



# Precision Measuring Instruments

Catalog No.5002

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02-214-0101

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# BORE GAUGES & MICRO-HOLE TEST

## Bore Gauges

Bore gauge is the comparative measuring instrument which measures internal diameter of a hole by comparing with master gauge (micrometer, ring gauge etc.) Center of probe and anvil are guided to diameter part of a hole by guide assembly, and displacement of contact point is transferred to dial indicator by right angle change in the ratio of 1:1 with cam mechanism. Measurement accuracy is changed according to graduation (resolution) of used dial indicator. Measuring range are available from  $\phi$  6mm to  $\phi$  450mm according to size of diameter.

## Micro-Hole test

This is designed for measuring diameter of small holes exclusively and can measures diameters from minimum  $\phi$  1.7mm to maximum  $\phi$  10mm. When the edge of probe is inserted to a small hole, the edge is closed to inside and presses inner driving rod upward. The principle is that movement is transferred to the contact point and instructs to dial indicator. Swing width of dial graduation is read as well as bore gauge. It is a marked characteristic that stability accuracy indicating performance is high as 2  $\mu$ m.



## Bore Gauge (CN type)

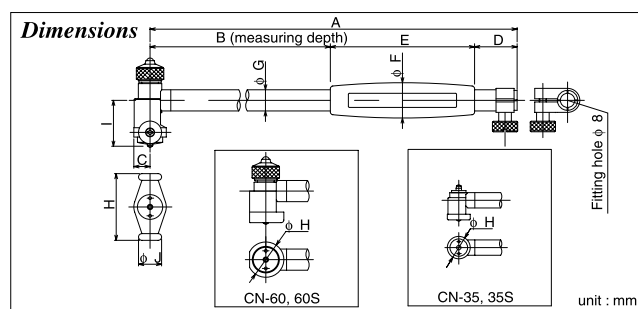


**CN-150**

Measuring Range 50 ~150mm  
The dial indicator is optional.

**CN-35S**

Short size  
Measuring Range 18 ~ 35mm  
The dial indicator is optional.



**Dimension Table**

| Model         | A     | B   | C  | D    | E   | $\phi$ F | $\phi$ G | H           | I    | $\phi$ J |
|---------------|-------|-----|----|------|-----|----------|----------|-------------|------|----------|
| <b>CN-35</b>  | 214.6 | 103 | 6  | 23.6 | 82  | 20       | 8.7      | $\phi$ 12.7 | 11.2 | —        |
| <b>CN-60</b>  | 262.6 | 150 | 9  | 23.6 | 80  | 20       | 12       | $\phi$ 20   | 17.5 | —        |
| <b>CN-100</b> | 262.6 | 150 | 9  | 23.6 | 80  | 20       | 12       | 37.8        | 26   | 12.8     |
| <b>CN-150</b> | 262.6 | 150 | 9  | 23.6 | 80  | 20       | 12       | 37.8        | 26   | 12.8     |
| <b>CN-160</b> | 262.6 | 150 | 9  | 23.6 | 80  | 20       | 12       | 46.4        | 39   | 12.8     |
| <b>CN-250</b> | 386.6 | 250 | 13 | 23.6 | 100 | 21       | 15       | 89          | 88.5 | 19.8     |
| <b>CN-400</b> | 386.6 | 250 | 13 | 23.6 | 100 | 21       | 15       | 89          | 88.5 | 19.8     |
| <b>CN-450</b> | 386.6 | 250 | 13 | 23.6 | 100 | 21       | 15       | 120         | 88.5 | 19.8     |

