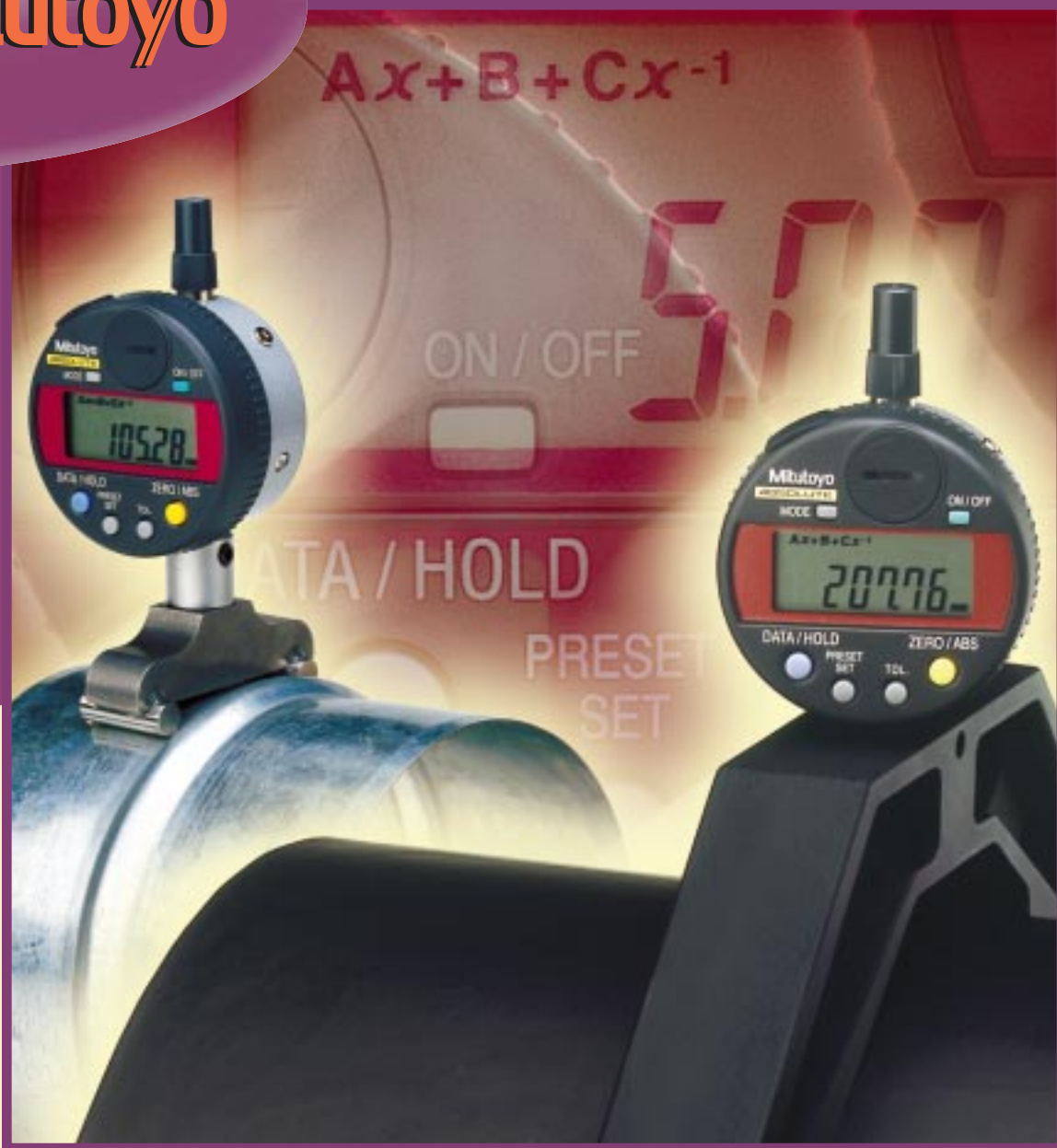


# Calculation-Type Digital Indicator

Mitutoyo



Absolute digital indicator with  
automatic calculation

# Absolute Digimatic Indicator

## Quick Measurement – No Need to Convert!

A conventional Digimatic indicator simply displays spindle displacement, but the Calculation-Type Digimatic indicator incorporates an internal calculation function in place of spindle displacement. With fixtures, measurements such as feeler, inside diameter and radius of curvature can easily be measured without the hassle of conversion tables or equivalents.

### The result:

A dramatic improvement in measuring accuracy.



### Fixture examples



### Application Measurement Example

#### Outside diameter



#### Radius of curvature



#### Groove width



#### Inside diameter



#### Hole diameter



#### Chamfer hole diameter



# r with Calculation Function

## Calculation function

The Absolute Digimatic indicator performs internal calculations using the formula  $Ax+B+Cx^{-1}$  (assuming spindle displacement as  $x$ ) while the coefficients A, B and, C can be set with respect to the purpose of measurement or dimensions of the fixtures. This unique feature allows you to read your measurements directly, without struggling for conversions.

