

▶ | 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	with Rev Counter
Group 0						
.0001"	.004"	.010"	0-2-0	–	A1/2Q	
.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	
Group 1						
.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
Group 2						
.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	P1/2I-RC
.002 mm	.200	.500	0-10-0	0-20	P1I	P1I-RC
.005 mm	.500	1.25	0-25-0	0-50	2015793	2014817
.010 mm	1.00	2.50	0-50-0	0-100	2015794	2014818
.020 mm	2.00	5.00	0-100-0	0-200	2015795	2014819
1 Rev						
.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	

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

Dial Indicators per ANSI/AGD

Features

You get more with Mahr Federal Dial Indicators

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

How to Order

How to Order Your Dial Indicator and Accessories

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

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

1-800-333-4243

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

Replacement indicators

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

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



Dial Indicators per ANSI/AGD

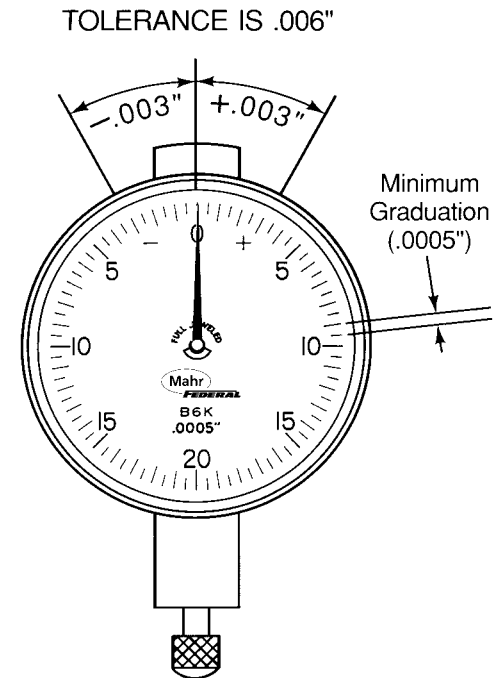
Selecting a Dial Indicator

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

Consider four characteristics when selecting a dial indicator:

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

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



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

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

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

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

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

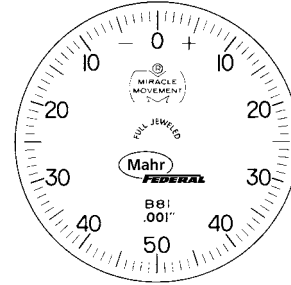
Dial Indicators per ANSI/AGD

Dial Types

1. Balanced (+) on right.

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

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

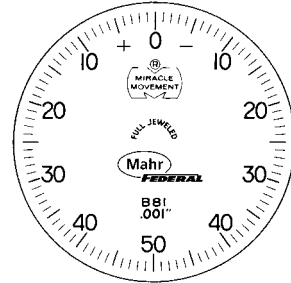


2. Balanced (+) on left.

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

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

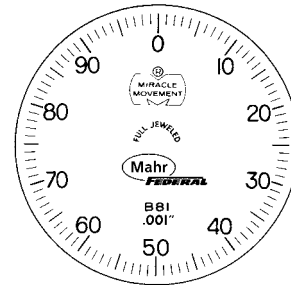
* Will vary as dictated by motion transfer design.



3. Continuous clockwise.

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

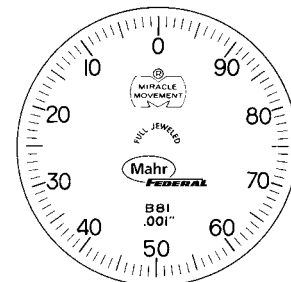
Note: With Revolution Counter models, counter dial numbered counterclockwise.



4. Continuous counterclockwise.

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

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



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

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



Technical Data

Mahr Federal Series A (inch)

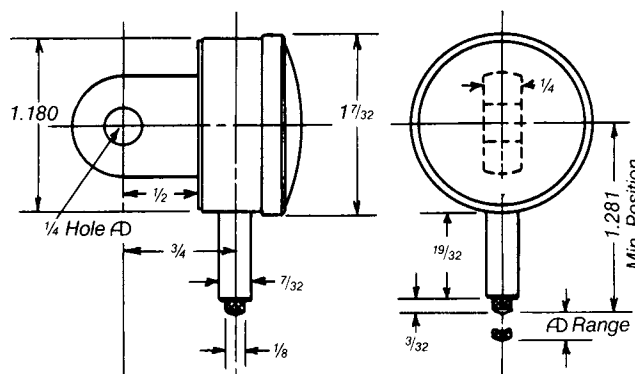
Dial: approx. 1.250" dia. with soft-green tint