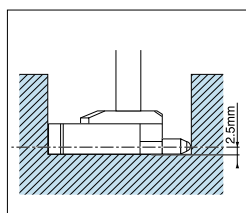
unit : mm

**Dimension Table: Short size**

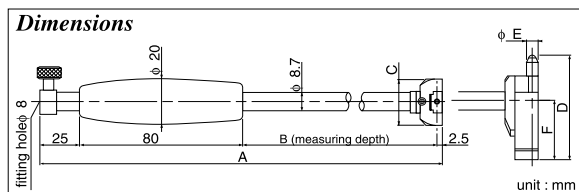
| Model          | A     | B   | C  | D    | E   | $\phi$ F | $\phi$ G | H           | I    | $\phi$ J |
|----------------|-------|-----|----|------|-----|----------|----------|-------------|------|----------|
| <b>CN-35S</b>  | 161.6 | 50  | 6  | 23.6 | 82  | 20       | 8.7      | $\phi$ 12.7 | 11.2 | —        |
| <b>CN-60S</b>  | 162.6 | 50  | 9  | 23.6 | 80  | 20       | 12       | $\phi$ 20   | 17.5 | —        |
| <b>CN-100S</b> | 162.6 | 50  | 9  | 23.6 | 80  | 20       | 12       | 37.8        | 26   | 12.8     |
| <b>CN-150S</b> | 162.6 | 50  | 9  | 23.6 | 80  | 20       | 12       | 37.8        | 26   | 12.8     |
| <b>CN-160S</b> | 162.6 | 50  | 9  | 23.6 | 80  | 20       | 12       | 46.4        | 39   | 12.8     |
| <b>CN-250S</b> | 286.6 | 150 | 13 | 23.6 | 100 | 21       | 15       | 89          | 88.5 | 19.8     |
| <b>CN-400S</b> | 286.6 | 150 | 13 | 23.6 | 100 | 21       | 15       | 89          | 88.5 | 19.8     |
| <b>CN-450S</b> | 286.6 | 150 | 13 | 23.6 | 100 | 21       | 15       | 120         | 88.5 | 19.8     |

unit : mm

## Bore Gauge (CN type) for shallow hole



Internal measurement is possible at the position from shallow hole bottom by 2.5mm.



**Dimension Table**

| Model           | A     | B   | C  | D    | E | F    |
|-----------------|-------|-----|----|------|---|------|
| <b>CN-35F</b>   | 257.5 | 150 | 10 | 15.7 | 5 | 9.7  |
| <b>CN-60F</b>   | 257.5 | 150 | 18 | 35.7 | 5 | 14.7 |
| <b>CN-150F</b>  | 257.5 | 150 | 27 | 50.7 | 5 | 23.7 |
| <b>CN-35FS</b>  | 157.5 | 50  | 10 | 15.7 | 5 | 9.7  |
| <b>CN-60FS</b>  | 157.5 | 50  | 18 | 35.7 | 5 | 14.7 |
| <b>CN-150FS</b> | 157.5 | 50  | 27 | 50.7 | 5 | 23.7 |

unit : mm



**CN-35F**

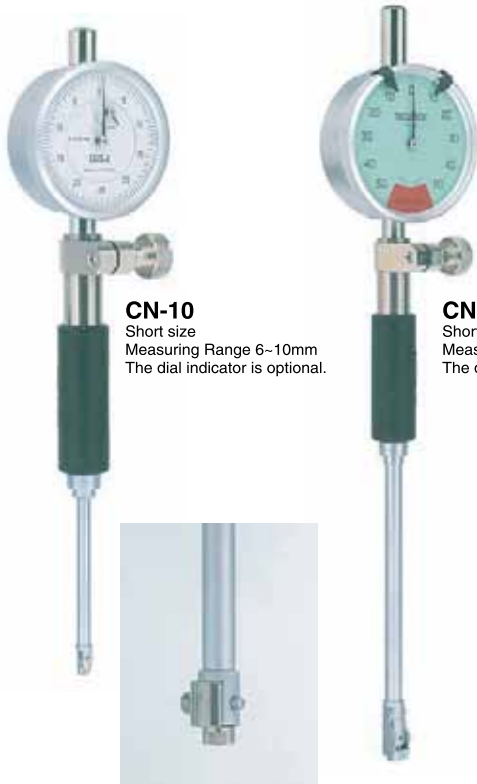
Measuring Range 15 ~ 35mm  
The dial indicator is optional.





