

MarCator ANSI/AGD Dial Indicators

OVERVIEW

| Dial Indicators Selection Guide | | | | | | |
|---------------------------------|----------------|--------------|--------------------|---------------------|-----------------|------------------|
| Grad | Range per Rev. | Total Range | Dial Style w/o Rev | Dial Style with Rev | Order number | |
| | | | | | w/o Rev Counter | with Rev Counter |
| Group 0 | | | | | | |
| <i>.0001"</i> | <i>.004"</i> | <i>.010"</i> | 0-2-0 | - | A1/2Q | |
| <i>.0001"</i> | <i>.010"</i> | <i>.025"</i> | 0-5-0 | - | A2I | |
| <i>.0005"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | - | A3Q | |
| <i>.001"</i> | <i>.040"</i> | <i>.100"</i> | 0-20-0 | - | A6Q | |
| .002 mm | .100 | .250 | 0-5-0 | - | N1/2O | |
| .005 mm | .500 | 1.25 | 0-25-0 | - | N3I | |
| .010 mm | 1.00 | 2.50 | 0-50-0 | - | N6I | |
| Group 1 | | | | | | |
| <i>.0001"</i> | <i>.010"</i> | <i>.025"</i> | 0-5-0 | 0-10 | 12I | 12I-RC |
| <i>.00025"</i> | <i>.010"</i> | <i>.025"</i> | 0-5-0 | 0-10 | 12Q | 12Q-RC |
| <i>.00025"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | B3K | B3K-RC |
| <i>.0005"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | B3Q | B3Q-RC |
| <i>.0005"</i> | <i>.030"</i> | <i>.075"</i> | 0-15-0 | 0-30 | B5M | B5M-RC |
| <i>.0005"</i> | <i>.040"</i> | <i>.100"</i> | 0-20-0 | 0-40 | B6K | B6K-RC |
| <i>.0005"</i> | <i>.050"</i> | <i>.125"</i> | 0-25-0 | 0-50 | B7I | B7I-RC |
| <i>.001"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | B3W | B3W-RC |
| <i>.001"</i> | <i>.040"</i> | <i>.100"</i> | 0-20-0 | 0-40 | B6Q | B6Q-RC |
| <i>.001"</i> | <i>.050"</i> | <i>.125"</i> | 0-25-0 | 0-50 | B7O | B7O-RC |
| <i>.001"</i> | <i>.100"</i> | <i>.250"</i> | 0-50-0 | 0-100 | B8I | B8I-RC |
| .002 mm | .200 | .500 | 0-10-0 | 0-20 | O1I | O1I-RC |
| .005 mm | .500 | 1.25 | 0-25-0 | 0-50 | O3I | O3I-RC |
| .010 mm | 1.00 | 2.50 | 0-50-0 | 0-100 | O6I | O6I-RC |
| .025 mm | 2.50 | 6.25 | 0-125-0 | 0-250 | O8I | O8I-RC |
| Group 2 | | | | | | |
| <i>.00005"</i> | <i>.004"</i> | <i>.010"</i> | 0-2-0 | 0-4 | C1/2K | C1/2K-RC |
| <i>.0001"</i> | <i>.008"</i> | <i>.020"</i> | 0-4-0 | 0-8 | C1K | C1K-RC |
| <i>.0001"</i> | <i>.010"</i> | <i>.025"</i> | 0-5-0 | 0-10 | 2015781 | 2014761 |
| <i>.00025"</i> | <i>.010"</i> | <i>.025"</i> | 0-5-0 | 0-10 | 2015782 | 2014791 |
| <i>.00025"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | 2015783 | 2014808 |
| <i>.0005"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | 2015784 | 2014810 |
| <i>.0005"</i> | <i>.030"</i> | <i>.075"</i> | 0-15-0 | 0-30 | 2015786 | 2014811 |
| <i>.0005"</i> | <i>.040"</i> | <i>.100"</i> | 0-20-0 | 0-40 | 2015787 | 2014812 |
| <i>.0005"</i> | <i>.050"</i> | <i>.125"</i> | 0-25-0 | 0-50 | 2015790 | 2014814 |
| <i>.001"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | 2015785 | 2014809 |
| <i>.001"</i> | <i>.040"</i> | <i>.100"</i> | 0-20-0 | 0-40 | 2015789 | 2014813 |
| <i>.001"</i> | <i>.050"</i> | <i>.125"</i> | 0-25-0 | 0-50 | 2015791 | 2014815 |
| <i>.001"</i> | <i>.100"</i> | <i>.250"</i> | 0-50-0 | 0-100 | 2015792 | 2011049 |
| .001 mm | .100 | .250 | 0-5-0 | 0-10 | P1/2I | P1/2I-RC |
| .002 mm | .200 | .500 | 0-10-0 | 0-20 | P1I | P1I-RC |
| .005 mm | .500 | 1.25 | 0-25-0 | 0-50 | 2015793 | 2014817 |
| .010 mm | 1.00 | 2.50 | 0-50-0 | 0-100 | 2015794 | 2014818 |
| .020 mm | 2.00 | 5.00 | 0-100-0 | 0-200 | 2015795 | 2014819 |
| 1 Rev | | | | | | |
| <i>.0005"</i> | - | <i>.040"</i> | - | - | 2014793 | |
| <i>.001"</i> | - | <i>.080"</i> | - | - | 2014792 | |
| .010 mm | - | 1.00 | - | - | 2014795 | |
| .020 mm | - | 2.00 | - | - | 2014794 | |
| .010 mm | - | 1.00 | - | - | 2014797 | |
| .020 mm | - | 2.00 | - | - | 2014796 | |

| Grad | Range per Rev. | Total Range | Dial Style w/o Rev | Dial Style with Rev | Order number | |
|-------------------|----------------|--------------|--------------------|---------------------|-----------------|------------------|
| | | | | | w/o Rev Counter | with Rev Counter |
| Group 3 | | | | | | |
| <i>.0001"</i> | <i>.008"</i> | <i>.020"</i> | 0-4-0 | 0-8 | D1K | D1K-RC |
| <i>.0001"</i> | <i>.010"</i> | <i>.025"</i> | 0-5-0 | 0-10 | 32I | 32I-RC |
| <i>.00025"</i> | <i>.010"</i> | <i>.025"</i> | 0-5-0 | 0-10 | 32Q | 32Q-RC |
| <i>.00025"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | D3K | D3K-RC |
| <i>.00025"</i> | <i>.030"</i> | <i>.075"</i> | 0-15-0 | 0-30 | D5G | D5G-RC |
| <i>.0005"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | D3Q | D3Q-RC |
| <i>.0005"</i> | <i>.030"</i> | <i>.075"</i> | 0-15-0 | 0-30 | D5M | D5M-RC |
| <i>.0005"</i> | <i>.040"</i> | <i>.100"</i> | 0-20-0 | 0-40 | D6K | D6K-RC |
| <i>.0005"</i> | <i>.050"</i> | <i>.125"</i> | 0-25-0 | 0-50 | D7I | D7I-RC |
| <i>.001"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | D3W | D3W-RC |
| <i>.001"</i> | <i>.040"</i> | <i>.100"</i> | 0-20-0 | 0-40 | D6Q | D6Q-RC |
| <i>.001"</i> | <i>.050"</i> | <i>.125"</i> | 0-25-0 | 0-50 | D7O | D7O-RC |
| <i>.001"</i> | <i>.100"</i> | <i>.250"</i> | 0-50-0 | 0-100 | D8I | D8I-RC |
| .002 mm | .200 | .500 | 0-10-0 | 0-20 | Q1I | Q1I-RC |
| .005 mm | .500 | 1.25 | 0-25-0 | 0-50 | Q3I | Q3I-RC |
| .010 mm | 1.00 | 2.50 | 0-50-0 | 0-100 | Q6I | Q6I-RC |
| .020 mm | 2.00 | 5.00 | 0-100-0 | 0-200 | Q8I | Q8I-RC |
| Group 4 | | | | | | |
| <i>.0001"</i> | <i>.008"</i> | <i>.020"</i> | 0-4-0 | 0-8 | E1K | E1K-RC |
| <i>.0001"</i> | <i>.010"</i> | <i>.025"</i> | 0-5-0 | 0-10 | 42I | 42I-RC |
| <i>.00025"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | E3K | E3K-RC |
| <i>.00025"</i> | <i>.030"</i> | <i>.075"</i> | 0-15-0 | 0-30 | E5G | E5G-RC |
| <i>.0005"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | E3Q | E3Q-RC |
| <i>.0005"</i> | <i>.030"</i> | <i>.075"</i> | 0-15-0 | 0-30 | E5M | E5M-RC |
| <i>.0005"</i> | <i>.050"</i> | <i>.125"</i> | 0-25-0 | 0-50 | E7I | E7I-RC |
| <i>.001"</i> | <i>.020"</i> | <i>.050"</i> | 0-10-0 | 0-20 | E3W | E3W-RC |
| <i>.001"</i> | <i>.050"</i> | <i>.125"</i> | 0-25-0 | 0-50 | E7O | E7O-RC |
| <i>.001"</i> | <i>.100"</i> | <i>.250"</i> | 0-50-0 | 0-100 | E8I | E8I-RC |
| .002 mm | .200 | .500 | 0-10-0 | 0-20 | R1I | R1I-RC |
| .005 mm | .500 | 1.25 | 0-25-0 | 0-50 | R3I | R3I-RC |
| .010 mm | 1.00 | 2.50 | 0-50-0 | 0-100 | R6I | R6I-RC |
| .020 mm | 2.00 | 5.00 | 0-100-0 | 0-200 | R8I | R8I-RC |
| Long Range | | | | | | |
| <i>.0001"</i> | <i>.010"</i> | <i>.500"</i> | – | 0-10 | | 42IQ |
| <i>.001"</i> | <i>.100"</i> | <i>.500"</i> | – | 0-100 | | 2014699 |
| <i>.001"</i> | <i>.100"</i> | <i>1.00"</i> | – | 0-100 | | 2014698 |
| <i>.001"</i> | <i>.100"</i> | <i>1.00"</i> | – | 0-100 | | D8IS |
| <i>.001"</i> | <i>.100"</i> | <i>2.00"</i> | – | 0-100 | | D8IT |
| <i>.001"</i> | <i>.100"</i> | <i>3.00"</i> | – | 0-100 | | E8IU |
| <i>.010"</i> | <i>1.00"</i> | <i>1.00"</i> | – | 0-1000 | | 2014816 |
| .010 mm | 1.00 | 25.00 | – | 0-100 | | SP6IS |
| .010 mm | 1.00 | 25.00 | – | 0-100 | | SQ6IS |
| .025 mm | 2.50 | 50.00 | – | 0-25 | | Q8IT |
| .025 mm | 2.50 | 75.00 | – | 0-25 | | R8IU |