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

Mahr Federal Series N (Metric – mm)

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

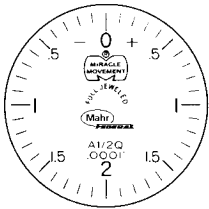
Measuring range	Graduation value	Dial style	Range per revolution	Accuracy	Order no.
0.250	0.002	0-5-0	0.100	± 0.002 mm	N1/2Q
1.250	0.005	0-25-0	0.500	± 0.005 mm	N3I
2.500	0.010	0-50-0	1.00	± 0.010 mm	N6I



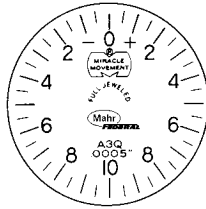
Backs can be rotated 90° and 180°

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

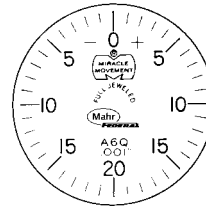
Mahr Federal Series A



A1/2Q



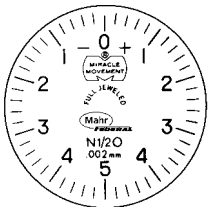
A3Q



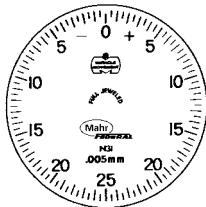
A6Q

- Normally furnished: balanced dial with + on right; centered vertical lug back; regular contact point, .09" radiused, .093" long.
- Optional dials: balanced dial with + on left; continuous clockwise; continuous counter-clockwise. Order by part number and specify dial style desired.

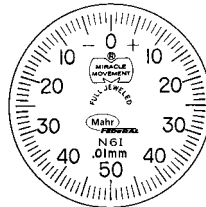
Mahr Federal Series N



N1/2O



N3I

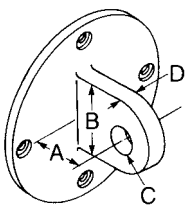


N6I

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

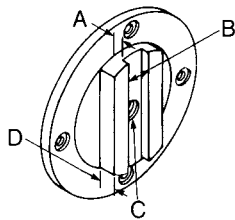
Backs for ANSI Group 0 - Series A and N

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



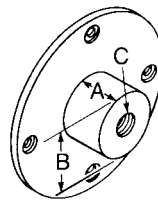
Vertical Lug (Centered)
BK-37

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



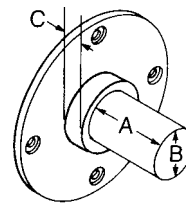
Adjustable
BK-45

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



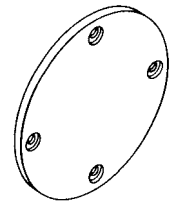
Screw Type
BK-88

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



Post
BK-38

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



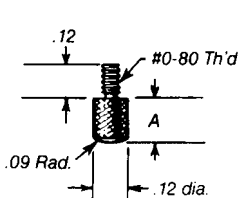
Flat
BK-32

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



Points for ANSI Group 0 - Series A and N

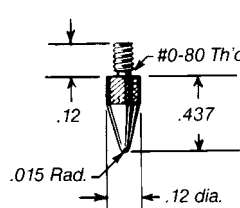
Regular PT-43 normally furnished



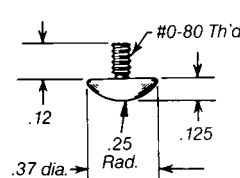
Dim. A Style

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

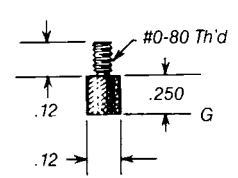
Taper PT-119



Button PT-118



Flat AL-61



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



Technical Data

Mahr Federal Series B (inch)

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

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

Mahr Federal Series O (Metric, mm)

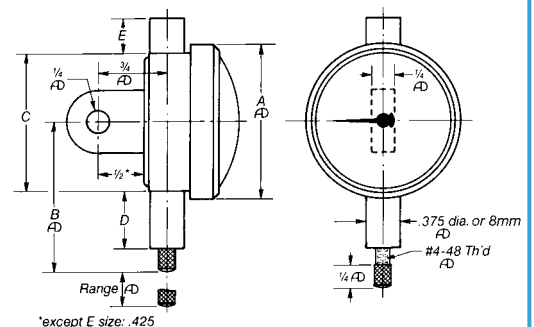
Dial: approx. 45 mm dia. with yellow tint

