. workpiece size: Ø 25 mm
Dimensions: 90 x 65 x 100 mm
Mass: 0,8 kg

Series 172

V-block with clamping device



172-378

Please order our brochure about the Fixture System "optifix".

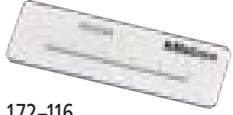
Profile Projectors PJ-A3000

Optional accessories

Series 172

Glass scale

For testing the magnification

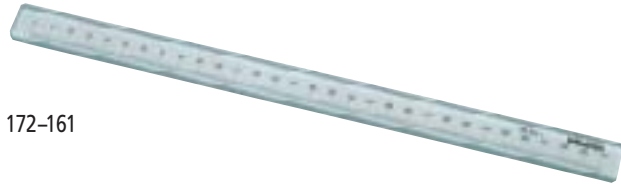


172-116

Series 172

Glass scale

For testing the magnification and measurement on the screen.

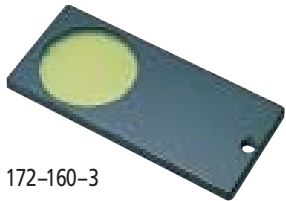


172-161

Series 172

Greenfilter

For increasing the acutance



172-160-3

Series 172

Incident light mirror

For observation by incident light of poorly reflecting workpieces



Objective	No.	Series
10x	172-229	PJ-A3000
20x	172-230	PJ-A3000

Specifications

Accuracy: Factory specification
 Measuring range: 50 mm
 Graduation: 0,1 mm
 Error limits: $(3 + 5L/1000) \mu\text{m}$
 L = measuring length in mm

Specifications

Accuracy: Factory specification
 Measuring range: No. 172-161 = 300 mm
 No. 172-118 = 200 mm
 Graduation: 0,5 mm
 Error limits: $(15 + 15L/1000) \mu\text{m}$
 L = measuring length in mm

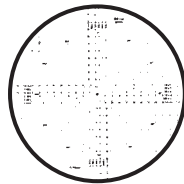
Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-A3000

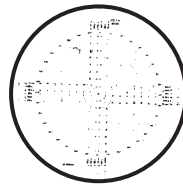
Optional accessories

Standard Overlay Charts

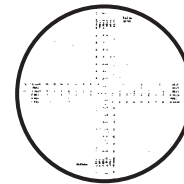
see page 409



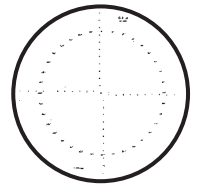
Type RE
Square line net



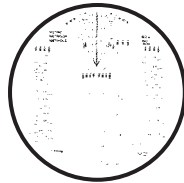
Type PO
Polar line net



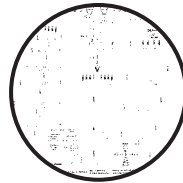
Type RA
Radii



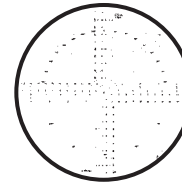
Type GO
Angle



Type M
Metrical ISO thread



Type DE
Involute toothing



Type CO
Combination of square line
and polar

For	Grid rectangular (Type RE)	Grid polar (Type PO)	Radius (Type RA)	Angle (Type GO)	Metric ISO thread (Type M)	Involute gearing (Type DE)	Combination (RE and PO) (Type CO)
PJ-A3000	No. 201386	No. 201387	No. 201388	No. 201389	No. 201390	No. 201391	No. 512652

Specifications

Stage size: 440 x 830 mm
Height: 660 mm

Series 172

Sub case for profile projector



172-269

MC Special cleaner

for laboratory and photo optics, microscopes (120 ml)



011298

Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-H3000 Type T2; T4

- **Incident illumination with variable incident light adjustment**

By rotating the condenser lens and changing the angle of the semitransmitting mirror in the objective, even poorly reflecting surfaces can be represented optimally.

- **Built in automatic edge detector OPTOEYE (Type T4 only)**

The Optoeye allows for automatic edge detection during measurement without influence of the user.

- **Motoric focussing**

The motoric focussing facilitates measuring. The focussing speed is progressively adjustable.

- **Newly developed objectives**

Newly developed objectives with improved lens systems provide a bright and clear workpiece representation on the screen.

- **Large measuring range**

The measuring projectors PJ-H3010FT2-300 and PJ-H3010FT4-300 offer a max. measuring range of 300 mm in X and 100 mm in Y direction. Additionally, these stages are suited with a Quick release system which allows for easy and rapid execution of large displacements.

- **Non reversed representation**

The large screen diameter (306 mm) facilitates observation of large workpieces. Representation on the screen is non reversed.

- **3 faced turret head**

The 3 faced turret head enables easy interchanging of objectives during measurement. The objectives are parfocal and can be interchanged without re-focussing.

Series 303



303-986 CED (Illustration with optional accessory)



Motoric focussing



Automatic edge detector (Type T4)

Functions	303-985 CED	303-988 CED	303-986 CED	303-989 CED
	Type T2	Type T2	Type T4	Type T4
Zero-setting for any axis	●	●	●	●
+/- direction choice	●	●	●	●
DIGIMATIC XY coordinate data output	●	●	●	●
Angle DIGIMATIC data output	●	●	●	●
Edge sensor (Optoeye)			●	●
Motoric focussing	●	●	●	●

Standard accessories

- No. 172-472 10x Objective
- No. 515530 2x Halogen lamps (24V/150W)
- No. 383876 Protective hood
- No. 172-201 Light shield

Optional accessories

- No. 172-271 5x Objective
- No. 172-473 20x Objective
- No. 172-474 50x Objective
- No. 172-275 100x Objective

See page 397 onwards for further optional accessories

Consumable Spares

- No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

Please order our brochure about the Fixture System "optifix".

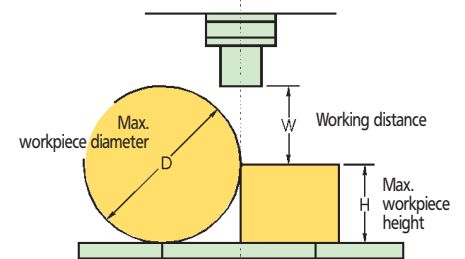
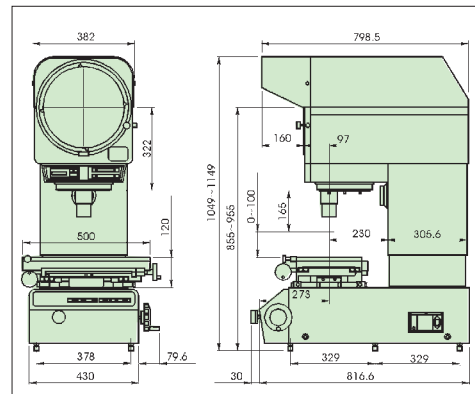
Profile Projectors PJ-H3000 Type T2; T4

Model		PJ-H3000 Series
Screen	Diameter	306 mm
	Protractor	Switchable degree/decimal, Resolution: switchable 0,01°/ 1' Display range: ± 360°
Functions		ABS/INC switch, ZERO, data output,
Objective receiver		3 faced turret head
Uncertainty of magnification		0,1% for transillumination, 0,15% for incident illumination
Illumination	Lamps	Halogen lamps (No. 515530), (24 V, 150 W)
	Illumination system	Telecentric (24 V, 150 W)
Power supply		230 V, 50/60 Hz
Mass		PJ-H3010FT4-200: 188 kg; PJ-H3010FT4-300: 189 kg; PJ-H3010FT2-200: 187 kg; PJ-H3010FT2-300: 188 kg

Specifications Coordinate measuring stage

	No.	303-985 CED	303-988 CED
Type T 2	Model	PJ-H3010FT2-200	PJ-H3010FT2-300
	No.	303-986 CED	303-989 CED
Type T 4	Model	PJ-H3010FT4-200	PJ-H3010FT4-300
	No.		

Measuring range X/Y axis	200 / 100 mm	300 / 100 mm
Resolution	0,001 mm	0,001 mm
Measuring system	Built in glass scales	Built in glass scales
Stage size	430 x 254 mm	500 x 254 mm
Stage glass size	280 x 180 mm	364 x 180 mm
Max. workpiece weight	20 kg	20 kg



Magnification	No.	Image field Ø	Measuring W	Measuring H	Measuring D
		mm	mm	mm	mm
5 x	172-271	61,2	66,0	105	188
10 x*	172-472	30,6	70,5	105	206
20 x	172-473	15,3	56,5	105	186
50 x	172-474	6,0	50,0	105	177
100 x	172-275	3,0	50,0	105	182

* Standard accessory

Consumable Spares:

No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



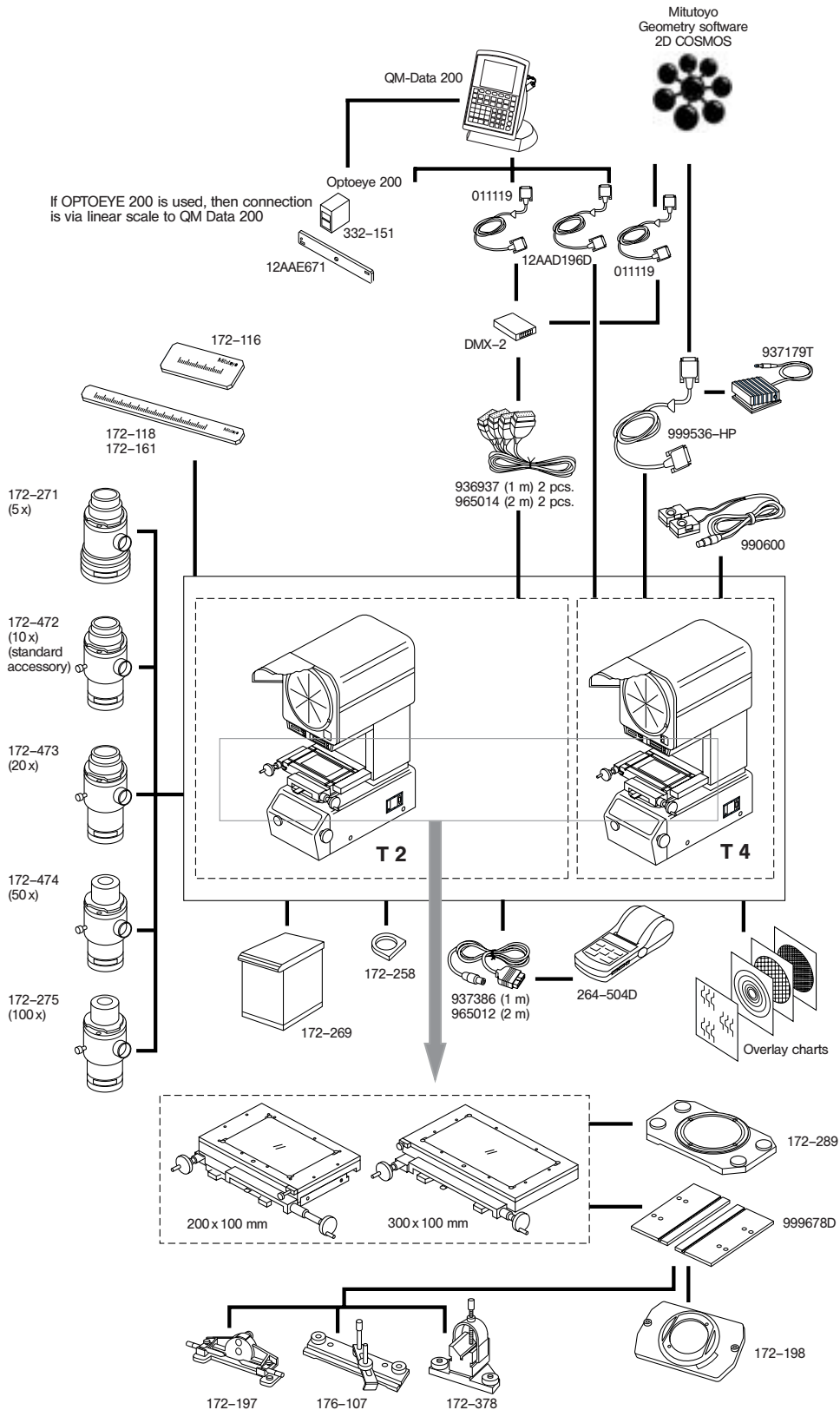
011298

Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-H3000 Type T2; T4

Series 302

System diagram



Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-H3000 Type T2; T4

Optional accessory

Series 172

Objectives for series PJ-H3000

All objectives are supplied with a built in semitransmitting mirror.



5x
172-271



10x
172-472
(standard
accessory)



20x
172-473



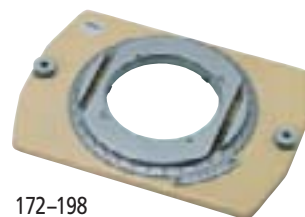
50x
172-474



100x
172-275

Series 172

Rotatable stage



172-198



172-289

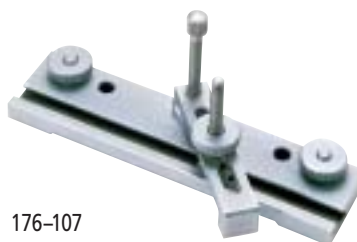
No.	Rotation mm	Graduation	Vernier reading	Contact surface Ø mm	Effective Ø mm	Height mm	Mass kg
172-198	360°	1°	2'	146	100	20,5	2,5
172-289	360°	-	-	-	200	33,0	14,0

Specifications

Max. workpiece height: 35 mm
T-slot length: 152 mm
Bore distance: 84 mm and 120 mm
Mass: 0,42 kg

Series 176

Holder with clamp



176-107

Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-H3000 Type T2; T4

Optional accessories

Series 172

Swivel center support



172-197

No.	Angular adjustment	Graduation	Max. workpiece Ø mm	Max. workpiece length mm	Mass kg
172-197	± 10°	1°	80 (65)	140	2,5

() If angle adjustment 10°

Adapter plates

Adapter plate for fixing the rotatable stage (172-196), clamping holder, center support and V-block with clamping device.



999678D

Series 172

V-block with clamping device



172-378

Please order our brochure about the Fixture System "optifix".

Specifications

Mass: 2 kg

Specifications

Max. workpiece size: Ø 25 mm

Dimensions: 90 x 65 x 100 mm

Mass: 0,8 kg

Profile Projectors PJ-H3000 Type T2; T4

Optional accessories

Specifications

Accuracy: Factory specification
Measuring range: 50 mm
Graduation: 0,1 mm
Error limits: $(3 + 5L/1000) \mu\text{m}$
L = measuring length in mm

Specifications

Accuracy: Factory specification
Measuring range: No. 172-161 = 300 mm
No. 172-118 = 200 mm
Graduation: 0,5 mm
Error limits: $(15 + 15L/1000) \mu\text{m}$
L = measuring length in mm

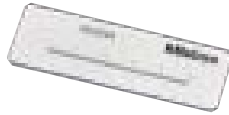
Specifications

Stage size: 440 x 830 mm
Height: 660 mm

Series 172

Glass scale

For testing the magnification

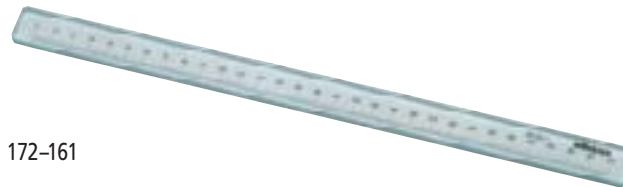


172-116

Series 172

Glass scale

For testing the magnification and measurement on the screen.



172-161

Series 172

Greenfilter

For increasing the acutance



172-258

Series 172

Sub case for measuring projector



172-269

Further optional accessories such as QM-Data 200 and Optoeye 200 (Type T2 only) see page 406 and 408

Please order our brochure about the Fixture System "optifix".

Profile Projector PV-5110

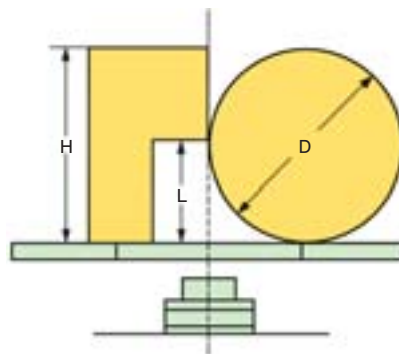
- The measuring projector PV-5110 is a robust stand alone device.
- The large rotatable screen guarantees good observation and easy measuring.

Series 304



No. 304-909D (PV-5110)
with KA Counter (optional accessory)

No.	304-909D
Model	PV-5110
XY measuring range	X 200 mm, Y 100 mm
Measuring system	"Linear Scale"
Resolution	1 μ m
Angle reading	0,01° or 1'
Screen diameter	508 mm
Max. workpiece weight	5 kg
Measuring range	200x 100 mm
Table glass size	280x 180 mm
Objective	10x (standard accessory)
Transillumination	24 V, 150 W
Incident illumination	24 V, 150 W
Dimensions	620 x 1073 x 1627 mm
Mass	190 kg
Projection laterally	reversed
Height adjustment	160 mm



H = maximum workpiece height
 L = maximum focussing range for step height
 D = maximum focussing range for cylinder diameter
 with an edge projected onto the screen center.

Projection objective	Viewing field \varnothing mm	Projection method	H mm	L mm	D mm
5 x	100	Transillumination	125	60,0	120,0
5 x	100	Incident illumination	125	27,0	-
10 x	50	Transillumination	181	60,0	120,0
10 x	50	Incident illumination	181	60,0	-
20 x	25	Transillumination	206	60,0	120,0
20 x	25	Incident illumination	206	60,0	-
50 x	10	Transillumination	87	32,4	64,8
100 x	5	Transillumination	87	22,5	45,0

Please order our brochure about the Fixture System "optifix".

Standard accessory

- Measuring stage (200 x 100 mm)
- Incident illumination (Halogen)
24 V, 150 W for 5 x, 10 x and 20 x
- No. 172-402** Objective set, 10 x
- No. 512089** Receiver for display unit
- No. 512305** Halogen lamp, 24 V, 150 W
Protective hood

Consumable Spares

- No. 011298** MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

Further optional accessory: QM-Data 200
see page 406 and 407

Profile Projector PV-5010

Series 304 System diagram

Optional accessories

Objectives

- No. 172-401** 5x Objective set including:
No. 172-406 Objective
No. 172-407 Condenser
No. 932602 Adapter for objective
(Incident illumination)
- No. 172-402** 10x Objective set
(standard accessory) including:
No. 172-409 Objective
No. 172-410 Condenser
- No. 172-403** 20x Objective set including:
No. 172-411 Objective
No. 172-412 Condenser
- No. 172-404** 50x Objective set including:
No. 172-413 Objective
No. 172-414 Condenser
- No. 172-405** 100x Objective set including:
No. 172-415 Objective
No. 172-414 Condenser

No. 999678 D Adapter for *

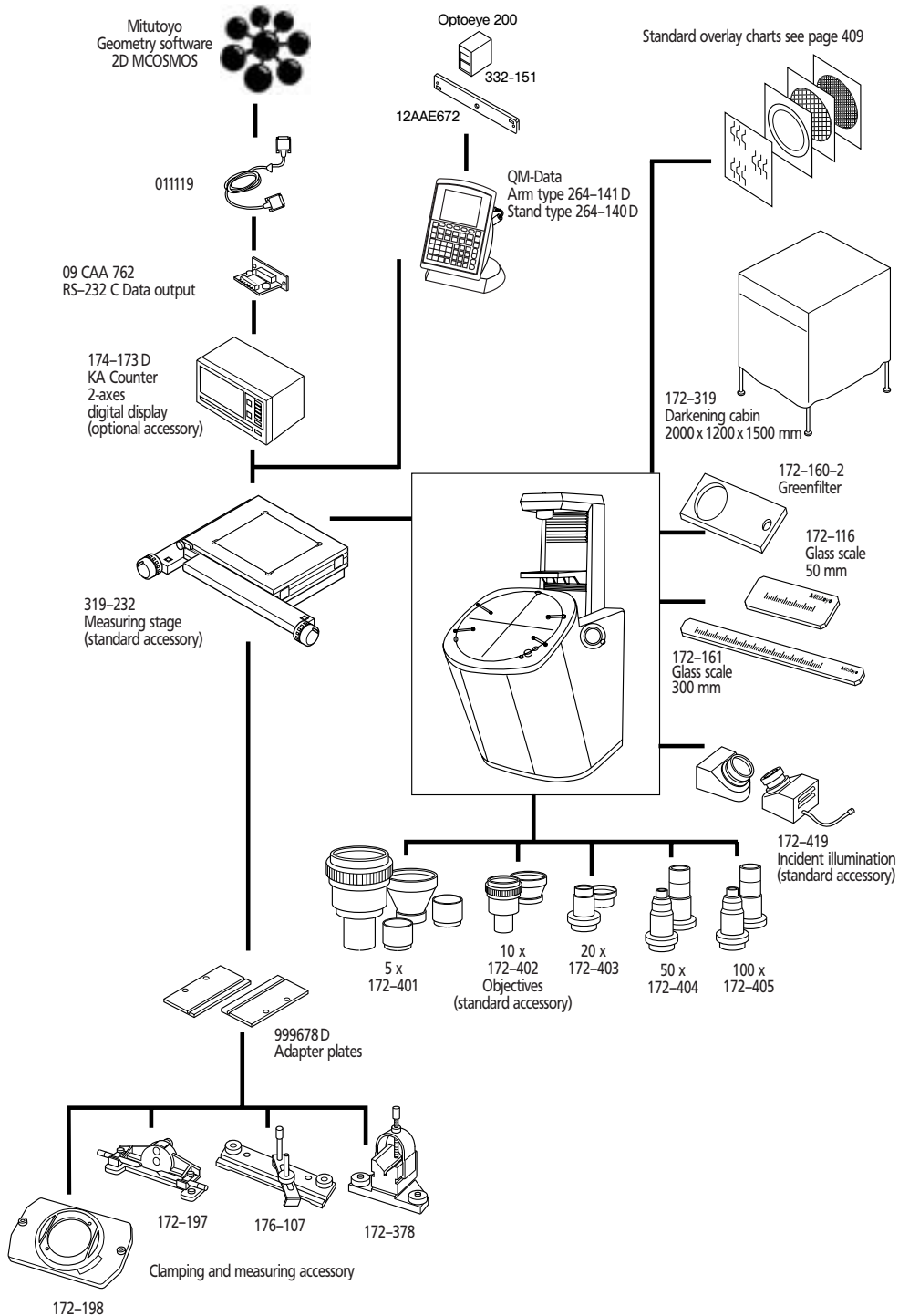
- * **No. 172-198** Rotatable stage
Rotation 360°, scale 1°, nonius 2'
Stage size: Ø 146 mm
Glass plate: Ø 100 mm (No. 200667)
Mass: 2,5 kg
- * **No. 172-197** Swivel center support
Angle adjustment: ± 10°,
Reading: 1°
Max. workpiece size:
vertical: Ø 80 mm x 140 mm
at ± 10° inclination:
Ø 65 mm x 140 mm
Mass: 2,5 kg
- * **No. 176-107** Clamping holder
Max. workpiece height: 35 mm
T-slot length: 152 mm
Bore distance: 84 mm and
120 mm
Mass: 0,42 kg
- * **No. 172-378** V-Block with clamps
Max. workpiece size: Ø 25 mm
Dimensions: 90 x 65 x 100 mm
Mass: 0,8 kg

No. 172-319 Protective cabin to darken
the screen
2000 x 1200 x 1500 mm

No. 172-116 Glass scale
Length 50 mm, graduation 0,1 mm
Accuracy (3 + 5L/1000) µm

No. 172-161 Glass scale
Length 300 mm, graduation 0,5 mm
Accuracy (15 + 15L/1000) µm

No. 172-160-2 Colorfilter (green)



Please order our brochure about the Fixture System "optifix".

