

## THEY POINT YOU IN THE RIGHT DIRECTION. **MARCATOR DIAL INDICATORS.**

▶ | Dial indicators due to their versatility rank as the most frequently applied transducer, just like our MarCator series. Our mechanical dial indicators have precision gears and pinions for a maximum accuracy. They are also available in shock and waterproof versions. Our digital indicator range contains highly precise electronic measuring systems, which make measuring functions possible yet without the loss of an analog display. With the simple operation, the large display that can be read error free and the possibility of a rapid and simple transmission of all your measurement results thus meeting all requirements of a modern measuring instrument. | ◀

## ▶ | MarCator. Dial and Digital Indicators

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# 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	Rev Counter
<b>Group 0</b>						
.0001"	.004"	.010"	0-2-0	-	A1/2Q	
.0001"	.010"	.025"	0-5-0	-	A2I	
.0005"	.020"	.050"	0-10-0	-	A3Q	
.001"	.040"	.100"	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	
<b>Group 1</b>						
.0001"	.010"	.025"	0-5-0	0-10	12I	12I-RC
.00025"	.010"	.025"	0-5-0	0-10	12Q	12Q-RC
.00025"	.020"	.050"	0-10-0	0-20	B3K	B3K-RC
.0005"	.020"	.050"	0-10-0	0-20	B3Q	B3Q-RC
.0005"	.030"	.075"	0-15-0	0-30	B5M	B5M-RC
.0005"	.040"	.100"	0-20-0	0-40	B6K	B6K-RC
.0005"	.050"	.125"	0-25-0	0-50	B7I	B7I-RC
.001"	.020"	.050"	0-10-0	0-20	B3W	B3W-RC
.001"	.040"	.100"	0-20-0	0-40	B6Q	B6Q-RC
.001"	.050"	.125"	0-25-0	0-50	B7O	B7O-RC
.001"	.100"	.250"	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
<b>Group 2</b>						
.00005"	.004"	.010"	0-2-0	0-4	C1/2K	C1/2K-RC
.0001"	.008"	.020"	0-4-0	0-8	C1K	C1K-RC
.0001"	.010"	.025"	0-5-0	0-10	2015781	2014761
.00025"	.010"	.025"	0-5-0	0-10	2015782	2014791
.00025"	.020"	.050"	0-10-0	0-20	2015783	2014808
.0005"	.020"	.050"	0-10-0	0-20	2015784	2014810
.0005"	.030"	.075"	0-15-0	0-30	2015786	2014811
.0005"	.040"	.100"	0-20-0	0-40	2015787	2014812
.0005"	.050"	.125"	0-25-0	0-50	2015790	2014814
.001"	.020"	.050"	0-10-0	0-20	2015785	2014809
.001"	.040"	.100"	0-20-0	0-40	2015789	2014813
.001"	.050"	.125"	0-25-0	0-50	2015791	2014815
.001"	.100"	.250"	0-50-0	0-100	2015792	2011049
.001 mm	.100	.250	0-5-0	0-10	P1/2I	P1/2-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
<b>1 Rev</b>						
.0005"	-	.040"	-	-	2014793	
.001"	-	.080"	-	-	2014792	
.010 mm	-	1.00	-	-	2014795	
.020 mm	-	2.00	-	-	2014794	
.010 mm	-	1.00	-	-	2014797	
.020 mm	-	2.00	-	-	2014796	

# 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	Rev Counter
<b>Group 3</b>						
.0001"	.008"	.020"	0-4-0	0-8	D1K	D1K-RC
.0001"	.010"	.025"	0-5-0	0-10	32I	32I-RC
.00025"	.010"	.025"	0-5-0	0-10	32Q	32Q-RC
.00025"	.020"	.050"	0-10-0	0-20	D3K	D3K-RC
.00025"	.030"	.075"	0-15-0	0-30	D5G	D5G-RC
.0005"	.020"	.050"	0-10-0	0-20	D3Q	D3Q-RC
.0005"	.030"	.075"	0-15-0	0-30	D5M	D5M-RC
.0005"	.040"	.100"	0-20-0	0-40	D6K	D6K-RC
.0005"	.050"	.125"	0-25-0	0-50	D7I	D7I-RC
.001"	.020"	.050"	0-10-0	0-20	D3W	D3W-RC
.001"	.040"	.100"	0-20-0	0-40	D6Q	D6Q-RC
.001"	.050"	.125"	0-25-0	0-50	D7O	D7O-RC
.001"	.100"	.250"	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
<b>Group 4</b>						
.0001"	.008"	.020"	0-4-0	0-8	E1K	E1K-RC
.0001"	.010"	.025"	0-5-0	0-10	42I	42I-RC
.00025"	.020"	.050"	0-10-0	0-20	E3K	E3K-RC
.00025"	.030"	.075"	0-15-0	0-30	E5G	E5G-RC
.0005"	.020"	.050"	0-10-0	0-20	E3Q	E3Q-RC
.0005"	.030"	.075"	0-15-0	0-30	E5M	E5M-RC
.0005"	.050"	.125"	0-25-0	0-50	E7I	E7I-RC
.001"	.020"	.050"	0-10-0	0-20	E3W	E3W-RC
.001"	.050"	.125"	0-25-0	0-50	E7O	E7O-RC
.001"	.100"	.250"	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
<b>Long Range</b>						
.0001"	.010"	.500"	–	0-10		42IQ
.001"	.100"	.500"	–	0-100		2014699
.001"	.100"	1.00"	–	0-100		2014698
.001"	.100"	1.00"	–	0-100		D8IS
.001"	.100"	2.00"	–	0-100		D8IT
.001"	.100"	3.00"	–	0-100		E8IU
.010"	1.00"	1.00"	–	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 specialized 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.**



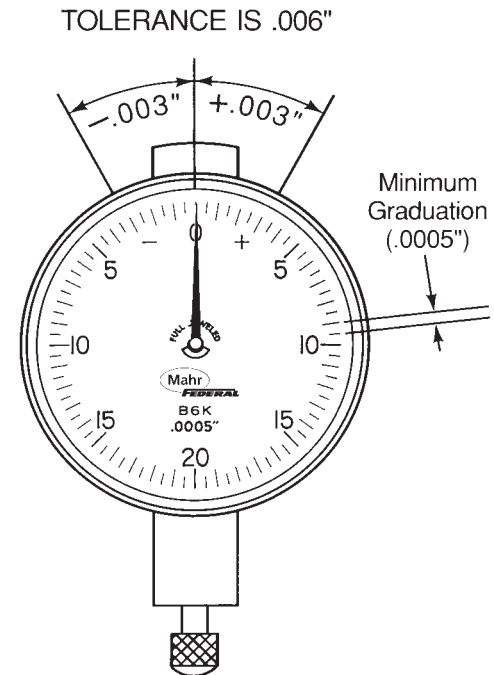
## Dial Indicators per ANSI/AGD

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 2-1/4in, 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 .006in ( $\pm .003$ in), then, the most suitable minimum graduation value is .0005in.*



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

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

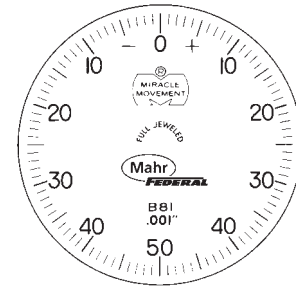
The American Society of Mechanical Engineers  
 ASME Order Desk  
 22 Law Drive  
 Fairfield, NJ 07007  
 (973)882-1167



## Dial Indicators per ANSI/AGD

**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.

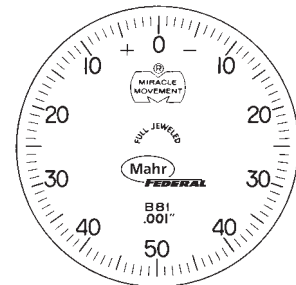
Note: If Revolution Counter models are ordered, counter dial operates counterclockwise.



**2. Balanced (+) on left.** Indicates decreasing values when contact is depressed as in comparison bore\* and depth gages.

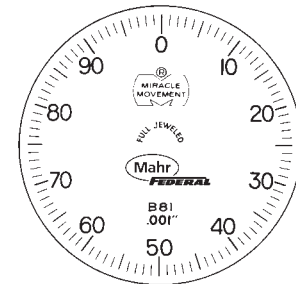
\* Will vary as dictated by motion transfer design.

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



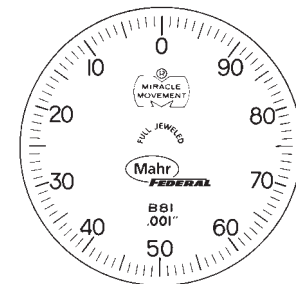
**3. Continuous clockwise.** Normally furnished on Long and Extra Long Range Indicators, unless otherwise specified. Indicates an increasing value when contact is depressed as in direct-reading thickness gages.

Note: With Revolution Counter models, counter dial operates 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 operates clockwise



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

### Features

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



### Technical Data

#### Mahr Federal Series A (inch)

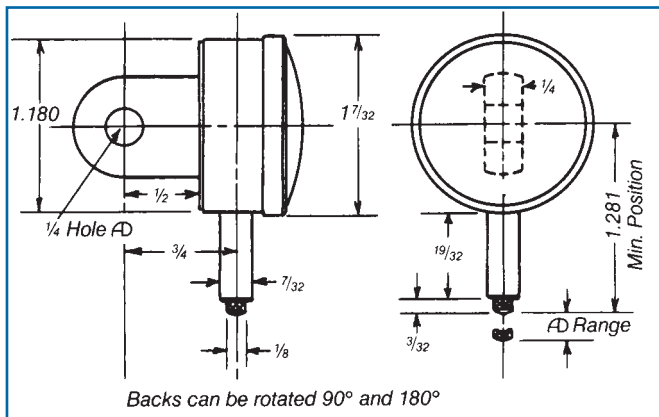
Dial: approx. 1.250in dia. with soft-green tint

Measuring range	Graduation value	Dial style	Range per revolution	Accuracy	Order number
.010"	.0001"	0-2-0	.004"	±0.001"	A1/2Q
.025"	.0001"	0-5-0	.010"	±0.001"	A2I
.050"	.0005"	0-10-0	.020"	±0.005"	A3Q
.100"	.001"	0-20-0	.040"	±0.001"	A6Q

#### Mahr Federal Series N (Metric – mm)

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

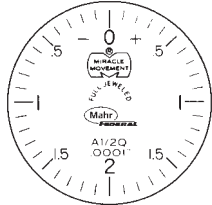
0.250	0.002	0-5-0	0.100	±0.002mm	N1/2O
1.250	0.005	0-25-0	0.500	±0.005mm	N3I
2.500	0.010	0-50-0	1.00	±0.010mm	N6I



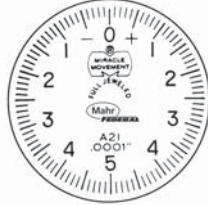


## Dial Indicators per ANSI/AGD Group 0 - Mahr Federal Series A and N

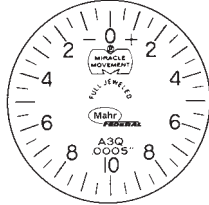
### Mahr Federal Series A



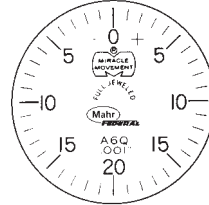
A1/2Q



A2I

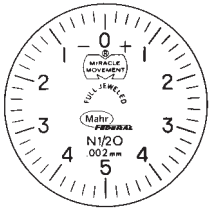


A3Q

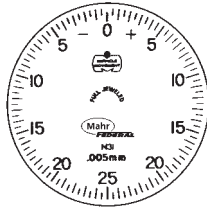


A6Q

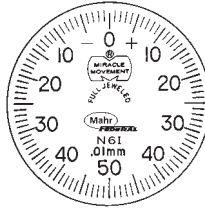
### Mahr Federal Series N



N1/2O



N3I

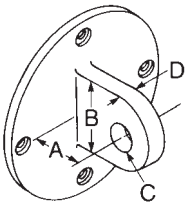


N6I

- Normally furnished: balanced dial with + on right; centered vertical lug back; regular contact point, .09in radiused, .093in long.
- Optional dials: balanced with + on left; continuous clockwise; continuous counter-clockwise. Order by part number and specify dial style desired.
- For other dial styles or special requirements, call Mahr Federal.

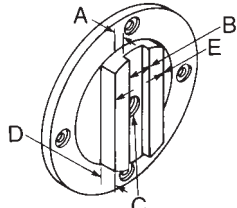
### Backs for ANSI Group 0 - Series A and N

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



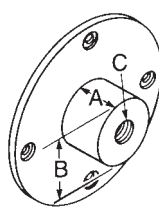
Vertical Lug (Centered) BK-37

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



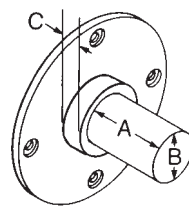
Adjustable BK-45

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



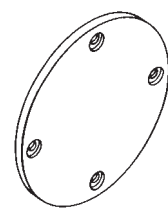
Screw Type BK-88

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



Post BK-38

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

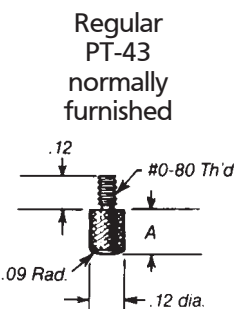


Flat BK-32

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

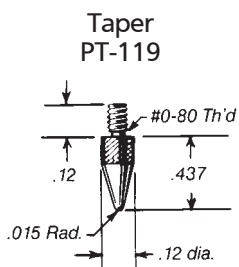


### Points for ANSI Group 0 - Series A and N

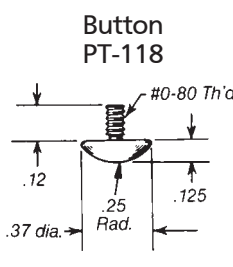


Regular PT-43 normally furnished

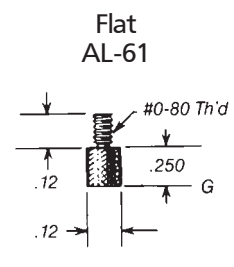
Dim. A Style	Part Number
3/32"	PT-43
1/4"	PT-204
3/8"	PT-205
1/2"	PT-207
5/8"	PT-208
3/4"	PT-209
7/8"	PT-210
1"	PT-211



Taper PT-119



Button PT-118



Flat AL-61

## ANSI/AGD Group 1 - Mahr Federal Series B and O

### Technical Data



#### Mahr Federal Series B (Inch)

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

Measuring range	Graduation value	Dial style w/o RC	Dial style w/ RC	Range per revolution	Accuracy	Order number w/o Rev Counter	Order number w/ 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)

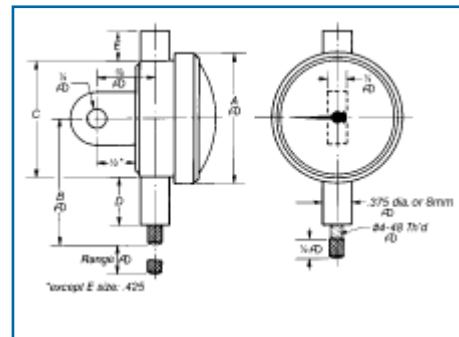
Dial: approx. 45mm dia. with yellow tint

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

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.