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

Dimensions

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

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



*except E size: .425

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



Ordering Information

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

www.mahr.com

Technical Data

Mahr Federal Series C (inch)

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

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

Super Sensitive Type (Inch)

.010"	.00005"	0-2-0	0-4	.004"	± .0001"	C1/2K	C1/2K-RC	C1/2K
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Mahr Federal Series P (Metric, mm)

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

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

Super Sensitive Type (Metric – mm)

0.250	0.001	0-5-0	0-10	0.100	± 0.002	P1/2I	P1/2I-RC	P1/2I
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These indicators are normally furnished with continuous dial (with R.C.) or + on right balance dial (w/o R.C.), lug back, .18" by .250" long contact and tolerance hands*.

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

Accessories

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

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

Recommended for larger gages and greater visibility.



Ordering Information

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

www.mahr.com

Technical Data

Mahr Federal Series D (inch)

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

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

Mahr Federal Series Q (Metric – mm)

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

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

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

Accessories

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

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



Technical Data

Mahr Federal Series E (inch)

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

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

Mahr Federal Series R (Metric, mm)

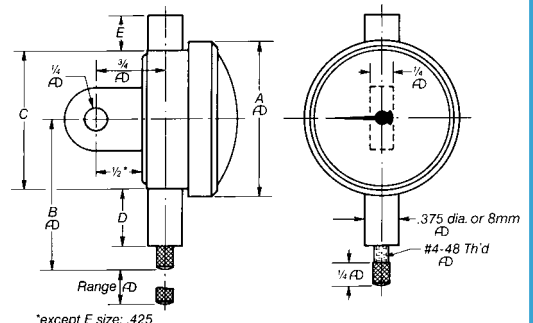
Dial: approx. 92 mm dia. with yellow tint

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

Dimensions

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

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



Easy Reading, Single Revolution Dial Indicator



Easy reading

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

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

Technical Data

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

High Performance, Dial Indicators per ANSI/AGD Group 2

Features

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



Technical Data

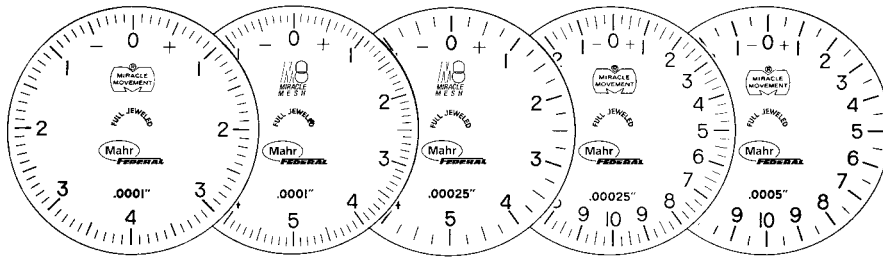
Measuring Range	Graduation value	Stem diameter	Dial style	Range per Rev.	Rev. Counter	Order no.
.250"	.001"	.375"	0-100	.100"	Standard	2016005
.500"	.001"	.375"	0-100	.100"	Speed read	2016004
1.00"	.001"	.375"	0-100	.100"	Speed read	2016002

Accessories

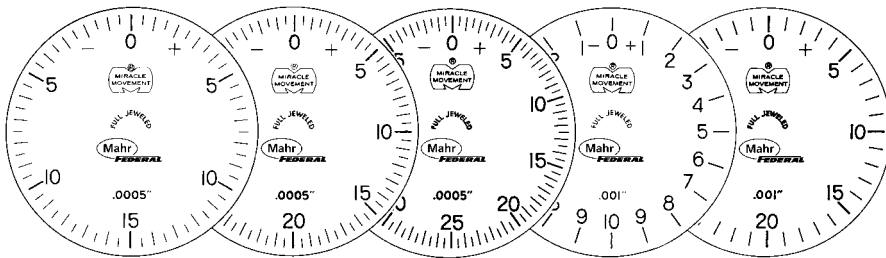
Flat Back	2247145
Lug Back	2016007
Screw back	2016008
Post back	2016009
Adj. Back	2016010
• Contact Points - see pg 5-27	

