

i-Checker

SERIES 170 – Inspection Instrument for Dial Indicator

The i-Checker is specially designed to calibrate dial indicators, dial test indicators, and other electronic comparison gage heads with a stroke of up to 100mm (4").

- $\pm(0.2+L/100)\mu\text{m}$ indication accuracy.
- Directly inspects an indicator with a stroke of up to 100mm (4"). The dial test indicator, bore gage and lever-type inductive head can be inspected with optional accessories.

- Adjustment of the measurement position is easily accomplished due to semi-automatic measurement and fully automatic measurement functions.
- Creates and prints out a simple inspection certificate.
- Saves inspection results as a CSV file for analysis by software.

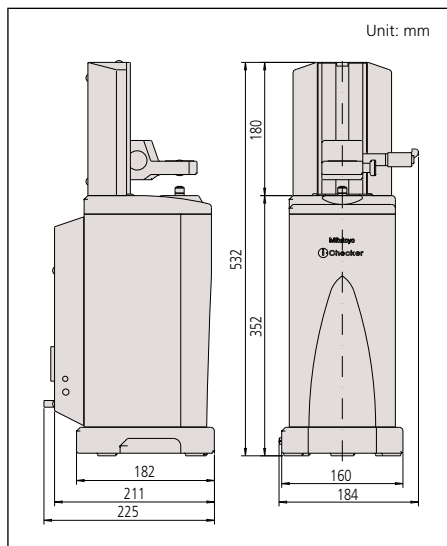


SPECIFICATIONS

| Order No. | Remarks |
|-----------|---------------------------------------|
| 170-321A* | with $\varnothing 8\text{mm}$ bushing |
| 170-322A* | with $\varnothing 3/8"$ bushing |

* PC is required and must be purchased separately.

DIMENSIONS



Applicable Indicators

- Dial indicator
- Hicator
- Digimatic indicator***
- Test indicator*
- Bore gage**
- Linear gage

* Requires optional test indicator attachment set.
 ** Contact the nearest Mitutoyo sales office for testable indicators.
 *** Requires optional bore gage accessory.
 **** Requires optional SPC cable for fully automatic measurement.



Using test indicator attachment set (02ASK000)



Technical Data

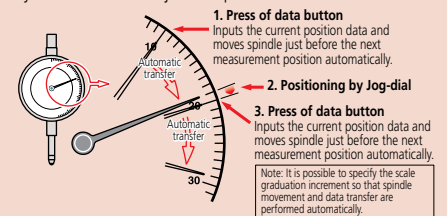
Measuring Range: 100mm/4"
 Resolution: 0.02 μm /0.8 μin
 Accuracy: $\pm(0.2+L/100)\mu\text{m}$ in vertical position
 $\pm(0.3+2L/100)\mu\text{m}$ in lateral position
 L = measuring length (mm)
 Drive method: Electric motor
 Measuring Unit: Reflective-type glass linear encoder
 Thermal expansion coefficient: $(8\pm 1)\times 10^{-6}/\text{K}$
 Measurement method: Semi-automatic / Fully automatic*
 Dimensions: 184 x 225 x 532mm (W x D x H)
 Operating temperature range: 20°C \pm 3°C
 Power supply: 100VAC to 240VAC \pm 10%, 50/60Hz
 Mass: 20kg/44.1lbs

* Automatic measurement requires the indicator's connection cable. Additionally, some form of indicator, along with a connecting machine (the optional accessory for indicator as a Digimatic power-supply unit on EF counter), will be needed.

Functions

Semi-automatic inspection of analog indicator

The pointer of the analog indicator is positioned just before the measuring point automatically via Mitutoyo's Semi-automatic Measurement function. After that, inspection begins simply by adjusting the pointer position with the jog-dial. Because of this function, measurement time is reduced and user fatigue is practically eliminated. Additionally all functions necessary for inspection are combined in the control box so that the operator need not rely on excessive eye movement to adjust the pointer.



Fully automatic inspection of digital indicator

The Automatic Measurement function, in tandem with a digital indicator, makes the spindle move so that measurement data is acquired automatically. Therefore, manual adjustment to the measurement position is unnecessary and the efficiency of every inspection is enhanced.



Create and printout a simplified inspection certificate

Create, edit and print your own inspection certificate. Data can be saved as a CSV file.

Optional Accessories

- 02ASK000: Test indicator attachment set ($\varnothing 6\text{mm}$ stem)
- 02ASK180: Test indicator attachment set ($\varnothing 8\text{mm}$ stem)
- 02ASK370: Test indicator holder ($\varnothing 6\text{mm}$ stem)
- 02ASK380: Test indicator holder ($\varnothing 8\text{mm}$ stem)
- 02ASK110: Accessory set for short-leg and digimatic bore gages
- 02ASL310: Accessory for bore gages
- 902803: $\varnothing 6\text{mm}$ dovetail grooved stem
- 902804: $\varnothing 8\text{mm}$ dovetail grooved stem
- 02ASK040: Stem bush $\varnothing 6\text{mm}$
- 02ASJ856: Stem bush $\varnothing 8\text{mm}$
- 02ASK150: Stem bush $\varnothing 8\text{mm}$, short
- 02ASL150: Stem bush $\varnothing 10$, short
- 02ASK050: Bush $\varnothing 9.5$ (Requires 02ASK070)
- 02ASK060: Stem bush $\varnothing 12\text{mm}$
- 02ASK070: Stem bush $\varnothing 15\text{mm}$
- 02ASK080: Stem bush $\varnothing 20\text{mm}$
- 02ASK710: Stem bush $\varnothing 28\text{mm}$
- 02ASK090: Stem bush $3/8"$
- 02ASK130: Stem bush case
- 02ASK730: Reflector
- 937179T: Foot switch



Optional Accessory

12AKK824: Stand for bore gage inspection



UDT-2 Dial Gage Testers

SERIES 170

The UDT-2 Dial Gage Tester consists of a specially designed 0-1" / 0-25mm micrometer head, with a large disc, and rigid holding fixtures. Gage tester to calibrate measuring accuracy of dial indicators, dial test indicators and dial bore gage.

FEATURES

- Clamping stem diameter—
170-102-10: 6mm and 8mm,
170-101-10: .25" and .375"
- With the optional stand (**12AAK824**), inspection of dial bore gages becomes possible.



170-102-10

SPECIFICATIONS

| Metric | | | |
|----------|-------------------|------------|----------|
| Range | Order No. | Graduation | Accuracy |
| 0 - 25mm | 170-102-10 | 0.001mm | ±1µm |

| Inch | | | |
|--------|-------------------|------------|----------|
| Range | Order No. | Graduation | Accuracy |
| 0 - 1" | 170-101-10 | .0001" | ±.0001" |

Calibration Testers

SERIES 521

The Calibration Tester is specially designed to calibrate measuring accuracy of short-range dial indicators, dial test indicators, and other electronic comparison gage heads.

FEATURES

- Universal bracket accepts any dial indicator, dial test indicator, and lever head of Mu-Checker without any additional accessory.
- Clamping capacity: ø4mm - ø10mm / .157"-.394" dia.
- Dual color-indexed directional graduations to facilitate measurements.



Calibrating test indicator



521-103

SPECIFICATIONS

| Metric | | | |
|---------|----------------|------------|----------|
| Range | Order No. | Graduation | Accuracy |
| 0 - 1mm | 521-103 | 0.0002mm | ±0.2µm |
| 0 - 5mm | 521-105 | 0.0002mm | ±0.8µm |

| Inch | | | |
|----------|----------------|------------|----------|
| Range | Order No. | Graduation | Accuracy |
| 0 - .05" | 521-104 | .00001" | ±.00001" |
| 0 - .2" | 521-106 | .00001" | ±.00003" |

Thickness Gages

SERIES 547, 7

Thickness Gages offer a quick and efficient means of inspection with a convenient grip handle, thumb trigger and spring-loaded spindle. The various models cover a range of applications.

