New Products

ABSOLUTE Digimatic Indicator ID-C (Signal Output Function Type)

Refer to page F-19 for details.

Dial Test Indicator

Refer to page F-67 for details.

Inspection Instruments for Indicators (i-Checker)

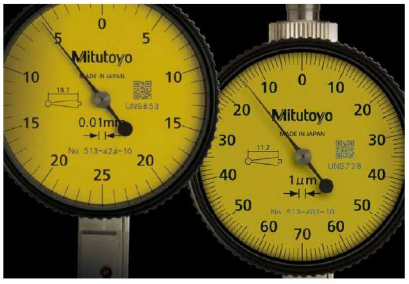
Refer to page F-77 for details.

Small Tool Instruments
Digimatic Indicators
Dial Indicators/
Dial Test Indicators

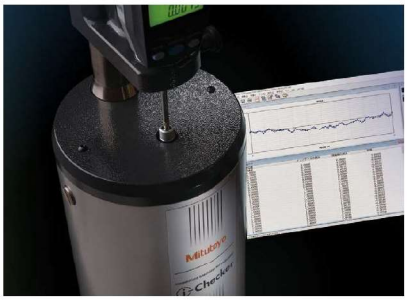
Digimatic Indicators

Dial Indicators

Dial Test Indicators



Dial Indicator Applications and Stands



INDEX

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABSOLUTE Solar-Powered Digimatic Indicator ID-SS SERIES 543

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- Solar powered, this series consists of environmentally friendly measuring instruments that do not require batteries, eliminating the need for battery replacement. Their minimum operating luminance is 40 lux (lx), lower than that inside a warehouse.
- The large-capacity built-in reservoir capacitor allows you to use the indicator for long periods of time under lighting conditions below the minimum level.
- All functions can be accessed by using the two or three large buttons on the front of the indicator.
- Origin recorded even if display disappears.
  The indicator includes an ABS (absolute) scale that allows the previously set origin to be restored even if the display disappears due to insufficient lighting, making it easy to resume measurement. This feature makes ID-SS ideal for long-time or multi-point measurement.
- Three types of accessories (optional) are available to enable spindle lifting in various measurement settings.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

543-500

MeasurLink® ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

ABSOLUTE™

PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page U-11 for details.

Technical Data

- Display: 6-digit LCD, sign
- Usable orientations: All
- Power supply: Solar battery (for indoor use)
- Minimum Operating illumination: 40 lux (lx)

Note: Rechargeable; can be used for approximately 3.5 hours when fully charged. Charging time is approximately 1.5 hours under 500 lux (lx) lighting conditions.

- Maximum response speed: No limit (scan-type measurement is not supported)

Functions

- Origin set (Zero-setting)
- Direction switching
- Data output
- Error alarm display

SPECIFICATIONS

Metric

ISO/JIS type ASME/ANSI/AGD type

Order No.	Range (mm)	Resolution (mm)	Maximum permissible error*1 (mm)			Measuring force MPL (N)	Back type	Net mass (g)
			MPE_E*2	Hysteresis MPE_H	Repeatability MPE_R			
543-500	12.7	0.001	0.003	0.002	0.002	1.5 or less	With lug	150
543-500B							Flat	140
543-505		0.01	0.02	0.02	0.01		With lug	150
543-505B							Flat	140

Inch/Metric

Order No.	Range	Resolution	Maximum permissible error*1			Measuring force MPL (N)	Back type	Net mass (g)
			MPE_E*2	Hysteresis MPE_H	Repeatability MPE_R			
543-501	0.5 in/12.7 mm	0.00005 in /0.001 mm	±0.0001 in /0.003 mm	0.0001 in /0.002 mm	0.0001 in /0.002 mm	1.5 or less	With lug	150
543-501B							Flat	140
543-502							With lug	165
543-502B							Flat	140
543-506		0.0005 in /0.01 mm	±0.0010 in /0.02 mm	0.0010 in /0.02 mm	0.0005 in /0.01 mm		With lug	150
543-506B							Flat	140
543-507							With lug	165
543-507B							Flat	140

*1 These values apply at 20 °C.
*2 Error of indication for the total measuring range
Note: Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

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Optional Accessories

Lifting lever

Lifting knob

Lifting cable

- Lifting
  Lifting lever **21EZA198** (ISO/JIS Type),
  21EZA199 (ASME/ANSI/AGD Type)
  Lifting knob **21EZA105** (ISO/JIS Type),
  21EZA150 (ASME/ANSI/AGD Type)
  Lifting cable **21JZA295**
- SPC Cable:
  905338 (1 m)
  905409 (2 m)
  (Refer to pages A-27 to A-29 for details.)
- USB Input Tool Direct (2 m): **06AFM380F**

Note: Please separately purchase **USB-ITPAK** since there is no data output switch on the measurement instrument. Refer to pages A-13, A-22 to A-24 for details.

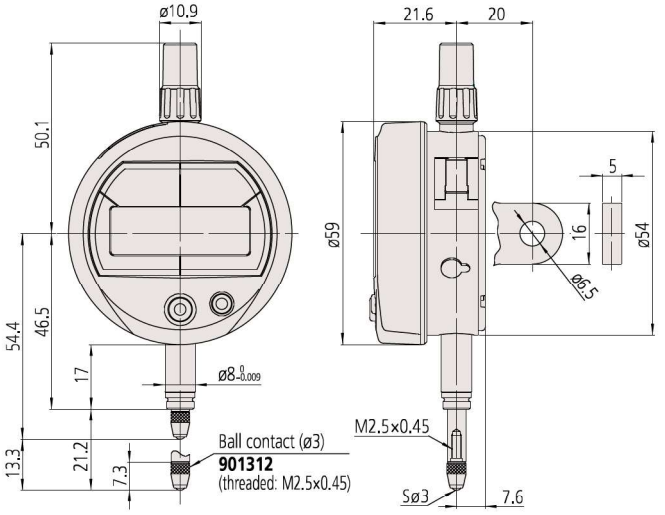
- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type):
  264-016-10
  IT-007R (RS-232C Communication Conversion Type):
  264-007
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm):
  02AZD790F
  For foot switch: **02AZE140F**
  (Refer to pages A-19 to A-21 for details.)
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**
- Contact points for Mitutoyo's dial indicators
  (Refer to pages F-57 to F-60 for details.)
- Interchangeable backs for 2 series
  (Refer to page F-61 for details.)
- Measuring stands
  (Refer to pages F-84 to F-91 for details.)
- **ID-SS** can be used in standard work environments.
  The following is excerpted from JIS Z9110: 2010 General rules of recommended lighting levels; 5.4 Factories:

Luminance (lux)	Settings and procedures
1500	Very detailed visual work
750	Detailed visual work; design and drawing work
500	Regular visual work such as work carried out in a factory; monitoring work such as using instrument panels and control panels
300	Administrative work carried out in a warehouse
200	Control rooms, bathrooms, and places where manual light work is carried out
150	Work such as loading, unloading, and shifting loads
100	Hallways, corridors, entrances and exits, and warehouses
50	Indoor emergency staircases

Dimensions

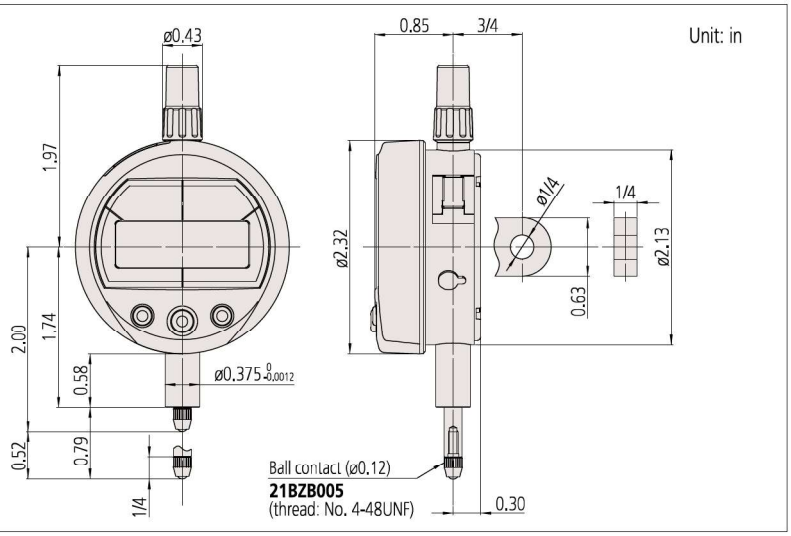
ISO/JIS Type

Unit: mm



ASME/ANSI/AGD Type

Unit: in



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Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABSOLUTE Digimatic Indicator ID-SX SERIES 543

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- Cost-effective oriented design
  ID-SX indicators use a button-type battery (SR44) and come with the minimum of functionality for ease of use. There is a choice of models in the lineup allowing selection of 0.01 mm, 0.001 mm or inch-based measurement resolutions.
- IP53 dust/water protection level
  The models listed below also provide IP53 dust/water protection level specifications:
  543-794/94B/95/95B/96/96B
- These Digimatic indicators employ Mitutoyo's proprietary ABS (absolute) scale, which makes it possible to restore the origin point even if the power is turned off. This eliminates the need to perform origin restoration each time the power is turned on. Furthermore, this scale ensures that overspeed errors do not occur, which improves reliability.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

543-781
ID-S1012X

543-790
ID-S112X

543-794
ID-S112PX
IP53

SPECIFICATIONS

Metric

ISO/JIS Type ASME/ANSI/AGD type

Order No.	Range (mm)	Resolution (mm)	Maximum permissible error*1 (mm) MPE$_E$*2	Hysteresis MPE$_H$	Repeatability MPE$_R$	Measuring force MPL (N)	Back type	Battery life*3	Net mass (g)	Dust/Water protection level*4
543-790	12.7	0.001	0.003	0.002	0.002	1.5 or less	With lug	Approx. 18,000 hours (Continuous use) Approx. 5 years (Normal use)	150	IP42
543-790B							Flat		140	
543-794						2.5 or less	With lug		150	IP53
543-794B							Flat		140	
543-781		0.01	0.02	0.02	0.01	1.5 or less	With lug	Approx. 20,000 hours (Continuous use) Approx. 5 years (Normal use)	155	IP42
543-781B							Flat		155	

Inch/Metric

Order No.	Range	Resolution	Maximum permissible error*1 MPE$_E$*2	Hysteresis MPE$_H$	Repeatability MPE$_R$	Measuring force MPL (N)	Back type	Battery life*3	Net mass (g)	Dust/Water protection level*4
543-791	0.5 in/ 12.7 mm	0.00005 in /0.001 mm	±0.0001 in /0.003 mm	0.0001 in /0.002 mm	0.0001 in /0.002 mm	1.5 or less	With lug	Approx. 18,000 hours (Continuous use) Approx. 5 years (Normal use)	150	IP42
543-791B							Flat		140	
543-792							With lug		165	
543-792B							Flat		140	
543-793		0.0001 in /0.001 mm					With lug		165	
543-793B							Flat		140	
543-795		0.00005 in /0.001 mm				2.5 or less	With lug		155	IP53
543-795B							Flat		155	
543-796							With lug		155	
543-796B							Flat		155	
543-782		0.0005 in /0.01 mm	±0.0010 in /0.02 mm	0.0010 in /0.02 mm	0.0005 in /0.01 mm	1.5 or less	With lug	Approx. 20,000 hours (Continuous use) Approx. 5 years (Normal use)	150	IP42
543-782B							Flat		140	
543-783							With lug		165	
543-783B							Flat		140	

*1 These values apply at 20 °C.
*2 Error of indication for the total measuring range
*3 The battery life varies, depending on the number of times a Digimatic indicator is used as well as the way it is used. The values listed above are approximations.
*4 This is only valid when the data socket cover is in place. Does not apply if the cover is removed, a lifting accessory is attached, or a connecting cable is attached.

Note: Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

MeasurLink® ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

ABSOLUTE™

PROPRIETARY INSPECTION CERTIFICATE
Mitutoyo guarantees the product quality

An inspection certificate is supplied as standard. Refer to page U-11 for details.

Technical Data

- Display: 6-digit LCD, sign
- Usable orientation: All
- Scale type: ABSOLUTE electrostatic linear encoder
- Battery: SR44 (1 pc.), **938882** for initial operational checks (standard accessory)
- Maximum response speed: No limit (except for scanning measurement)

Functions

- Origin set (Zero-setting)
- Direction switching
- Data output
- Low battery voltage alarm display
- Error alarm display

Optional Accessories

- Lifting
  Lifting lever **21EZA198** (ISO/JIS Type), **21EZA199** (ASME/ANSI/AGD Type)
  Lifting knob **21EZA105** (ISO/JIS Type), **21EZA150** (ASME/ANSI/AGD Type)
  Lifting cable **21JZA295**
- SPC Cable:
  905338 (1 m)
  905409 (2 m)
  (Refer to pages A-27 to A-29 for details.)
- USB Input Tool Direct (2 m): **06AFM380F**

Note: Please separately purchase **USB-ITPAK** since there is no data output switch on the measurement instrument. Refer to pages A-13, A-22 to A-24 for details.

- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type): **264-016-10**
  IT-007R (RS-232C Communication Conversion Type): **264-007**
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm): **02AZD790F**
  For foot switch: **02AZE140F**
  (Refer to pages A-19 to A-21 for details.)
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**
- Contact points for Mitutoyo's dial indicators (Refer to pages F-57 to F-60 for details.)
- Interchangeable backs for 2 series (Refer to page F-61 for details.)
- Measuring stands (Refer to pages F-84 to F-91 for details.)

IP53 dust/water protection level*

Level 5: Dust protection
While complete protection against intrusion of dust is not provided, protection is adequate to prevent dust intrusion in amounts that would inhibit the prescribed operations and safety of the electronic equipment.

Level 3: Protection against spraying water
The product suffers no harmful effects when subjected to water sprayed at an angle of up to 60° on both sides.

For details on the dust/water protection level test conditions, refer to IEC 60529: 2001 and JIS C 0920: 2003.

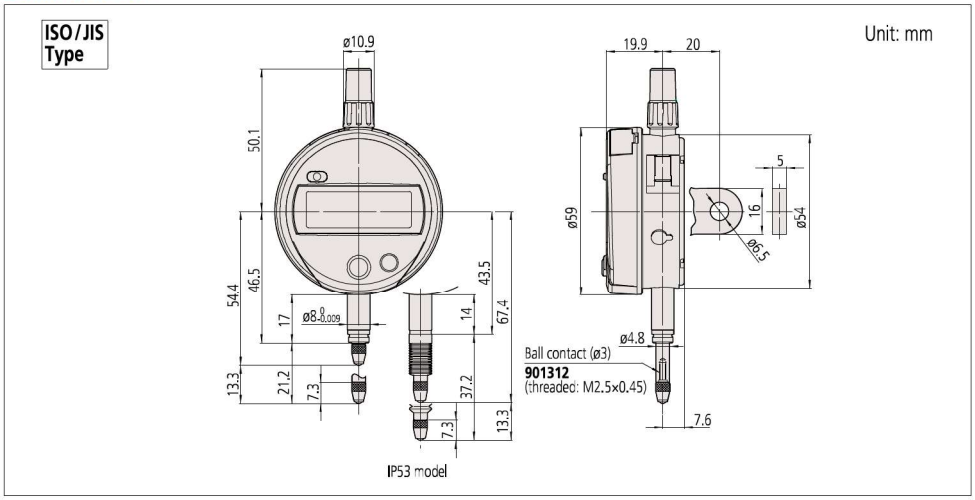
* IP code is the degree of protection against the intrusion of solid foreign objects and water.
Mitutoyo offers a lineup of coolant proof, **ID-N/B** indicators that have excellent resistance to oil, water and dust and so are suitable for use in environments that include splashing cutting fluid. (Refer to page F-10 for details.)

F

Dimensions

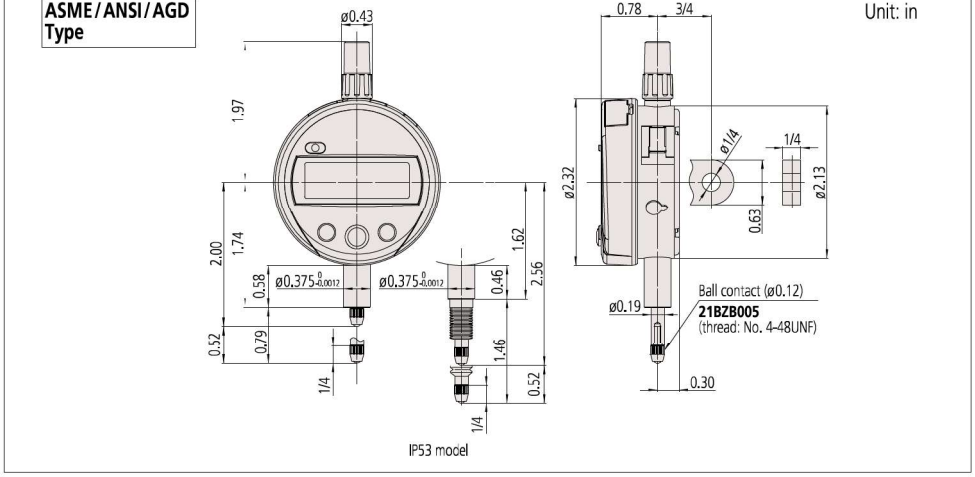
ISO / JIS Type

Unit: mm



ASME / ANSI / AGD Type

Unit: in



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Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABLOLUTE Digimatic Indicator ID-CX SERIES 543 — Standard Type

MeasurLink® ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

ABSOLUTE™

An inspection certificate is supplied as standard. Refer to page U-11 for details.

- The ABS (absolute) scale restores the last origin position automatically when the indicator is turned on.
- Thanks to Mitutoyo's ABSOLUTE Linear Encoder, reliability has been increased due to elimination of over-speed errors.
- Tolerance judgment can be performed by setting upper and lower tolerance limits. The judgment result (GO/NO-GO) can be displayed in full-size characters.
- Battery life of approx. 7,000 hours in continuous use has been achieved with only one battery.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

Measuring range 12.7 mm **543-390B**

Low measuring force model **543-394B**

Measuring range 25.4 mm **543-470B**

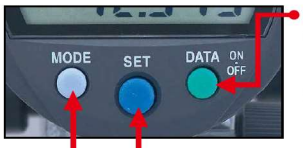
Measuring range 50.8 mm **543-490B**

• Large LCD

The large LCD incorporates 11 mm characters giving 1.5 times the character area of conventional products (which display 8.5 mm characters) making measurement values much easier to read.

• Three large buttons

The popular three-large button design, which is used in products such as the ABS coolant proof Digimatic indicators **ID-N/B**, makes buttons easier to press and operations easier to perform.



- Power switch
- Data output (when connected to an external device)
- Data hold (when no external device is connected)

Switches between the ABS (preset) and INC (zeroset) measurement modes

- Parameter setting mode
  Count direction switching, tolerance judgment setting, resolution switching, scale factor setting, and function lock setting
- inch/mm conversion (inch/mm models)

• 330° rotary display

The display can be rotated 330°, allowing use at a position where you can easily read the measurement value.

• Calculation: f (x) =Ax

Mounting the **ID-CX** on a measuring jig and setting the multiplying factor (to any practical value) allows direct indication of size (see example below) without using a conversion table and so improves measurement efficiency.

Typical application
Note: The measuring jig is not supplied with the **ID-CX**.

• Function Lock

Ensures reliability of measurement by locking the settings to prevent preset function settings from being changed by mistake.

Technical Data

- Display: 6-digit LCD, sign
- Battery: SR44 (1 pc.), **938882** for initial operational checks (standard accessory)
- Battery life: Approx. 7,000 hours of continuous use. Approx. 1.2 years under normal use.

Note: Depends on use of the indicator. The above values are reference values.

- Maximum response speed: No limit (except for scanning measurement)

Functions

- Zero-setting (INC system)
- Presetting (ABS system)
- Direction switching
- Tolerance judgment
- Resolution switching
  (For 0.001 mm or 0.00005 inch resolution models)
- Calculation: f(x) =Ax
- Function Lock
- Data output
- Display value holding
  (when no external device is connected)
- 330° rotary display
- Low battery/voltage alarm display
- Error alarm display

Optional Accessories

- Lifting
  Lifting lever:
  21EZA198 (12.7 mm/0.5 inch ISO/JIS type)
  21EZA199 (12.7 mm/0.5 inch ASME/ANSI/AGD type)
  Lifting cable: **21JZA295**
  (stroke 12.7 mm: 12.7 mm/0.5 in models)
  (stroke 25.4 mm: 25.4 mm/1 in and 50.8 mm/2 in models)
  Lifting knob:
  21EZA105 (12.7 mm/0.5 inch ISO/JIS type)*1
  21EZA150 (12.7 mm/0.5 inch ASME/ANSI/AGD type)*1
  21EZA197 (25.4 mm/1 inch models)
  21EZA200 (50.8 mm/2 inch models)
  Lifting lever:**137693** (for measuring range: 25.4 and 50.8 mm)
  (supplied with 25.4 mm and 50.8 mm models as standard.)

*1 Not available for low measuring force models.

- Auxiliary spindle spring:
  02ACA571 (25.4 mm/1 inch models)*2
  02ACA773 (50.8 mm/2 inch models)*2

*2 Required when orienting the indicator upside down.

- Lug-on-Center Back:
  101040 (25.4 mm/1 in and 50.8 mm/2 in, ISO/JIS type)
  101306 (25.4 mm/1 in and 50.8 mm/2 in, ASME/ANSI/AGD type)
- SPC Cable:
  905338 (1 m)
  905409 (2 m)
  (Refer to pages A-27 to A-29 for details.)
- USB Input Tool Direct (2 m): **06AFM380F**
- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type):
  264-016-10
  IT-007R (RS-232C Communication Conversion Type):
  264-007
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm): **02AZD790F**
  For foot switch: **02AZE140F**
  (Refer to pages A-19 to A-21 for details.)
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**
- Contact points for Mitutoyo's dial indicators
  (Refer to pages F-57 to F-60 for details.)
- Interchangeable backs for 2 series
  (Refer to page F-61 for details.)
- Measuring stands (Refer to pages F-84 to F-91 for details.)

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Usable orientation

- Standard models with measuring range 12.7 mm: Usable in all orientations.
- Models with measuring range 25.4 or 50.8 mm: Usable between the contact point pointing downward and spindle in horizontal orientation. To use the contact point pointing upward, the auxiliary spindle spring (optional) is required.
- Low measuring force model: See "Setting measuring force on low measuring force models" below.

Setting measuring force on low measuring force models

The measuring force of models with low measuring force can be set by combining standard accessory springs and weights.

• 543-404/404B/405/405B/406/406B

Spindle orientation	Spring	Weight (approximately 0.1 N)	Maximum measuring force (N)
Pointing vertically downward	Yes	Yes	0.5 or less
	Yes	No	0.4 or less
	No	Yes	0.3 or less
	No	No	0.2 or less
Horizontal	Yes	No	0.3 or less

Note: Operation using configurations other than shown above is not guaranteed.

• 543-394/394B/395/395B/396/396B

Spindle orientation	Spring	Weight (approximately 0.1 N)	Maximum measuring force (N)
Pointing vertically downward	Yes	Yes	0.7 or less
	Yes	No	0.6 or less
	No	Yes	0.4 or less
	No	No	Not guaranteed

Note: Operation using configurations other than shown above is not guaranteed.

SPECIFICATIONS

Metric

ISO/JIS type ASME/ANSI/AGD type

Order No. (w/lug, flat-back)		Range (mm)	Resolution (mm)	Maximum permissible error*1 (mm)			Measuring force MPL (N)
				MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$	
543-390	**543-390B**	12.7	0.001/0.01 (selectable)	0.003	0.002	0.002	1.5 or less
543-394*2	**543-394B***2						0.4 to 0.7
—	**543-470B**	25.4					1.8 or less
—	**543-490B**	50.8		0.005			2.3 or less
543-400	**543-400B**	12.7	0.01	0.02	0.02	0.01	0.9 or less
543-404*2	**543-404B***2						0.2 to 0.5
—	**543-474B**	25.4					1.8 or less
—	**543-494B**	50.8		0.04			2.3 or less

*1 These values apply at 20 °C.
*2 Low measuring force
*3 Error of indication for the total measuring range
Note: Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

Inch/Metric

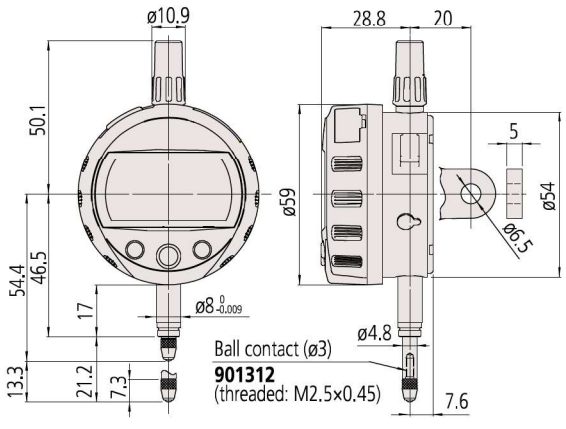
Order No. (w/lug, flat-back)		Range (in)	Resolution	Maximum permissible error*1			Measuring force MPL (N)
				MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$	
543-391	**543-391B**	0.5	0.0005/ 0.0001/ 0.00005 in 0.01/ 0.001 mm (selectable)	±0.0001 in /0.003 mm	0.0001 in /0.002 mm	0.0001 in /0.002 mm	1.5 or less
543-392	**543-392B**						1.5 or less
543-395*2	**543-395B***2						0.4 to 0.7
543-396*2	**543-396B***2						0.4 to 0.7
—	**543-471B**	1					1.8 or less*4
—	**543-472B**						1.8 or less*4
—	**543-491B**	2		±0.0002 in /0.005 mm			2.3 or less*4
—	**543-492B**						2.3 or less*4
543-401	**543-401B**	0.5	0.0005 in/ 0.01 mm	±0.001 in /0.02 mm	0.001 in /0.02 mm	0.0005 in /0.01 mm	0.9 or less
543-402	**543-402B**						0.9 or less
543-405*2	**543-405B***2						0.2 to 0.5
543-406*2	**543-406B***2						0.2 to 0.5
—	**543-475B**	1					1.8 or less*4
—	**543-476B**						1.8 or less*4
—	**543-495B**	2		±0.0015 in /0.04 mm			2.3 or less*4
—	**543-496B**						2.3 or less*4

*1 These values apply at 20 °C.
*2 Low measuring force
*3 Error of indication for the total measuring range
*4 Applies for a spindle orientation between the spindle pointing vertically downward to the spindle horizontal.
Note: Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

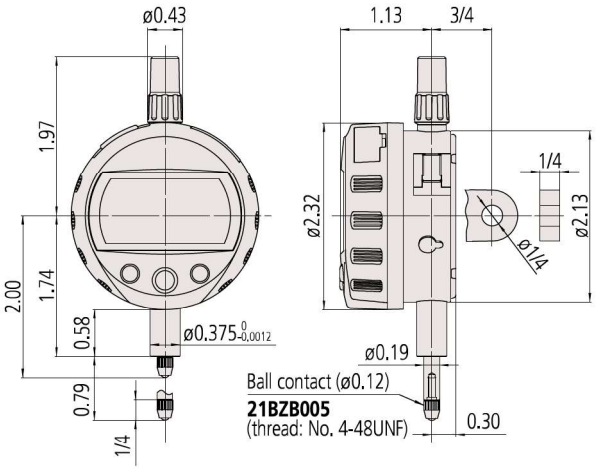
DIMENSIONS

12.7 mm range models

ISO/JIS Type Unit: mm



ASME/ANSI/AGD Type Unit: in



Note: Products with an Order No. suffixed "**B**" have a plain back, and other models have a center-lug back. Refer to page F-61 for details of the backs.