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

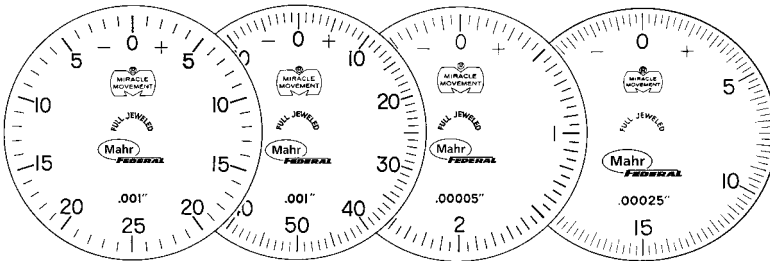
Mahr Federal Series B thru E



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

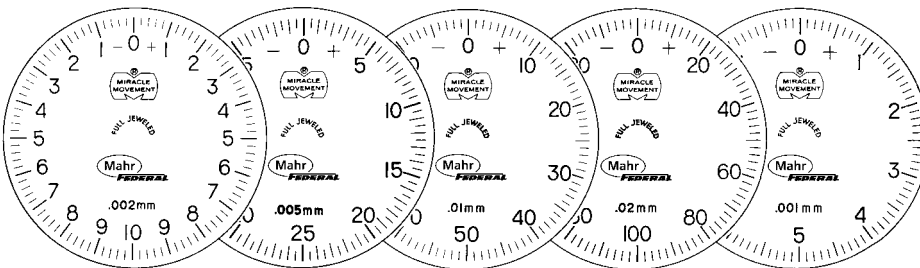


B5M **B6K** **B7I** **B3W** **B6Q**
2015786 **2015787** **2015790** **2015785** **2015789**
D5M **D6K** **D7I** **D3W** **D6Q**
E5M **E7I** **E3W**



B7O **B8I** **C1/2K** **D5G**
2015791 **2015792** **2015795**
D7O **D8I** **E5G**
E7O **E8I**

Mahr Federal Series O thru R



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

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

Features

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

Accessories

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

Ordering Information

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

www.mahr.com

Long Range and Extra Long Range Indicators



Technical Data

Long Range/Extra Long Range (Inch)

Dial: soft-green tint

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

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

Long Range/Extra Long Range (Metric)

Dial: yellow tint

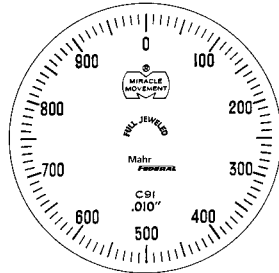
Measuring range	Graduation value	Dial style	Range per revolution	Accuracy	ANSI/AGD	Model no.	Order no.
25.000	0.010	0-100	1.000	0.020	2	SP6IS	
25.000	0.010	0-100	1.000	0.020	3	SQ6IS	
Extra Long Range							
50.000	0.025	0-25	2.500	0.025****	3	Q8IT	
75.000	0.025	0-25	2.500	0.025****	4	R8IU	

**** for first 25 mm of travel.

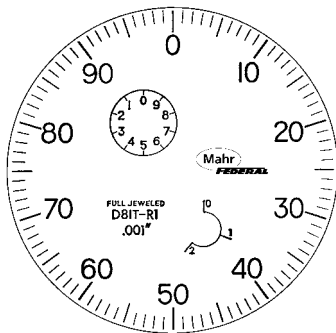
Dial Styles for Long Range and Extra Long Range Indicators