Dial Indicators per ANSI/AGD

Features

You get more with Mahr Federal Dial Indicators

- Proven for the most demanding applications
- Superior design and serviceability
- Unmatched customer and technical support
- Catalog and customized styles
- Full range of accessories to suit virtually every need
- Unit construction, removable movement . . . saves repair/cleaning time and maintenance costs
- Hardened gears and stainless steel racks provide lasting protection against indicator failure due to shock or wear
- Jeweled bearings resist friction, add to longer indicator life
- Skeletonized, hobbled gears for more sensitive response, superior indicator accuracy with minimal hysteresis error
- Soft-tinted dials (green, inch, or yellow, metric) minimize eye strain
- Special steel alloy, balanced dial hand affords no-shift, precise reading
- Controlled rack and pinion mesh eliminates slope for precise response and reading
- Smooth-adjusting bezels for easy setup
- Positive pressure pull-back spring . . . less maintenance
- Compliance with ANSI/AGD dimensional and accuracy specifications
- Many models employ stainless steel stem for added durability

How to Order

How to Order Your Dial Indicator and Accessories

1. Select the type of Indicator you require. Check the specialize types as well as regular ANSI/AGD models.
2. Choose the Model best suited to the magnification, range and viewing needs of your job.
3. Accessories. These are important because they greatly increase the speed, efficiency and convenience of obtaining desired results. A wide selection of Mahr Federal dial indicator accessories are shown in this catalog.
4. Options. You are not restricted to the normally furnished equipment mentioned above. A wide choice of optionally available points, backs or dial arrangements can be specified at little or no extra cost. We maintain the most extensive stock of indicators and gages for dimensional measurement available anywhere. Items which are in stock are normally shipped within five working days. If you need them sooner, inquire when ordering. We can often make next-day deliveries. Understandably, some of the items in this catalog are not always in stock or are special order items, which take a little longer to ship.

If you need help in determining what Indicators right for your application, just ask us. Contact Mahr Federal:

1-800-333-4243

One of our experienced professionals will give you courteous, professional advice that can save you time and money.

Replacement indicators

Although Mahr Federal dial indicators are known for their lifetime service, it is not uncommon to change an indicator back, contact point, dial or to even add an accessory to suit your latest application.

When ordering a replacement dial indicator for a specific application, always verify the configuration of the indicator. Ordering a replacement using the standard model number shown on your indicator may not provide you with the configuration or accessories you desire.



Dial Indicators per ANSI/AGD

Selecting a Dial Indicator

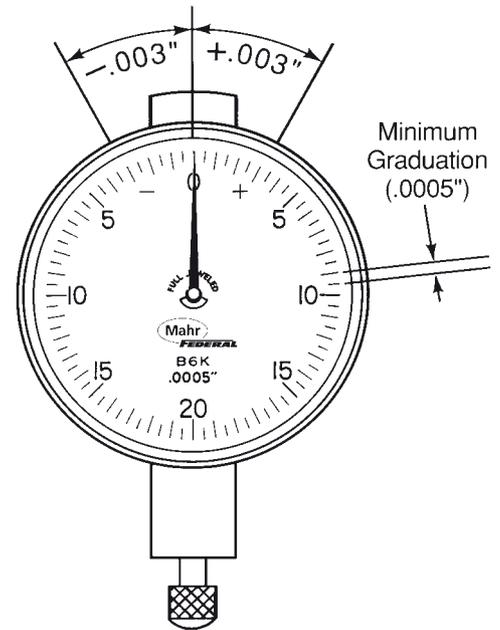
Since modern manufacturing involves a wide range of tolerances, choosing a dial indicator might be difficult, especially since the number of indicators available is so vast. The following guidelines were prepared to assist you in selecting the right model for your application.

Consider four characteristics when selecting a dial indicator:

- **Minimum Graduation Value** — value of the smallest graduations marked on the dial. From several different values available from Mahr Federal, select the one which is closest to 10% of the tolerance spread of the work you are measuring. This assures that the tolerance will span about ten divisions of the dial.
- **Size** — represents the bezel diameter. Make your selection on the basis of space available for the indicator and the distance from which it will be viewed. The Indicator photograph shown on the first page of each ANSI/AGD Group is full scale. Simply place the page which illustrates the Indicator at the expected viewing distance, and choose the size that offers you the best readability and is the proper size for your fixture. Mahr Federal's "C" size bezels (ANSI/AGD Group 2), which have a diameter of 2-1/4", are the most popular.
- **Range per Revolution** — represents the distance the spindle travels with one complete revolution of the dial hand. From the dials available in the size and minimum graduation value you chose, select the range per revolution which allows the tolerance spread to occupy 1/10 to 1/4 of the dial.
- **Total Range** — the maximum distance over which the indicator spindle can travel. Usually, this represents 2-1/2 revolutions of the hand, which is adequate for most needs. Sometimes, however, this may not be adequate for your application and a special total range may be necessary.

If your tolerance spread is .006" ($\pm .003$ "), then, the most suitable minimum graduation value is .0005".

TOLERANCE IS .006"



Your tolerance spread is .006". You have chosen an ANSI/AGD Group 2 (Mahr Federal "C" Size) dial with a minimum graduation value of .0005". Mahr Federal offers four indicator types in this size and minimum graduation value. Of these, type C5M has a range per revolution of .030" which is about midway between your tolerance extremes.

You selected a C5M indicator. Your total range, however, needs to be at least .200" so the spindle can clear the lip of your part. But, the longest range available in the C5M indicator you need is only .075". Special ranges up to .400" are available for this indicator type. Select the closest range for your application (for Model C5M, you would select .250").

If the range you need is not listed under the "Special Ranges" category, contact Mahr Federal. Chances are we can supply the range you need.

Copies of the current ANSI Standard for Dial Indicators (ANSI B89.1.1 0-1987) are available from:

The American Society of Mechanical Engineers
ASME Order Desk
22 Law Drive
Fairfield, NJ 07007
(973)882-1167

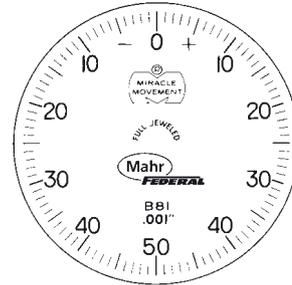
Dial Indicators per ANSI/AGD

Dial Types

1. Balanced (+) on right.

Normally furnished on all Group 0, 1, 3 and 4 ANSI/AGD indicators only, unless otherwise specified. Indicates an increasing value when contact is depressed as in comparison type O.D. snap and bench thickness gages.

Note: If Revolution Counter models are ordered, counter dial numbered counterclockwise.

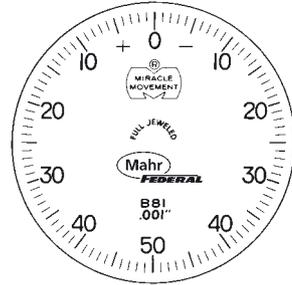


2. Balanced (+) on left.

Indicates decreasing values when contact is depressed as in comparison bore* and depth gages.

Note: With Revolution Counter models, counter dial numbered clockwise.

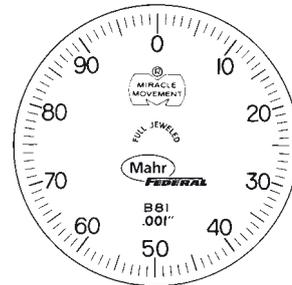
* Will vary as dictated by motion transfer design.



3. Continuous clockwise.

Normally furnished on Long and Extra Long Range Indicators, unless otherwise specified. Indicates an increasing value when contact is depressed as in direct-reading thickness gages.

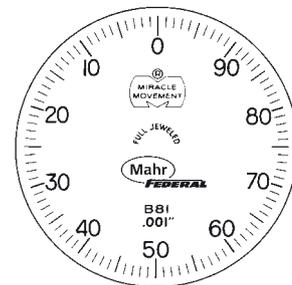
Note: With Revolution Counter models, counter dial numbered counterclockwise.



4. Continuous counterclockwise.

Indicates a decreasing value when contact is depressed as in direct reading slot, recess or hole depth measurements.

Note: If Revolution Counter models are ordered, counter dial numbered clockwise



Dial Indicators per ANSI/AGD Group 0 - Mahr Federal Series A and N

Where available space prohibits the use of a larger dial indicator.



Technical Data

Mahr Federal Series A (inch)

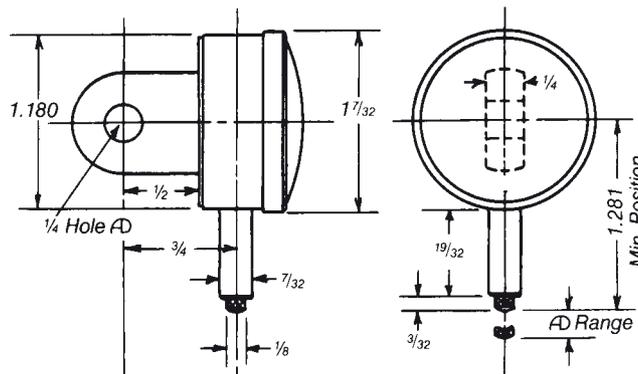
Dial: approx. 1.250" dia. with soft-green tint

| Measuring range | Graduation value | Dial style | Range per revolution | Accuracy | Order no. |
|-----------------|------------------|------------|----------------------|----------|-----------|
| .010" | .0001" | 0-2-0 | .004" | ± .0001" | A1/2Q |
| .025" | .0001" | 0-5-0 | .010" | ± .0001" | A2I |
| .050" | .0005" | 0-10-0 | .020" | ± .0005" | A3Q |
| .100" | .001" | 0-20-0 | .040" | ± .001" | A6Q |

Mahr Federal Series N (Metric – mm)

Dial: approx. 32 mm dia. with soft-yellow tint

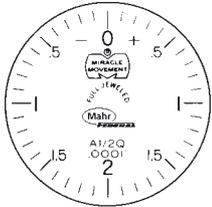
| Measuring range | Graduation value | Dial style | Range per revolution | Accuracy | Order no. |
|-----------------|------------------|------------|----------------------|------------|-----------|
| 0.250 | 0.002 | 0-5-0 | 0.100 | ± 0.002 mm | N1/2Q |
| 1.250 | 0.005 | 0-25-0 | 0.500 | ± 0.005 mm | N3I |
| 2.500 | 0.010 | 0-50-0 | 1.00 | ± 0.010 mm | N6I |



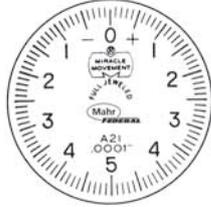
Backs can be rotated 90° and 180°

Dial Indicators per ANSI/AGD Group 0 - Mahr Federal Series A and N

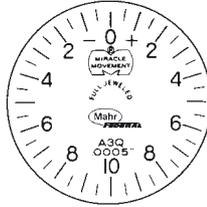
Mahr Federal Series A



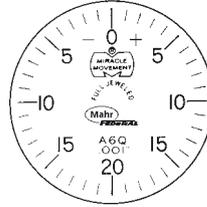
A1/2Q



A2I



A3Q



A6Q

- Normally furnished: balanced dial with + on right; centered vertical lug back; regular contact point, .09" radiused, .093" long.