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Digimatic Indicators

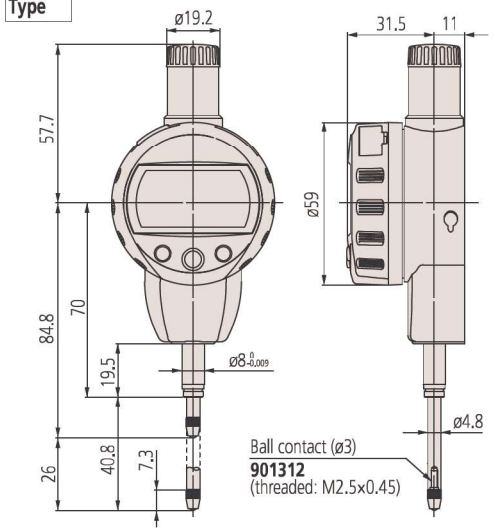
Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

25.4 mm range models

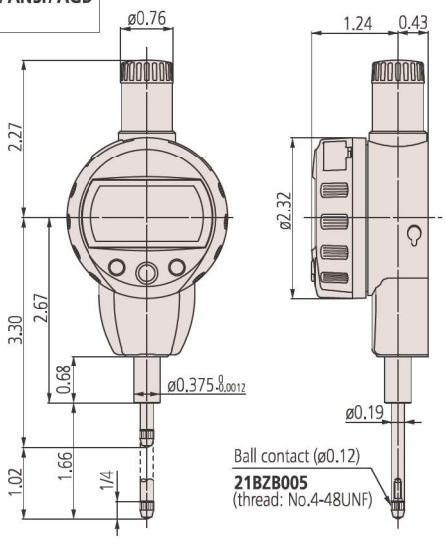
Unit: mm

ISO/JIS Type



Unit: in

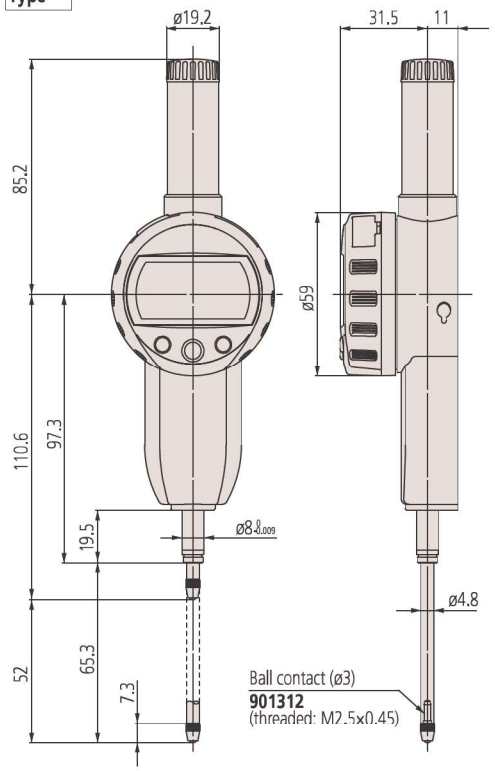
ASME/ANSI/AGD Type



50.8 mm range models

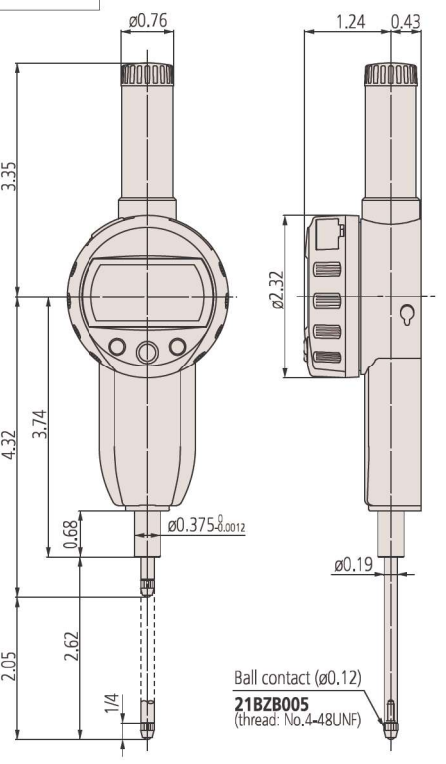
Unit: mm

ISO/JIS Type



Unit: in

ASME/ANSI/AGD Type



Note: Products with an Order No. suffixed "**B**" have a plain back, and other models have a center-lug back. Refer to page F-61 for details of the backs.

F

MeasurLink ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

ABSOLUTE™

An inspection certificate is supplied as standard. Refer to page U-11 for details.

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABSOLUTE Digimatic Indicator ID-N/B SERIES 543 — with Dust/Water Protection Conforming to IP66

MeasurLink® ENABLED
Data Management Software by Mitutoyo

Functions

- Zero-setting (INC system)
- Presetting (ABS system)
- Direction switching
- Tolerance judgment
- LCD readout reversal
- Resolution switching (For 0.001 mm or 0.00005 in resolution models)
- Data output
- Display value holding (when no external device is connected)
- Low battery voltage alarm display
- Error alarm display

- Our unique ABS scale restores the last origin position automatically when the indicator is turned on.
- The chance of overspeed errors has been eliminated thanks to the ABS scale.
- Rated to IP66: can be used satisfactorily even in adverse environments where the indicator is subject to splashing by cutting fluid or coolant.
- Slim body design (body width: only 35 mm) is advantageous in multipoint measurement situations where space is restricted. The LCD readout can also be rotated 180° to allow reading from the most convenient direction.
- Succeeded in digitalization of the Back Plunger type widely used for dial indicators for **ID-B**. A 5 mm-stroke plunger with a higher degree of accuracy has been implemented by adopting a direct reading scale for plunger displacement.
- Tolerance judgment can be performed by setting upper and lower tolerance limits. The judgment result (GO/NO-GO) can be displayed in full-size characters.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

543-575

543-585

IP66

TÜVRheinland CERTIFIED
www.tuv.com ID 0000007161

IP66

TÜVRheinland CERTIFIED
www.tuv.com ID 0000007162

Rated to IP66 water- and dust-proofing standard and oil resistance improved.

Body width 35 mm

LCD readout reversal function

SPECIFICATIONS

ISO/JIS type ASME/ANSI/AGD type

Metric

Order No.	Range (mm)	Resolution (mm)	Maximum permissible error (mm)			Measuring force MPL (N)	Remarks
			MPE$_E$*	Hysteresis MPE$_H$	Repeatability MPE$_R$		
543-570	12.7	0.01	0.02	0.02	0.01	2.5 or less	Slim type
543-580	5.0					2.0 or less	Back Plunger type
543-575	12.7	0.01/0.001 (selectable)	0.01/0.003	0.02	0.002	2.5 or less	Slim type
543-585	5.0					2.0 or less	Back Plunger type

Inch/Metric

Order No.	Range (in)	Resolution	Maximum permissible error			Measuring force MPL (N)	Remarks
			MPE$_E$*	Hysteresis MPE$_H$	Repeatability MPE$_R$		
543-571	0.5	0.0005 in/0.01 mm	±0.001 in/0.02 mm	0.001 in/0.02 mm	0.0005 in/0.01 mm	2.5 or less	Slim type
543-581	0.2					2.0 or less	Back Plunger type
543-576	0.5	0.00005/0.0005 in 0.001/0.01 mm (selectable)	±0.0001 in/0.003 mm	0.0001 in/0.002 mm	0.0001 in/0.002 mm	2.5 or less	Slim type
543-586	0.2					2.0 or less	Back Plunger type

* Error of indication for the total measuring range
Note: One silver oxide button cell (SR44) for monitor included

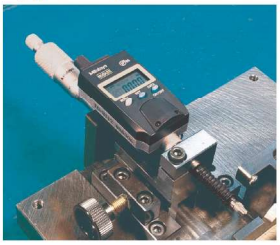
F

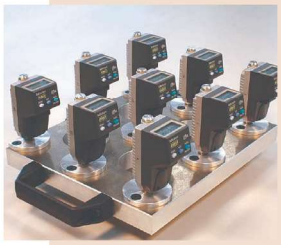
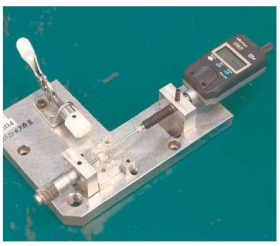
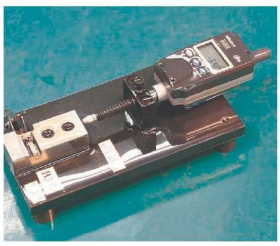
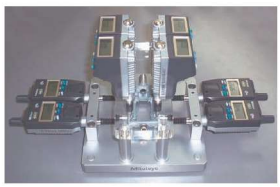
Mitutoyo

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Typical applications



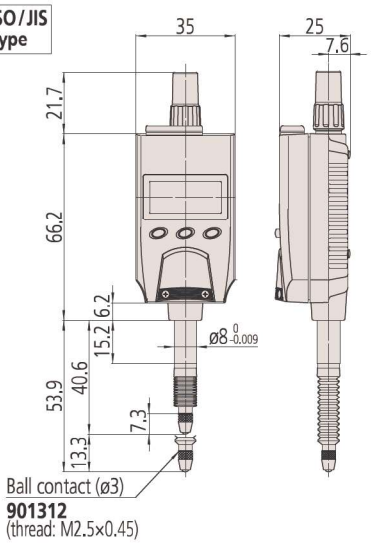






DIMENSIONS

Slim Type
ID-N

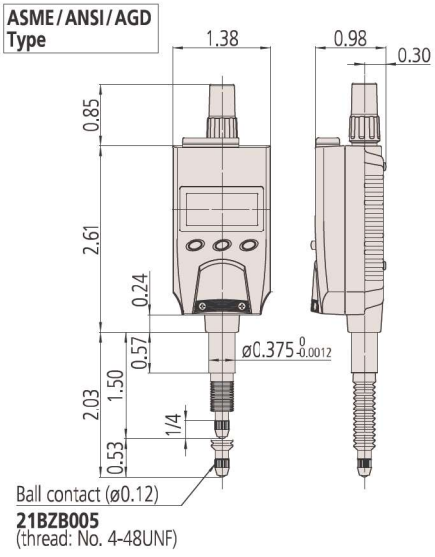
Unit: mm

ISO/JIS Type



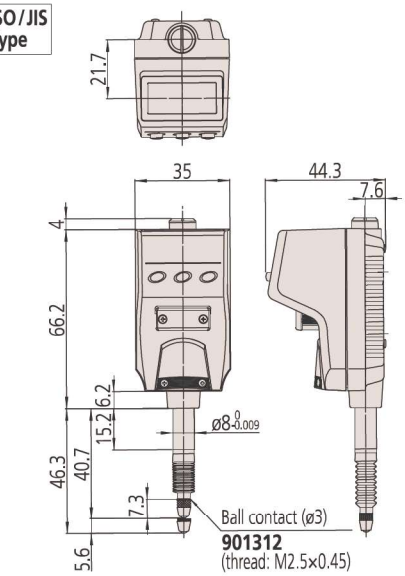
Unit: in

ASME/ANSI/AGD Type

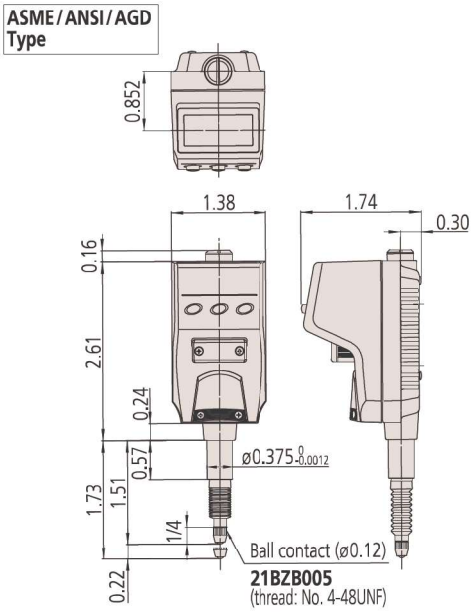


Back plunger Type
ID-B

ISO/JIS Type



ASME/ANSI/AGD Type



Optional Accessories

- Lifting knob (only for **ID-N**)
  21EZA105 (ISO/JIS type)
  21EZA150 (ASME/ANSI/AGD type)
  Spindle can be manually lifted. Remove the spindle cap for **ID-N** and attach the lifting knob to the spindle. Note that water resistance is not maintained in this configuration.

Typical application using the lifting knob

- Lug
  21EZA145 (ISO/JIS type)
  21EZA146 (ASME/ANSI/AGD type)
- Arm for **ID-B** (made-to-order)
- Rubber boot
  For oil resistance (NBR) **21EAA423** (for **ID-N**)
  21AAB562 (for **ID-B**)
  For durability (silicone) **238774** (for **ID-N**)
  21EAA212 (for **ID-B**)
- SPC cable:
  21EAA194 (1 m)
  21EAA190 (2 m)

SPC cable

Bifurcated connecting cable with zero-setting terminal

- USB Input Tool Direct (2 m): **06AFM380G**
- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type): **264-016-10**
  IT-007R (RS-232C Communication Conversion Type): **264-007**
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm): **02AZD790G**
  For foot switch: **02AZE140G**
  (Refer to pages A-19 to A-21 for details.)
- Digimatic Mini-Processor **DP-1VA LOGGER**. **264-505**
- Bifurcated connecting cable with zero-setting terminal:
  21EAA210 (1 m)
  21EAA211 (2 m)
  Two of the wires inside the cable are separated for zero setting without touching the SET switch on the main body. Use these wires in combination with commercially available switches. Zero setting is performed by briefly connecting these two wires together (less than a second), and ABS preset & recall by connecting for a second or more.
- Contact points for Mitutoyo's dial indicators.
  (Refer to pages F-57 to F-60 for details.)

MeasurLink ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

ABSOLUTE™

PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page U-11 for details.

Functions

- Peak detection (MAX/MIN)
- Runout (MAX - MIN) Hold

Note: Peak detection
1) Sampling rate: 50 readings/sec
2) Capturing speed: 50 µm/sec (max.)

- Zeroset (INC system)
- Preset function (ABS system)
- Counting direction switching
- Tolerance judgment (P1, P2, P3, and INC can be stored)
- Resolution selection
- Simple calculation f(x) =Ax
- Analog bar resolution selection
- Key lock
- in/mm conversion (inch/mm models)
- Display hold (when no external device is connected)
- Data output
- External PC setting input
- Display rotation (330°)
- Low battery voltage alarm display
- Error alarm display

Optional Accessories

- Lifting
  Lifting lever
  21EZA198 (ISO/JIS Type),
  21EZA199 (ASME/ANSI/AGD Type)
  Lifting cable **21JZA295**
  Lifting knob
  21EZA105 (ISO/JIS Type),
  21EZA150 (ASME/ANSI/AGD Type)
- SPC Cable:
  905338 (1 m)
  905409 (2 m)
  (Refer to pages A-27 to A-29 for details.)
- USB Input Tool Direct (2 m) : **06AFM380F**
- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type):
  264-016-10
  IT-007R (RS-232C Communication Conversion Type):
  264-007
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm):
  02AZD790F
  For foot switch: **02AZE140F**
  (Refer to pages A-19 to A-21 for details.)
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**
- Parameter setup kit: **21EZA313**

Note: Parameter setting software (can be downloaded for free from the Mitutoyo website) is also required.

Parameter setup kit

Parameter setting software

- Contact points for Mitutoyo's dial indicators
  (Refer to pages F-57 to F-60 for details.)
- Interchangeable backs for 2 series
  (Refer to page F-61 for details.)
- Measuring stands.
  (Refer to pages F-84 to F-91 for details.)

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABSOLUTE Digimatic Indicator ID-C SERIES 543 — Peak-Value Hold Type

MeasurLink ENABLED
Data Management Software by Mitutoyo

- Run-out/MAX-MIN Hold function enables GO/±NG judgment*1 for peak or difference values.
- Five buttons, status icons, and clear button indications allow for easy operation of a wide variety of functions.
- Wide LCD and new analog bar graph are now standard on all models.
- The ABS (absolute) scale restores the last origin position*2 automatically when the indicator is turned on, and realizes high reliability by eliminating over-speed errors.
- By using the parameter setup kit (optional) and the dedicated software, the functions and the parameters can be configured using a computer.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

*1 Tolerance judgment results cannot be output.
*2 Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

543-300 / 543-300B

SPECIFICATIONS

ISO/JIS type ASME/ANSI/AGD type

Metric

Order No. (w/lug, flat-back)	Range (mm)	Resolution (mm)	Maximum permissible error (mm) MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$	Measuring force MPL (N)	Power supply	Battery life (normal use)*4	Net mass (g)
543-300	12.7	0.001/ 0.01 (selectable)	0.003	0.002	0.002	1.5 or less	CR2032x1 pc.	Approx. 1 year	180
543-300B									170

Inch / Metric

Order No. (w/lug, flat-back)	Range	Resolution	Maximum permissible error MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$	Measuring force MPL (N)	Power supply	Battery life (normal use)*4	Net mass (g)
543-301	0.5 in/ 12.7 mm	0.00005/ 0.0001/ 0.0005 in, 0.001/0.01 mm (selectable)	±0.00010 in /0.003 mm	0.00010 in /0.002 mm	0.00010 in /0.002 mm	1.5 or less	CR2032x1 pc.	Approx. 1 year	180
543-301B									170
543-302									195
543-302B									170

*3 Error of indication for the total measuring range
*4 Applies only if not connected to a data processor. Battery life depends on use of the indicator. Use the above value as a guide only.
Note: Products with an Order No. suffixed "**B**" have a flat back.

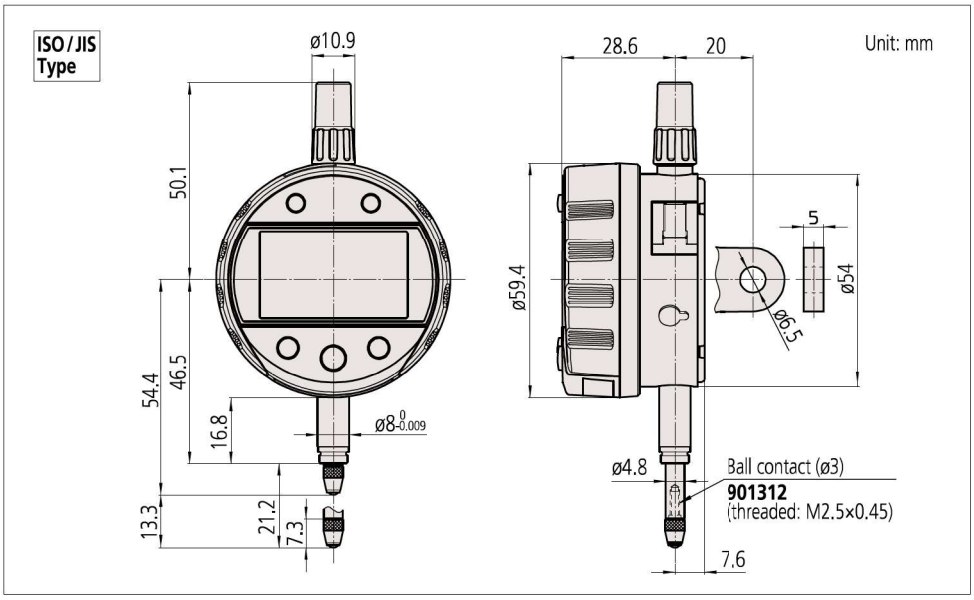
F

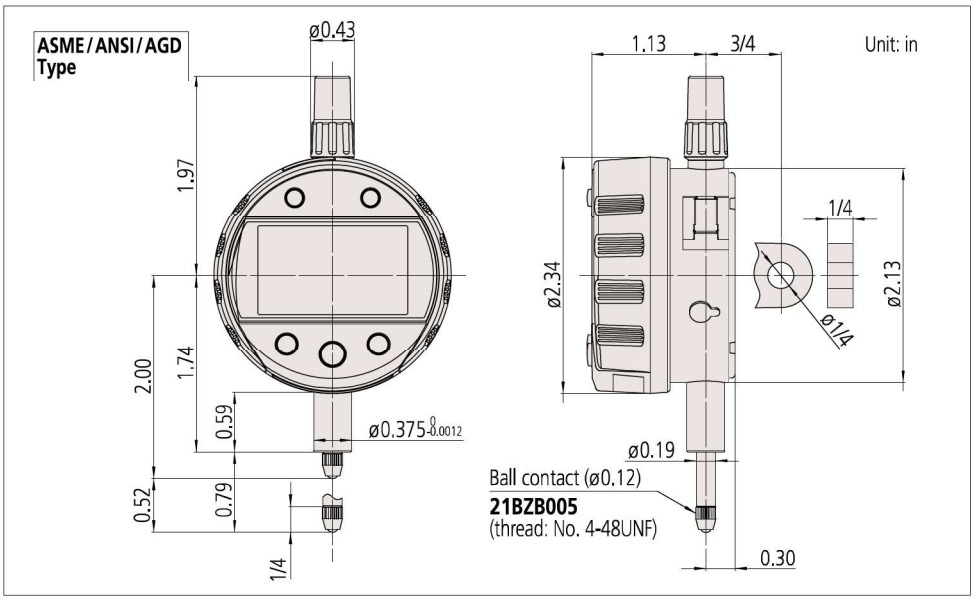
Mitutoyo

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS





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MeasurLink ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

ABSOLUTE™

Mitutoyo guarantees the product quality. Mitutoyo guarantees the product quality. PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page U-11 for details.

Functions

- Minimum value detection

Note: Peak detection
1) Sampling rate: 50 readings/sec
2) Capturing speed: 50 µm/sec (max.)

- Preset (3 Preset values can be stored)
- Tolerance judgment
  (3 sets of upper and lower limits can be stored)
- Resolution selection
- Analog bar resolution selection
- Key lock
- Display hold (when no external device is connected)
- Data saving/calling
  (when no external device is connected)
- Data output
- External PC setting input
- Display rotation (330°)
- Low battery voltage alarm display
- Error alarm display

Optional Accessories

- SPC Cable:
  905338 (1 m)
  905409 (2 m)
  (Refer to pages A-27 to A-29 for details.)
- USB Input Tool Direct (2 m): **06AFM380F**
- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type): **264-016-10**
  IT-007R (RS-232C Communication Conversion Type): **264-007**
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm): **02AZD790F**
  For foot switch: **02AZE140F**
  (Refer to pages A-19 to A-21 for details.)
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**
- Parameter setup kit: **21EZA313**

Note: Parameter setting software (can be downloaded for free from the Mitutoyo website) is also required.

The ABSOLUTE Digimatic Bore Gage

ABSOLUTE Digimatic Bore Gages, which integrate the display with a bore gage measuring unit, are also available. Refer to pages C-43 and C-44 for details.

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABSOLUTE Digimatic Indicator ID-C SERIES 543 — Bore Gage Type

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- Dedicated to inside measurement with minimum-value Hold and tolerance judgment functions*1.
  Use together with a Mitutoyo bore gage (refer to pages C-27 to C-42 for details).
- Five buttons, status icons, and clear button indications allow for easy operation of a wide variety of functions.
- Wide LCD and new analog bar graph are now standard on all models.
- Can store up to three sets of master reference values and tolerances, alleviating the need for multiple settings to master gages.
- The ABS (absolute) scale restores the last origin position*2 automatically when the indicator is turned on, and realizes high reliability by eliminating over-speed errors.
- By using the parameter setup kit (optional) and the dedicated software, the functions and the parameters can be configured using a computer.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

*1 Tolerance judgment results cannot be output.
*2 Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

543-310B
Typical application
The Bore Gage is optional.

SPECIFICATIONS

Metric

ISO/JIS type ASME/ANSI/AGD type

Order No.	Range (mm)	Resolution (mm)	Maximum permissible error (mm)			Measuring force MPL (N)	Power supply	Battery life (normal use)*4	Net mass (g)
			MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$				
543-310B	12.7	0.001/0.01 (selectable)	0.003	0.002	0.002	1.5 or less	CR2032 ×1 pc.	Approx. 1 year	170

Inch/Metric

Order No.	Range	Resolution	Maximum permissible error			Measuring force MPL (N)	Power supply	Battery life (normal use)*4	Net mass (g)
			MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$				
543-311B	0.5 in/ 12.7 mm	0.00005/0.0001/ 0.0005 in, 0.001/0.01 mm (selectable)	±0.00010 in /0.003 mm	0.00010 in /0.002 mm	0.00010 in /0.002 mm	1.5 or less	CR2032 ×1 pc.	Approx. 1 year	170
543-312B									

*3 Error of indication for the total measuring range
*4 Applies only if not connected to a data processor. Battery life depends on use of the indicator. Use the above value as a guide only.
Note: Flat back type only.

F

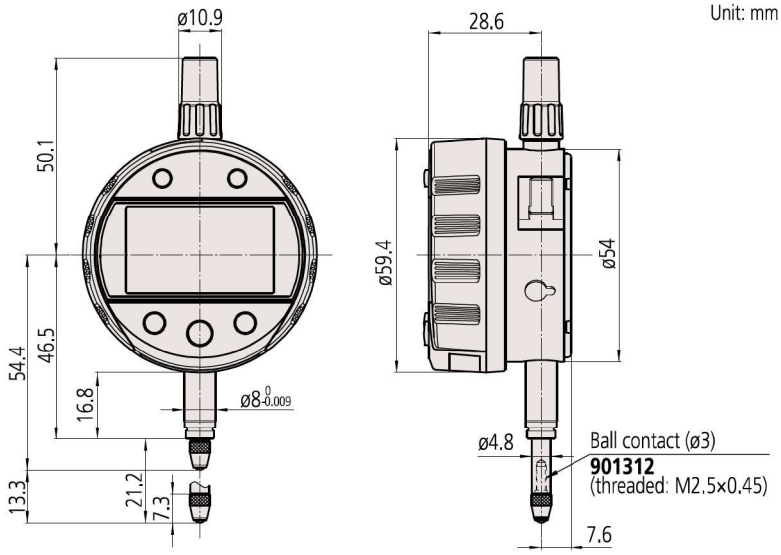
Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

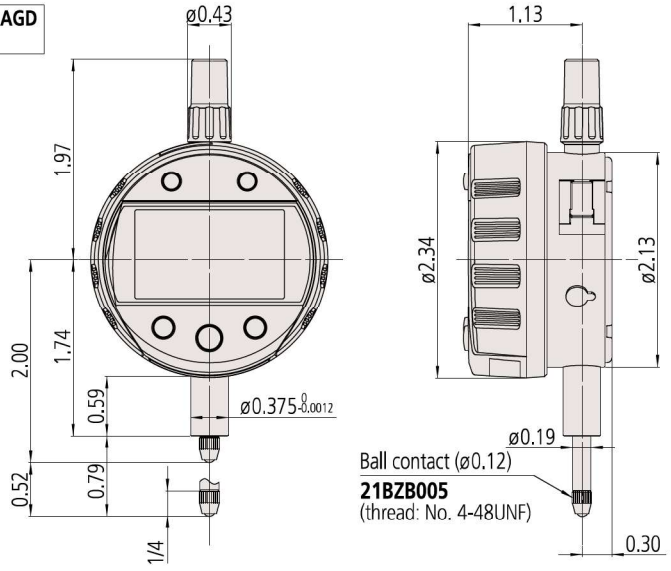
ISO/JIS Type

Unit: mm



ASME/ANSI/AGD Type

Unit: in



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MeasurLink® ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

ABSOLUTE™

PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page U-11 for details.

Functions

- Calculation f (x') =Ax'+B+Cx'$^{-1}$ (x'=x+offset)
- Peak detection (MAX/MIN)
- Runout (MAX - MIN) Hold

Note: Peak detection
1) Sampling rate: 10 readings/sec
2) Capturing speed: 10 µm/sec (max.)
Settings can be changed to:
1) Sampling rate: 50 readings/sec
2) Capturing speed: 50 µm/sec (max.)

- Zero-setting (INC system)
- Preset (ABS system)
- Tolerance judgment (P1, P2, P3, and INC can be stored)
- Analog bar resolution selectable
- Key lock
- Display hold (when no external device is connected)
- Data output
- External PC setting input
- Display rotation (330°)
- Low battery voltage alarm display
- Error alarm display
- Resolution switching*

Resolution (mm)		
0.0002	0.005	0.1
0.0005	0.01	0.2
0.001	0.02	0.5
0.002	0.05	1

Resolution (in)		
0.00001	0.0002	0.005
0.00002	0.0005	0.01
0.00005	0.001	0.02
0.0001	0.002	0.05

* Since the calculation resolution is one micrometer (0.001 mm), using sub-micrometer resolution settings may result in the 4th-place digit being unreliable, particularly when B is set to a very low value and C=0. It does not change at all with certain combinations of calculation coefficient (for example, A=1, B=C=0). The 3rd-place digit representing micrometers (if displayed) is always reliable.