Profile Projector PH-A14

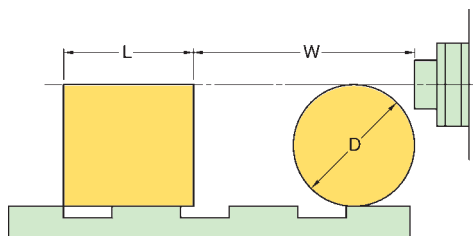
- The profile projector PH-A14 is a device in horizontal design.
It is suited for measuring and observing of larger workpieces as e.g. toothed racks, punching tools, etc.
- Max. workpiece mass 45 kg.

Series 172



No. 172-810 DM (PH-A14)
with optional evaluation unit
QM-Data 200 (264-141 D)

No.	172-810DM
Model	PH-A14
XY measuring range	X 200 mm, Y 100 mm
Measuring system	"Linear Scale"
Resolution	0,001 mm
Screen diameter	356 mm (rotatable)
Angle reading	2'
Max. workpiece weight	45 kg
Stage size	407x 153 mm
Objective	10x
Transillumination:	24, 150 W Telecentric
Incident illumination:	24 V, 150 W (Two separate light guides)
Dimensions	612x 1240 x 1158 mm
Mass	ca. 140 kg
Focussing range:	50,8 mm



Magnification	No.	Image field Ø mm	Measuring W mm	Measuring L mm	Measuring D mm
10 x*	172-011	35,60	93	235	130
20 x	172-012	17,80	40	235	116
50 x	172-013	7,12	14,6	109	31,3
100 x	172-014	3,56	9,5	109	19,2

* Standard accessory

Standard accessories

- No. 172-011 10 x Objective
- No. 512305 Halogen lamp 24 V, 150 W

Consumable Spares

- No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)

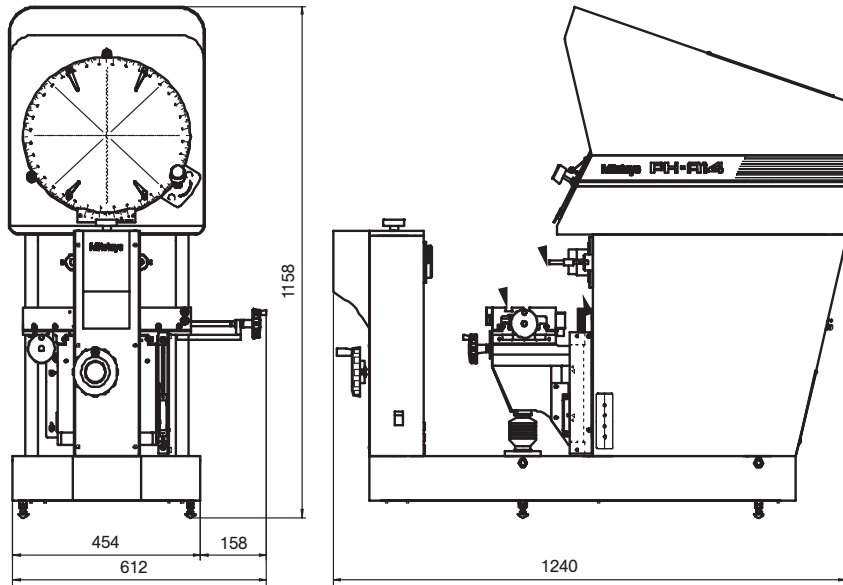


011298

Please order our brochure about the Fixture System "optifix".

Profile Projector PH-A14

Series 172 Dimensions



Optional accessories

Objectives

- No. 172-011 10x Objective (standard accessory)
- No. 172-012 20x Objective
- No. 172-013 50x Objective
- No. 172-014 100x Objective
- No. 172-142 Tailstocks, locator dia. 120 mm, (Ø 240 mm with 172-143) Mass: 3,3 kg
- No. 172-143 Support frames for 172-142 Mass: 2,2 kg
- No. 172-132 Workpiece locator Mass: 1,3 kg
- No. 172-144 Rotatable vice
Rotation range 360°,
Max. aperture 76 mm
Mass: 2,8 kg

- No. 172-234 V block
Max. workpiece size: Ø 50 mm
Mass: 1,24 kg

- No. 172-001 Workpiece locator for e.g. saw blades, disc milling cutters

- No. 172-002 Workpiece locator for e.g. saw blades, disc milling cutters

- No. 172-116 Glass scale
Length 50 mm,
graduation 0,1 mm
Accuracy (3 + 5L/1000) µm

- No. 172-118 Glass scale
Length 200 mm,
graduation 0,1 mm
Accuracy (3 + 5L/1000) µm

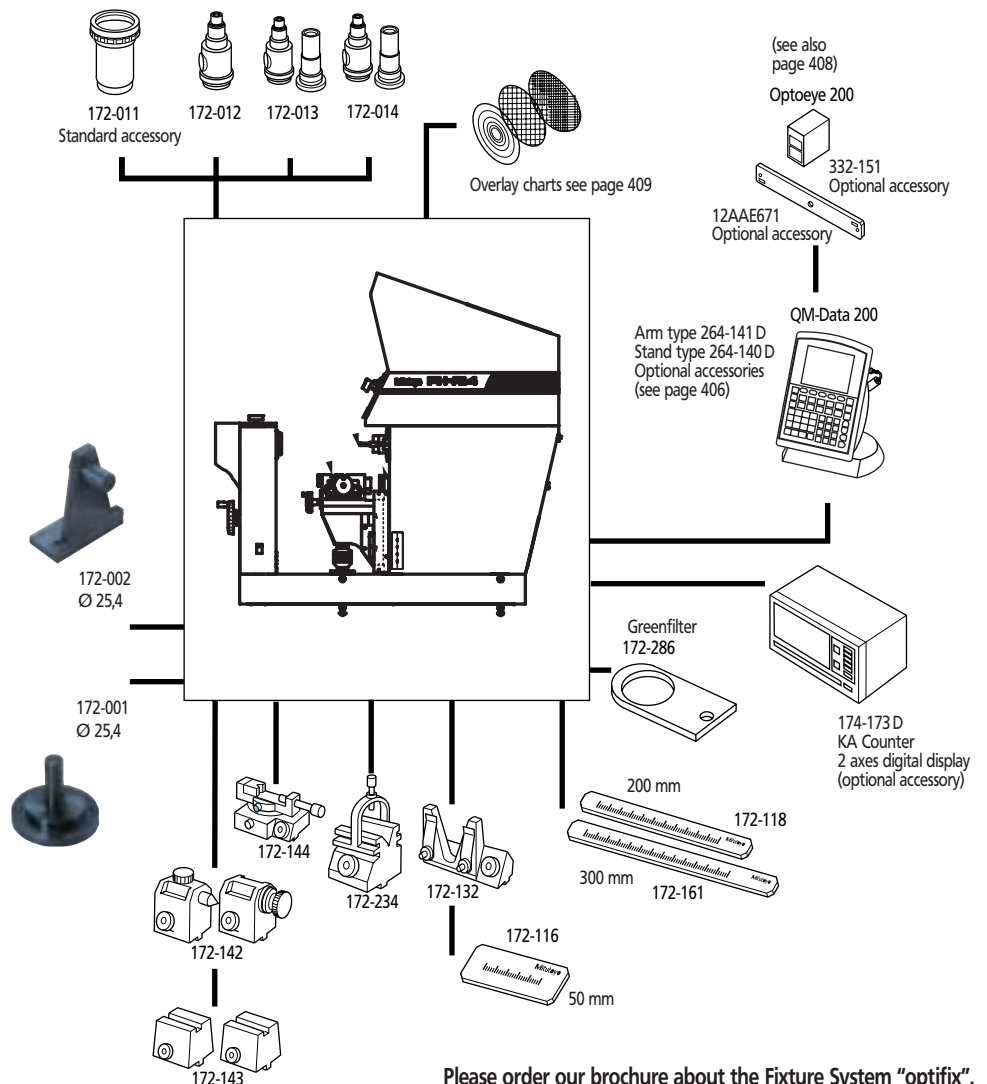
- No. 172-161 Glass scale
Length 300 mm,
graduation 0,5 mm
Accuracy (15 + 15L/1000) µm

- No. 172-286 Colorfilter (green)

- No. 174-173D KA display
2 axes

- No. 58AAA407 Locator for KA display

Series 172 System diagram



Please order our brochure about the Fixture System "optifix".

Profile Projector PH-3515 F

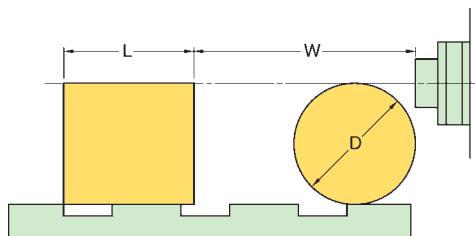
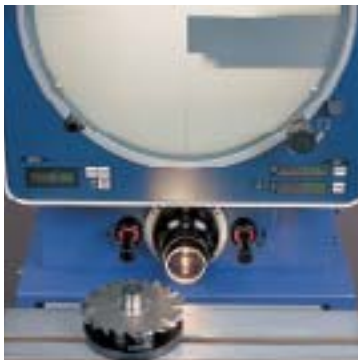
- The profile projector PH-3515 F is a device in horizontal design.
- It is suited for measuring and observing of larger workpieces as e.g. toothed racks, punching tools, etc.
- Max. workpiece mass 45 kg.

Series 172



No. 172-847 (PH-3515 F)

No.	172-847
Model	PH-3515 F
XY measuring range	X 254 mm, Y 152 mm
Measuring system	"Linear Scale"
Resolution	0,001 mm
Angle reading	0,01° oder 1'
Screen diameter	353 mm
Max. workpiece weight	45 kg
Stage size	450 x 146 mm
Objective	10 x
Transillumination:	24, 150 W Rotatable screen. Built in XY digital display
Incident illumination:	24 V, 200 W (Twin cold-light illumination)
Dimensions	460 x 1115 x 1150 mm
Mass	150 kg
Focussing range:	50 mm



Magnification	No.	Image field Ø mm	Measuring W mm	Measuring L mm	Measuring D mm
5 x	172-145	71,20	160,0	175	152,4
10 x*	172-184	35,60	93,0	235	152,4
20 x	172-173	17,80	40,0	235	116,0
50 x	172-165	7,12	14,6	80	30,4
100 x	172-166	3,50	9,5	109	19,0

* Standard accessory

Please order our brochure about the Fixture System "optifix".

Specifications

Built in digital display for angle measurement

Standard accessory

- No. 172-184** 10 x Objective
- No. 383228** Protective hood
- No. 515530** Halogen lamp 24 V, 150 W (1 pcs.)
- No. 12BAA637** Halogen lamp 24 V, 200 W (1 pcs.)

Consumable Spares

- No. 011298** MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

Profile Projector for Heavy Workpieces PH-3515 F

Optional accessories

Objectives

- No. 172-145 5 x Objective
- No. 172-295 10 x Objective
(standard accessory)
- No. 172-173 20 x Objective
- No. 172-165 50 x Objective
- No. 172-166 100 x Objective

No. 172-142 Tailstocks, locator dia. 120 mm,
(Ø 240 mm with 172-143)
Mass: 3,3 kg

No. 172-143 Support frames for 172-142
Mass: 2,2 kg

No. 172-132 Workpiece locator
Mass: 1,3 kg

No. 172-133 Incident illumination

No. 172-144 Rotatable vice
Rotation range 360°,
Max. aperture 76 mm
Mass: 2,8 kg

No. 172-234 V block
Max. workpiece size: Ø 50 mm
Mass: 1,24 kg

No. 172-001 Workpiece locator for e.g.
saw blades, disc milling cutters

No. 172-002 Workpiece locator for e.g.
saw blades, disc milling cutters

No. 172-116 Glass scale
Length 50 mm,
graduation 0,1 mm
Accuracy (3 + 5L/1000) µm

No. 172-118 Glass scale
Länge 200 mm,
graduation 0,1 mm
Accuracy (3 + 5L/1000) µm

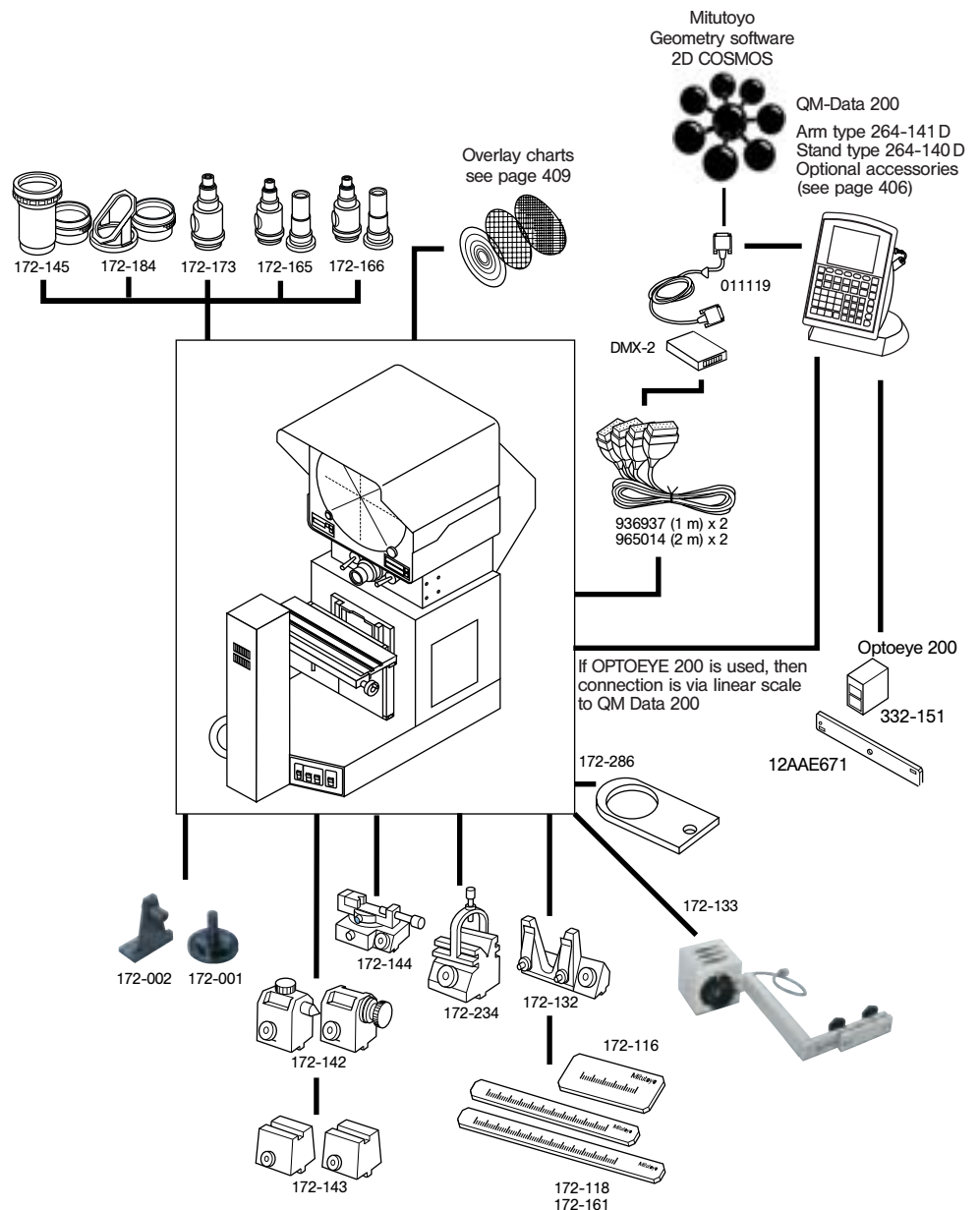
No. 172-161 Glass scale
Länge 300 mm,
graduation 0,5 mm
Accuracy (15 + 15L/1000) µm

No. 172-286 Colorfilter (green)

No. 174-173D KA display
2 axes

No. 58AAA407 Locator for KA display

Series 172 System diagram



Please order our brochure about the Fixture System "optifix".

Data Processing Unit QM-Data 200

No. 264-140 D QM-Data 200 (Table-top version)

No. 264-141 D QM-Data 200 (Built-on version)

- The Data Processing Unit QM 200 has been especially developed to process measuring data generated by a profile projector or a measuring microscope.
- Measuring instructions, measuring values and calculation results for various operations shown on the back-lit LCD are easy to grasp and comprehend.
- Measuring results can also be printed, either by a small and convenient receipt printer (available as special option) or on ESC/P printer and continuous paper.
- By connecting the optional floppy disk drive newly created part programs, measuring values as well as calculation results may be stored and/or loaded.

Series 264

Table-top type



No. 264-140 D

Series 264

Built-on type



No. 264-141 D

Specifications

Screen:	Graphic LCD (320 x 240 dot; with background lighting)
Power supply:	AC adapter
Power consumption:	max. 24 W (accessories not included)
Dimensions (W x D x H):	200 x 90 x 280 mm
Mass:	1,2 kg (Data Processing Unit); approx. 1,0 kg (Stand, optionally available)

Optional accessories

No. 12AAD033	Printer (with cable)
No. 908353-1	Printer paper (1 roll)
No. I-1525612	Printer cable for ESC/P (Page-Printer (2 m))
No. 12AAA799	Diskdrive
No. 937179 T	Foot switch

Functions:

Multiple Language Display

For convenient operation the user may choose from nine languages: German, English, French, Italian, Spain, Portuguese, Japanese, Chinese, and Korean.

Measuring of Geometric Elements

In addition to measuring basic elements like point, circle, line, ellipse, rectangular hole, slot, distance, and point & angle a number of functions for evaluation, e.g. perpendicularity, parallelism etc. are being provided.

Mitutoyo's AI Function

The AI function (AI = Artificial Intelligence) renders choosing the element type before measuring obsolete. Measured points are analysed by the QM Data and the results for basic elements calculated, thus facilitating the measuring procedure.