## BORE GAUGES & MICRO-HOLE TEST

### Bore Gauge (CN type) for small holes

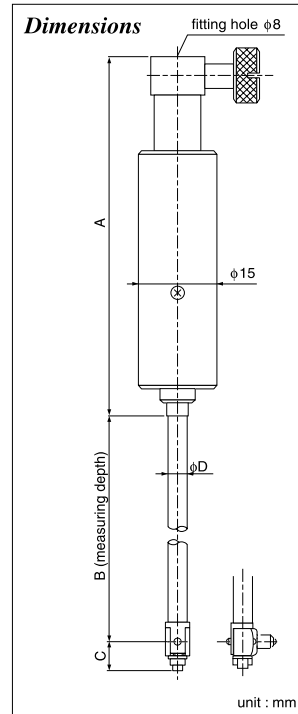


**CN-10**

Short size  
Measuring Range 6~10mm  
The dial indicator is optional.

**CN-18**

Short size  
Measuring Range 10~18.5mm  
The dial indicator is optional.



**Dimension Table**

| Model | A    | B   | C   | D |
|-------|------|-----|-----|---|
| CN-10 | 80   | 49  | 5.4 | 4 |
| CN-18 | 76.7 | 100 | 8.5 | 6 |

unit : mm

#### Specifications: Bore Gauges (CN type) for small holes

| Model | Measuring Range (mm) | Probe Depth (mm) | Number of Anvils | Number of Washers | Sub Anvil | Weight (g) |
|-------|----------------------|------------------|------------------|-------------------|-----------|------------|
| CN-10 | 6~10                 | 49               | 9pcs.            | —                 | —         | 70         |
| CN-18 | 10~18.5              | 100              | 9pcs.            | 1                 | —         | 80         |

#### Specifications

| Model  | Measuring Range (mm) | Probe Depth (mm) | Number of Anvils    | Number of Washers | Sub Anvil | Weight (g) |
|--------|----------------------|------------------|---------------------|-------------------|-----------|------------|
| CN-35  | 18~35                | 103              | 9pcs./2mm incream.  | 2                 | —         | 145        |
| CN-60  | 35~60                | 150              | 6pcs./5mm incream.  | 4                 | —         | 210        |
| CN-100 | 50~100               | 150              | 11pcs./5mm incream. | 4                 | —         | 240        |
| CN-150 | 50~150               | 150              | 11pcs./5mm incream. | 4                 | 50        | 280        |
| CN-160 | 100~160              | 150              | 13pcs./5mm incream. | 4                 | —         | 330        |
| CN-250 | 160~250              | 250              | 6pcs./15mm incream. | 7                 | 50        | 740        |
| CN-400 | 250~400              | 250              | 5pcs./15mm incream. | 7                 | 75        | 1,000      |
| CN-450 | 250~450              | 250              | 5pcs./15mm incream. | 7                 | 50,75     | 1,050      |

#### Specifications: Bore Gauges (CN type) for shallow hole

| Model    | Measuring Range (mm) | Probe Depth (mm) | Number of Anvils    | Number of Washers | Sub Anvil | Weight (g) |
|----------|----------------------|------------------|---------------------|-------------------|-----------|------------|
| CN-35F   | 15~35                | 150              | 9pcs./2mm incream.  | 1                 | 10        | 160        |
| CN-60F   | 35~60                | 150              | 6pcs./5mm incream.  | 4                 | —         | 180        |
| CN-150F  | 50~150               | 150              | 11pcs./5mm incream. | 4                 | 50        | 220        |
| CN-35FS  | 15~35                | 50               | 9pcs./2mm incream.  | 1                 | 10        | 130        |
| CN-60FS  | 35~60                | 50               | 6pcs./5mm incream.  | 4                 | —         | 150        |
| CN-150FS | 50~150               | 50               | 11pcs./5mm incream. | 4                 | 50        | 190        |