Optional Accessories

- Lifting
  Lifting lever **21EZA198** (ISO/JIS Type), **21EZA199** (ASME/ANSI/AGD Type)
  Lifting knob **21EZA105** (ISO/JIS Type), **21EZA150** (ASME/ANSI/AGD Type)
  Lifting cable **21JZA295**
- SPC Cable:
  905338 (1 m)
  905409 (2 m)
  (Refer to pages A-27 to A-29 for details.)
- USB Input Tool Direct (2 m): **06AFM380F**
- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type): **264-016-10**
  IT-007R (RS-232C Communication Conversion Type): **264-007**
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm): **02AZD790F**
  For foot switch: **02AZE140F**
  (Refer to pages A-19 to A-21 for details.)
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**
- Parameter setup kit: **21EZA313**

Note: Parameter setting software (can be downloaded for free from the Mitutoyo website) is also required.

- Contact points for Mitutoyo's dial indicators
  (Refer to pages F-57 to F-60 for details.)
- Measuring stands
  (Refer to pages F-84 to F-91 for details.)

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABSOLUTE Digimatic Indicator ID-C SERIES 543 — Calculation Type

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- Calculation function operates on spindle displacement.
  Entering the appropriate formula factors for a fixture dedicated to the application enables direct measurement readout, thereby eliminating any need for the conversion tables previously needed for those applications where fixtures are typically used.
- Five buttons, status icons, and clear button indications allow for easy operation of a wide variety of functions.
- Wide LCD and new analog bar graph are now standard on all models.
- The ABS (absolute) scale restores the last origin position*1 automatically when the indicator is turned on, and realizes high reliability by eliminating over-speed errors.
- By using the parameter setup kit (optional) and the dedicated software, the functions and the parameters can be configured using a computer.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

*1 Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

543-342B

SPECIFICATIONS

ISO/JIS type ASME/ANSI/AGD type

Metric

Order No.	Range (mm)	Resolution (selectable)	Maximum permissible error*2 (mm) MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$	Measuring force MPL (N)	Power supply	Battery life (normal use)*5	Net mass (g)
543-340B	12.7	12 steps*5	0.003	0.002	0.002	1.5 or less	CR2032x1 pc.	Approx. 1 year	170
543-590B	25.4					1.8 or less*4			190
543-595B	50.8		0.006			2.3 or less*4			260

Inch/Metric

Order No.	Range	Resolution (selectable)	Maximum permissible error*2 MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$	Measuring force MPL (N)	Power supply	Battery life (normal use)*5	Net mass (g)
543-341B	0.5 in /12.7 mm	12 steps*5	±0.0001 in /0.003 mm	0.0001 in /0.002 mm	0.0001 in /0.002 mm	1.5 or less	CR2032x1 pc.	Approx. 1 year	170
543-342B									
543-591B	1 in /25.4 mm					1.8 or less*4			190
543-592B									
543-596B	2 in /50.8 mm		±0.00025 in /0.006 mm			2.3 or less*4			260
543-597B									

*2 Valid for resolution set to 0.001 mm/0.00005 in and coefficients A=1, B=0 and C=0.
*3 Error of indication for the total measuring range
*4 Applies for a spindle orientation between the spindle pointing vertically downward to the spindle horizontal.
*5 Applies only if not connected to a data processor. Battery life depends on use of the indicator. Use the above value as a guide only.
Note: Flat back type only.

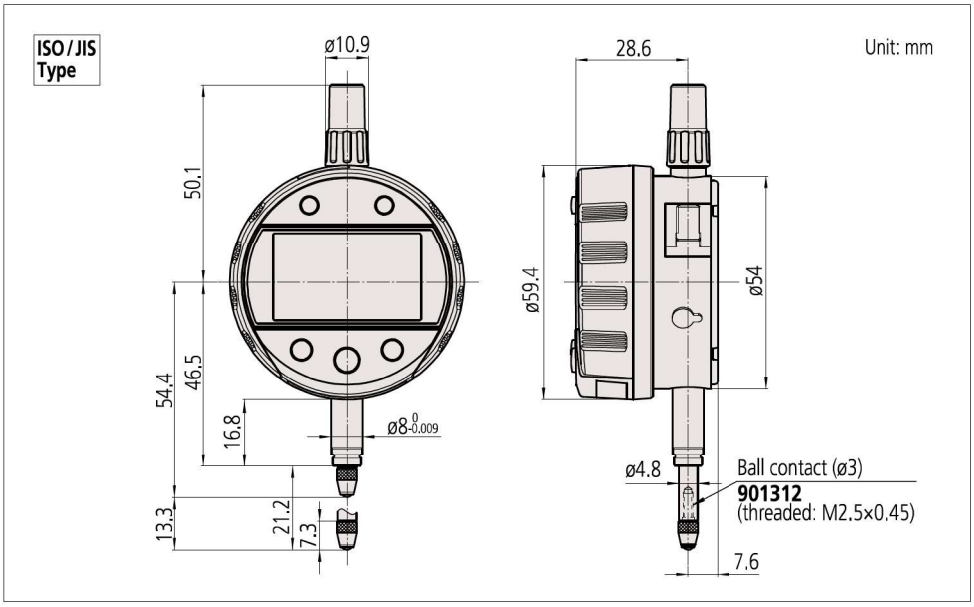
F

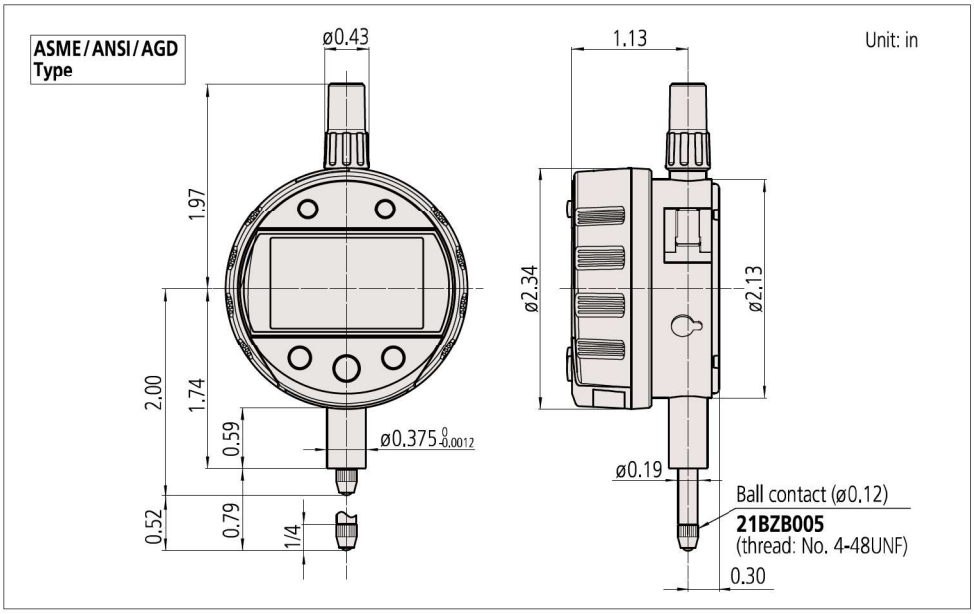
Mitutoyo

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS





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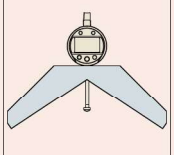
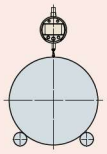
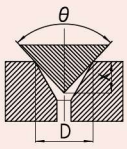
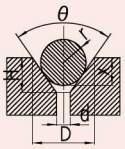
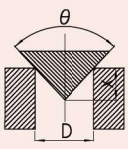
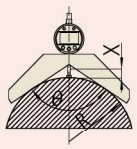
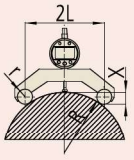
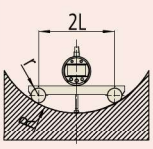
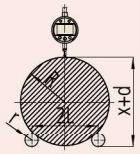
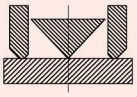
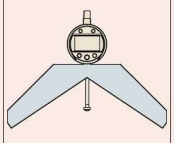
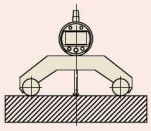
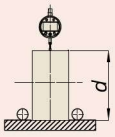
Typical applications

Examples of measuring various features

Item		D=Countersink diameter/Groove width; H=Countersink depth/Groove depth				R=Outside radius of round object		R=Inside radius of round object	R=Outside radius of round object
Fixture type*1									
Contact point		Cone	Ball		Cone	—			
Measuring method x: Spindle displacement									
Calculation		D=Ax	D=Ax+B	H=Ax+B	D=Ax	R=Ax	R=Ax+B+Cx^{-1}		R=A(x+d)+B+C(x+d)$^{-1}$
Coefficient values	A	$-2\tan\frac{\theta}{2}$	$-2\tan\frac{\theta}{2}$	-1	$-2\tan\frac{\theta}{2}$	$-\frac{\sin\frac{\theta}{2}}{1-\sin\frac{\theta}{2}}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$
	B	0	$2r\left(\frac{1}{\cos\frac{\theta}{2}}-\tan\frac{\theta}{2}\right)$	$r\left(\frac{1}{\sin\frac{\theta}{2}}-1\right)-\frac{d}{2\tan\frac{\theta}{2}}$	0	0	$-r$	r	$-r$
	C	0	0	0	0	0	$\frac{L^2}{2}$	$-\frac{L^2}{2}$	$\frac{L^2}{2}$
Origin offset value (function ON/OFF)	d	0 (OFF)	0 (OFF)	0 (OFF)	0 (OFF)	0 (OFF)	0 (OFF)	0 (OFF)	d (ON)
ORIGIN-set position (x=0 position)									
Displayed measurement value at ORIGIN-set position (Value displayed when x=0)		0	Value of coefficient B	0	0	0	Err 30*2 (Overflow error of Display value)		Depends on value of d

*1 A dedicated fixture for a workpiece can be made to order.
*2 The error is cleared when the measured value returns to the displayable range as a result of moving the spindle.

F

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABSOLUTE Digimatic Indicator ID-C
SERIES 543 — Signal Output Function Type

- Enables a tolerance judgment to be output to external equipment for a measurement result against user-defined limits. Solid-state switching provides high reliability by avoiding metallic switch contacts.
- Output is enabled by directly connecting to external devices (sequencers, etc., for which a logical invert is available if required). The measurement and judgment results are displayed on the LCD. The judgment result is also indicated by 2 LEDs.
- A peak-detection function is equipped for measuring and judging peak values, such as runout.
- Positional detection is absolute (ABS system) relative to a set origin point*1 that does not need to be reset every time power is turned on. Furthermore, the ABS system ensures that overspeed errors do not occur.
- Provided with a 4 m cable.
- External power supply required is 5-24 VDC / 100 mA (max.).
- Dust-water protection level: Conforms to IP54.

*1 Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

543-350

IP54

SPECIFICATIONS

Metric

ISO/JIS type ASME/ANSI/AGD type

Order No.	Range (mm)	Resolution (mm)	Maximum permissible error (mm)			Measuring force MPL (N)	Net mass (g)
			MPE*2	Hysteresis MPEH	Repeatability MPER		
543-350	12.7	0.001/0.01 (selectable)	0.003	0.002	0.002	2.5 or less	290
543-350B							285

Inch/Metric

Order No.	Range	Resolution	Maximum permissible error			Measuring force MPL (N)	Net mass (g)
			MPE*2	Hysteresis MPEH	Repeatability MPER		
543-351	0.5 in /12.7 mm	0.00005/0.0001/ 0.0005 in, 0.001/0.01 mm (selectable)	±0.00010 in /0.003 mm	0.0001 in /0.002 mm	0.0001 in /0.002 mm	2.5 or less	295
543-351B							285
543-352							295
543-352B							285

*2 Error of indication for the total measuring range
Note 1: LCD readout does not rotate.
Note 2: MAX/MIN holding: sample rate is 100 readings/s; max. rate of change of reading is 100 µm/s or less.
Note 3: Products with an Order No. suffixed "**B**" have a flat back
Note 4: Standard contact point: **901312** (ISO/JIS type), **21BZB005** (ANSI/AGD type)

ABSOLUTE™

PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Functions

- Signal output (–NG/OK/+NG, N-ch open drain, logical invert is available)
- Remote control (peak start preset/zero-set)
- Peak detection (MAX/MIN)
- Runout range measurement (MAX - MIN)
- Zero-setting (INC system)
- Presetting (ABS system)
- Direction switching
- Tolerance judgment (3 pairs of ABS, INC memory function)
- Resolution switching
- Calculation: f(x) =Ax
- Key lock
- Calibration mode (Signal output in Digimatic code format)
- Error alarm display

Optional Accessories

- Lifting*1
  Lifting lever **21EZA198** (ISO/JIS Type), **21EZA199** (ASME/ANSI/AGD Type)
  Lifting cable **21JZA295**
  Lifting knob **21EZA105** (ISO/JIS Type), **21EZA150** (ASME/ANSI/AGD Type)
- Digimatic power supply unit: **21EZA345**
  To denote your AC power cable add the following suffixes to the order No.: **A** for UL/CSA, **D** for CEE, **DC** for CCC, **E** for KC. **No suffix** is required for JIS/100VAC.
  Used in the calibration mode when executing automatic inspection using i-Checker **IC2000**.
  In such a case, purchase connecting cable **21EAA194** (1 m), or **21EAA190** (2 m).

Note: It can't be used as a power suppy when using in the normal mode.

- Contact points for Mitutoyo's dial indicators.*2
- Measuring stands (Refer to pages F-84 to F-91 for details.)

*1 Dust-water protection is not guaranteed.
*2 Refer to pages F-57 to F-60 for details.

Output signals and LCD display

Wire	– NG	OK	+ NG	ABS data composition error
Orange (– NG)	Low	High	High	High
Green (OK)	High	Low	High	High
Brown (+ NG)	High	High	Low	High
LED	Red	Green	Red	Red flashing
LCD	◀	○	▶	"x.xxE" indication

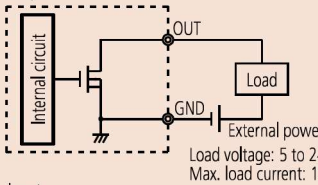
Note: Logical invert is available.

I/O Specifications

Wire	Signal	I/O	Description
Black	– V (GND)	—	Connected to minus (-) terminal
Red	+ V	—	Power supply (5 to 24VDC)
Orange	– NG	O	Tolerance judgment result output: Only the terminal corresponding to a judgment result is set to the low level.
Green	OK	O	
Brown	+ NG	O	
Yellow	PRESET_RECALL ZERO	I	External input terminal: If the relevant terminal is set to the low level, its signal becomes true.
Blue	PEAK_START	I	
Shield	FG	—	Connected to GND (Earth)

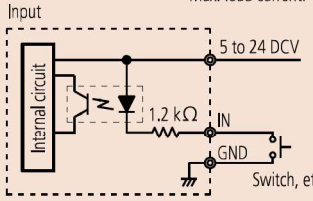
Note: Measurement data cannot be output.

Output



Load voltage: 5 to 24 VDC
Max. load current: 100 mA or less

Input

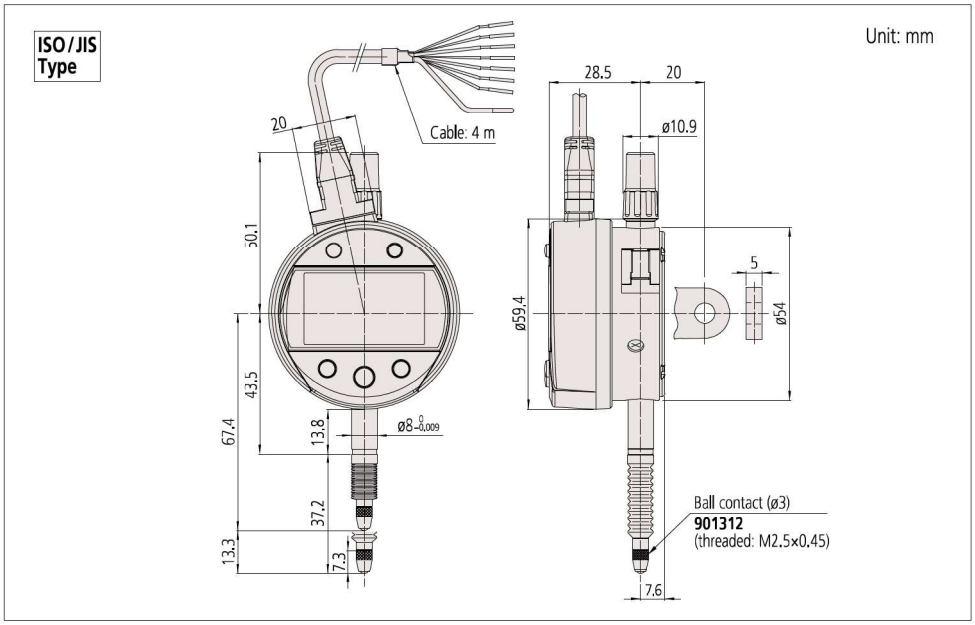


Input current: Max. 20 mA

DIMENSIONS

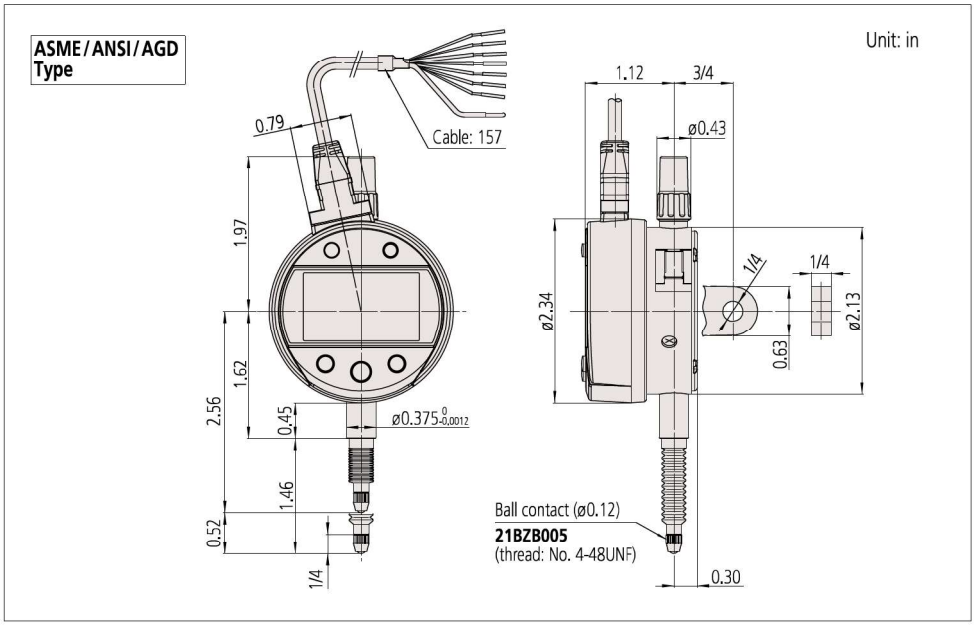
ISO / JIS Type

Unit: mm



ASME / ANSI / AGD Type

Unit: in



F

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABSOLUTE Digimatic Indicator ID-U SERIES 575 — Slim and Economical Design

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- General-purpose indicator with a measuring range of 25.4 mm and a resolution of 0.01 mm.
- Cost-effective and user-friendly type which is equipped with only the basic functions necessary.
- The ABS (absolute) scale restores the last origin position* automatically when the indicator is turned on, and realizes high reliability by eliminating over-speed errors.
- Battery life of approx. 20,000 hours in continuous use has been achieved.
- Easy-to-read large LCD readout with a character height of 8 mm.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

* Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

General-purpose type

575-121

SPECIFICATIONS

ISO/JIS type ASME/ANSI/AGD type

Metric

Order No.	Range (mm)	Resolution (mm)	Maximum permissible error (mm)			Measuring force MPL (N)
			MPE*	Hysteresis MPEH	Repeatability MPER	
575-121	25.4	0.01	0.02	0.02	0.01	1.8 or less

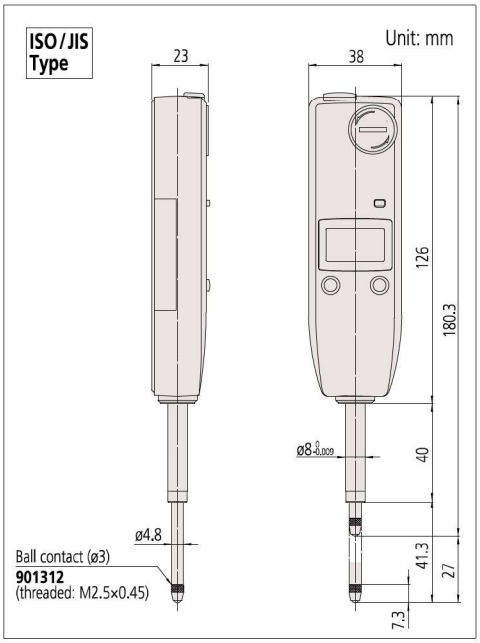
Inch/Metric

Order No.	Range	Resolution	Maximum permissible error			Measuring force MPL (N)
			MPE*	Hysteresis MPEH	Repeatability MPER	
575-122 575-123	1 in/ 25.4 mm	0.0005 in/ 0.01 mm	±0.001 in/0.02 mm	0.001 in/ 0.02 mm	0.0005 in/ 0.01 mm	1.8 or less

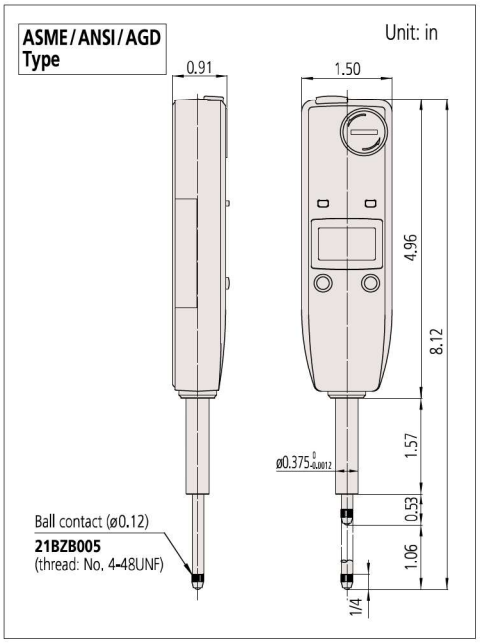
* Error of indication for the total measuring range

DIMENSIONS

ISO/JIS Type Unit: mm



ASME/ANSI/AGD Type Unit: in



MeasurLink® ENABLED Data Management Software by Mitutoyo
Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

ABSOLUTE™

An inspection certificate is supplied as standard. Refer to page U-11 for details.

Technical Data

- Display: 5-digit LCD, sign
- Battery: SR44 (1 pc.), **938882** for initial operational checks (standard accessory)
- Battery life: Approx. 20,000 hours of continuous use. Approx. 5 years under normal use.

Note: It varies depending on use frequency and method. Please take the values as rough indications.

- Lifting lever: **137693**

Function

- Origin set (Zero-setting)
- Direction switching
- Data output
- Low battery voltage alarm display
- Error alarm display

Optional Accessories

- Spindle lifting cable (stroke: 10 mm): **21JZA295**
- Contact points for Mitutoyo's dial indicators (Refer to pages F-57 to F-60 for details.)
- SPC Cable:
  905338 (1 m)
  905409 (2 m)
  (Refer to pages A-27 to A-29 for details.)
- USB Input Tool Direct (2 m): **06AFM380F**

Note: Please separately purchase **USB-ITPAK** since there is no data output switch on the measurement instrument. Refer to pages A-13, A-22 to A-24 for details.

- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type): **264-016-10**
  IT-007R (RS-232C Communication Conversion Type): **264-007**
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm): **02AZD790F**
  For foot switch: **02AZE140F**
  Refer to pages A-19 to A-21 for details.
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**
- Measuring stands
  (Refer to pages F-84 to F-91 for details.)

F

MeasurLink® ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

Mitutoyo guarantees the product quality. PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page U-11 for details.

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

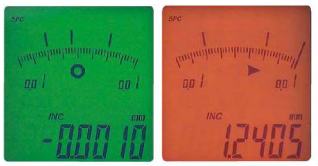
Digimatic Indicator ID-H SERIES 543 — High Accuracy and High Functionality Type

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- A top-level digital indicator that supports high accuracy and multi-functional measurement.
- Take advantage of its high accuracy backed up by 0.0005 mm/0.00002 inch inch resolution, remote control functionality via a handheld controller (or an RS-232C interface) and easy runout measurements with the well-established analog bar display.
- Functionality meets the needs of diverse measurement applications.

Tolerance judgment

OK NG



Analog bar display

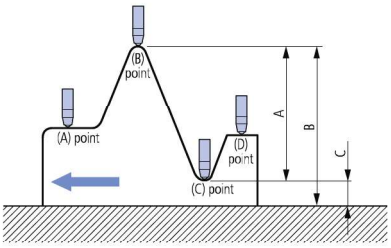
Resolution switching

- Measuring maximum value, minimum value and runout (MAX - MIN)

Maximum value/minimum value measurement

Difference/runout measurement

Example: Indicator traces between points <A> to <D>
Difference (or Total Runout) is displayed as <A>. Dimensions <B> (maximum value) and <C> (minimum value) can be retrieved from memory with a simple key sequence or using the remote control (optional).



- With the optional remote controller, operations such as zero-setting and presetting can be made without touching the indicator body, thereby avoiding disturbance to the set-up.
- An advanced, remote control system can be implemented with the built-in RS-232C interface and a PC.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

Remote controller (optional)

543-561

543-563

Technical Data

- Display: 7-digit LCD, sign, and analog bar with 2-color backlight
- Power supply: 6 V DC (via AC adapter) **06AFZ950***
* To denote your AC power cable add the following suffixes to the order No.: **JA** for UL/CSA and PSE, **D** for CEE, **DC** for CCC, **E** for BS, **K** for KC, **No suffix** is required for JIS/100 V
- Positional detection method: Photoelectric-type reflection linear encoder
- Maximum response speed: 1000 mm/s
- Lifting lever: **137693**

Optional Accessories

- Remote controller: **21EZA099**
- Lifting
  Lifting cable: **21JZA295** (stroke 30 mm)
  Lifting knob: **21EZA101**
- SPC Cable:
  936937 (1 m)
  965014 (2 m)
  (Refer to pages A-27 to A-29 for details.)
- USB Input Tool Direct (2 m): **06AFM380D**
- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type): **264-016-10**
  IT-007R (RS-232C Communication Conversion Type): **264-007**
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm): **02AZD790D**
  For foot switch: **02AZE140D**
  (Refer to pages A-19 to A-21 for details.)
- RS-232C Connecting cable (2 m): **21EAA131**
- Lug-on-center back:
  101040 (ISO/JIS type)
  101306 (ASME/ANSI/AGD type)
- Contact points for Mitutoyo's dial indicators
  (Refer to pages F-57 to F-60 for details.)
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**
- Granite comparator stands
  (Refer to page F-88 for details.)
- Comparator stands
  (Refer to page F-90 for details.)

Comparator stand
215-505-10

Remote controller

Lifting cable

F

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SPECIFICATIONS

Metric

Order No.*1	Range (mm)	Resolution (mm)	Maximum permissible error (mm)			Measuring force MPL (N)	Net mass (g)
			MPE_E*2	Hysteresis MPE_H	Repeatability MPE_R		
543-561	30.4	0.0005/ 0.001 (selectable)	0.0015	0.0015	0.001	2.0 or less	290
543-563	60.9		0.0025	0.0025		2.5 or less	305

Inch/Metric

ISO/JIS type ASME/ANSI/AGD type

Order No.*1	Range	Resolution	Maximum permissible error			Measuring force MPL (N)	Net mass (g)
			MPE_E*2	Hysteresis MPE_H	Repeatability MPE_R		
543-562	1.2 in /30.4 mm	0.00002/ 0.00005/ 0.0001 in, 0.0005/ 0.001 mm (selectable)	±0.00006 in/ 0.0015 mm	0.00006 in/ 0.0015 mm	0.00004 in/ 0.001 mm	2.0 or less	300
543-564	2.4 in /60.9 mm		±0.0001 in/ 0.0025 mm	0.0001 in/ 0.0025 mm		2.5 or less	

*1 To denote your AC power cable add the following suffixes to the order No.: **A** for UL/CSA, **D** for CEE, **DC** for CCC, **E** for BS, **K** for KC, **No suffix** is required for JIS/100 V

*2 Error of indication for the total measuring range

Note 1: The indicator can output SPC (Digimatic) data consisting of up to 6 digits in full. If the data consists of 7 digits the first digit is not output (example: 123.4565 mm is output as 23.4565 mm).