Customized Operation

Macro functions and the creation of part programs speed up single and serial measurements. Additionally macro commands, part programs as well as frequently used standard operations can be registered as user's menus.

Statistical Processing

Basic statistical calculations (range, mean values, standard deviation) and graphic functions like histograms are realised.

Environmental conditions

Due to a specially developed technology the processor is protected against vibrations and shock. The dust-proof key panel allows for convenient installation even on the shop floor.

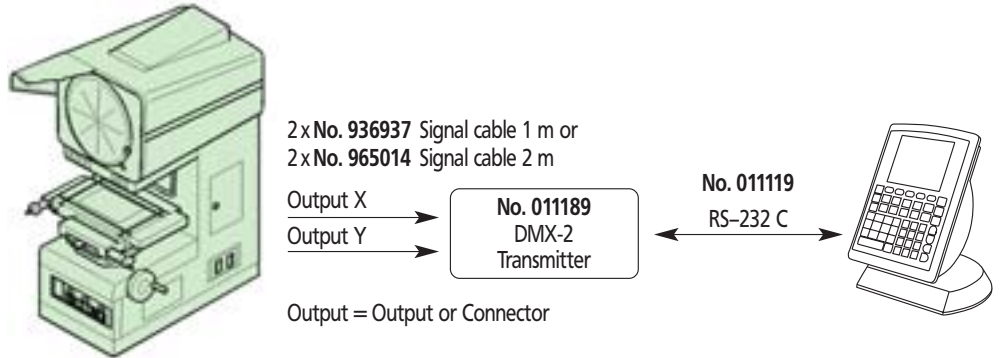
Data Processing Unit QM-Data 200

Series 264

Possible connectors
(other device-specific connectors can be found in the system diagrams for the appropriate devices)

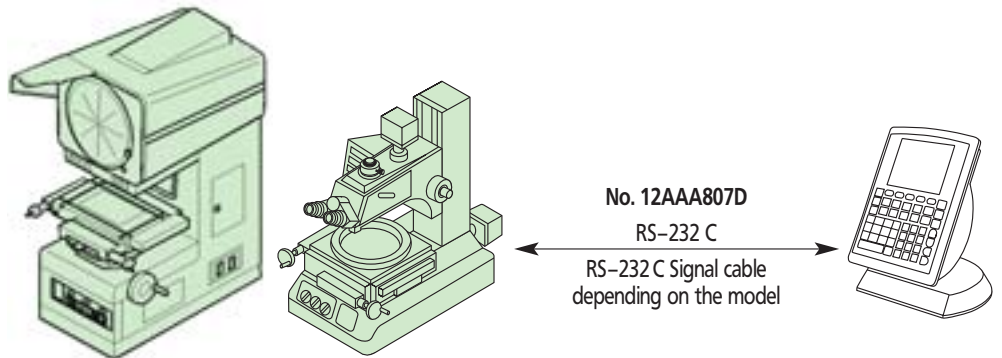
Example 1: DIGIMATIC Data output

e.g. PJ-H3000 without Optoeye / PH-3515 F



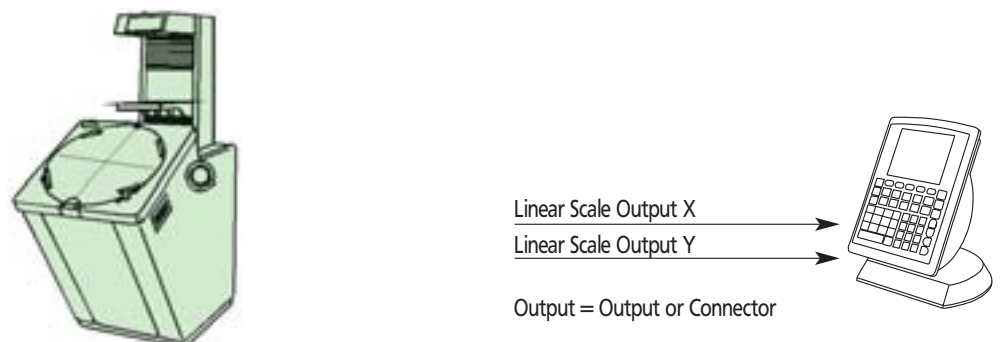
Example 2: RS-232 C Data output

e.g. PJ-A3000 / MF-Microscope



Example 3: Linear Scale Connector

e.g. PV-5110



Edge Sensor "OPTOEYE 200"

• Optoeye 200 reduces the human influence during measurement by automatic edge detection.

No. 332-151 "OPTOEYE 200"

Series 332

For measuring projectors only in combination with QM-Data 200



Note:

- If Optoeye 200 is used, the measuring projector must be connected via the linear scale to the QM-Data 200.

Specifications

Angle characteristic: no direction select

Minimum image diameter: 2 mm on the screen

Minimum image width: 1 mm on the screen

Brightness: 30 to 500 Lux
Min. brightness difference bright to dark 20 Lux

Repeatability: $s = 1 \mu\text{m}$

Optional accessories

12AAE671 Sensor holder for PJ-A3000, PJ-H3000, PH-3515F, PH-A14

12AAE672 Sensor holder for PV-5000, PV-5010, PV-5110

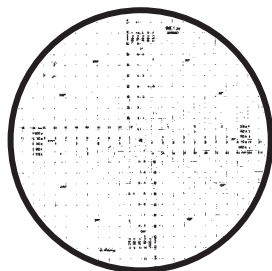
Specifications

Line width:	0,05, 0,08, 0,1 and 0,12 mm
Graduation lines, linear:	Error limits: (0,04 + L/3000) mm
Graduation lines, angular:	Error limits: 25 angular seconds
Thermal extension coefficient of plastics:	$2,7 \times 10^{-5} \text{ K}^{-1}$

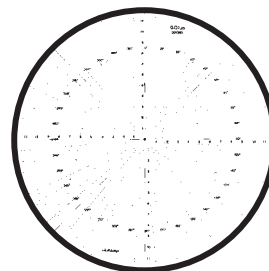
Standard Overlay Charts

- The reference drawings of the standard overlay charts increase the range of application and the efficiency of Mitutoyo profile projectors.
- The charts are supplied in the sizes \varnothing 250, 300, 340 and 500 mm so that they are suited for the screens of Mitutoyo projectors.
This offers a large range of scales and profiles which can be tested quickly and easily. Length, height, parallelism, angle, radius, taper, bore position, diameter, as well as all standardized thread and tooth profiles can be tested.
- All charts are made of distortion free special plastics compound and are provided with a protective coating.

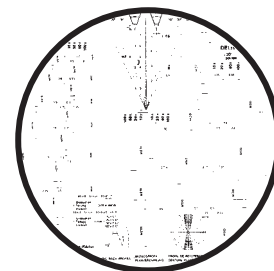
For measuring on measuring projectors



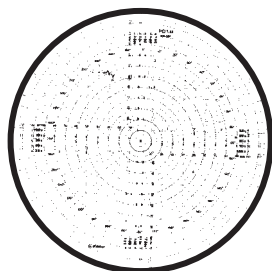
Type RE
Square line net



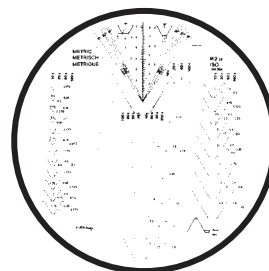
Type GO
Angle



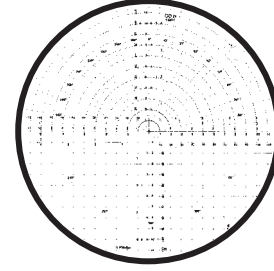
Type DE
Involute toothing



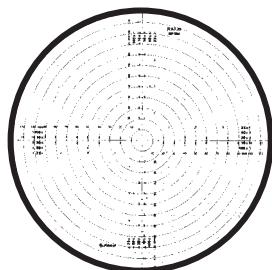
Type PO
Polar line net



Type M
Metrical ISO thread



Type CO
Combination of square line
and polar



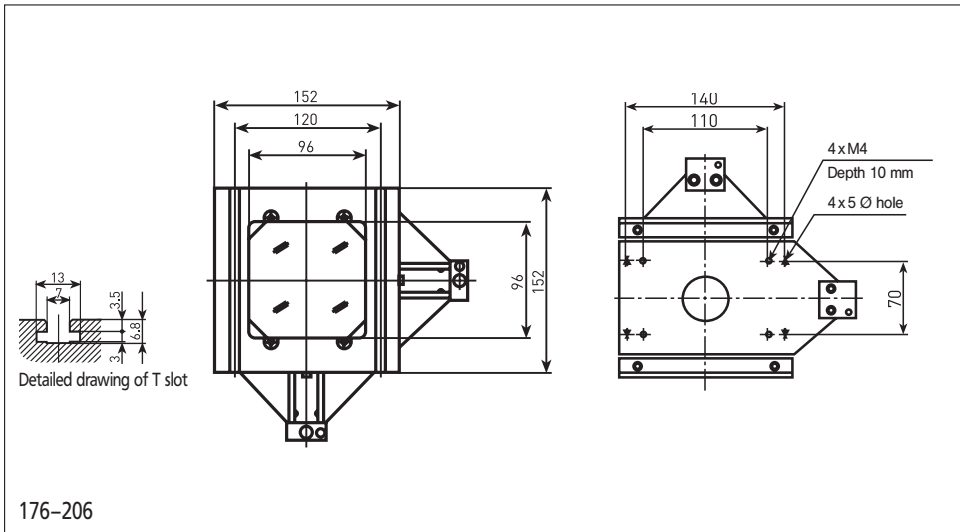
Type RA
Radii

No.	\varnothing mm
Square line net Type RE	
201380	250
201386	300
201392	340
512621	500
Polar line net Type PO	
201381	250
201387	300
201393	340
512622	500
Radii Type RA	
201382	250
201388	300
201394	340
512623	500
Angle Type GO	
201383	250
201389	300
201395	340
512624	500

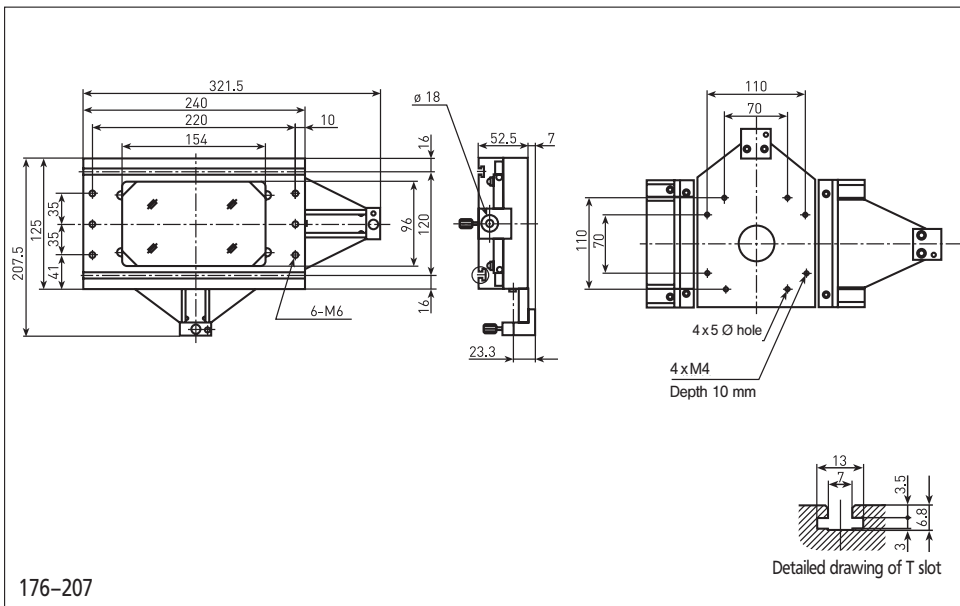
No.	\varnothing mm
Metrical ISO thread Type M	
201384	250
201390	300
201396	340
512625	500
Involute toothing Type DE	
201385	250
201391	300
201397	340
512626	500
Combination (RE and PO) Type CO	
512651	250
512652	300
512653	340
512654	500

Measurement table dimensions

For TM-500



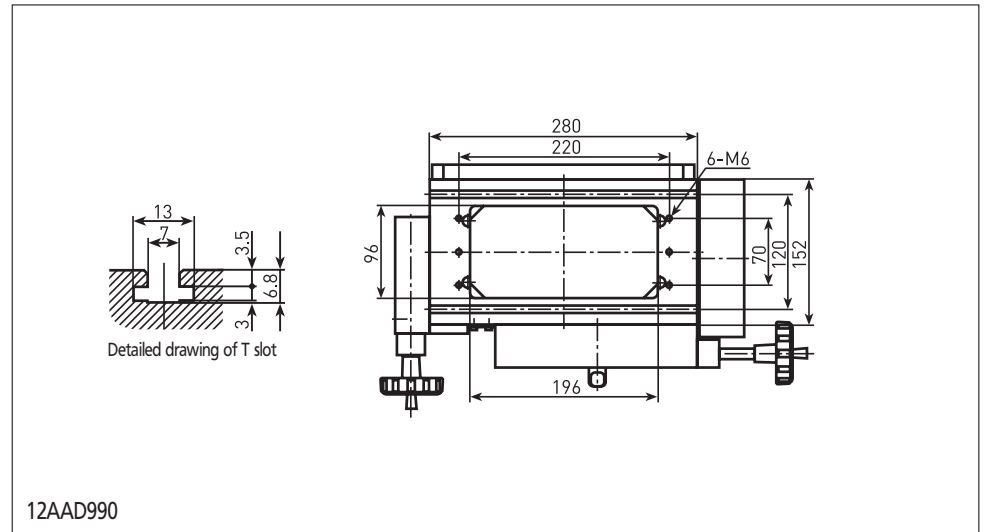
For TM-500



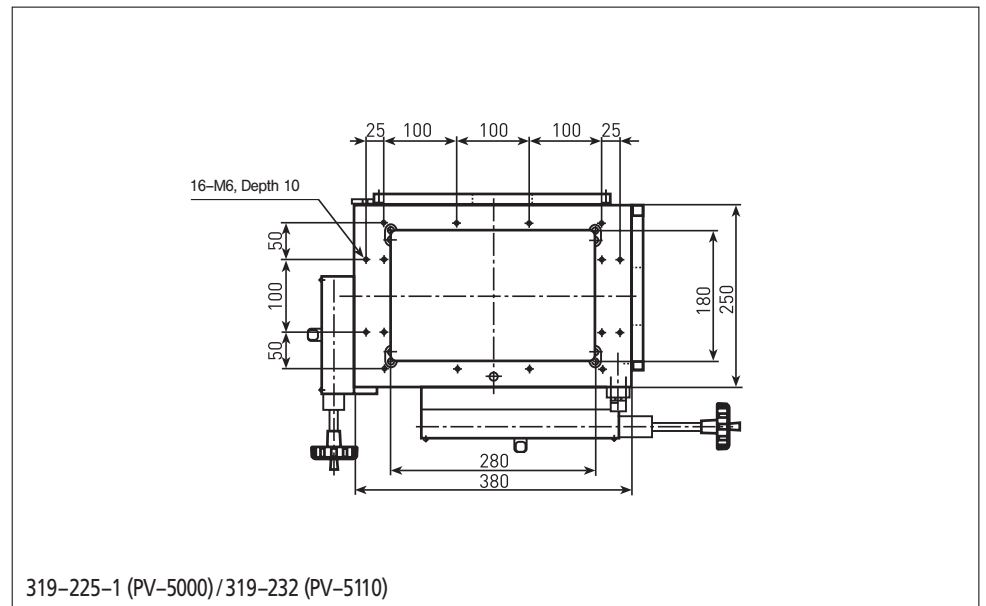
No.	176-206	176-207
Adjustment range	50 x 50 mm	100 x 50 mm
Measurement table dimensions	152 x 152 mm	240 x 152 mm
Glass plate dimensions	96 x 96 mm	154 x 96 mm
Glass plate order no.	380405	510408
Max. workpiece weight	5 kg	5 kg
Measuring methods	Integral micrometer	Integral micrometer
Installation diameter	18 mm	18 mm
Table height	44,5 mm	52,5 mm
Bore pattern for table installation	100 x 70 mm	100 x 70 mm
T slot distance	120 mm	120 mm
Mass	2,72 kg	4,17 kg
For measuring instruments	TM-500	TM-500

Measurement table dimensions

For PJ-A3000



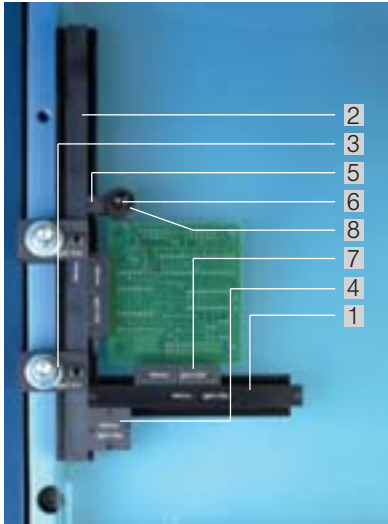
For PJ-A3000 / PV-5000



No.	12AAD990	319-225-1 (319-232)
Adjustment range	150x50 mm	200x100 mm
Measurement table dimensions	280x152 mm	380x250 mm
Glass plate dimensions	196x96x5 mm	280x180x6 mm
Glass plate order no.	981349	382762
Max. workpiece weight	5 kg	5 kg
Measuring methods	Linear Scale	Linear Scale
Installation diameter	-	-
Table height	52,5 mm	75 mm
Bore pattern for table installation	100x70 mm	210x140 mm
T slot distance	120 mm	-
Mass	16 kg	18,5 kg
For measuring instruments	PJ-A3000	PJ-A3000/PV-5000 (PV-5110)

"OPTI-FIX" clamping system

- "OPTI-FIX", a modular, flexible clamping system for profile projectors, measuring microscopes and vision measuring instruments
- Consisting of remarkably few components, it will also fix difficult to hold pieces in the required position for the measuring process.
- "OPTI-FIX" has proven itself to be particularly rational and reliable for repeat and series tests.



"Basic-Set" Order No.: 011323

Item no.	"Basis-Set" consisting of:	Piece	Dimensions
M550838	1. Clamping profile strip with connecting slot	1	100 mm
M550857	2. Clamping profile strip without connecting slot	1	200 mm
M550846*	3. Fixing plate	2	-
M550842	4. Connecting piece with connecting slot	1	-
M550853	5. Clamping bracket	1	-
M550891	6. Cylindrical pin with thread	1	30 mm
M550845	7. Ridged seat with longitudinal slot	2	40/10 mm
M550849	8. Sprung clip, long 15°	1	-

* Other sizes available on request



All components are anodised matt black in order to avoid disruptive reflections from the ambient lighting or the illumination.

Assembly of the clamping components on the measuring table either uses an installation frame on a fixing plate or can be fixed using vacuum clamping plates that can be placed anywhere on the measuring table.

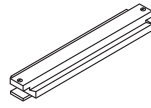
"OPTI-FIX" clamping system

Optional accessories

Clamping profile strips with rear connecting slot

M550838	100/19,6 mm
M550859	200/19,6 mm
M550835	240/19,6 mm
M550836	250/19,6 mm

Other lengths on request
(adaptable to table dimensions)

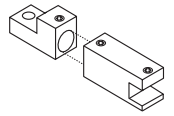


Telescope holder

-End piece
M550852

-Slider
M550839

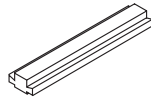
Used with threadless cylindrical pin.



Clamping profile strips without rear connecting slot

M550861	100/19,6 mm
M550857	200/19,6 mm
M550854	250/19,6 mm
M550834	310/19,6 mm

Other lengths on request
(adaptable to table dimensions)



Dowel pin Ø 6 mm

For telescope holders (threadless)

M550887	10 mm
M550888	20 mm
M550889	30 mm
M550890	40 mm

For press pads (with M4 thread)

M550891	30 mm
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Fixing plate with longitudinal hole for fixing clamping profile strips

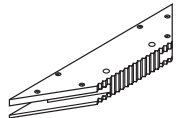
M550846

Other lengths on request
(adaptable to table dimensions)



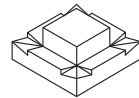
Ridged seat 30°/45°

M550837 250/20 mm



20/20 Connector with dove-tailed connection

M550841



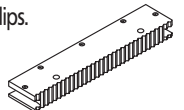
Ridged seat 100/20 mm

M550843

With connection slots along length and at back and M4 locating thread for spring clips.

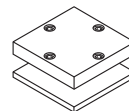
Ridged seat 40/10 mm

M550845 With longitudinal slot only



20/20 Connector with connecting slots

M550842

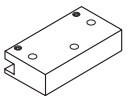


Ridged seat 100/20 mm

M550858 nur With longitudinal slot only

Spring clip holder

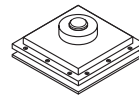
M550850



Vacuum adhesion plate as docking element on table

M550844

If no threaded holes are available for fixing plates.