#### Specifications: Short size

| Model   | Measuring Range (mm) | Probe Depth (mm) | Number of Anvils    | Number of Washers | Sub Anvil | Weight (g) |
|---------|----------------------|------------------|---------------------|-------------------|-----------|------------|
| CN-35S  | 18 35                | 50               | 9pcs./2mm incream.  | 2                 | —         | 125        |
| CN-60S  | 35 60                | 50               | 6pcs./5mm incream.  | 4                 | —         | 160        |
| CN-100S | 50 100               | 50               | 11pcs./5mm incream. | 4                 | —         | 190        |
| CN-150S | 50 150               | 50               | 11pcs./5mm incream. | 4                 | 50        | 230        |
| CN-160S | 100 160              | 50               | 13pcs./5mm incream. | 4                 | —         | 280        |
| CN-250S | 160 250              | 150              | 6pcs./15mm incream. | 7                 | 50        | 660        |
| CN-400S | 250 400              | 150              | 5pcs./15mm incream. | 7                 | 75        | 920        |
| CN-450S | 250 450              | 150              | 5pcs./15mm incream. | 7                 | 50,75     | 970        |



## Parts

### Interchangeable rods (anvils), Washers and Extension rods (sub anvils)

| Model               | Part<br>Nominal No. | Extension<br>rods<br>(sub anvils) | Interchangeable rods (anvils) |          |        |        |        |        |         |        |        |        |        |        |        | Washers |        |        |        |        |        |        |
|---------------------|---------------------|-----------------------------------|-------------------------------|----------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|
|                     |                     |                                   | No.1                          | No.2     | No.3   | No.4   | No.5   | No.6   | No.7    | No.8   | No.9   | No.10  | No.11  | No.12  | No.13  | 0.5     | 1mm    | 2mm    | 3mm    | 4mm    | 5mm    | 6mm    |
| CN-10               | NML                 |                                   | 6                             | 6.5      | 7      | 7.5    | 8      | 8.5    | 9       | 9.5    | 10     |        |        |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-300                        | ZJ-301   | ZJ-302 | ZJ-303 | ZJ-304 | ZJ-305 | ZJ-306  | ZJ-307 | ZJ-308 |        |        |        |        |         |        |        |        |        |        |        |
| CN-18               | NML                 |                                   | 10                            | 11       | 12     | 13     | 14     | 15     | 16      | 17     | 18     |        |        |        |        | ZJ-343  |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-310                        | ZJ-311   | ZJ-312 | ZJ-313 | ZJ-314 | ZJ-315 | ZJ-316  | ZJ-317 | ZJ-318 |        |        |        |        |         |        |        |        |        |        |        |
| CN-35<br>CN-35S     | NML                 |                                   | 18                            | 20       | 22     | 24     | 26     | 28     | 30      | 32     | 34     |        |        |        |        | ZJ-382  | ZJ-383 |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-350                        | ZJ-351   | ZJ-352 | ZJ-353 | ZJ-354 | ZJ-355 | ZJ-356  | ZJ-357 | ZJ-358 |        |        |        |        |         |        |        |        |        |        |        |
| CN-60<br>CN-60S     | NML                 |                                   | 35                            | 40       | 45     | 50     | 55     | 60     |         |        |        |        |        |        |        | ZJ-384  | ZJ-385 | ZJ-386 | ZJ-387 |        |        |        |
|                     | code No.            |                                   | ZJ-360                        | ZJ-361   | ZJ-362 | ZJ-363 | ZJ-364 | ZJ-365 |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
| CN-100<br>CN-100S   | NML                 |                                   | 50                            | 55       | 60     | 65     | 70     | 75     | 80      | 85     | 90     | 95     | 100    |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-360                        | ZJ-361   | ZJ-362 | ZJ-363 | ZJ-364 | ZJ-365 | ZJ-366  | ZJ-367 | ZJ-368 | ZJ-369 | ZJ-370 |        |        |         |        |        |        |        |        |        |
| CN-150<br>CN-150S   | NML                 |                                   | 50                            | 55       | 60     | 65     | 70     | 75     | 80      | 85     | 90     | 95     | 100    |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-360                        | ZJ-361   | ZJ-362 | ZJ-363 | ZJ-364 | ZJ-365 | ZJ-366  | ZJ-367 | ZJ-368 | ZJ-369 | ZJ-370 |        |        |         |        |        |        |        |        |        |
| CN-160<br>CN-160S   | NML                 | 50mm                              | (100)                         | 105      | 110    | 115    | 120    | 125    | 130     | 135    | 140    | 145    | 150    |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-379                        | (ZJ-360) | ZJ-361 | ZJ-362 | ZJ-363 | ZJ-364 | ZJ-365  | ZJ-366 | ZJ-367 | ZJ-368 | ZJ-369 | ZJ-370 |        |         |        |        |        |        |        |        |