FEATURES

- Wide range of applications with various types of measuring faces (on the spindle and anvil).

Flat-Anvil Type

Standard Type / Digital



Deep-Throat Type / Digital



Deep-Throat Type / Dial

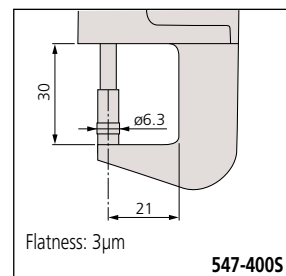


High-Accuracy Type / Digital



- Digital models incorporate Mitutoyo's popular ID-C and ID-S Series Digimatic Indicators to provide error-free LCD readings, as well as data output for SPC analysis.
- **547-4005** is ideally suited for measuring thicknesses of paper, film, wire, sheet metal and similar materials.

DIMENSIONS



Technical Data

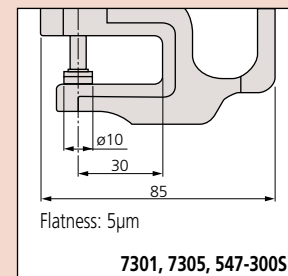
Function of Digital Models

- IDS Types
- ON/OFF
 - Inch / mm Conversion
 - Origin
 - \pm Direction Changeover
 - SPC Output
 - Battery Life: 20,000 hrs
 - Power Supply: Silver Oxide Cell (SR-44 1pc.)

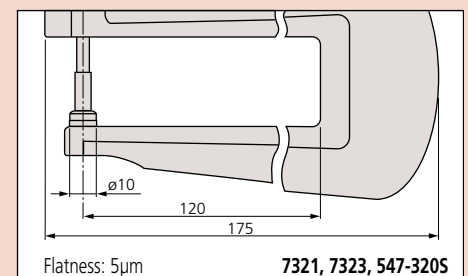
IDC Types

- ON/OFF
- Inch / mm Conversion
- Zero / ABS
- \pm Direction Changeover
- SPC Output
- Battery Life: 5,000 hrs
- Power Supply: Silver Oxide Cell (SR-44 1pc.)
- Preset
- Provides go/no-go judgment
- Face Rotates 330°

DIMENSIONS



Unit: mm



Thickness Gages

SERIES 547, 7

Optional Accessories

- 905338:** SPC cable (40" / 1m) for digital type
905409: SPC cable (80" / 2m) for digital type
902794: Spindle lifting lever for IDS digimatic type (stroke .5" / 12.7mm)

Standard Accessories

- 21AZB149:** Spindle lifting lever for digimatic and dial thickness gage (stroke .5" / 12.7mm)
21AZB150: Spindle lifting lever for dial indicator (stroke 1" / 25.4mm)

Flat Anvil

SPECIFICATIONS

| Inch/Metric | | Digital Type | | | | |
|---------------------|-----------------|----------------|----------|-----------------|---------------|------------------------|
| Range | Order No. | Resolution | Accuracy | Measuring Force | Indicator | Spindle/Anvil Material |
| 0 - .47" / 0 - 12mm | 547-500S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDS | Ceramic |
| 0 - .47" / 0 - 12mm | 547-520S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDS | Ceramic |
| 0 - .47" / 0 - 12mm | 547-526S | .0001"/0.001mm | ±.0002" | 1.5N or less | Digimatic IDS | Ceramic |
| 0 - .4" / 0 - 10mm | 547-300S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDC | Ceramic |
| 0 - .4" / 0 - 10mm | 547-320S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDC | Ceramic |
| 0 - .47" / 0 - 12mm | 547-400S | .0005"/0.001mm | ±.00015" | 3.5N or less | Digimatic IDC | Carbide |

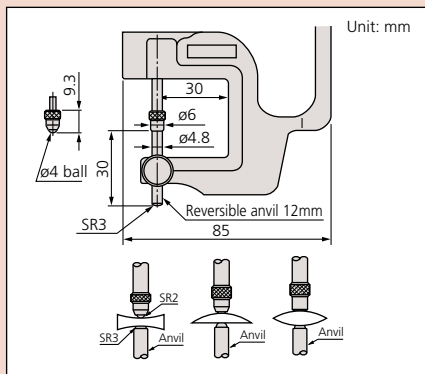
Inch Dial Type

| Range | Order No. | Graduation | Accuracy | Measuring Force | Remarks |
|----------|--------------|------------|----------|-----------------|--|
| 0 - .05" | 7326S | .0001" | ±.0002" | 1.4N or less | Fine dial reading, ceramic spindle/anvil |
| 0 - .5" | 7300S | .001" | ±.001" | 1.4N or less | Standard, ceramic spindle/anvil |
| 0 - 1" | 7304S | .001" | ±.002" | 2.0N or less | Standard, ceramic spindle/anvil |
| 0 - 1" | 7322S | .001" | ±.002" | 2.0N or less | Deep throat, ceramic spindle/anvil |

Metric Dial Type

| Range | Order No. | Graduation | Accuracy | Measuring Force | Remarks |
|----------|-------------|------------|----------|-----------------|--|
| 0 - 1mm | 7327 | 0.001mm | ±5µm | 1.4N or less | Fine dial reading, ceramic spindle/anvil |
| 0 - 10mm | 7301 | 0.01mm | ±15µm | 1.4N or less | Standard, ceramic spindle/anvil |
| 0 - 20mm | 7305 | 0.01mm | ±20µm | 2.0N or less | Standard, ceramic spindle/anvil |
| 0 - 10mm | 7321 | 0.01mm | ±15µm | 1.4N or less | Deep throat, ceramic spindle/anvil |
| 0 - 20mm | 7323 | 0.01mm | ±22µm | 2.0N or less | Deep throat, ceramic spindle/anvil |

DIMENSIONS



Lens thickness measurement (reverse anvil)



SPECIFICATIONS

| Inch/Metric | | Digital Type | | | |
|---------------------|-----------------|---------------|----------|-----------------|---------------|
| Range | Order No. | Resolution | Accuracy | Measuring Force | Indicator |
| 0 - .47" / 0 - 12mm | 547-512S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDS |
| 0 - .4" / 0 - 10mm | 547-312S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDC |

Inch Dial Type

| Range | Order No. | Graduation | Accuracy | Measuring Force | Remarks |
|---------|--------------|------------|----------|-----------------|----------------|
| 0 - .5" | 7312S | .001" | ±.001" | 1.4N or less | Lens thickness |

Metric Dial Type

| Range | Order No. | Graduation | Accuracy | Measuring Force | Remarks |
|----------|-------------|------------|----------|-----------------|----------------|
| 0 - 10mm | 7313 | 0.01mm | ±15µm | 1.4N or less | Lens thickness |

Thickness Gages

SERIES 547, 7

Tube thickness measurement



SPECIFICATIONS

Inch/Metric Digital Type

| Range | Order No. | Resolution | Accuracy | Measuring Force | Indicator |
|---------------------|-----------|---------------|----------|-----------------|---------------|
| 0 - .47" / 0 - 12mm | 547-561S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDS |
| 0 - .4" / 0 - 12mm | 547-361S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDC |