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



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

Technical Data



Mahr Federal Series C (Inch)

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

Measuring range	Graduation value	Dial style w/o RC	Dial style w/ RC	Range per revolution	Accuracy	Order number w/o Rev Counter	Order number w/ Rev Counter	Old number
.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
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Mahr Federal Series P (Metric – mm)

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

0.500	0.002	0-10-0	0-20	0.200	±0.002	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
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- **Contact Points** - see pages 5-27 and 5-28
- **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.

*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 & P1/2I.*

## ANSI/AGD Group 3 - Mahr Federal Series D and Q

### Technical Data

Recommended for larger gages and greater visibility.



#### Mahr Federal Series D (Inch)

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

Measuring range	Graduation value	Dial style w/o RC	Dial style w/ RC	Range per revolution	Accuracy	Order number w/o Rev Counter	Order number w/ 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. 70mm dia. with soft-yellow tint

0.500	0.002	0-10-0	0-20	0.200	±0.002	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

- **Contact Points** - see pages 5-27 and 5-28
- **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.

*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.*

## ANSI/AGD Group 4 - Mahr Federal Series E and R

### Technical Data

When distance or reduced lighting requires a larger size for improved visibility.



#### Mahr Federal Series E (Inch)

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

Measuring range	Graduation value	Dial style w/o RC	Dial style w/ RC	Range per revolution	Accuracy	Order number w/o Rev Counter	Order number w/ 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)

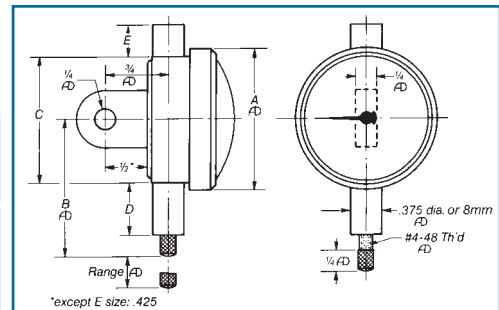
Dial: approx. 92mm dia. with soft-yellow tint

0.500	0.002	0-10-0	0-20	0.200	±0.002	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

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.

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



## Easy Reading, Single Revolution Dial Indicator

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



## Technical Data

Measuring Range	Graduation value	Stem diameter	Model number	Order number
2mm	0.02mm	.375"	P1RN-200	2014794
1mm	0.01mm	.375"	P1RN-100	2014795
2mm	0.02mm	8mm	M1RN-200	2014796
1mm	0.01mm	8mm	M1RN-100	2014797
.080"	.001"	.375"	C1RN-80	2014792
.040"	.0005"	.375"	C1RN-40	2014793

## Special Designs - Ranges - Dials - Ratios - Stem Lengths

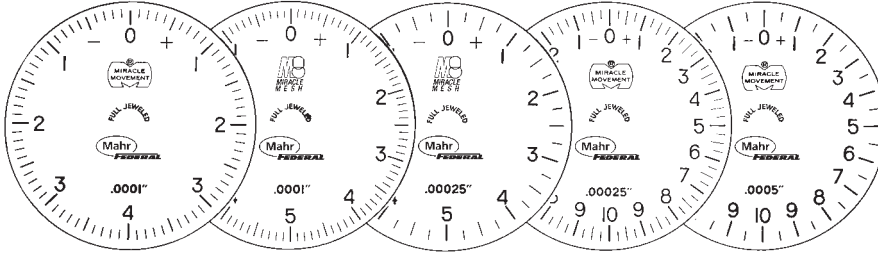
Although we offer the widest choice of Dial Indicators, Test Indicators and associated equipment available, there is sometimes a need for a special design. Let our experience, capability and unusually large file of special items help you.

Whatever your requirement may be, chances are we already have a design on file that will do the job, thus saving you the time and expense of a special design.

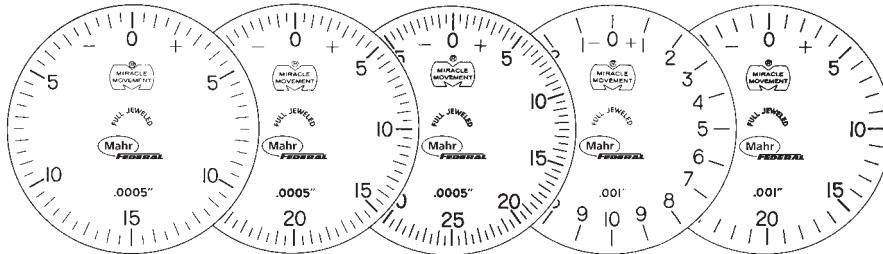
- Special Ranges
- Special Stem Lengths
- Special Contacts
- Restricted Hand Travel
- Special Dials
- Push-Down Action
- Special Ratio Movements
- Specified Contact Loads
- High Temperature Applications
- Reverse Action

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

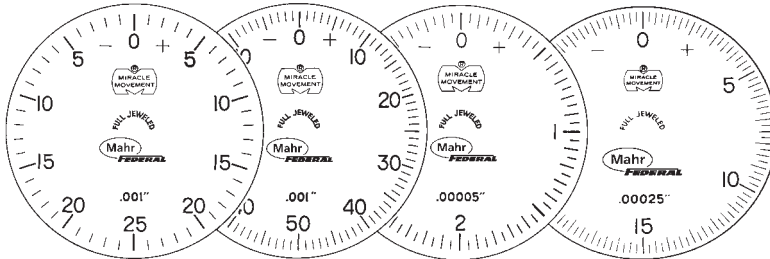
### Mahr Federal Series B thru E



<b>C1K</b>	<b>12I</b>	<b>12Q</b>	<b>B3K</b>	<b>B3Q</b>
<b>D1K</b>	<b>2015781</b>	<b>2015782</b>	<b>2015783</b>	<b>2015784</b>
<b>E1K</b>	<b>32I</b>	<b>32Q</b>	<b>D3K</b>	<b>D3Q</b>
	<b>42I</b>		<b>E3K</b>	<b>E3Q</b>

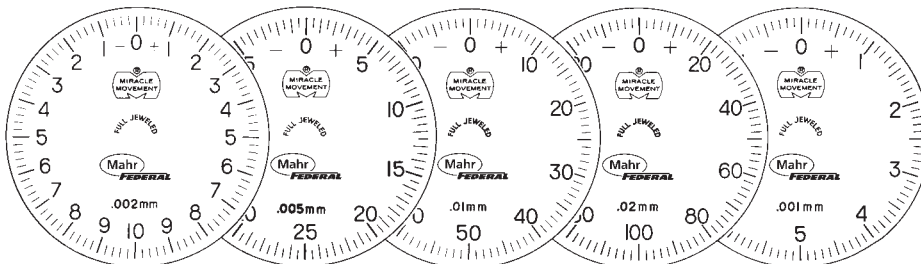


<b>B5M</b>	<b>B6K</b>	<b>B7I</b>	<b>B3W</b>	<b>B6Q</b>
<b>2015786</b>	<b>2015787</b>	<b>2015790</b>	<b>2015785</b>	<b>2015789</b>
<b>D5M</b>	<b>D6K</b>	<b>D7I</b>	<b>D3W</b>	<b>D6Q</b>
<b>E5M</b>		<b>E7I</b>	<b>E3W</b>	



<b>B7O</b>	<b>B8I</b>	<b>C1/2K</b>	<b>D5G</b>
<b>2015791</b>	<b>2015792</b>		<b>E5G</b>
<b>D7O</b>	<b>D8I</b>		
<b>E7O</b>	<b>E8I</b>		

### Mahr Federal Series O thru R



<b>O1I</b>	<b>O3I</b>	<b>O6I</b>	<b>Q8I</b>	<b>P1/2I</b>
<b>21IN</b>	<b>2015793</b>	<b>2015794</b>	<b>2015795</b>	
<b>Q1I</b>	<b>Q3I</b>	<b>Q6I</b>	<b>R8I</b>	
<b>R1I</b>	<b>R3I</b>	<b>R6I</b>		

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

- Normally furnished: dial as illustrated; centered vertical lug back; regular contact point, .18in radiused, 1/4in 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.
- **Contact Points** - see pages 5-27 and 5-28
- **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](http://www.mahr.com)



## Long Range and Extra Long Range Indicators

For applications where extended measuring range is needed or spindle retraction is necessary.



### Technical Data

#### Long Range/Extra Long Range (Inch)

Dial: soft-green tint

##### Long Range

Measuring range	Graduation value	Dial style	Range per revolution	Accuracy	ANSI/AGD Group	Model number	Order number	Old number
.500"	.0001"	0-10	.010"	.0001"	4	42IQ	42IQ **	E2IQ
.500"	.001"	0-100	.100"	.001"	2	28IQN	2014699	C8IQ
1.000"	.001"	0-100	.100"	.001"	2	28ISN	2014698	C8IS
1.000"	.001"	0-100	.100"	.001"	3	D8IS	D8IS	
1.000"	.010"	0-1000	1.000"	.010"	2	29I	2014816	C9I

##### 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 = 0.0002" for full range

\*\*\* for first 1 inch of travel.

#### Long Range/Extra Long Range (Metric)

Dial: yellow tint

##### Long Range

25.000	0.010	0-100	1.000	.020	2	SP6IS		
25.000	0.010	0-100	1.000	.020	3	SQ6IS		

##### Extra Long Range

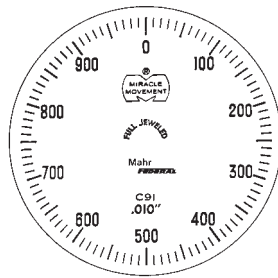
50.000	0.025	0-25	2.500	.025****	3	Q8IT		
75.000	0.025	0-25	2.500	.025****	4	R8IU		

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

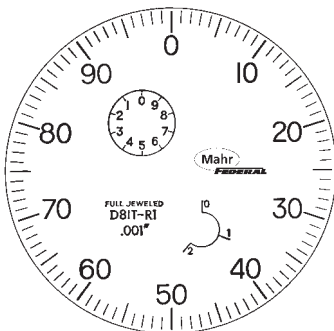
## Dial Styles for Long Range and Extra Long Range Indicators



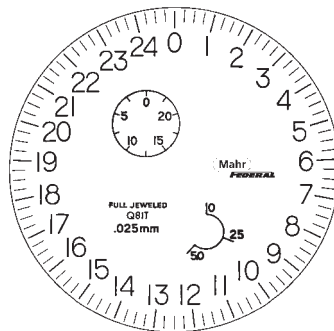
281QN, 281SN & D81S



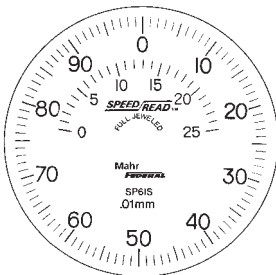
291



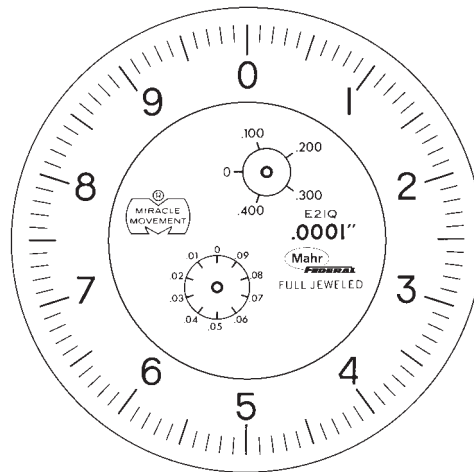
D81T & E81U



Q81T & R81U



SP61S & SQ61S



421Q

- Normally furnished: continuous clockwise dial; centered vertical lug back; regular contact point, .18in radiused, .250in 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.

- **Contact Points** - see pages 5-27 and 5-28
- **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](http://www.mahr.com)

### Dial Indicator Modifications & Specials

Available to meet specific requirements.