| CN-250<br>CN-250S   | NML                 |                                   | 100                           | 105      | 110    | 115    | 120    | 125    | 130     | 135    | 140    | 145    | 150    | 155    | 160    |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-360                        | ZJ-361   | ZJ-362 | ZJ-363 | ZJ-364 | ZJ-365 | ZJ-366  | ZJ-367 | ZJ-368 | ZJ-369 | ZJ-370 | ZJ-371 | ZJ-372 |         |        |        |        |        |        |        |
| CN-400<br>CN-400S   | NML                 |                                   | 160                           | 175      | 190    | 205    | 220    | 235    |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-373                        | ZJ-374   | ZJ-375 | ZJ-376 | ZJ-377 | ZJ-378 |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
| CN-450<br>CN-450S   | NML                 |                                   | 250                           | 265      | 280    | 295    | 310    |        |         |        |        |        |        |        |        | ZJ-388  | ZJ-389 | ZJ-390 | ZJ-391 | ZJ-392 | ZJ-393 | ZJ-394 |
|                     | code No.            |                                   | ZJ-373                        | ZJ-374   | ZJ-375 | ZJ-376 | ZJ-377 |        |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
| CN-450<br>CN-450S   | NML                 | 75mm                              | 325                           | 340      | 355    | 370    | 385    | 400    |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-380                        | ZJ-373   | ZJ-374 | ZJ-375 | ZJ-376 | ZJ-377 | *ZJ-377 |        |        |        |        |        |        |         |        |        |        |        |        |        |
| CN-35F<br>CN-35FS   | NML                 |                                   | 250                           | 265      | 280    | 295    | 310    |        |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-373                        | ZJ-374   | ZJ-375 | ZJ-376 | ZJ-377 |        |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
| CN-60F<br>CN-60FS   | NML                 | 75mm                              | 325                           | 340      | 355    | 370    | 385    | 400    |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-380                        | ZJ-373   | ZJ-374 | ZJ-375 | ZJ-376 | ZJ-377 | *ZJ-377 |        |        |        |        |        |        |         |        |        |        |        |        |        |
| CN-150F<br>CN-150FS | NML                 | 50mm                              | 375                           | 390      | 405    | 420    | 435    | 450    |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-381                        | ZJ-373   | ZJ-374 | ZJ-375 | ZJ-376 | ZJ-377 | *ZJ-377 |        |        |        |        |        |        |         |        |        |        |        |        |        |
| CN-35F<br>CN-35FS   | NML                 |                                   | 15                            | 16       | 17     | 18     | 19     | 20     | 21      | 22     | 23     | 24     | 25     |        |        | ZJ-344  |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-319                        | ZJ-320   | ZJ-321 | ZJ-322 | ZJ-323 | ZJ-324 | ZJ-325  | ZJ-326 | ZJ-327 | ZJ-328 | ZJ-329 |        |        |         |        |        |        |        |        |        |
| CN-60F<br>CN-60FS   | NML                 | 10mm                              | (25)                          | 26       | 27     | 28     | 29     | 30     | 31      | 32     | 33     | 34     | 35     |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-341                        | ZJ-319   | ZJ-320 | ZJ-321 | ZJ-322 | ZJ-323 | ZJ-324  | ZJ-325 | ZJ-326 | ZJ-327 | ZJ-328 | ZJ-329 |        |         |        |        |        |        |        |        |
| CN-150F<br>CN-150FS | NML                 |                                   | 35                            | 40       | 45     | 50     | 55     | 60     |         |        |        |        |        |        |        | ZJ-344  | ZJ-345 | ZJ-346 | ZJ-347 |        |        |        |
|                     | code No.            |                                   | ZJ-330                        | ZJ-331   | ZJ-332 | ZJ-333 | ZJ-334 | ZJ-335 |         |        |        |        |        |        |        |         |        |        |        |        |        |        |
|                     | NML                 | 50mm                              | (100)                         | 105      | 110    | 115    | 120    | 125    | 130     | 135    | 140    | 145    | 150    |        |        |         |        |        |        |        |        |        |
|                     | code No.            |                                   | ZJ-342                        | (ZJ-330) | ZJ-331 | ZJ-332 | ZJ-333 | ZJ-334 | ZJ-335  | ZJ-336 | ZJ-337 | ZJ-338 | ZJ-339 | ZJ-340 |        |         |        |        |        |        |        |        |