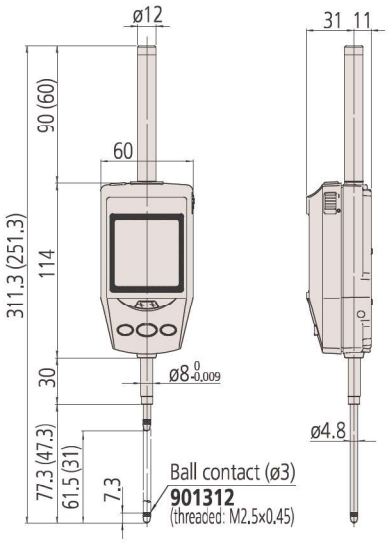
Note 2: Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

Note 3: The orientation for use can be from vertical (contact point pointing downward) to horizontal (spindle in horizontal orientation).

DIMENSIONS

ISO/JIS Type

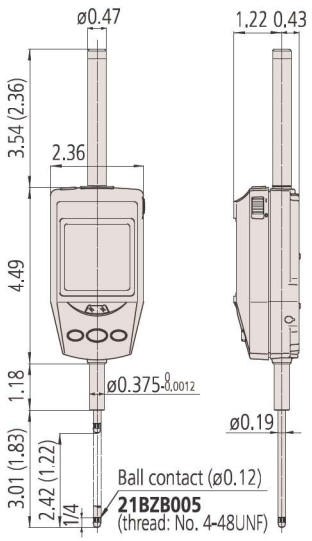
Unit: mm



Note: ( ) = **543-561**

ASME/ANSI/AGD Type

Unit: in



Note: ( ) = **543-562**

MeasurLink ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

ABSOLUTE™

PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page U-11 for details.

Technical Data

- Display: 6-digit LCD, sign, and analog bar with 2-color backlight
- Power supply: 9 VDC, 1.2 A (via AC adapter) **06AGC585***1
  *1 To denote your AC power cable add the following suffixes to the order No.: **JA** for UL/CSA and PSE, **D** for CEE, **DC** for CCC, **E** for BS, **K** for KC
- Lifting lever: **137693**

Functions

- Max/Min value hold
- Runout measurement (MAX - MIN)
- Zero-setting (INC system)
- Presetting (ABS system)
- Direction switching
- Tolerance judgment
- Digital display switching (0.01 mm ⟷ 0.001 mm)
- Analog resolution selection (±0.02, ±0.04, ±0.1, ±0.2, ±0.4 mm)
- Function Lock
- Data output
- Error alarm display

Optional Accessories

- Lifting cable: **21JZA295** (stroke 25.4 mm)
- Lug-on-center back:
  101040(ISO/JIS type)
  101306 (ASME/ANSI/AGD type)
- Auxiliary spindle spring:
  02ACA571 (25.4 mm/1 inch models)
  02ACA773 (50.8 mm/2 inch models)
- SPC cable:
  936937 (1 m)
  965014 (2 m)
  (Refer to pages A-27 to A-29 for details.)
- USB Input Tool Direct (2 m): **06AFM380D**

Note: Please separately purchase **USB-ITPAK** since there is no data output switch on the measurement instrument. (Refer to pages A-13 and A-22 to A-24 for details.)

- Input Tool Series
  IT-016U (USB Keyboard Signal Conversion Type): **264-016-10**
  IT-007R (RS-232C Communication Conversion Type): **264-007**
  (Refer to page A-14 for details.)
- Connecting Cables for **U-WAVE-T** (160 mm): **02AZD790D**
  For foot switch: **02AZE140D**
  (Refer to pages A-19 to A-21 for details.)
- Contact points for Mitutoyo's dial indicators*3
- Interchangeable backs for SERIES 2 models*4
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**
- Measuring stands*5
  *3 Refer to pages F-57 to F-60 for details.
  *4 Refer to page F-61 for details.
  *5 Refer to pages F-84 to F-91 for details.

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ABSOLUTE Digimatic Indicator ID-F SERIES 543 — with Back-lit LCD Screen

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- Multi-functional.
- GO/±NG judgment function: If a judgment result shows an out of tolerance condition, the display backlighting changes from green to red.

Green indication for GO judgment

Red indication for ±NG judgment

- An analog bar indicator has been integrated to make upper/lower limit and turnover point reading more comfortable.
- The ABS (absolute) scale restores the last origin position*1 automatically when the indicator is turned on, and realizes high reliability by eliminating over-speed errors.
- Easy-to-read large LCD readout with the character height of 8.5 mm.

*1 Regarding origin setting, refer to "Origin Setting of Digimatic Indicators" on page F-25.

- External power supply type: an AC adapter is a standard accessory. Does not require battery replacement.
- The resolution can be switched between 0.001 mm/0.01 mm (or 0.001 in/0.0005 in/0.0001 in/0.00005 in).
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page A-3)

Multi-functional model

543-551

543-553

SPECIFICATIONS

Metric

Order No.*2	Range (mm)	Resolution (mm)	Maximum permissible error (mm)			Measuring force MPL (N)	Net mass (g)
			MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$		
543-551	25.4	0.001/ 0.01 (selectable)	0.003	0.002	0.002	1.8 or less	Approx. 240
543-557	50.8		0.003			2.3 or less	Approx. 330
543-553	50.8		0.006				

Inch/Metric ISO/JIS type ASME/ANSI/AGD type

Order No.*2	Range	Resolution	Maximum permissible error			Measuring force MPL (N)	Net mass (g)
			MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$		
543-552	1 in /25.4 mm	0.00005/ 0.0001/ 0.0005/ 0.001 in, 0.001/ 0.01 mm (selectable)	±0.0001 in /0.003 mm	0.00010 in /0.002 mm	0.00010 in /0.002 mm	1.8 or less	Approx. 240
543-558	2 in /50.8 mm		±0.0001 in /0.003 mm			2.3 or less	Approx. 330
543-554	2 in /50.8 mm		±0.00025 in /0.006 mm				

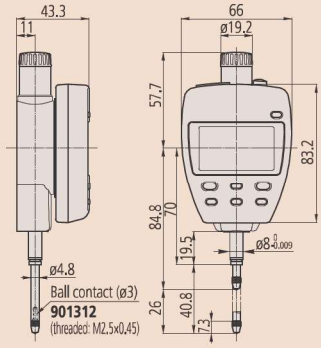
*2 To denote your AC power cable add the following suffixes to the order No.: **A** for UL/CSA, **D** for CEE, **DC** for CCC, **E** for BS, **K** for KC, **No suffix** is required for JIS/100 V
*3 Error of indication for the total measuring range

DIMENSIONS

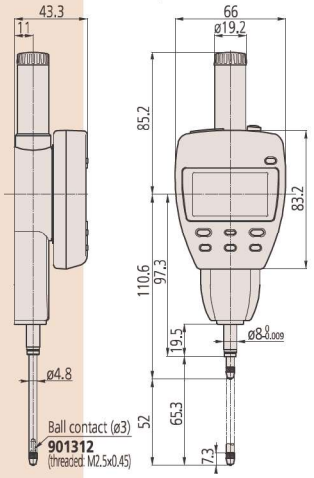
Unit: mm

ISO/JIS Type

543-551



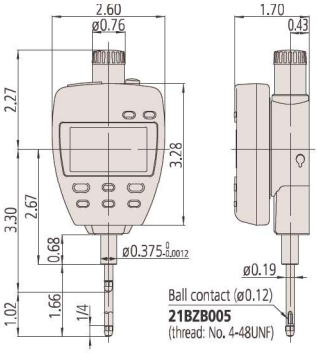
543-553, 543-557



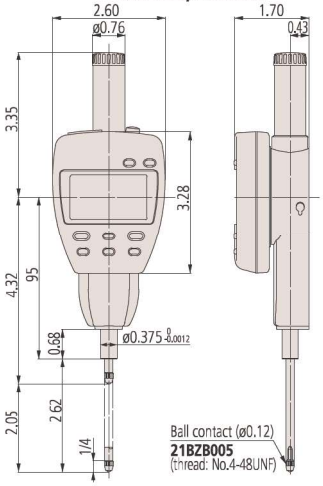
Unit: in

ASME/ANSI/AGD Type

543-552



543-554, 543-558



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Mitutoyo

Digimatic Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Supplemental information on Digimatic Indicators

Origin setting of Digimatic Indicators

Repeatability in the range of 0.2 mm from the lowest rest point is not guaranteed for Digimatic indicators. When setting the origin or presetting a specific value, be sure to lift the spindle at least 0.2 mm from the lowest rest point.

EC Counter
SERIES 542 — Low-cost, Modular Type Display Unit

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- –NG, OK and +NG tolerance judgment results can be displayed.
- Can be set to produce either tolerance judgment output or Digimatic output.
- Small size (96×48 mm) which conforms to DIN standards.

542-007

MeasurLink® ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

Functions

- Preset
- Tolerance judgment (3 steps)

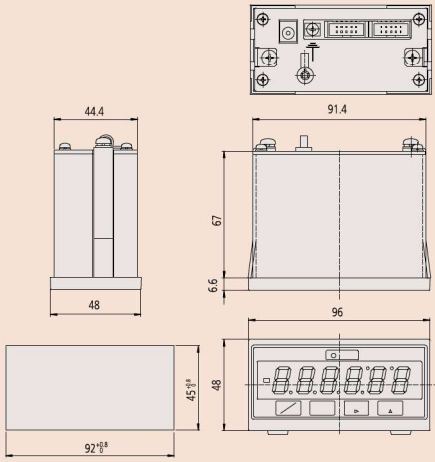
SPECIFICATIONS

Order No.		542-007*
Quantizing error		±1 count
Resolution ( ) indicates maximum display range		0.01 mm (±9999.99)/0.0005 in (±99.9995 in)/0.001 in (±999.999 in) 0.001 mm (±9999.999)/0.00005 in (±9.99995 in)/0.0001 in (±99.999 in) [automatic setting by gage]
Tolerance judgment display		LED display (3 steps: Amber, Green, Red)
External output (switching type)	Tolerance judgment output	–NG, OK, +NG (open-collector)
	Data output	Digimatic output
Control input		External PRESET, external HOLD
Operation temperature range		0 to 40 °C (RH 20 to 80 %, no condensation)
Storage temperature range		–10 to 50 °C (RH 20 to 80 %, no condensation)
External dimensions		96 (W) ×48 (H) ×84.6 (D) mm
AC adapter		AC adapter: (Japan/North America) **06AGC585JA**/(EU) **06AGC585D**/ (UK) **06AGC585E**/(Korea) **06AGC585K**/(China) **06AEG302DC**
Standard Accessories		AC adapter, rubber feet
Mass		220 g

* To denote your AC power cable add the following suffixes to the order No.: **A** for UL/CSA, **D** for CEE, **DC** for CCC, **E** for BS, **K** for KC, C and **No suffix** are required for PSE.

DIMENSIONS

Unit: mm



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Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Feature icons

Icon	Feature description
	Continuous scale
	Balanced scale
	Reverse reading type, Suitable for depth and step measurement.
	One revolution type for easy and error-free reading
	Double scale spacing type, easy-on-the-eyes
	Shockproof
	Waterproof (IP63)
	Waterproof (IP64)
	With damper at lowest rest point
	Jeweled bearing
	Peak retaining
	Dustproof
	With coaxial revolution counter
	Back Plunger
	Adjustable hand

Note: Mitutoyo produces ASME-compatible products. Contact us for details.

Dial Indicators

Mitutoyo's dial indicators have long been used by many of our customers. In full recognition of their needs, we have devoted ourselves to the research and development necessary to produce high-quality and high-accuracy dial indicators. Due to the recent re-acknowledgement of the importance of measurement technologies, the demands on dial indicators are many and varied: installation in measuring jigs, mounting in countless types of precision equipment, etc. We offer numerous models with various types of dial faces, measuring ranges, graduation styles and environmental resistance ratings. The stems, which ensure the fixture reliability, and the spindles, which are the basis of accuracy, have excellent resistance against hard use thanks to the hardened stainless steel construction. 0.01 mm resolution dial indicators have a grand gear made of stainless steel with high resistance to wear and deformation. 0.001 mm graduation dial indicators employ a sector gear made of a special alloy in order to further increase the resistance to wear.
S-type dial indicators employ an O-ring to ensure the air tightness between the outer frame and the crystal case in order to prevent water or oil penetration.
Mitutoyo's dial indicators are manufactured and inspected according to JIS B 7503:2017. (Inspection orientation: vertical)
Important factors in choosing a dial indicator: the size (bezel diameter), resolution (graduation) and measuring range. Use the table on the right to help choose a suitable model for your application.

Parts of a dial indicator

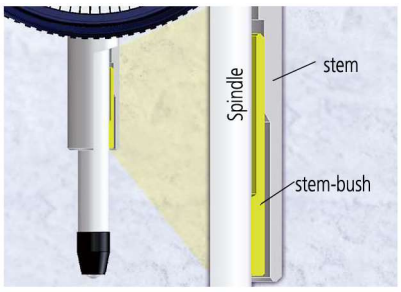
F

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

FEATURES: S Series (SERIES 2, 3, 4)

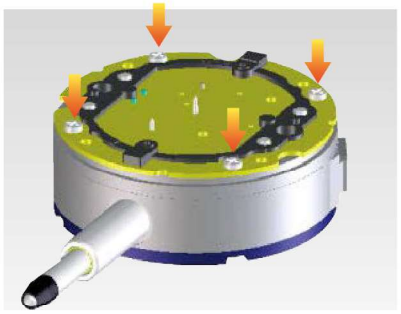
- No through screw-holes on the frame for high oil- and dust-resistance. The bezel clamp can be attached either to the right or left side.
- Improved Impact- and oil-resistant materials are employed in the bezel. Easier reading is due to the improved shape of the crystal face.



- Revolutionary stem-bush design for trouble-free stem clamping (longer clamping range; maximum tightening torque at the clamping point with M5 screw: 150 N-cm).

- The spindle lifting lever (optional: **21AZB149**) can be attached to either the right or left side providing high operability and smooth movement. This lever can be easily installed and removed without tools.

- Limit hand (1) can be moved without interfering with the bezel clamp (2).



- Greater rigidity in the bearing plate for reduced retrace error and 4-screw mounting for increased impact resistance.

F

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 2 — Standard Type, 0.01 mm Graduation

- Standard 0.01 mm graduation dial gages having a bezel with an outside diameter of 57 mm. All types come with limit markers and a bezel clamp as standard.
- The bezel clamp and lifting lever (optional) can be attached to either the right or left side. These parts can be easily installed and removed without tools.
- Watertight assembly of bezel and crystal as well as the use of an O-ring prevents water or oil penetration.
- The stem and spindle are made of high-strength quench-hardened stainless steel suitable for heavy-duty use.
- A carbide contact point is used.
- The grand gear is made of stainless steel with high resistance to wear and deformation.
- Application of a hard coating on the surface of the crystal makes the gage highly scratch- and chemical-resistant.

2046S

Continuous scale

Graduation: 0.01 mm, Measuring range: 10 mm

2046S
2046S-09
Shockproof type

Balanced scale

Graduation: 0.01 mm, Measuring range: 10 mm

2047S

Reverse reading type. Suitable for depth and step measurement.

Graduation: 0.01 mm, Measuring range: 10 mm

2902S

Continuous scale

Graduation: 0.01 mm, Measuring range: 10 mm

2310S-10
With coaxial revolution counter
Jeweled bearing type

Continuous scale

Graduation: 0.01 mm, Measuring range: 5 mm

2044S
2044S-09
Shockproof

Balanced scale

Graduation: 0.01 mm, Measuring range: 5 mm

2045S

F

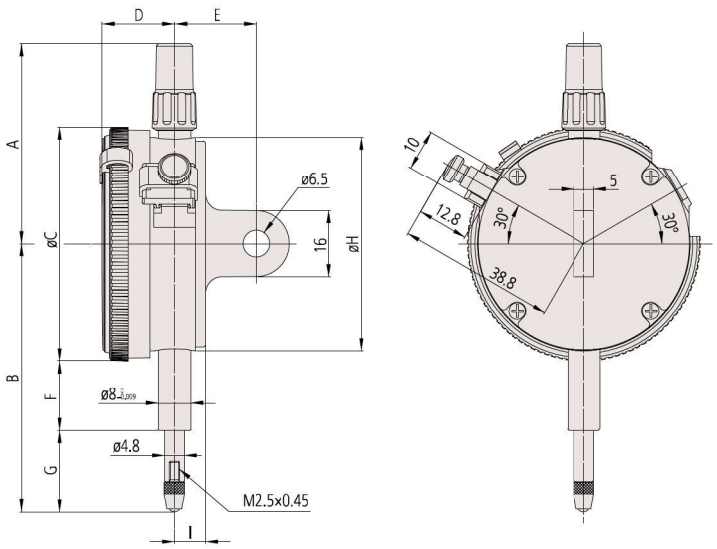
Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

ISO/JIS Type

Unit: mm



Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
2046S	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	144	135
2046S-09	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	146	137
2047S	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	144	135
2902S	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	144	135
2310S-10	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	146	137
2044S	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	145	136
2044S-09	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	147	138
2045S	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	145	136

Note: Refer to pages F-57 to F-60 for details of contact points.

FEATURES

Metric

Order No.								
w/lug	Flat-back							
2046S	**2046SB**	✔						
2046S-09	**2046SB-09**	✔			✔			
2047S	**2047SB**		✔					
2902S	**2902SB**			✔				
2310S-10	**2310SB-10**	✔					✔	✔
2044S	**2044SB**	✔						
2044S-09	**2044SB-09**	✔			✔			
2045S	**2045SB**		✔					

SPECIFICATIONS

Metric

ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeat-ability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
2046S	**2046SB**	0.01	10 (1)	5	9	10	13	3	3	±0-100	1.4 or less
2046S-09	**2046SB-09**	0.01	10 (1)	5	9	10	15	3	3	±0-100	1.4 or less
2047S	**2047SB**	0.01	10 (1)	5	9	10	13	3	3	0-50-0	1.4 or less
2902S	**2902SB**	0.01	10 (1)	5	9	10	13	3	3	100-0	1.4 or less
2310S-10	**2310SB-10**	0.01	10 (1)	5	9	10	15	3	3	±0-100	1.4 or less
2044S	**2044SB**	0.01	5 (1)	5	9	10	12	3	3	±0-100	1.4 or less
2044S-09	**2044SB-09**	0.01	5 (1)	5	9	10	12	3	3	±0-100	1.4 or less
2045S	**2045SB**	0.01	5 (1)	5	9	10	12	3	3	0-50-0	1.4 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 2 — Standard Type, 0.001 mm & 0.005 mm Graduation

- Standard 0.001 mm and 0.005 mm graduation dial indicators having a bezel with an outside diameter of 57 mm. All types come with limit markers and a bezel clamp.
- The bezel clamp and lifting lever (optional) can be attached to either the right or left side. These parts can be easily installed and removed without tools.
- Watertight assembly of bezel and crystal as well as the use of an O-ring prevents water or oil penetration.
- The stem and spindle are made of high-strength quench-hardened stainless steel suitable for heavy-duty use.
- A carbide contact point is used.
- A special alloy is used for the sector gears to provide improved wear resistance.
- The indicator uses jeweled bearings, providing excellent indication sensitivity and durability.
- Application of a hard coating on the surface of the crystal makes the gage highly scratch- and chemical-resistant.

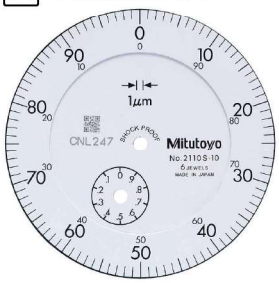
2109S-10

Balanced scale

Graduation: 0.001 mm, Measuring range: 1 mm

2109S-10
Shockproof type
Jeweled bearing type

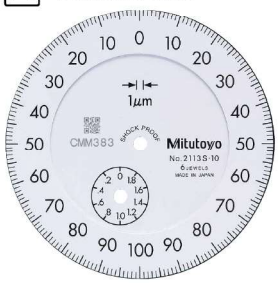
Continuous scale



Graduation: 0.001 mm, Measuring range: 1 mm

2110S-10
Double scale spacing type
Shockproof type
Jeweled bearing type

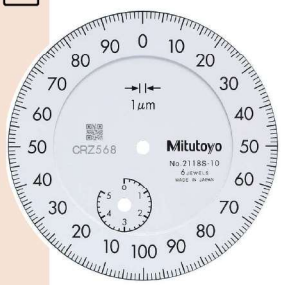
Balanced scale



Graduation: 0.001 mm, Measuring range: 2 mm

2113S-10
Shockproof type
Jeweled bearing type

Continuous scale



Graduation: 0.001 mm, Measuring range: 5 mm

2118S-10
Jeweled bearing

Balanced scale

Graduation: 0.001 mm, Measuring range: 5 mm

2119S-10
Jeweled bearing

Continuous scale

Graduation: 0.005 mm, Measuring range: 5 mm

2124S-10
Jeweled bearing

F

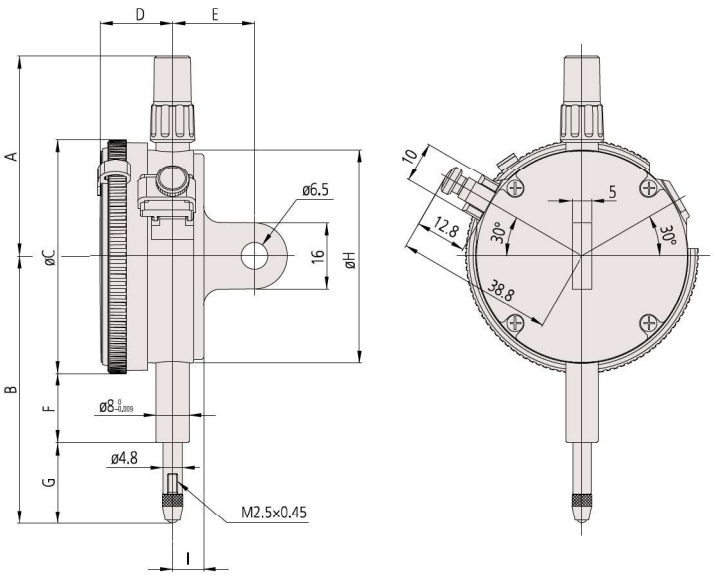
Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

ISO/JIS Type

Unit: mm



Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
2109S-10	48.8	60.5	57	17.7	20	16.9	15.1	52	7.6	148	139
2110S-10	48.8	66.5	57	17.7	20	16.9	21.1	52	7.6	149	140
2113S-10	48.8	61	57	17.7	20	16.9	15.6	52	7.6	148	139
2118S-10	48.8	60.3	57	17.7	20	16.9	14.9	52	7.6	146	137
2119S-10	48.8	60.3	57	17.7	20	16.9	14.9	52	7.6	146	137
2124S-10	48.8	60.3	57	17.7	20	16.9	14.9	52	7.6	146	137

Note: Refer to pages F-57 to F-60 for details of contact points.

FEATURES

Metric

Order No.							
w/lug	Flat-back						
2109S-10	**2109SB-10**		✔	✔		✔	
2110S-10	**2110SB-10**	✔		✔		✔	✔
2113S-10	**2113SB-10**		✔	✔		✔	
2118S-10	**2118SB-10**	✔				✔	
2119S-10	**2119SB-10**		✔			✔	
2124S-10	**2124SB-10**	✔				✔	

SPECIFICATIONS

Metric

ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeat-ability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
2109S-10	**2109SB-10**	0.001	1 (0.2)	2	3	4	5	2	0.5	0-100-0	1.5 or less
2110S-10	**2110SB-10**	0.001	1 (0.1)	2	3	4	5	2	0.5	±0-100	1.8 or less
2113S-10	**2113SB-10**	0.001	2 (0.2)	2	4	5	7	2	0.5	0-100-0	1.5 or less
2118S-10	**2118SB-10**	0.001	5 (0.2)	3.5	5	6	10	3	1	0-100-100	1.5 or less
2119S-10	**2119SB-10**	0.001	5 (0.2)	3.5	5	6	10	3	1	0-100-0	1.5 or less
2124S-10	**2124SB-10**	0.005	5 (0.5)	5	8	9	12	3	3	±0-50	1.5 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

IP64

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 2 — Waterproof Type, 0.01 mm & 0.001 mm Graduation

- Waterproof type dial indicators having a bezel with an outside diameter of 57 mm.
- O-rings and rubber bellows are used to prevent water and oil penetration.
- All types come with limit markers and a bezel clamp as standard.
- The bezel clamp can be attached to either the right or left side. These parts can be easily installed and removed without tools.
- The stem and spindle are made of high-strength quench-hardened stainless steel suitable for heavy-duty use.
- A carbide contact point is used.
- Application of a hard coating on the surface of the crystal makes the gage highly scratch- and chemical-resistant.

2046S-60

2109S-70

Continuous scale

Graduation: 0.01 mm,
Measuring range: 10 mm

2046S-60
Waterproof

Continuous scale

Graduation: 0.01 mm,
Measuring range: 5 mm

2044S-60
Waterproof

Balanced scale

Graduation: 0.001 mm,
Measuring range: 1 mm

2109S-70
Waterproof
Shockproof
Jeweled bearing

Continuous scale

Graduation: 0.001 mm,
Measuring range: 1 mm

2110S-70
Waterproof
Double scale spacing
Shockproof
Jeweled bearing

F

Mitutoyo

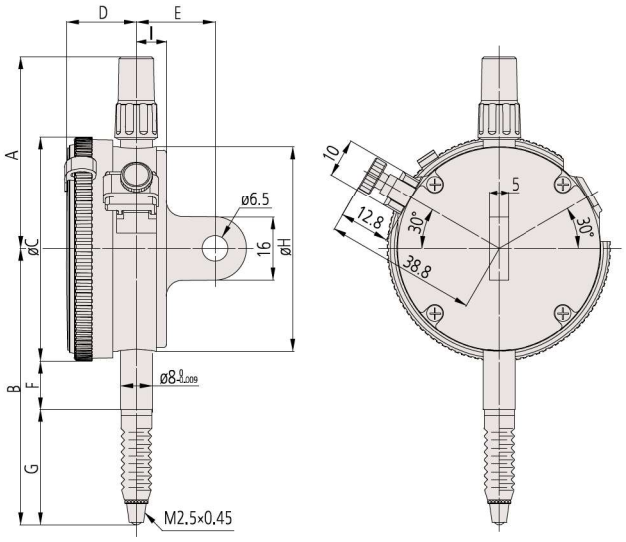
Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

ISO/JIS Type

Unit: mm



Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
2046S-60	48.8	70	57	17.7	20	12.3	29.2	52	7.6	146	137
2044S-60	48.8	70	57	17.7	20	12.3	29.2	52	7.6	147	138
2109S-70	48.8	65.3	57	17.7	20	12.3	24.5	52	7.6	149	140
2110S-70	48.8	67.5	57	17.7	20	12.3	26.7	52	7.6	150	141

Note 1: Refer to pages F-57 to F-60 for details of contact points.
Note 2: If the contact point of the waterproof model is replaced, the water resistance cannot be guaranteed.