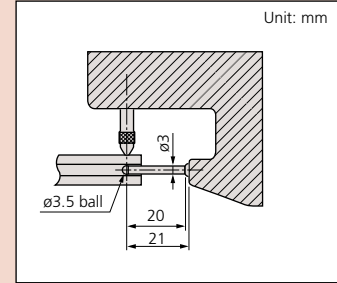
Inch Dial Type

| Range | Order No. | Graduation | Accuracy | Measuring Force | Remarks |
|---------|-----------|------------|----------|-----------------|----------------|
| 0 - .5" | 7361S | .001" | ±.001" | 1.4N or less | Tube thickness |

Metric Dial Type

| Range | Order No. | Graduation | Accuracy | Measuring Force | Remarks |
|----------|-----------|------------|----------|-----------------|----------------|
| 0 - 10mm | 7360 | 0.01mm | ±15µm | 1.4N or less | Tube thickness |

DIMENSIONS



Optional Accessories

- 905338: SPC cable (40" / 1m) for digital type
- 905409: SPC cable (80" / 2m) for digital type
- 902794: Spindle lifting lever for IDS digimatic type (stroke .5" / 12.7mm)

Standard Accessories

- 21AZB149: Spindle lifting lever for digimatic and dial thickness gage (stroke .5" / 12.7mm)
- 21AZB150: Spindle lifting lever for dial indicator (stroke 1" / 25.4mm)

Groove thickness measurement (Blade anvil)



SPECIFICATIONS

Inch/Metric Digital Type

| Range | Order No. | Resolution | Accuracy | Measuring Force | Indicator |
|---------------------|-----------|---------------|----------|-----------------|---------------|
| 0 - .47" / 0 - 12mm | 547-516S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDS |
| 0 - .47" / 0 - 10mm | 547-316S | .0005"/0.01mm | ±.001" | 1.5N or less | Digimatic IDC |

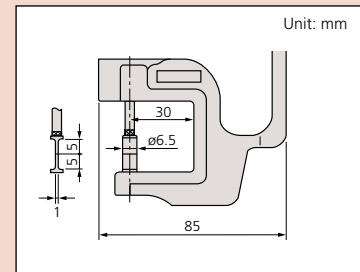
Inch Dial Type

| Range | Order No. | Graduation | Accuracy | Measuring Force | Remarks |
|---------|-----------|------------|----------|-----------------|------------------|
| 0 - .5" | 7316S | .001" | ±.001" | 1.4N or less | Groove thickness |

Metric Dial Type

| Range | Order No. | Graduation | Accuracy | Measuring Force | Remarks |
|----------|-----------|------------|----------|-----------------|------------------|
| 0 - 10mm | 7315 | 0.01mm | ±15µm | 1.4N or less | Groove thickness |

DIMENSIONS



Quick-Mini

SERIES 700

A compact comparator designed for carrying convenience is suited for quick inspection of paper thickness, leather, wires, plastic parts, etc. The digital display provides error-free reading with 0.01mm / .0005" resolution.

FEATURES

- Measuring force less than 2N.
- Supplied in fitted plastic case.



700-118-20

Technical Data

Accuracy: Refer to the list of specifications.
 Resolution: 0.01mm or .0005"/0.01mm
 Display: LCD
 Battery: SR44 (1 pc.), **938882**
 Battery life: Approx. 2 years under normal use

Function

Zero-setting, Data hold, Power ON/OFF, inch/mm conversion (on inch/metric models only)

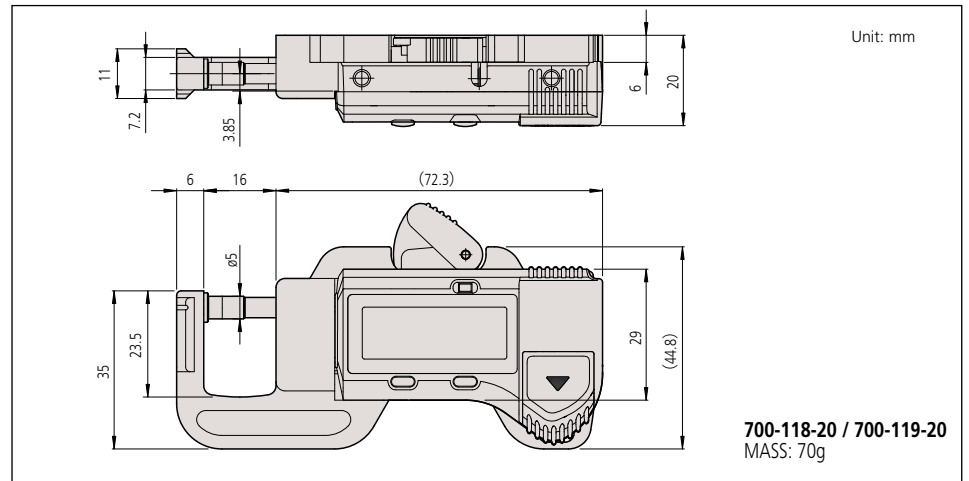


SPECIFICATIONS

| Metric | | |
|----------|-------------------|----------|
| Range | Order No. | Accuracy |
| 0 - 12mm | 700-119-20 | ±0.02mm |

| Inch/Metric | | |
|--------------------|-------------------|----------|
| Range | Order No. | Accuracy |
| 0 - .5"/0 - 12.7mm | 700-118-20 | ±.001" |

DIMENSIONS AND MASS



Digimatic Caliper Gages

SERIES 209 — Internal Tube Thickness Measurement

Versatile ID measuring gages for hole diameters, groove thickness, tube diameter and hard-to-reach dimensions. The Digimatic Caliper Gages provide error-free LCD readings, as well as data output for SPC analysis.

Internal measurement type

209-552



Technical Data

Accuracy: Refer to the list of specifications
 Resolution: .001", .0005", or .0002"
 .01mm, 0.02mm, or 0.005mm
 Display: LCD Analog / Digital
 Power Supply: AAA Battery (2 pcs.)
 Battery life: Approx. 350 hours
 Measuring Force: 0.9 - 1.8N
 Dust/Water protection level: IP67
 Provided with inspection certificate.

Function

Zeraset, Preset, Auto power off, Inch/Metric, conversion Data hold, Max/Min value holding, Data output

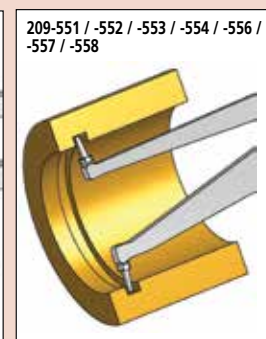
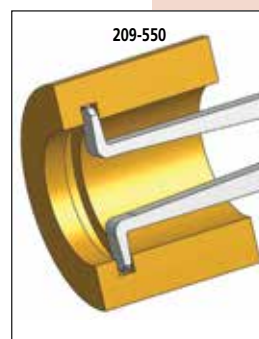
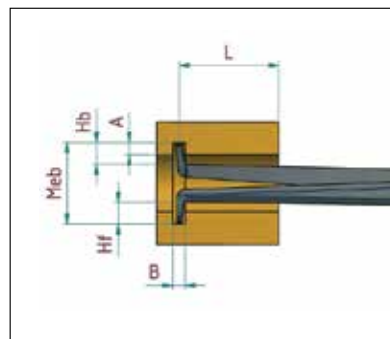
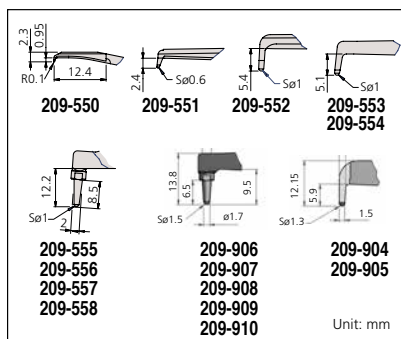
Optional Accessories