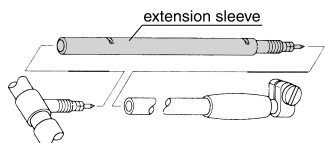
NML : Nominal measuring length \* : Using washers.

### Extension sleeves

| Length (mm)                | CN-35  | CN-60~<br>CN-160 | CN-250~<br>CN-450 |
|----------------------------|--------|------------------|-------------------|
| 125                        | ZJ-400 | ZJ-403           | ZJ-408            |
| 250                        | ZJ-401 | ZJ-404           | ZJ-409            |
| 500                        | ZJ-402 | ZJ-405           | ZJ-410            |
| 750                        | —      | ZJ-406           | ZJ-411            |
| 1000                       | —      | ZJ-407           | ZJ-412            |
| Extension sleeve dia. (mm) | φ 8.7  | φ 12             | φ 15              |
| Spanner                    | ZZ-018 | ZZ-019           |                   |

Can not be used for CN-10, 18, 35F, 60F, 150F.

In case of measuring deep holes which can not be measured by standard bore gauge, measuring depth is extended by extension sleeve.



Extension sleeve is to be 1 unit as it may cause bend and error.

### Dial Gauge Protection Cover (ZY-094)



This is protection cover for conventional bore gauge and can not be used for Micro-hole test.

### Extension Rods and Washer Set

| Code No. | Model      |
|----------|------------|
| ZJ-918   | CN-10      |
| ZJ-919   | CN-18      |
| ZJ-920   | CN-35F     |
| ZJ-921   | CN-60F     |
| ZJ-922   | CN-150F    |
| ZJ-923   | CN-35      |
| ZJ-924   | CN-60      |
| ZJ-925   | CN-100*150 |
| ZJ-926   | CN-160     |
| ZJ-927   | CN-250     |
| ZJ-928   | CN-400*450 |