FEATURES

Metric

Order No.							
w/lug	Flat-back						
2046S-60	**2046SB-60**	✔			✔		
2044S-60	**2044SB-60**	✔			✔		
2109S-70	**2109SB-70**		✔	✔	✔	✔	
2110S-70	**2110SB-70**	✔		✔	✔	✔	✔

SPECIFICATIONS

Metric

ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeat-ability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
2046S-60	**2046SB-60**	0.01	10 (1)	5	9	10	13	3	3	±0-100	2.5 or less
2044S-60	**2044SB-60**	0.01	5 (1)	5	9	10	12	3	3	±0-100	2.5 or less
2109S-70	**2109SB-70**	0.001	1 (0.2)	2	3	4	5	2	0.5	0-100-0	2.0 or less
2110S-70	**2110SB-70**	0.001	1 (0.1)	2	3	4	5	2	0.5	±0-100	2.0 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

F

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 2 — Standard Type, Inch Reading

SPECIFICATIONS

Inch

ANSI/AGD type

Order No.		Graduation (in)	Range (range/rev) (in)	Accuracy (in)		Repeat-ability (in)	Dial reading	Measuring force (N)
w/lug	Flat-back			First 1 Rev/2.5 Rev/10 Rev	Retrace			
2414S	**2414SB**	0.001	0.5 (0.1)	±0.001/±0.001/±0.001	0.0002	±0.0002	±0-100	1.8 or less
2415S	**2415SB**	0.001	0.5 (0.1)	±0.001/±0.001/±0.001	0.0002	±0.0002	0-50-0	1.8 or less
2914S	**2914SB**	0.001	0.5 (0.1)	±0.001/±0.001/±0.001	0.0002	±0.0002	100-0	1.8 or less
2506S	**2506SB**	0.0005	0.125 (0.05)	±0.0005/±0.0005/—	0.00016	±0.0001	±0-50	1.8 or less
2507S	**2507SB**	0.0005	0.125 (0.05)	±0.0005/±0.0005/—	0.00016	±0.0001	0-25-0	1.8 or less
2514S	**2514SB**	0.0005	0.5 (0.05)	±0.0005/±0.0005/±0.0015	0.00016	±0.0001	±0-50	1.8 or less
2922S	**2922SB**	0.0005	0.125 (0.05)	±0.0005/±0.0005/—	0.00016	±0.0001	0-25-0	1.8 or less
2356S-10	**2356SB-10**	0.0001	0.25 (0.01)	±0.0002/±0.0002/±0.0003/±0.0004 (First 20rev)/±0.0005 (Over 20rev)	0.0001	±0.00003	0-10	2.0 or less
2358S-10	**2358SB-10**	0.0001	0.5 (0.01)	±0.0002/±0.0002/±0.0003/±0.0004 (First 20rev)/±0.0008 (Over 20rev)	0.00015	±0.00003	0-10	2.0 or less
2802S-10	**2802SB-10**	0.0001	0.025 (0.01)	±0.0001/±0.0001/—	0.0001	±0.00003	0-10	2.0 or less
2803S-10	**2803SB-10**	0.0001	0.025 (0.01)	±0.0001/±0.0001/—	0.0001	±0.00003	0-5-0	2.0 or less
2804S-10	**2804SB-10**	0.0001	0.05 (0.01)	±0.0001/±0.0001/±0.0002	0.0001	±0.00003	0-10	2.0 or less
2805S-10	**2805SB-10**	0.0001	0.05 (0.01)	±0.0001/±0.0001/±0.0002	0.0001	±0.00003	0-5-0	2.0 or less
2905S-10	**2905SB-10**	0.0001	0.05 (0.01)	±0.0001/±0.0001/±0.0002	0.0001	±0.00003	10-0	2.0 or less
2923S-10	**2923SB-10**	0.0001	0.05 (0.01)	±0.0001/±0.0001/±0.0002	0.0001	±0.00003	0-5-0	2.0 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

FEATURES

Inch

Order No.				
w/lug	Flat-back			
2414S	**2414SB**			
2415S	**2415SB**			
2914S	**2914SB**		✔	
2506S	**2506SB**			
2507S	**2507SB**			
2514S	**2514SB**			
2922S	**2922SB**			
2356S-10	**2356SB-10**			✔
2358S-10	**2358SB-10**			✔
2802S-10	**2802SB-10**	✔		✔
2803S-10	**2803SB-10**	✔		✔
2804S-10	**2804SB-10**	✔		✔
2805S-10	**2805SB-10**	✔		✔
2905S-10	**2905SB-10**	✔	✔	✔
2923S-10	**2923SB-10**	✔		✔

F

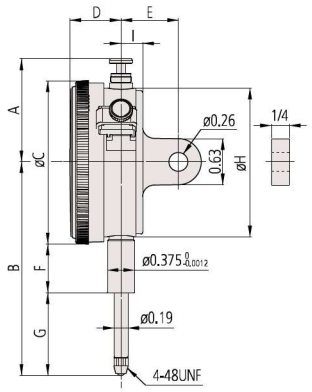
Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

ANSI/AGD Type

Unit: in



Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
2414S	1.53	2.52	2.24	0.70	3/4	0.54	0.87	2.05	0.30	164	139
2415S	1.53	2.52	2.24	0.70	3/4	0.54	0.87	2.05	0.30	164	139
2914S	1.53	2.52	2.24	0.70	3/4	0.54	0.87	2.05	0.30	164	139
2506S	1.92	2.14	2.24	0.70	3/4	0.54	0.48	2.05	0.30	164	139
2507S	1.92	2.14	2.24	0.70	3/4	0.54	0.48	2.05	0.30	164	139
2514S	1.53	2.52	2.24	0.70	3/4	0.54	0.87	2.05	0.30	164	139
2922S	1.92	2.14	2.24	0.70	3/4	0.54	0.48	2.05	0.30	164	139
2356S-10	1.92	2.25	2.24	0.70	3/4	0.54	0.59	2.05	0.30	163	138
2358S-10	1.53	2.50	2.24	0.70	3/4	0.54	0.85	2.05	0.30	164	139
2802S-10	1.92	2.02	2.24	0.70	3/4	0.54	0.37	2.05	0.30	164	139
2803S-10	1.92	2.02	2.24	0.70	3/4	0.54	0.37	2.05	0.30	164	139
2804S-10	1.92	2.04	2.24	0.70	3/4	0.54	0.38	2.05	0.30	166	141
2805S-10	1.92	2.04	2.24	0.70	3/4	0.54	0.38	2.05	0.30	166	141
2905S-10	1.92	2.04	2.24	0.70	3/4	0.54	0.38	2.05	0.30	164	139
2923S-10	1.92	2.04	2.24	0.70	3/4	0.54	0.38	2.05	0.30	164	139

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

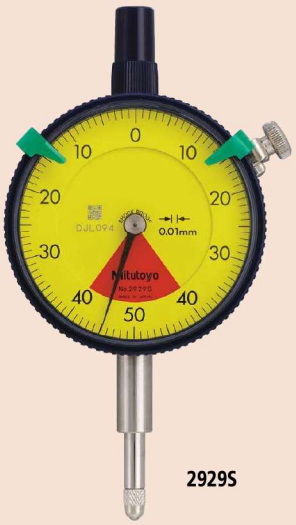
Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 2 — Standard One Revolution Type for Error-free Reading

- Mitutoyo's unique shock-proof mechanism is incorporated, providing improved resistance to shock due to sudden spindle retraction caused by impact.
- This series has been developed to eliminate the possibility of reading errors due to miscounting multiple revolutions.
- All types come with limit markers and a bezel clamp.
- The bezel clamp and lifting lever (optional) can be attached to either the right or left side. These parts can be easily installed and removed without tools.
- The stem and spindle are made of high-strength quench-hardened stainless steel suitable for heavy-duty use.
- A carbide contact point is used.
- Application of a hard coating on the surface of the crystal makes the gage highly scratch- and chemical-resistant.
- The dead zone in red indicates "accuracy not guaranteed".

2900S-10

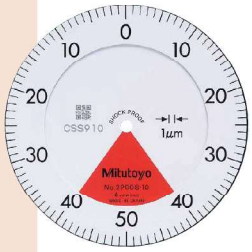


2929S

One revolution type Back Plunger dial gages are also available. (Refer to pages F-55 to F-56 for details.)

2990T-10

Balanced scale



Graduation: 0.001 mm, Measuring range: 0.08 mm

2900S-10
- One revolution
- Shockproof
- Jeweled bearing

2900S-72
- One revolution
- Shockproof
- Dustproof
- Jeweled bearing

Balanced scale

Graduation: 0.001 mm, Measuring range: 0.16 mm

2901S-10
- One revolution
- Shockproof
- Jeweled bearing

Balanced scale

Graduation: 0.1 mm, Measuring range: 4 mm

2928S
- One revolution
- Shockproof

Balanced scale

Graduation: 0.01 mm, Measuring range: 0.8 mm

2929S
- One revolution
- Shockproof

2929S-62
- One revolution
- Shockproof
- Dustproof

Balanced scale

Graduation: 0.01 mm, Measuring range: 1.6 mm

2959S
- One revolution
- Shockproof

F

Mitutoyo

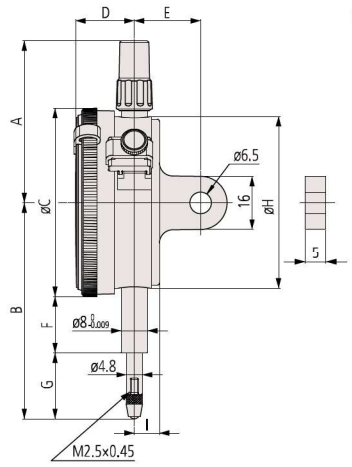
Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

ISO/JIS Type

Unit: mm

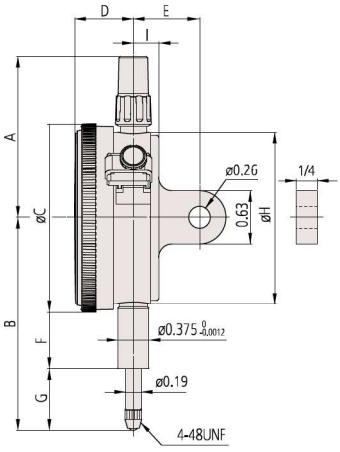


Order No.	A	B	C	D	E	F	G	H	I	Mass (g) w/lug	Mass (g) Flat-back
2928S	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	145	136
2929S	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	145	136
2929S-62	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	145	136
2959S	48.8	65.2	57	17.7	20	16.9	19.8	52	7.6	145	136
2900S-10	48.8	66	57	17.7	20	16.9	20.6	52	7.6	149	140
2900S-72	48.8	66	57	17.7	20	16.9	20.6	52	7.6	149	140
2901S-10	48.8	66.1	57	17.7	20	16.9	20.7	52	7.6	149	140

Note: Refer to pages F-57 to F-60 for details of contact points.

ANSI/AGD Type

Unit: in



Order No.	A	B	C	D	E	F	G	H	I	Mass (g) w/lug	Mass (g) Flat-back
2909S-62	1.92	2.04	2.24	0.70	3/4	0.54	0.39	2.05	0.30	163	138
2910S-10	1.92	2.02	2.24	0.70	3/4	0.54	0.36	2.05	0.30	164	139

FEATURES

Metric

Order No. w/lug	Order No. Flat-back						
2928S	2928SB	✔	✔	✔			
2929S	2929SB	✔	✔	✔			
2929S-62	2929SB-62	✔	✔	✔		✔	
2959S	2959SB	✔	✔	✔			
2900S-10	2900SB-10	✔	✔	✔			✔
2900S-72	2900SB-72	✔	✔	✔		✔	✔
2901S-10	2901SB-10	✔	✔	✔			✔

Inch

Order No. w/lug	Order No. Flat-back						
2909S-62	2909SB-62	✔	✔	✔		✔	
2910S-10	2910SB-10	✔	✔	✔			✔

SPECIFICATIONS

Metric

☐ ISO/JIS type

Order No. w/lug	Order No. Flat-back	Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm) Indication error 1/10 Rev	1/2 Rev	1 Rev	Measuring range	Hysteresis	Repeatability	Dial reading	Measuring force (N)
2928S	2928SB	0.1	4 (5)	20	—	—	40	20	20	2-0-2	1.4 or less
2929S	2929SB	0.01	0.8 (1)	5	—	—	8	3	3	40-0-40	1.4 or less
2929S-62	2929SB-62	0.01	0.8 (1)	5	—	—	8	3	3	40-0-40	2.0 or less
2959S	2959SB	0.01	1.6 (2)	5	—	—	10	3	3	80-0-80	1.4 or less
2900S-10	2900SB-10	0.001	0.08 (0.1)	2	—	—	3	2	0.5	40-0-40	1.5 or less
2900S-72	2900SB-72	0.001	0.08 (0.1)	2	—	—	3	2	0.5	40-0-40	2.0 or less
2901S-10	2901SB-10	0.001	0.16 (0.2)	2	—	—	4	2	0.5	80-0-80	1.5 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

☐ ANSI/AGD type

Order No. w/lug	Order No. Flat-back	Graduation (in)	Range (range/rev) (in)	Accuracy (in) First 1 Rev/2.5 Rev/10 Rev	Retrace	Repeatability (in)	Dial reading	Measuring force (N)
2909S-62	2909SB-62	0.0005	0.04/0.05	±0.0005/—/—	0.00016	±0.0001	20-0-20	2.5 or less
2910S-10	2910SB-10	0.0001	0.008/0.01	±0.0001/—/—	0.0001	±0.00003	4-0-4	1.8 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

F

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

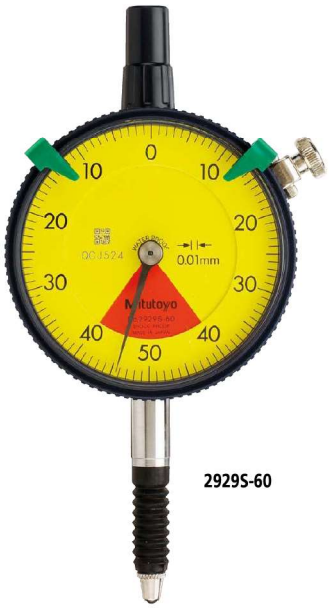
IP64

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

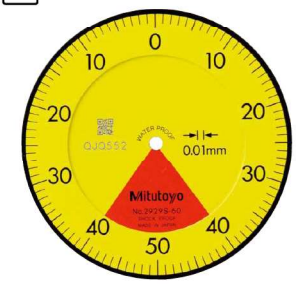
SERIES 2 — Standard One Revolution Type for Error-free Reading, Waterproof Type

- Mitutoyo's unique shock-proof mechanism is incorporated, providing improved resistance to shock due to sudden spindle retraction caused by impact.
- This series has been developed to eliminate the possibility of reading errors due to miscounting multiple revolutions.
- All types come with limit markers and a bezel clamp.
- The bezel clamp and lifting lever (optional) can be attached to either the right or left side. These parts can be easily installed and removed without tools.
- The stem and spindle are made of high-strength quench-hardened stainless steel suitable for heavy-duty use.
- A carbide contact point is used.
- Application of a hard coating on the surface of the crystal makes the gage highly scratch- and chemical-resistant.
- The dead zone in red indicates "accuracy not guaranteed".



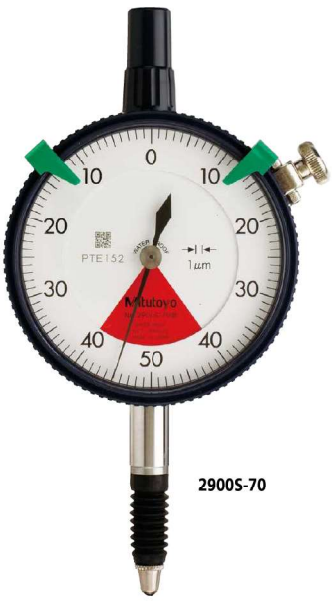
2929S-60

Balanced scale



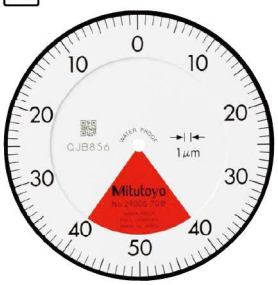
Graduation: 0.01 mm,
Measuring range: 0.8 mm

2929S-60
- One revolution
- Shockproof
- Waterproof



2900S-70

Balanced scale



Graduation: 0.001 mm,
Measuring range: 0.08 mm

2900S-70
- One revolution
- Shockproof
- Waterproof
- Jeweled bearing

F

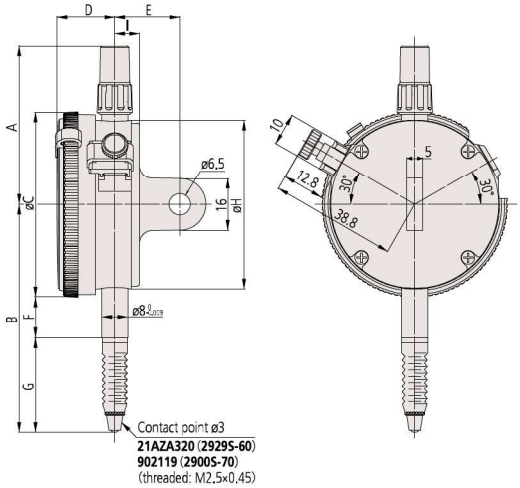
Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

ISO/JIS Type

Unit: mm

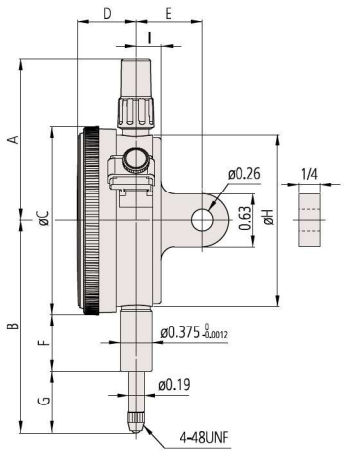


Order No.	A	B	C	D	E	F	G	H	I	Mass (g) w/lug	Mass (g) Flat-back
2929S-60	48.8	70	57	17.7	20	12.3	29.2	52	7.6	146	137
2900S-70	48.8	67	57	17.7	20	12.3	26.2	52	7.6	150	141

Note 1: Refer to pages F-57 to F-60 for details of contact points.
Note 2: If the contact point of the waterproof model is replaced, the water resistance cannot be guaranteed.

ANSI/AGD Type

Unit: in



Order No.	A	B	C	D	E	F	G	H	I	Mass (g) w/lug	Mass (g) Flat-back
2910S-72	1.92	2.02	2.24	0.70	3/4	0.54	0.36	2.05	0.30	150	141

Note 1: Refer to pages F-57 to F-60 for details of contact points.
Note 2: If the contact point of the waterproof model is replaced, the water resistance cannot be guaranteed.

FEATURES

Metric

Order No. w/lug	Order No. Flat-back						
2929S-60	**2929SB-60**	✔	✔	✔	✔		
2900S-70	**2900SB-70**	✔	✔	✔	✔		✔

Inch

Order No. w/lug	Order No. Flat-back						
2910S-72	**2910SB-72**	✔	✔	✔		✔	✔

SPECIFICATIONS

Metric

☐ ISO/JIS type

Order No. w/lug	Order No. Flat-back	Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm) Indication error 1/10 Rev	1/2 Rev	1 Rev	Measuring range	Hysteresis	Repeat-ability	Dial reading	Measuring force (N)
2929S-60	**2929SB-60**	0.01	0.8 (1)	5	—	—	8	3	3	40-0-40	2.0 or less
2900S-70	**2900SB-70**	0.001	0.08 (0.1)	2	—	—	3	2	0.5	40-0-40	2.0 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

☐ ANSI/AGD type

Order No. w/lug	Order No. Flat-back	Graduation (in)	Range (range/rev) (in)	Accuracy (in) First 1 Rev/2.5 Rev/10 Rev	Retrace	Repeat-ability (in)	Dial reading	Measuring force (N)
2910S-72	**2910SB-72**	0.0001	0.008/0.01	±0.0001/—/—	0.0001	±0.00003	4-0-4	2.5 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

F

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

IP43

Dial Indicators

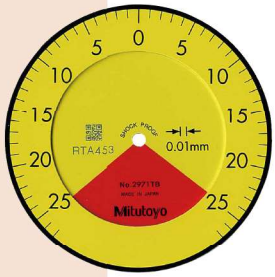
Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 2 — Standard One Revolution Type for Error-free Reading, Lightweight Type

- Mitutoyo's unique shock-proof mechanism is incorporated, providing improved resistance to shock due to sudden spindle retraction caused by impact.
- This series has been developed to eliminate the possibility of reading errors due to miscounting multiple revolutions.
- The stem and spindle are made of high-strength quench-hardened stainless steel suitable for heavy-duty use.
- A carbide contact point is used.
- Application of a hard coating on the surface of the crystal makes the gage highly scratch- and chemical-resistant.
- Lightweight type (70 g).
- The dead zone in red indicates "accuracy not guaranteed".

2972TB

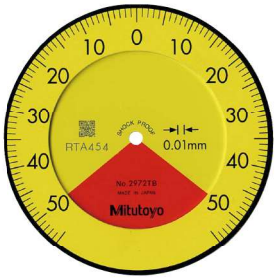
Balanced scale



Graduation: 0.01 mm,
Measuring range: 0.5 mm

2971TB
One revolution
Shockproof
Dustproof

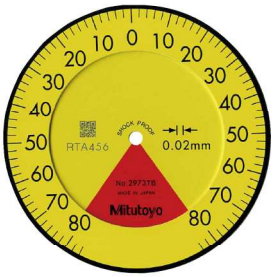
Balanced scale



Graduation: 0.01 mm,
Measuring range: 1 mm

2972TB
One revolution
Shockproof
Dustproof

Balanced scale



Graduation: 0.02 mm,
Measuring range: 1.6 mm

2973TB
One revolution
Shockproof
Dustproof

F

Mitutoyo

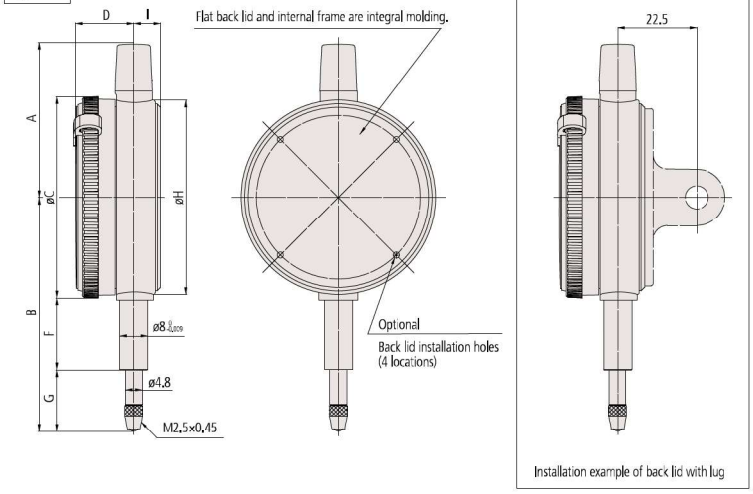
Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

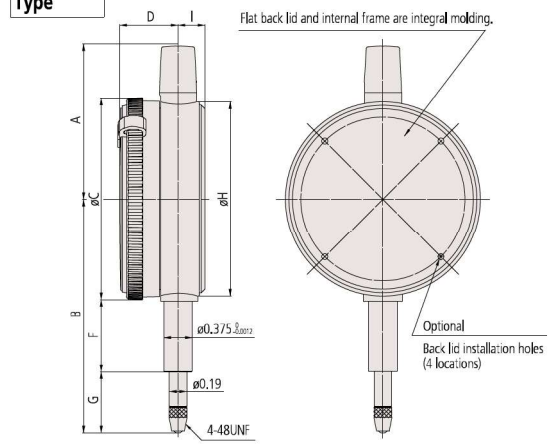
ISO/JIS Type

Unit: mm



ANSI/AGD Type

Unit: in



Note 1: When installing an optional back (refer to page F-61 for details) 4 retaining screws must also be obtained (**546666**: Self-tapping screw only for plastic). Do not apply a tightening torque of more than 20 N-cm in order to avoid stripping the screw threads.
Note 2: An optional lifting lever, release or bezel clamp cannot be installed.

Metric

Order No.	A	B	C	D	F	G	H	I	Mass (g)
2971TB	43.2	65.6	57	16.5	21	16.8	55	7.6	70
2972TB	43.2	66	57	16.5	21	17.2	55	7.6	
2973TB	43.2	66.3	57	16.5	21	17.5	55	7.6	

Inch

Order No.	A	B	C	D	F	G	H	I	Mass (g)
2976TB	1.70	2.55	2.24	0.65	0.80	0.63	2.17	0.30	70
2977TB	1.70	2.56	2.24	0.65	0.80	0.64	2.17	0.30	
2978TB	1.70	2.57	2.24	0.65	0.80	0.65	2.17	0.30	

Note: Refer to pages F-57 to F-60 for details of contact points.

FEATURES

Metric

Order No.					
w/lug	Flat-back				
—	**2971TB**	✔	✔	✔	✔
—	**2972TB**	✔	✔	✔	✔
—	**2973TB**	✔	✔	✔	✔

Inch

Order No.					
w/lug	Flat-back				
—	**2976TB**	✔	✔	✔	✔
—	**2977TB**	✔	✔	✔	✔
—	**2978TB**	✔	✔	✔	✔

SPECIFICATIONS

Metric

☐ ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeat-ability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
—	**2971TB**	0.01	0.5 (0.7)	5	—	—	8	3	3	25-0-25	1.4 or less
—	**2972TB**	0.01	1 (1.4)	5	—	—	8	3	3	50-0-50	1.4 or less
—	**2973TB**	0.02	1.6 (2)	8	—	—	16	6	5	80-0-80	1.4 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

☐ ANSI/AGD type

Order No.		Graduation (in)	Range (range/rev) (in)	Accuracy (in)		Repeat-ability (in)	Dial reading	Measuring force (N)
w/lug	Flat-back			First 1 Rev/2.5 Rev/10 Rev	Retrace			
—	**2976TB**	0.0005	0.02 (0.028)	±0.0005/—/—	0.00016	±0.0001	10-0-10	1.4 or less
—	**2977TB**	0.0005	0.04 (0.055)	±0.0005/—/—	0.00016	±0.0001	20-0-20	1.4 or less
—	**2978TB**	0.001	0.06 (0.079)	±0.001/—/—	0.0002	±0.0002	30-0-30	1.4 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 2 — Long Stroke Type

- Long stroke dial indicators with a ø57 mm bezel. All the models are equipped with limit markers and a bezel clamp as standard. (inch models are exception)
- Watertight assembly of bezel and crystal as well as the use of an O-ring prevents water or oil penetration.
- The stem and the spindle are made of high-strength quench-hardened stainless steel suitable for heavy-duty use.
- A carbide contact point is employed.
- The grand gear is made of stainless steel with high resistance to wear and deformation.
- Application of a hard coating on the surface of the crystal makes the gage highly scratch- and chemical-resistant.
- The bezel clamp and lifting lever* (optional) can be attached to either the right or left side. These parts can be easily installed and removed without any tools.

* These cannot be used on waterproof models and models with a measuring range of 30 mm.