## Data output

The Absolute Digimatic indicator can also output data to a data processor. This allows the recording of measuring results and the configuration of a system that includes process control via the data processor. Additionally, arithmetic coefficients can be set from a personal computer rather than the indicator itself.

## Tolerance judgment

H sets the upper/lower limits, and produces a display of tolerance judgments.

## Large display LCD

A large LCD makes it easy to read the settings of arithmetic coefficients, as well as tolerance judgments and other aspects of the measuring process.

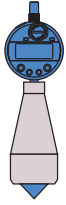

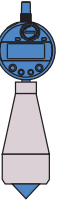
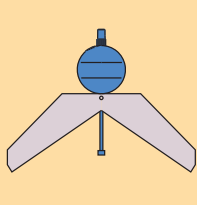
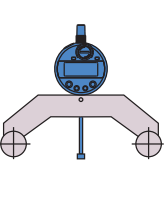
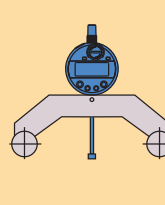
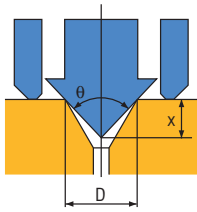
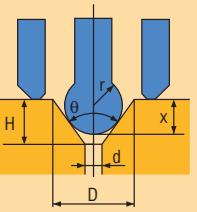
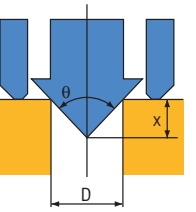
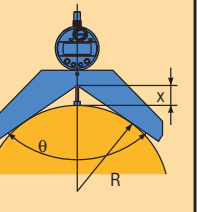
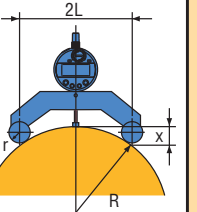
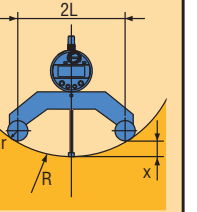
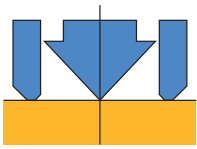
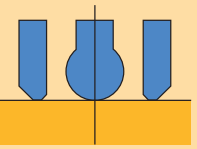
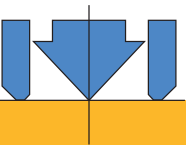
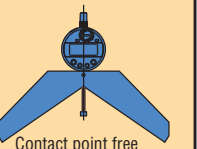
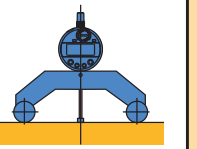
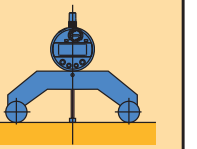
## Display hold

The Display Hold function is useful when LCD viewing is difficult during measurement.

Maximum and minimum values can be held, as well.

## Calculation examples of arithmetic coefficients

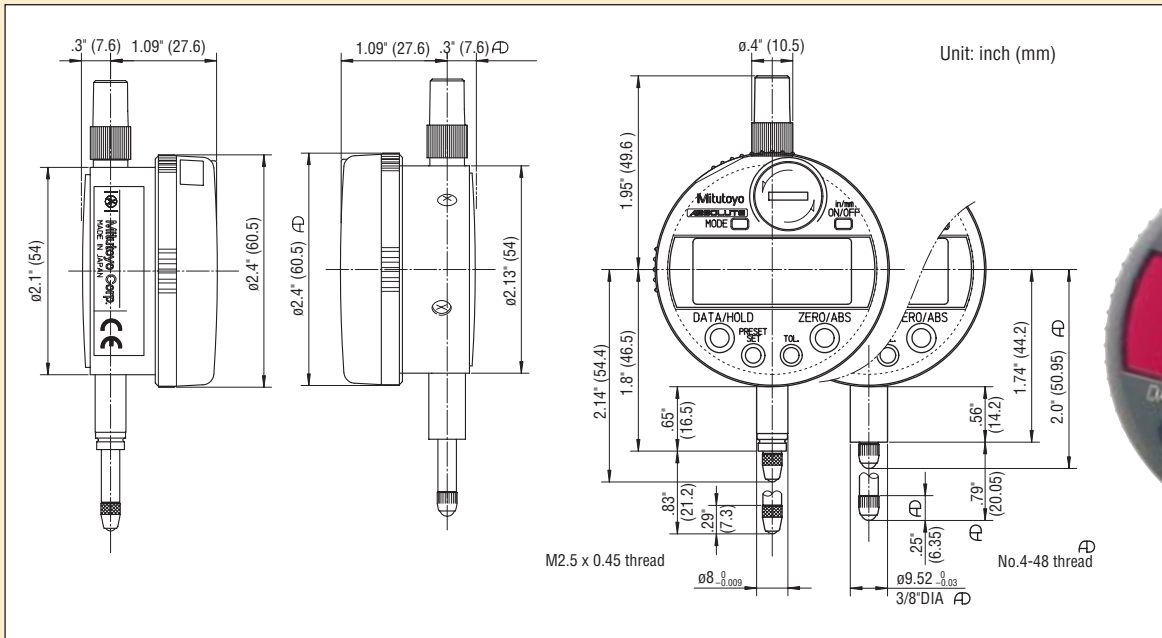
(Calculate arithmetic coefficients A, B, and C with a scientific calculator and then set the value you've determined. For details, refer to the table below.)