Swivel component with cylindrical pin

M550847



Swivel component with blade

M550851



Clamp with M4 thread

M550853

For insertion of spring clips
Can also be used as a connecting element when building-on.



Spring clip 15°

M550870 (short)

M550849 (long)



Joint with dovetail connection

M550840

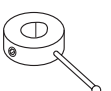
Used with M550853.



Spring clip 30°

M550848 (short)

M550869 (long)



PRODUCT NEWS



Hardness Tester Rockwell / Super Rockwell / Brinell Type Durotwin Plus

Detailed information on page 416.



Portable Hardness Tester "HARDMATIC" HH-411

Detailed information on page 427.



Hardness Tester
Rockwell / Super Rockwell / Brinell

Hardness Tester Micro-Vickers

Hardness Tester Vickers

Hardness Tester Vickers + Brinell

Portable Hardness Tester Shore

Portable Hardness Testing Devices



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Hardness Tester

Rockwell/Super Rockwell Type Durotwin

Rockwell/Super Rockwell/Brinell Type Durotwin Plus

• Robust and user-friendly manual Rockwell, Super Rockwell and Brinell hardness testers.

Series 963



963-102 R



963-103

Overview Durotwin and Durotwin Plus (DT10, DT20)

Model	Durotwin	Durotwin with Brinell Nachrüstsatz	Durotwin Plus
No.	963-102 R	963-102 R + 56AAE552	963-103
Rockwell	Skales A – D – C (Diamond indenter)	Skales A – D – C (Diamond indenter)	Skales A – D – C (Diamond indenter)
	Skales F – B – G (1/16" Steel ball indenter)	Skales F – B – G (1/16" Steel ball indenter)	Skales F – B – G (1/16" Steel ball indenter)
	Skales H – E – K* (1/8" Steel ball indenter)	Skales H – E – K* (1/8" Steel ball indenter)	Skales H – E – K* (1/8" Steel ball indenter)
Super Rockwell	Skales 15N – 30N – 45N (Diamond indenter)	Skales 15N – 30N – 45N (Diamond indenter)	Skales 15N – 30N – 45N (Diamond indenter)
	Skales 15T – 30T – 45T (1/16" Steel ball indenter)	Skales 15T – 30T – 45T (1/16" Steel ball indenter)	Skales 15T – 30T – 45T (1/16" Steel ball indenter)
Brinell	–	Skale HBW1/30 (1 mm Carbide ball)	Skale HBW5/125* (5 mm Carbide ball)
	–	Skale HBW2,5/187,5 (2,5 mm Carbide ball)	Skale HBW2,5/187,5 (2,5 mm Carbide ball)
	–	–	Skale HBW2,5/62,5 (2,5 mm Carbide ball)
	–	–	Skale HBW2,5/31,25 (2,5 mm Carbide ball)

* Accessories (optional)

No.	963-103		
	963-102 R		
	Rockwell	Super Rockwell	Brinell
Preliminary test force (N)	98,07	29,42	98,07
Test force (N)	588,4; 980,7; 1471	147,1; 294,2; 441,3	306,5; 612,9; 1226; 1839
Graduation	0,5 HR	1 HR	–
Display	Analogue		Stand microscope*
Max. workpiece height	105 mm (with spindle cover) 170 mm (no spindle cover)		–
Max. workpiece depth	150 mm from the center of the indenter ball		–
Mass	44 kg		48 kg

* Accessories (optional)

Standard accessories

- No. 19BAA072 Diamond indenter
- No. 19BAA074 Steel ball indenter 1/16"
– Steel balls 1/16" (5 pcs.)
– Flat table Ø 64 mm
– V-anvil Ø 41 mm, groove width 25 mm
– Dust protection cover
– Hardness testing block 60-65 HRC
– Hardness testing block 60-64 HR30N
– Level

Additional standard accessories Durotwin Plus

- No. 19BAA279 Carbide indenter
Ø 2,5 mm
- No. 19BAA283 Replacement carbide ball indenter
Ø 2,5 mm (5 pcs.)
– Hardness testing block
350 HBW 2,5/187,5

Optional accessories

- No. 19BAA072 D Diamond indenter
(incl. MPA certificate)
- No. 19BAA075 Steel ball indenter 1/8"
- No. 19BAA082 Steel balls 1/16" (10 pcs.)
- No. 19BAA083 Steel balls 1/8" (10 pcs.)
- No. 075202 Round table Ø 200 mm
- No. 810-040 V-anvil Ø 40 mm, groove width 30 mm, 120°
- No. 810-041 V-anvil Ø 40 mm, groove width 6 mm, 90°
- No. 810-042 V-anvil Ø 10 mm, groove width 8 mm, 120°
- No. 810-030 Point anvil
(diamond tipped for Super-Rockwell)
- No. 810-043 Point anvil (Ø 12 mm)
- No. 810-044 Point anvil (Ø 5,5 mm)

Additional optional accessories Durotwin Plus

- No. 19BAA280 Carbide indenter Ø 5 mm
- No. 19BAA162 Replacement carbide ball Ø 5 mm
(1 pcs.)
- No. 19BAA318 D Stand microscope 40x
- No. 19BAA319 D Stand microscope 100x

No. 56AAE552 Brinell upgrade set for 963-102 R

Standard accessories for Brinell upgrade set

- No. 19BAA277 Carbide indenter Ø 1 mm
- No. 18BAA279 Carbide indenter Ø 2,5 mm
– Hardness testing block
350 HBW 2,5/187,5
– Additional weight 187,5

Further certified hardness comparison plates on request.

Hardness Tester Rockwell/Super Rockwell/Brinell* Type Wizhard

Series 810

Standard accessories

- No. 19BAA073 Diamond indenter, min. bore \varnothing 40 mm
- No. 19BAA074 Steel ball indenter $1/16''$
- No. 810-039 Flat table \varnothing 64 mm
- No. 810-040 V-anvil \varnothing 40 mm, groove width 30 mm, 120°
- No. 19BAA123 Hardness testing block 30-35 HRC
- No. 19BAA125 Hardness testing block 60-65 HRC
- No. 19BAA126 Hardness testing block 90-95 HRB
- No. 19BAA128 Hardness testing block 64-69 HR30N
- No. 19BAA129 Hardness testing block 74-79 HR30T
- No. 19BAA517 Dust protection cover
- No. 19BAA098 Level

Optional accessories

- No. 19BAA072D Diamond indenter (incl. MPA certificate)
- No. 19BAA292 Diamond indenter, min. bore \varnothing 22 mm
- No. 19BAA075 Steel ball indenter $1/8''$
- No. 810-037 Round table \varnothing 180 mm
- No. 810-038 Round table \varnothing 250 mm
- No. 810-040 V-anvil \varnothing 40 mm, groove width 30 mm, 120°
- No. 810-041 V-anvil \varnothing 40 mm, groove width 6 mm, 90°
- No. 810-042 V-anvil \varnothing 10 mm, groove width 8 mm, 120°
- No. 810-029 V-anvil length 400 mm, groove width 50 mm, 120°
- No. 810-030 Point anvil (diamond tipped for Super-Rockwell)
- No. 810-043 Point anvil (\varnothing 12 mm)
- No. 810-044 Point anvil (\varnothing 5,5 mm)

Optional accessories for Brinell hardness testing

- No. 19BAA277 Carbide ball indenter \varnothing 1 mm
- No. 19BAA279 Carbide ball indenter \varnothing 2,5 mm
- No. 19BAA280 Carbide ball indenter \varnothing 5 mm
- No. 19BAA284 Carbide ball indenter \varnothing 10 mm
- No. 19BAA281 Replacement carbide ball \varnothing 1 mm (5 pcs.)
- No. 19BAA283 Replacement carbide ball \varnothing 2,5 mm (5 pcs.)
- No. 19BAA162 Replacement carbide ball \varnothing 5 mm (1 pcs.)
- No. 19BAA163 Replacement carbide ball \varnothing 10 mm (1 pcs.)
- No. 19BAA318D Stand microscope 40x
- No. 19BAA319D Stand microscope 100x

Further certified hardness comparison plates on request.



HR-522



HR-511 Control unit



HR-522 / HR-523
Touch Screen

Model	HR-511	HR-522 / HR-523
Control unit operation	●	—
Touch screen operation	—	●
Test force control	●	●
Data offset	●	●
Measured value compensation when testing cylindrical or spherical surfaces	—	●
Conversion into other hardness scales	—	HV, HK, HBS, Tensile strength, HRA, HRB, HRC, HRD, HRF, HRG, HR15T, HR30T, HR45T, HR15N, HR30N, HR45N, HS, HB (HBS)
Statistical functions	No. of values, Max, Min, mean value, range, UL, LL, standard deviation, no. of OK/±NG evaluations (via data output only) Storage of 1024 values	No. of values, Max, Min, mean value, range, UL, LL, standard deviation, no. of OK/±NG evaluations, histogram, X-R control card Storage and editing of 1024 values
Tolerance evaluation	●	●

Model	HR-511	HR-522	HR-523
No.	810-208	810-203	810-204
Preliminary test force (N)	29,42; 98,07		
Test force			
Rockwell (N)	588,4; 980,7; 1471		
Super Rockwell (N)	147,1; 294,2; 441,3		
Brinell* (ball- \varnothing /kg)	HBW 2,5/187,5	HBW 1/10; HBW 1/30; HBW 2,5/6,25; HBW 2,5/15,625; HBW 2,5/31,25; HBW 2,5/62,5; HBW 2,5/187,5; HBW 5/25; HBW 5/62,5; HBW 5/125; HBW 10/100	
Loading process	Automatic control (loading, duration, unloading)		
Display unit	Control unit	LCD Touch Screen	
Test force selection	Via keyboard input	Via Touch Screen	
Effective period	0 to 120 sec (in 1-second stages)		
Max. workpiece height	Height: 205 mm, Depth: 150 mm from the center of the indenter shaft		
Table movement	manual	fully automatic	
Data output	RS-232 C / DIGIMATIC / Centronics		
Power supply	230 V, 50/60 Hz		
Dimensions (WxDxH)	Main unit 250x670x605 mm		
Mass	Main unit approx.60 kg		

* Indentations must be measured using a measuring microscope (not supplied).

Hardness Tester ROCKWELL

Series 810

Analogue and digital types.



AR-10



AR-20



ARK-600

Standard accessories

- No. 19BAA072 Diamond indenter
- No. 19BAA074 Steel ball indenter 1/16"
- No. 810-039 Flat table Ø 64 mm
- No. 19BAA123 Hardness testing block 30-35 HRC
- No. 19BAA125 Hardness testing block 60-65 HRC
- No. 19BAA126 Hardness testing block 90-95 HRB
- No. 19BAA111 Dust protection cover

Optional accessories

- No. 19BAA072 D Diamond indenter (incl. MPA certificate)
- No. 264-504 D Printer DP-1 VR
- No. 810-037 Round table Ø 180 mm
- No. 810-038 Round table Ø 250 mm
- No. 810-040 V-anvil Ø 40 mm, groove width 30 mm, 120°
- No. 810-041 V-anvil Ø 40 mm, groove width 6 mm, 90°
- No. 810-042 V-anvil Ø 10 mm, groove width 8 mm, 120°
- No. 810-029 V-anvil length 400 mm, groove width 50 mm, 120°
- No. 810-043 Point anvil (Ø 12 mm)
- No. 810-044 Point anvil (Ø 5,5 mm)
- No. 810-026 Special table for Jominy-Test
- No. 810-027 Variable support arm (length 250 mm)

Further certified hardness comparison plates on request.

Consumables

- No. 19BAA097 Lamp

Model No.	AR-10 810-200	AR-20 810-201	ARK-600 810-218
Version	Rockwell		
Preliminary test force (N)	98,07		
Test force (N)	588,4; 980,7; 1471		
Table up/down drive	manual		
Loading process	automatic (loading, duration, unloading)		
Effective period	adjustable		
Display	Analog dial		LED (4 digit)
Resolution/Graduation	0,5		0,1
Max. workpiece height	140 mm		
Max. workpiece depth	115 mm (from the center of the indenter shaft)	122 mm (from the center of the indenter shaft)	122 mm (from the center of the indenter shaft)
Data output	-		RS-232 C / DIGIMATIC
Dimensions (WxDxH)	220x445x655 mm		210x486x680 mm
Mass	36 kg		40 kg

Hardness Tester ROCKWELL, SUPER-ROCKWELL

Series 810

Digital type.

Standard accessories

- No. 19BAA073 Diamond indenter
- No. 19BAA074 Steel ball indenter 1/16"
- No. 810-039 Flat table Ø 64 mm
- No. 19BAA123 Hardness testing block 30-35 HRC
- No. 19BAA125 Hardness testing block 60-65 HRC
- No. 19BAA126 Hardness testing block 90-95 HRB
- No. 19BAA128 Hardness testing block 64-69 HR30N
- No. 19BAA129 Hardness testing block 74-79 HR30T
- No. 19BAA112 Dust protection cover

Optional accessories

- No. 19BAA072D Diamond indenter (incl. MPA certificate)
- No. 264-504 D Printer DP-1 VR
- No. 810-037 Round table Ø 180 mm
- No. 810-038 Round table Ø 250 mm
- No. 810-040 V-anvil Ø 40 mm, groove width 30 mm, 120°
- No. 810-041 V-anvil Ø 40 mm, groove width 6 mm, 90°
- No. 810-042 V-anvil Ø 10 mm, groove width 8 mm, 120°
- No. 810-029 V-anvil length 400 mm, groove width 50 mm, 120°
- No. 810-030 Point anvil (diamond tipped for Super-Rockwell)
- No. 810-043 Point anvil (Ø 12 mm)
- No. 810-044 Point anvil (Ø 5,5 mm)
- No. 810-026 Special table for Jominy-Test
- No. 810-027 Variable support arm (length 250 mm)

Further certified hardness comparison plates on request.

Consumables

- No. 19BAA097 Lamp



ATK-600

Model No.	ATK-600 810-257
Version	Rockwell / Super-Rockwell
Preliminary test force (N)	98,07 / 29,42
Test force (N)	588,4; 980,7; 1471; 147,1; 294,2; 441,3
Table up/down drive	manual
Loading process	automatic (loading, duration, unloading)
Effective period	adjustable
Display	LED (4 digit)
Resolution/ Graduation	0,1 / 0,2
Max. workpiece height	140 mm
Max. workpiece depth	122 mm (from the center of the indenter ball)
Data output	RS-232 C / DIGIMATIC / Centronics
Dimensions (W x D x H)	210 x 486 x 720 mm
Mass	42 kg

Hardness Tester Micro-VICKERS Type HM

Series 810



HM-101



HM-112 / HM-122 / HM-124
Touch Screen



HM-112

Model	HM-112	HM-122 / HM-124
"Touch screen" operation	●	●
Reading of diagonals D1 and D2	●	●
Reading of hardness values	●	●
Reading of XY stage position	●	●
Test conditions such as test force or effective period	●	●
Tolerance evaluation	●	●
Measured value compensation when testing cylindrical or spherical surfaces	●	●
Control of automatic lens system switch	-	●
Conversion into other hardness scales	Soft: HV, HK, HBS, Tensile strength, HRA, HRB, HRF, HRG, HR15T, HR30T, HR45T Hard: HV, HK, HS, HBS, Tensile strength, HRA, HRC, HRD, HR15N, HR30N, HR45N	
Statistical functions	No. of values, Max, Min, mean value, range, UL, LL, standard deviation, No. of OK/±NG evaluations, storage and editing of 256 values	

Test force (N)

	HM-101	HM-112	HM-122	HM-124
4.903 x 10 ⁻³ /HV0.0005; 9.807 x 10 ⁻³ /HV0.001; 19.61 x 10 ⁻³ /HV0.002; 29.42 x 10 ⁻³ /HV0.003; 39.22 x 10 ⁻³ /HV0.004; 49.03 x 10 ⁻³ /HV0.005	-	-	-	●
98.07 x 10 ⁻³ /HV0.01; 0.2452/HV0.025; 0.4903/HV0.05; 0.9807/HV0.1; 1.961/HV0.2; 2.942/HV0.3; 4.903/HV0.5; 9.807/HV1	●	●	●	●
19.61/HV2	-	-	-	●

Model	HM-101	HM-112	HM-122	HM-124
No.	810-124	810-126	810-127	810-129
Loading process	automatic (loading, duration, unloading)			
Effective period	5-30 s (in 5 sec increm.)	5-90 s (in 1 sec increments)		
Lens system	10x; 50x	10x; 50x	10x; 50x	10x; 50x; 100x
Lens system switch	manual		motor driven	
Magnification	100x; 500x	100x; 500x	100x; 500x	100x; 500x; 1000x
Min. resolution	0,2 μm (50x Objective)		0,01 μm	
XY-stage dimensions	100x100 mm			
Traveling range	25x 25 mm			
Graduation	0,01 mm (Nonius)		0,001 mm (Digital)	
Max. Workpiece size	height 95 mm; depth 150 mm (from the center of the indenter shaft)			
Observation by	micrometer eyepiece			
Display	LCD Touch Screen			
Data output	-	RS-232 C / DIGIMATIC / Centronics		
Dimensions (W x H x D)	Main unit 410 x 600 x 590 mm			
Mass	Main unit 42 kg			

Standard accessories

No. 810-617	10x Objective
No. 810-619	50x Objective
No. 810-620	100x Objective (HM-124)
No. 19BAA058	Diamond indenter for HM-101, HM-112, HM-122
No. 19BAA059	Diamond indenter for HM-124
No. 810-011	XY table (HM-101)
No. 810-074	XY table (HM-112, HM-122, HM-124)
No. 810-016	Vise, max. 45 mm groove width
No. 10BAA445	Camera-Adapter for CCD-camera
No. 19BAA109	Dust protection cover
No. 19BAA007	Hardness testing block (700 HV0.3) - Vickers hardness testing table (HM-101) - Halogen lamp (6 V/20 W) built-in (all models) - Level

Optional accessories

No. 19BAA058 HD	Diamond indenter for HM-124 (incl. MPA certificate)
No. 19BAA058 D	Diamond indenter for HM-101, HM-112, HM-122 (incl. MPA certificate)
No. 810-616	5x Objective*
No. 810-617	10x Objective*
No. 810-618	20x Objective*
No. 810-619	50x Objective*
* Installation by Mitutoyo	
No. 810-012	XY table 50 x 50 mm, Table dimensions 125 x 125 mm
No. 810-017	Vise, max. 100 mm groove width
No. 810-013	Thin plate holder, (max. specimen thickness 5 mm)
No. 810-014	Wire holder horizontal, (max. Ø 3,2 mm)
No. 810-015	Wire holder vertical, (max. Ø 3,2 mm)
No. 810-018	Rotary table
No. 810-019	Variable angle anvil (horizontal, vertical)
No. 810-020	Universal specimen holder
No. 810-085	Specimen holder, adjustable, for thin plates

Further certified hardness comparison plates on request.

Software with camera for measuring and evaluation on request.

Hardness Tester VICKERS Type AVK

• With manual measurement of diagonals.