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

## 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)

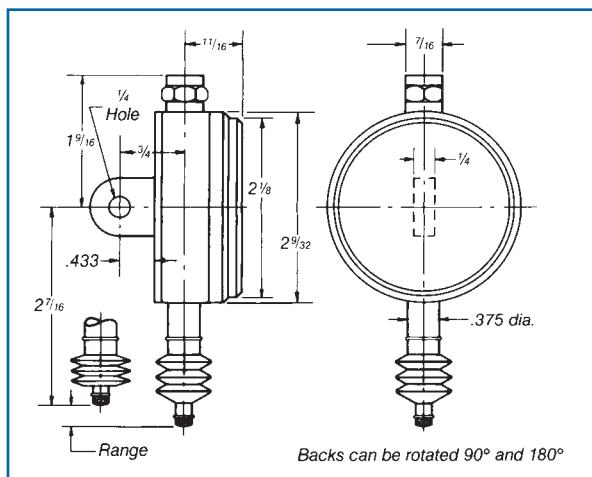
Dial: approx. 2-1/4in dia. with soft-green tint

Measuring range	Graduation value	Dial style	Range per revolution	Accuracy	Order number
.025"	.0001"	0-10	.010"	.0001"	W221
.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"	WC71
.250"	.001"	0-100	.100"	.001"	WC81
1.000"	.001"	0-100	.100"	.001"	WC81S

#### Series WC and WP Wetproof Dial Indicators (Metric)

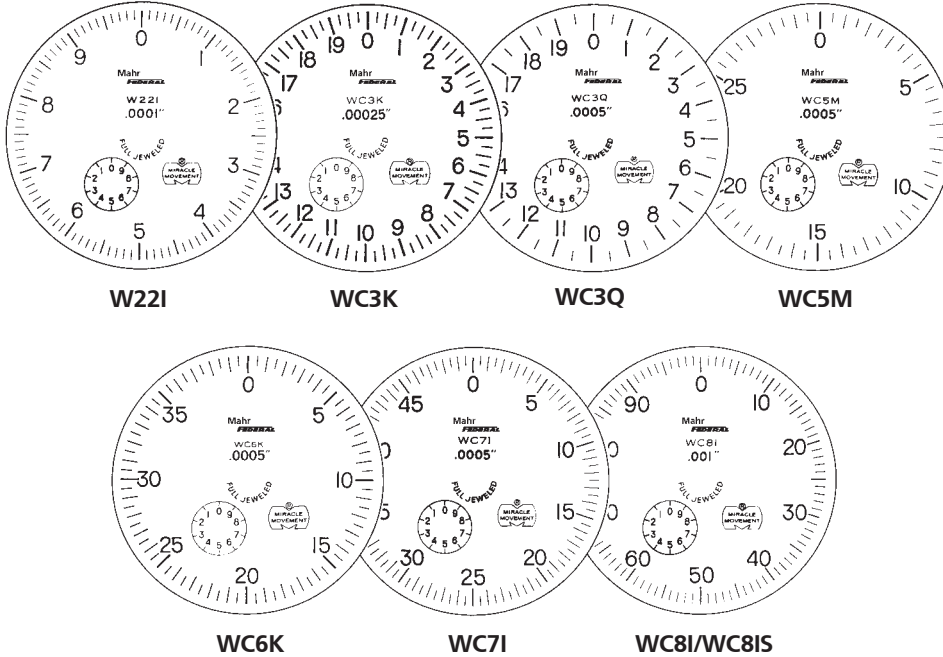
Dial: approx. 57mm dia. with yellow tint

0.500	0.002	0-20	0.200	0.002	WP11
1.250	0.005	0-50	0.500	0.005	WP31
2.500	0.010	0-100	1.000	0.010	WP61



## Dial Styles for WC and WP Wetproof Dial Indicators

### Series WC indicators

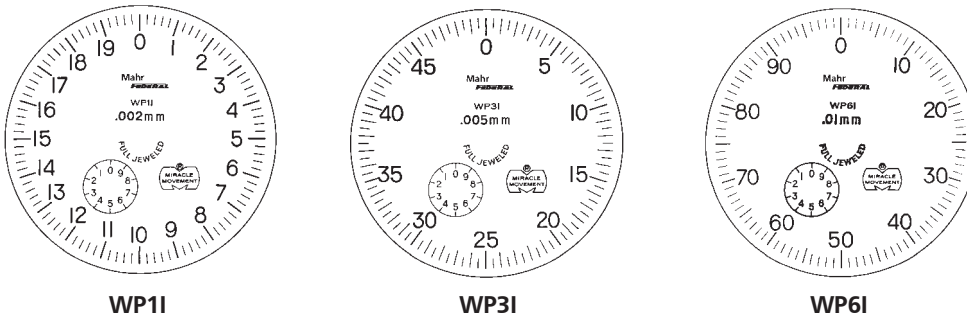


- Normally furnished: continuous clockwise dial with revolution counter; BK-63 centered vertical lug back; regular contact point, .18in radiused, .625in long
- Optional Dials: continuous counter-clockwise with revolution counter; balanced outer dial with + on right or left. Order by dial type and specify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

• **Contact Points** - see pages 5-27 and 5-28

• **Accessories** - see pages 5-23 and 5-24

### Series WP indicators



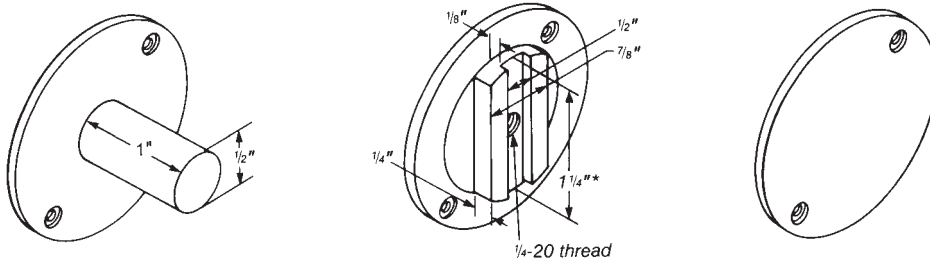
### Ordering Information

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](http://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)

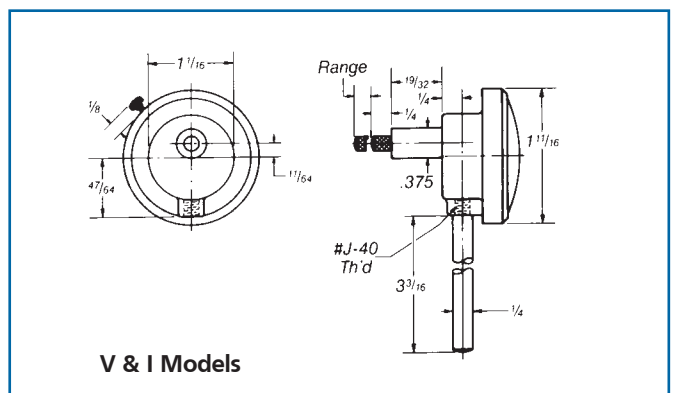
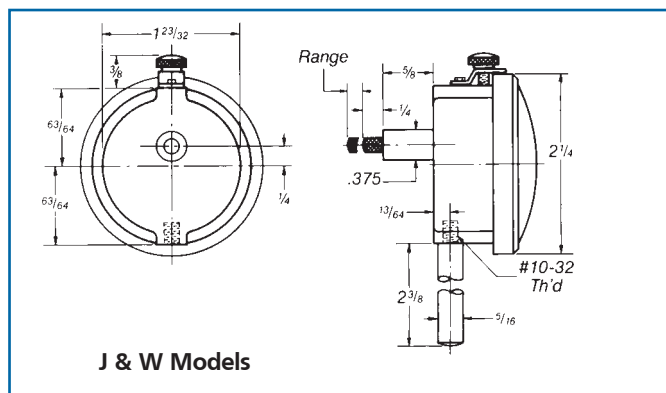
Dial: soft-green tint

Measuring range	Graduation value	Dial style	Range per revolution	Accuracy	Gear type	Dial Dia. (approx.)	Order number
.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)

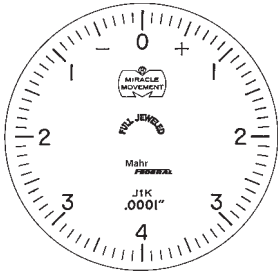
Dial: yellow tint

0.200	0.002	0-10-0	0.200	0.002	crown	57	W1I
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

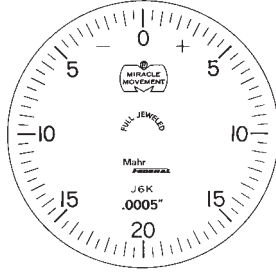


## Dial Styles for Perpendicular Indicators

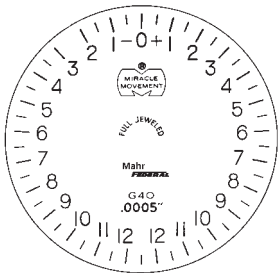
### Series J, G, V, F



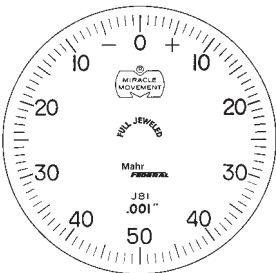
J1K



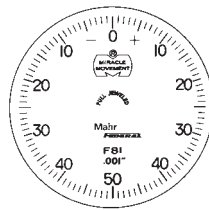
J6K



G40



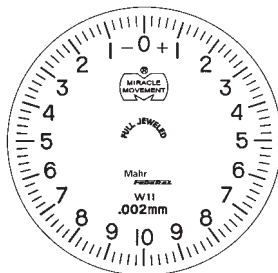
J8I & G8I



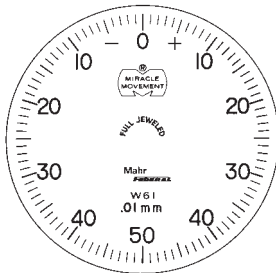
V8I & F8I

- Normally furnished: balanced dial with + on right; mounting rod (see dimension drawings); regular contact point, .18in radiused, .250in long.
- Threaded stem versions available as an option; AD-59 (.562in long x .500in O.D. for "J & W" styles), 3/8-32 internally threaded bushings and AD-60 (.687in long x .500in O.D. for "G & F" Models) purchased separately. Bushings also available separately.
- For other dial styles or special requirements - call Mahr Federal.

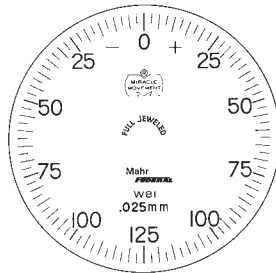
### Series W, I



W1I



W6I



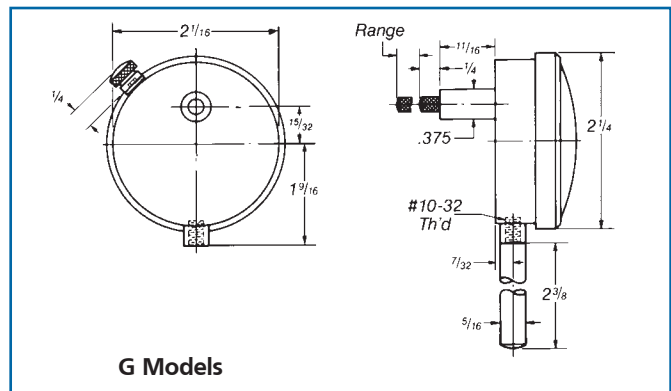
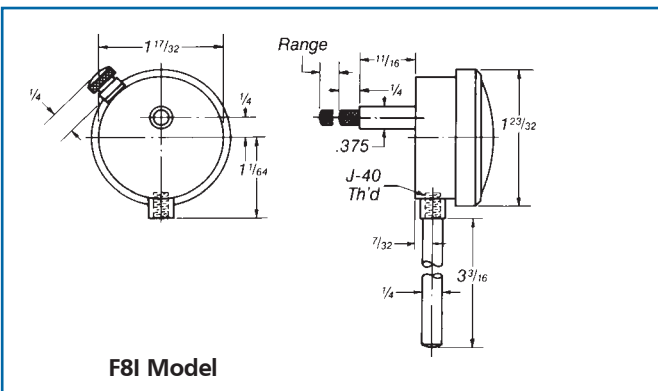
W8I & I8I

- **Contact Points** - see pages 5-27 and 5-28
- **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.

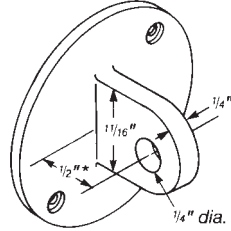
[www.mahr.com](http://www.mahr.com)



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

- 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.

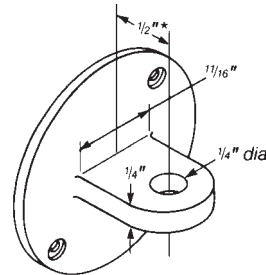
### Vertical Lug



*\*\*27/64" for E/R size*

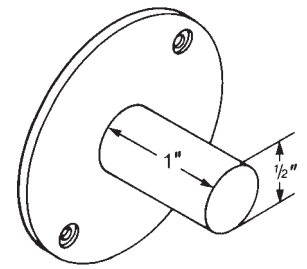
(centered)  
normally furnished

### Horizontal Lug

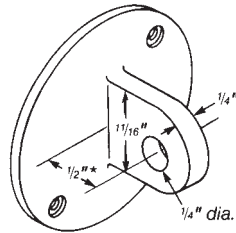


(centered)

### Post

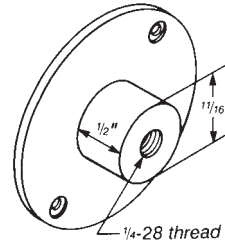


### Vertical Lug

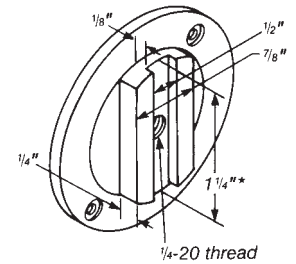


(offset) Left face of lug is on centerline of back

### Screw Type

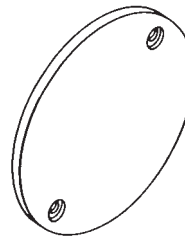


### Adjustable



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

### Flat



### ANSI/AGD

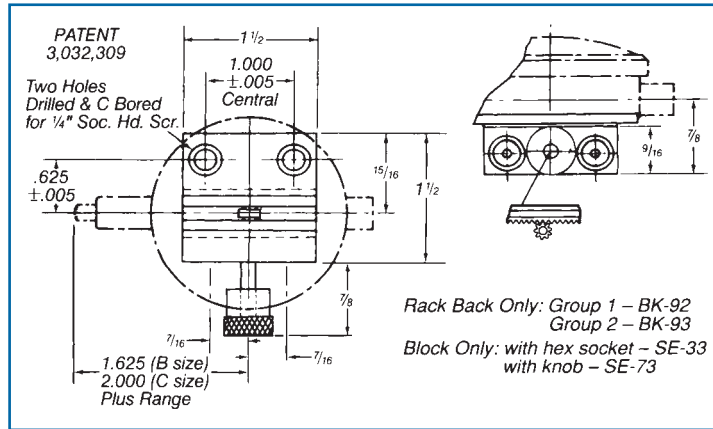
	Group 1 Series B/O	Group 2 Series C/P	Group 3 Series D/Q	Group 4 Series E/R
Vertical Lug, Centered	BK-1600	BK-383	BK-431	BK-3
Vertical Lug, Offset	BK-1601	BK-2168	BK-545	BK-4
Horizontal Lug, Centered	BK-19	BK-400	BK-109	BK-3
Flat	BK-1660	BK-470	BK-473	BK-5
Post	BK-1634	BK-2093	BK-664	BK-17
Screw	BK-1661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