- Optional dials: balanced with + on left; continuous clockwise; continuous counter-clockwise. Order by part number and specify dial style desired.

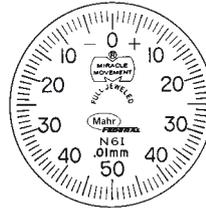
Mahr Federal Series N



N1/2O



N3I

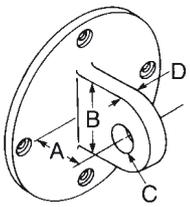


N6I

- For other dial styles or special requirements, call Mahr Federal.

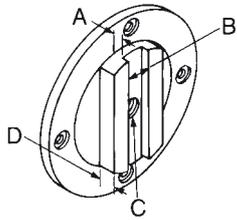
Backs for ANSI Group 0 - Series A and N

Vertical (Centered) Lug Back is normally furnished and included in price of Indicator. Back can be rotated 90° for horizontal lug mounting.



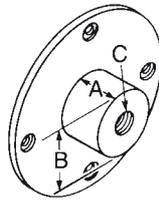
Vertical Lug (Centered)
BK-37

A B C D
1/2 11/16 1/4 1/4



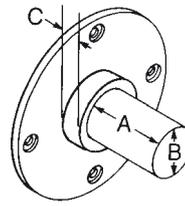
Adjustable
BK-45

A B C D
1/8 3/8 8-32 1/4



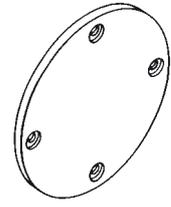
Screw Type
BK-88

A B C
1/2 11/16 1/4-28



Post
BK-38

A B C
5/16 7/32 1/16



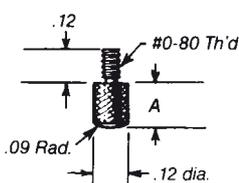
Flat
BK-32

Split Bushing, BU-112 Fits Stem (.218" I.D. x .375" O.D.). .500" long.



Points for ANSI Group 0 - Series A and N

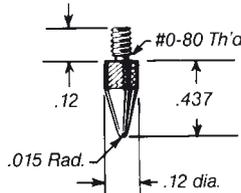
Regular PT-43 normally furnished



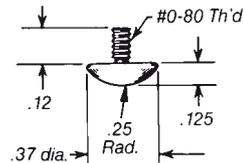
Dim. A Style

3/32" PT-43
1/4" PT-204
3/8" PT-205
1/2" PT-207
5/8" PT-208
3/4" PT-209
7/8" PT-210
1" PT-211

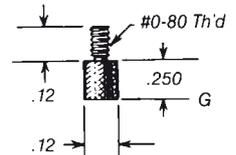
Taper PT-119



Button PT-118



Flat AL-61



Dial Indicators per ANSI/AGD Group 1 - Mahr Federal Series B and O



Technical Data

Mahr Federal Series B (inch)

Dial: approx. 1.750" dia. with soft-green tint

| Measuring range | Graduation value | Dial style w/o Rev Counter | Dial style with Rev Counter | Range per revolution | Accuracy | Order no. w/o Rev Counter | Order no. with Rev Counter |
|-----------------|------------------|----------------------------|-----------------------------|----------------------|----------|---------------------------|----------------------------|
| .025" | .0001" | 0-5-0 | 0-10 | .010" | ±.0001" | 12I | 12I-RC |
| .025" | .00025" | 0-5-0 | 0-10 | .010" | ±.00025" | 12Q | 12Q-RC |
| .050" | .00025" | 0-10-0 | 0-20 | .020" | ±.00025" | B3K | B3K-RC |
| .050" | .0005" | 0-10-0 | 0-20 | .020" | ±.0005" | B3Q | B3Q-RC |
| .075" | .0005" | 0-15-0 | 0-30 | .030" | ±.0005" | B5M | B5M-RC |
| .100" | .0005" | 0-20-0 | 0-40 | .040" | ±.0005" | B6K | B6K-RC |
| .125" | .0005" | 0-25-0 | 0-50 | .050" | ±.0005" | B7I | B7I-RC |
| .050" | .001" | 0-10-0 | 0-20 | .020" | ±.001" | B3W | B3W-RC |
| .100" | .001" | 0-20-0 | 0-40 | .040" | ±.001" | B6Q | B6Q-RC |
| .125" | .001" | 0-25-0 | 0-50 | .050" | ±.001" | B7O | B7O-RC |
| .250" | .001" | 0-50-0 | 0-100 | .100" | ±.001" | B8I | B8I-RC |

Mahr Federal Series O (Metric, mm)

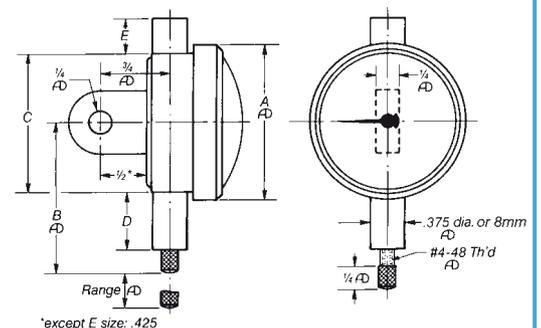
Dial: approx. 45 mm dia. with yellow tint

| Measuring range | Graduation value | Dial style w/o Rev Counter | Dial style with Rev Counter | Range per revolution | Accuracy | Order no. w/o Rev Counter | Order no. with Rev Counter |
|-----------------|------------------|----------------------------|-----------------------------|----------------------|----------|---------------------------|----------------------------|
| 0.500 | 0.002 | 0-10-0 | 0-20 | 0.200 | ± 0.004 | O1I | O1I-RC |
| 1.250 | 0.005 | 0-25-0 | 0-50 | 0.500 | ± 0.005 | O3I | O3I-RC |
| 2.500 | 0.010 | 0-50-0 | 0-100 | 1.000 | ± 0.010 | O6I | O6I-RC |
| 6.250 | 0.025 | 0-125-0 | 0-250 | 2.500 | ± 0.025 | O8I | O8I-RC |

Dimensions

| ANSI / AGD Group | Mahr Federal Styles | A mm/inch | B mm/inch | C mm/inch | D mm/inch | E mm/inch |
|------------------|---------------------|---------------|---------------|---------------|--------------|--------------|
| 1 | B/O | 42.86/ 1.688" | 41.28/ 1.625" | 38.10/ 1.5" | 15.88/ .625" | 8.73/ .344" |
| 2 | C/P | 57.15/ 2.25" | 50.80/ 2" | 52.39/ 2.063" | 18.26/ .719" | 8.73/ .344" |

These indicators are normally furnished with continuous dial (with R.C.) or + on right balance dial (w/o R.C.), lug back and .18" by .250" long contact.



Dial Indicators per ANSI/AGD Group 2 - Mahr Federal Series C and P



Ordering Information

In addition to the information provided below, see pages 5-4 & 5-5 for complete instructions on ordering your dial indicators and accessories.

www.mahr.com

Technical Data

Mahr Federal Series C (inch)

Dial: approx. 2.250" dia. with soft-green tint

| Measuring range | Graduation value | Dial style w/o Rev Counter | Dial style with Rev Counter | Range per revolution | Accuracy | Order no. w/o Rev Counter | Order no. with Rev Counter | OLD Order no. |
|-----------------|------------------|----------------------------|-----------------------------|----------------------|-----------|---------------------------|----------------------------|---------------|
| .020" | .0001" | 0-4-0 | 0-8 | .008" | ± .0001" | C1K | C1K-RC | C1K |
| .025" | .0001" | 0-5-0 | 0-10 | .010" | ± .0001" | 2015781 | 2014761 | C2I/22I |
| .025" | .00025" | 0-5-0 | 0-10 | .010" | ± .00025" | 2015782 | 2014791 | C2Q/22Q |
| .050" | .00025" | 0-10-0 | 0-20 | .020" | ± .00025" | 2015783 | 2014808 | C3K/23K |
| .050" | .0005" | 0-10-0 | 0-20 | .020" | ± .0005" | 2015784 | 2014810 | C3Q/23Q |
| .075" | .0005" | 0-15-0 | 0-30 | .030" | ± .0005" | 2015786 | 2014811 | C5M/25M |
| .100" | .0005" | 0-20-0 | 0-40 | .040" | ± .0005" | 2015787 | 2014812 | C6K/26K |
| .125" | .0005" | 0-25-0 | 0-50 | .050" | ± .0005" | 2015790 | 2014814 | C7I/27I |
| .050" | .001" | 0-10-0 | 0-20 | .020" | ± .001" | 2015785 | 2014809 | C3W/23W |
| .100" | .001" | 0-20-0 | 0-40 | .040" | ± .001" | 2015789 | 2014813 | C6Q/26Q |
| .125" | .001" | 0-25-0 | 0-50 | .050" | ± .001" | 2015791 | 2014815 | C7O/27O |
| .250" | .001" | 0-50-0 | 0-100 | .100" | ± .001" | 2015792 | 2011049 | C8I/28IN |

Super Sensitive Type (Inch)

| | | | | | | | | |
|-------|---------|-------|-----|-------|----------|-------|----------|-------|
| .010" | .00005" | 0-2-0 | 0-4 | .004" | ± .0001" | C1/2K | C1/2K-RC | C1/2K |
|-------|---------|-------|-----|-------|----------|-------|----------|-------|

Mahr Federal Series P (Metric, mm)

Dial: approx. 57 mm dia. with soft-yellow tint

| Measuring range | Graduation value | Dial style w/o Rev Counter | Dial style with Rev Counter | Range per revolution | Accuracy | Order no. w/o Rev Counter | Order no. with Rev Counter | OLD Order no. |
|-----------------|------------------|----------------------------|-----------------------------|----------------------|----------|---------------------------|----------------------------|---------------|
| 0.500 | 0.002 | 0-10-0 | 0-20 | 0.200 | ± 0.004 | P1I | P1I-RC | P1I/21IN |
| 1.250 | 0.005 | 0-25-0 | 0-50 | 0.500 | ± 0.005 | 2015793 | 2014817 | P3I/23I |
| 2.500 | 0.010 | 0-50-0 | 0-100 | 1.000 | ± 0.010 | 2015794 | 2014818 | P6I/26I |
| 5.000 | 0.020 | 0-100-0 | 0-200 | 2.000 | ± 0.020 | 2015795 | 2014819 | P8I/28IM |

Super Sensitive Type (Metric – mm)

| | | | | | | | | |
|-------|-------|-------|------|-------|---------|-------|----------|-------|
| 0.250 | 0.001 | 0-5-0 | 0-10 | 0.100 | ± 0.002 | P1/2I | P1/2I-RC | P1/2I |
|-------|-------|-------|------|-------|---------|-------|----------|-------|

These indicators are normally furnished with continuous dial (with R.C.) or + on right balance dial (w/o R.C.), lug back, .18" by .250" long contact and tolerance hands*.