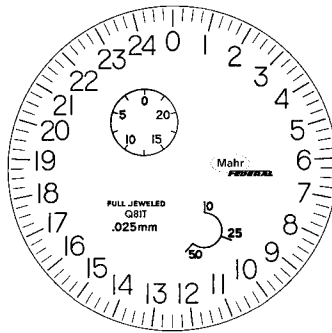
281QN, 281SN & D81S



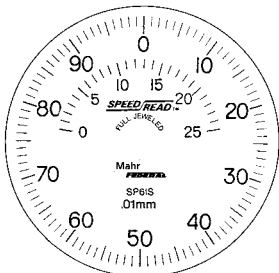
291



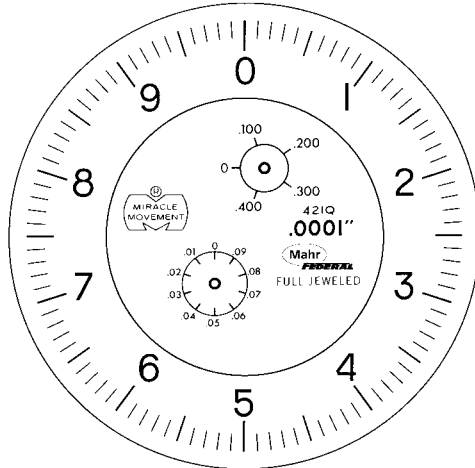
D81T & E81U



Q81T & R81U



SP61S & SQ61S



421Q

Features

- Normally furnished: continuous clockwise dial; centered vertical lug back; regular contact point, .18" radius, .250" long.
- Long Range Models: include (1) revolution counter (except C9I without revolution counter). Extra Long Range Models: include (2) revolution counters.
- For other dial styles or special requirements - call Mahr Federal.
- Indicator dimensions are located on pages containing individual ANSI/AGD descriptions.

Accessories

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

Dial Indicator Modifications & Specials

Available to meet specific requirements.

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

Ordering Information

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

www.mahr.com

Series WC and WP Wetproof Dial Indicators

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



Technical Data

Series WC and WP Wetproof Dial Indicators (Inch)

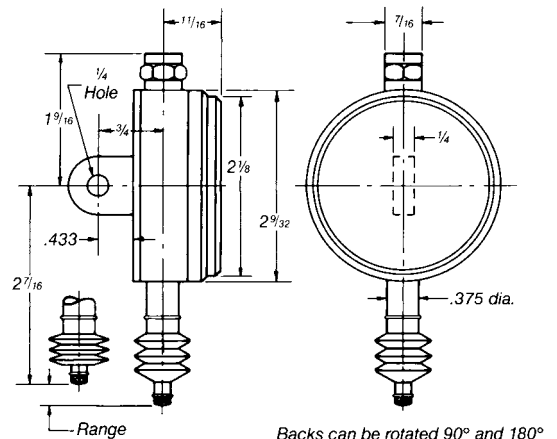
Dial: approx. 2-1/4" dia. with soft-green tint

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

Series WC and WP Wetproof Dial Indicators (Metric)

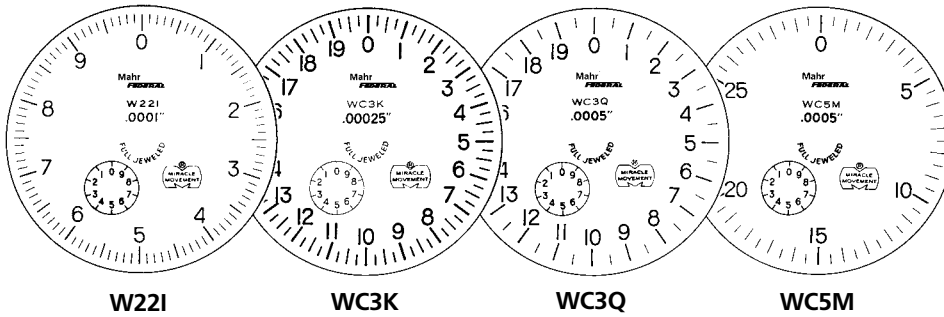
Dial: approx. 57 mm dia. with soft-yellow tint