Series 810

Standard accessories

- No. 810-064 10x Objective
- No. 19BAA060 Diamond indenter
- No. 810-039 Flat table Ø 64 mm
- No. 810-040 V-anvil Ø 40 mm,
groove width 30 mm, 120°
- No. 810-041 V-anvil Ø 40 mm,
groove width 6 mm, 90°
- No. 19BAA219 D Lamp built-in
- No. 19BAA110 Dust protection cover
- No. 19BAA016 Hardness testing block
(720 HV 10)
 - Vickers table
 - Level

Optional accessories

- No. 19BAA060 D Diamond indenter
(incl. MPA certificate)
- No. 810-037 Round table Ø 180 mm
- No. 810-038 Round table Ø 250 mm
- No. 810-017 Vise
(max. groove width 100 mm)

Further hardness testing blocks and upgrade kits for Brinell testing on request



AVK-C0

Model	AVK-C0
No.	810-160
Test force (N)	9,807; 49,03; 98,07; 196,1; 294,2; 490,3
Loading process	automatic (loading, duration, unloading)
Effective period	5 to 30 sec (in 5 sec increments)
Objective	10x
Magnification	100x
Min. resolution	1 µm
Max. workpiece size	height 205 mm / depth 165 mm (from the center of the indenter shaft)
Observation by	micrometer eyepiece
Power supply	230 V, 50 Hz
Dimensions	330x580x705 mm
Mass	49 kg

Hardness Tester VICKERS + Brinell Type HV

Series 810



810-163



HV-112 / HV-114

Model	HV-112 / HV-114
"Touch screen" operation	●
Reading of diagonals D1 and D2	●
Reading of hardness values	●
Test conditions such as test force or effective period	●
Tolerance evaluation	●
Measured value compensation when testing cylindrical or spherical surfaces	●
Control of automatic lens system switch	●
Conversion into other hardness scales	Soft: HV, HK, Tensile strength, HRA, HRB, HRF, HRG, HR15T, HR30T, HR45T Hard: HV, HK, HS, HBS, Tensile strength, HRA, HRC, HRD, HR15N, HR30N, HR45N
Statistical functions	No. of values, Max, Min, mean value, range, UL, LL, standard deviation, No. of OK±NG evaluations, storage and editing of 256 values

Model	HV-112	HV-114
No.	810-163 D	810-165 D
Test force (N)	1,961; 2,942; 4,903; 9,807; 24,51; 49,03; 98,07; 196,1	9,807; 19,61; 29,42; 49,03; 98,07; 196,1; 294,2; 490,3
Loading process	automatic (loading, duration, unloading)	
Effective period	5-99 sec (in 1 sec increments)	
Lens system	20x, 10x	
Lens system switch	motor driven	
Magnification	200x, 100x	
Min. resolution	0,1 μm	
Max. workpiece size	height 210 mm / depth 170 mm (from the center of the indenter shaft)	
Observation by	Micrometer eyepiece	
Display	LCD Touch screen	
Data output	RS-232 C / Centronics / DIGIMATIC	
Dimensions (WxDxH)	Main unit: 245 x 515 x 840 mm	
Mass	Main unit: 57 kg	

Standard accessories

- No. 810-617 10x Objective
- No. 810-618 20x Objective
- No. 19BAA060 Diamond indenter
- No. 810-039 Flat table Ø 64 mm
- No. 810-040 V-anvil Ø 40 mm, groove width 30 mm, 120°
- No. 810-041 V-anvil Ø 40 mm, groove width 6 mm, 90°
- No. 19BAA219 Halogen lamp (6 V/20 W), built-in
- No. 19BAA016 Hardness testing block (720 HV 10)
- No. 19BAA110 Dust protection cover

Optional accessories

- No. 19BAA060 D Diamond indenter (incl. MPA certificate)
- No. 810-616 5x Objective*
- No. 810-619 50x Objective*
- * Installation by Mitutoyo
- No. 19BAA063 Knoop diamond indenter
- No. 810-012 XY table 50x50 mm, Table dimensions 125x125 mm
- No. 810-016 Vise, max. 45 mm groove width
- No. 810-017 Vise, max. 100 mm groove width
- No. 810-037 Round table Ø 180 mm
- No. 810-038 Round table Ø 250 mm
- No. 19BAA445 Camera-Adapter for CCD-camera

Optional accessories for Brinell hardness testing (Upgrading only by Mitutoyo engineer on request!)

- No. 19BAA277 Carbide ball indenter Ø 1 mm
- No. 19BAA278 Carbide ball indenter Ø 2 mm
- No. 19BAA279 Carbide ball indenter Ø 2,5 mm
- No. 19BAA280 Carbide ball indenter Ø 5 mm
- No. 19BAA415 Mass 22,73 g for Brinell hardness testing HBW 1/2.5 (for HV-114)
- No. 19BAA416 Mass 113,6 g for Brinell hardness testing HBW 2.5/6.25 (for HV-112, HV-114)
- No. 19BAA417 Mass 454,5 g for Brinell hardness testing HBW 5/25 (for HV-112, HV-114)
- No. 19BAA418 Mass 511,4 g for Brinell hardness testing HBW 2.5/15.625 (for HV-112, HV-114)

Further certified hardness comparison plates on request.

Devices with external monitor for measuring diagonals: HV-113 and HV-115 on request.

Software with camera for measuring and evaluation, on request.

Portable Hardness Tester Shore

- Testing of rubber, elastomers and plastics.

Series 811

Analog type

- Long leg and compact design
- Shore hardness "A" and "D"

Shore A

Hardness scale range: 0–100 Shore A
Measuring range: 10– 90 Shore A

Shore D

Hardness scale range: 0–100 Shore D
Measuring range: 20– 90 Shore D

Optional accessories

No. 811-019 Measuring stand for 811-331

No. 811-012 Measuring stand for 811-333

No. 811-013 Measuring stand for 811-335-01

No. 811-014 Measuring stand for 811-337-01

additional optional accessory on request



811-331



811-335-01

No.	Long leg design		Compact design	
	811-331	811-333	811-335-01	811-337-01
Materials to be tested	regular rubber soft plastic	hard rubber hard plastic	regular rubber soft plastic	hard rubber hard plastic
Shore hardness	A	D	A	D
Standard	JIS K 7215, JIS K 6253, ISO 868, ISO 7619, ASTM D 2240			
Tip form	Cut cone	Cone	Cut cone	Cone
Tip radius	–	0,1 ± 0,012 mm	–	0,1 ± 0,012 mm
Tip diameter	Ø 0,79 mm	–	Ø 0,79 mm	–
Graduation	1 degree / dial with maximum pointer			
Pressure plan form	Ø 18 mm		Ø 18 mm	
Mass	320 g		300 g	

No. 64AAA964

Hardness Testing Block Set (Rubber) (Hardness 30, 60, 90 Shore "A")



Portable Hardness Tester Shore

- Testing of rubber, elastomers and plastics.

Series 811

Digital type

- Long leg and compact design
- Shore hardness "A" and "D"



811-332



811-338-01

No.	Long leg design		Compact design	
	811-332	811-334	811-336-01	811-338-01
Materials to be tested	regular rubber soft plastic	hard rubber hard plastic	regular rubber soft plastic	hard rubber hard plastic
Shore hardness	A	D	A	D
Standard	JIS K 7215, JIS K 6253, ISO 868, ISO 7619, ASTM D 2240			
Tip form	Cut cone	Cone	Cut cone	Cone
Resolution	0,5 degree / Digital display with HOLD function and "DIGIMATIC" output			
Pressure plan form	Ø 18 mm		Ø 18 mm	
Mass	310 g		approx. 290 g	

No. 64AAA964

Hardness Testing Block Set (Rubber) (Hardness 30, 60, 90 Shore "A")



Functions	Series 811
Data output	●
ON / OFF	●
DATA / HOLD	●
ZERO setting	●

Shore A

Hardness scale range: 0-100 Shore A
Measuring range: 10- 90 Shore A

Shore D

Hardness scale range: 0-100 Shore D
Measuring range: 20- 90 Shore D

Optional accessories

- No. 905693 Signal cable (1 m)
 - No. 905694 Signal cable (2 m)
 - No. 264-504 D Data processor (printer)
 - No. 811-019 Measuring stand for 811-332
 - No. 811-012 Measuring stand for 811-334
 - No. 811-013 Measuring stand for 811-336-01
 - No. 811-014 Measuring stand for 811-338-01
- additional optional accessory on request

"HARDMATIC" Portable Hardness Testing Devices

- These "HARDMATIC" instruments are direct-reading hardness testers that include the generally-recognised hardness scales and make the use of conversion tables superfluous.
- The clear division of the large digits on these instruments covers the whole range of Vickers, Brinell, Rockwell B and Rockwell C hardness scales.

Relation between surface roughness and minimum depth of workpiece

- 1) Surface
The workpiece surface should be R_{max} 1,5 μm to 1,7 μm or less.
- 2) Minimum depth
Minimum depth has to be at least 3 times the indentation depth.

Optional accessories

No. 60BAA014 Measuring stand

Series 810 Analog type



810-503

No.	Description	Scale	Measuring range
810-503	HH-110-03	Vickers	100-1000 HV
		Brinell	100- 500 HB
		Rockwell B	50- 100 HRB
		Rockwell C	20- 70 HRC
810-504	HH-110-04	Tensile strength	350-1400 N/mm ²
		Brinell	100- 400 HB
		Rockwell B	50- 100 HRB
		Rockwell C	20- 70 HRC

"HARDMATIC" Portable Hardness Testing Devices

- These "HARDMATIC" instruments are direct-reading hardness testers that include the generally-recognised hardness scales and make the use of conversion tables superfluous.

Series 810

Digital type

- 5 Hardness scales plus option for measuring tensile strength
Vickers HV, Brinell HB, Rockwell C (HRC), Rockwell B (HRB), Shore HS.
- Memory for 450 measured values.



Relation between surface roughness and minimum depth of workpiece

- 1) Surface
The workpiece surface should be R_{max} 1,5 μm to 1,7 μm or less.
- 2) Minimum depth
Minimum depth has to be at least 3 times the indentation depth.

Standard accessories

- No. 19BAA190 Indenter (built-in)
- No. 19BAA180 Clamping shaft (\varnothing 8 mm) for mounting on drill chuck for 810-264 (HH-140)
- No. 19BAA196 Hardness testing block 30HRC
- No. 19BAA197 Hardness testing block 60HRC
 - Battery
 - Power supply unit
 - Carry case

Optional accessories

- No. 937386 Signal cable 1 m
- No. 965012 Signal cable 2 m
- No. 19BAA191 RS-232 C cable
- No. 810-081 Measuring stand (only HH-140)
- No. 19BAA189 Cylinder probe anvil
- No. 19BAA194 Step anvil
- No. 19BAA195 V-anvil
- No. 19BAA037D Hardness testing block 30HRC (incl. MPA certificate)
- No. 19BAA040D Hardness testing block 60HRC (incl. MPA certificate)

Model No.	HH-120 810-263	HH-140 810-264
Measurement and conversion range		
Vickers	32 HV-999 HV	
Brinell	81 HB-767 HB for hard materials (e.g. steel, ...) 42 HB-169 HB for soft materials (e.g. brass, ...)	
Rockwell B	41.0 HRB-110.0 HRB for hard materials (e.g. steel, ...) 10.0 HRB- 93.5 HRB for soft materials (e.g. brass, ...)	
Rockwell C	0 HRC-68.0 HRC for hard materials (e.g. steel, ...)	
Shore	14.0 HS-101.3 HS for hard materials (e.g. steel, ...) 5.5 HS- 30.2 HS for soft materials (e.g. brass, ...)	
Tensile strength	390-1999 N/mm ² for hard materials (e.g. steel, ...)	
Resolution	HV / HB / Tensile strength: 1 HRB / HRC / HS: 0.1	
Test force	15 kg	
Indenter shaft	Diamond cone 100°	
Data output	RS-232 C / DIGIMATIC	
Power supply	AC adapter or battery (9 V battery pack)	
Dimensions (W x D x H)	136 x 100 x 143 mm	136 x 83 x 60 mm* / 82 x 112 x 33 mm**
Mass	950 g	800 g* / 200 g**

* Measuring unit

** Display unit

"HARDMATIC" HH-411 Portable Hardness Testing Devices

- The "HARDMATIC" HH-401 is a light-weight portable hardness testing instrument for metal workpieces.
- It works on the rebound hardness principle (standardised according to ASTM 7956).
- Measurement is conducted with hardness value L (Leeb-value), however, conversion to any desired hardness scale can be performed.
- In addition the display automatically shows OK/NG with the tolerance function set and selected.
- Memory function for 1800 measured values.
- Automatic measuring direction angle-compensation.



810-288 (optional accessory)



810-289 (optional accessory)



810-290 (optional accessory)

Series 810 Digital type



810-283-01

Surface roughness and minimum depth/mass of workpiece

- 1) Surface
The workpiece surface should be Ra 10 µm or less.
- 2) Minimum depth/mass
Minimum depth has to be at least 5 mm, minimum mass at least 5 kg; workpieces with other characteristic may be measured after certain preparation (i.e. mounting on granite plate).

Standard accessories

- | | |
|-----------------|--|
| No. 810-287 | Main unit (impact device) |
| No. 19BAA450-01 | Valuation unit |
| No. 19BAA457 | Carbide ball indenter |
| No. 19BAA451 | Support ring Ø 22 mm
– Batteries (2 pcs.) |
| No. 19BAA258 | Cleaning brush |
| No. 19BAA452 | Support ring Ø 14 mm |
| No. 19BAA265 | Hardness testing block HLD 800
– Plastic case |
| No. 19BAA460 | Detector cable |

Optional accessories

- | | |
|---------------|---|
| No. 19BAA248 | Anvil for convex cylinder
(r = 10–20 mm) |
| No. 19BAA249 | Anvil for concave cylinder
(r = 14–20 mm) |
| No. 19BAA250 | Anvil for convex spheric
surfaces (r = 10–27,5 mm) |
| No. 19BAA251 | Anvil for concave spheric
surfaces (r = 13,5–20 mm) |
| No. 19BAA243 | Hardness testing block HLD 880 |
| No. 19BAA244 | Hardness testing block HLD 830 |
| No. 19BAA245 | Hardness testing block HLD 730 |
| No. 19BAA246 | Hardness testing block HLD 620 |
| No. 19BAA247 | Hardness testing block HLD 520 |
| No. 264-504 D | "DIGIMATIC" miniprocessor
DP1-VR |
| No. 937386 | Signal cable (1 m) |
| No. 19BAA238 | RS-232 C cable |
| No. 526688 D | AC/DC adapter |
| No. 810-288 | Impact device Type DC
approx. Ø 22 x 85 mm, 50 g |
| No. 810-289 | Impact device Type D+15
approx. Ø 28 x 190 mm, 130 g |
| No. 810-290 | Impact device Type DL
approx. Ø 28 x 230 mm, 140 g |

Model		HH-411
No.		810-283-01
Hardness value		Hardness L (Leeb)
Impacter		Carbide
Functions	Conversion range	
	Rockwell C	19.3 HRC – 68.2 HRC
	Rockwell B	13.5 HRB – 101.7 HRB
	Vickers	43 HV – 950 HV
	Shore	13.2 HS – 99.3 HS
	Tensile strength	499 – 1996 MPa
	Brinell	20 – 894 HB
		Automatic compensation for impact or test direction, tolerance evaluation, Offset values, data storage 1800 measured values, Statistical analysis (average value, max. value, min. value, standard deviation), Internal counter for measurements carried out
Data output		RS-232 C / DIGIMATIC
Power supply		AC-Adapter or Battery LR6 (2 pcs.)
Dimensions		Ø 28 x 175 mm (Measuring unit) / 70 x 110 x 35 mm (Display unit)
Mass		120 g (Measuring unit) / 200 g (Display unit)



Sample application

QV-objective 1x

$\infty / 0$



Vision Measuring System
QUICK IMAGE



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Vision Measuring System
QUICK SCOPE manual



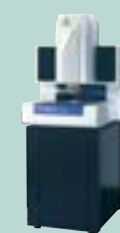
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Vision Measuring System
QUICK SCOPE CNC



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3D CNC Vision Measuring System
QUICK VISION ELF



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3D CNC Vision Measuring System
QUICK VISION APEX / HYPER QUICK VISION
QUICK VISION HYBRID



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3D CNC Vision Measuring System
QUICK VISION ACCEL



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3D CNC Vision Measuring System
ULTRA QUICK VISION



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UMAP VISION Systems



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NANOCORD



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Vision Measuring Machine QUICK IMAGE

Excellent depth of focus, extra-wide field of view, software included.

- **Bilateral telecentric system**

The wide range of focal depth means that workpieces of different heights or offset surfaces, for example turned parts or cutting tools can be measured without difficulty and without refocusing.

- **Extra-wide field of view**

The field of view of 32 x 34 mm enables complete detection of small parts at a single view – for rapid, easy and automated measurement

- **Standard software**

Conveniently repeatable, programmable measuring sequences and high rate of evaluation with integrated high-end software QIPAK. Bringing maximum quality and versatility to the evaluation process.

- **Can be combined with desktop PC or notebook.**



QUICK IMAGE

Model	QI-RL	QI-505 RL	QI-1010 RL	QI-2010 RL	QI-2017 RL	QI-3017 RL
Field of view	32 x 24 mm					
Measuring accuracy on monitor	± 5 µm (High resolution mode) / ± 8 µm (Normal mode)					
Measuring accuracy (U1 xy)	– (5 + 0,08 L) µm; L in mm					
Measuring range XxY (mm)	–	50 x 50	100 x 100	200 x 100	200 x 170	300 x 170
Z (mm)	25	100				
Camera	1,3 Mega-Pixel 1/2" C-MOS colour camera					
Optical system Magnification	0,2 x					
Focus	± 0,6 mm (High resolution mode) / ± 11 mm (Normal mode)					
Beleuchtung Transmitted- / Co-axial light	●	●	●	●	●	●
4 Quadrant ring light	●	●	●	●	●	●
Max. workpiece weight	approx.5 kg		approx.10 kg		approx.20 kg	

All systems are also available without ring light



Request our detailed brochure!

Vision Measuring Machines QUICK SCOPE manual

Specifications

Resolution: 0,0001 mm
 Accuracy (E₁) 20 °C (XY): (3+2L/100) μm
 Magnification on monitor (17"): with fix-lens 1 x: 42 x (option)
 with fix-lens 2,5 x: 105 x (standard)
 with fix-lens 5 x: 210 x (option)
 with Powerzoom: 21 x to 147 x

QUICK SCOPE manual:

- Compact, economical table-top instrument for the uncomplicated manual measurement of single parts.

System with Fix-Lens:

- High-precision measurement objectives 1 x, 2.5 x and 5 x.

System with Power zoom:

- Powerzoom programming with automatic adaptation of light intensity and pixel size.



QUICK SCOPE

Model	Controller	Measuring range X : Y : Z (mm)	Accuracy E ₁ (XY)	Fix-lens	Zoom-objective	Transmitted light	Co-axial light	Ring-light	Auto-fokus
QS-E 1020	manual	200 : 100 : 150	(3+2,0L/100) μm	●	–	●	●	–	–
QS-L 1020AF	manual	200 : 100 : 150	(3+2,0L/100) μm	●	–	●	●	●	●
QS-L 1020Z	manual	200 : 100 : 150	(3+2,0L/100) μm	–	●	●	●	●	–
QS-L 1020Z/AF	manual	200 : 100 : 150	(3+2,0L/100) μm	–	●	●	●	●	●

Vision Measuring Machines QUICK SCOPE CNC

QUICK SCOPE CNC:

- A color CCD camera is used to provide for realistic workpiece observation and measurement. The color image can be captured and stored as a bitmap image for other uses and can be printed out.

System with Objective:

- High-precision measurement objectives 1 x, 2.5 x and 5 x.

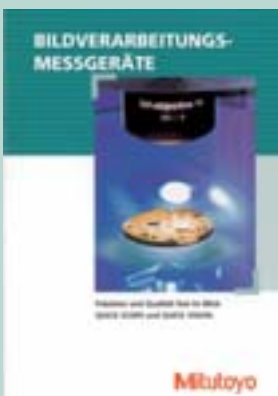
System with Power zoom:

- Powerzoom programming with automatic adaptation of light intensity and pixel size.



QUICK SCOPE CNC

Model	Controller	Measuring range X : Y : Z (mm)	Accuracy E ₁ (XY)	Fix-lens	Zoom-objective	Transmitted light	Co-axial light	Ring-light	Auto-fokus
QS 200	CNC	200 : 200 : 100	(2,5+0,6L/100) μm	●	–	●	●	●	●
QS 250	CNC	200 : 250 : 100	(2,5+0,6L/100) μm	●	–	●	●	●	●
QS 200 Z	CNC	200 : 200 : 100	(2,5+0,6L/100) μm	–	●	●	●	●	●
QS 250 Z	CNC	200 : 250 : 100	(2,5+0,6L/100) μm	–	●	●	●	●	●



Request our detailed brochure!

Vision Measuring Machines QUICK VISION ELF

Quick Vision moves your vision measurement and inspection productivity to higher levels with advanced features!

PT-Version:

- Halogen-Ring-Fiber illumination

Pro-Version:

- Halogen-Ring-Fiber illumination
- Programmable power turret tube lens and programmable RGB LED ring light.



QUICK VISION ELF

Model	Measuring range X : Y : Z (mm)	Accuracy E ₁ (XY)
QVE 200 PT	200 : 200 : 100	(2+0,3 L/100) μm
QVE 250 PT	200 : 250 : 100	(2+0,3 L/100) μm

Both PT models are also available in PRO version.

Vision Measuring Machines QUICK VISION APEX / HYPER QUICK VISION

De facto standards for vision measurement.
With 4-quadrant-LED-Co-axial- and -Ring-light.

Pro-System:

- Programmable 4-quadrant-LED Ring-light



QUICK VISION

Model	Measuring range X : Y : Z (mm)	Accuracy E ₁ (XY)
QUICK VISION APEX		
QVX 202 PT	200 : 200 : 200	(1,5+0,3 L/100) μm
QVX 302 PT	300 : 200 : 200	(1,5+0,3 L/100) μm
QVX 404 PT	400 : 400 : 250	(1,5+0,3 L/100) μm
QVX 606 PT	600 : 650 : 250	(1,5+0,3 L/100) μm
HYPER QUICK VISION		
HQV 202 PT	200 : 200 : 200	(0,8+0,2 L/100) μm
HQV 302 PT	300 : 200 : 200	(0,8+0,2 L/100) μm
HQV 404 PT	400 : 400 : 250	(0,8+0,2 L/100) μm
HQV 606 PT	600 : 650 : 250	(0,8+0,2 L/100) μm

The PT models are also available in PRO version.