* tolerance hands not supplied on C1K, C1/2K, P1I & P1/2I.

Accessories

- Contact Points - see page 5-27 and 5-22
- Backs and Mounting Brackets - see pages 5-21 and 5-22
- Accessories - see pages 5-23 and 5-24

Dial Indicators per ANSI/AGD Group 3 - Mahr Federal Series D and Q

Recommended for larger gages and greater visibility.



Ordering Information

In addition to the information provided below, see pages 5-4 & 5-5 for complete instructions on ordering your dial indicators and accessories.

www.mahr.com

Technical Data

Mahr Federal Series D (inch)

Dial: approx. 2.750" dia. with soft-green tint

| Measuring range | Graduation value | Dial style w/o Rev Counter | Dial style with Rev Counter | Range per revolution | Accuracy | Order no. w/o Rev Counter | Order no. with Rev Counter |
|-----------------|------------------|----------------------------|-----------------------------|----------------------|----------|---------------------------|----------------------------|
| .020" | .0001" | 0-4-0 | 0-8 | .008" | ±.0001" | D1K | D1K-RC |
| .025" | .0001" | 0-5-0 | 0-10 | .010" | ±.0001" | 32I | 32I-RC |
| .025" | .00025" | 0-5-0 | 0-10 | .010" | ±.00025" | 32Q | 32Q-RC |
| .050" | .00025" | 0-10-0 | 0-20 | .020" | ±.00025" | D3K | D3K-RC |
| .075" | .00025" | 0-15-0 | 0-30 | .030" | ±.00025" | D5G | D5G-RC |
| .050" | .0005" | 0-10-0 | 0-20 | .020" | ±.0005" | D3Q | D3Q-RC |
| .075" | .0005" | 0-15-0 | 0-30 | .030" | ±.0005" | D5M | D5M-RC |
| .100" | .0005" | 0-20-0 | 0-40 | .040" | ±.0005" | D6K | D6K-RC |
| .125" | .0005" | 0-25-0 | 0-50 | .050" | ±.0005" | D7I | D7I-RC |
| .050" | .001" | 0-10-0 | 0-20 | .020" | ±.001" | D3W | D3W-RC |
| .100" | .001" | 0-20-0 | 0-40 | .040" | ±.001" | D6Q | D6Q-RC |
| .125" | .001" | 0-25-0 | 0-50 | .050" | ±.001" | D7O | D7O-RC |
| .250" | .001" | 0-50-0 | 0-100 | .100" | ±.001" | D8I | D8I-RC |

Mahr Federal Series Q (Metric – mm)

Dial: approx. 70 mm dia. with soft-yellow tint

| Measuring range | Graduation value | Dial style w/o Rev Counter | Dial style with Rev Counter | Range per revolution | Accuracy | Order no. w/o Rev Counter | Order no. with Rev Counter |
|-----------------|------------------|----------------------------|-----------------------------|----------------------|----------|---------------------------|----------------------------|
| 0.500 | 0.002 | 0-10-0 | 0-20 | 0.200 | ± 0.004 | Q1I | Q1I-RC |
| 1.250 | 0.005 | 0-25-0 | 0-50 | 0.500 | ± 0.005 | Q3I | Q3I-RC |
| 2.500 | 0.010 | 0-50-0 | 0-100 | 1.000 | ± 0.020 | Q6I | Q6I-RC |
| 5.000 | 0.020 | 0-100-0 | 0-200 | 2.000 | ± 0.020 | Q8I | Q8I-RC |

These indicators are normally furnished with continuous dial (with R.C.) or + on right balance dial (w/o R.C.), lug back, and .18" by .250" long contact.

Accessories

- Contact Points - see pages 5-27 and 5-22
- Backs and Mounting Brackets - see pages 5-21 and 5-22
- Accessories - see pages 5-23 and 5-24

Dial Indicators per ANSI/AGD Group 4 - Mahr Federal Series E and R



Technical Data

Mahr Federal Series E (inch)

Dial: approx. 3.625" dia. with soft-green tint

| Measuring range | Graduation value | Dial style w/o Rev Counter | Dial style with Rev Counter | Range per revolution | Accuracy | Order no. w/o Rev Counter | Order no. with Rev Counter |
|-----------------|------------------|----------------------------|-----------------------------|----------------------|-----------|---------------------------|----------------------------|
| .020" | .0001" | 0-4-0 | 0-8 | .008" | ± .0001" | E1K | E1K-RC |
| .025" | .0001" | 0-5-0 | 0-10 | .010" | ± .0001" | 42I | 42I-RC |
| .050" | .00025" | 0-10-0 | 0-20 | .020" | ± .00025" | E3K | E3K-RC |
| .075" | .00025" | 0-15-0 | 0-30 | .030" | ± .00025" | E5G | E5G-RC |
| .050" | .0005" | 0-10-0 | 0-20 | .020" | ± .0005" | E3Q | E3Q-RC |
| .075" | .0005" | 0-15-0 | 0-30 | .030" | ± .0005" | E5M | E5M-RC |
| .125" | .0005" | 0-25-0 | 0-50 | .050" | ± .0005" | E7I | E7I-RC |
| .050" | .001" | 0-10-0 | 0-20 | .020" | ± .001" | E3W | E3W-RC |
| .125" | .001" | 0-25-0 | 0-50 | .050" | ± .001" | E7O | E7O-RC |
| .250" | .001" | 0-50-0 | 0-100 | .100" | ± .001" | E8I | E8I-RC |

Mahr Federal Series R (Metric, mm)

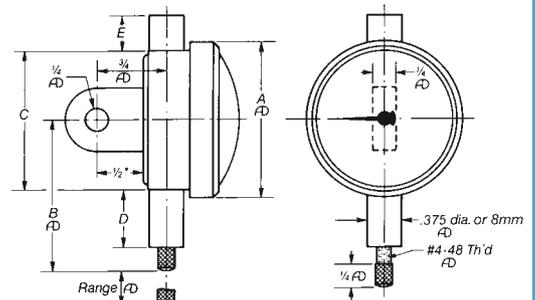
Dial: approx. 92 mm dia. with yellow tint

| Measuring range | Graduation value | Dial style w/o Rev Counter | Dial style with Rev Counter | Range per revolution | Accuracy | Order no. w/o Rev Counter | Order no. with Rev Counter |
|-----------------|------------------|----------------------------|-----------------------------|----------------------|----------|---------------------------|----------------------------|
| 0.500 | 0.002 | 0-10-0 | 0-20 | 0.200 | ± 0.004 | R1I | R1I-RC |
| 1.250 | 0.005 | 0-25-0 | 0-50 | 0.500 | ± 0.005 | R3I | R3I-RC |
| 2.500 | 0.010 | 0-50-0 | 0-100 | 1.000 | ± 0.010 | R6I | R6I-RC |
| 5.000 | 0.020 | 0-100-0 | 0-200 | 2.000 | ± 0.020 | R8I | R8I-RC |

Dimensions

| ANSI / AGD Group | Mahr Federal Styles | A mm/inch | B mm/inch | C mm/inch | D mm/inch | E mm/inch |
|------------------|---------------------|---------------|---------------|---------------|--------------|-------------|
| 3 | D/Q | 69.85/ 2.75" | 53.98/ 2.125" | 65.09/ 2.563" | 15.88/ .625" | 8.73/ .344" |
| 4 | E/R | 92.08/ 3.625" | 65.09/ 2.563" | 87.31/ 3.438" | 15.88/ .625" | 8.73/ .344" |

These indicators are normally furnished with continuous dial (with R.C.) or + on right balance dial (w/o R.C.), lug back and .18" by .250" long contact.



Easy Reading, Single Revolution Dial Indicator



Easy reading

A practical solution for inspectors and machine operators who need to eliminate the potential for indicator misreadings. No matter how far out of tolerance a part may be, the needle of a one revolution indicator will always stay in the red, non-read zone — no passing zero again — no reading errors.