## Adjustable Mounting Brackets

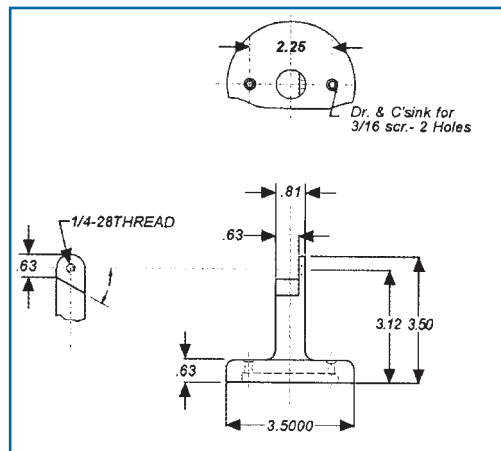
- Allows fast, positive indicator adjustments
- Ideal for permanent indicator mounting to fixtures
- Rack Back included with all Brackets
- Sizes for ANSI/AGD Groups 1 and 2

Order number	Used with	Mahr Federal Indicator
AT-27	hex socket adjust.	Group 1
AT-115	adjusting knob	Group 1
AT-28	hex socket adjust.	Group 2
AT-116	adjusting knob	Group 2



## Universal Mounting Base

- Allows mounting indicator to custom fixtures
- Uses lug back to mount indicator
- Accommodates all size indicators



Order number: BA-1051

## Indicator Accessories



### Weights

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



### 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 .687in O.D. bushing (not included). Order **HG-100** for Indicator models with ranges up to 6.35mm/.250in, **HG-101** for ranges of 6.35mm/.250in to 25mm/1in. Recommended bushings: **BU-111** split bushing, or **AD-87** split collet. See next page.



### 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.



### Range Limiting Caps

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

### Lifting Levers - CAM Type

Used with ANSI/AGD type and long range indicators.

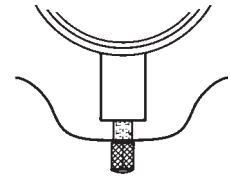


### Order number

Left Hand	Right Hand	Use with Indicator Type
<b>LR-46</b>	<b>LR-47</b>	ANSI/AGD Group 1*
<b>LR-48</b>	<b>LR-49</b>	ANSI/AGD Group 2*
<b>LR-50</b>	<b>LR-51</b>	ANSI/AGD Group 3*
<b>LR-68</b>	<b>LR-69</b>	ANSI/AGD Group 4*
<b>LR-115</b>	<b>LR-116</b>	Federal Models D8IT & Q8IT
<b>LR-40</b>		Ox-Bow Lifting Lever

*\*Up to 25mm/1in range*

### Type LR-40 Ox-Bow Lifting Lever



### Tolerance Hands

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



### Order number

Snap-on Bezel	Screw-type Bezel	Use with Indicator Type
<b>HD-128</b>	<b>HD-59</b>	ANSI/AGD Group 1
<b>BZ-2503</b>	<b>HD-57</b>	ANSI/AGD Group 2
	<b>HD-55</b>	ANSI/AGD Group 3
	<b>HD-53</b>	ANSI/AGD Group 4

### 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 .375in diameter stems. For measuring internal surfaces. Order **AT-7293**, 47.50mm/1.87in long, **AT-7294**, 25mm/1in long.



### Brake Attachment

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



### Auxiliary Plungers

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



### 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, .375in stem hole x .500in O.D., **BU-111** for use with protective housings (.375in stem hole x .687in O.D.), **BU-112** (.218in stem hole x .375in O.D.), **BU-197** with shoulder, **4310103** without shoulder. (8mm stem hole x .375in O.D.)



### Split Collet

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



### 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**, .625in long, .500in O.D., 5/16-32 internal thread. Threaded bushings for perpendicular indicators, see page 5-19.



### Dust Guard

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



### Right Angle Attachments

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



## Indicator Calibrator with Digital Readout

### 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.



**400B-50**  
Indicator Calibrator  
with Digital Readout

## Technical Data

		Range	Minimum Graduation	Accuracy
Inch	High mag. station	.100"	.0001"	±20µ"
	Low mag. station	.500"	.0005"	±50µ"
Metric (mm)	High mag. station	2.5	0.0001	±0.4µm
	Low mag. station	12.5	0.0005	±1.5µm
Display		6-digit, 7-segment LED		
Output		RS-232		
Power		115Vac/60Hz/220Vac/50Hz-switchable		
Dimensions (approx.)				
Calibrator		330 x 200 x 285mm h/13 x 8 x 11.25" h		
Readout Unit		170 x 125 x 80mm h/6.625 x 5 x 3.25" h		
Weight (approx.)				
Calibrator		11.8 kg/26 lb.		
Readout Unit		0.8 kg/1.75 lb.		

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

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

- 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

	Order number	Range	Minimum Graduation	Accuracy
Metric (mm)	400B-4	0-25	0.002	within 0.001*
Inch	400B-3	0-1.000"	.0001"	within .000050"*

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

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

## Universal Calibrator

### 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 12.5mm/.500in).
- 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

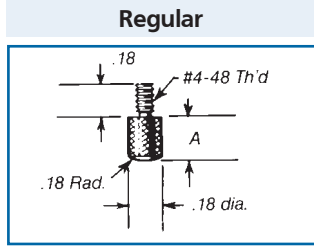
	Order number	Range	Minimum Graduation	Accuracy
Metric (mm)	400B-25	2.5 12.5	0.0002 0.001	±0.4µm ±0.8µm
Inch	400B-5	.100" .500"	.000010" .000050"	±20µ" ±30µ"

- Normally furnished:  
**AM-178** Arm Assembly;  
**AT-119** Mounting Clamp for 9.5mm/.375in dia. stems and probes;  
**BU-112** Bushing (.218in I.D. to .375in O.D.); **BU-197** Bushing (8mm I.D. to .375in 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 Maxµm® Indicators. Points for ANSI Group 0 Indicators - see page 5-8. For Special Points - call Mahr Federal.

See pages 5-45 & 5-46 for additional Metric Contact Points.



### Hardened Steel

Dimension A	Order number
1/8"	PT-225
1/4"	PT-223*
3/8"	PT-563
1/2"	PT-14
5/8"	PT-564**
3/4"	PT-31
7/8"	PT-201
1"	PT-232
1-1/8"	PT-305
1-1/4"	PT-565
1-3/8"	PT-239
1-1/2"	PT-50
1-5/8"	PT-235
1-3/4"	PT-241
1-7/8"	PT-100
2"	PT-51
2-1/8"	PT-243
2-1/4"	PT-696
2-3/8"	PT-101
2-1/2"	PT-245
2-5/8"	PT-102
2-3/4"	PT-566
2-7/8"	PT-247
3"	PT-155

### Metric\*\*\*

Dimension	Order number
6mm	EPT-1037-W1
10	EPT-1037-W2
12	EPT-1037-W6
15	EPT-1037-W3
20	EPT-1037-W4
25	EPT-1037-W5

### Tungsten Carbide

1/4"	PT-35
1/4"	PT-317

### Set of 8 Steel

1/8" to 1"	PT-116
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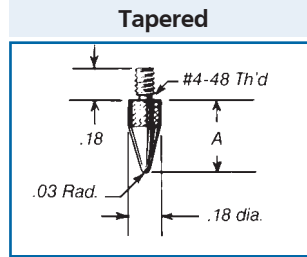
### Set of 24 Steel

1/8" to 3"	PT-115
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\* PT-223 normally furnished with all Indicators

\*\* PT-564 normally furnished with all Wetproof Indicators

\*\*\* All Metric Points have M2.5 thread



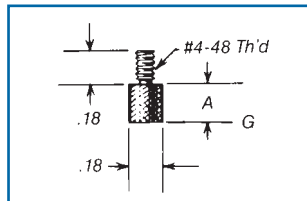
### Hardened Steel

Dimension A	Order number
3/16"	PT-233
7/16"	PT-229
1"	PT-253
1-7/16"	PT-230
2"	PT-231

### Tungsten Carbide

7/16"	PT-181
3/4"	PT-182
1"	PT-183

### Flat End



### Hardened Steel

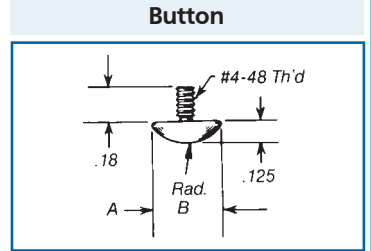
Dimension A	Order number
1/8"	AL-19
1/4"	AL-673
3/8"	AL-20
1/2"	AL-21
5/8"	AL-22
3/4"	AL-23
7/8"	AL-24
1"	AL-25

### Metric\*\*\*

Dimension	Order number
6mm	EAL-1016-W1
10	EAL-1016-W2
15	EAL-1016-W3
20	EAL-1016-W4
25	EAL-1016-W5

### Tungsten Carbide

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



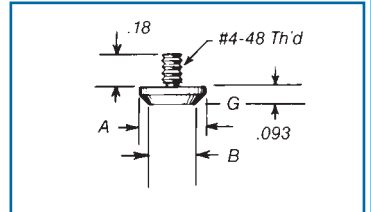
### Hardened Steel

Dimension A	Dimension B	Order number
.375"	.250"	PT-227
.500"	.375"	PT-619

### Tungsten Carbide

.375"	.250"	PT-120
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### Wide Face



### Hardened Steel

Dimension A	Dimension B	Order number
.356"	.250"	AL-502
.500"	.375"	AL-1510
.615"	.500"	AL-520
.731"	.625"	AL-44

### Metric\*\*\*

Dimension A	Dimension B	Order number
9.04mm	6.35mm	EAL-1020-W1
12.7	9.5	EAL-1020-W2
15.6	12.7	EAL-1020-W3
18.6	15.9	EAL-1020-W4

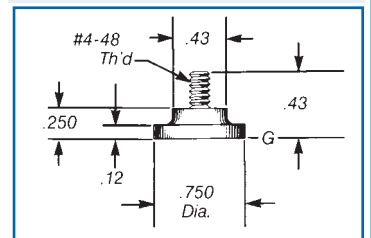
### Tungsten Carbide

.356"	.250"	AL-1730
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### Metric\*\*\*

9.04mm	6.35mm	EAL-1021
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### Extra Wide Face



Hardened Steel AL-291



## Added flexibility for your Mahr Federal dial indicators

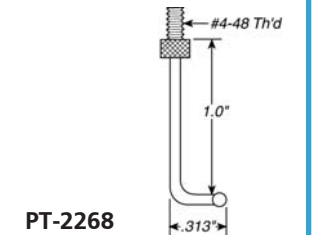
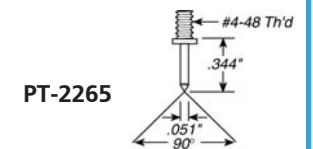
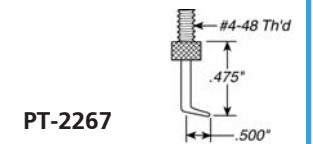
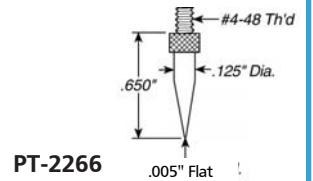
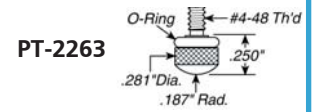
Innovative Contact Points make your indicators more versatile.

- Minimize point damage with a shock absorbing contact, without the need for a cushion gear.
- Needle point perfect for checking small areas – etchings, pits and more.
- Chisel point easily adapts to small slots or screw heads.
- Small offset point for narrow recesses – grooves, holes and under ledges.
- Right angle point makes hard to reach grooves easily accessible.

Order number	Description
PT-2263	Shock Absorbing Contact. "O" ring over threads provides a barrier between metal surface and stem, minimizing damage if point is pushed in with excessive force.
PT-2266	Chisel Point Contact for checking small slots. Furnished with a small lock nut for positioning on the indicator.
PT-2267	Small Offset Point Contact. Small tip, .010in radius, permits checking narrow recesses. Furnished with a lock nut for indicator positioning.
PT-2265	Needle Contact for checking into small areas. Correct length for use as a replacement on Mahr Federal 65P-40 depth gage.
PT-2268	Right Angle Contact with a .093in diameter ball for checking hard-to-reach grooves. Right angle allows checking to bottom or to top of a groove when used with a push down action Indicator. Its 1in length makes it long enough to be used with Mahr Federal 75P-50 Series Depth Gages.