KPL1961-09 SPC Adapter
937387 Digimatic cable (1m)
965013 Digimatic cable (2m)
KPL8004-50 Holder for stand

SPECIFICATIONS

Inch / Metric

| Range | Order No. | Resolution | Accuracy | Max. Measuring Depth L | Max. Groove Depth A | Min. Groove Width B | Type of Measuring Contact | Mass(g) |
|---------------------------|----------------|------------------|------------------|------------------------|---------------------|---------------------|---------------------------|---------|
| .10 - .49" / 2.5 - 12.5mm | 209-550 | .0002" / 0.005mm | .0008" / 0.015mm | .47" / 12mm | .027" / 0.7mm | .023" / 0.5mm | Chisel R .0039" / 0.1mm | 225 |
| .20 - .59" / 5 - 15mm | 209-551 | .0002" / 0.005mm | .0008" / 0.015mm | 1.37" / 35mm | .09" / 2.3mm | .032" / 0.8mm | Ball .024" / 0.6mm dia. | 230 |
| .39 - 1.18" / 10-30mm | 209-552 | .0005" / 0.01mm | .0015" / 0.03mm | 3.3" / 85mm | .19" / 5.2mm | .06" / 1.2mm | Ball .04" / 1mm dia. | 250 |
| .79 - 1.58" / 20-40mm | 209-553 | .0005" / 0.01mm | .0015" / 0.03mm | 3.3" / 85mm | .26" / 7mm | .06" / 1.2mm | Ball .04" / 1mm dia. | 250 |
| 1.18 - 1.97" / 30-50mm | 209-554 | .0005" / 0.01mm | .0015" / 0.03mm | 3.3" / 85mm | .26" / 7mm | .06" / 1.2mm | Ball .04" / 1mm dia. | 255 |
| 1.58 - 2.36" / 40-60mm | 209-555 | .0005" / 0.01mm | .0015" / 0.03mm | 3.3" / 85mm | .31" / 8.3mm | .06" / 1.2mm | Ball .04" / 1mm dia. | 265 |
| 1.97 - 2.75" / 50-70mm | 209-556 | .0005" / 0.01mm | .0015" / 0.03mm | 3.3" / 85mm | .31" / 8.3mm | .06" / 1.2mm | Ball .04" / 1mm dia. | 265 |
| 2.36 - 3.15" / 60-80mm | 209-557 | .0005" / 0.01mm | .0015" / 0.03mm | 3.3" / 85mm | .31" / 8.3mm | .06" / 1.2mm | Ball .04" / 1mm dia. | 270 |
| 2.75 - 3.54" / 70-90mm | 209-558 | .0005" / 0.01mm | .0015" / 0.03mm | 3.3" / 85mm | .31" / 8.3mm | .06" / 1.2mm | Ball .04" / 1mm dia. | 270 |
| 0.51 - 1.69" / 13-43mm | 209-904 | .001" / 0.02mm | .002" / 0.04mm | 5.0" / 127mm | .177" / 4.5mm | .079" / 2.0mm | Ball Ø.05" / 1.3mm | 360 |
| 1.18 - 2.36" / 30-60mm | 209-906 | .001" / 0.02mm | .002" / 0.04mm | 5.2" / 132mm | .256" / 6.5mm | .098" / 2.5mm | Ball Ø.06" / 1.5mm | 370 |
| 1.97 - 3.15" / 50-80mm | 209-907 | .001" / 0.02mm | .002" / 0.04mm | 5.2" / 132mm | .335" / 8.5mm | .098" / 2.5mm | Ball Ø.08" / 2mm | 370 |
| 2.76 - 3.94" / 70-100mm | 209-908 | .001" / 0.02mm | .002" / 0.04mm | 5.2" / 132mm | .335" / 8.5mm | .098" / 2.5mm | Ball Ø.08" / 2mm | 375 |
| 3.54 - 4.72" / 90-120mm | 209-909 | .001" / 0.02mm | .002" / 0.04mm | 5.2" / 132mm | .335" / 8.5mm | .098" / 2.5mm | Ball Ø.08" / 2mm | 380 |
| 0.59 - 2.56" / 15-65mm | 209-905 | .001" / 0.02mm | .0024" / 0.06mm | 7.4" / 188mm | .196" / 5mm | .087" / 2.2mm | Ball Ø.06" / 1.5mm | 415 |
| 1.57 - 3.54" / 40-90mm | 209-910 | .001" / 0.02mm | .0024" / 0.06mm | 7.56" / 192mm | .315" / 8mm | .098" / 2.5mm | Ball Ø.08" / 2mm | 420 |



Edge R 0.1 mm

Ball Ø 0.6mm, Ø 1mm, Ø 1.3mm
 Ø 1.5mm and Ø 2mm



Digimatic Caliper Gages

SERIES 209 — External Tube Thickness Measurement

Technical Data

Accuracy: Refer to the list of specifications
 Resolution: .001", .0005", or .0002"
 0.01mm, 0.02mm, or 0.005mm
 Display: Analog / Digital
 Power Supply: AAA Battery (2 pcs.)
 Battery life: Approx. 350 hours
 Measuring Force: 0.8 - 1.7N
 Dust/Water protection level: IP67
 Provided with inspection certificate.

Function

Zeraset, Preset, Auto power off, Inch/Metric conversion, Data hold, Max/Min value holding, Data output
 * Contact type 3, 4 does not have max. min. value hold.

Versatile OD measuring gages for groove thickness, tube thickness and hard-to-reach dimensions. Digimatic Caliper Gages provide error-free LCD readings, as well as data output for SPC analysis.

External measurement type

209-572



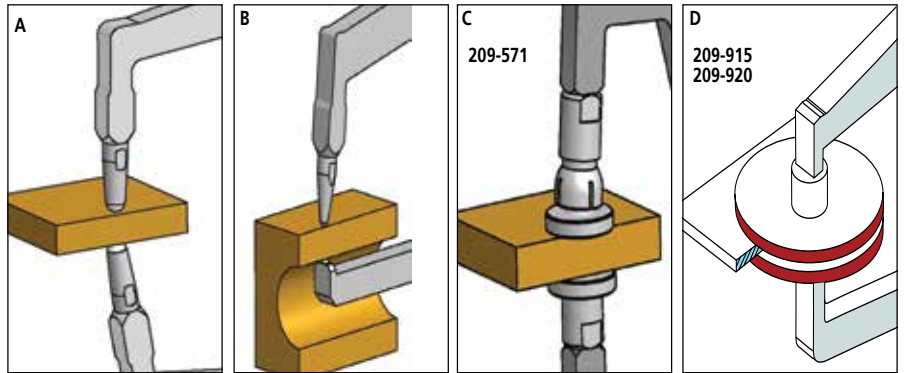
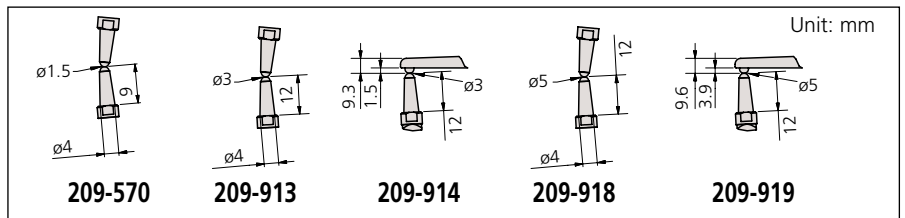
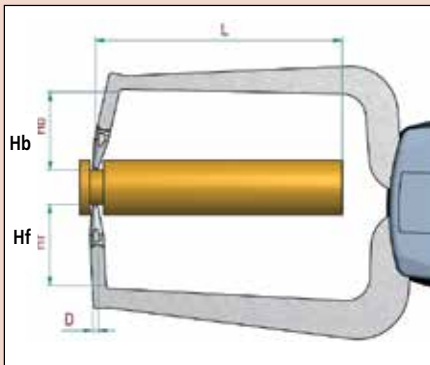
SPECIFICATIONS