- No limited contact travel
- Shockproof "Following Movement" always keeps the hand within a single revolution
- Alternate contact points, backs and other accessories are optionally available
- Metric dials are yellow
- One-piece case design
- Inserted precision bearings
- Available in ANSI/AGD Group 2 size
- Flat back

Technical Data

| Measuring range | Graduation value | Stem diameter | Model no. | Order no. |
|-----------------|------------------|---------------|-----------|-----------|
| 2 mm | 0.02 mm | .375" | P1RN-200 | 2014794 |
| 1 mm | 0.01 mm | .375" | P1RN-100 | 2014795 |
| 2 mm | 0.02 mm | 8 mm | M1RN-200 | 2014796 |
| 1 mm | 0.01 mm | 8 mm | M1RN-100 | 2014797 |
| .080" | .001" | .375" | C1RN-80 | 2014792 |
| .040" | .0005" | .375" | C1RN-40 | 2014793 |

High Performance, Dial Indicators per ANSI/AGD Group 2

Features

- A well thought-out design, the use of high-quality components and materials as well as the precision engineered mechanism guarantee the outstanding quality of these indicators.
- The concentric "Speed Read" pointer (on 1.0" and .500" models) allows easy and safe reading of this Dial Indicator
- Spindle and stem are made of resistant stainless steel.
Supplied with: Lug Back and Tolerance Hands



Technical Data

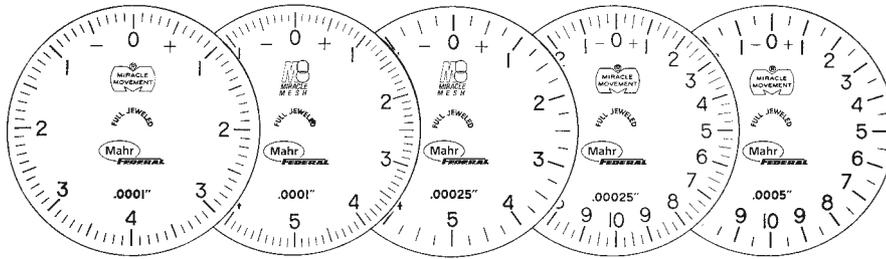
| Measuring Range | Graduation value | Stem diameter | Dial style | Range per Rev. | Rev. Counter | Order no. |
|-----------------|------------------|---------------|------------|----------------|--------------|-----------|
| .250" | .001" | .375" | 0-100 | .100" | Standard | 2016005 |
| .500" | .001" | .375" | 0-100 | .100" | Speed read | 2016004 |
| 1.00" | .001" | .375" | 0-100 | .100" | Speed read | 2016002 |

Accessories

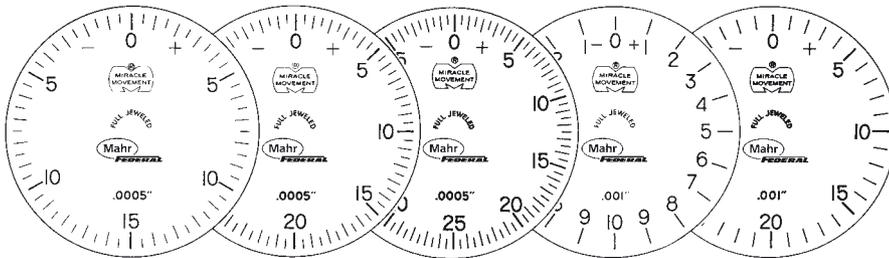
- Contact Points - see page 5-27

Dial Styles for ANSI/AGD Groups 1 thru 4 Balanced Dials

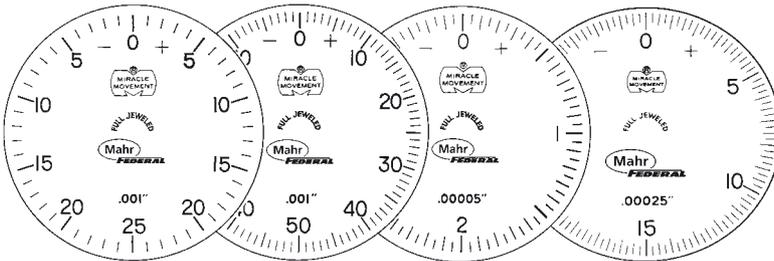
Mahr Federal Series B thru E



| | | | | |
|------------|----------------|----------------|----------------|----------------|
| C1K | 12I | 12Q | B3K | B3Q |
| D1K | 2015781 | 2015782 | 2015783 | 2015784 |
| E1K | 32I | 32Q | D3K | D3Q |
| | 42I | | E3K | E3Q |

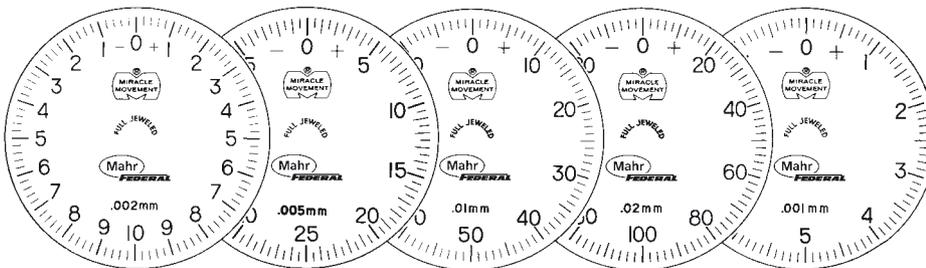


| | | | | |
|----------------|----------------|----------------|----------------|----------------|
| B5M | B6K | B7I | B3W | B6Q |
| 2015786 | 2015787 | 2015790 | 2015785 | 2015789 |
| D5M | D6K | D7I | D3W | D6Q |
| E5M | | E7I | E3W | |



| | | | |
|----------------|----------------|--------------|------------|
| B7O | B8I | C1/2K | D5G |
| 2015791 | 2015792 | | E5G |
| D7O | D8I | | |
| E7O | E8I | | |

Mahr Federal Series O thru R



| | | | | |
|------------|----------------|----------------|----------------|--------------|
| O1I | O3I | O6I | Q8I | P1/2I |
| P1I | 2015793 | 2015794 | 2015795 | |
| Q1I | Q3I | Q6I | R8I | |
| R1I | R3I | R6I | | |

Indicator O8I is not illustrated: Dial style is 0-125-0, minimum graduation is .025 mm

Features

- Normally furnished: dial as illustrated; centered vertical lug back; regular contact point, .18" radiused, 1/4" long.
- Optional Dials: balanced dial with + on left; continuous clockwise; continuous counter-clockwise. (Order by part number and specify dial style desired.)
- Revolution Counters available, please specify when ordering, Includes continuous dial unless otherwise specified.
- For other dial styles or special requirements - call Mahr Federal.
- Indicator dimensions are located on pages containing individual ANSI/AGD descriptions.

Accessories

- Contact Points - see page 5-27 and 5-22
- Backs and Mounting Brackets - see pages 5-21 and 5-22
- Accessories - see pages 5-23 and 5-24

Ordering Information

In addition to the information provided above, see pages 5-4 & 5-5 for complete instructions on ordering your dial indicators and accessories.

www.mahr.com

Long Range and Extra Long Range Indicators



Technical Data

Long Range/Extra Long Range (Inch)

Dial: soft-green tint

| Measuring range | Graduation value | Dial style | Range per revolution | Accuracy | ANSI/AGD | Model no. | Order no. |
|-------------------------|------------------|------------|----------------------|-----------|----------|-----------|-----------|
| .500" | .0001" | 0-10 | .010" | .0001" | 4 | 42IQ | 42IQ ** |
| .500" | .001" | 0-100 | .100" | .001" | 2 | 28IQN | 2014699 |
| 1.000" | .001" | 0-100 | .100" | .001" | 2 | 28ISN | 2014698 |
| 1.000" | .001" | 0-100 | .100" | .001" | 3 | D8IS | D8IS |
| 1.000" | .010" | 0-1000 | 1.000" | .010" | 2 | 29I | 2014816 |
| Extra Long Range | | | | | | | |
| 2.000" | .001" | 0-100 | .100" | .001"**** | 3 | D8IT | |
| 3.000" | .001" | 0-100 | .100" | .001"**** | 4 | E8IU | |

- * for first 2-1/2 revolutions only.
- ** hysteresis = .0003" for full range
- *** for first 1 inch of travel.

Long Range/Extra Long Range (Metric)

Dial: yellow tint

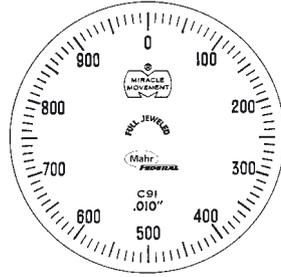
| Measuring range | Graduation value | Dial style | Range per revolution | Accuracy | ANSI/AGD | Model no. | Order no. |
|-------------------------|------------------|------------|----------------------|-----------|----------|-----------|-----------|
| 25.000 | 0.010 | 0-100 | 1.000 | 0.020 | 2 | SP6IS | |
| 25.000 | 0.010 | 0-100 | 1.000 | 0.020 | 3 | SQ6IS | |
| Extra Long Range | | | | | | | |
| 50.000 | 0.025 | 0-25 | 2.500 | 0.025**** | 3 | Q8IT | |
| 75.000 | 0.025 | 0-25 | 2.500 | 0.025**** | 4 | R8IU | |

- **** for first 25 mm of travel.

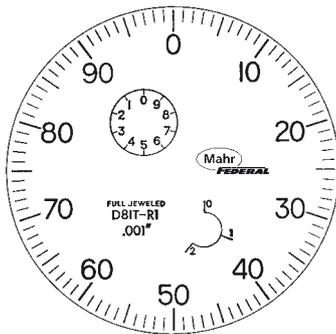
Dial Styles for Long Range and Extra Long Range Indicators



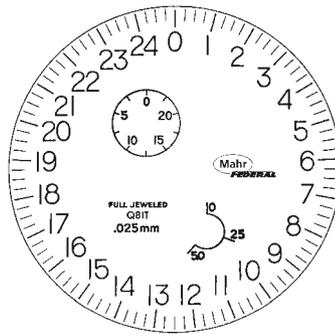
281QN, 281SN & D81S



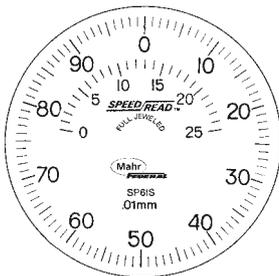
291



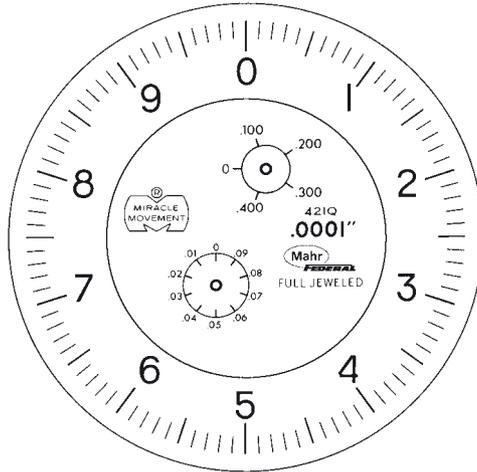
D81T & E81U



Q81T & R81U



SP61S & SQ61S



421Q

Features

- Normally furnished: continuous clockwise dial; centered vertical lug back; regular contact point, .18" radius, .250" long.
- Long Range Models: include (1) revolution counter (except C91 without revolution counter). Extra Long Range Models: include (2) revolution counters.
- For other dial styles or special requirements - call Mahr Federal.
- Indicator dimensions are located on pages containing individual ANSI/AGD descriptions.

Accessories

- Contact Points - see page 5-27 and 5-22
- Backs and Mounting Brackets - see pages 5-21 and 5-22
- Accessories - see pages 5-23 and 5-24

Dial Indicator Modifications & Specials

Available to meet specific requirements.