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



Dial Styles for WC and WP Wetproof Dial Indicators

Series WC indicators

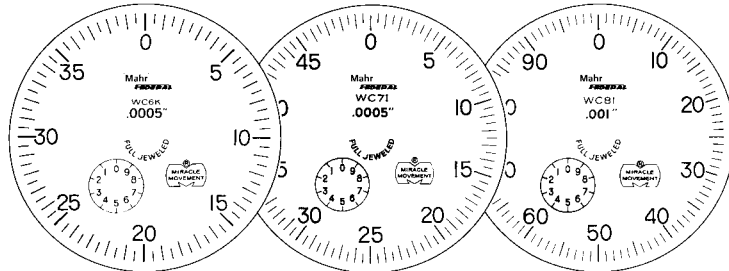


W221

WC3K

WC3Q

WC5M



WC6K

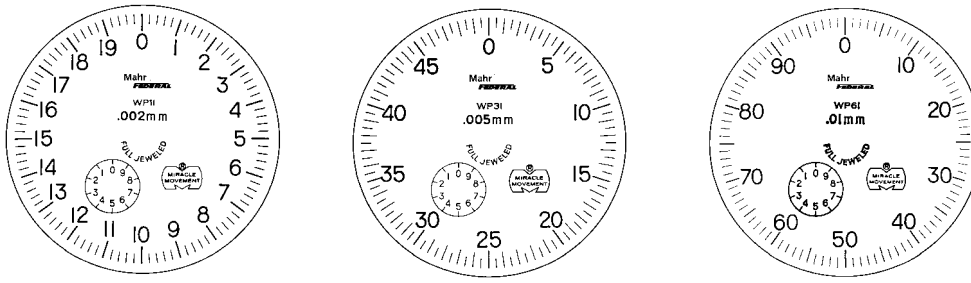
WC7I

WC8I/WC8IS

Features

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

Series WP indicators



WP1I

WP3I

WP6I

Accessories

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

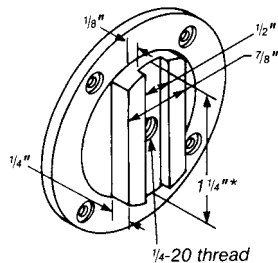
Ordering Information

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

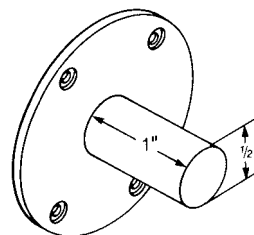
www.mahr.com

Backs for Wetproof Dial Indicators

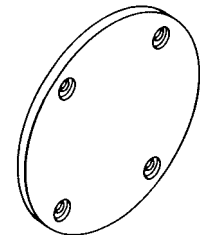
Vertical (centered) lug back is normally furnished and included in price of indicator. Back can be rotated 90° for horizontal lug mounting.



BK-68
Adjustable Back



BK-90
Post Back



BK-97
Flat Back

Perpendicular Dial Indicators

Provides improved readability where other style indicators cannot be used.



Technical Data

Series F, G, J, V (Inch)

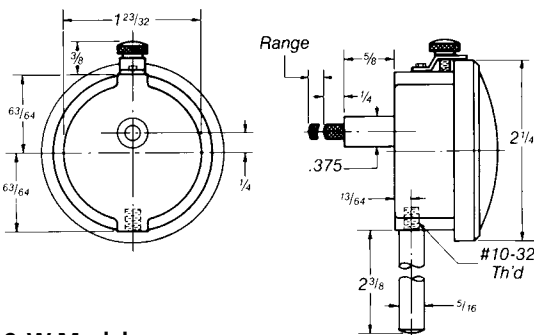
Dial: soft-green tint

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

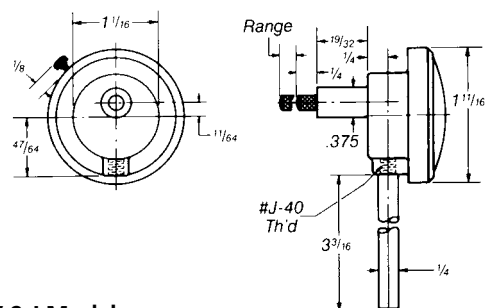
Series I, W (Metric)

Dial: yellow tint

Measuring range	Graduation value	Dial style	Range per revolution	Accuracy	Gear type	Dial Dia. (approx.)	Order no.
0.200	0.002	0-10-0	0.200	0.002	crown	57	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