### Contact Adaptors








Order number	Description
AD-185	Contact Thread Adapter, Adapts M2.5 thread to 4-48 thread (.375in length)
4912909	4-48 to M2.5 Threaded Adapter












# MarCator. DIN style Dial Indicators








## Overview

Precision Small Dial Indicators						
Version	803 A	805 A	803 S	803 SW	803 SB	803 AZ
						
Range	3 mm	5 mm	3 mm	3 mm	0,4 mm (±0,2)	.120"
Readings	0,01 mm	0,01 mm	0,01 mm	0,01 mm	0,01 mm	.0005"
Dial style	0-50	0-100	0-50	0-50	0-20-0	0-20
Shockproof			●	●	●	
Waterproof				●		
Order no.	4324050	4324060	4324000	4326000	4324250	4324900

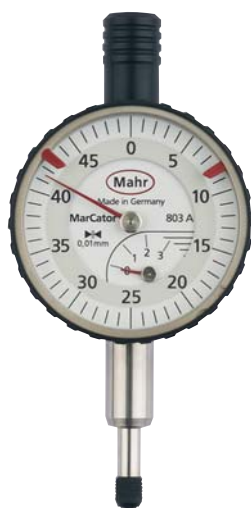
  

Precision Dial Indicators						
Version	810 A	810 AT	810 S	810 SW	810 SB	810 SM
						
Range	10 mm	10 mm	10 mm	10 mm	0,8 mm (±0,4)	1
Readings	0,01 mm	0,01 mm	0,01 mm	0,01 mm	0,01 mm	0,001 mm
Dial style	0-100	0-100	0-100	0-100	0-40-0	0-100
Shockproof			●	●	●	●
Waterproof				●		
Order no.	4311050	4311060	4311000	4315000	4317000	4311070

Version	810 SRM	810 AZ	810 AU	810 AX	810 AG	810 V
						
Range	10 mm	.400"	10 mm	10 mm	10 mm	40 mm
Readings	0,001 mm	.0005"	0,01 mm	0,1 mm	0,01 mm	0,01 mm
Dial style	0-100	0-45	100-0	0-10	0-100	0-100
Shockproof		●				●
Waterproof						
Order no.	4311080	4311900	4329050	4331000	4322000	4321110

## Precision Small Dial Indicators 803 / 805 DIN style



803 A



805 A



SHOCK  
PROOF

803 S

### Features

#### Small Dial Indicator 803 A Standard version

- High precision gears and pinions
- Lifter protection cap on the upper end of the measuring spindle
- Adjustable tolerance markers
- Chrome-plated housing

#### Small Dial Indicator 805 A Standard version

- High precision gears and pinions
- Lifter protection cap on the upper end of the measuring spindle
- Adjustable tolerance markers
- Chrome-plated housing

#### Small Dial Indicator 803 S Shockproof version

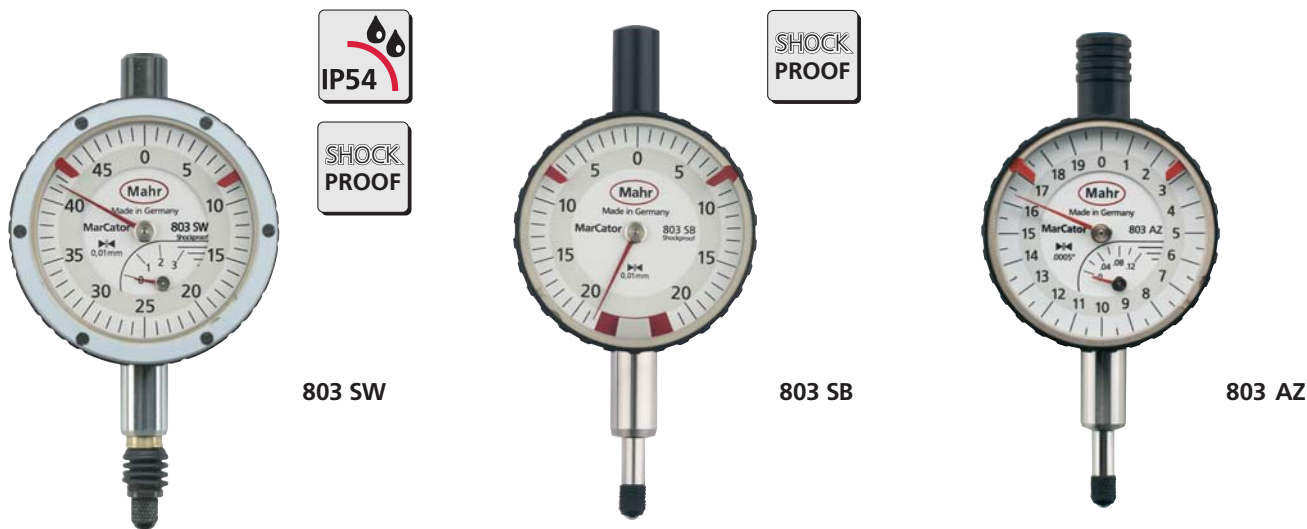
- High precision gears and pinions
- Lifter protection cap on the upper end of the measuring spindle
- Adjustable tolerance markers
- Chrome-plated housing

All indicators delivered in plastic case

### Technical Data

	Range	Readings	Dial face dia.	Overtravel	Mounting shank dia.	Measuring force	$f_e$	Accuracy			Order no.
	mm	mm	mm	mm	mm	N	$\mu\text{m}$	$f_{\text{ges}}$	$f_u$	DIN 878	
							$\mu\text{m}$	$\mu\text{m}$	$\mu\text{m}$		
803 A	3	0,01	38	0,1	8h6	0,7-1,1	10	12	3	●	4324050
805 A	5	0,01	38	0,1	8h6	0,7-1,1	12	14	3	●	4324060
803 S	3	0,01	38	0,1	8h6	0,7-1,1	10	12	3	●	4324000
803 SW	3	0,01	38	0,1	8h6	0,7-1,6	10	12	3	●	4326000
803 SB	0,4(±0,2)	0,01	38	4,5	8h6	1	7	9	3	●	4324250
803 AZ	.120"	.0005"	1.5"	.008"	8h6	0,7-1,1	.0004"	.0005"	.00012"		4324900

## Precision Small Dial Indicators 803 / 805 DIN style



### Features

#### Small Dial Indicator 803 SW

- Waterproof and oil proof
- Design features identical to 803 S, with the following exceptions:
- Hermetically sealed upper protective measuring spindle cap as well as bezel and transparent dial cover; sealed with O-rings
  - Measuring spindle sealed with rubber sleeve, thus preventing contamination by liquids and impurities

#### Dial Indicator 803 SB

- with limited measuring range
- Design features identical to 803 S, with the following exceptions:
- Limited measuring range (0.4 mm) for error-free readings
  - Large overtravel (approx. 4.5 mm), for easier insertion of test items in measuring devices
  - Hermetically sealed upper protective measuring spindle cap

#### Small Dial Indicator 803 AZ

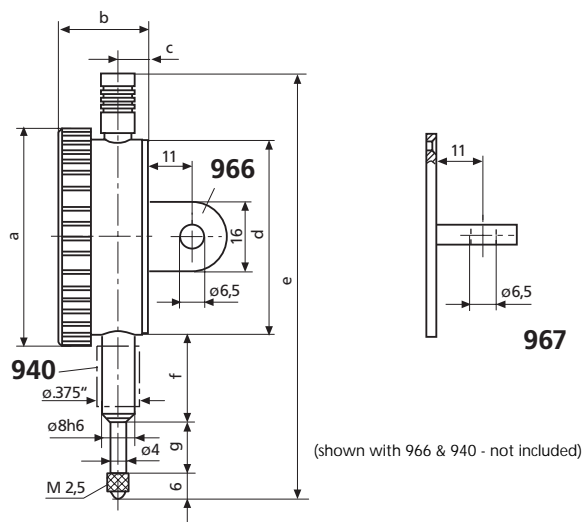
- Inch version
- Design features identical to 803 A, with the following exception:
- The scope of supply includes an Adapter Bush 940 for adapting mounting shank 8h6 mm to inch bore .375"

### Dimensions

mm	a	b	c	d	e	f	g
803 A	∅ 40	20,6	6,8	∅ 37	83	15,5	8
805 A	∅ 40	20,6	6,8	∅ 37	83	15,5	8
803 S	∅ 40	20,6	6,8	∅ 37	80	15	5,5
803 SW	∅ 44	21,6	7,1	∅ 37	86	15	11
803 SB	∅ 40	20,6	6,8	∅ 37	83	15,5	8
803 AZ	∅ 40	20,6	6,8	∅ 37	83	15,5	8

### Accessories

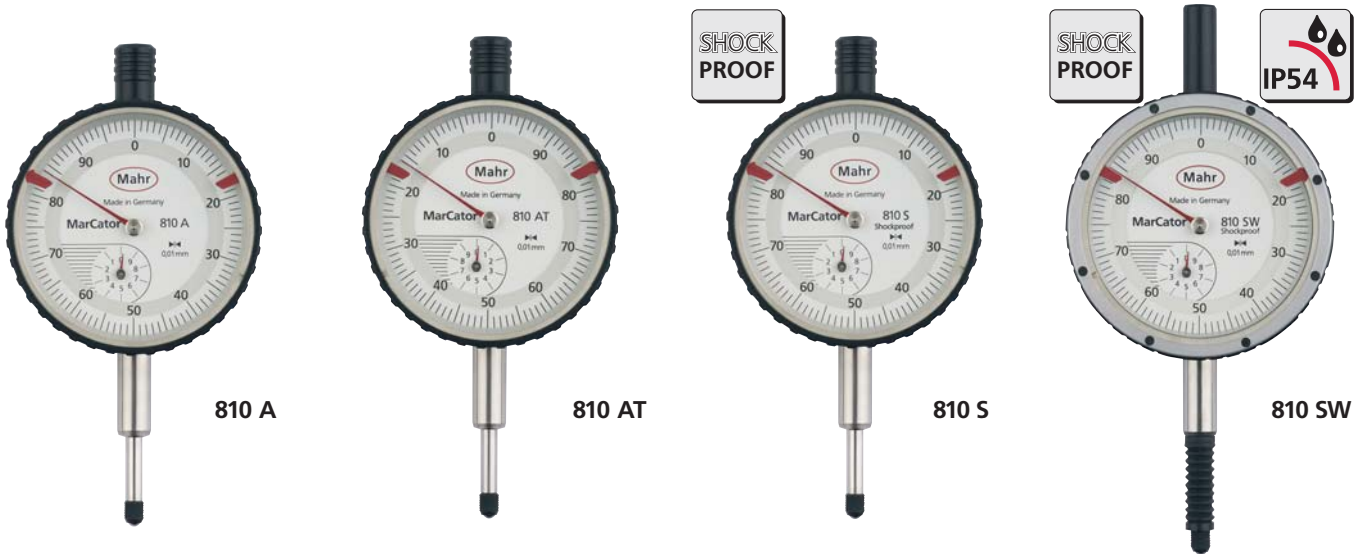
	Order no.	
<b>Adapter Bush</b> for adapting mounting shank 8h6 mm to inch bore .375"	940	4310103
<b>Splash Guard Cover</b> for bezel dia. 40 mm	956	4373021
<b>Mounting Lug</b> for 803 A / 803 SB		
Bore perpendicular to mounting shank	966	4375020
Bore parallel to mounting shank	967	4375021



(shown with 966 & 940 - not included)

Additional Accessories	Page
Contact Points	901-913 5-45
Special Holder	941 5-46
Sensor Lever	943 5-46

## Precision Dial Indicators 810 DIN style



### Features

#### Dial Indicator 810 A Standard version

- High precision gears and pinions
- Lifter protection cap on the upper end of the measuring spindle
- Adjustable tolerance markers
- Chrome-plated housing

#### Dial Indicator 810 AT for depth measurement

Design features identical to 810 A, with the following exception:

- Scale of the dial face is counter-clockwise

#### Dial Indicator 810 S Shockproof

- High precision gears and pinions
- Lifter protection cap on the upper end of the measuring spindle
- Adjustable tolerance markers
- Chrome-plated housing

#### Dial Indicator 810 SW Waterproof and oil proof

Design features identical to 810 S, with the following exceptions:

- Measuring spindle sealed with rubber sleeve, thus preventing contamination by liquids and impurities
- Hermetically sealed upper protective measuring spindle cap

All indicators delivered in plastic case

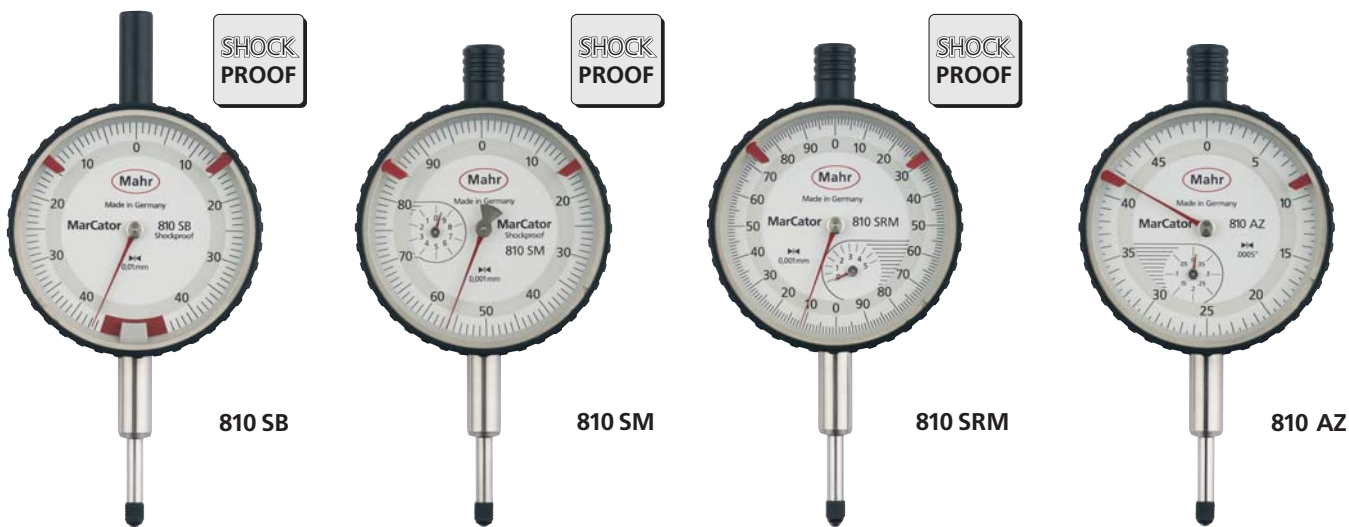
### Technical Data

	Range	Readings	Dial face dia.	Overtravel	Mounting shank dia.	Measuring force	$f_e$	Accuracy	$f_u$	DIN 878	Order no.
	mm	mm	mm	mm	mm	N	$\mu\text{m}$	$f_{\text{ges}}$ $\mu\text{m}$	$\mu\text{m}$		
810 A	10	0,01	54	0,1	8h6	0,7-1,3	15	17	3	●	4311050
810 AT	10	0,01	54	0,1	8h6	0,7-1,3	15	17	3	●	4311060
810 S	10	0,01	54	0,1	8h6	0,8-1,3	15	17	3	●	4311000
810 SW	10	0,01	54	0,1	8h6	0,9-1,5	15	17	3	●	4315000
810 SB	0,8 ( $\pm 0,4$ )	0,01	54	9	8h6	0,9	7	9	3	●	4317000
810 SM	1	0,001	54	4	8h6	1,3-1,8	3	4	1,5		4311070
810 SRM	5	0,001	54	0,1	8h6	1,5-2	10	12	3		4311080
810 AZ	.400"	.0005"	2.1"	.004"	8h6	0,9-1,5	.0006"	.0007"	.00012"		4311900