- Special Ranges
- Restricted Hand Travel
- Special Dials
- High Temperature
- Special Contact Points
- 8 mm Stem Diameters Special Lengths
- Specified Contact Load
- Counter-clockwise Movement
- Special Stem Lengths
- Push-Down Action
- Special Ratio Movement
- Threaded Stems

Ordering Information

In addition to the information provided above, see pages 5-4 & 5-5 for complete instructions on ordering your dial indicators and accessories.

www.mahr.com

Series WC and WP Wetproof Dial Indicators

Splashproof protection from coolant, oil, or other contaminant's.



Technical Data

Series WC and WP Wetproof Dial Indicators (Inch)

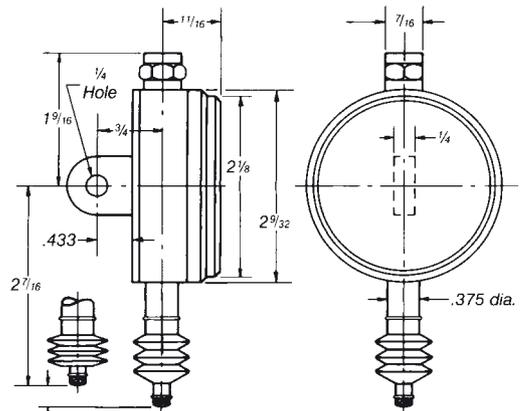
Dial: approx. 2-1/4" dia. with soft-green tint

| Measuring range | Graduation value | Dial style | Range per revolution | Accuracy | Order no. |
|-----------------|------------------|------------|----------------------|----------|-----------|
| .025" | .0001" | 0-10 | .010" | .0001" | W22I |
| .050" | .00025" | 0-20 | .020" | .00025" | WC3K |
| .050" | .0005" | 0-20 | .020" | .0005" | WC3Q |
| .075" | .0005" | 0-30 | .030" | .0005" | WC5M |
| .100" | .0005" | 0-40 | .040" | .0005" | WC6K |
| .125" | .0005" | 0-50 | .050" | .0005" | WC7I |
| .250" | .001" | 0-100 | .100" | .001" | WC8I |
| 1.000" | .001" | 0-100 | .100" | .001" | WC8IS |

Series WC and WP Wetproof Dial Indicators (Metric)

Dial: approx. 57 mm dia. with soft-yellow tint

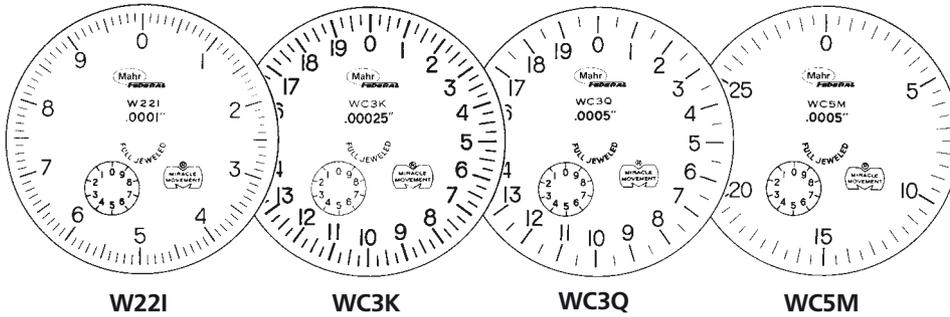
| Measuring range | Graduation value | Dial style | Range per revolution | Accuracy | Order no. |
|-----------------|------------------|------------|----------------------|----------|-----------|
| 0.500 | 0.002 | 0-20 | 0.200 | 0.004 | WP1I |
| 1.250 | 0.005 | 0-50 | 0.500 | 0.005 | WP3I |
| 2.500 | 0.010 | 0-100 | 1.000 | 0.010 | WP6I |



Backs can be rotated 90° and 180°

Dial Styles for WC and WP Wetproof Dial Indicators

Series WC indicators

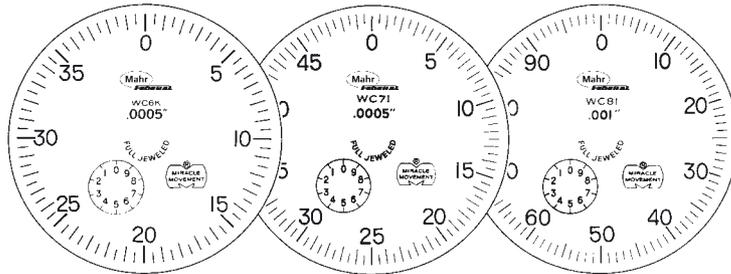


W221

WC3K

WC3Q

WC5M



WC6K

WC7I

WC8I/WC8IS

Features

- Normally furnished: continuous clockwise dial with revolution counter; BK-63 centered vertical lug back; regular contact point, .18" radiused, .625" long
- Optional Dials: continuous counter-clockwise with revolution counter; balanced outer dial with + on right or left. Order by dial type and specify dial style desired.
- For other dial styles or special requirements - call Mahr Federal.

Series WP indicators



WP1I

WP3I

WP6I

Accessories

- Contact Points - see page 5-27 and 5-22
- Accessories - see pages 5-23 and 5-24

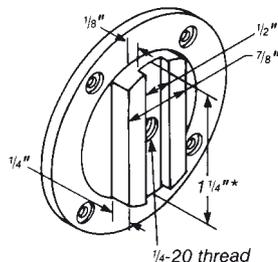
Ordering Information

In addition to the information provided above, see pages 5-4 & 5-5 for complete instructions on ordering your dial indicators and accessories.

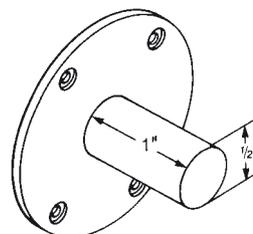
www.mahr.com

Backs for Wetproof Dial Indicators

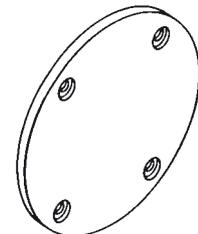
Vertical (centered) lug back is normally furnished and included in price of indicator. Back can be rotated 90° for horizontal lug mounting.



BK-68
Adjustable Back



BK-90
Post Back



BK-97
Flat Back

Perpendicular Dial Indicators

Provides improved readability where other style indicators cannot be used.



Technical Data

Series F, G, J, V (Inch)

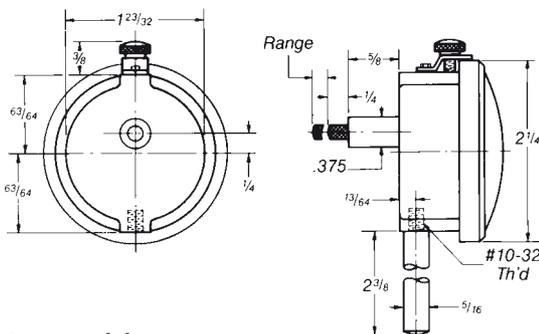
Dial: soft-green tint

| Measuring range | Graduation value | Dial style | Range per revolution | Accuracy | Gear type | Dial Dia. (approx.) | Order no. |
|-----------------|------------------|------------|----------------------|----------|-----------|---------------------|-----------|
| .008" | .0001" | 0-4-0 | .008" | .0001" | crown | 2-1/4" | J1K |
| .040" | .0005" | 0-20-0 | .040" | .0005" | crown | 2-1/4" | J6K |
| .100" | .0005" | 0-12-0 | .025" | .0005" | spiral | 2-1/4" | G40 |
| .100" | .001" | 0-50-0 | .100" | .001" | crown | 2-1/4" | J8I |
| .100" | .001" | 0-50-0 | .100" | .001" | crown | 1-11/16" | V8I |
| .200" | .001" | 0-50-0 | .100" | .001" | spiral | 1-23/32" | F8I |
| .200" | .001" | 0-50-0 | .100" | .001" | spiral | 2-1/4" | G8I |

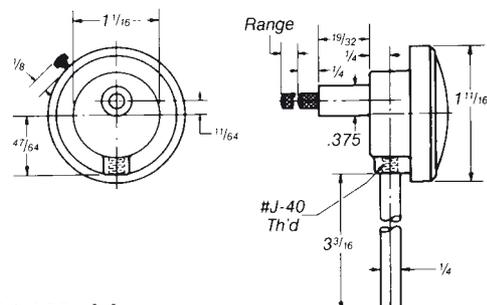
Series I, W (Metric)

Dial: yellow tint

| Measuring range | Graduation value | Dial style | Range per revolution | Accuracy | Gear type | Dial Dia. (approx.) | Order no. |
|-----------------|------------------|------------|----------------------|----------|-----------|---------------------|-----------|
| 0.200 | 0.002 | 0-10-0 | 0.200 | 0.002 | crown | 57 | W11 |
| 1.000 | 0.010 | 0-50-0 | 1.000 | 0.010 | crown | 57 | W6I |
| 2.500 | 0.025 | 0-125-0 | 2.500 | 0.025 | crown | 57 | W8I |
| 2.500 | 0.025 | 0-125-0 | 2.500 | 0.025 | crown | 43 | I8I |



J & W Models



V & I Models

Dial Styles for Perpendicular Indicators

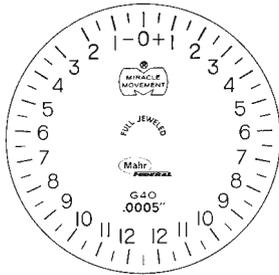
Series J, G, V, F



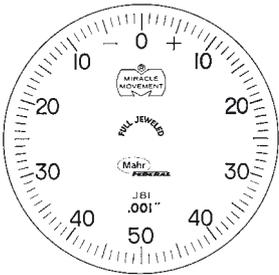
J1K



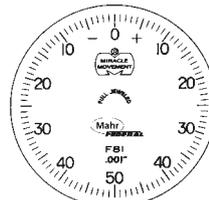
J6K



G40



J8I & G8I



V8I & F8I

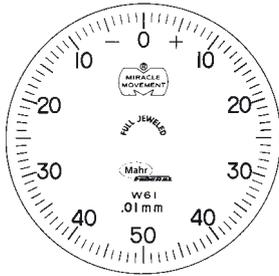
Features

- Normally furnished: balanced dial with + on right; mounting rod (see dimension drawings); regular contact point, .18" radiused, .250" long.
- Threaded stem versions available as an option; AD-59 (.5622 long x .500" O.D. for "J & W" styles), 3/8-32 internally threaded bushings and AD-60 (.687" long x .500" O.D. for "G & F" Models) purchased separately. Bushings also available separately.
- For other dial styles or special requirements - call Mahr Federal.