2050S

Continuous scale

Graduation: 0.01 mm, Measuring range: 20 mm

2050S
With damper at lowest rest point

2050S-19
Shockproof
Jeweled bearing
With damper at lowest rest point

2050S-60
Waterproof

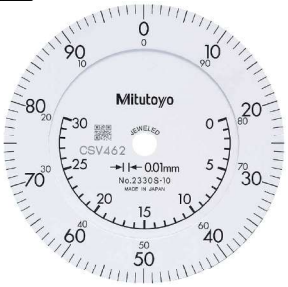
Continuous scale

Graduation: 0.01 mm, Measuring range: 30 mm

2052S
With damper at lowest rest point

2052S-19
Shockproof
Jeweled bearing
With damper at lowest rest point

Continuous scale

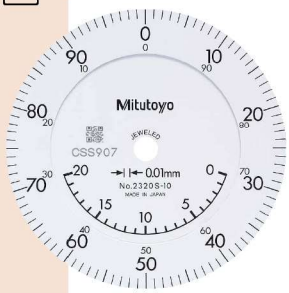


Graduation: 0.01 mm, Measuring range: 30 mm

2330S-10
With coaxial revolution counter
With damper at lowest rest point
Jeweled bearing

2050S-60

Continuous scale



Graduation: 0.01 mm, Measuring range: 20 mm

2320S-10
With coaxial revolution counter
With damper at lowest rest point
Jeweled bearing

Reverse reading

Graduation: 0.01 mm, Measuring range: 30 mm

2952S
With damper at lowest rest point

F

Mitutoyo

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

FEATURES

Metric

Order No.									
w/lug	Flat-back								
2050S	2050SB	✔					✔		
2050S-60	2050SB-60	✔				✔			
2050S-19	2050SB-19	✔			✔		✔	✔	
2320S-10	2320SB-10	✔					✔	✔	✔
2052S	2052SB	✔					✔		
2052S-19	2052SB-19	✔			✔		✔	✔	
2330S-10	2330SB-10	✔					✔	✔	✔
2952S	2952SB			✔			✔		

SPECIFICATIONS

Metric

ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (μm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeat-ability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
2050S	2050SB	0.01	20 (1)	8	10	15	20	5	4	±0-100	2.0 or less
2050S-60*	2050SB-60*	0.01	20 (1)	8	10	15	20	5	4	±0-100	2.5 or less
2050S-19	2050SB-19	0.01	20 (1)	8	10	15	20	5	4	±0-100	2.0 or less
2320S-10	2320SB-10	0.01	20 (1)	8	10	15	20	5	4	±0-100	2.0 or less
2052S	2052SB	0.01	30 (1)	10	12	15	25	7	5	±0-100	2.5 or less
2052S-19	2052SB-19	0.01	30 (1)	10	12	15	25	7	5	±0-100	2.5 or less
2330S-10	2330SB-10	0.01	30 (1)	10	12	15	25	7	5	±0-100	2.5 or less
2952S	2952SB	0.01	30 (1)	10	12	15	25	7	5	100-0	2.5 or less

* **2050S-60** and **2050SB-60** are waterproof types that use a rubber bellows to cover the spindle.
Note that the outer diameter of the bellows (ø9.5) is larger than that of the stem (ø8).
Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

Order No.								
w/lug	Flat-back							
2416S	2416SB	✔						
2416S-06	2416SB-06	✔						
2416S-10	2416SB-10	✔				✔		
2417S	2417SB		✔					
2424S-19	2424SB-19	✔		✔		✔		✔
2776S	2776SB	✔						
2904S	2904SB				✔			

ANSI/AGD type

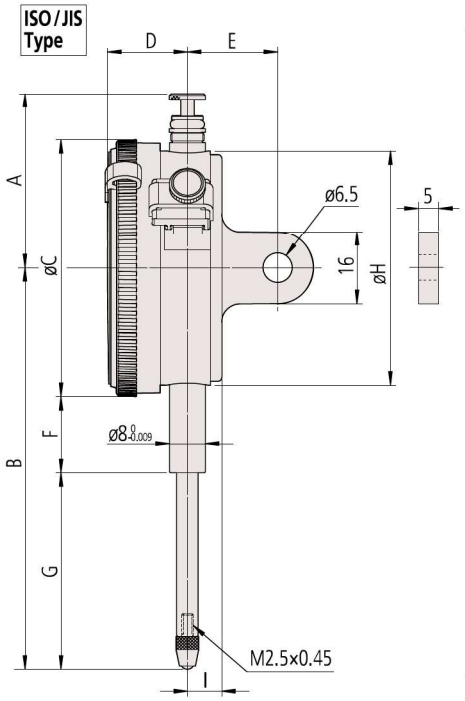
Order No.		Graduation (ir)	Range (range/rev) (in)	Accuracy (in)		Repeat-ability (in)	Dial reading	Measuring force (N)
w/lug	Flat-back			First 1 Rev/2.5 Rev/10 Rev	Retrace			
2416S	2416SB	0.001	1 (0.1)	±0.001/±0.001/±0.002	0.0002	±0.0002	±0-100	1.8 or less
2416S-06	2416SB-06	0.001	1 (0.1)	±0.001/±0.001/±0.002	0.0002	±0.0002	±0-100	1.8 or less
2416S-10	2416SB-10	0.001	1 (0.1)	±0.001/±0.001/±0.002	0.0002	±0.0002	±0-100	1.8 or less
2417S	2417SB	0.001	1 (0.1)	±0.001/±0.001/±0.002	0.0002	±0.0002	0-50-0	1.8 or less
2424S-19	2424SB-19	0.001	2 (0.1)	±0.001/±0.001/±0.002/±0.003 (First 20 Rev)	0.00033	±0.0002	±0-100	2.5 or less
2776S	2776SB	0.0005	1 (0.05)	±0.0005/±0.0005/±0.0015/±0.002 (First 20 Rev)	0.0002	±0.0001	±0-50	2.5 or less
2904S	2904SB	0.001	1 (0.1)	±0.001/±0.001/±0.002	0.0002	±0.0002	100-0	1.8 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

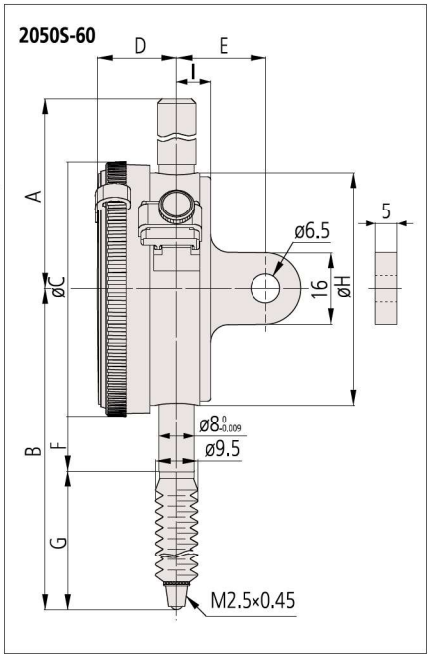
DIMENSIONS

Unit: mm

ISO/JIS Type



2050S-60

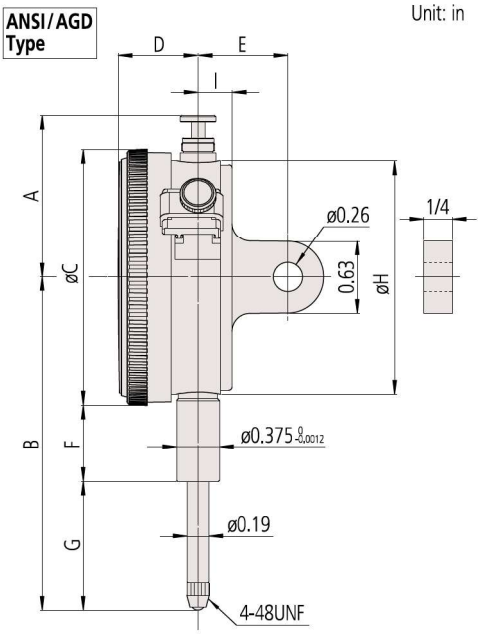


Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
2050S	38.8	75.2	57	17.7	20	16.9	29.8	52	7.6	149	140
2050S-60	59.8	87.2	57	17.7	20	12.3	46.4	52	7.6	155	145
2050S-19	38.8	75.2	57	17.7	20	16.9	29.8	52	7.6	149	140
2320S-10	38.8	75.2	57	17.7	20	16.9	29.8	52	7.6	150	141
2052S	38.8	88.7	57	17.7	20	16.9	43.3	52	7.6	152	143
2052S-19	38.8	88.7	57	17.7	20	16.9	43.3	52	7.6	152	143
2330S-10	38.8	88.7	57	17.7	20	16.9	43.3	52	7.6	153	144
2952S	38.8	88.7	57	17.7	20	16.9	43.3	52	7.6	152	143

Note 1: Refer to pages F-57 to F-60 for details of contact points.
Note 2: If the contact point of the waterproof model is replaced, the water resistance cannot be guaranteed.

Unit: in

ANSI/AGD Type



Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
2416S	1.53	3.02	2.24	0.70	3/4	0.54	1.37	2.05	0.30	164	139
2416S-06	1.53	3.02	2.24	0.70	3/4	0.54	1.37	2.05	0.30	164	139
2416S-10	1.53	3.02	2.24	0.70	3/4	0.54	1.37	2.05	0.30	164	139
2417S	1.53	3.02	2.24	0.70	3/4	0.54	1.37	2.05	0.30	164	139
2424S-19	4.65	5.61	2.24	0.70	5/6	2.14	2.35	2.05	0.37	248	239
2776S	1.53	3.02	2.24	0.70	3/4	0.54	1.37	2.05	0.30	164	139
2904S	1.53	3.02	2.24	0.70	3/4	0.54	1.37	2.05	0.30	164	139

Note 1: Refer to pages F-57 to F-60 for details of contact points.
Note 2: If the contact point of the waterproof model is replaced, the water resistance cannot be guaranteed.

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 1 — Compact Type, Extra Small Diameter

- Compact dial indicators with bezel diameters of 31 or 36 mm for restricted-space applications in gaging jigs.

1911T-10

Balanced scale

Graduation: 0.01 mm,
Measuring range: 2.5 mm

1911T-10
Jeweled bearing

Balanced scale

Graduation: 0.02 mm,
Measuring range: 0.5 mm

1913T-10
Jeweled bearing

1003T

Balanced scale

Graduation: 0.01 mm,
Measuring range: 4 mm

1003T

F

Dial Indicators

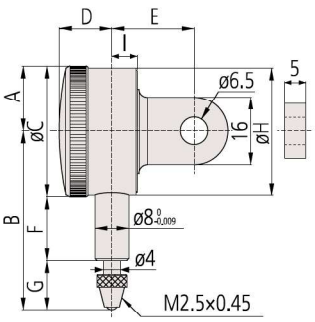
Comparison measuring instruments which ensure high quality, high accuracy and reliability.

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

DIMENSIONS

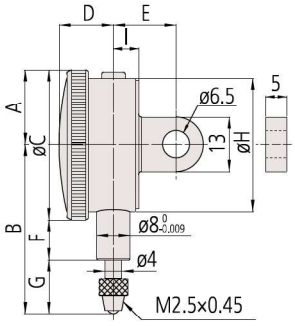
ISO/JIS Type

1911T-10/1913T-10



1003T

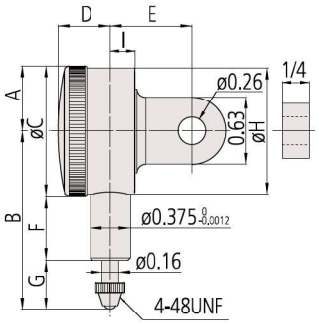
Unit: mm



ANSI/AGD Type

1921T-10/1923T-10/1925T-10

Unit: in



Metric

Unit: mm

Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
1911T-10	15.5	42	31	12.9	19.2	15	11.5	30	5.9	56	52
1913T-10	15.5	39.5	31	12.9	19.2	15	9	30	5.9	56	52
1003T	18	40.3	36	13	15	9.5	12.8	32	6	61	58

Inch

Unit: in

Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
1921T-10	0.61	1.57	1.22	0.51	3/4	0.59	0.37	1.18	0.27	56	52
1923T-10	0.61	1.51	1.22	0.51	3/4	0.59	0.31	1.18	0.27	56	52
1925T-10	0.61	1.48	1.22	0.51	3/4	0.59	0.28	1.18	0.27	56	52

Note 1: Limit hands, bezel clamps and lifting levers cannot be installed.
Note 2: The shoulder on a contact point (standard accessory) acts as a stop to prevent spindle overrun that may otherwise damage the indicator. For this reason, if you need to install an optional contact point with an outside diameter smaller than 7 mm, use a washer (with outside diameter of at least 7 mm, inside diameter of 3 mm, and thickness of approx. 0.5 mm) placed between the contact point and the spindle.
Note 3: Being fixed by only two retaining screws, the back cannot be rotated by 90° to change the orientation of the lug.

SPECIFICATIONS

Metric

ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeat-ability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
1911T-10	**1911TB-10**	0.01	2.5 (1)	8	9	10	12	4	3	0-50-0	1.8 or less
1913T-10	**1913TB-10**	0.002	0.5 (0.2)	2.5	4	5	6	2.5	1	0-100-0	1.8 or less
1003T	**1003TB**	0.01	4 (1)	8	10	11	13	4	3	0-50-0	1.4 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

ANSI/AGD type

Order No.		Graduation (in)	Range (range/rev) (in)	Accuracy (in)		Repeat-ability (in)	Dial reading	Measuring force (N)
w/lug	Flat-back			First 1 Rev/2.5 Rev/10 Rev	Retrace			
1921T-10	**1921TB-10**	0.001	0.1 (0.04)	±0.001/±0.001/—	0.0002	±0.0002	0-20-0	1.8 or less
1923T-10	**1923TB-10**	0.0005	0.05 (0.02)	±0.0005/±0.005/—	0.00016	±0.0001	0-10-0	1.8 or less
1925T-10	**1925TB-10**	0.0001	0.025 (0.01)	±0.0002/±0.0002/—	0.0001	±0.00003	0-5-0	1.8 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 1 — Compact Type, Small Diameter

- Compact dial indicators ideal for restricted-space applications in gaging jigs.
- All models come with limit markers and a bezel clamp.
- Watertight assembly of bezel and crystal as well as the use of an O-ring prevents water or oil penetration.
- The stem and spindle are made of high-strength quench-hardened stainless steel suitable for heavy-duty use.
- A carbide contact point is used.
- Application of a hard coating on the surface of the crystal makes the gage highly scratch- and chemical-resistant.

1044S

Continuous scale

Graduation: 0.01 mm, Measuring range: 3.5 mm

1040S

Double scale spacing

Balanced scale

Graduation: 0.01 mm, Measuring range: 3.5 mm

1041S

Double scale spacing

Continuous scale

Graduation: 0.01 mm, Measuring range: 5 mm

1044S

1044S-15

Jeweled bearing

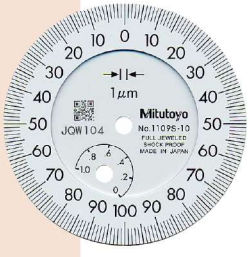
Balanced scale

Graduation: 0.01 mm, Measuring range: 5 mm

1045S

1109S-10

Balanced scale



Graduation: 0.001 mm, Measuring range: 1 mm

1109S-10

Shockproof

Jeweled bearing

Balanced scale

Graduation: 0.002 mm, Measuring range: 1 mm

1013S-10

Shockproof

Jeweled bearing

Continuous scale

Graduation: 0.005 mm, Measuring range: 3.5 mm

1124S

F

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

An inspection certificate is supplied as standard. Refer to page U-11 for details.

1044S-60

Continuous scale

Graduation: 0.01 mm,
Measuring range: 5 mm

1044S-60

Waterproof

SPECIFICATIONS

Metric

ISO/JIS type

Order No. w/lug	Order No. Flat-back	Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm) Indication error 1/10 Rev	1/2 Rev	1 Rev	Measuring range	Hysteresis	Repeatability	Dial reading	Measuring force (N)
1013S-10	**1013SB-10**	0.002	1 (0.2)	2.5	4	5	6	2.5	1	0-100-0	1.5 or less
1040S	**1040SB**	0.01	3.5 (0.5)	8	10	11	13	4	3	±0-50	1.4 or less
1041S	**1041SB**	0.01	3.5 (0.5)	8	10	11	13	4	3	0-25-0	1.4 or less
1044S	**1044SB**	0.01	5 (1)	8	10	11	13	4	3	±0-100	1.4 or less
1044S-15	**1044SB-15**	0.01	5 (1)	8	10	11	13	4	3	±0-100	0.4 or less*
1044S-60	**1044SB-60**	0.01	5 (1)	8	10	11	13	4	3	±0-100	2.0 or less
1045S	**1045SB**	0.01	5 (1)	8	10	11	13	4	3	0-50-0	1.4 or less
1109S-10	**1109SB-10**	0.001	1 (0.2)	2.5	3.5	4.5	5	2	1	0-100-0	1.5 or less
1124S	**1124SB**	0.005	3.5 (0.5)	6	9	10	12	3.5	3	±0-50	1.4 or less

* For low measuring force type, use in the vertical orientation.

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

FEATURES

Metric

Order No. w/lug	Order No. Flat-back						
1013S-10	**1013SB-10**		✔		✔	✔	
1040S	**1040SB**	✔		✔			
1041S	**1041SB**		✔	✔			
1044S	**1044SB**	✔					
1044S-15	**1044SB-15**	✔				✔	
1044S-60	**1044SB-60**	✔					✔
1045S	**1045SB**		✔				
1109S-10	**1109SB-10**		✔		✔	✔	
1124S	**1124SB**	✔					

Inch

ANSI/AGD type

Order No. w/lug	Order No. Flat-back	Graduation (in)	Range (range/rev) (in)	Accuracy (in) First 1 Rev/2.5 Rev/10 Rev	Retrace	Repeatability (in)	Dial reading	Measuring force (N)
1410S	**1410SB**	0.001	0.25 (0.1)	±0.001/±0.001/—	0.0002	±0.0002	0-100	1.4 or less
1411S	**1411SB**	0.001	0.25 (0.1)	±0.001/±0.001/—	0.0002	±0.0002	0-50-0	1.4 or less
1410S-10	**1410SB-10**	0.001	0.25 (0.1)	±0.001/±0.001/—	0.0002	±0.0002	0-100	1.4 or less
1780S	**1780SB**	0.001	0.125 (0.05)	±0.001/±0.001/—	0.0002	±0.0002	0-50	1.4 or less
1781S	**1781SB**	0.001	0.125 (0.05)	±0.001/±0.001/—	0.0002	±0.0002	0-25-0	1.4 or less
1506S	**1506SB**	0.0005	0.125 (0.05)	±0.0005/±0.0005/—	0.00016	±0.0001	0-50	1.4 or less
1507S	**1507SB**	0.0005	0.125 (0.05)	±0.0005/±0.0005/—	0.00016	±0.0001	0-25-0	1.4 or less
1670S	**1670SB**	0.0005	0.1 (0.04)	±0.0005/±0.0005/—	0.00016	±0.0001	0-40	1.4 or less
1671S	**1671SB**	0.0005	0.1 (0.04)	±0.0005/±0.0005/—	0.00016	±0.0001	0-20-0	1.4 or less
1802S-10	**1802SB-10**	0.0001	0.025 (0.01)	±0.0001/±0.0001/—	0.0001	±0.00003	0-10	1.5 or less
1803S-10	**1803SB-10**	0.0001	0.025 (0.01)	±0.0001/±0.0001/—	0.0001	±0.00003	0-5-0	1.5 or less

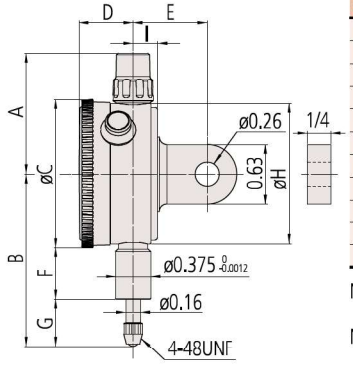
Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

Order No. w/lug	Order No. Flat-back				
1410S	**1410SB**	✔			
1411S	**1411SB**		✔		
1410S-10	**1410SB-10**	✔		✔	
1780S	**1780SB**	✔			
1781S	**1781SB**		✔		
1506S	**1506SB**	✔			
1507S	**1507SB**		✔		
1670S	**1670SB**	✔			
1671S	**1671SB**		✔		
1802S-10	**1802SB-10**	✔		✔	✔
1803S-10	**1803SB-10**		✔	✔	✔

DIMENSIONS

ANSI/AGD Type



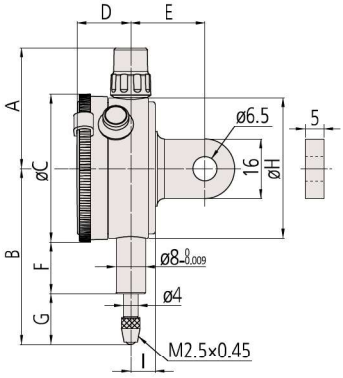
Unit: in

Order No.	A	B	C	D	E	F	G	H	I
1410S	1.28	1.87	1.57	0.57	3/4	0.50	0.58	1.50	0.26
1411S	1.28	1.87	1.57	0.57	3/4	0.50	0.58	1.50	0.26
1410S-10	1.28	1.87	1.57	0.57	3/4	0.50	0.58	1.50	0.26
1780S	1.28	1.74	1.57	0.57	3/4	0.50	0.44	1.50	0.26
1781S	1.28	1.74	1.57	0.57	3/4	0.50	0.44	1.50	0.26
1506S	1.28	1.74	1.57	0.57	3/4	0.50	0.44	1.50	0.26
1507S	1.28	1.74	1.57	0.57	3/4	0.50	0.44	1.50	0.26
1670S	1.28	1.71	1.57	0.57	3/4	0.50	0.42	1.50	0.26
1671S	1.28	1.71	1.57	0.57	3/4	0.50	0.42	1.50	0.26
1802S-10	1.28	1.63	1.57	0.57	3/4	0.50	0.33	1.50	0.26
1803S-10	1.28	1.63	1.57	0.57	3/4	0.49	0.33	1.50	0.26

Note 1: Refer to pages F-57 to F-60 for details of contact points.

Note 2: If the contact point of the waterproof model is replaced, the water resistance cannot be guaranteed.

ISO/JIS Type



Unit: mm

Order No.	A	B	C	D	E	F	G	H	I
1013S-10	32.5	49	40	14.5	20	13.8	15.2	38	6.6
1040S	32.5	46	40	14.5	20	13.8	12.2	38	6.6
1041S	32.5	46	40	14.5	20	13.8	12.2	38	6.6
1044S	32.5	47.5	40	14.5	20	13.8	13.7	38	6.6
1044S-15*3	32.5	47.5	40	14.5	20	13.8	13.7	38	6.6
1044S-60	32.5	57	40	14.5	20	12.2	24.8	38	6.6
1045S	32.5	47.5	40	14.5	20	13.8	13.7	38	6.6
1109S-10	32.5	49	40	14.5	20	13.8	15.2	38	6.6
1124S	32.5	46	40	14.5	20	13.8	12.2	38	6.6

*3 Use in the vertical orientation (contact point downward) for the low measuring force model.

Note 1: Refer to pages F-57 to F-60 for details of contact points.

Note 2: If the contact point of the waterproof model is replaced, the water resistance cannot be guaranteed.

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Dial Indicators

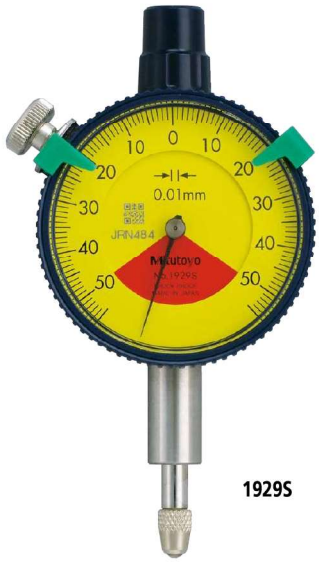
Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 1 — Compact One Revolution Type for Error-free Reading

- Compact dial indicators ideal for restricted-space applications in gaging jigs.
- Mitutoyo's unique shock-proof mechanism is incorporated, providing improved resistance to shock due to sudden spindle retraction caused by impact.
- This series has been developed to eliminate the possibility of reading errors due to miscounting multiple revolutions.
- The dead zone in red indicates "accuracy not guaranteed".
- One revolution type Back Plunger dial gages are also available. (Refer to pages F-55 to F-56 for details)
- All types come with limit markers and a bezel clamp.

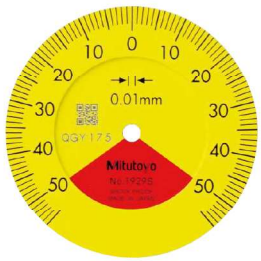
One revolution type Back plunger dial gages are also available. (Refer to pages F-55 to F-56 for details.)

2990T-10



1929S

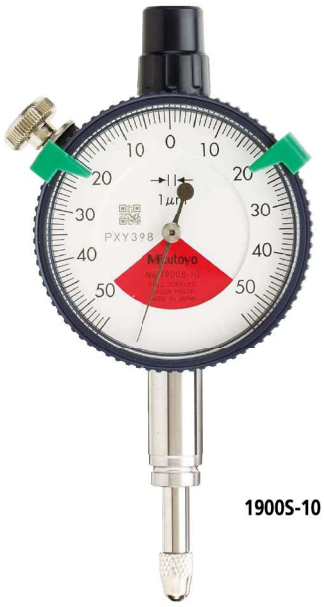
Balanced scale



Graduation: 0.01 mm,
Measuring range: 1 mm

1929S
One revolution
Shockproof

1929S-62
One revolution
Shockproof
Dustproof



1900S-10

Balanced scale

Graduation: 0.001 mm,
Measuring range: 0.1 mm

1900S-10
One revolution
Shockproof
Jeweled bearing

1900S-72
One revolution
Shockproof
Dustproof
Jeweled bearing

F

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

FEATURES

Metric

Order No.						
w/lug	Flat-back					
1929S	**1929SB**	✔	✔			✔
1929S-62	**1929SB-62**	✔	✔		✔	✔
1900S-10	**1900SB-10**	✔	✔	✔		✔
1900S-72	**1900SB-72**	✔	✔	✔	✔	✔

Inch

Order No.						
w/lug	Flat-back					
1909S-62	**1909SB-62**	✔	✔		✔	✔
1910S-72	**1910SB-72**	✔	✔	✔	✔	✔

SPECIFICATIONS

Metric ☐ ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeat-ability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
1929S	**1929SB**	0.01	1 (1.4)	7	—	—	11	4	3	50-0-50	1.4 or less
1929S-62	**1929SB-62**	0.01	1 (1.4)	7	—	—	11	4	3	50-0-50	1.4 or less
1900S-10	**1900SB-10**	0.001	0.1 (0.14)	2.5	—	—	5	2	1	50-0-50	1.5 or less
1900S-72	**1900SB-72**	0.001	0.1 (0.14)	2.5	—	—	5	2	1	50-0-50	1.5 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch ☐ ANSI/AGD type

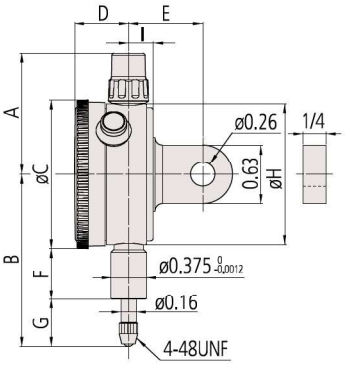
Order No.		Graduation (in)	Range (range/rev) (in)	Accuracy (in)		Repeat-ability (in)	Dial reading	Measuring force (N)
				First 1 Rev/2.5 Rev/10 Rev	Retrace			
w/lug	Flat-back							
1909S-62	**1909SB-62**	0.0005	0.04 (0.056)	±0.0005/—/—	0.00016	±0.0001	20-0-20	1.4 or less
1910S-72	**1910SB-72**	0.0001	0.006 (0.008)	±0.0001/—/—	0.0001	±0.00003	3-0-3	1.5 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

DIMENSIONS

ANSI/AGD Type

Unit: in

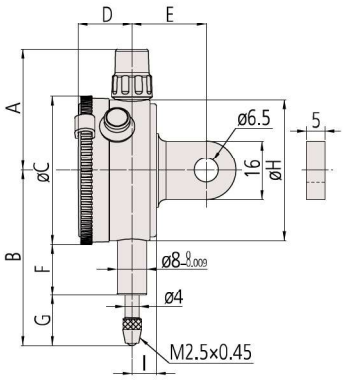


Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
1909S-62	1.28	1.64	1.57	0.57	0.75	0.50	0.35	1.50	0.26	90	70
1910S-72	1.28	1.61	1.57	0.57	0.75	0.50	0.31	1.50	0.26	90	70

Note: Refer to pages F-57 to F-60 for details of contact points.

ISO/JIS Type

Unit: mm



Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
1929S	32.5	47.5	40	14.5	20	13.8	13.7	38	6.6	90	70
1929S-62	32.5	47.5	40	14.5	20	13.8	13.7	38	6.6	90	70
1900S-10	32.5	53.5	40	14.5	20	16.8	16.7	38	6.6	95	75
1900S-72	32.5	53.5	40	14.5	20	16.8	16.7	38	6.6	95	75

Note: Refer to pages F-57 to F-60 for details of contact points.

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Continuous scale

Balanced scale

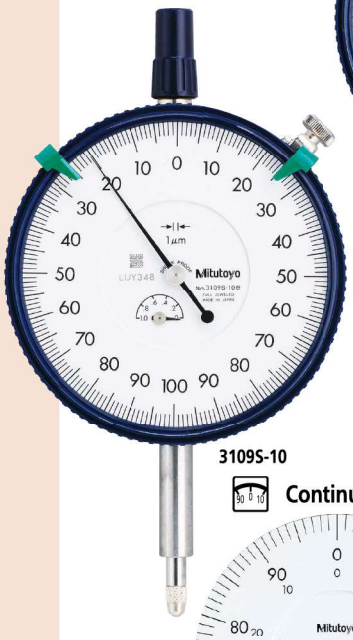
SERIES 3, 4 — Long StrokeType, Large Diameter

- Dial indicators with a large-diameter dial face for easy reading.
- Models with longer measuring ranges are also available.
- All types are supplied with limit markers and a bezel clamp as standard.
- The stem and spindle are made of high-strength quench-hardened stainless steel suitable for heavy-duty use.
- A carbide contact point is used.
- The bezel clamp and lifting lever* (optional) can be attached to either the right or left side. These parts can be easily installed and removed without tools.

* Can be attached only to **3046S**, **3047S**, **3050S**, **3109S-10** and **4046S**.