Specifications

Resolution: 0,0001 mm
Accuracy
(E₁) 20 °C (XY): (2+0,3 L/100) μm

Specifications

Resolution: 0,0001 mm (APEX),
0,00002 mm (HYPER)
Accuracy
(E₁) 20 °C (XY): 1,5+0,3 L/100 μm (APEX),
0,8+0,2 L/100 μm (HYPER)



Request our detailed brochure!

Specifications

Resolution: 0,0001 mm,
0,00002 mm (HYPER)

Accuracy
(E_i) 20 °C (XY): 1,5+0,3 L/100 μm,
0,8+0,2 L/100 μm (HYPER)

Laserprobe scanning system

The fast laser scanning system distinguishes the QUICK VISION HYBRID machines from the QUICK VISION APEX / HYPER QUICK VISION. It turns them into high-precision 3D contour scanners for the digitisation and testing of surfaces and contours including on the finest of objects.

Vision Measuring Machines QUICK VISION HYBRID

Stationary Measuring System with measuring Laser-scanning-system. Ideal for testing electronic components and digitising small 3D surfaces.

Specification same as QUICK VISION APEX / HYPER QUICK VISION and added:

- Two different laser-scanning systems to choose from.
- Efficient testing of electronic components, e.g. BGA measurements (ball grid array).
- Laser-autofocus.
- Programmable 4-quadrant-LED Ring-light



QUICK VISION HYBRID 404 PRO

Model	Measuring range X : Y : Z (mm)	Accuracy E _i (XY)
QVH 302 PRO	300* : 200 : 200	(1,5+0,3 L/100) μm
QVH 404 PRO	400* : 400 : 250	(1,5+0,3 L/100) μm
QVH 606 PRO	600* : 650 : 250	(1,5+0,3 L/100) μm
HYPER		
HQVH 302 PRO	300* : 200 : 200	(0,8+0,2 L/100) μm
HQVH 404 PRO	400* : 400 : 250	(0,8+0,2 L/100) μm
HQVH 606 PRO	600* : 650 : 250	(0,8+0,2 L/100) μm

* The measuring range is restricted when the laserprobe scanning system is used.

Specifications

Resolution: 0,0001 mm

Accuracy
(E_i) 20 °C (XY): 1,5+0,3 L/100 μm

Vision Measuring Machines QUICK VISION ACCEL

Stationary measuring system with fixed measuring table for rapid acceleration and high-speed travel. The dynamic solution for fast testing of series.

Pro-Version:

- Programmable 4-quadrant-LED Ring-light



QUICK VISION ACCEL 404 PRO

Model	Measuring range X : Y : Z (mm)	Accuracy E _i (XY)
QVA 404 PT	400 : 400 : 150	(1,5+0,3 L/100) μm
QVA 606 PT	600 : 650 : 150	(1,5+0,3 L/100) μm
QVA 806 PT	800 : 800 : 150	(1,5+0,3 L/100) μm

The PT models are also available in the PRO version.



Request our detailed brochure!

Vision Measuring Machine ULTRA QUICK VISION

Stationary CNC Measuring System with hydrostatic air bearing system.

To maximize an accuracy of machine movement.

This provides a sub-micron linearity for full-stroke travel.



ULTRA QUICK VISION 350 PRO

Specifications

Resolution: 0,00001 mm

Accuracy
(E_i) 20 °C (XY): (0,3 + 0,1L/100) μm

Measuring range
X : Y : Z (mm)

350 : 350 : 150

Accuracy

E_i (XY)

(0,3 + 0,1L/100) μm



Request our detailed brochure!



UMAP contact sensor



Optical sensor for positioning and vision measurements

Vision Measuring Machine UMAP VISION Systems

Contact measurement of the finest contours using an extra-small contact probe tip – probe ball diameter 30 μm and shaft length 2 mm

- The UMAP 103 micro measurement sensor enables, for example, contact measurement of very small and narrow bores with the help of an extra-small probe tip – probe ball diameter 30 μm – shaft length 2 mm – length ratio 66.7.

An optical sensor enables the user to magnify any required detail and to carry out vision measurements

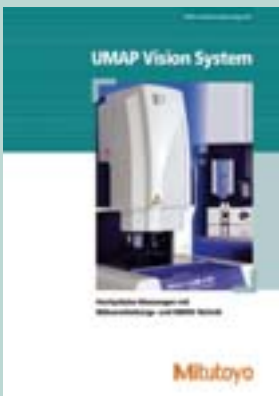
- With an optical sensor, the probe tip can be positioned easily and accurately onto a tiny area that is difficult to see with the naked eye. The sensor can also be used for vision measurements.

Contour measurement with contact scanning

- Also for measuring fixed geometric forms, the UMAP 103 enables point-to-point measurements by tactile scanning. Here scanning is automatic, the device determining the contour of the current point using the measured data and then predicting the next measuring point.



UMAP VISION System HYPER 302 Type 1



Request our detailed brochure!

Vision Measuring Machine NANOCORD

Flexible 3D vision measuring machine for the nano measuring range.

- A basic device with a wide variety of different sensors (e.g. UMAP) for every task.
- High precision MPE: $(0,3 + L/1000) \mu\text{m}$.
- Large measuring range: 300 x 200 x 100 mm.



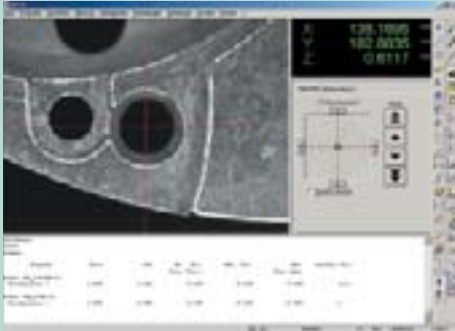
NANOCORD

QVPAK software system

Enormously versatile and user-friendly basic software for the QUICK VISION vision measuring systems.

- The clever design, practical tools and excellent on-screen representation open up a whole new dimension of efficient measuring. With QVPAK, even highly complex measuring procedures can be planned, controlled and evaluated. Even unaccustomed users will familiarise themselves with the QVPAK environment very quickly and easily using the integrated online help.

QVBasic programming language, which is based on Visual-Basic ensures maximum flexibility – for instance when linked up to barcode readers, for data transfer to MS Office applications or the preparation of user-defined input and inquiry dialogues.



MiCAT
Mitutoyo Intelligent Computer Aided Technology

the standard in world
metrology software

CMM

Vision Measuring Systems

QV
QVPAK

Software package

Expansion modules

MeasurLink

Module for the statistical management of measured data as well as the analysis and storage of measured data.

QV CAD-IMPORT/EXPORT

The CAD-Import & Export program converts the workpiece CAD data (IGES or DXF format) so that it can be brought into QVPAK.

QV EIO

Serves communication of the QUICK VISION system with an external programmable controller.

QV EIO PC

QVEio PC provides external control through a personal computer equipped with an RS-232C interface.

QV PARTMANAGER

QVPartManager is an optional software package that allows multiple workpieces lined up on the stage to be measured at once using a part program.

PAGPAK

PAGPAK automatically generates a part program based on 2D CAD data (in IGES, DXF or GERBER format) or NC processing data, for measuring discontinuous through-holes in printed circuit boards.

EASYPAG

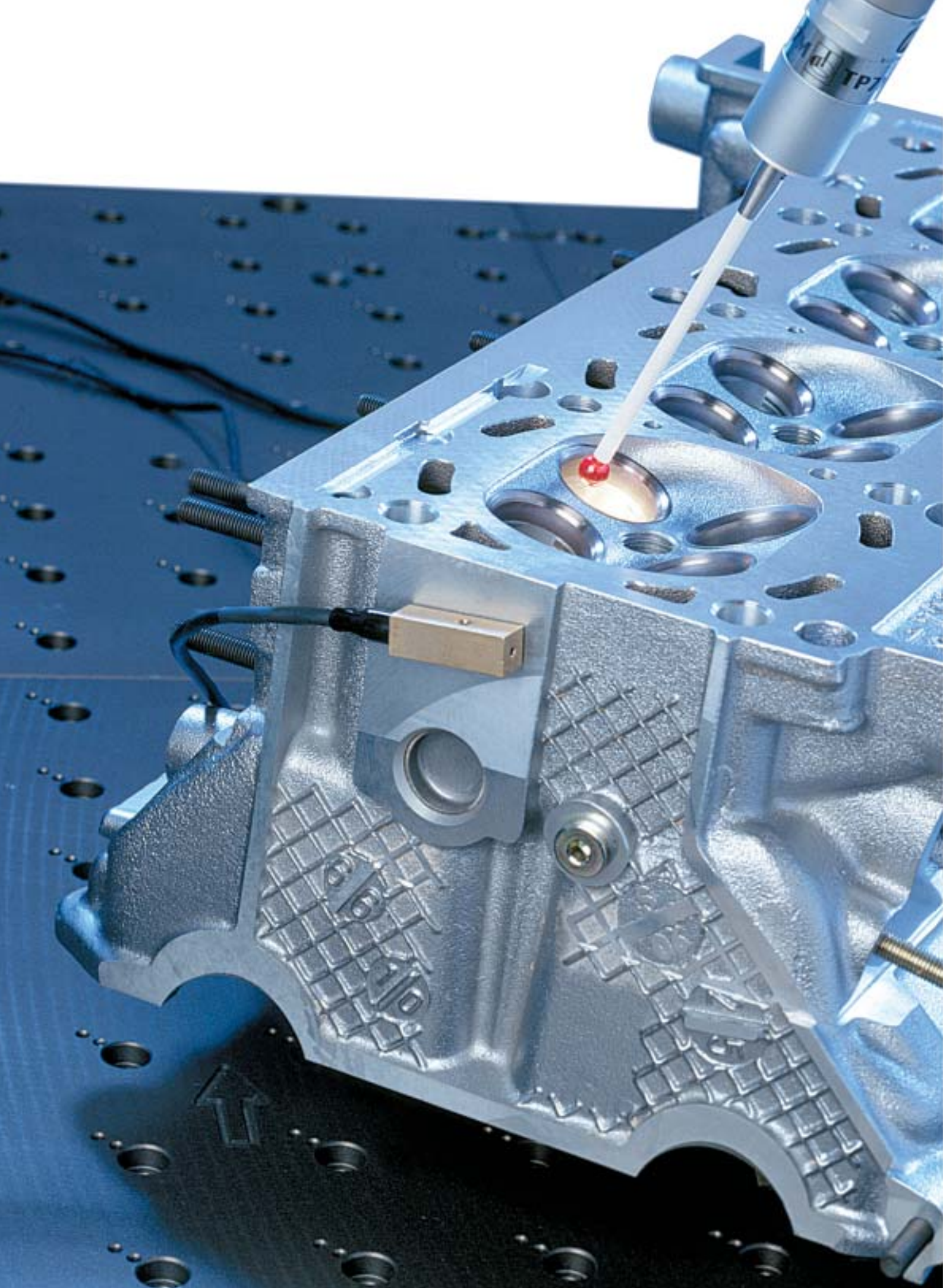
EASYPAG allows off-line part programming for QVPak by using a two-dimensional CAD data (in IGES or DXF format).

FORMPAK-QV

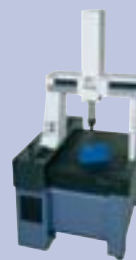
FORMPAK-QV performs two-dimensional contour analysis based on measurement data collected by Quick Vision, comparing that data with nominal values.

QV GEARPAK

Generates a parts programme for measuring toothed wheels including evaluation module for toothed wheel parameters.



Coordinate Measuring Machines
QM-M 333
Crysta-Plus M



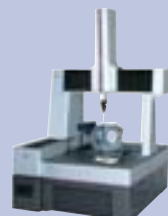
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CNC-Coordinate Measuring Machines
Crysta-Apex C



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CNC-Coordinate Measuring Machines
Euro-C STRATO



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CNC-Coordinate Measuring Machines
LEGEX



Pages 445–447

CNC-Coordinate Measuring Machines
MACH



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CARBapex
CARBstrato



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Software System MCOSMOS
Software System MeasurLink®
Indexible Fixture System REPRO-FIX



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FLEXIBLE GAUGE QM-M 333

FLEXIBLE GAUGE is a measuring machine for the manual measurement of workpieces – fast, precise and flexible. FLEXIBLE GAUGE has been specially designed for aggressive conditions in the workshop and production environments.

- Rapid, simple execution of measuring processes with data processor QM-Data.
- High-precision measurement with rapid, direct processing of measured data.
- Robust, stable construction, particularly user-friendly design.
- An integrated Temperature Compensation System guarantees the accuracy of the CMM main unit under temperature conditions of 15 °C to 30 °C as option possible.
- Can be supplied with PC and MCOSMOS software as an option.



QM-M 333



Data processor QM-Data

Model	Measuring range X : Y : Z mm	Accuracy*
QM-M 333	300 : 300 : 300	$E = (3,0 + 0,4L/100) \mu\text{m}$
QM-M 353	300 : 500 : 300	$E = (3,0 + 0,4L/100) \mu\text{m}$

* According to ISO 10360-2 in the temperature range $20\text{ °C} \pm 1\text{ °C}$ with TP2, TP20

Coordinate Measuring Machines Crysta-Plus M

Manually-operated compact devices for a very economical entry into the world of 3D coordinate measurement. For uncomplicated, rapid and powerful workshop testing, as part of the production process.

- Compact unit with excellent price-performance ratio.
- The Crysta-Plus M can be upgraded to a CNC Machine.
- An optional temperature compensation system can be installed on the Crysta-Plus M. It guarantees the accuracy of the CMM main unit under temperature conditions of 16 to 26 °C.
- Supplied as standard with PC and MCOSMOS software.



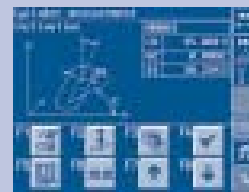
Crysta-Plus M with PC

Model	Measuring range X : Y : Z mm	Accuracy*
Crysta-Plus M544	500 : 400 : 400	$E = (3,5 + 0,45L/100) \mu\text{m}$
Crysta-Plus M574	500 : 700 : 400	$E = (3,5 + 0,45L/100) \mu\text{m}$
Crysta-Plus M776	700 : 700 : 600	$E = (4,5 + 0,45L/100) \mu\text{m}$
Crysta-Plus M7106	700 : 1000 : 600	$E = (4,5 + 0,45L/100) \mu\text{m}$

* According to ISO 10360-2 in the temperature range $20\text{ °C} \pm 1\text{ K}$ with TP2, TP20

Specification

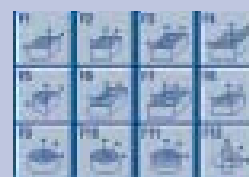
Accuracy: $3,0\text{ }\mu\text{m}$



QM-Data screenshot



QM-Data sample menu



QM-Data sample menu

Specification

Accuracy: $3,5\text{ }\mu\text{m}$ and $4,5\text{ }\mu\text{m}$



Request our detailed brochure or make an inquiry on the Internet at www.mitutoyo.de – product lounge!

Specification

Accuracy: 1,7 µm

CNC-Coordinate Measuring Machines Crysta-Apex C

CNC machines for the trickiest tasks in the laboratory or production line. A great variety of versions for a large selection of measuring ranges.

- An integrated Temperature Compensation System guarantees the accuracy of the CMM main unit under temperature conditions of 16 to 26 °C.
- High drive speed up to 520 mm/s.
- Compatible with a wide range of measuring systems.
- Supplied as standard with PC and MCOSMOS software.



Crysta-Apex C700 with PC



Crysta-Apex C500



Crysta-Apex C900



Request our detailed brochure!

Model	Measuring range X : Y : Z mm	Accuracy* L in mm
Crysta-Apex C544	505 : 405 : 405	$MPE_E = (1,7 + 0,4L/100) \mu m$
Crysta-Apex C574	505 : 705 : 405	$MPE_E = (1,7 + 0,4L/100) \mu m$
Crysta-Apex C776	705 : 705 : 605	$MPE_E = (1,7 + 0,4L/100) \mu m$
Crysta-Apex C7106	705 : 1005 : 605	$MPE_E = (1,7 + 0,4L/100) \mu m$
Crysta-Apex C9106	905 : 1005 : 605	$MPE_E = (1,7 + 0,4L/100) \mu m$
Crysta-Apex C9108	905 : 1005 : 805	$MPE_E = (1,7 + 0,4L/100) \mu m$
Crysta-Apex C9166	905 : 1605 : 605	$MPE_E = (1,7 + 0,4L/100) \mu m$
Crysta-Apex C9168	905 : 1605 : 805	$MPE_E = (1,7 + 0,4L/100) \mu m$
Crysta-Apex C9206	905 : 2005 : 605	$MPE_E = (1,7 + 0,4L/100) \mu m$
Crysta-Apex C9208	905 : 2005 : 805	$MPE_E = (1,7 + 0,4L/100) \mu m$

* According to ISO 10360-2 in the temperature range 16 °C to 26 °C with SP 25M

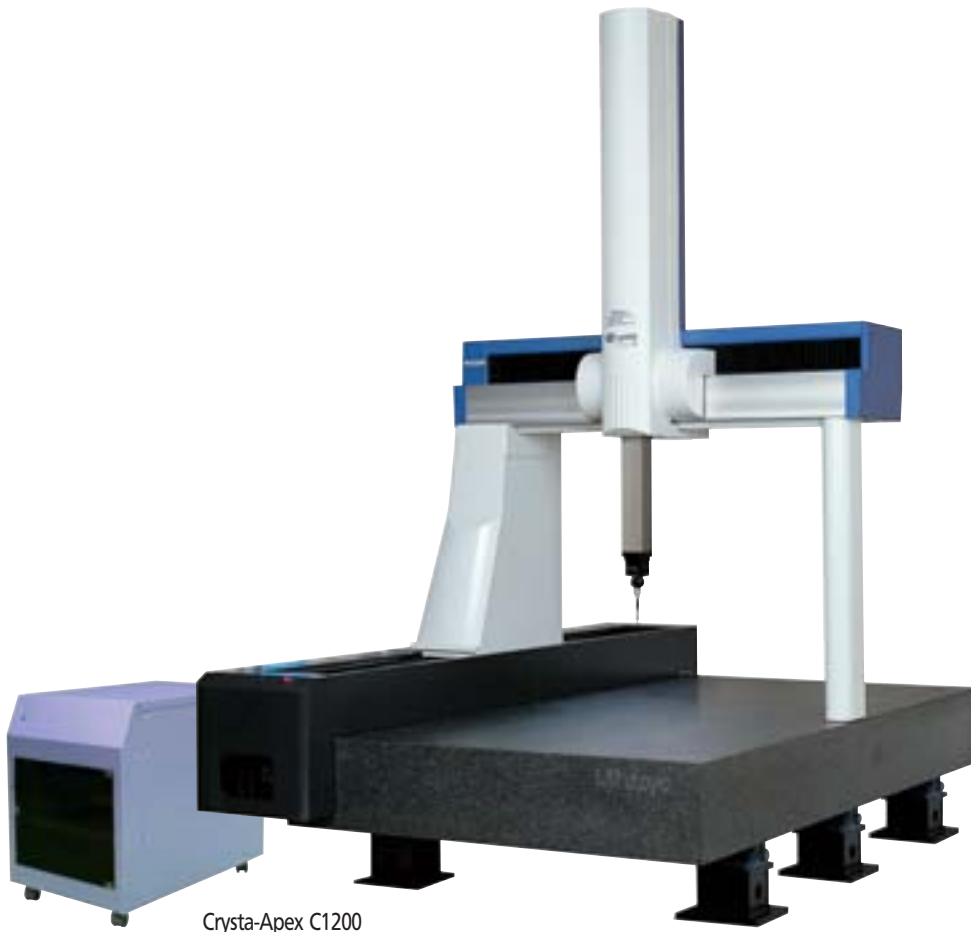
CNC-Coordinate Measuring Machines Crysta-Apex C

CNC machines for the trickiest tasks in the laboratory or production line. A great variety of versions for a large selection of measuring ranges.

- An integrated Temperature Compensation System guarantees the accuracy of the CMM main unit under temperature conditions of 18 °C to 22 °C.
- High drive speed up to 520 mm/s.
- Compatible with a wide range of measuring systems.
- Supplied as standard with PC and MCOSMOS software.