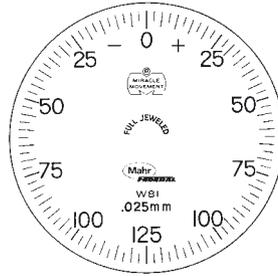
Series W, I



W1I



W6I



W8I & I8I

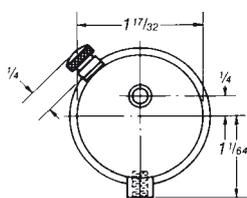
Accessories

- Contact Points - see page 5-27 and 5-22
- Accessories - see pages 5-23 and 5-24

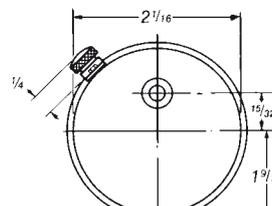
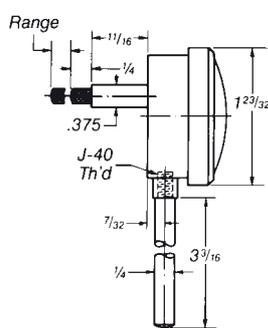
Ordering Information

In addition to the information provided above, see pages 5-4 & 5-5 for complete instructions on ordering your dial indicators and accessories.

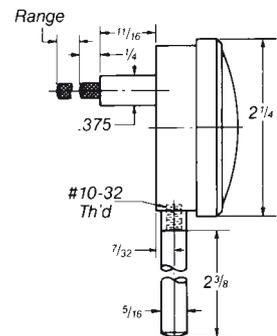
www.mahr.com



F8I Model



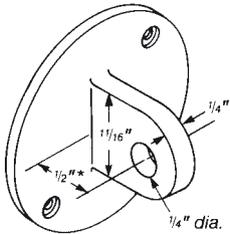
G Models



Backs for ANSI/AGD Group 1, 2, 3, and 4 Dial Indicators

Vertical Lug

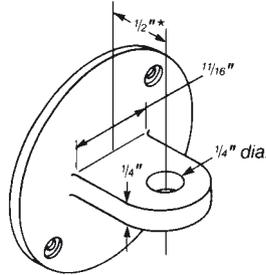
(centered) normally furnished



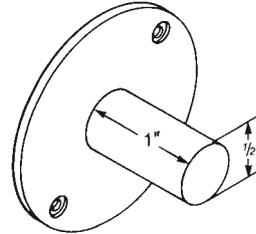
*27/64" for E/R size

Horizontal Lug

(centered)



Post

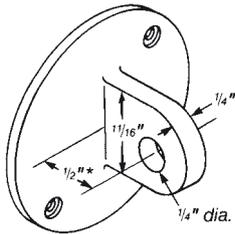


Features

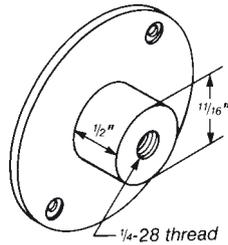
- Backs shown are for ANSI/AGD Groups 1,2,3,4, Long Range and Extra Long Range Indicators. Backs for ANSI/AGD Group 0 Indicators - see page 5-8. Backs for Wetproof Indicators - see page 5-18.
- To order - specify Back Order Number (from table below).
- Backs for ANSI/AGD Group 1 (Series B/O) Indicators can be repositioned 180°. Backs for ANSI/AGD Group 4 (Series E/R) Indicators can be repositioned 90° and 180°.
- For Special Backs - call Mahr Federal.

Vertical Lug

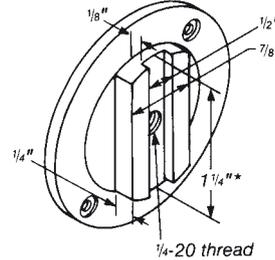
(offset) Left face of lug is on centerline of back



Screw Type

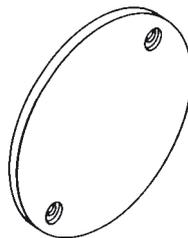


Adjustable



*7/8" for B/O size; no flats

Flat



Ordering Numbers

| | ANSI/AGD | | | |
|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Group 1 Series B/O | Group 2 Series C/P | Group 3 Series D/Q | Group 4 Series E/R |
| Vertical Lug, Centered | BK-1600 | BK-383 | BK-431 | BK-3 |
| Vertical Lug, Offset | BK-1601 | BK-2168 | BK-545 | BK-4 |
| Horizontal Lug, Centered | BK-19 | BK-400 | BK-109 | BK-3 |
| Flat | BK-1660 | BK-470 | BK-473 | BK-5 |
| Post | BK-1634 | BK-2093 | BK-664 | BK-17 |
| Screw | BK-1661 | BK-692 | BK-177 | BK-16 |
| Adjustable | BK-1633 | BK-531 | BK-10 | BK-18 |

Indicator Accessories

Weights

Used with ANSI/AGD type and long range indicators. Applies constant pressure throughout indicator range. To order specify requirement.



Lifting Levers - CAM Type.

Used with ANSI/AGD type and long range indicators.



| Use with Indicator Type | Order no. Left Hand | Order no. Right Hand |
|----------------------------|---------------------|----------------------|
| ANSI/AGD Group 1* | LR-46 | LR-47** |
| ANSI/AGD Group 2* | LR-48 | LR-49** |
| ANSI/AGD Group 3* | LR-50 | LR-51** |
| ANSI/AGD Group 4* | LR-68 | LR-69 |
| Federal Models D8IT & Q8IT | LR-115 | |
| Ox-Bow Lifting Lever | LR-40 | |

* Up to 25 mm / 1" range

** Requires case to have Bezel Clamp on Left

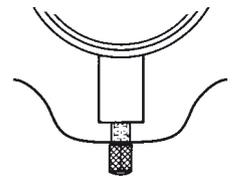
Protective Housing

For ANSI/AGD Group 2 indicators. Opens at rear so indicator can be mounted by its back. Mounts to indicator stem using a .687" O.D. bushing (not included). Order **HG-100** for Indicator models with ranges up to 6.35 mm / .250", **HG-101** for ranges of 6.35 mm / .250" to 25 mm / 1".

Recommended bushings: **BU-111** split bushing, or **AD-87** split collet. See next page.



Ox-Bow Lifting Lever - Type LR-40



Magnetic Maximum Hand

For ANSI/AGD Groups 2 and 3 indicators having plain dials. Accurately indicates maximum reading. Easy to reset. Order **2014804** (Group 2, snap-on bezel), **2011341** (Group 3, screw-on bezel).

Styles for Groups 1 and 4 indicators available on special order; consult Mahr Federal Customer Resource Center.



Tolerance Hands

Used with ANSI/AGD, long range and some Perpendicular indicators. Furnished integrally with split bezel. Easily replaces regular bezel.



| Use with Indicator Type | Order no. Snap-on Bezel | Order no. Screw-type Bezel |
|-------------------------|-------------------------|----------------------------|
| ANSI/AGD Group 1 | HD-128 | HD-59 |
| ANSI/AGD Group 2 | BZ-2503 | HD-57 |
| ANSI/AGD Group 4 | | HD-53 |

Range Limiting Caps

Used with ANSI/AGD type indicators. Adjustable thru 9.52 mm / .375" to limit range to any desired amount. Order **CS-123**.



Electronic Probe Adapter

Permits using electronic probes with many Mahr Federal dial indicators. Order **AD-138**.



Indicator Accessories

Hole Attachments

For ANSI/AGD type and perpendicular indicators with .375" diameter stems. For measuring internal surfaces. Order **AT-7293**, 47.50 mm/ 1.87" long, **AT-7294**, 25 mm /1" long.



Split Collet

For .375" diameter stem indicators. Six-finger grip permits easy, secure indicator adjustment. Requires 1/2-32 threaded hole. O.D. is 17.45 mm/ .687". Can be used with protective housings, page 5-23, Order **AD-87**. For 1/2-32 tap, Order **V-892**. 8 mm stem, Order **AD-190**.



Brake Attachment

For ANSI/AGD indicators with .001" graduations. Requires indicator modification for assembly. Range limited to 6.35 mm/ .250" for Group 1 indicators; and to 12 mm/ .500" for Group 2 indicators. Order **AT-A-7** stem mount, **AT-81** dust cap mount.



Threaded Bushing

For ANSI/AGD indicators with 5/16-32 threaded stems (an available option from Mahr Federal). Permits conventional stem mounting of indicator in gages and fixtures. Order **AD-62**, .625" long, .500" O.D., 5/16-32 internal thread. Threaded bushings for perpendicular indicators, see page 5-19.



Auxiliary Plungers

For extending reach of all ANSI/AGD type and perpendicular indicators with .375" diameter stems and ranges up to 6.35 mm/ .250" range. Attaches to indicator stem by integral split collet. Body is 12 mm/ .500" O.D. Order **AT-25**, 57 mm/ 2.25" long, **AT-26**, 104 mm/ 4" long. Special lengths available. Replacement contact. **PT-184**, 8-32 thread.



Dust Guard

For ANSI/AGD perpendicular indicators with .375" diameter stems. Recommended for ranges of 7.62 mm/ .300" or less. Oil resistant to protect spindle and bushing from dust, mist and contaminant's. Order **GU-2**. For sealed indicators, see Wetproof models, page 5-17.



Split Bushings

Fits all ANSI/AGD type and perpendicular indicators, Permits safe, non-cramping stem mounting. Order **BU-94** without counterbore, **BU-80** with counterbore, .375" stem hole x .500" O.D., **BU-111** for use with protective housings (.375" stem hole x .687" O.D.), **BU-112** (.218" stem hole x .375" O.D.), **BU-197** with shoulder, **4310103** without shoulder. (8 mm stem hole x .375" O.D.)



Right Angle Attachments

For ANSI/AGD type and perpendicular indicators (.375" diameter stems), For making measurements at right angle to spindle movement, Order **A-9**, regular type with flat spring hinge; for ranges up to 3.05 mm/ .120". Replacement spring: **SP-56**. Order **AT-24**, long range type with pivot-type bearing; for ranges up to 9.50 mm/ .375".