### Accessories

	Order no.		Order no.
<b>Adapter Bush</b> for adapting mounting shank 8h6 mm to inch bore .375"	940	<b>Mounting Lug</b> Bore perpendicular to mounting shank	961
<b>Splash Guard Cover</b> for bezel dia. 58 mm	955	Bore parallel to mounting shank	962
	4310103		4375010
	4373020		4375011

## Precision Dial Indicators 810 DIN style



### Features

#### Dial Indicator 810 SB with limited measuring range

Design features identical to 810 S, with the following exceptions:

- Limited measuring range (0.8 mm) for error-free readings
- Large overtravel (approx. 9 mm) for easier insertion of test items in measuring devices
- Hermetically sealed upper protective measuring spindle cap

#### Dial Indicator 810 SM Shockproof with reading 0.001mm

- Precise mechanism with a combined gear lever transmission
- High accuracy with a minimum span of error
- Lifter protection cap on the upper end of the measuring spindle
- Adjustable tolerance markers
- Chrome-plated housing

#### Dial Indicator 810 SRM Shockproof with reading 0.001mm

- High precision gears and pinions
- Lifter protection cap on the upper end of the measuring spindle
- Adjustable tolerance markers
- Chrome-plated housing

#### Dial Indicator 810 AZ Inch version

Design features are identical to 810 A, with the following exception:

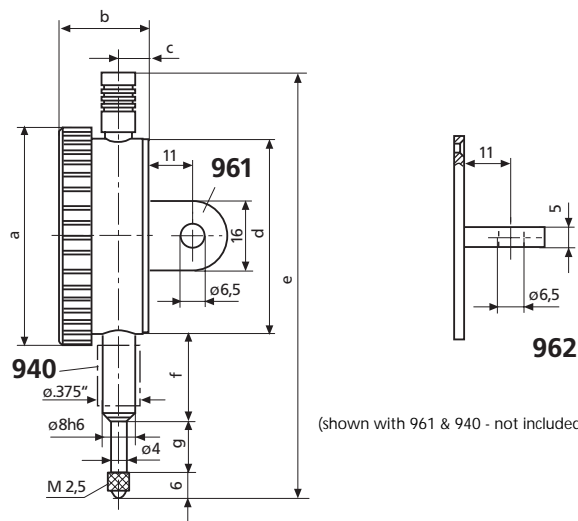
- The scope of supply includes an Adapter Bush 940 for adapting mounting shank 8h6 mm to inch bore .375"

### Dimensions

mm	a	b	c	d	e	f	g
810 A/AT	∅ 58	23	7,5	52	112	21	16
810 S	∅ 58	23	7,5	52	111,5	22	15
810 SW	∅ 61	24,15	7,9	52	127,6	22	22,1
810 SB	∅ 58	23	7,5	52	120	22	15
810 SM	∅ 58	25	8,5	52	111,5	22	15
810 SRM	∅ 58	23	7,5	52	111,5	22	15
810 AZ	∅ 58	23	7,5	52	111,5	22	15

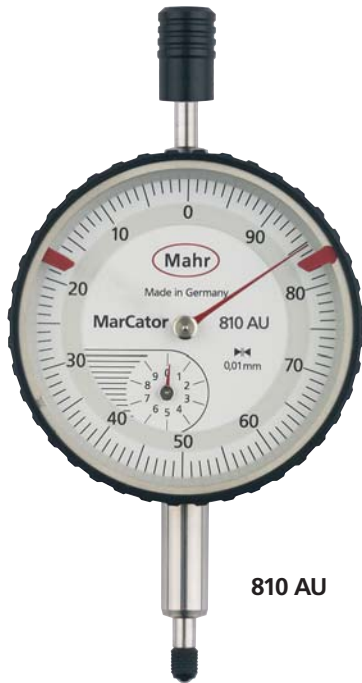
### Additional Accessories

	Page
Contact Points	901-913 5-45
Special Holder	941 5-46
Sensor Lever	943 5-46

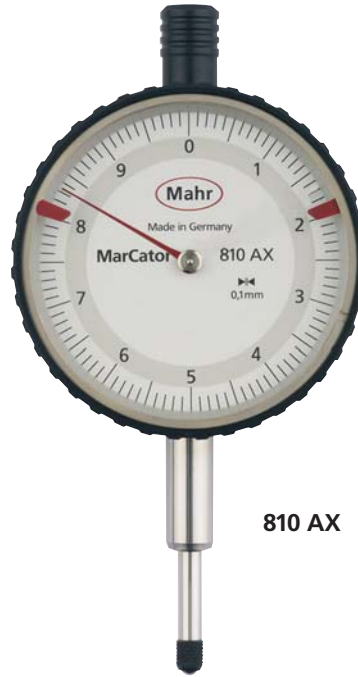
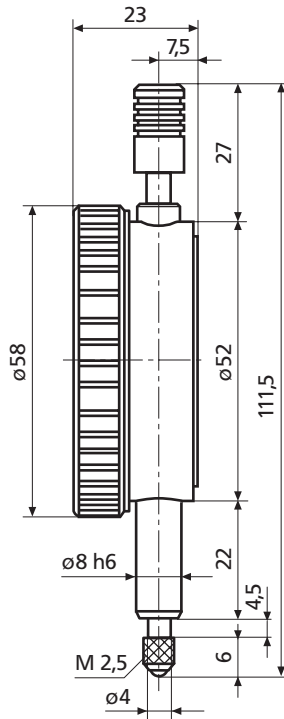


(shown with 961 & 940 - not included)

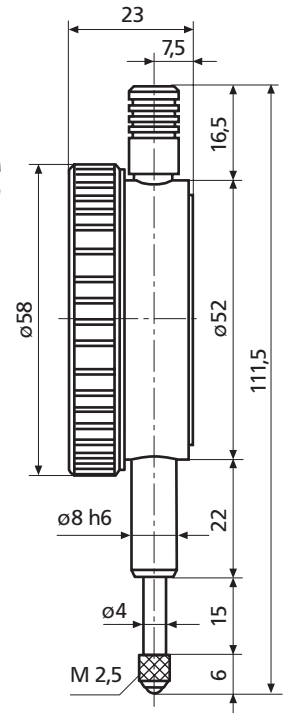
## Precision Dial Indicators 810



810 AU



810 AX



### Features

**Dial Indicator 810 AU**  
with a reversed measuring force direction

- Chrome-plated housing towards the top
- Adjustable tolerance markers
- Scale on the dial increases counterclockwise (+ on left)
- Measuring force acting towards the top
- Delivered in plastic case

**Dial Indicator 810 AX**  
with reading 0.1 mm

- Constant measuring force
- Chrome-plated housing
- Adjustable tolerance markers
- 1 pointer movement on 10 mm
- Delivered in plastic case

### Technical Data

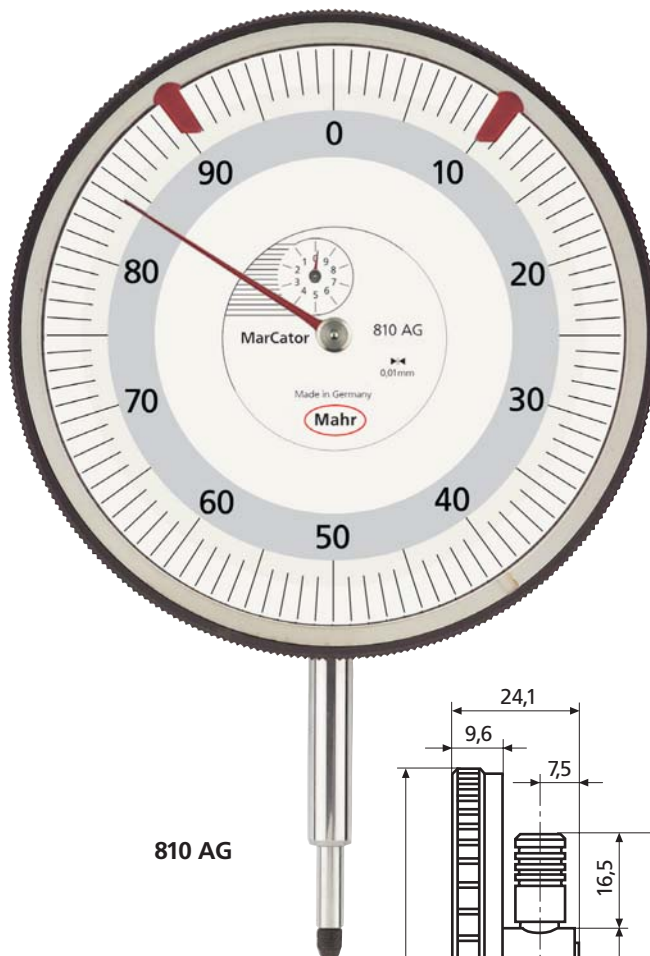
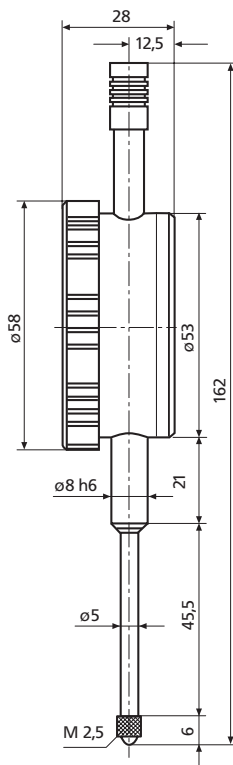
	Range mm	Readings mm	Dial face dia. mm	Overtravel mm	Mounting shank dia. mm	Measuring force N	Accuracy			Order no.
							$f_e$ $\mu\text{m}$	$f_{ges}$ $\mu\text{m}$	$f_u$ $\mu\text{m}$	
810 AU	10	0,01	54	0,1	8h6	1-1,8	15	17	5	4329050
810 AX	10	0,1	54	0,5	8h6	0,9-1,3	40	55	15	4331000
810 V	40	0,01	50	0,3	8h6	0,9-2,0	25	30	6	4321110
810 AG	10	0,01	108	0,1	8h6	1,3-2,2	15	17	5	4322000



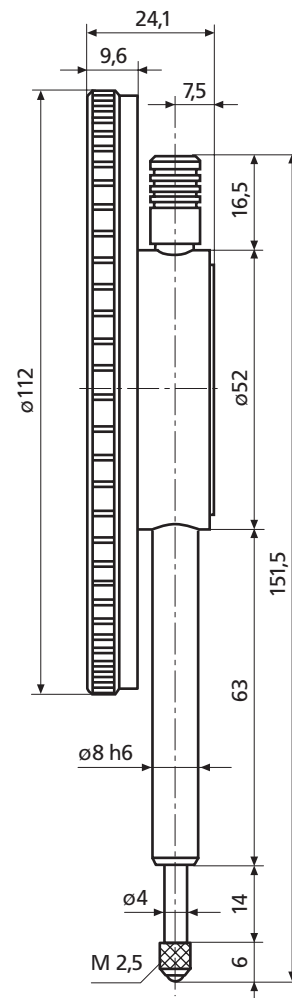
## Precision Dial Indicators 810



810 V



810 AG



### Features

#### Long Range Dial Indicator 810 V with larger measuring range

- Range 40 mm
- Strengthened measuring spindle (5 mm)
- Raising of measuring spindle via lifting cap
- Adjustable tolerance markers
- Shockproof movement
- Delivered in folded box

#### Extra large Dial Indicator 810 AG with dial face dia. 108 mm

- Ideal for long reading distance and in bad light conditions
- Plastic outer ring
- Delivered in folded box




### Accessories

	Order no.	
Adapter Bush for adapting mounting shank 8h6 mm to inch bore .375"	940	4310103
Splash Guard Cover for bezel dia. 58 mm	955	4373020
Mounting Lug to mount on mounting shank of all versions	963	4375002
<b>Additional Accessories</b>		<b>Page</b>
Contact Points	901-913	5-45
Special Holder	941	5-46
Sensor Lever	943	5-46






# MarCator. Digital Indicators (Long Range)

## Overview





Functions of Digital Indicators		1075	1080	1082
				
Catalog page		5 - 38	5 - 38	5 - 39
Measuring ranges	metric/ <i>inch</i>	12.5 mm / .5"	12.5 mm / .5"	12.5 mm / .5" 25 mm / 1" 50 mm / 2" 100 mm / 4"
Resolution	metric/ <i>inch</i>	0.01 mm / .0005"	0.005 mm / .0001"	0.01 mm / .0005" 0.001 mm / .00005"

### Functions:

On/Off		●	●	●
Set display to zero		●	●	●
mm/inch switchable		●	●	●
Reversal of counting direction		●	●	●
Entering numerical value		●	●	●
Preset				
Data-button (on indicator)			●	●
Data-button integrated on data cable			●	●
Hold-Function				●
ABS/REL-switchable				
Tolerance display				
Dynamic measuring functions	Min, Max Max-Min (Tir)			
Resolution switchable				
Analog display				
Analog display switchable				
Lock (buttons can be blocked)				
Data output	Digimatic	●	●	●
	Opto Simplex RS232C	●	●	●
	Opto Duplex RS232C			
	ASCII / RS232			