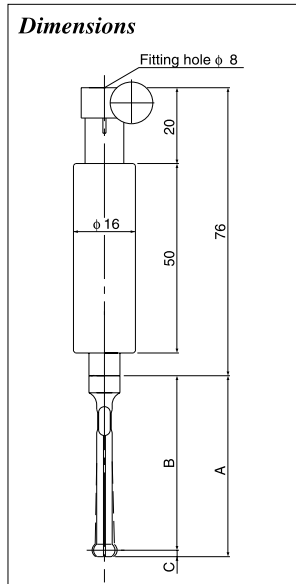
## BORE GAUGES & MICRO-HOLE TEST

### Micro-Hole test

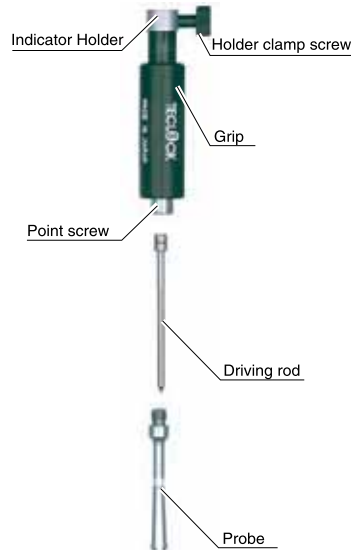
- It can comply with measuring internal diameter from minimum  $\phi$  1.7mm to maximum  $\phi$  10mm.
- It has realized stability accuracy  $2\mu\text{m}$ , even though it is applied for small internal diameter which is difficult to measure.
- It realizes smooth operation with hard chrome plating. It can be naturally inserted to small internal diameter and obtain stable indication value.
- In case the measuring range is limited, it is possible to select required contact point.



**MT-10N**  
Measuring Range 6~10mm  
The dial indicator is optional.



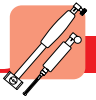
#### Deal drawing



#### Specifications

| Model  | Measuring Range (mm) | Probe           |     |                      |                      |     |              | Accessories  |                |         | Indication Error (μm) | Repeatability (μm) | Weight (g) |   |   |   |     |     |     |
|--------|----------------------|-----------------|-----|----------------------|----------------------|-----|--------------|--------------|----------------|---------|-----------------------|--------------------|------------|---|---|---|-----|-----|-----|
|        |                      | Number of probe | No. | Measuring Range (mm) | Probe dimension (mm) |     |              | Driving rod  | Extension rods | Spanner |                       |                    |            |   |   |   |     |     |     |
|        |                      |                 |     |                      | A                    | B   | C            |              |                |         |                       |                    |            |   |   |   |     |     |     |
| MT-3N  | 1.7~3.2              | 4               | 012 | 1.70~2.10            | 25.3                 | 17  | 0.9          | Driving rod1 | 1              | 1       | 8                     | 2                  | 100        |   |   |   |     |     |     |
|        |                      |                 | 013 | 2.10~2.40            |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |
|        |                      |                 | 014 | 2.30~2.70            | 30.6                 | 22  | 1.2          | Driving rod2 |                |         |                       |                    |            | 1 | 1 | 8 | 2   | 100 |     |
|        |                      |                 | 015 | 2.70~3.20            |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |
| MT-4N  | 2.7~4.3              | 4               | 015 | 2.70~3.20            | 30.6                 | 22  | 1.2          |              | Driving rod2   | 1       | 1                     | 8                  | 2          |   |   |   |     |     | 100 |
|        |                      |                 | 016 | 3.10~3.50            |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |
|        |                      |                 | 017 | 3.40~3.80            | 30.6                 | 22  | 2.0          | Driving rod3 |                |         |                       |                    |            | 1 | 1 | 8 | 2   | 100 |     |
|        |                      |                 | 018 | 3.80~4.30            |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |
| MT-6N  | 3.8~6.2              | 4               | 018 | 3.80~4.30            | 30.6                 | 22  | 2.0          |              | Driving rod3   | 1       | 1                     | 8                  | 2          |   |   |   |     |     | 100 |
|        |                      |                 | 021 | 4.20~5.00            |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |
|        |                      |                 | 022 | 4.70~5.50            | 47.3                 | 40  | 2.0          | Driving rod3 |                |         |                       |                    |            | 1 | 1 | 8 | 2   | 100 |     |
|        |                      |                 | 023 | 5.30~6.20            |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |
| MT-10N | 6.0~10.0             | 6               | 024 | 6.00~6.80            | 47.3                 | 40  | 2.0          |              | Driving rod3   | 1       | 1                     | 8                  | 2          |   |   |   |     |     | 100 |
|        |                      |                 | 025 | 6.60~7.50            |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |
|        |                      |                 | 026 | 7.30~8.10            |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |
|        |                      |                 | 027 | 8.00~8.80            |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |
|        |                      |                 | 028 | 8.50~9.40            | 50                   | 2.0 | Driving rod3 | 1            |                |         |                       |                    |            | 1 | 8 | 2 | 100 |     |     |
|        |                      |                 | 029 | 9.20~10.00           |                      |     |              |              |                |         |                       |                    |            |   |   |   |     |     |     |