Indicator Calibrator with Digital Readout

Features

Model 400B-50

- A precision, benchtop instrument, providing a convenient means for calibrating a wide variety of precision measuring instruments, including dial indicators, test indicators, AirProbes®, electronic gage heads, or any other device that magnifies the linear displacement of a contact point or measuring spindle – user selectable for either inch or metric units.
- Two calibration stations provide high magnification and long range in a single unit. Incorporated within the micrometer-style control is a rotary encoder which senses the amount of movement and displays the actual displacement on a digital readout.
- Digital readout consists of six high visibility, LED digits and operator-accessible controls for inch/metric units, range selection, zero reset, and polarity/direction.
- RS232 Output.



400B-50 Indicator Calibrator with Digital Readout

Technical Data

| | Range | Minimum Graduation | Accuracy |
|---------------------------------|--|--------------------|----------|
| Inch | | | |
| High mag. station | .100" | .00001" | ±20µ" |
| Low mag. station | .500" | .00005" | ±50µ" |
| Metric (mm) | | | |
| High mag. station | 2.5 | 0.0001 | ±0.4 µm |
| Low mag. station | 12.5 | 0.0005 | ±1.5 µm |
| Display | 6-digit, 7-segment LED | | |
| Output | RS-232 | | |
| Power | 115Vac/60Hz/220Vac/50Hz-switchable | | |
| Dimensions Calibrator (approx.) | 330 x 200 x 285 mm h /13 x 8 x 11.25" h | | |
| Readout Unit | 170 x 125 x 80 mm h /6.625 x 5 x 3.25" h | | |
| Weight Calibrator (approx.) | 11.8 kg /26 lb. | | |
| Readout Unit | 0.8 kg /1.75 lb | | |

- Normally furnished:
 - AM-178** Arm Assembly;
 - AT-119** Mounting Clamp for .375" /9.5 mm dia. stems and probes;
 - BU-112** Bushing (.218" I.D. to .375" O.D.).
 - BU-197** Bushing (8 mm I.D. to .375" O.D.).
 - AT-117** Adaptor for holding gage blocks.
- Also Available:
 - AT-120** Adaptor for test indicators with long contacts.
 - AT-122** Adaptor for test indicators with short contacts.
 - AT-121** Adaptor for AGD type indicators with lug backs.

Upgrade Kit

EKT-1204

A kit is available to upgrade Models 400B-5 and 400B-25 Universal Calibrators to digital readout units with RS-232 output. The kit consists of a precision micrometer style controller with a digital encoder, which replaces the mechanical head, plus a digital readout unit.

Dial Indicator Calibrator

Features

400B-3 and 400B-4 Shop-floor Calibrators

All too often we have blinders on and don't look at the whole picture on how a precision gage can do more than what's its intended to do. Take for example our Dial Indicator Calibrators 400B-3 & 400B-4. We look at it and know that its purpose is to calibrate AGD dial indicators right? But let's take it a step further! If we add the Universal centering support frame 800b (part number 4305893) from the test indicator section of our catalog and an 8mm to .375" bushing (part number 4310103) we now have the ability to calibrate test indicators having a .0001" / .002mm resolution giving the once only dial indicator calibrator a DUAL PURPOSE!

- For checking dial indicators (both ANSI/AGD and perpendicular styles) and other transducers.
- Large micrometer wheel has widely spaced graduations for easy setting and reading.
- Adjustable crosshair provides on-the-mark setting.
- Tungsten carbide anvil for maximum wear resistance.
- Indicator clamped in-line with micrometer spindle.



400B-3
Dial Indicator Calibrator



Technical Data

| | Range | Minimum Graduation | Accuracy | Order no. |
|--------------------|-----------------|--------------------|------------------------|---------------|
| Metric (mm) | 0-25 | 0.002 | within 0.001* | 400B-4 |
| Inch | 0-1.000" | .0001" | within .000050" | 400B-3 |

- Normally furnished:
BU-112 Bushing (.218" I.D. to .375" O.D.)
AD-58 Bushing (.275" I.D. to .375" O.D.)
BU-197 Bushing (8 mm I.D. to .375" O.D.)

* Accuracy calibration as specified in Federal Specification GGG-105B.

Universal Calibrator

Features

Model 400B-5 and 400B-25

- Highest accuracy calibrator for precise monitoring of any gaging transducer— mechanical Indicator, air probe, or electronic gage head.
- Two calibrating stations: one for high magnification transducers and one for long range (up to 12.5 mm/ .500").
- Easy to use: fine adjustment; large bi-directional reading micrometer head; carbide reference anvils; adjustable viewing angle.
- Furnished in a fitted wooden storage case.



400B-5
Universal Calibrator

Technical Data

| | Range | Minimum Graduation | Accuracy | Order no. |
|--------------------|------------------------------|------------------------------------|----------------------------------|----------------|
| Metric (mm) | 2.5 12.5 | 0.0002 0.001 | ±0.4 μm ±0.8 μm | 400B-25 |
| Inch | .100" .500" | .000010" .000050" | ±20 μm" ±30 μm" | 400B-5 |

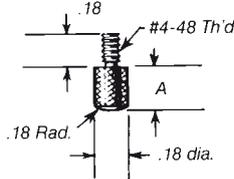
- Normally furnished:
AM-178 Arm Assembly;
AT-119 Mounting Clamp for 9.5 mm / .375" dia. stems and probes;
BU-112 Bushing (.218" I.D. to .375" O.D.);
BU-197 Bushing (8 mm I.D. to .375" O.D.);
AT-117 Adaptor for holding gage blocks.

- Also Available:
AT-120 Adaptor for test indicators with long contacts
AT-122 Adaptor for test indicators with short contacts
AT-121 Adaptor for AGD type Indicators with lug backs

Contact Points

Used with ANSI/AGD Groups 1.2.3.4 Long Range Wetproof Perpendicular and *MaxumIII*® Indicators, Points for ANSI Group 0 Indicators - see page 5-8. For Special Points - call Mahr Federal. See pages 5-52 & 5-53 for additional Metric Contact Points.

Regular



Hardened Steel (inch)

| Dimension A | Order no. | Dimension A | Order no. |
|-------------|-----------|-------------|-----------|
| 1/8" | PT-225 | 1-5/8" | PT-235 |
| 1/4" | PT-223* | 1-3/4" | PT-241 |
| 3/8" | PT-563 | 1-7/8" | PT-100 |
| 1/2" | PT-14 | 2" | PT-51 |
| 5/8" | PT-564** | 2-1/8" | PT-243 |
| 3/4" | PT-31 | 2-1/4" | PT-696 |
| 7/8" | PT-201 | 2-3/8" | PT-101 |
| 1" | PT-232 | 2-1/2" | PT-245 |
| 1-1/8" | PT-305 | 2-5/8" | PT-102 |
| 1-1/4" | PT-565 | 2-3/4" | PT-566 |
| 1-3/8" | PT-239 | 2-7/8" | PT-247 |
| 1-1/2" | PT-50 | 3" | PT-155 |

Hardened Steel (Metric***)

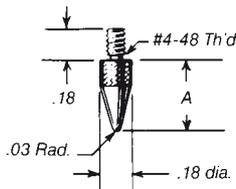
| Dimension A | Order no. | Dimension A | Order no. |
|-------------|-------------|-------------|-------------|
| 6 mm | EPT-1037-W1 | 15 mm | EPT-1037-W3 |
| 10 mm | EPT-1037-W2 | 20 mm | EPT-1037-W4 |
| 12 mm | EPT-1037-W6 | 25 mm | EPT-1037-W5 |

Tungsten Carbide
 1/4" PT-35 **Set of 8 Steel**
 1/8" to 1" PT-116

Diamond
 1/4" PT-317 **Set of 24 Steel**
 1/8" to 3" PT-115

* PT-223 normally furnished with all Indicators
 ** PT-564 normally furnished with all Wetproof Indicators
 *** All Metric Points have M2.5 thread

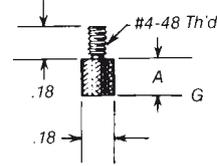
Tapered



Hardened Steel (inch) Tungsten Carbide (inch)

| Dimension A | Order no. | Dimension A | Order no. |
|-------------|-----------|-------------|-----------|
| 3/16" | PT-233 | 7/16" | PT-181 |
| 7/16" | PT-229 | 3/4" | PT-182 |
| 1" | PT-253 | 1" | PT-183 |
| 1-7/16" | PT-230 | | |
| 2" | PT-231 | | |

Flat End



Hardened Steel (inch)

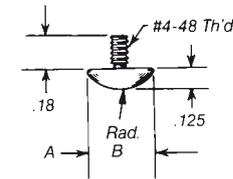
| Dimension A | Order no. |
|-------------|-----------|
| 1/8" | AL-19 |
| 1/4" | AL-673 |
| 3/8" | AL-20 |
| 1/2" | AL-21 |
| 5/8" | AL-22 |
| 3/4" | AL-23 |
| 7/8" | AL-24 |
| 1" | AL-25 |

Hardened Steel (Metric***)

| Dimension A | Order no. |
|-------------|-------------|
| 6 mm | EAL-1016-W1 |
| 10 mm | EAL-1016-W2 |
| 15 mm | EAL-1016-W3 |
| 20 mm | EAL-1016-W4 |
| 25 mm | EAL-1016-W5 |

Tungsten Carbide
 1/4" AL-51
 Set of 8 Steel
 1/8" to 1" AL-55

Button



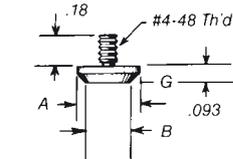
Hardened Steel (inch)

| Dim. A | Dim. B | Order no. |
|--------|--------|-----------|
| .375" | .250" | PT-227 |
| .500" | .375" | PT-619 |

Tungsten Carbide

| Dim. A | Dim. B | Order no. |
|--------|--------|-----------|
| .375" | .250" | PT-120 |

Wide Face



Hardened Steel (inch)

| Dim. A | Dim. B | Order no. |
|--------|--------|-----------|
| .356" | .250" | AL-502 |
| .500" | .375" | AL-1510 |
| .615" | .500" | AL-520 |
| .731" | .625" | AL-44 |

Hardened Steel (Metric***)

| Dim. A | Dim. B | Order no. |
|--------|--------|-------------|
| 9.04 | 6.35 | EAL-1020-W1 |
| 12.7 | 9.5 | EAL-1020-W2 |
| 15.6 | 12.7 | EAL-1020-W3 |
| 18.6 | 15.9 | EAL-1020-W4 |

Tungsten Carbide (inch)
 .356" .250" AL-1730

Set of 8 Steel (Metric*)**
 9.04 6.35 EAL-1021

Extra Wide Face

Hardened Steel

Order no. AL-291