# MarCator. Digital Indicators (Long Range)

## Overview

1083	1085	μMaxumXLI	μMaxumXLT Standard	μMaxumXLT High Accuracy
				
5 - 42	5 - 42	5 - 40	5 - 40	5 - 40
12.5 mm / .5" 25 mm / 1"	12.5 mm / .5" 25 mm / 1"	12.5 mm / .5" 25 mm / 1"	50 mm / 2" 100 mm / 4"	50 mm / 2" 100 mm / 4"
0.001 mm / .00005"	0.001 mm / .00005"	0.001 mm / .00005"	0.01 mm / .0005" 0.02 mm / .0001" 0.05 mm / .002" 0.1 mm / .005"	0.001 mm / .00005" 0.002 mm / .0001" 0.005 mm / .0002" 0.01 mm / .0005" 0.02 mm / .001" 0.05 mm / .002" 0.1 mm / .005"

•	•	•	•	•
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•	3 values	•	•	•
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•	•	•	•	•
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•	•	•	•	•

## Digital Indicator 1075 / 1080



- 1 Protection cap for lifter
- 2 Measuring spindle lifter
- 3 Display
- 4 Operating buttons
- 5 Mounting shank
- 6 Measuring spindle
- 7 Contact point 901
- 8 Data output
- 9 Battery compartment

(shown with 1075 b - not supplied)

### Features

#### Functions:

- ON/OFF
- 0 (Set display to zero) mm/inch
- Reversal of counting direction
- PRESET (for entering a numerical value)
- DATA (data transmission with a data connection cable)

- Capacitive measuring system, life of battery approx. 2 years
- Max measuring speed 1.5 m/sec (60"/sec)
- Data output: either OPTO RS232C or Digimatic
- High contrast Liquid Crystal Display with 8.5 mm high digits
- Operating temperature 10-40°C
- Class of protection IP51 according to IEC 529

### Technical Data

	Measuring range mm (inch)	Resolution mm/inch	Span of error G * mm	Measuring force N	Weight g	Order no.
1075	12.5 (.5")	0.01/ .0005"	0.025	0.6 - 1	120	4336400
1075	12.5 (.5")	0.01/ .0005"	0.025	0.6 - 1	120	4336410**
1080	12.5 (.5")	0.005/ .0001"	0.015	0.6 - 1	120	4336500

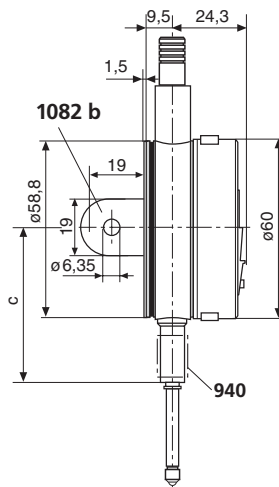
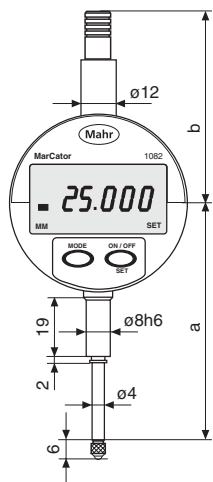
\* in any zero point

\*\* .375" stem diameter and removable lug back

### Accessories

	Order no.	Additional Accessories	Page
Battery 3V, Type CR 2032	4102520	Contact Points	901-913 5-45
Data Connection Cable Opto RS232C (2 m), with SUB-D jack 9-pin	16 EXr 4102410	Special Holder	941 5-46
Data Connection Cable Digimatic (2 m), Flat plug 10-pin	16 EXd 4102411	Sensor Lever	943 5-46
Adapter bush for adapting mounting shank 8h6 mm to inch bore .375"	940 4310103	Accessories for Data Processing see Chapter 11	
Lug back, removable	1075 b 4336565		

## Digital Indicator 1082



(shown with 1082 b - not supplied)

### Dimensions

Range			a	b	c
mm	inch				
12.5	.5"		66	54	50.5
25	1"		82.5	64	53.9
50	2"		142.5	121	88
100	4"		244.5	172	139

### Features

#### Functions:

- ON/OFF
- RESET (Zero setting)
- PRESET (for entering a numerical value)
- mm/inch-switchable
- DATA (data transmission with a data connection cable)
- HOLD (saves the current measuring value)

- Capacitive measuring system, life of battery approx. 2 years
- Max measuring speed 1.5 m/sec (60"/sec)
- Data output: either OPTO RS232C or Digimatic
- High contrast LCD with 8.5 mm high digits
- Operating and display unit (bezel) can be rotated through 280°
- Protection class IP51
- Operating temperature 5 - 40°C
- Scope of supply: Battery

### Technical Data

Measuring range	Resolution	Span of error G *	Measuring force	Weight	Order no.
mm (inch)	mm/inch	mm	N	g	
12.5 (.5")	0.01/ .0005"	0.02	0.7 - 0.95	220	4336205
25 (1")	0.01/ .0005"	0.02	0.6 - 1.1	220	4336206
50 (2")	0.01/ .0005"	0.02	2.0 - 3.0	400	4336207
100 (4")	0.01/ .0005"	0.02	2.3 - 4.0	600	4336208
12.5 (.5")	0.001/ .00005"	0.005	0.7 - 0.95	220	4336201
25 (1")	0.001/ .00005"	0.005	0.6 - 1.1	220	4336200
50 (2")	0.001/ .00005"	0.008	2.0 - 3.0	430	4336202
100 (4")	0.001/ .00005"	0.009	2.3 - 4.0	620	4336203

\* in any zero point

### Accessories

	Order no.	Additional Accessories	Page
Battery 3V, Type CR 2032	4102520	Lifting devices	5-44
Data Connection Cable (2 m), Opto RS232C with SUB-D jack 9-pin	16 ESv 4102510	Contact Points	901-913 5-45
Splash Protection Cap	4336242	Special Holder	941 5-46
Mounting Lug Horizontal/Vertical	1082 b 4336313	Sensor Lever	943 5-46
Adapter Bush for adapting mounting shank 8h6 mm to inch bore .375"	940 4310103	Accessories for Data Processing see Chapter 11	

## μMaxμm® XL Digital Indicators

### Features

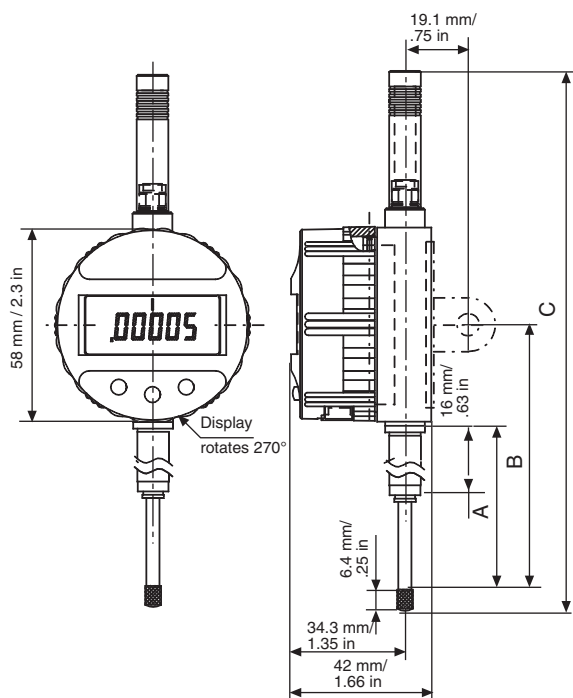
The μMaxμm XL Series offers all the benefits of Federal's μMaxμm Indicators and is designed for convenience, ease of use, dependability and rugged shop floor handling ... plus:

- Long measuring ranges of 12.5 mm/ .5", 25 mm/ 1", 50 mm/ 2" and 100 mm/ 4".
- XLT incorporates switchable resolution.
- The XL never loses zero, even when powered down.
- Features easy to use controls.
- Preset capabilities for direct dimension readout.
- Unilateral tolerances.
- Go/no-go display for foolproof operation.
- Large digital/analog dual display for fast, accurate readings.
- Two-format data output, serial or Digimatic, is compatible with most data collection devices.
- World version furnished with metric stem sizes and contact threads.
- Versions also available for deadweight applications with compressible materials.
- Special ratio and lockout versions also available.

### Accessories

#### Order no.

ELR-1092	Right Hand Lifting Lever
ELR-1093	Left Hand Lifting Lever



Dimensions: XLI Models & XLT Models

Range	A	B	C
mm / inch	mm / inch	mm / inch	mm / inch
12.5 / .5"	35.1 / 1.38"	68.6 / 2.7"	128.27 / 5.05"
25 / 1"	47.5 / 1.87"	81.3 / 3.2"	153.7 / 6.05"
50 / 2"	72.64 / 2.86"	153 / 6"	275.6 / 10.85"
100 / 4"	123 / 4.88"	253 / 9.97"	427 / 16.8"

## μMaxμm® XL Digital Indicators

### Ordering Information

μMaxμm XL Indicators		<b>XLI-</b>	<b>X</b>		<b>X</b>	<b>0</b>	<b>0</b>	<b>X</b>
Model Number:								
Model	Range	Stem Diameter / Length	Code	Ratio	Code	Back	Code	
U.S. version	0.5"	.375" / 0.63"	1	1:1	0	Flat Back (EBK-1020)	0	
U.S. version	1.0"	.375" / 0.63"	2			Lug (BK-183) vert/horiz	1	
World version	12.5 mm	8 mm/ 16 mm	3	4/5	1	Adjustable (BK-531)	2	
World version	25 mm	8 mm/ 16 mm	4			Post (BK-2930)	3	
World version	25 mm	8 mm/ No spring	5*			Screw (BK-692)	4	
						Adaptor back for 75B Gage (EPL-1914)	5	
						Rack Back (BK-93)		

\* Deadload Model (used with weights)

**Examples:** XLI-10001 is a μMaxμm XL with 0.5" range, .375" stem diameter, 0.63" / 16 mm stem length, and a Lug Back.

μMaxμm XLT Indicators*		<b>XLT-</b>	<b>X</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>X</b>	
Model Number:								
Version	Range	Stem Diameter / Length	Accuracy	Code	Back	Code		
World	50 mm	8 mm / 15 mm	High: 8 μm/.00032"	1	Flat Back (EBK-1020)	0	For additional contact points see pages 5-27, 5-28, 5-45 & 5-46	
World	50 mm	8 mm / 15 mm	Std: 20 μm/.0008"	2	Lug (BK-383)	1		
World	100 mm	8 mm / 15 mm	High: 9 μm/.00036"	3	Adjustable (BK-531)	2		
World	100 mm	8 mm / 15 mm	Std: 20 μm/.0008"	4	Post (BK-2093)	3		
					Screw (BK-692)	4		

XLT Models include 3/8" bushing, M2.5 to 4-48 Adaptor AD-185 and Contact Point PT-223

### Technical Data

Model no.	Range mm/inch	Resolution mm/inch	Accuracy mm/inch	Gage Force	Weight
XLI Resolution Fixed	12.7/ .50"	0.001/ .0005"	0.005/ .0002"	0.8 N / 3 - 4 oz.	200 g / 7 oz.
	25.4/ 1.0"				
XLT Standard Accuracy Resolution Selectable	50/ 2.0"	0.01/ .0005" 0.02/ .001" 0.05/ .002" 0.1/ .005"	0.02/ .0008"	0.8 - 1 N / 7 - 11 oz.	200 g / 10 oz.
	100/ 4.0"	2.3 - 4 N / 8 - 14 oz.		340 g / 12 oz.	
XLT High Accuracy Resolution Selectable	50/ 2.0"	0.001/ .0005" 0.002/ .0001" 0.005/ .0002" 0.01/ .0005" 0.02/ .001" 0.05/ .002" 0.1/ .005"	0.008/ .00032"	0.8 - 1 N / 7 - 11 oz.	200 g / 10 oz.
	100/ 4.0"	0.009/ .00036"	2.3 - 4 N / 8 - 14 oz.	340 g / 12 oz.	