Inch / Metric

| Range | Order No. | Resolution | Accuracy | Max. Measuring Depth L | Measuring Contact length Hb | Measuring Contact length Hf | Type of Measuring Contact/type of set up | Mass(g) |
|-------------------|-----------|------------------|-----------------|------------------------|-----------------------------|-----------------------------|--|---------|
| 0 - .39" / 0-10mm | 209-570 | .0002" / 0.005mm | .0008" / 0.05mm | 1.37" / 35mm | .75" / 19.1mm | .73" / 18.6mm | Ball .059" / 1.5mm dia. Both/ A | 240 |
| 0 - .39" / 0-10mm | 209-571 | .0002" / 0.005mm | .001" / 0.02mm | 1.37" / 35mm | .85" / 21.7mm | .58" / 14.8mm | Desc .24" / 6mm dia. Both/ C | 175 |
| 0 - .78" / 0-20mm | 209-572 | .0005" / 0.01mm | .0015" / 0.03mm | 3.2" / 85mm | .97" / 24.7mm | .97" / 24.6mm | Ball .059" / 1.5mm dia. Both/ A | 280 |
| 0 - .78" / 0-20mm | 209-573 | .0005" / 0.01mm | .0015" / 0.03mm | 3.2" / 80mm | .97" / 24.7mm | .10" / 2.5mm | Ball .059" / 1.5mm dia. Both/ B | 270 |
| 0-1.18" / 0-30mm | 209-913 | .001" / 0.02mm | .002" / 0.04mm | 4.5" / 114mm | 1.17" / 30mm | 1.17" / 30mm | Ball Ø.12" / 3mm A | 430 |
| 0-1.18" / 0-30mm | 209-914 | .001" / 0.02mm | .002" / 0.04mm | 4.58" / 116mm | 1.17" / 30mm | .16" / 4mm | Ball Ø.12" / 3mm B | 410 |
| 0-1.18" / 0-30mm | 209-915 | .001" / 0.02mm | .002" / 0.04mm | 4.56" / 116mm | 1.42" / 36mm | .94" / 24mm | Disc Ø1.97" / 50mm D | 430 |
| 0-1.97" / 0-50mm | 209-918 | .001" / 0.02mm | .002" / 0.04mm | 6.57" / 167mm | 1.17" / 30mm | 1.17" / 30mm | Ball Ø.12" / 3mm A | 490 |
| 0-1.97" / 0-50mm | 209-919 | .001" / 0.02mm | .0024" / 0.06mm | 6.57" / 167mm | 1.17" / 30mm | .18" / 4.6mm | Ball Ø.12" / 3mm B | 460 |
| 0-1.97" / 0-50mm | 209-920 | .001" / 0.02mm | .003" / 0.08mm | 6.57" / 167mm | 1.42" / 36mm | .94" / 24mm | Disc Ø1.97" / 50mm both/D | 500 |

Optional Accessories

- KPL1961-09: SPC Adapter
- 937387 Digimatic cable (1m)
- 965013 Digimatic cable (2m)
- KPL8004-50 Holder for stand



Ball ø 1.5 and 3mm for wall thickness

Ball ø 1.5 and 3mm for min. wall thickness ø3mm / 9mm

Disc ø6mm for flat surfaces

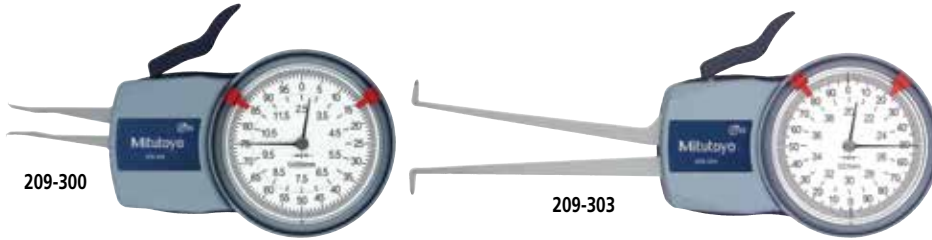
Disc ø50mm for flat surfaces



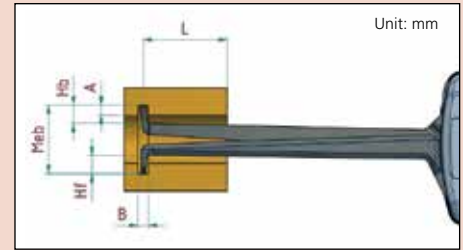
Dial Caliper Gages

SERIES 209 — Internal Measurement

The caliper is spring loaded and makes point contact at a constant measuring pressure.



DIMENSIONS



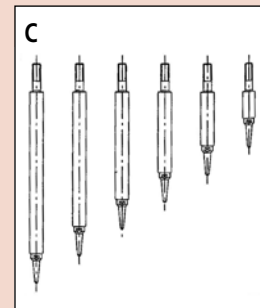
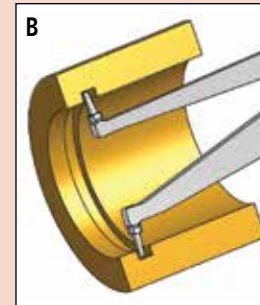
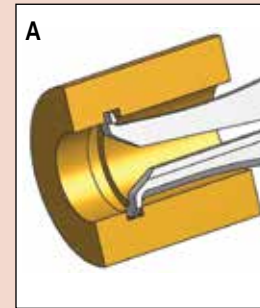
SPECIFICATIONS

| Inch | | | | | | | | | |
|-----------------|-----------------|------------|----------|------------------------|---------------------|---------------------|------------------------|-----------|----------|
| Measuring Range | Order No. | Graduation | Accuracy | Max. Measuring Depth L | Max. Groove Depth A | Min. Groove Width B | Measuring Contact Type | Size (mm) | Mass (g) |
| .10 - .50" | 209-350 | .0002" | ± .0008" | .47" | .027" | .023" | A | R0.1 | 200 |
| .20 - .60" | 209-351 | .0002" | ± .0008" | 1.37" | .09" | .032" | B | ø0.6 | 200 |
| .40 - 1.2" | 209-352 | .0005" | ± .0015" | 3.3" | .19" | .06" | B | ø1 | 200 |
| .80 - 1.6" | 209-354 | .0005" | ± .0015" | 3.3" | .26" | .06" | B | ø1 | 200 |
| 1.2 - 2" | 209-355 | .0005" | ± .0015" | 3.3" | .26" | .06" | B | ø1 | 200 |
| 1.6 - 2.4" | 209-356 | .0005" | ± .0015" | 3.3" | .31" | .06" | B | ø1 | 200 |
| 2 - 2.8" | 209-357 | .0005" | ± .0015" | 3.3" | .31" | .06" | B | ø1 | 200 |
| 2.4 - 3.2" | 209-358 | .0005" | ± .0015" | 3.3" | .31" | .06" | B | ø1 | 250 |
| 2.8 - 3.6" | 209-359 | .0005" | ± .0015" | 3.3" | .31" | .06" | B | ø1 | 250 |
| 3.2 - 4" | 209-360 | .0005" | ± .0015" | 3.3" | .31" | .06" | B | ø1 | 250 |
| 2 - 4" | 209-361* | .0005" | ± .0015" | 3.3" | .31" | .06" | C | ø1 | 250 |
| 3.6 - 5.6" | 209-362* | .0005" | ± .0015" | 3.3" | .31" | .06" | C | ø1 | 250 |
| 5.2 - 7.2" | 209-363* | .0005" | ± .0015" | 3.3" | .31" | .06" | C | ø1 | 250 |