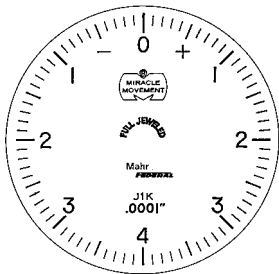
J & W Models



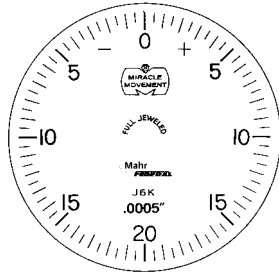
V & I Models

Dial Styles for Perpendicular Indicators

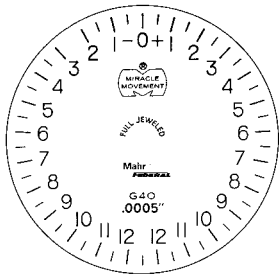
Series J, G, V, F



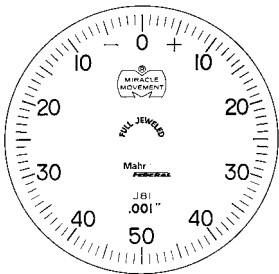
J1K



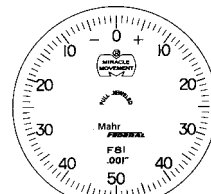
J6K



G40



J8I & G8I

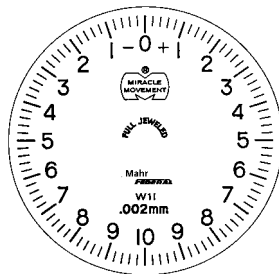


V8I & F8I

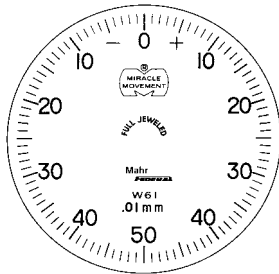
Features

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

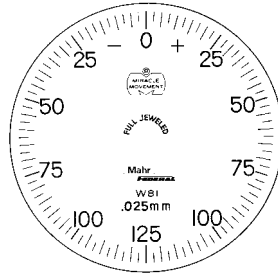
Series W, I



W1I



W6I



W8I & I8I

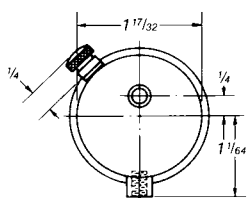
Accessories

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

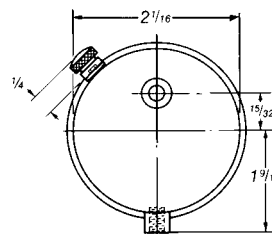
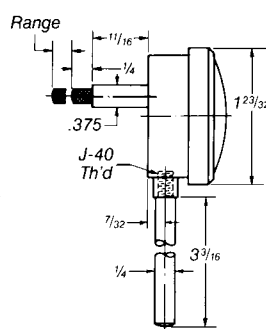
Ordering Information

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

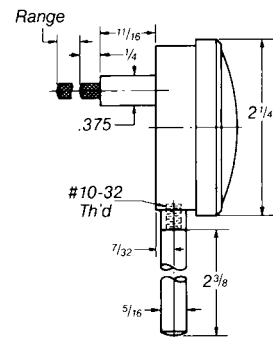
www.mahr.com



F8I Model



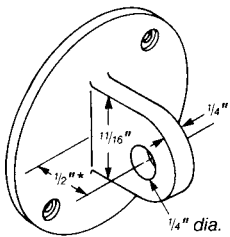
G Models



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

Vertical Lug

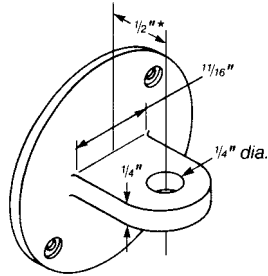
(centered) normally furnished



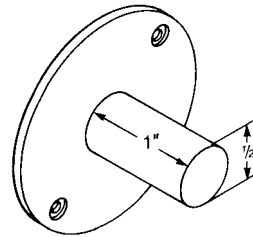
*27/16" for E/R size

Horizontal Lug

(centered)



Post

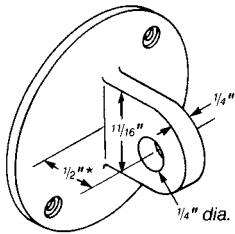


Features

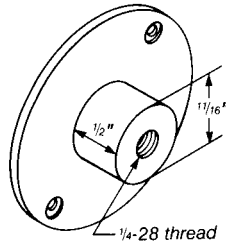
- Backs shown are for ANSI/AGD Groups 1,2,3,4, Long Range and Extra Long Range Indicators. Backs for ANSI/AGD Group 0 Indicators - see page 5-8. Backs for Wetproof Indicators - see page 5-18.
- To order - specify Back Order Number (from table below).
- Backs for ANSI/AGD Group 1 (Series B/O) Indicators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

Vertical Lug

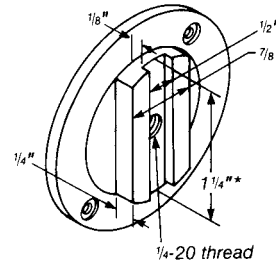
(offset) Left face of lug is on centerline of back