## BORE GAUGES & MICRO-HOLE TEST



### Technical Data

- Dial indicator can be installed to bore gauges and Micro-hole Test. It is selectable for easier reading in compliance with objective and dimension range.



As to dial indicator installed to bore gauge, dial indicator with flat back is recommended. Lug back is standard for ordinary dial indicators but it will be with flat back by adding suffix "f" to the end of model name. TM-105 and TM-37C dial indicator is supplied with Flat back as standard.

| Measuring purpose                                   | Applicable Models (with flat back)                                                   |                                                                                                                                     |
|-----------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Graduation 0.001mm                                  |    | <b>TM-1201f</b><br>(Measuring Range 1mm)<br><b>TM-1202f</b><br>(Measuring Range 2mm)                                                |
| Graduation 0.001mm<br>Continuous Dial               |    | <b>TM-1251f</b><br>(Measuring Range 1mm)                                                                                            |
| Graduation 0.001mm<br>One Revolution Dial Indicator |    | <b>TM-1200f</b><br>(Measuring Range 0.16mm)                                                                                         |
| Graduation 0.01mm                                   |    | <b>TM-105</b><br>(Measuring Range 5mm)                                                                                              |
| Graduation 0.01mm<br>One Revolution Dial Indicator  |  | <b>TM-102f</b><br>(Measuring Range 1mm)                                                                                             |
| Small Dial Indicators                               |  | <b>TM-36f</b><br>( Graduation 0.005mm<br>Measuring Range 3.5mm )<br><b>TM-37C</b><br>( Graduation 0.01mm<br>Measuring Range 3.5mm ) |

## OTHER PRECISION MEASURING INSTRUMENTS



### Calibration Tester

- FM-10 is an calibration device to check accuracy of dial indicators, test indicators, back plunger type dial indicators and bore gauges. Accuracy of various gauges mentioned in the following list can be measured according to combination of various units. Optional Pole (ZY-095) is needed for 400~600mm measuring range bore gauges.



Dial Indicator



Dial Test Indicator

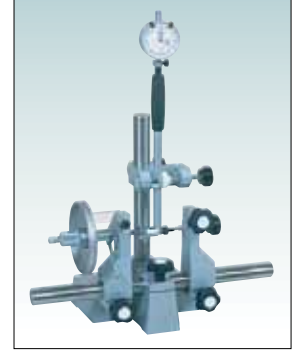
#### FM-10

With a certificate of calibration  
Graduation 0.001mm  
Measuring Range 25mm  
Weight 9kg

Used Micrometer Head  
Pitch 0.5mm  
Range 25mm  
Sleeve graduation 1μm  
Instrumental error ± 1μm



Back Plunger Dial Indicator



Bore Gauge

#### Applicable gauges and industrial standard

|                                   |            |
|-----------------------------------|------------|
| 0.01mm Dial Indicators            | JIS B 7503 |
| 0.01mm Dial Indicators (20mm)     | JAMS 2001  |
| 0.001mm Dial Indicators           | JIS B 7503 |
| Small Dial Indicators             | JAMS 2001  |
| Test Indicator                    | JIS B 7533 |
| Back Plunger Type Dial Indicators | —          |
| Bore Gauges                       | JIS B 7515 |
| Bore Gauges for small holes       | JAMS 2009  |