4046S

3058S-19



3109S-10

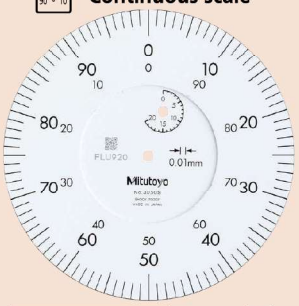
Continuous scale

Graduation: 0.01 mm, Measuring range: 10 mm **3046S**

Balanced scale

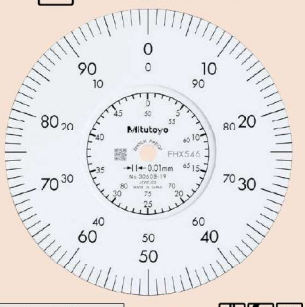
Graduation: 0.01 mm, Measuring range: 10 mm **3047S**

Continuous scale



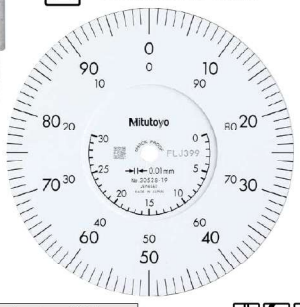
Graduation: 0.01 mm, Measuring range: 20 mm **3050S**

Continuous scale



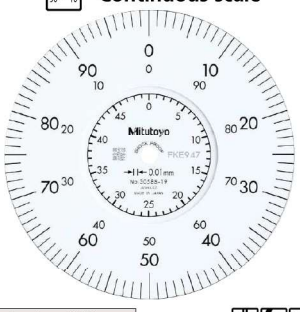
Graduation: 0.01 mm, Measuring range: 80 mm **3060S-19**

Continuous scale



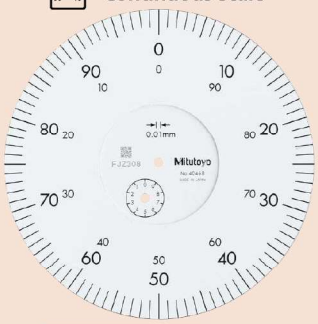
Graduation: 0.01 mm, Measuring range: 30 mm **3052S-19**

Continuous scale



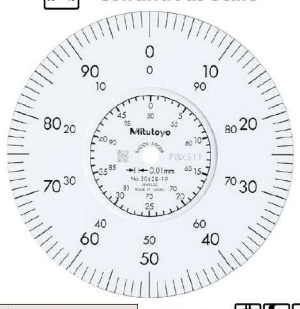
Graduation: 0.01 mm, Measuring range: 50 mm **3058S-19**

Continuous scale



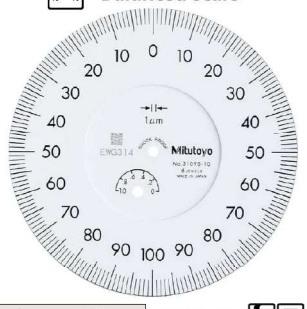
Graduation: 0.01 mm, Measuring range: 10 mm **4046S**

Continuous scale



Graduation: 0.01 mm, Measuring range: 100 mm **3062S-19**

Balanced scale



Graduation: 0.001 mm, Measuring range: 1 mm **3109S-10**

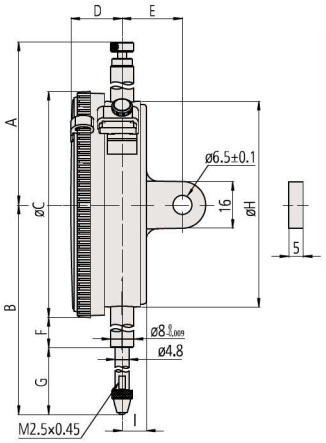
F

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

ISO/JIS Type



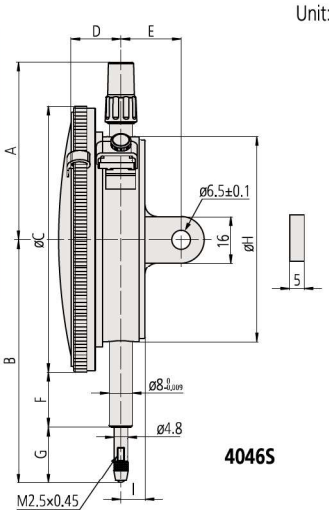
Unit: mm

Order No.	A	B	C	D	E	F	G	H	I
3046S	61.2	75.5	78	17.7	21	15.9	20.6	71	9
3047S	61.2	75.5	78	17.7	21	15.9	20.6	71	9
3050S	52.6	94	78	17.7	21	25.9	29.1	71	9
3052S-19*	72.9	104.3	78	17.7	21	25.9	39.4	71	9
3058S-19*	81.9	142.3	78	17.7	21	43.9	59.4	71	9
3060S-19*	120.9	202.3	78	17.7	21	73.9	89.4	71	9
3062S-19*	141.9	243.3	78	17.7	21	94.9	109.4	71	9
3109S-10	61.2	79	78	17.7	21	25.9	14.1	71	9
4046S	61.2	84	92	21.5	21	18.9	19.1	71	9

* The shoulder on a contact point (standard accessory) acts as a stop to prevent spindle overrun that may otherwise damage the indicator. For this reason, if you need to install an optional contact point with an outside diameter smaller than 7 mm, use a washer (with outside diameter of at least 7 mm, inside diameter of 3 mm, and thickness of approx. 0.5 mm) placed between the contact point and the spindle.

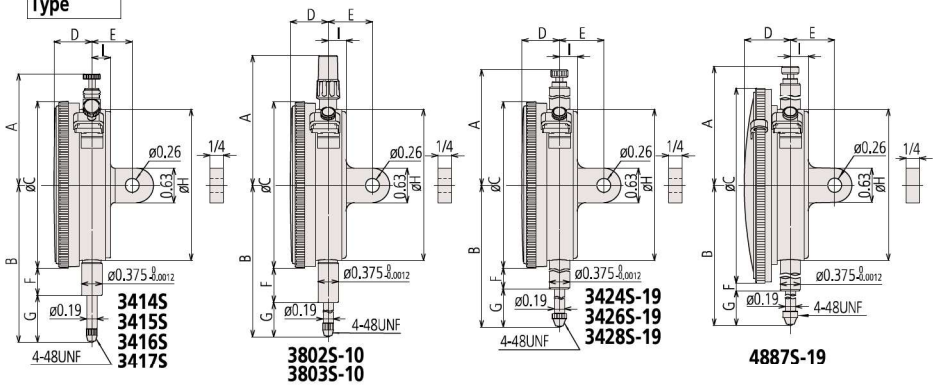
Note: Refer to pages F-57 to F-60 for details of contact points.

Unit: mm



4046S

ANSI/AGD Type



Unit: in

Order No.	A	B	C	D	E	F	G	H	I
3414S	2.07	2.89	3.07	0.70	3/4	0.50	0.86	2.80	0.35
3415S	2.07	2.89	3.07	0.70	3/4	0.50	0.86	2.80	0.35
3416S	2.07	3.39	3.07	0.70	3/4	0.50	1.36	2.80	0.35
3417S	2.07	3.39	3.07	0.70	3/4	0.50	1.36	2.80	0.35
3424S-19*	3.31	5.88	3.07	0.70	3/4	1.99	2.35	2.80	0.35
3426S-19*	4.84	7.80	3.07	0.70	3/4	2.91	3.35	2.80	0.35
3428S-19*	5.67	9.63	3.07	0.70	3/4	3.74	4.35	2.80	0.35
3802S-10	2.41	2.35	3.07	0.70	3/4	0.50	0.32	2.80	0.35
3803S-10	2.41	2.35	3.07	0.70	3/4	0.50	0.32	2.80	0.35
4887S-19*	4.84	7.80	3.62	0.85	3/4	2.63	3.35	2.80	0.35

FEATURES

Metric

Order No.							
w/lug	Flat-back						
3046S	3046SB	✔					
3047S	3047SB		✔				
3050S	3050SB	✔			✔		
3052S-19	3052SB-19	✔		✔		✔	✔
3058S-19	3058SB-19	✔		✔		✔	✔
3060S-19	3060SB-19	✔		✔		✔	✔
3062S-19	3062SB-19	✔		✔		✔	✔
3109S-10	3109SB-10		✔	✔		✔	
4046S	4046SB	✔					

Inch

Order No.						
w/lug	Flat-back					
3414S	3414SB	✔				
3415S	3415SB		✔			
3416S	3416SB	✔				
3417S	3417SB		✔			
3424S-19	3424SB-19	✔		✔	✔	✔
3426S-19	3426SB-19	✔		✔	✔	✔
3428S-19	3428SB-19	✔		✔	✔	✔
3802S-10	3802SB-10	✔		✔	✔	
3803S-10	3803SB-10		✔	✔	✔	
4887S-19	4887SB-19	✔		✔	✔	✔

SPECIFICATIONS

Metric

ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeat-ability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
3046S	3046SB	0.01	10 (1)	5	9	10	15	3	3	±0-100	1.4 or less
3047S	3047SB	0.01	10 (1)	5	9	10	15	3	3	0-50-0	1.4 or less
3050S	3050SB	0.01	20 (1)	8	10	15	20	5	4	±0-100	2.0 or less
3052S-19	3052SB-19	0.01	30 (1)	10	12	15	25	7	5	±0-100	2.5 or less
3058S-19	3058SB-19	0.01	50 (1)	10	12	15	30	8	5	±0-100	3.0 or less
3060S-19*1	3060SB-19*1	0.01	80 (1)	12	17	20	45	9	5	±0-100	3.0 or less
3062S-19*1	3062SB-19*1	0.01	100 (1)	12	17	20	50	9	5	±0-100	3.2 or less
3109S-10	3109SB-10	0.001	1 (0.2)	2	3.5	4	5	2	0.5	0-100-0	1.5 or less
4046S	4046SB	0.01	10 (1)	5	9	10	15	3	3	±0-100	1.4 or less

*1 Use in a vertical orientation (contact point downward) for the long stroke model.
*2 Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

ANSI/AGD type

Order No.		Graduation (in)	Range (range/rev) (in)	Accuracy*2 (in)		Repeat-ability (in)	Dial reading	Measuring force (N)
				First 1 Rev/2.5 Rev/10 Rev	Retrace			
3414S	3414SB	0.001	0.5 (0.1)	±0.001/±0.001/±0.001	0.0002	±0.0002	±0-100	1.8 or less
3415S	3415SB	0.001	0.5 (0.1)	±0.001/±0.001/±0.001	0.0002	±0.0002	0-50-0	1.8 or less
3416S	3416SB	0.001	1 (0.1)	±0.001/±0.001/±0.002	0.0002	±0.0002	±0-100	1.8 or less
3417S	3417SB	0.001	1 (0.1)	±0.001/±0.001/±0.002	0.0002	±0.0002	0-50-0	1.8 or less
3424S-19	3424SB-19	0.001	2 (0.1)	±0.001/±0.001/±0.002 /±0.003 (20 Rev)	0.00033	±0.0002	±0-100	3.0 or less
3426S-19*1	3426SB-19*1	0.001	3 (0.1)	±0.001/±0.001/±0.002/±0.003 (20 Rev)/±0.005 (Over 20 Rev)	0.00033	±0.0002	±0-100	3.0 or less
3428S-19*1	3428SB-19*1	0.001	4 (0.1)	±0.001/±0.001/±0.002/±0.003 (20 Rev)/±0.005 (Over 20 Rev)	0.00033	±0.0002	±0-100	3.2 or less
3802S-10	3802SB-10	0.0001	0.025 (0.01)	±0.0001/±0.0001/—	0.0001	±0.00003	0-10	2.0 or less
3803S-10	3803SB-10	0.0001	0.025 (0.01)	±0.0001/±0.0001/—	0.0001	0±.00003	0-5-0	2.0 or less
4887S-19*1	4887SB-19*1	0.001	3 (0.1)	±0.001/±0.001/±0.002/±0.003 (20 Rev)/±0.005 (Over 20 Rev)	0.00033	±0.0002	±0-100	3.0 or less

*1 Use in a vertical orientation (contact point downward) for the long stroke model.
*2 Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

ANSI/AGD Type Metric Dial Indicators
with ø3/8 inch Stem and #4-48UNF-Thread Contact Point Compatible Type

SPECIFICATIONS

Metric SERIES 1 — ANSI/AGD type

Order No. w/lug	Order No. Flat-back	Graduation (mm)	Range (range/rev) (mm)	Accuracy (µm) First 1 Rev/2.5 Rev/10 Rev	Accuracy (µm) Retrace	Repeatability (µm)	Dial reading	Measuring force (N)
1230S-01	**1230SB-01**	0.01	2.5 (1)	±10/±10/—	3	±2	0-100	1.4 or less
1231S-01	**1231SB-01**	0.01	2.5 (1)	±10/±10/—	3	±2	0-50-0	1.4 or less
1044S-01	**1044SB-01**	0.01	5 (1)	±10/±10/±13	3	±3	±0-100	1.4 or less
1045S-01	**1045SB-01**	0.01	5 (1)	±10/±10/±13	3	±3	0-50-0	1.4 or less
1010S-11	**1010SB-11**	0.002	0.5 (0.2)	±2/±2/—	2	±1	0-20	1.5 or less
1011S-11	**1011SB-11**	0.002	0.5 (0.2)	±2/±2/—	2	±1	0-10-0	1.5 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Metric SERIES 2 — ANSI/AGD type

Order No. w/lug	Order No. Flat-back	Graduation (mm)	Range (range/rev) (mm)	Accuracy (µm) First 1 Rev/2.5 Rev/10 Rev	Accuracy (µm) Retrace	Repeatability (µm)	Dial reading	Measuring force (N)
2231S-01	**2231SB-01**	0.01	2.5 (1)	±10/±10/—	3	±3	0-50-0	1.4 or less
2046S-01	**2046SB-01**	0.01	10 (1)	±10/±10/±13	3	±3	±0-100	1.4 or less
2046S-11	**2046SB-11**	0.01	10 (1)	±10/±10/±13	3	±3	±0-100	1.4 or less
2047S-01	**2047SB-01**	0.01	10 (1)	±10/±10/±13	3	±3	0-50-0	1.4 or less
2047S-11	**2047SB-11**	0.01	10 (1)	±10/±10/±13	3	±3	0-50-0	1.4 or less
2902S-01	**2902SB-01**	0.01	10 (1)	±10/±10/±13	3	±3	100-0	1.4 or less
2050S-01	**2050SB-01**	0.01	20 (1)	±10/±10/±15/±20 (20 Rev)	4	±3	±0-100	2.0 or less
2056S-01	**2056SB-01**	0.01	25 (1)	±10/±10/±15/±20 (20 Rev)/ ±25 (Over 20 Rev)	4	±3	±0-100	2.5 or less
2109S-11	**2109SB-11**	0.001	1 (0.2)	±3/±3/±4	2	±0.3	0-10-0	1.5 or less
2119S-11	**2119SB-11**	0.001	5 (0.2)	±7/±7/±8/±10 (20 Rev)/ ±10 (Over 20 Rev)	2.5	±0.3	0-10-0	1.5 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

FEATURES

Metric

Order No. w/lug	Order No. Flat-back							
1230S-01	**1230SB-01**							
1231S-01	**1231SB-01**							
1044S-01	**1044SB-01**							
1045S-01	**1045SB-01**							
1010S-11	**1010SB-11**				✔			✔
1011S-11	**1011SB-11**				✔			✔

Metric

Order No. w/lug	Order No. Flat-back								
2231S-01	**2231SB-01**								
2046S-01	**2046SB-01**								
2046S-11	**2046SB-11**				✔				
2047S-01	**2047SB-01**								
2047S-11	**2047SB-11**				✔				
2902S-01	**2902SB-01**								✔
2050S-01	**2050SB-01**								
2056S-01	**2056SB-01**								
2109S-11	**2109SB-11**				✔			✔	
2119S-11	**2119SB-11**				✔				

Optional Accessories

- Backs (See page F-61)
- Contact points (See pages F-57 to F-60)

Mitutoyo

Dial Indicators

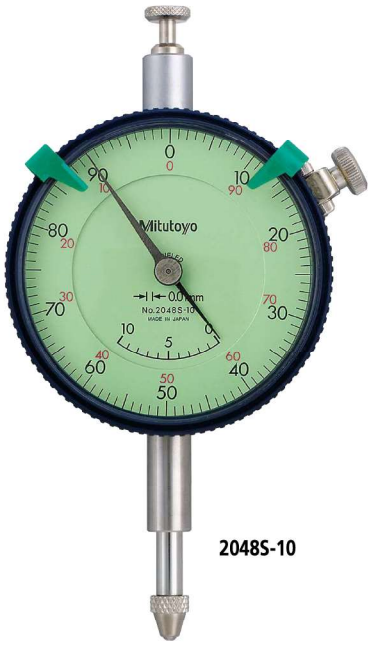
Comparison measuring instruments which ensure high quality, high accuracy and reliability.

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

SERIES 2 — Special Dial Indicators

Adjustable hand dial indocator

- The hand position can be adjusted independently of the position of the spindle by rotating the top knob.



2048S-10

Continuous scale

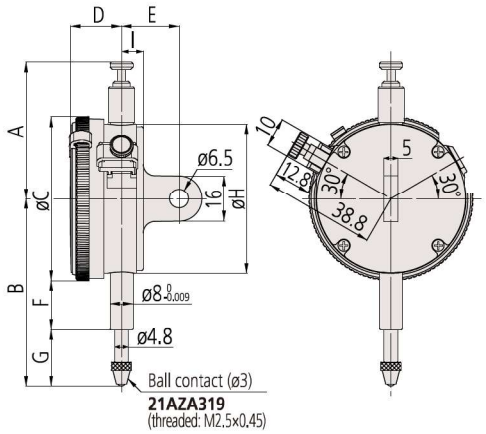
Graduation: 0.01 mm,
Measuring range: 10 mm

2048S-10
With coaxial revolution counter
Adjustable hand
Jeweled bearing

DIMENSIONS

ISO/JIS Type

Unit: mm



Order No.	A	B	C	D	E	F	G	H	I	Mass (g)	
										w/lug	Flat-back
2048S-10	47.4	64.9	57	17.7	20	16.9	19.5	52	7.6	144	135

Note 1: Contact points, other than dedicated types, cannot be installed.
Note 2: The shoulder on a contact point (standard accessory) acts as a stop to prevent spindle overrun that may otherwise damage the indicator. For this reason, if you need to install an optional contact point with an outside diameter smaller than 7 mm, use a washer (with outside diameter of at least 7 mm, inside diameter of 3 mm, and thickness of approx. 0.5 mm) placed between the contact point and the spindle.

SPECIFICATIONS

Metric

ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeatability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
2048S-10	2048SB-10	0.01	10 (1)	5	9	10	15	3	3	±0-100	1.4 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

ANSI/AGD type

Order No.		Graduation (in)	Range (range/rev) (in)	Accuracy (in)		Repeatability (in)	Dial reading	Measuring force (N)
w/lug	Flat-back			First 1 Rev/2.5 Rev/10 Rev	Retrace			
2915S-10	2915SB-10	0.001	0.5 (0.1)	±0.001/±0.001/±0.001	0.0002	±0.0002	±0-100	1.8 or less
2918S-10	2918SB-10	0.001	0.5 (0.1)	±0.001/±0.001/±0.001	0.0002	±0.0002	0-50-0	1.8 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

FEATURES

Metric

Order No.						
w/lug	Flat-back					
2048S-10	2048SB-10	✔	✔		✔	✔

Inch

Order No.							
w/lug	Flat-back						
2915S-10	2915SB-10	✔		✔		✔	✔
2918S-10	2918SB-10		✔	✔		✔	✔

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

SERIES 2 — Special Dial Indicators

- A mechanism holds the pointer and the spindle at the position of maximum depression and hence displays the maximum value.

Note: Clearance of peak hold: Push the mechanism release in the direction of the arrow indicated in the dimensional drawing below.

2046S-80

Continuous scale

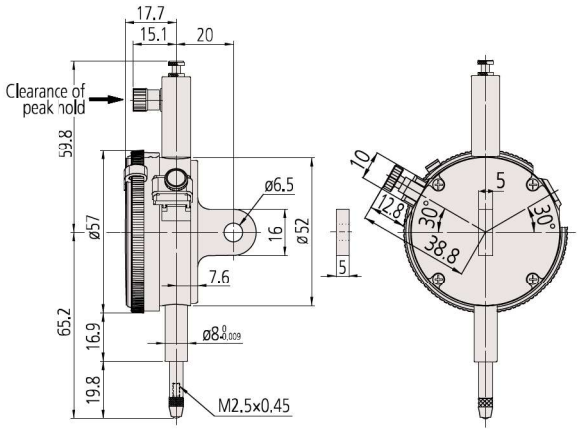
Graduation: 0.01 mm,
Measuring range: 10 mm

2046S-80
Peak retaining

DIMENSIONS

ISO/JIS Type

Unit: mm



FEATURES

Metric

Order No.					
w/lug	Flat-back				
2046S-80	2046SB-80	✔		✔	

SPECIFICATIONS

Metric

ISO/JIS type

Order No.		Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
				Indication error				Hysteresis	Repeat-ability		
w/lug	Flat-back			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
2046S-80	2046SB-80	0.01	10 (1)	5	9	10	15	—	—	±0-100	5.0 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

F

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Back Plunger Type Dial Indicators SERIES 2

- Back Plunger type dial indicators are suitable for mounting onto leveling machine tool tables or inspection jigs, and for use in small spaces where the graduations of standard dial indicators are difficult to see.
- Mitutoyo's proprietary shock-proofing mechanism provides excellent durability and shock resistance.
- Model **2990T-10** provides 0.001 mm graduation.

An inspection certificate is supplied as standard. Refer to page U-11 for details.

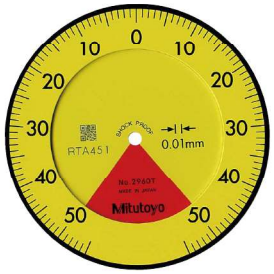
Holding bar (optional)

Order No.	øD (mm)	L (mm)
21AAA166	ø6	42
136567	ø6	81
124625	ø6.35	81
21AAA167	ø6.35	42
21AAA168	ø8	42
136568	ø8	81

Note: øD and L: detail shown in drawing below.

2960T

Balanced scale

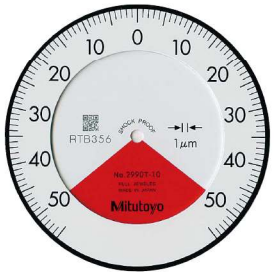


Graduation: 0.01 mm, Measuring range: 1 mm

2960T
- One revolution
- Shockproof
- Back Plunger

2990T-10

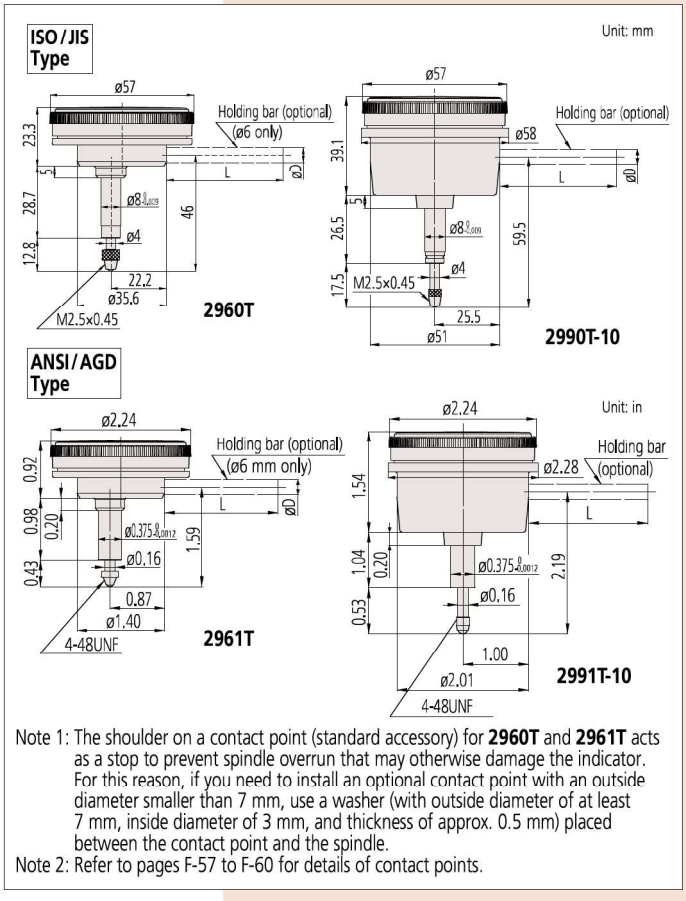
Balanced scale



Graduation: 0.01 mm, Measuring range: 1 mm

2990T-10
- One revolution
- Shockproof
- Back Plunger
- Jeweled bearing

DIMENSIONS



Note 1: The shoulder on a contact point (standard accessory) for **2960T** and **2961T** acts as a stop to prevent spindle overrun that may otherwise damage the indicator. For this reason, if you need to install an optional contact point with an outside diameter smaller than 7 mm, use a washer (with outside diameter of at least 7 mm, inside diameter of 3 mm, and thickness of approx. 0.5 mm) placed between the contact point and the spindle.

Note 2: Refer to pages F-57 to F-60 for details of contact points.

Metric — ISO/JIS type

Order No.	Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
			Indication error				Hysteresis	Repeat-ability		
			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
2960T	0.01	1 (1.27)	8	—	—	14	4	3	50-0-50	1.4 or less
2990T-10	0.001	0.1 (0.14)	2.5	—	—	5	2	1	50-0-50	1.5 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Metric

Order No.	Balanced scale	One revolution	Shockproof	Jeweled bearing	Back Plunger
2960T	✔	✔	✔		✔
2990T-10	✔	✔	✔	✔	✔

Inch — ANSI/AGD type

Order No.	Graduation (in)	Range (range/rev) (in)	Accuracy (in)		Repeatbility (in)	Dial reading	Measuring force (N)
			First 1 Rev/2.5 Rev/10 Rev	Retrace			
2961T	0.0005	0.04/0.05	±0.0005/—/—	0.00016	±0.0001	20-0-20	1.4 or less
2991T-10	0.0001	0.008/0.01	±0.0002/—/—	0.0001	±0.00005	4-0-4	1.5 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

Order No.	Balanced scale	One revolution	Shockproof	Jeweled bearing	Back Plunger
2961T	✔	✔	✔		✔
2991T-10	✔	✔	✔	✔	✔

An inspection certificate is supplied as standard.
Refer to page U-11 for details.

Back Plunger Type Dial Indicators SERIES 1

- Back Plunger type dial indicators are suitable for mounting onto leveling machine tool tables or inspection jigs, and for use in situations where standard dial indicators are difficult to read.
- Model **1960T** and **1961T**, which uses Mitutoyo's proprietary shock-proofing mechanism, has excellent durability and shock resistance.

1160T

Continuous scale

Graduation: 0.01 mm, Measuring range: 5 mm

1160T
Back Plunger

Reverse reading

Graduation: 0.01 mm, Measuring range: 5 mm

1162T
Back Plunger

Holding bar (optional)

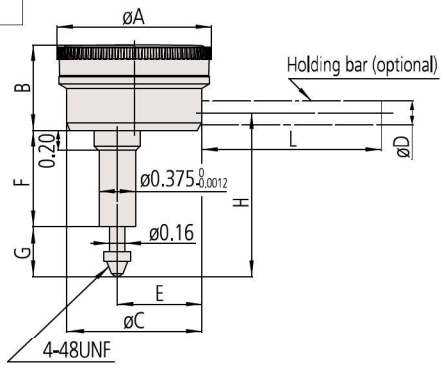
Order No.	øD (mm)	L (mm)
21AAA166	ø6	42
136567	ø6	81
124625	ø6.35	81
21AAA167	ø6.35	42
21AAA168	ø8	42
136568	ø8	81

Note: øD and L: detail shown in drawing below.

DIMENSIONS

ANSI/AGD Type

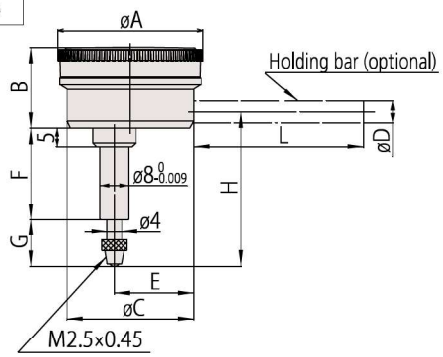
Unit: in



Order No.	A	B	C	E	F	G	H	Mass (g) (Bar excluded)
1166T	1.57	0.87	1.40	7/8	0.98	0.43	1.65	80
1167T	1.57	0.87	1.40	7/8	0.98	0.43	1.65	80
1168T	1.57	0.87	1.40	7/8	0.98	0.43	1.65	80
1961T	1.57	0.87	1.40	7/8	0.98	0.43	1.57	80

ISO/JIS Type

Unit: mm



Order No.	A	B	C	E	F	G	H	Mass (g) (Bar excluded)
1160T	40	22.1	35.6	22.2	25	13.8	43.3	80
1162T	40	22.1	35.6	22.2	25	13.8	43.3	80
1960T	40	22.1	35.6	22.2	28.7	12.8	46	80

Note 1: Contact point (standard accessory) for all products in this page has a role as a top dead point stopper. For this reason, if you need to install an optional contact point with an outside diameter smaller than 7 mm, use a washer (with outside diameter of at least 7 mm, inside diameter of 3 mm, and thickness of approx. 0.5 mm) placed between the contact point and the spindle.
Note 2: Refer to pages F-57 to F-60 for details of contact points.