Specification

Accuracy: 2,3 µm to 6,0 µm



Crysta-Apex C1200

Model	Measuring range X : Y : Z mm	Accuracy* L in mm
Crysta-Apex C121210	1205 : 1205 : 1005	$MPE_E = (2,3 + 0,3L/100) \mu\text{m}$
Crysta-Apex C122010	1205 : 2005 : 1005	$MPE_E = (2,3 + 0,3L/100) \mu\text{m}$
Crysta-Apex C123010	1205 : 3005 : 1005	$MPE_E = (2,3 + 0,3L/100) \mu\text{m}$
Crysta-Apex C163012	1600 : 3000 : 1200	$MPE_E = (3,3 + 0,45L/100) \mu\text{m}$
Crysta-Apex C163016	1600 : 3000 : 1600	$MPE_E = (4,5 + 0,55L/100) \mu\text{m}$
Crysta-Apex C164012	1600 : 4000 : 1200	$MPE_E = (3,3 + 0,45L/100) \mu\text{m}$
Crysta-Apex C164016	1600 : 4000 : 1600	$MPE_E = (4,5 + 0,55L/100) \mu\text{m}$
Crysta-Apex C165012	1600 : 5000 : 1200	$MPE_E = (3,3 + 0,45L/100) \mu\text{m}$
Crysta-Apex C165016	1600 : 5000 : 1600	$MPE_E = (4,5 + 0,55L/100) \mu\text{m}$
Crysta-Apex C203016	2000 : 3000 : 1600	$MPE_E = (4,5 + 0,8L/100) \mu\text{m}$
Crysta-Apex C203020	2000 : 3000 : 2000	$MPE_E = (6,0 + 0,9L/100) \mu\text{m}$
Crysta-Apex C204016	2000 : 4000 : 1600	$MPE_E = (4,5 + 0,8L/100) \mu\text{m}$
Crysta-Apex C204020	2000 : 4000 : 2000	$MPE_E = (6,0 + 0,9L/100) \mu\text{m}$
Crysta-Apex C205016	2000 : 5000 : 1600	$MPE_E = (4,5 + 0,8L/100) \mu\text{m}$
Crysta-Apex C205020	2000 : 5000 : 2000	$MPE_E = (6,0 + 0,9L/100) \mu\text{m}$

* According to ISO 10360-2 in the temperature range 18 °C to 22 °C with SP25M



Request our detailed brochure!

CNC-Coordinate Measuring Machines Crysta-Apex C Measuring Systems

Contact measuring systems

Overview of probe change systems:



ACR1



SCRMPPP



MRS-FCR25



MRS-SCP80



SCR200



MRS-ACR3



Sample application

Measuring heads	Probe change system	Description	With probe
Touch-trigger probe heads for single point or multi-point measurement			
	SCR200	Stepless manual-swivel measuring head with separate measuring probe.	
	ACR1 / MRS-ACR3	Rigid measuring system. Measuring head with separate measuring probe.	+
	ACR1 / MRS-ACR3	Motorised turning and swivelling measuring system. Measuring head with separate measuring probe.	+
	SCR 200	Motorised turning and swivelling measuring system. Measuring head with separate measuring probe.	

Dynamic measuring probe heads for single point or multi point measurement			
	MRS-SCRMPPP / MRS-SCP80	Compact measuring systems. Measuring heads with integrated measuring probes.	
	ACR1 / FCR25 / MRS-ACR3	Motorised turning and swivelling measuring system. Measuring heads with separate measuring probes.	

* Only applies from 700 series

Optical (non-contact) measuring systems

Measuring heads	Probe change system	Description	With measuring system
Video measuring head for single point or multi-point measurement			
	ACR1 / MRS-ACR3	Video measuring head also in combination with other measuring systems.	
Laser measuring systems for single point measurement, contour measurement and digitalisation			
	ACR1 / MRS-ACR3	Laser-scan measuring heads also in combination with other measuring systems.	

* Only applies from 700 series



Request our detailed brochure!

CNC-Coordinate Measuring Machines Euro-C STRATO

High-precision CNC system for high-efficiency use in the measuring laboratory and directly in the production environment. With integrated vibration suppression.

- An integrated Temperature Compensation System guarantees the accuracy of the CMM main unit under temperature conditions of 18 °C to 22 °C.
- High drive speed up to 430 mm/s.
- Compatible with a wide variety of measurement systems.
- Supplied as standard with PC and MCOSMOS software.



Euro-C STRATO

Specification

Accuracy: 1,2 and 1,3 μm
3,8 and 4,8 μm

Model	Measuring range X : Y : Z mm	Accuracy* L in mm
Euro-C STRATO 776	705 : 705 : 605	$MPE_E = (1,2 + 0,3L/100) \mu\text{m}$
Euro-C STRATO 7106	705 : 1005 : 605	$MPE_E = (1,2 + 0,3L/100) \mu\text{m}$
Euro-C STRATO 9106	905 : 1005 : 605	$MPE_E = (1,3 + 0,3L/100) \mu\text{m}$
Euro-C STRATO 9166	905 : 1605 : 605	$MPE_E = (1,3 + 0,3L/100) \mu\text{m}$
Euro-C STRATO 162012	1605 : 2005 : 1205	$MPE_E = (3,8 + 0,4L/100) \mu\text{m}$
Euro-C STRATO 162015	1605 : 2005 : 1505	$MPE_E = (4,8 + 0,5L/100) \mu\text{m}$
Euro-C STRATO 163012	1605 : 3005 : 1205	$MPE_E = (3,8 + 0,4L/100) \mu\text{m}$
Euro-C STRATO 163015	1605 : 3005 : 1505	$MPE_E = (4,8 + 0,5L/100) \mu\text{m}$
Euro-C STRATO 164012	1605 : 4005 : 1205	$MPE_E = (3,8 + 0,4L/100) \mu\text{m}$
Euro-C STRATO 164015	1605 : 4005 : 1505	$MPE_E = (4,8 + 0,5L/100) \mu\text{m}$

* According to ISO 10360-2 in the temperature range 18 °C to 22 °C; with SP 25 M (for 700 series and 900 series) with TP 200 (for 1600 series)



Request our detailed brochure!

Specification

Accuracy: 0,35 μm and 0,8 μm

CNC-Coordinate Measuring Machines LEGEX

CNC machine with impressive accuracy to 0.35 μm . Absolute top-of-the-range technology for the most stringent precision requirements in the test laboratory.

- An integrated Temperature Compensation System guarantees the accuracy of the CMM main unit under temperature conditions of 18 °C to 22 °C.
- High drive speed up to 200 mm/s.
- Integrated vibration suppression (from 500 series models).
- Highly rigid.
- Supplied as standard with PC and MCOSMOS software.



LEGEX 322 with PC



LEGEX 322



Request our detailed brochure!



LEGEX 774

Model	Measuring range X : Y : Z mm	Accuracy* L in mm
LEGEX 322	300 : 200 : 200	$MPE_E = (0,8 + 0,2L/100) \mu\text{m}$
LEGEX 574	510 : 710 : 455	$MPE_E = (0,35 + 0,1L/100) \mu\text{m}$
LEGEX 774	705 : 705 : 455	$MPE_E = (0,35 + 0,1L/100) \mu\text{m}$
LEGEX 776	705 : 705 : 605	$MPE_E = (0,35 + 0,1L/100) \mu\text{m}$

* According to ISO 10360-2 in the temperature range 20 °C \pm 2 K; LEGEX 322 with TP 7 M; from 500 series with MPP 300 Q

CNC-Coordinate Measuring Machines LEGEX

CNC machine with impressive accuracy to 0.35 μm . Absolute top-of-the-range technology for the most stringent precision requirements in the test laboratory.

- An integrated Temperature Compensation System guarantees the accuracy of the CMM main unit under temperature conditions of 18 °C to 22 °C.
- High drive speed up to 200 mm/s.
- Integrated vibration suppression.
- Highly rigid.
- Supplied as standard with PC and MCOSMOS software.



LEGEX 9106



LEGEX 12128 with PC

Model	Measuring range X : Y : Z mm	Accuracy* L in mm
LEGEX 9106	905 : 1005 : 605	$MPE_E = (0,35 + 0,1 L/100) \mu\text{m}$
LEGEX 12128	1210 : 1210 : 805	$MPE_E = (0,6 + 0,15 L/100) \mu\text{m}$

* According to ISO 10360-2 in the temperature range 20 °C \pm 2 K; with MPP300Q

Specification

Accuracy: 0,35 μm and 0,6 μm



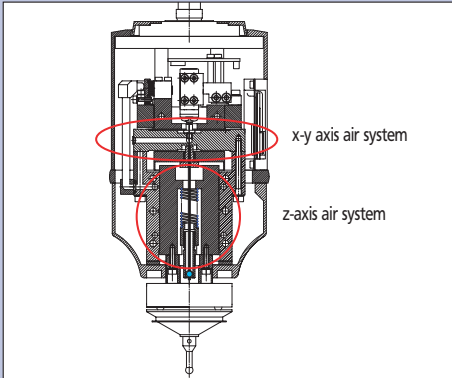
Request our detailed brochure!

CNC-Coordinate Measuring Machines LEGEX

Measuring probe and accessories

Specification MPP-300Q

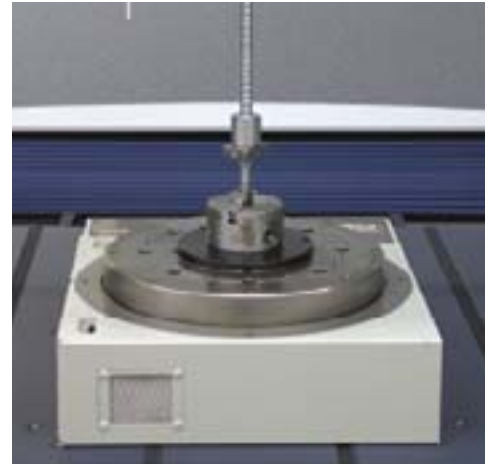
Measuring system resolution: 0,01 μm
 Repeatability (σ): 0,1 μm
 Scanning force: 0,03 to 0,2 N
 Measuring range: ± 1 mm (all axes)
 Clamping function: all axes
 Probe lengths: max. 200 mm horizontal/vertical
 Location: secured in spindle sleeve



Probe system MPP-300Q



Turntable MRT-320



Can be used with all CMMs from X axis 500 mm

Specification MRT-320

Table top size: $\varnothing 320$ mm
 Resolution: 1/100000°
 Max. workpiece weight: 100 kg
 Concentricity: ≤ 1 μm
 Axial run-out: ≤ 2 μm



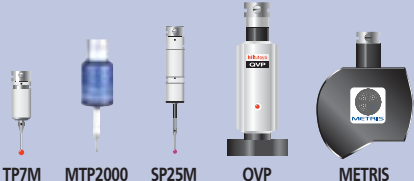

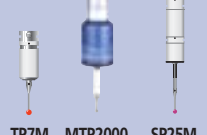
Specification MTP-2000

Repeatability (σ): $\leq 0,075$ μm
 Probe system error: 0,5 μm
 Probe lengths: max. 50 mm horizontal,
 max. 100 mm vertical
 Fixing: Autojoint location

Probe system MTP-2000



Measuring Systems

Measuring head	With measuring probe	Measuring probe
For LEGEX 500 / 700 / 900 / 1200	Ultra high accuracy scanning probe SP80.	
 SP80		
 PH10MQ	High accuracy touch-trigger probe TP7M, MTP2000 High accuracy scanning probe SP25M Vision probe QVP METRIS XC / LC Line laser probe	 TP7M MTP2000 SP25M QVP METRIS
For LEGEX 322	High accuracy touch-trigger probe TP7M, MTP2000 High accuracy scanning probe SP25M	
 PH6M		 TP7M MTP2000 SP25M



Request our detailed brochure!

CNC-Coordinate Measuring Machines MACH

CNC-Hi-speed, in-line coordinate measuring. Drive speed up to 1800 mm/s.

With its enormous stability and strength, ideal and uncomplicated for direct integration into the production process.

- Extremely high travel speed with maximum precision.
- Integrated thermal error compensation for measuring device and workpiece for use directly in the production environment.
- High probing speed up to 30 mm/s.
- Enormous stability and strength.
- Supplied as standard with PC and MCOSMOS software.



MACH V



MACH 806

Model	Measuring range X : Y : Z mm	Accuracy* (L in mm) μm	Range of temperature	Probing speed	Drive speed
MACH-V 565	500 : 600 : 500	$E = (2,9 + 0,43L/100) \mu\text{m}$	15 to 35 °C	1–20 mm/s	max. 866 mm/s
MACH-V 796	700 : 900 : 600	$E = (2,9 + 0,43L/100) \mu\text{m}$	15 to 35 °C	1–20 mm/s	max. 866 mm/s
MACH-V 9106	900 : 1000 : 600	$E = (2,9 + 0,43L/100) \mu\text{m}$	15 to 35 °C	1–20 mm/s	max. 866 mm/s
MACH 403	460 : 460 : 300	$E = (3,5 + 0,4L/100) \mu\text{m}$ $E = (5,0 + 0,5L/100) \mu\text{m}$	15 to 25 °C 10 to 35 °C	1–30 mm/s	max. 1800 mm/s
MACH 806	1021 : 818 : 615	$E = (3,5 + 0,4L/100) \mu\text{m}$ $E = (5,0 + 0,5L/100) \mu\text{m}$	15 to 25 °C 10 to 35 °C	1–30 mm/s	max. 1800 mm/s

* According to ISO 10360-2 with TP 7 M

Integration of the MACH 806 into the Production.



MACH V



MACH 806

Specification

Accuracy: 2,5, 3,5 and 5,0 μm



MACH 403

Workpiece table optional



Request our detailed brochure!

CNC-Coordinate Measuring Machines CARBapex and CARBstrato

Horizontal CNC coordinate measuring machines for the efficient measurement of bodywork.

- Two different models are available: CARBapex and CARBstrato.
- Single or dual arm measuring systems. Both systems can be synchronously controlled.
- New, high-precision technology for volumetric compensation.
- Software with additional functions, e.g. for the location of bores, edge measurements, for the checking of gap dimensions and for non-contact bodywork measurement (CAD-Compare).
- Supports a wide variety of probes such as touch-trigger probes, measurement probes, laser probes and vision probes (CCD camera).
- Guide range of the x axis dust protected and walkable.
- Collision monitoring with photoelectric barrier on the cross-arm (y axis) on the workpiece side and optional monitoring of the rear area on the cross-arm (CARBstrato).
- Supplied as standard with PC and MCOSMOS software.



CARBapex



CARBstrato

Model		CARBapex	CARBstrato
Measuring range mm	X	6000	6000
	Y	1600	1600
	Z	2400	2400
Accuracy MPE _E *	Single TP2/TP20	(25 + 28 L/1000) μm; ≤ 95 μm	(18 + 20 L/1000) μm; ≤ 70 μm
	Dual TP2/TP20	(50 + 35 L/1000) μm; ≤ 120 μm	(38 + 30 L/1000) μm; ≤ 90 μm
Probing speed mm/s		1–5	1–10
Drive speed mm/s		max. 433	max. 866
Max. measuring range mm	X	18000	18000
	Single Y	2000	2000
	Dual Y	3900	3900
	Z	3500	3500

* According to ISO 10360-2 (16 to 26 °C)

Software System MCOSMOS

MCOSMOS is the MiCAT Technology modular software system for professional control, measurement and evaluation in coordinate measurement.

- Software packages and expansion modules for every requirement.
- With this high-end modular software system developed by Mitutoyo, you will have the capabilities of a variety of software packages and expansion modules at your fingertips. They can make comprehensive measurement evaluations, document and present them in an effective form. The data is archived into clear, practical structures. M-COSMOS 1 of course supplied as standard with all Crysta-Apex C coordinate-measuring machines.

MiCAT
Mitutoyo Intelligent Computer Aided Technology

the standard in world
metrology software
CMM

MCOSMOS expansion modules



- Statistical evaluation module (MeasurLink)
- 2-D profile evaluation module (SCANPAK)
- Measuring module for involute gear profiles (GEARPAK)
- 3-D freeform surface module (3D-TOL)
- Coordinate measuring instruments – standard interface module (Pure DMISPAK/I++)
- Bearing surface evaluation module (MAFIS)
- NC correction value module (CORRECT PLUS)
- ... further modules on request.

Features of the software packages

PartManager

is the command centre that boots the software package and manages the parts program.

Geometry module (GEOPAK)

For easy parts program generation (online/offline) supported by the CAD model with collision control.

Online/offline programming module (CAT 300)

For control geometry and uncomplicated parts program generation (online/offline) supported by the CAD model with collision control.

3-D freeform surface module (3D-TOL)

For the automatic scanning of workpiece forms and for the preparation of setpoint/actual value comparisons from CAD model form surfaces and measuring points.

2-D profile evaluation module (SCANPAK)

for the automatic scanning of workpiece forms.

MCOSMOS 1 MCOSMOS 2 MCOSMOS 3

Supports as standard all probe systems, turning and swivelling heads as well as probe change systems.

MeasurLink®-Module



Real-Time_Stat-Measure
 Real-Time-Plus_Stat-Measure-Plus
 Process-Analyzer
 Process-Manager
 Gauge management (test and inspection instrument management)
 Gauge RR (test and inspection instrument capability investigation)
 Pocket-ML



Sample application

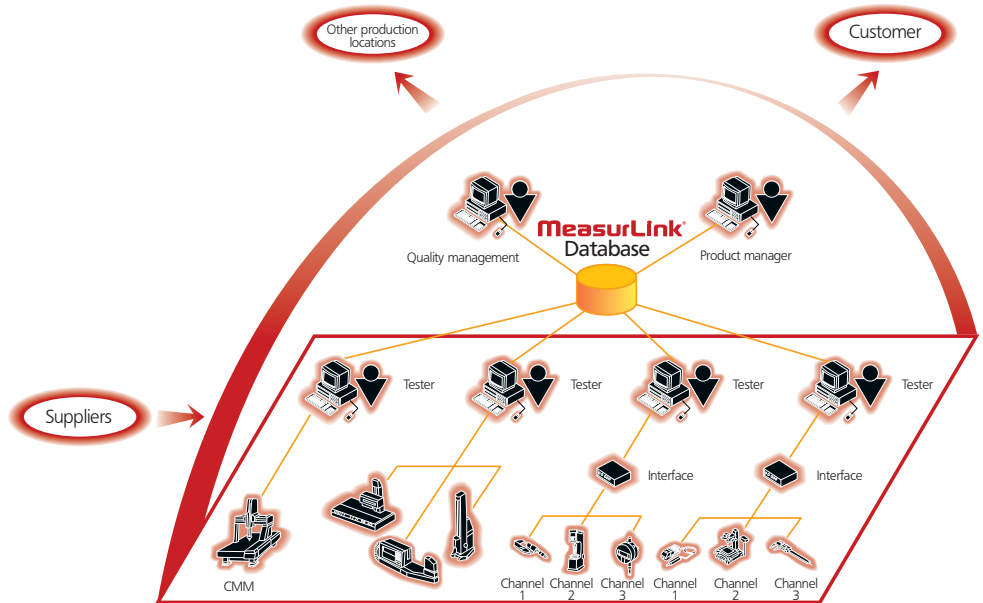


Sample application

MeasurLink®

The complete solution for quality data processing with no limits.
 Universal compatibility with custom functionality.

- MeasurLink® is the comprehensive software for the smooth acquisition, monitoring and evaluation as well as the exchange of quality data.
- MeasurLink® supports all Mitutoyo digital measuring systems – from calipers through to vision systems or coordinate measuring machines. Even data from analogue devices can be easily integrated into the process environment after manual acquisition. With its open program architecture, MeasurLink® can even process the measuring results from instruments from other manufacturers and incorporate them into its own work processes. This places the user in a whole new dimension of measured-data-assisted quality assurance.
- With MeasurLink®, all Mitutoyo measuring systems can now be combined in a single quality analysis system. Data obtained from various instruments is collated centrally, evaluated and efficiently documented according to need.



There is a full description of MeasurLink® on page 15.

Indexible Fixture System REPRO-FIX

The REPRO-FIX flexible fixture system saves even more time and cost, and brings even greater accuracy to measurements in the production environment.

- No matter how specific the task, REPRO-FIX is perfect in combination with coordinate measuring machines. REPRO-FIX exclusive clamping technology is easy to take apart, either completely or in modules.
- The QUICK-RAIL expansion module for positioning REPRO-FIX units makes all this even easier and faster.



– Name, Logo; Philosophy



Everyone needs three things ...

It goes without saying that the prime aim of Japanese companies is to be economically successful.

However, the self-image of a Japanese entrepreneur is more strongly influenced by philosophical principles than in the Western world.

This is often shown already by means of the company name and the company logo.

That is Mitutoyo.

As the son of a highly respected Japanese temple priest, the founder of the company Mitutoyo, Yehan Numata possessed pronounced, moral ideas. Kindness, character strength, sincerity and humbleness were the terms determining the cornerstones of his life. In addition, there were aspects of the Western way of thinking based on his economically orientated studies at the Stanford University in the US.

In 1934, this intellectual equipment combined with the absolutely necessary flair of a successful busi-

nessman resulted in the foundation of a company, which had the mere aim to produce an external screw type micrometer.

However, this micrometer had to meet two requirements: It had to be the qualitatively best one in the world and at the same time cheap enough that every craftsman and very company was able to afford one.

This was not an easy task that Yehan Numata had set himself, but he was determined to solve it by means of the human strengths, which can still be found in the name and logo of the entrepreneur as his stylistic representation.

According to Yehan Numata everybody should have three essential qualities: intelligence, good nature and strength. He interpreted intelligence as the gift of exact observation, good nature as expression of sympathy and strength as an ability to fulfil recognised demands with strength.

