

# Dial Indicators

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

## Optional Accessories

- Limit hand (2 pcs.): **21AZB195**
- Bezel clamp: **21AZB148**

## FEATURES

| Metric    |           |          |         |       |                 |            |                |              |                     |
|-----------|-----------|----------|---------|-------|-----------------|------------|----------------|--------------|---------------------|
| Order No. |           |          |         |       |                 |            |                |              |                     |
| w/lug     | Flat-back | 1/10 Rev | 1/2 Rev | 1 Rev | Measuring range | Hysteresis | Repeat-ability | Dial reading | Measuring force (N) |
| 2050A     | 2050AB    | ✓        |         |       |                 |            |                | ±0-100       | 2.0 or less         |
| 2050A-60  | 2050AB-60 | ✓        |         |       |                 |            |                | ±0-100       | 2.5 or less         |
| 2050A-19  | 2050AB-19 | ✓        |         |       |                 |            |                | ±0-100       | 2.0 or less         |
| 2320A-10  | 2320AB-10 | ✓        |         |       |                 |            |                | ±0-100       | 2.0 or less         |
| 2052A     | 2052AB    | ✓        |         |       |                 |            |                | ±0-100       | 2.5 or less         |
| 2052A-19  | 2052AB-19 | ✓        |         |       |                 |            |                | ±0-100       | 2.5 or less         |
| 2330A-10  | 2330AB-10 | ✓        |         |       |                 |            |                | ±0-100       | 2.5 or less         |
| 2952A     | 2952AB    | ✓        |         |       |                 |            |                | 100-0        | 2.5 or less         |

## SPECIFICATIONS

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

\* 2050A-60 and 2050AB-60 are water-proof types that use a rubber bellows to cover the spindle.

Note that the outer diameter of the bellows (ø9.5) is larger than that of the stem (ø8).

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

| Inch      |           |          |         |       |                 |            |                |              |                     |
|-----------|-----------|----------|---------|-------|-----------------|------------|----------------|--------------|---------------------|
| Order No. |           |          |         |       |                 |            |                |              |                     |
| w/lug     | Flat-back | 1/10 Rev | 1/2 Rev | 1 Rev | Measuring range | Hysteresis | Repeat-ability | Dial reading | Measuring force (N) |
| 2416A     | 2416AB    | ✓        |         |       |                 |            |                | ±0-100       | 1.8 or less         |
| 2416A-06  | 2416AB-06 | ✓        |         |       |                 |            |                | ±0-100       | 1.8 or less         |
| 2416A-10  | 2416AB-10 | ✓        |         |       |                 |            |                | ±0-100       | 1.8 or less         |
| 2417A     | 2417AB    | ✓        |         |       |                 |            |                | 0-50-0       | 1.8 or less         |
| 2424A-19  | 2424AB-19 | ✓        |         |       |                 |            |                | ±0-100       | 2.5 or less         |
| 2776A     | 2776AB    | ✓        |         |       |                 |            |                | ±0-50        | 2.5 or less         |
| 2904A     | 2904AB    | ✓        |         |       |                 |            |                | 100-0        | 1.8 or less         |

| Inch     |           | Graduation (in) | Range (range/rev) (in) | Accuracy (in)                                 |         | Repeat-ability (in) | Dial reading | Measuring force (N) |
|----------|-----------|-----------------|------------------------|-----------------------------------------------|---------|---------------------|--------------|---------------------|
| w/lug    | Flat-back |                 |                        | First 1 Rev/2.5 Rev/10 Rev                    | Retrace |                     |              |                     |
| 2416A    | 2416AB    | 0.001           | 1 (0.1)                | ±0.001/±0.001/±0.002                          | 0.0002  | ±0.0002             | ±0-100       | 1.8 or less         |
| 2416A-06 | 2416AB-06 | 0.001           | 1 (0.1)                | ±0.001/±0.001/±0.002                          | 0.0002  | ±0.0002             | ±0-100       | 1.8 or less         |
| 2416A-10 | 2416AB-10 | 0.001           | 1 (0.1)                | ±0.001/±0.001/±0.002                          | 0.0002  | ±0.0002             | ±0-100       | 1.8 or less         |
| 2417A    | 2417AB    | 0.001           | 1 (0.1)                | ±0.001/±0.001/±0.002                          | 0.0002  | ±0.0002             | 0-50-0       | 1.8 or less         |
| 2424A-19 | 2424AB-19 | 0.001           | 2 (0.1)                | ±0.001/±0.001/±0.002/±0.003 (First 20 Rev)    | 0.00033 | ±0.0002             | ±0-100       | 2.5 or less         |
| 2776A    | 2776AB    | 0.0005          | 1 (0.05)               | ±0.0005/±0.0005/±0.0015/±0.002 (First 20 Rev) | 0.0002  | ±0.0001             | ±0-50        | 2.5 or less         |
| 2904A    | 2904AB    | 0.001           | 1 (0.1)                | ±0.001/±0.001/±0.002                          | 0.0002  | ±0.0002             | 100-0        | 1.8 or less         |

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

## DIMENSIONS

**ISO/JIS Type**

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

Unit: mm

**ANSI/AGD Type**

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

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

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