Balanced scale

Graduation: 0.01 mm, Measuring range: 1 mm

1960T
One revolution
Shockproof
Back Plunger

FEATURES

Metric

Order No.						
1960T		✔	✔	✔		✔
1160T	✔					✔
1162T					✔	✔

Inch

Order No.						
1961T		✔	✔	✔		✔
1166T	✔					✔
1167T		✔				✔
1168T					✔	✔

SPECIFICATIONS

Metric

ISO/JIS type

Order No.	Graduation (mm)	Range (range/rev) (mm)	Maximum permissible error (MPE) (µm)						Dial reading	Measuring force (N)
			Indication error				Hysteresis	Repeat-ability		
			1/10 Rev	1/2 Rev	1 Rev	Measuring range				
1960T	0.01	1 (1.27)	8	—	—	14	4	3	50-0-50	1.4 or less
1160T	0.01	5 (1)	8	12	14	16	4	3	±0-100	1.4 or less
1162T	0.01	5 (1)	8	12	14	16	4	3	100-0	1.4 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

Inch

ANSI/AGD type

Order No.	Graduation (in)	Range (range/rev) (in)	Accuracy (in)		Repeatbility (in)	Dial reading	Measuring force (N)
			First 1 Rev/2.5 Rev/10 Rev	Retrace			
1961T	0.001	0.04 (0.05)	±0.001/—/—	0.0002	±0.0002	20-0-20	1.4 or less
1166T	0.001	0.2 (0.05)	±0.001/±0.001/±0.001	0.00033	±0.0002	±0-50	1.4 or less
1167T	0.001	0.2 (0.05)	±0.001/±0.001/±0.001	0.00033	±0.0002	0-25-0	1.4 or less
1168T	0.001	0.2 (0.05)	±0.001/±0.001/±0.001	0.00033	±0.0002	50-0	1.4 or less

Note: Completed products inspection is performed in the vertical orientation (contact point downward) and the stated accuracy is guaranteed.

F

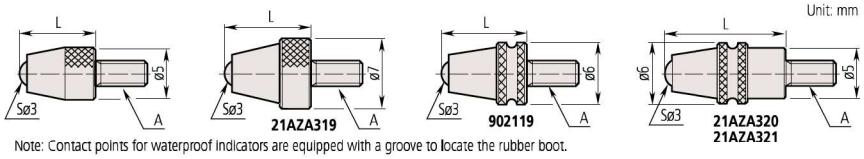
Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Optional Accessories for Digimatic and Dial Indicators and Linear Gages

Contact points, extension rod

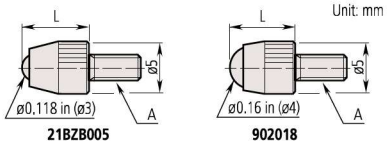
Standard contact point



Note: Contact points for waterproof indicators are equipped with a groove to locate the rubber boot.

A: M2.5×0.45

L (mm) \ Material	Carbide		Ruby	Plastic
	Without groove	With groove (waterproof type)	Without groove	Without groove
7.3	**901312**	—	**120047**	**901994**
8.3	**21AZA319**	**902119**	—	—
12.1	—	**21AZA320**	—	—
14	**21JAA225**	—	—	—
15	**120049**	—	**120051**	—
17	**21JAA224**	—	—	—
19.3	—	**21AZA321**	—	—
20	**137391**	—	**137392**	—
22	**21JAA226**	—	—	—
25	**120053**	—	**120055**	—
30	**21AAA252**	—	**21AAA253**	—

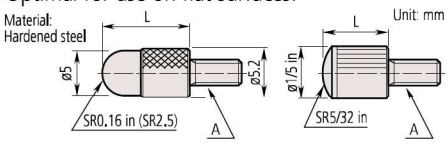


A: 4-48UNF

L (inch) \ Material	Carbide	Plastic
1/4	**21BZB005**	**902018**

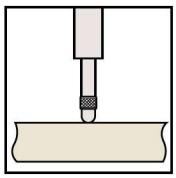
Shell Type Point

Contact point with a large radius.
Optimal for use on flat surfaces.



A: M2.5×0.45

Order No.	L (mm)
101386	5
101118	10
137393	15
101387	20
101388	25
21AAA254	30

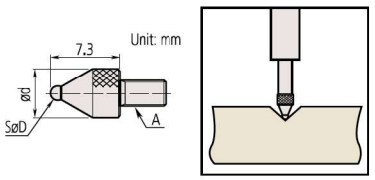


A: 4-48UNF

Order No.	L (in)
193697	3/32
101184	5/32
21AAA031	1/4
21AAA032	3/8
101185	1/2
21AAA033	5/8
101186	3/4
21AAA034	7/8
101187	1
21AAA035	1 1/4
21AAA036	1 1/2
21AAA037	1 3/4
21AAA038	2
21AAA039	2 1/4
21AAA040	2 1/2
21AAA041	2 3/4
21AAA042	3

Ball point

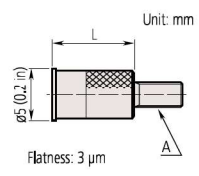
Optimal for workpieces with deep indentations.

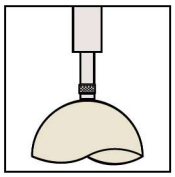


A: M2.5×0.45

Order No.	SøD (mm)	ød (mm)
21AAA349	1, carbide	5
21AAA350	1.5, carbide	5
101122	1.8, steel	5
21AAA351	2.5, carbide	5
21AAA352	4, carbide	5

Flat Point





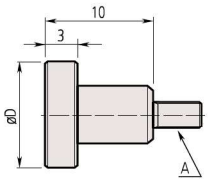
A: M2.5×0.45

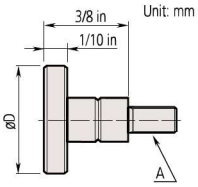
Order No.	L
131365	8
21AAA340	10

A: 4-48UNF

Order No.	L (in)
133017	5/16
21AAA043	1/2
21AAA044	3/4
21AAA045	1

131365





A: M2.5×0.45

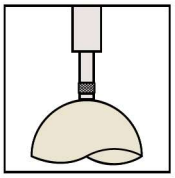
Order No.	øD
101117	10
21AAA341	15
21AAA342	20
21AAA343	25
21AAA344	30

A: 4-48UNF

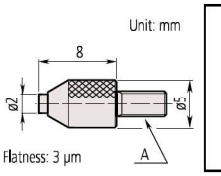
Order No.	øD (in)
101188	1/2
101189	3/8

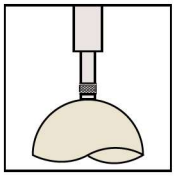
101117

Flatness: 5 µm



Flat Point (Carbide)

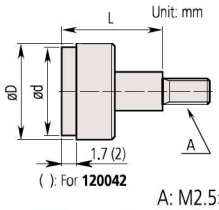


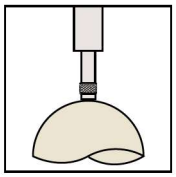


120056

A: M2.5×0.45

Order No.
120056



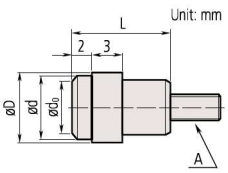


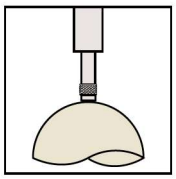
120043

A: M2.5×0.45

Order No.	øD	ød	L
120041	5.2	4.3*1	5
120042	7	6.5*1	10
120043	10.5	9.5*1	10
21AAA345	17	15*2	10
21AAA346	22	20*2	10
21AAA347	27	25*2	10
21AAA348	32	30*2	10

Flatness: *1: 3 µm, *2: 5 µm





137255

A: M2.5×0.45

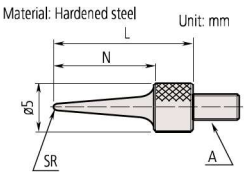
Order No.	ød0	ød	øD	L
137255	3	6.4	7	10
137399	4.5	8	9	10

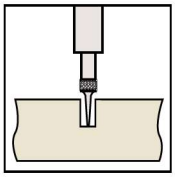
Flatness: 3 µm

Needle Point

Suitable for probing the bottom of a groove or hole.

Material: Hardened steel





101121

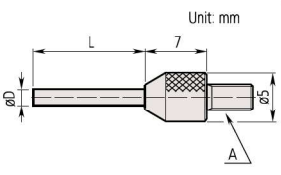
A: M2.5×0.45

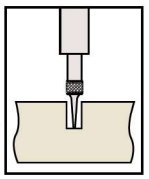
Order No.	N	L	SR
101121	11	15	0.4
137413	13	17	0.2
21AAA255	21	25	0.4
21AAA256	31	35	0.4

A: 4-48UNF

Order No.	L (in)	SR (in)
21AAA030	0.6	0.016
21AAA046	1	0.016
21AAA047	1 1/2	0.016
21AAA048	2	0.016

Needle Point (Carbide)





137257

A: M2.5×0.45

Order No.	øD	L
120066	0.45	3
21AAA329	0.45	5
120065	1	3
21AAA330	1	5
21AAA331	1	8
21AAA332	1	10
21AAA333	1	20
21AAA334	1	40
21AAA335	1.5	5
21AAA336	1.5	10
120064	1.5	13
21AAA337	1.5	20
21AAA338	1.5	40
137257	2	8
21AAA257	2	18
21AAA258	2	28
21AAA339	2	40

F

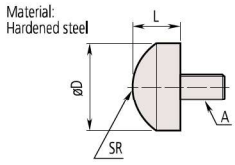
Dial Indicators

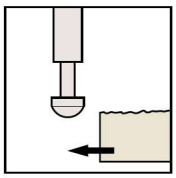
Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Optional Accessories for Digimatic and Dial Indicators and Linear Gages

Spherical Point

A large radius makes this contact point optimal for use where the workpiece needs to slide from the side.





101119

A: M2.5×0.45

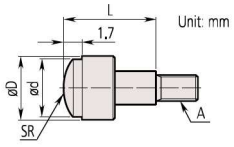
Order No.	D (mm)	L (mm)	SR (mm)
111460	5.5	3	5
125258	7.9	5	5
101119	10	5	7

A: 4-48UNF

Order No.	D (in)	L (in)	SR (in)
101205	1/2	1/8	0.35
101204	3/8	3/32	0.28

Spherical Point (Carbide)

120059

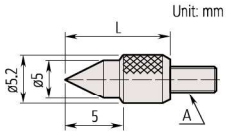


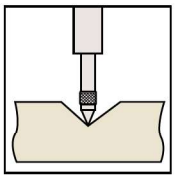
A: M2.5×0.45

Order No.	øD	ød	L	SR
120058	5.2	4.3	5	5
120059	7.5	6.5	10	7
120060	10.5	9.5	10	10

Conical Point

Used for positioning the measurement point. Since it can damage a workpiece easily, it is not suitable for use on soft materials.





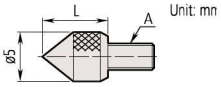
A: M2.5×0.45

Order No.	Tip angle	L
101120	60°	10

101120

A: 4-48UNF

Order No.	Tip angle	L (in)
101190	60°	1/2



101385

A: M2.5×0.45

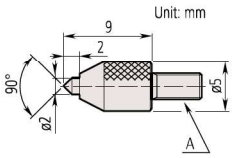
Order No.	Tip angle	L
101385	90°	5

A: 4-48UNF

Order No.	Tip angle	L (in)
101191	90°	1/4

Conical Point (Carbide)

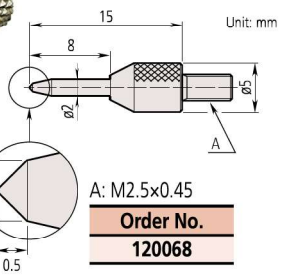
120057



A: M2.5×0.45

Order No.
120057

120068

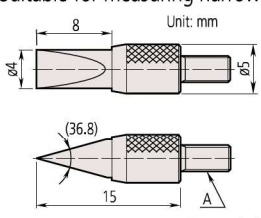


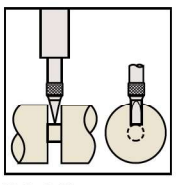
A: M2.5×0.45

Order No.
120068

Knife Edge Point (Carbide)

Suitable for measuring narrow groove diameter, etc.





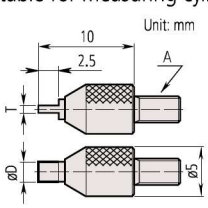
A: M2.5×0.45

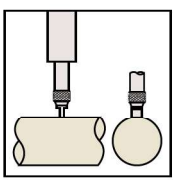
Order No.
120067

120067

Blade Point (Carbide)

Suitable for measuring cylinders.





A: M2.5×0.45

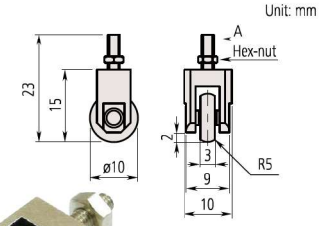
Order No.	T	øD
120061	0.4	2
120062	0.6	2
120063	1	4

120062

F

Roller Point

Suitable for use on a moving workpiece surface, or where the workpiece needs to slide from the side.



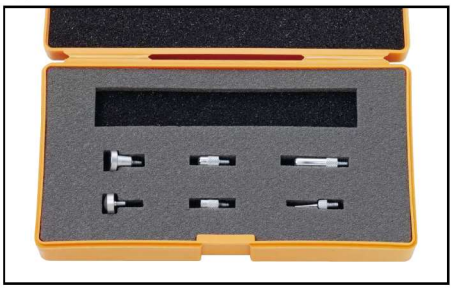
901954

A: M2.5×0.45	A: 4-48UNF
Order No.	Order No.
901954	901991

Roller material: Hardened steel
Roller runout: 10 µm or better
Note 1: For a different roller diameter, contact your local Mitutoyo sales office.
Note 2: High-accuracy roller with 5 µm runout is also available. (Special order item)

Interchangeable Contact Point Set

This set consists of six types of popular contact point for extending the use of an indicator to many applications.

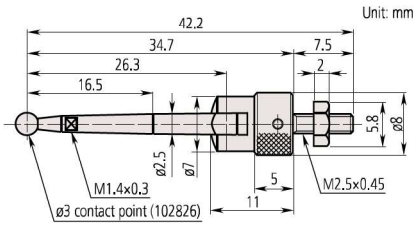


A: M2.5×0.45

Order No.	Contact points included
7822	Flat Point (**131365**, ø5 mm)
	Flat Point (**101117**, ø10 mm)
	Needle Point (**101121**)
	Spherical Point (**101119**)
	Shell Type Point (**101118**) (R2.5×10)
	Shell Type Point (**101387**) (R2.5×10)

Lever Point

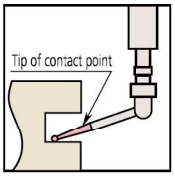
Suitable for use* on perpendicular faces, such as those within mold cavities. Lever can be adjusted to the required angle.



900391

A: M2.5×0.45
Order No.
900391

A: 4-48UNF
Order No.
900393



The tip of contact point is interchangeable.
Interchangeable contact points (optional)
ø1 mm contact point: **102824**
ø2 mm contact point: **102825**
ø3 mm contact point: **102826** (provided as standard)

* Perform measurement in the same posture and conditions as for the reference setting so that variation due to lever deflection are reduced. Gently bring the contact point into touch with the workpiece. Use a dial indicator with as small a measuring force as possible.

Extension Rod

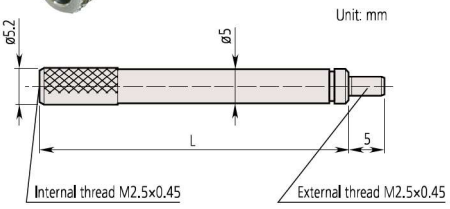
A: M2.5×0.45

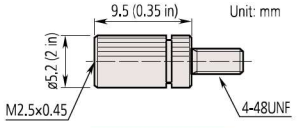
Order No.	L
303611	10
21AAA259A	15
303612	20
21AAA259B	25
303613	30
21AAA259C	35
21AAA259D	40
21AAA259E	45
21AAA259F	50
21AAA259G	55
304146	60
21AAA259H	65
21AAA259J	70
21AAA259L	75
21AAA259M	80
304147	90
303614	100

A: 4-48UNF

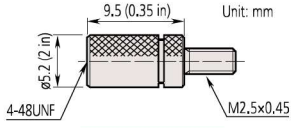
Order No.	L (in)
139167	1/2
301655	1
301657	2
301659	4

303613





Order No.
21AAA011



Order No.
21AAA012

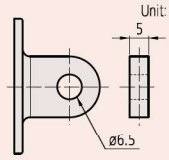
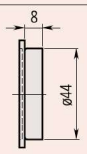
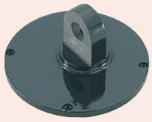
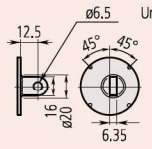
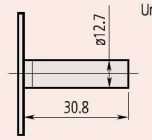
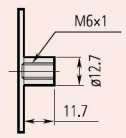
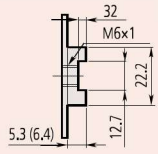
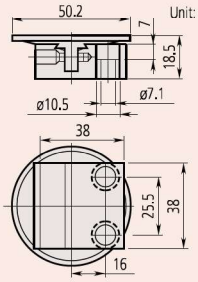
F

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Interchangeable Backs
Optional Accessory for Digimatic and Dial Indicators

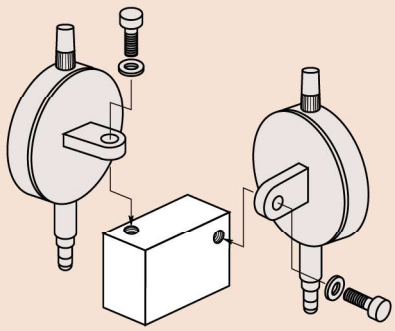
SPECIFICATIONS

Description		Order No.		
		SERIES 1 (ø31, ø36, ø40 mm)	SERIES 2 (ø57 mm)	SERIES 3, 4 (ø78, 92 mm)
Lug-on-Center Back 		**101210**: metric type **101307**: inch type **190561**: for 1911T-10, 1913-10 **190139**: 1921T-10, 1923T-10, 1925T-10 **137905**: for 1003T	**101040**: metric type **101306**: inch type **21AZB230**: for water-proof of S type (mm) **21BZB104**: for water-proof of S type (inch)	**100691**: metric type **100797**: inch type
Flat Back 		**101211**: a=2.2 **136872**: for water-proof type **191559**: for 1911TB-10, 1913TB-10, 1921TB-10, 1923TB-10, 1925TB-10 **137906**: for 1003TB	**101039**: a=2.5 **21AZB231**: for water-proof of S type **192910**: (F type waterproof model)	**100836**: a=3.0
Magnetic Back 		**Special order**	**900928**	**900929**
Back with Offset Lug 		**Special order**	**101167**	**100837**
Back with Post 		**193172** Custom made	**101169**	**100839**
Back with Screw Mount 		**193173**: M6×1, Custom made **193174**: #1/4-28UNF, Custom made	**136023**: M6×1 **101170**: #1/4-28UNF	**136024**: M6×1 **100840**: #1/4-28UNF
Adjustable Back 		**136025**: M6×1 **129721**: #1/4-20UNC	**136026**: M6×1 **101168**: #1/4-20UNC	**136027**: M6×1 **100838**: #1/4-20UNC
Back with Adjustable Bracket 		—	**901963**	—

Note 1: If back lids are replaced when using a waterproof or dustproof model, the water resistance will not be guaranteed.
Note 2: When installing to **297XTB** Series, separately prepare 4 fixing screws (**546666** Self-tapping screw only for plastic). Do not apply a tightening torque of more than 20 N-cm in order to avoid stripping the screw threads.

- A dial or Digimatic indicator may be held in position by clamping on either the stem or the lug on the back of the indicator. The back of the indicator may need to be interchanged with another type for special applications. A wide variety of backs is available for Mitutoyo Digimatic and dial indicators.
- Most lugged backs can be rotated by 90° because they have four retaining screws. However, **190561** and **137905** (for compact dial indicators) are only equipped with two retaining screws, therefore the lug orientation cannot be changed.

Typical application



F

Spindle Lifting Lever and Cable
Optional Accessories for Digimatic and Dial Indicators

Spindle Lifting Lever (F type)

21BZA205[*1*3]
Use for F type SERIES 1 dial indicators.

900527: Lever
101171: Screw

902011[*3]
Use for F type SERIES 2 dial indicators (up to 10 mm/0.4 in range).

900525: Lever
101171: Screw

903424[*1*3]
Use for F type SERIES 2 dial indicators (up to 20 mm/0.8 in range) and SERIES 3 and 4 dial indicators (up to 10 mm/0.4 in range).

903307: Lever
192686: Screw

Spindle Lifting Lever (S type)

902100[*1]
Use for S type SERIES 1 and F type SERIES 2 (up to 10 mm/0.4 in range) dial indicators.

21AZB149[*2]
Use for S type SERIES 2, 3, and 4 dial indicators (up to 10 mm/0.4 in).

21AZB150[*2]
Use for S type SERIES 2 and 3 dial indicators (from 10 mm/0.4 in up to 20 mm/0.8 in).

Spindle Lifting Lever (for ID-SS, ID-SX, ID-CX)

21EZA198[*1*3]

21AZB149: Lever
101171: Screw

*1 Before use, replace the stop screw with the standard accessory.
*2 Use the stop screw already fixed to the dial indicator body.
*3 Stop screw is for mm model.

F

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Spindle Lifting Cable

- The spindle can be moved up and down using the lifting lever or the release.

Lifting cable

Stroke: 10 mm

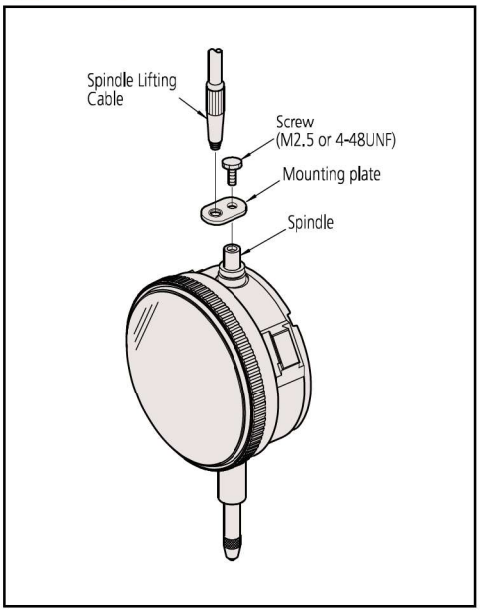
21JZA301: with auto-stop function (300 mm)
21JZA295: without auto-stop function (500 mm)

Note: This accessory is not applicable to dial indicators with a range of 20 mm or more. Applicable models are: **2048S(B)-10**, **2046S(B)-80**, **1911T(B)-10**, **1913T(B)-10**, **1921T(B)-10**, **1923T(B)-10**, **1925T(B)-10**, **2971TB**, **2972TB**, **2973TB**, **2976TB**, **2977TB**, **2978TB** and waterproof type.

Spindle Lifting Lever

137693
Suitable for 4.8 mm spindle diameter.

Typical application



F

Limit Stickers

- Stuck onto the dial indicator's dial face or crystal, these stickers indicate the tolerance limits. They are available in three colors: red, green, and yellow. They are available only for Series 2 dial indicators (55.6 mm or 57 mm bezel/outside diameter).

Red

136420
(10 sheets/set)

Green

136421
(10 sheets/set)

Yellow

136422
(10 sheets/set)

Color-coded Spindle Caps

- 9 color-coded spindle caps are available for dial indicators with a range of 10 mm or less.

Note: When attaching to small dial indicators, the measuring range height will be 8 mm taller.

Color	Order No.	
	Standard	Waterproof
Black	**193051**	**193595**
White	**193051W**	**193595W**
Red	**193051R**	**193595R**
Green	**193051G**	**193595G**
Blue	**193051B**	**193595B**
Yellow	**193051Y**	**193595Y**
Orange	**193051D**	**193595D**
Pink	**193051P**	**193595P**
Navy	**193051S**	**193595S**

Note: This accessory is not applicable to **1003T(B)**, **1911T(B)-10**, **1913T(B)-10**, **1921T(B)-10**, **1923T(B)-10**, **1925T(B)-10**, **2971TB**, **2972TB**, **2973TB**, **2976TB**, **2977TB**, **2978TB**.

F

Dial Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Dial Indicator Repair Tool Kit

Set order No. 7823EU

Set Configuration

(1) Spindle rest (**129730**)
(2) Pin remover (**129732**)
(3) Punch (**129733**)
(4) Bearing adjuster (**129734**)
(5) Pinion rest (**129735**)
(6) Reamer (ø1: 1/50 taper) (**129736**)
(7) Reamer (ø0.6: 1/50 taper) (**193702**)
(8) Reamer for pointer (ø0.5: 1/20 taper) (**21JAA273**)
(9) Pointer removing tool (**126628**)
(10) Soft touch pliers (**21JAA371**)
(11) Nippers (**901179**)
(12) Pin rest (**129731**)
(13) Hammer (**901178**)
(14) Stick (**21JAA314**)
(15) Brush (**901177**)
(16) Bamboo brush (**901176**)
(17) Pin-vise (**901175**)
(18) Screwdriver (Phillips/flat blade) (**901174**)
(19) Tweezers (**129729**)
(20) Screwdriver (Phillips) (**901173**)
(21) Pointer removing tip (ø0.8) (**126630**)
(22) Pointer removing tip (ø0.5) (**126630B**)
(23) Pointer removing tip (ø1.6) (**126630C**)
(24) Adjustable nut (**100699**)

Typical applications

Remove the long hand
Position the pointer removing tool (No. 9) on the hole diameter of the minute hand. Push the pivot with the pointer removing tool to remove the long hand.

Remove the little hand
Remove the little hand with the nippers (No. 11).

Adjust a bearing
Press the steel or jeweled bearing into its housing using the bearing adjuster (No. 4).

Remove or replace a pin
Place the spindle on the groove of the spindle rest (No. 1). Remove the pin with the pin remover (No. 2) and the hammer (No. 13). Tap the pin directly with the hammer (No. 13) to replace the pin.

Replace the long or little hand
Screw the pinion rest (No. 5) into the pin rest (No. 12). Support the pinion with the fixed pinion rest, and replace the hand with the punch (No. 3) and hammer (No. 13). Reaming is necessary when replacing with a new hand. Use reamers as follows:

- The hands of TI-X Series*1 dial test indicators do not require reaming.
- Use the reamer for pointer (No. 8) (ø0.5: 1/20 taper) for S type and T type dial indicators*2.
- Depending on the shaft diameter, use reamer (No. 6) (ø1: 1/50 taper) or reamer (No. 7) (ø0.6: 1/50 taper) for F type dial indicators and other than TI-X Series dial test indicators.

*1 Dial test indicator whose model No. ends in "X".
*2 Dial indicator whose order No. includes an "S" or "T".

Dial Indicator Crystal Setter

Order No. 7000

- Used for fitting a crystal on dial indicators (1003, 1911, 1913-10, 1003T, 1911T-10, 1913T-10, and 4046S) and dial test indicators (pocket type) with a non- integrated molded crystal.
- 8 sizes of crystal setting pads are supplied as standard.
- Typical applications
  Nos. 2 and 3: Bezel outside diameter of approx. ø28
  Nos. 3 and 4: Bezel outside diameter of approx. ø35
- Size of crystal setting pads (mm)
  (1) ø19.5 (2) ø22.5 (3) ø25.5 (4) ø28.5
  (5) ø32.5 (6) ø35 (7) ø38 (8) ø50
- Crystal setting pads set (including No. 1 to No. 8): **21JAA032**

Note: Crystal setting pads for large dial indicators (SERIES **3** and **4**) are available by special order.

Replacing bezels and graduation plates

A bezel and graduation plate must be swaged together so that the graduation plate always rotates with the bezel. Assemblies comprised of a swaged bezel and graduation plate are available for some models.

Order No. of dial indicators	Order No. of swaged assemblies
2046S	**21AZB132**
2109S-10	**21AZB138**
2046F	**903457**
2109F	**903464**