These are three absolutely essential character strengths or three important pre-conditions you need to do good things in life and to be successful. Three: in Japanese "Mitu" or "Mitsu" is a number

which is of very great importance in the cultural and spiritual life in Japan, e.g. when listing the most important religious elements.

This is the reason why "Mitu" or "Mitsu" can be found in numerous Japanese company names – e.g. the automobile and machine manufacturer Mitsubishi (three diamonds) or the Mitsuboshi group (three stars).

In this context, Mitutoyo – roughly translated means "the wealth of the three elements" which stands for the absolute necessary combination of the character qualities "intelligence, good nature and strength highly esteemed by Yehan Numata.

He chose these three aspects as the contents of his company philosophy. Aspects, which still determine the self-image of Mitutoyo – in the traditional Japanese sense and in the Western understanding as innovation readiness, customer orientation and service strength.

The great challenge

The Japanese Mitutoyo Corporation tried to open up Europe as the second economic "overseas" market after the US. This was a bold venture because the competitive situation turned out to be very pretentious.

The creation of a good basis always belonged to the company strategy of Yehan Numata, the founder of the company Mitutoyo. For 30 years he had taken his time to establish strong foundations in Japan which were supposed to be the basis for the step of the company into the US American market in 1963. This was a clever decision proven by the immediate success.

As former student of the Stanford University with a sound education in economics and a preference for careful analyses, he gave orders for thorough field studies for the second step of the worldwide Mitutoyo expansion. The aim was to open up the second economic market of international importance: Europe.

In the mid-sixties, Mitutoyo made inquiries about the competitive situation on the spot in close

cooperation with the dealer partners – starting with Great Britain and the Netherlands followed by France. Soon it turned out that Mitutoyo products would be able to enter in competition with the established products, provided that they developed well-aimed sales strategies. Thus, the decision for a dense European commitment had fallen.

Already at this early stage, one of the most important questions to find a country which would be best suited for establishing the Mitutoyo central office for the coordination in Europe. It was relatively quickly decided to take Germany where already solid strategies were developed and realised with a strong, domestic sales partner. The present Mitutoyo Messgeräte GmbH being seated in Neuss near Düsseldorf developed from this successful connection from 1968. Starting from this basis and the close cooperation of the Japanese Mitutoyo group headquarters with national European companies a dense manufacturing, sales and service network was developed in Europe.

Nowadays, it comprises 43 different locations in 24 countries:

Mitutoyo Sales Companies:

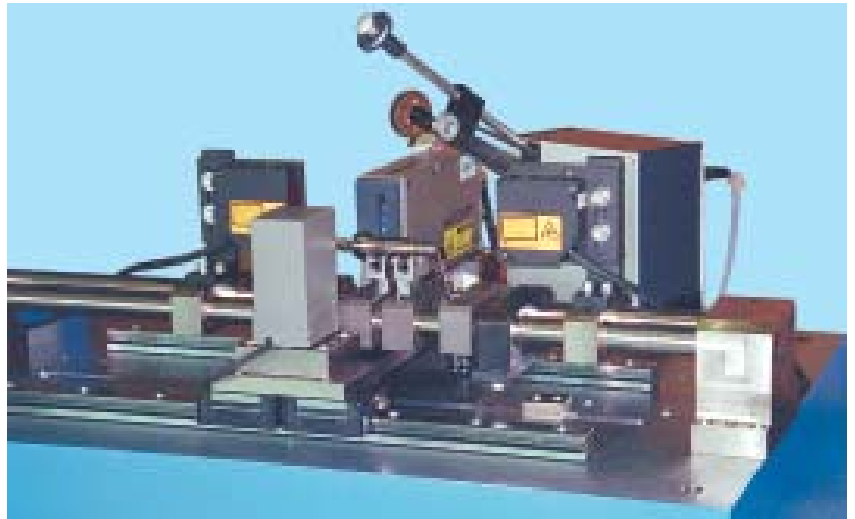
Mitutoyo Messgeräte GmbH, Germany
Mitutoyo Belgium N.V.
Mitutoyo France S.A.R.L.
Mitutoyo Italiana S.l.
Mitutoyo Nederland B.V.
Mitutoyo Schweiz AG
Mitutoyo Scandinavia AB, Sweden
Mitutoyo (UK) Ltd., Great Britain
Mitutoyo Polska Sp.zo.o., Poland
Mitutoyo Cesko s.r.o., Czech Republic
Mitutoyo Hungária

Mitutoyo Research and Manufacturing Plants:

CTL Oberndorf (Software), Germany
Manufacturing Plant Veenendaal, Netherlands
KOME G GmbH, Germany



KOMEG: Full Service For Mitutoyo Users



When the KOME G GmbH of the Saarland became a 100% subsidiary company of Mitutoyo Messgeräte GmbH an essential Mitutoyo philosophy was resolutely continued in Germany: the full service dealing with all concerns of pretentious users of measuring technology. When Komeg was founded in 1974 as "KOordinaten MEssmaschinen-Gesellschaft" (coordinate measuring machine company), it only attended to the coordinate measuring technology, which was at that time at an early stage. As partner of leading KMG manufacturers KOME G contributed essentially to its stormy advancement and spreading in almost all industrial areas.

Since the end of the seventies the activities were further expanded to other fields, first of all to computer-aided manufacturing measuring technology, then to handling and installation technology

and finally to materials-handling technology and to the general industrial plant engineering. During this diversification KOME G became a widely branched company group with numerous business premises. The "KOME G Industrielle Messtechnik GmbH" having its seat at the manufacturing location of the measuring technology in Völklingen resulted from the re-structuring of the KOME G Group in 1997. Since then, it has been a subsidiary company of Mitutoyo Messgeräte GmbH and has been concentrating on the traditional strengths of the original company: the computer-aided quality control and the coordinate measuring technology advancing more and more into the manufacturing area. In addition, the company possesses a well-founded know-how and comprehensive experience in the fields of automatic/manual loading systems as well as air-conditioning technology.

"Correct Plus", a convincing system for the feedback of correction data to machining centres, clearly proves how well the competences of Mitutoyo and KOME G complement each other in the sense of complex task solutions for pretentious customers. Another highlight is the test line "Speedway" with which KOME G reaches a level in the automobile quality control so far never achieved. This quantum jump was only made possible by means of a technology realised world-wide for the first time – namely the technology of simultaneous coordinate measuring of geometry and function in a single pass.

This founding philosophy existing for over 70 years determines the relation of Mitutoyo with its customers



Information and communication create confidence, understanding and liking

Get to know us and our competence in the European Mitutoyo customer centres or visit our websites on the internet to get a first impression. On the internet, you will obtain a general view of the company, its different departments and services as well as of all our measuring and test instruments. In case of particular questions you can directly ask per e-mail the experts of the individual departments.

Our complete energy is devoted to the Mitutoyo success factors: quality, efficiency and long service life

These factors also apply to us when dealing with our customers and planning our services. Each contact, each meeting with our customers opens new possibilities and chances for growth and further development – for Mitutoyo as well as for our customers. We appreciate the efforts and performance of everybody who is involved in this process, of our customers, our dealers and our well-trained staff.

– Our Investment In The Satisfaction Of Our Customers

Service

– Tailor-made for you



With competent advice, training, documentation, installation, startup, maintenance and calibration as well as comprehensive information in the Mitutoyo media network, you can make from us valuable services. Services, which make sure that you will certainly make the correct choice and that you will not be left alone with the measuring technology after purchase.

Advice Discussion – the start of a profitable association



Highly qualified staff will answer all your questions and clarify your requirements and wishes with you. Already in the searching and planning phase, the contact with us will be worthwhile. We will check together with you whether we have the correct solution for your measuring requirements. With each discussion between you and us, we will get to know your challenges and can develop our measuring instruments further on the basis of this information and create the foundations for new products. You can learn a lot during these discussions with us, which can be useful for you in future beyond your current needs.

Maintenance

– Maintaining without losing time



For high-rating measuring units, Mitutoyo offers also maintenance contracts for hardware and software. Your measuring instruments stay precise, reliable and efficient due to regular maintenance at (in general once per year).

Repair– quick, competent, immediate, on the spot



The repairs of the measuring instruments are carried out in our service workshops or in the case of coordinate measuring instruments or other high-rating instruments at your plant. Your measuring instruments will only be equipped with original replacement parts and experienced mechanics and technicians will install them.

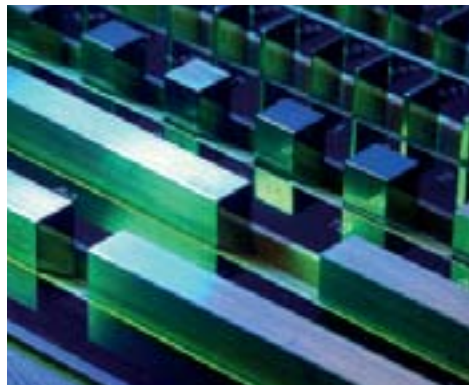
Certified – according to DIN EN ISO 9001:2000

The Mitutoyo Messgeräte GmbH has a quality management system certified according to DIN EN ISO 9001:2000

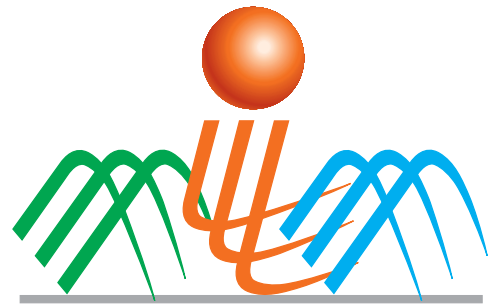


The calibration service – all sizes in the correct measure

Mitutoyo has set up its own calibration laboratories for measuring and test devices in order to constantly guarantee high quality. Experienced measuring technicians will carefully carry out the calibrations of your measuring and test instruments with the greatest thoroughness. Our calibration service ensures the reset of Mitutoyo measuring and test instruments to the linear standard. All calibration procedures correspond to the quality requirements according to DIN ISO 9000 (and later norms).



Mitutoyo Information Center of Metrology



As biggest manufacturer of measuring and test instruments in the manufacturing technology, Mitutoyo offers a comprehensive program for advanced training for all areas of the manufacturing measuring technology in Germany. In 1999 Mitutoyo Messgeräte GmbH founded the Mitutoyo Center of Metrology in the Deutschlandzentrale in Neuss. It is a training centre, which is open for all interested people. The centre is equipped with comprehensive training material in generous seminar rooms and offers in addition to training courses in technology and software, teaching courses for system applications. Besides, there are seminars about the basics of the linear measuring technology with practical exercise facilities and advanced training courses for special subjects. The basic philosophy of the Information Center of Metrology is the exchange of experience and knowledge. Not only does it serve mere imparting of knowledge in training courses but also dialogues among specialists. Therefore it is not only open for Mitutoyo customers but for all interested people from the areas of manufacturing, quality control, construction and materials testing.

The following seminars are available at the moment:

- Quality Control with Manual Measuring Instruments
- Image Processing in Linear Measuring Technology
- Introduction in Surface Measuring
- Introduction in 3D Coordinate Measuring
- Test Instruments Control

The current seminar dates you will find on the internet under www.mitutoyo.de

Battery

No.	Name
011031	Battery set for dial caliper gauge Series 209
011037	Battery LR-6
011076	Battery P-60AA for DP-1HS
011263	Battery CR-123A for dial caliper gauge Series 209
011372	Battery for 900872 Electronic contact scanning device
128487	See 011372
210696	Battery for 518-203
224815	Battery for 518-904
353489	Battery LR-14 (3 pcs.)
525369	Battery AM-15 (3 pcs.)
938882	Battery SR-44
995433	Battery for 178-921
996072	Battery for 178-924
996945	Battery for Surftest 301
055AA217D	Battery CR-2032 for 192-613, -614, -615, -663, -664, -665
12AAA786	Battery for 518-321
12BAA240	Battery for SJ-201
12BAA688	Battery for SJ-301 und SJ-401, SJ-402

Glass plates for measuring stages

No.	Name
011014	270 x 170 mm (for 172-260)
12BAD381	180 x 180 x 8 mm
12BAD760	250 x 150 x 8 mm
12BAD363	270 x 240 x 8 mm
12BAD330	370 x 240 x 8 mm
200662	Ø 66 mm
200666	Ø 90 mm
200667	Ø 100 mm
200673	Ø 80 mm
200674	Ø 60 mm
200675	Ø 40 mm
380405	96 x 96 x 5 mm
380412	190 x 160 x 6 mm (equal to long corner edges)
380495	154 x 96 x 5 mm
380558	404 x 179 x 8 mm
381349	196 x 96 x 5,5 mm
381952	280 x 180 x 8 mm
382255	486 x 336 x 8 mm
382762	280 x 180 x 6 mm (for 319-225-1) PV-5000
383141	Ø 84 mm
384111	Ø 188 mm
384261	380 x 180 mm
510042	190 x 92 x 5 mm
510166	180 x 130 x 5 mm
510185	Ø 130 mm
510408	150 x 92 mm
511451	Ø 146 x 5 mm
512627	Ø 145 x 5 mm
515264	190 x 160 x 6 mm (diagonal folded edge not equal)

Glass plates for measuring stages (continue)

No.	Name
517505	310 x 170 x 8 mm

Illumination

No.	Name
19BAA219D	Lamp 6 V/20 W for MVK-H3
19BAA095	Lamp 6 V/1 W for AVK-C1
19BAA097	Lamp 100 V/5 W for ARK-600
19BAA096	Lamp 12 V/10 W for AVK-A2
383038	Lamp 24 V for TM-500
513666	Lamp 6 V/20 W for TM-300
513667	Lamp 12 V/50 W for TF, MP, MF-U -500/100
513614	Lamp 6 V/10 W for DR, DV-4, SR
011300	Lamp 8 V/20 W for 376-911-1
101479	Lamp 6,3 V for TM-100
050108	Lamp for 176-152
162151	Lamp for 375-101
515557	Lamp 8 V/24 W for TM-200 transmitted light
515558	Lamp 8 V/24 W for TM-200 incident light
515559	Lamp 8 V/12 W for 176-322
512437	Lamp 12 V/100 W for PJ-250H, PJ-300H, PV-350H, PV-500, PH-350H
515530	Lamp 24 V/150 W for PJ-H3000, PJ-3000, PJ-A3000, PJ-2500, PJ-5000

Glass for semi translucent mirror

No.	For article
515514	for PJ-250H (172-125)
515515	for PJ-250H (172-126)
515516	for PJ-300H (172-202)
515517	for PJ-300H (172-203)
515518	for PV-350H (172-150)
515519	for PH-350H (172-151)
200670	for PH-350H (172-152)
200671	for PH-350H (172-153)

Printingpaper

No.	For article
011046	Surftest 201/301 (10 rolls)
011074	DP-1HS (264-503 D) (5 rolls)
201128	178-704 (1 roll)
270005	DP-5, DP-7 (10 rolls à 10 m)
270009	DP-5, DP-7 (10 rolls à 50 m)
270527	DP-1 HS (264-503 D) (1 roll)
270732	SV 400 (5 rolls)
270732	MICROPAK 5 (5 rolls)
225703	Linear Height (10 rolls)
997662	Linear Height Series 518 (10 rolls)
270490	Multi-Printer (164-515) (10 rolls)
350262	Roundtest 200/7/711 (100 pages)
353138	Roundtest RA 112/122 (1 roll)

Printingpaper (continue)

No.	For article
353535	Surftest 501 (1 roll)
526686	LSM 1000/2000 (1 roll)
536922	Contracer CB-41 (1 roll)
538554	Contracer CP-11/-21; CA-41/-42 (1 roll)
538646	Contracer CB-41/81 (1 block DIN A 4)
535653	Contracer CB-41/81 (1 roll)
541087	Surfcorder 178-702, 178-703 (1 roll)
541493	DP-1 (264-500); STP-1 (178-801) (1 roll)
544629	DP-1 DX (264-501); STP-2 (178-802) (1 roll)
544944	DP-2 DX/3 DX (1 roll à 50 m)
731098	DP-2 DX, DP-3 DX (1 roll à 8 m)
998698	RA-114 (10 rolls)
997471	RA-300/400 (10 rolls)
09EAA082-5	DP-1 VR (5 rolls)
09EAA069D	DP-1 VR (1 roll)
12 AAA 802	518-321, 518-321-20 Thermal Printingpaper (10 rolls)

Cleaning fluidtel

No.	Name
011298	For Profile Projectors, Microscopes, Objectives, Vision Measuring Systems (120 ml)

Ribbon cassettes

No.	Name
197216 D	Ribbon cassettes for Multi-Printer (164-515), DP-1 HS (264-503) (5 pcs.)
356058	Ribbon cassettes for Surftest SV 201/301 (5 pcs.)
527511 B	Pen black for DP-5, DP-7
527511 C	Pen blue for DP-5, DP-7
527511 D	Pen green for DP-5, DP-7
527511 E	Pen red for DP-5, DP-7
538653	Recording pen for Contracer CP-11/21; Contracer CA-41/42

Scriber

No.	For article
07GZA000	192-130, -132, -133, -614, 615 514-102, -103, -104, -105, -106, -107 570-223, -225, -228, -229 574-110-1, -111-1
900167	192-201
900168	192-106, -104, -105, -930, -932, -601, -603, -604 514-161 570-103, -105
900173	506-201, -202, -204, -205, -207, -209 570-102, -112, -202, -227
900258	192-116, -114, -140, -142, -605, -606, -607, -608 506-204, -205 570-213, -215, -223, -234, -235, -247 574-210-1
900282	520-163, -150, -156

Scriber (continue)

No.	For article
900285	520-151
900388	570-203, -205 574-110, -111
900389	520-151, -157
900390	514-170
900913	570-113, -114
905200	192-651, -653, -654, -661, -663, -664, -665 514-108 570-206, -226, -230
905201	192-655, -656, -657, -658, -667, -669 570-216, -236

Scriber holder

No.	For article
05GZA033	192-130, -132, -133, -613, -614, -615, -663, -664, -665 514-102, -106, -108 570-228, -229, -230
07GZA002	192-130, -132, -133, -614, -615 514-102, -103, -104, -105, -106, -107 570-223, -225, -228, -229 574-110-1, -111-1
07GZA004	506-201, -202, -204, -205, -207, -209 570-102, -112, -202, -227
07GZA032	92-116, -114, -140, -142, -605, -606, -607, -608 506-204, -205 570-213, -215, -223, -234, -235, -247 574-210-1
901338	570-227
901384	192-106, -104, -105, -201, -930, -932, -601, -603, -604, -651, -653, -654, 192-661, -663, -664, -665 514-108, -161 570-103, -105, -203, -205, -206, -226, -230 574-110, -111
901385	192-655, -656, -657, -658, -667, -669 570-216, -236
905006	520-163, -150, -156
905008	520-151
900514	520-151, -157

Our task is to serve the society by producing high-precision linear measuring instruments and to promote the progress of quality.

Mitutoyo

expresses the high demand we have to meet.

Challenge us with your demands, requirements and wishes.

In doing so you take care of our common growth and common progress.

Then we contribute together to the welfare of our global society.





Industry protections



International Protection Index of degree of protection according to DIN EN 60 529 (approximate)

Protection against foreign substances and dust

Particles > 50,0 mm	IP 1 x
Particles > 12,5 mm	IP 2 x
Particles > 2,5 mm	IP 3 x
Particles > 1,0 mm	IP 4 x
Dust residue	IP 5 x
Dust intrusion	IP 6 x

International Protection Index of degree of protection according to DIN EN 60 529 (approximate)

Water resistance

Drip-water vertical	IP x 1
Drip-water oblique	IP x 2
Spray-water	IP x 3
Splash-water	IP x 4
Hose-water	IP x 5
Strong hose water	IP x 6
Temporary immersion	IP x 7
Permanent immersion (depth of immersion in m)	IP x 8

Example:

IP-65 = "Dust intrusion" and "Hose-water"
(Please refer to our leaflet on IP protection for further information).

Mitutoyo patents registered or applied for*

Registered Mitutoyo patents




















Patent-No.	US4879508	US4878013	US5053715	US6329813	US6400138
	JP1783035	JP1783036	JP1745485	JP3436510	JP1745486
	EP0248165	EP0404980	EP0240020		
	CN87102580	CN87102624	CN89106051		

Mitutoyo patents applied for

Patent-No.	EP1014041
	CN1272620

* Correct at time of going to press: April 2005

Function features dial gage

-  Double sided scale
-  Continuous scale
-  Jewel bearing
-  DIN Standard
-  Low Measuring force
-  Shock proof
-  Wide scale spacing
-  Splash proof
-  Damped endpoint
-  Scale graduation counterclockwise
-  Slave pointer
-  Adjustable pointer
-  Revolution counter central
-  One pointer rotation
-  Dust proof
-  Revolution counter
-  High precision type
-  Compact design
-  Long probe tip
-  Double scales
-  Nonmagnetic

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