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. 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.)

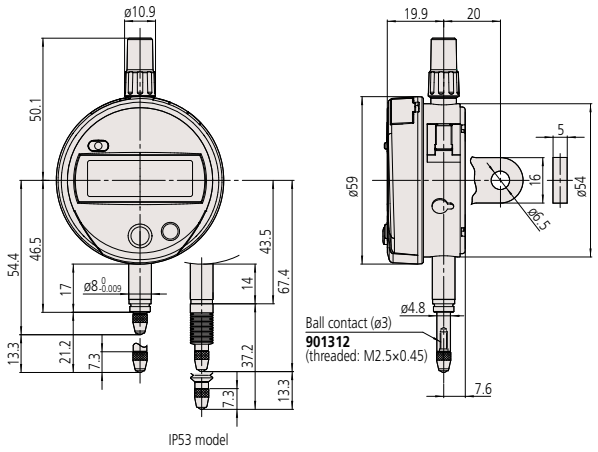
F

Mitutoyo reserves the right to change any or all aspects of any product specification, including prices, designs and service content, without notice.

Dimensions

ISO / JIS Type

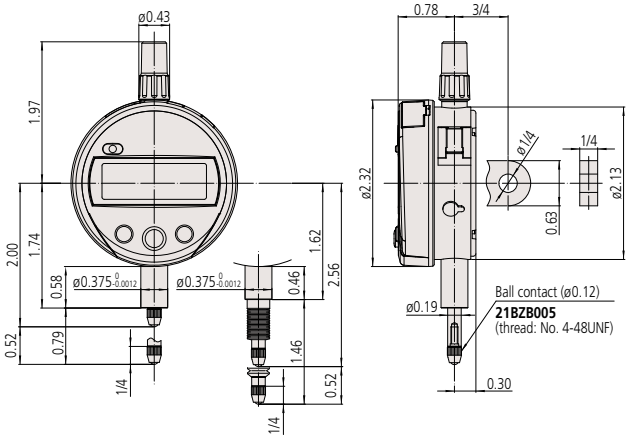
Unit: mm



IP53 model

ASME / ANSI / AGD Type

Unit: in



IP53 model

F

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

- 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

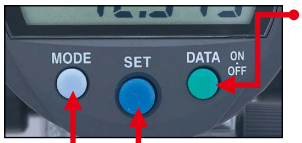
Measuring range 50.8 mm
543-490B

• 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.



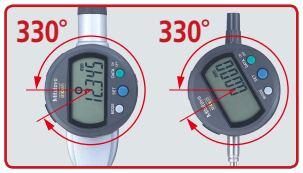
- Power switch
- Data output (when connected to an external device)
- Data hold (when no external device is connected)

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)

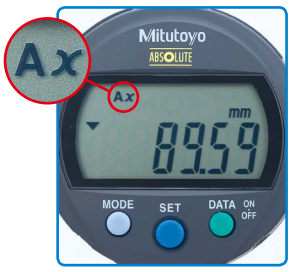
• 330° rotary display

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



• Calculation: f (x) =Ax

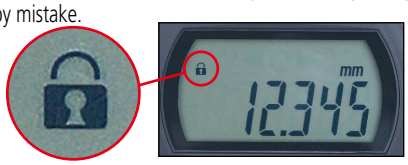
Mounting the **ID-CX** on a measuring jig and setting the multiplying factor (to any practical value) allows direct indication of size (see example below) without using a conversion table and so improves measurement efficiency.



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.



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

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.)

F

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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

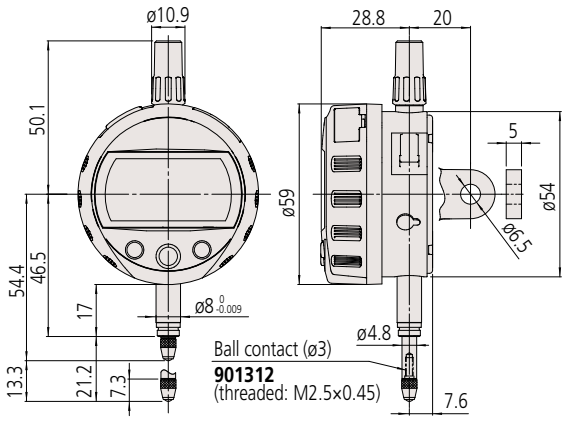
Order No. (w/lug, flat-back)		Range (in)	Resolution	Maximum permissible error*1			Measuring force MPL (N)
				MPE$_E$*3	Hysteresis MPE$_H$	Repeatability MPE$_R$	
543-391	**543-391B**	0.5	0.0005 / 0.0001 / 0.00005 in	±0.0001 in / 0.003 mm	0.0001 in / 0.002 mm	0.0001 in / 0.002 mm	1.5 or less
543-392	**543-392B**						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	0.01 / 0.001 mm (selectable)				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.