### XL Common Specification Values

Output	Serial BCD, 13 digits, 52 bits; ASCII encoded 2400 baud asynchronous stream.
Spindle Velocity	60 in/sec (1.5m/sec) Maximum
Operating Temps	40° to 105° F / 5° to 40° C
Storage Temps	- 40° to 140° F / -20° to 60° C
Repeatability	± 1 least significant digit
Battery life	12 months normal use or 4000 hours. (May vary with "Auto Power Down Option")

## Digital Indicator 1083/1085 Millitast



### Features

#### Millitast 1083

##### Functions:

- ON/OFF
- RESET (zero setting of display)
- PRESET (set buttons can be used to enter any numerical values)
- mm/inch switchable
- DATA (Data transmission)
- HOLD (saves the current measuring value)
- Reversal of counting direction
- Switching the analog display

- Capacitive measuring system, life of battery approx. 2 years
- Max measuring speed 1.5 m/sec (60"/sec)
- Updates values at 7 readings/sec

- Data output: Opto RS232C (Mahr Duplex)
- Indicator can be operated by remote control via the interface
- High contrast LCD with 6.5 mm high digits. Analog display has a 4 mm long pointer for better visual perception, ideal when checking concentricity and flatness as well as search for the reversal point when measuring bores
- Operating and display unit (bezel) can be rotated through 280°
- Protection class IP52
- Operating temperature 5 - 40°C
- Scope of supply: Battery

#### Millitast 1085

Features are identical to the 1083, but with the following additional functions:

- 3 x PRESET values can be stored
- 2 additional analog displays
- MAX / MIN memory, e.g. to search for the reversal point
- MAX-MIN e.g. for concentricity and flatness testing

- ABS: display can be set to zero without losing the reference to the preset value
- LOCK: Operating buttons can be locked to avoid being inadvertently adjusted
- Scope of supply: Battery

### Technical Data

	Measuring range mm (inch)	Resolution mm/inch	Span of error G * mm	Measuring force N	Weight g	Order no.
1083	12.5 (.5")	0.001/ .00005"	0.005	0.7-0.95	160	4336800
	25 (1")	0.001/ .00005"	0.005	0.6-1.1	160	4336801
1085	12.5 (.5")	0.001/ .00005"	0.005	0.7-0.95	160	4336301
	25 (1")	0.001/ .00005"	0.005	0.6-1.1	160	4336300

\* in any zero point

#### Analog display 1083

Readings  
mm / inch

Display range  
mm (inch)

0.001 / .00005"

± 0.03 (± .0015")

0.01 / .0005"

± 0.30 (± .0150")



#### Analog display 1085

Readings  
mm / inch

Display range  
mm (inch)

0.001 / .00005"

± 0.03 (± .0015")

0.002 / .0001"

± 0.06 (± .0030")

0.01 / .0005"

± 0.30 (± .0150")

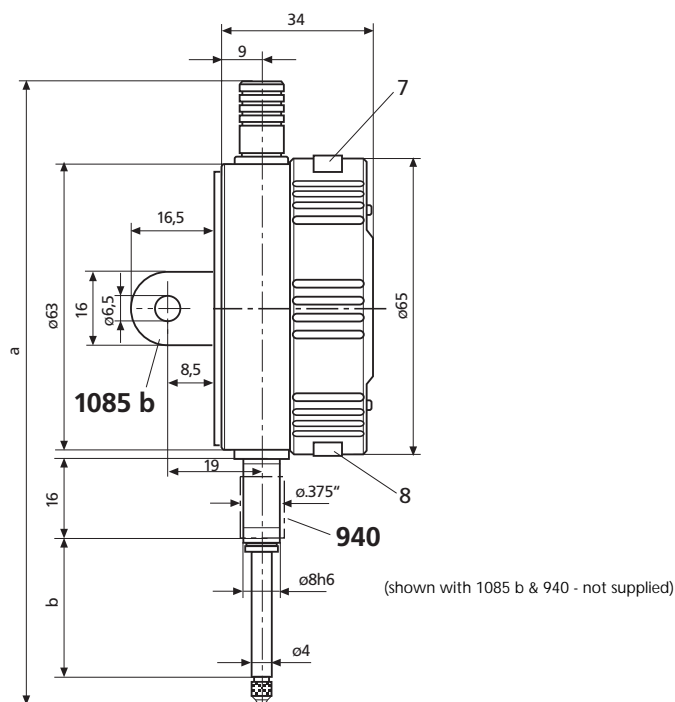
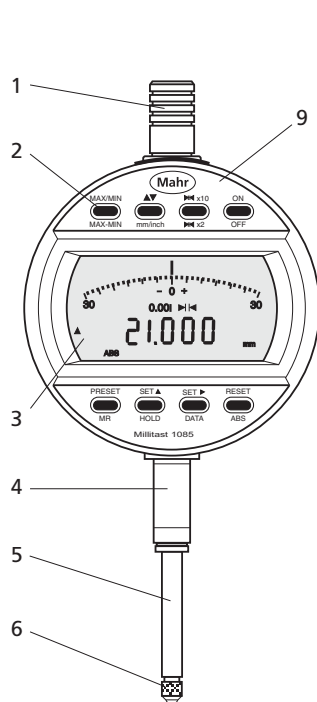
0.02 / .001"

± 0.60 (± .0300")



## Digital Indicator 1083/1085 Millitast

- 1 Lifting protection cap for measuring spindle
- 2 Operating buttons
- 3 Display
- 4 Mounting shank
- 5 Measuring spindle
- 6 Contact point 901
- 7 RS232C Data output
- 8 Battery compartment
- 9 Rotatable operating and display unit



### Dimensions

		a	b
<b>1083 / 1085</b>	12.5 mm ( .5")	126	19
<b>1083 / 1085</b>	25 mm ( 1")	144.5	31.5

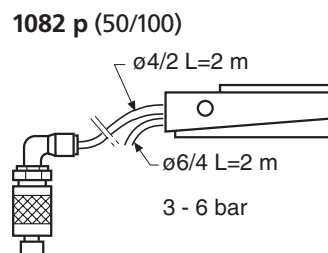
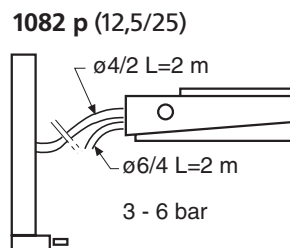
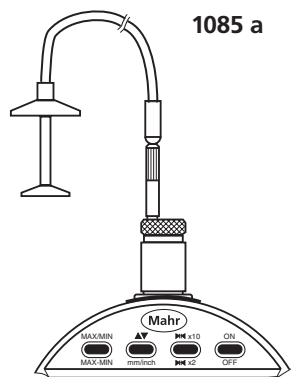
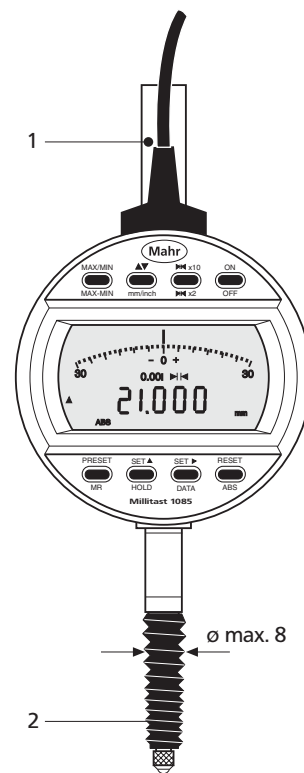
### Accessories

	Order no.	Additional Accessories	Page
<b>Battery 3V</b> , Type CR 2450	<b>4884464</b>	<b>Contact Points</b>	<b>901-913</b> 5-45
<b>Data Connection Cable RS232C</b> (2 m) for connecting to a PC, D-SUB-jack 9-pin	<b>1085 v</b> 4336305	<b>Special Holder</b>	<b>941</b> 5-46
<b>Data Connection Cable RS 232C</b> (2 m) for connection to peripherals RS232C D-SUB-jack 9-pin	<b>16 ESv</b> 4102510	<b>Sensor Lever</b>	<b>943</b> 5-46
<b>Mounting Lug</b> Horizontal/Vertical	<b>1085 b</b> 4336310	Accessories for Data Processing see Chapter 11	
<b>Adapter Bush</b> for adapting mounting shank 8h6 mm to inch bore .375"	<b>940</b> 4310103		

## Accessories for 1082, 1083, 1085, $\mu$ Max $\mu$ m XL

	Order no.
<b>1 Protection Cap</b> for measuring ranges, 12.5 and 25 mm	<b>4336238</b>
<b>2 Rubber Bellows</b> for measuring ranges, 12.5 and 25 mm	<b>4336239</b>
<b>Cable Release</b> for measuring ranges, 12.5 and 25 mm	<b>1085 a 4336311</b>
<b>Pneumatic Lifter</b> for measuring ranges 12.5 and 25 mm (Pressure)	<b>1082 p 4336237</b>
<b>Pneumatic Lifter</b> for measuring ranges 50 and 100 mm (Vacuum)	<b>1082 p 4336230</b>
<b>Additional Accessories</b>	<b>Page</b>
<b>Contact Points</b>	<b>901-913 5-45</b>
<b>Special Holder</b>	<b>941 5-46</b>
<b>Sensor Lever</b>	<b>943 5-46</b>

Accessories for Data Processing see Chapter 11



**Contact Points and Accessories** for Dial Indicators, Dial Comparators and Probes

**Standard Contact Points 901**

Ball dia. 3 mm

Catalog no.		Order no.
901	with steel ball	4360001
901 H	with carbide ball	4360002
901 R	with ruby ball	4360003

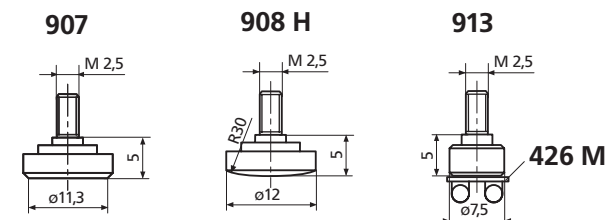
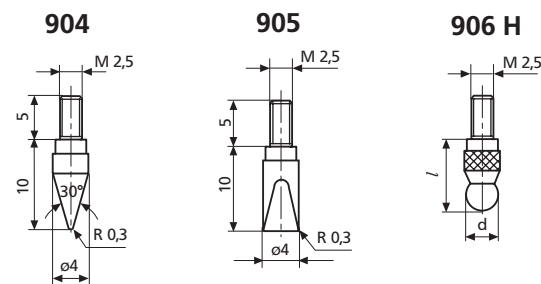
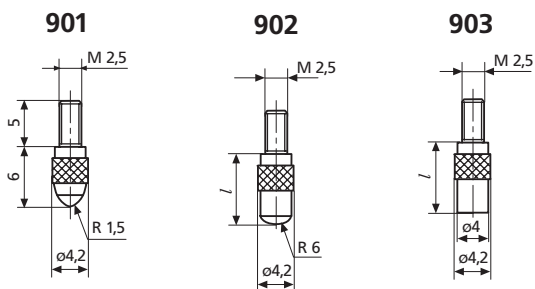
**Spherical Contact Points 902      Flat Contact Points 903**

902	902 H	903	903 H
Steel	Carbide contact face	Steel	Carbide tipped
Length mm	Order no.	Order no.	Order no.
4	4360007	–	4360070
6	4360009	–	4360071
8	4360010	4360040	4360072
10	4360011	4360041	4360073
12	4360012	4360042	4360074
15	4360013	4360043	4360075
20	4360014	4360044	4360076
25	4360015	4360045	4360077
30	4360016	4360046	4360300
35	4360017	4360047	4360078
40	4360019	4360049	4360310
45	4360026	4360050	4360303
50	4360018	4360048	4360079
55	4360031		4360109
65	4360035		
75	4360020		
85	4360036		
95	4360029		

**Ball Contact Point 906 H**

with carbide ball, accuracy ball dia. 0/-6µm

Ball dia. d mm	l mm	Order no.	Ball dia. d mm	l mm	Order no.
1	8.5	4360150	5.5	9	4360161
1.25	8.5	4360151	6	9	4360162
1.5	8.5	4360152	6.35 (1/4")	9	4360163
1.75	8.5	4360153	6.5	10	4360164
2	8.5	4360154	7	10	4360165
2.5	8.5	4360155	7.5	11	4360166
3	8.5	4360156	8	11	4360167
3.5	8.5	4360157	8.5	12	4360168
4	8.5	4360158	9	12	4360169
4.5	8.5	4360159	10	13	4360170
5	9	4360160			



**Special Contact Points**

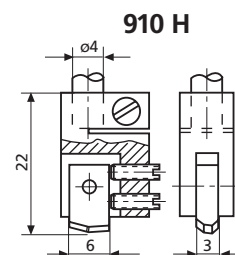
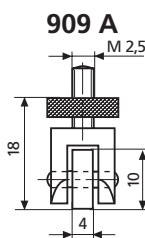
	Order no.
<b>Conical Contact Points, Steel</b>	904      4360130
Carbide tipped	904 H    4360131
<b>Wedge Shaped Contact Points, Steel</b>	905      4360140
Carbide tipped	905 H    4360141
<b>Flat Contact Points, Steel, A = 1 cm<sup>2</sup></b>	907      4360200
Carbide tipped, dia. 7 mm	907 H    4360201
<b>Spherical Contact Points, Steel</b>	908      4360210
Carbide tipped	908 H    4360211
<b>Flat Contact Point, for mounting</b>	
Pin Gage Holder 426 M for measuring threads using three-wire method	913      4360400

## Contact Points and Accessories for Dial Indicators, Dial Comparators and Probes

### Contact Rollers 909

Concentricity error 3 μm

		Order no.
Cylindrical Roller	909 A	4360220
Radiused Roller, R = 5 mm	909 B	4360221

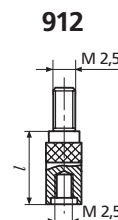
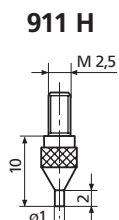


### Measuring Attachment 910 H

	Order no.
with parallel adjustable carbide wedges	910 H 4360230

### Pin Contact Point 911 H

	Order no.
Carbide tipped, dia. 1 mm, flat	911 H 4360240

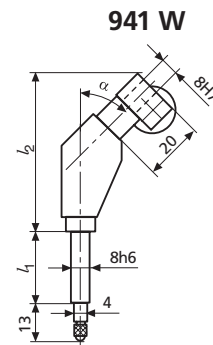
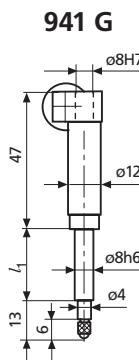


### Measuring Spindle Extensions 912

Length l mm	Order no.	Length l mm	Order no.
10	4360250	35	4360254
15	4360251	50	4360255
20	4360252	75	4360256
25	4360253	100	4360257

### Special Holder 941

For all types of measuring equipment  
 For placing a dial indicator at a certain distance or angle  
 Travel of the measuring spindle 3 mm  
 Contact Point 901 (interchangeable)



**Straight Holder 941 G**  
 Mounting shank length  $l_1$  Order no.

**Angular Holder 941 W**

25 4365000  
 50 4365001  
 75 4365002

Order no.	$l_2$ mm	Order no.	$l_2$ mm	Order no.	$l_2$ mm
Angle $\alpha=45^\circ$	53.7	Angle $\alpha=60^\circ$	49.3	Angle $\alpha=90^\circ$	34.5
4365010*		4365020		4365030	
4365011		4365021		4365031	
4365012		4365022		4365032	

Transmission error with the 941 W  
 max. 1%;  
 for travel 3 mm = 0.03 mm

\* includes anvil

### Sensor Level 943

	Order no.
For testing concentricity in bore holes as well as difficult to reach outside diameters To be inserted in a measuring stand with a lifting device Contact Point 901 interchangeable Travel $\pm 1$ mm	4367000