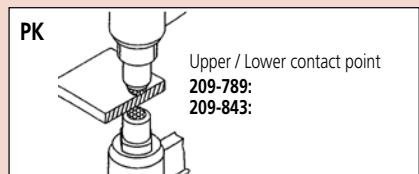
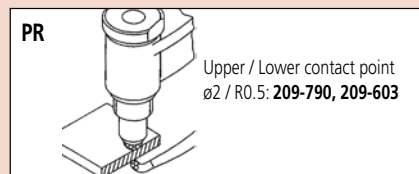
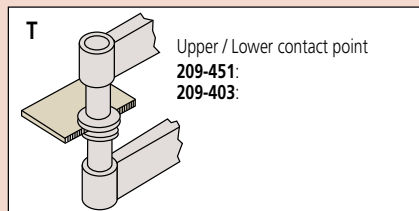
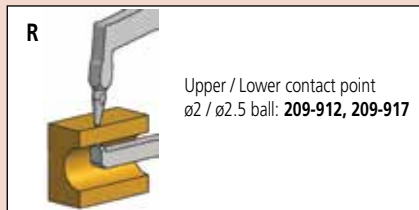
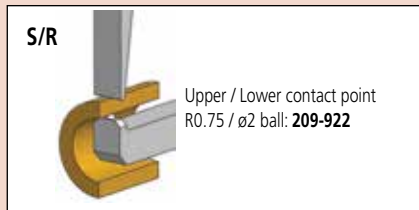
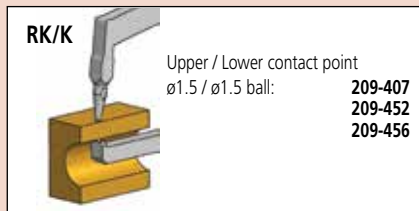
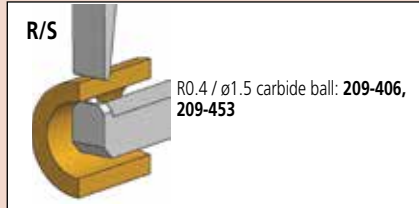
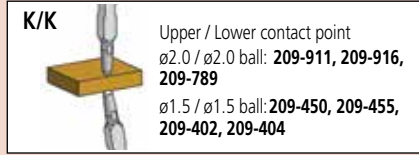
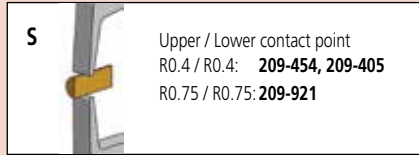
*Interchangeable contact points (additional anvil 4 pcs.) with ball point .04" dia. These Dial Caliper Gages are used only as comparison gages and should be used along with a setting ring or a micrometer.

| Metric | | | | | | | | | |
|-----------------|-----------------|------------|----------|------------------------|---------------------|---------------------|------------------------|-----------|---------|
| Measuring Range | Order No. | Graduation | Accuracy | Max. Measuring Depth L | Max. Groove Depth A | Min. Groove Width B | Measuring Contact Type | Size (mm) | Mass(g) |
| 2.5 - 12.5mm | 209-300 | 0.005mm | ±0.015mm | 12mm | 0.7mm | 0.5mm | A | R0.1 | 155 |
| 5 - 15mm | 209-301 | 0.005mm | ±0.015mm | 35mm | 2.3mm | 0.8mm | B | ø0.6 | 160 |
| 10 - 30mm | 209-302 | 0.01mm | ±0.03mm | 85mm | 5.2mm | 1.2mm | B | ø1 | 180 |
| 20 - 40mm | 209-303 | 0.01mm | ±0.03mm | 85mm | 7mm | 1.2mm | B | ø1 | 180 |
| 30 - 50mm | 209-304 | 0.01mm | ±0.03mm | 85mm | 7mm | 1.2mm | B | ø1 | 185 |
| 40 - 60mm | 209-305 | 0.01mm | ±0.03mm | 85mm | 8.3mm | 1.2mm | B | ø1 | 195 |
| 50 - 70mm | 209-306 | 0.01mm | ±0.03mm | 85mm | 8.3mm | 1.2mm | B | ø1 | 195 |
| 60 - 80mm | 209-307 | 0.01mm | ±0.03mm | 85mm | 8.3mm | 1.2mm | B | ø1 | 200 |
| 70 - 90mm | 209-308 | 0.01mm | ±0.03mm | 85mm | 8.3mm | 1.2mm | B | ø1 | 200 |
| 80 - 100mm | 209-309 | 0.01mm | ±0.03mm | 85mm | 8.3mm | 1.2mm | B | ø1 | 200 |
| 50 - 100mm | 209-310* | 0.01mm | ±0.03mm | 85mm | 8.3mm | 1.2mm | C | ø1 | 220 |
| 90 - 140mm | 209-311* | 0.01mm | ±0.03mm | 85mm | 8.3mm | 1.2mm | C | ø1 | 230 |
| 130 - 180mm | 209-312* | 0.01mm | ±0.03mm | 85mm | 8.3mm | 1.2mm | C | ø1 | 240 |
| 15-65mm | 209-901 | 0.05mm | ±0.05 | 188 | 5 | 1.9 | B | ø1.5mm | 355 |
| 40-90mm | 209-902 | 0.05mm | ±0.05 | 192 | 8.5 | 2.4 | B | ø2mm | 370 |
| 70-120mm | 209-903 | 0.05mm | ±0.05 | 192 | 8.5 | 2.4 | B | ø2mm | 380 |

*Interchangeable contact point (additional anvil 5pcs.) with ball point 1mm dia. These Dial Caliper Gages are used only as comparison gages and should be used along with a setting ring or a micrometer.