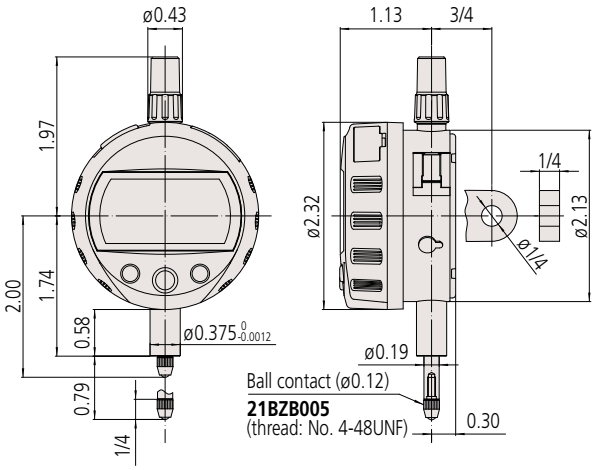
DIMENSIONS

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

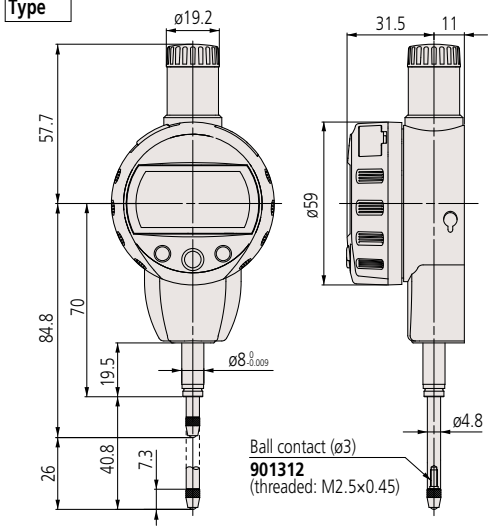
Comparison measuring instruments which ensure high quality, high accuracy and reliability.

DIMENSIONS

25.4 mm range models

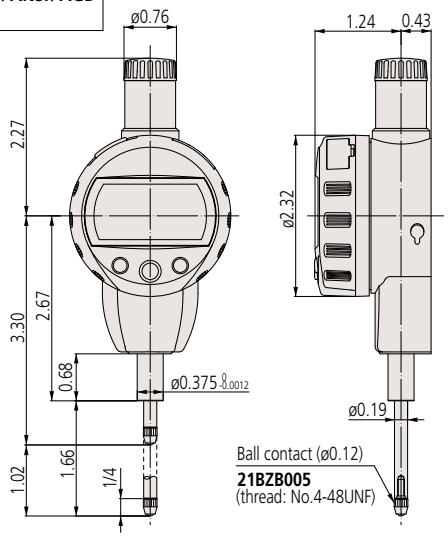
Unit: mm

ISO / JIS Type



Unit: in

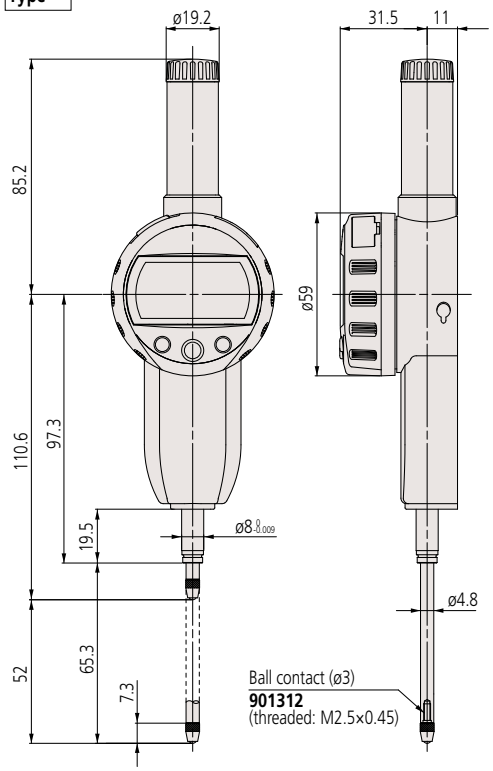
ASME / ANSI / AGD Type



50.8 mm range models

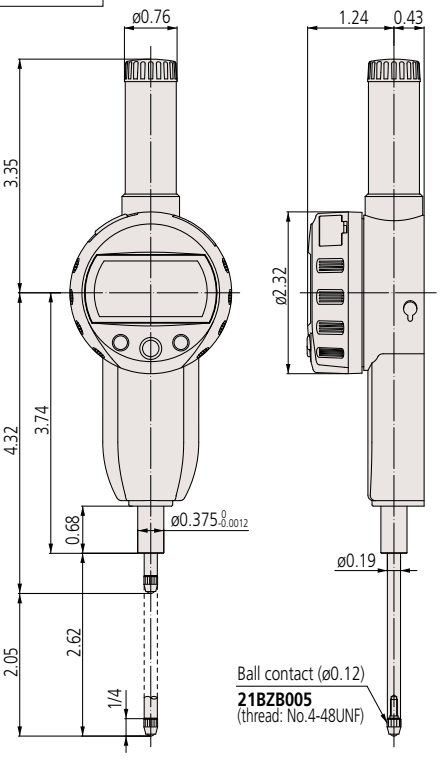
Unit: mm

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.

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