|   |   |   |   |  |   |   |                 |                  |
|---|---|---|---|--|---|---|-----------------|------------------|
| Fixture   |    |    |    |                          |    |    |                 |                  |
| Contact point   | Cone  | Ball  | Cone  | —  | —   | —   |                 |                  |
| Dimension X: Spindle displacement                                 |  |  |  |                        |  |  |                 |                  |
| Measurement item  | D= Diameter/Feeler/<br>Groove width<br>H= Countersink depth                         | D= Diameter/Feeler/<br>Groove width<br>H= Countersink depth                         | D= Hole diameter/<br>Feeler/<br>Groove width  | 2R=Outside diameter  | 2R=Outside diameter   | 2R=Inside diameter  |                 |                  |
| Calculation formula   | $D=Ax$  | $D=Ax+B$<br>$H=Ax+B$  | $D=Ax$  | $R=Ax$   | $R=Ax+B+Cx^{-1}$  | $R=Ax+B+Cx^{-1}$  |                 |                  |
| Arithmetic Coefficient  | A   | $-2\tan \frac{\theta}{2}$   | $-2\tan \frac{\theta}{2}$   | $-1$   | $-2\tan \frac{\theta}{2}$   | $-\frac{\sin \frac{\theta}{2}}{1-\sin \frac{\theta}{2}}$                              | $\frac{1}{2}$   | $-\frac{1}{2}$   |
|   | 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   | $-r$            | $r$              |
|   | C   | 0   | 0   | 0  | 0   | 0   | $\frac{L^2}{2}$ | $-\frac{L^2}{2}$ |
| Origin setting position (the position when $x=0$ )                |  |  |  | <br>Contact point free |  |  |                 |                  |
| Indicated value when origin setting (indicated value when $x=0$ ) | 0   | Value for coefficient B   | 0   | 0  | (Overflow)  | (Overflow)  |                 |                  |

• Various fixtures suited for individual workpieces can be used.

• Measuring accuracy is subject to fixture accuracy.

# Dimensions / Specifications



## Functions

- Calculation
- Zero set
- Presetting
- Tolerance judgment
- Hold facility
- Output
- Switching ABS/INC conversion

## Specifications

| Order No.                     | 543-285B   | 543-286B   | 543-287B |
|-------------------------------|--|--|----------|
| <b>Resolution</b>             | 0.0002mm to 1mm<br>(Twelve selectable stepped resolutions.)  | .00001"/0.0002mm to .05"/1mm<br>(Twelve selectable stepped resolutions.) |          |
| <b>Measuring range</b>        | 12mm   | .5" / 12mm   |          |
| <b>Accuracy</b>               | 0.00012" (0.003mm) or less (Quantization error is not included. Further, it varies by arithmetic coefficient setting.) |  |          |
| <b>Stem diameter</b>          | ø8mm   | 3/8" DIA (ø9.53mm)   |          |
| <b>Measuring force</b>        | 1.5N or less   |  |          |
| <b>Power supply</b>           | Silver-oxide cell (SR-44) x 1 pc.  |  |          |
| <b>Battery life</b>           | 12 months under normal use   |  |          |
| <b>Maximum response speed</b> | Infinite (If spindle speed exceeds 10µm/sec, correct peak value may not be displayed.)                                 |  |          |
| <b>Positional sensor</b>      | Electrostatic capacitance ABS (absolute)   |  |          |
| <b>Mass of main unit</b>      | .35 lbs. (160g)  |  |          |

• All instruments in this series are of the flat-back type.

## Optional Accessories

| Order No. | Name   |
|-----------|--|
| 540774    | Release cable                                      |
| 902011    | Lifting-lever and screw set for 543-285B, 543-286B |
| 902794    | Lifting-lever and screw set for 543-287B           |
| 905338    | Connecting cable: 1m                               |
| 905409    | Connecting cable: 2m                               |

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