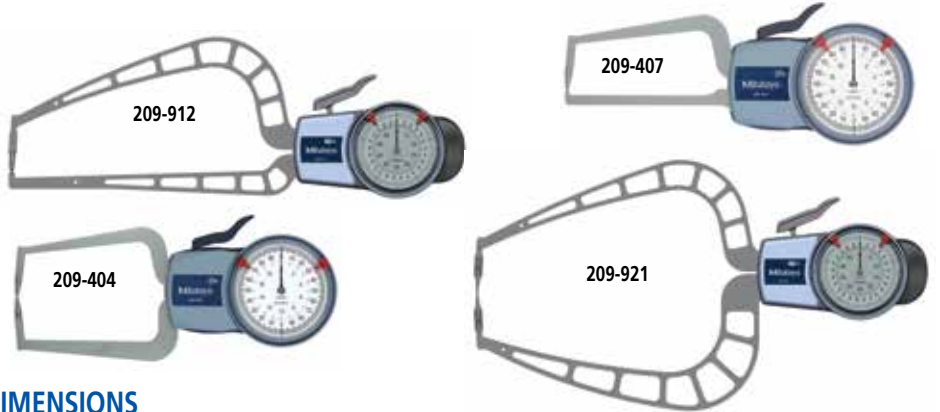


Type of Contact Points

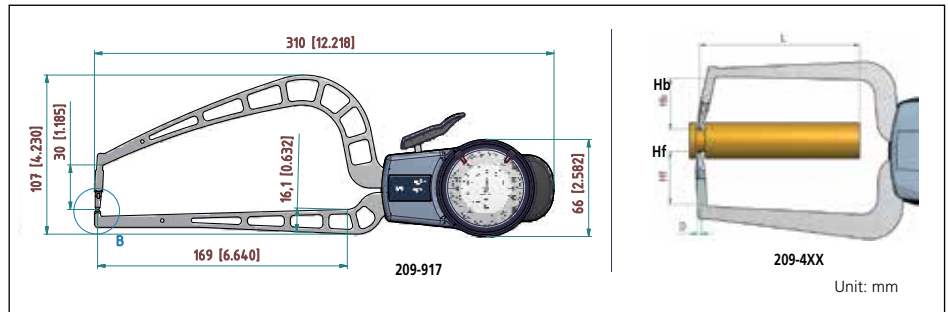


Dial Caliper Gages

SERIES 209 — External Measurement



DIMENSIONS



SPECIFICATIONS

| Measuring Range | Order No. | Graduation | Accuracy | Max. Measuring Depth L | Length Hb | Length Hf | Measuring Contact Type | Size (mm) | Mass (g) |
|-----------------|-----------|------------|----------|------------------------|-----------|-----------|------------------------|-------------------|----------|
| 0 - .40" | 209-450 | .0002" | ± .0008" | 1.37" | .75" | .75" | K/K | ø1.5 | 170 |
| 0 - .40" | 209-451 | .0002" | ± .001" | 1.37" | .85" | .58" | T | ø6 | 175 |
| 0 - .40" | 209-452 | .0002" | ± .0008" | 1.37" | .75" | .035" | RK/K | ø1.5 | 165 |
| 0 - .40" | 209-453 | .0002" | ± .0008" | 1.37" | .75" | .035" | R/S | Chisel R0.4, ø1.5 | 165 |
| 0 - .50" | 209-789 | .005" | ± .005" | 1.38" | - | - | PK | ø2, Chisel R0.5 | 40 |
| 0 - .50" | 209-790 | .005" | ± .005" | 1.38" | - | - | PR | ø2 | 40 |
| 0 - .80" | 209-454 | .0005" | ± .0015" | 3.2" | .97" | .97" | S | Chisel R0.4 | 210 |
| 0 - .80" | 209-455 | .0005" | ± .0015" | 3.2" | .97" | .97" | K/K | ø1.5 | 210 |
| 0 - .80" | 209-456 | .0005" | ± .0015" | 3.2" | .97" | .10" | RK/K | ø1.5 | 200 |
| 0 - .80" | 209-457 | .0005" | ± .0015" | 3.2" | .97" | .10" | R/S | Chisel R0.4, ø1.5 | 200 |
| 0 - 2.0" | 209-916 | .001" | ± .002" | 6.6" | 1.2" | 1.2" | K/K | ø3 | 430 |
| 0 - 2.0" | 209-917 | .001" | ± .002" | 6.6" | 1.2" | .18" | RK/K | ø3 | 400 |

Metric

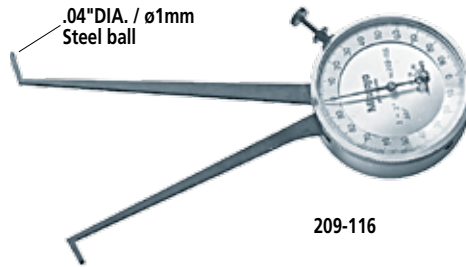
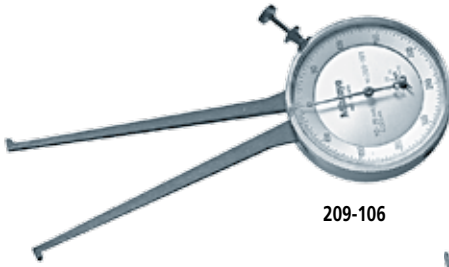
| Measuring Range | Order No. | Graduation | Accuracy | Max. Measuring Depth L | Length Hb | Length Hf | Measuring Contact | Size (mm) | Mass (g) |
|-----------------|-----------|------------|----------|------------------------|-----------|-----------|-------------------|-------------------|----------|
| 0 - 10mm | 209-402 | 0.005mm | ±0.015mm | 35mm | 19.1mm | 18.6mm | K/K | ø1.5 | 240 |
| 0 - 10mm | 209-403 | 0.005mm | ±0.02mm | 35mm | 21.7mm | 14.8mm | T | ø6 | 175 |
| 0 - 20mm | 209-404 | 0.01mm | ±0.03mm | 85mm | 7mm | 24.6mm | K/K | ø1.5 | 210 |
| 0 - 20mm | 209-405 | 0.01mm | ±0.03mm | 85mm | 7mm | 24.6mm | S | R 0.4 | 210 |
| 0 - 20mm | 209-406 | 0.01mm | ±0.03mm | 80mm | 7mm | 2.5mm | R/S | Chisel R0.4, ø1.5 | 200 |
| 0 - 20mm | 209-407 | 0.01mm | ±0.03mm | 80mm | 7mm | 2.5mm | RK/K | ø1.5 | 200 |
| 0 - 10mm | 209-843 | 0.1mm | ±0.1mm | 36mm | - | - | PK | ø2, Chisel R0.5 | 40 |
| 0 - 10mm | 209-603 | 0.1mm | ±0.1mm | 33mm | - | - | PR | ø2 | 40 |
| 0 - 50mm | 209-911 | 0.05mm | ±0.05mm | 167mm | 30mm | 30mm | KK | Ball ø3mm | 430 |
| 0 - 50mm | 209-912 | 0.05mm | ±0.05mm | 169mm | 30mm | 4.5mm | RK/K | Ball ø3mm | 400 |
| 0 - 50mm | 209-921 | 0.05mm | ±0.05mm | 167mm | 30mm | 30mm | S | Chisel R0.75 | 490 |
| 0 - 50mm | 209-922 | 0.05mm | ±0.05mm | 169mm | 30mm | 4.5mm | R/S | ø3, Chisel R0.75 | 400 |

Dial Caliper Gages

SERIES 209 — Internal Measurement

These Dial Caliper Gages are used only as comparison gages and should be used with a setting ring or a micrometer. The caliper is

spring loaded and makes point contact at a constant measuring pressure.



Technical Data

Dial Diameter: 2" / 50mm
 Measuring Force: 2.0N or less
 Repeatability: .001" / 0.025mm

Metric Yellow Dial Face

| Order No. | Range | Graduation | Accuracy |
|-----------|---------|------------|----------------|
| 209-106 | 10-35mm | 0.025mm | ± 0.075 mm |
| 209-107 | 30-55mm | 0.025mm | ± 0.075 mm |
| 209-108 | 50-75mm | 0.025mm | ± 0.075 mm |

Inch

| Order No. | Range | Graduation | Accuracy |
|-----------|-----------|------------|--------------|
| 209-116 | .4"-1.4" | .001" | $\pm .003$ " |
| 209-117 | 1.2"-2.2" | .001" | $\pm .003$ " |
| 209-118 | 2.0"-3.0" | .001" | $\pm .003$ " |

DIMENSIONS

80mm

| Range | A | B | Mass(g) |
|------------------------|-------|-------|---------|
| 10 - 35mm / .4 - 1.4" | 2.6mm | 2.6mm | 85 |
| 30 - 55mm / 1.2 - 2.2" | 8.5mm | 7.5mm | 85 |
| 50 - 75mm / 2.0 - 3.0" | 8.5mm | 7.5mm | 85 |

$\phi 1.6$ mm

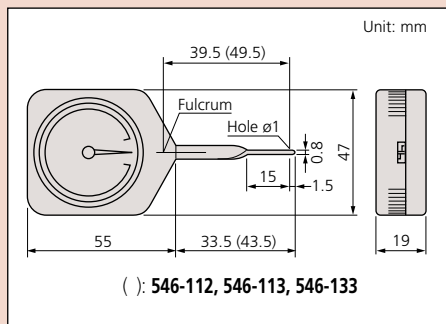
B

Application

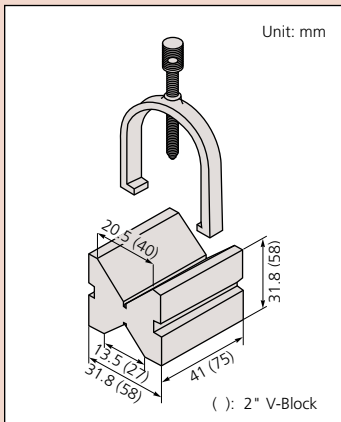
Measuring contact force of relay



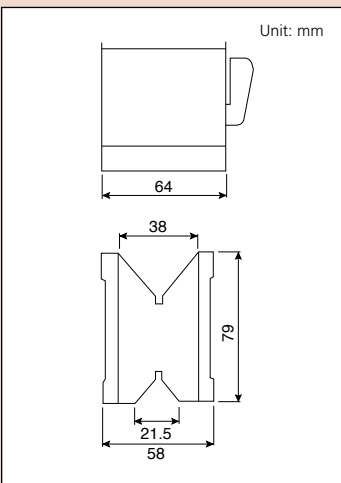
DIMENSIONS



DIMENSIONS



DIMENSIONS



Dial Tension Gages

SERIES 546

FEATURES

- Can measure dynamic tension in Newton (N) units.
- Dial Tension Gages are widely used to determine the contact force of other measuring instruments, as well as that of electrical relays, micro-switches, valves and precision springs.
- Convenient peak-hold type gages are also available.



SPECIFICATIONS

Standard

| Range | Order No. | Minimum reading |
|--------------|-----------|-----------------|
| 6mN - 50mN | 546-112 | 2mN |
| 10mN - 100mN | 546-113 | 5mN |
| 30mN - 300mN | 546-114 | 10mN |
| 0.06N - 0.5N | 546-115 | 0.02N |
| 0.1N - 1N | 546-116 | 0.05N |
| 0.15N - 1.5N | 546-117 | 0.05N |
| 0.3N - 3N | 546-118 | 0.1N |
| 0.6N - 5N | 546-119 | 0.2N |

Peak hold

| Range | Order No. | Graduation |
|--------------|-----------|------------|
| 10mN - 100mN | 546-133 | 5mN |
| 30mN - 300mN | 546-134 | 10mN |
| 0.06N - 0.5N | 546-135 | 0.02N |
| 0.1N - 1N | 546-136 | 0.05N |
| 0.15N - 1.5N | 546-137 | 0.05N |
| 0.3N - 3N | 546-138 | 0.1N |
| 0.6N - 5N | 546-139 | 0.2N |

V-Block Sets

SERIES 181

FEATURES

- Two V-blocks per set.
- Magnetic type is available. (The magnetic V-block is not provided with a workpiece clamp.)



SPECIFICATIONS

Inch

| Max. workpiece dia. | Order No. | Thread Size | Remarks | Mass(g) |
|---------------------|------------|-------------|------------|---------|
| 1" | 181-901-10 | UNC 1/4"-20 | With clamp | 750 |
| 2" | 181-904-10 | 5/16"-18NC | With clamp | 3600 |

Magnetic V-Block

SERIES 181

SPECIFICATIONS

Metric

| Max. workpiece dia. | Order No. | Magnetic Pull | Remarks |
|---------------------|-----------|---------------|---------|
| 50mm | 181-146 | 60 kg | 1 Piece |

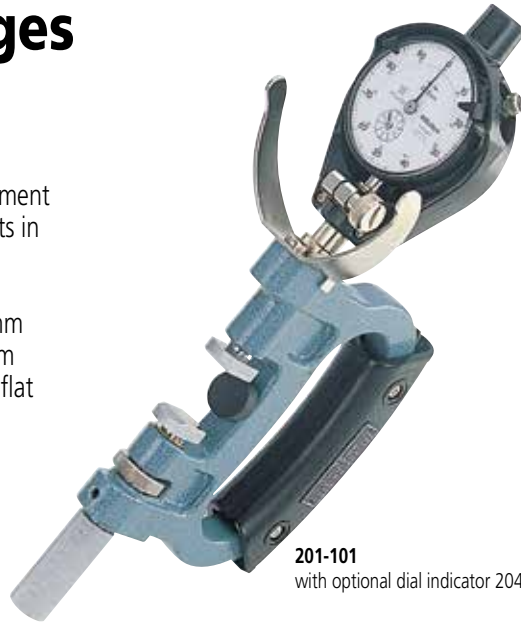


Dial Snap Gages

SERIES 201

FEATURES

- Designed for quick go/no-go judgment of diameters of cylinders and shafts in machining processes.
- Dial indicator is optional.
- Anvil retracting stroke: .078" / 2mm
- Anvil positioning range: 1" / 25mm
- Wide (.53 x .47" / 13.5 x 12mm), flat carbide anvils
- Both front edges of the anvil are chamfered for easy insertion.



201-101
with optional dial indicator 2046SB

SPECIFICATIONS

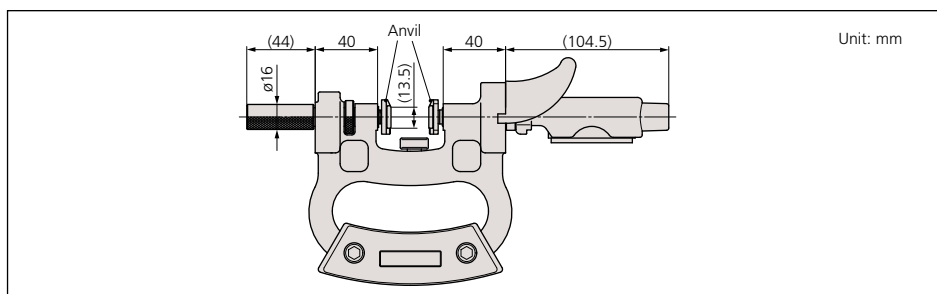
Metric — Gage stem diameter 8mm

| Range | Order No. | Parallelism | Measuring force | Recommended dial indicator (optional) |
|-------------|----------------|-------------|-----------------|--|
| 0 - 25mm | 201-101 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 25 - 50mm | 201-102 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 50 - 75mm | 201-103 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 75 - 100mm | 201-104 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 100 - 125mm | 201-105 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 125 - 150mm | 201-106 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 150 - 175mm | 201-107 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 175 - 200mm | 201-108 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 200 - 225mm | 201-109 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 225 - 250mm | 201-110 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 250 - 275mm | 201-111 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |
| 275 - 300mm | 201-112 | 5µm or less | 15N±3N | 2046SB (0.01mm reading), 2109SB-10 (0.001mm reading) |

Inch — Gage stem diameter 3/8"

| Range | Order No. | Parallelism | Measuring force | Recommended dial indicator (optional) |
|----------|----------------|-----------------|-----------------|---------------------------------------|
| 0 - 1" | 201-151 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 1 - 2" | 201-152 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 2 - 3" | 201-153 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 3 - 4" | 201-154 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 4 - 5" | 201-155 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 5 - 6" | 201-156 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 6 - 7" | 201-157 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 7 - 8" | 201-158 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 8 - 9" | 201-159 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 9 - 10" | 201-160 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 10 - 11" | 201-161 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |
| 11 - 12" | 201-162 | .00025" or less | 15N±3N | 2803SB-10 (.0001" reading) |

DIMENSIONS



Technical Data

Accuracy: Refer to the list of specifications
 Anvil retracting stroke: .078" / 2mm
 Anvil positioning range: 1" / 25mm
 Anvil flatness: .00004" / 1µm