Screw Type

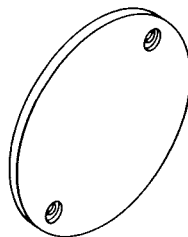


Adjustable



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

Flat



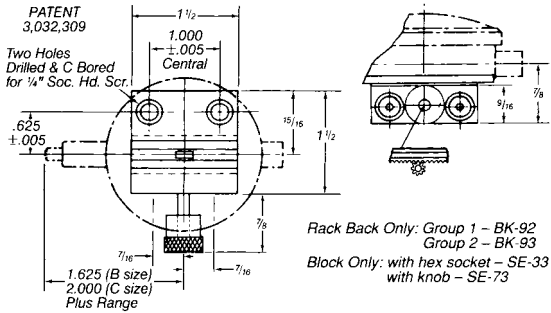
Ordering Numbers

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

Adjustable Mounting Brackets

Features

- 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 Numbers

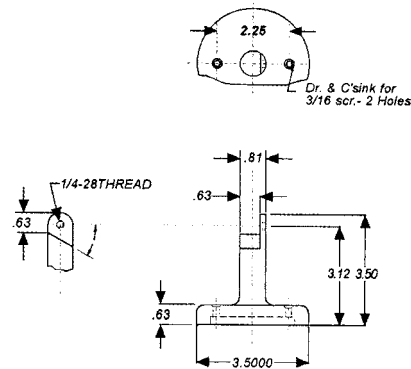
Mahr Federal Indicator	Used with	Order no.
Group 1	hex socket adjust	AT-27
Group 1	adjusting knob	AT-115
Group 2	hex socket adjust	AT-28
Group 2	adjusting knob	AT-116

Universal Mounting Base

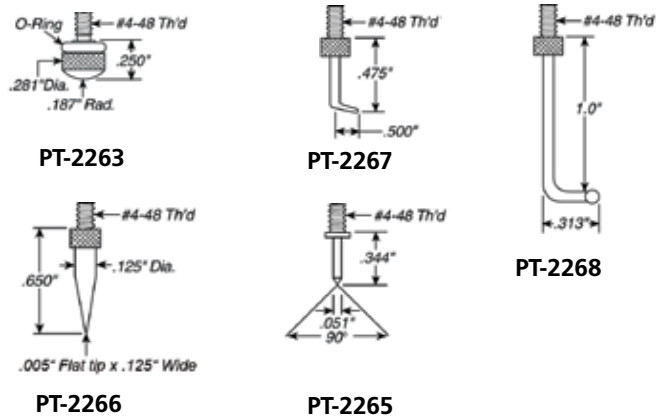
Features

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

Order no. BA-1051



Added flexibility for your Mahr Federal Dial Indicators



Description

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.

Order no.

PT-2263

Chisel Point Contact for checking small slots. Furnished with a small lock nut for positioning on the indicator.

PT-2266

Small Offset Point Contact. Small tip, .010" radius, permits checking narrow recesses. Furnished with a lock nut for indicator positioning.

PT-2267

Needle Contact for checking into small areas. Correct length for use as a replacement on Mahr Federal 65P-40 Depth Gage.

PT-2265

Right Angle Contact with a .093" 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 1" length makes it long enough to be used with Mahr Federal 75P-50 Series Depth Gages.

PT-2268

Contact Thread Adapter, Male M2.5 thread to 4-48 Female thread (.375" length)

AD-185

4-48 Male to M2.5 Female Threaded Adapter

2236519

Features

- 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.

Indicator Accessories

Weights

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



Lifting Levers - CAM Type.

Used with ANSI/AGD type and long range indicators.



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

* Up to 25 mm /1" range

** Requires case to have Bezel Clamp on Left

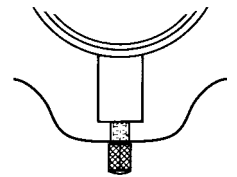
Protective Housing

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

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



Ox-Bow Lifting Lever - Type LR-40



Magnetic Maximum Hand

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



Tolerance Hands

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



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

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

Range Limiting Caps

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



Electronic Probe Adapter

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



Indicator Accessories

Hole Attachments

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



Split Collet

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



Brake Attachment

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



Threaded Bushing

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



Auxiliary Plungers

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



Dust Guard

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



Split Bushings

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



Right Angle Attachments

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



Long Range Indicator Calibrator

Features

Model OPTIMAR 25

- A precision, benchtop instrument, providing a wide variety of precision measuring instruments including dial and digital indicators, dial and digital comparators, dial and digital test indicators, electronic probes and gageheads, Air Probes® and jet probes, or any other devices that magnifies the linear displacement of a contact point or measuring spindle
- MarCheck, large clearly readable LCD monochrome digital display (240x160 pixels) with background illumination with 13 mm / 0.512" high digits
- User selectable for either inch or metric
- Output:
 - USB interface maxed at 3GB USB thumb drive
 - USB interface for PC
 - Selectable RS232 interface
 - Includes certification of calibration

Order no. 2062722



Technical Data

	Range	Resolution	Accuracy	Normally furnished:	Order no.
Inch	1.00"	0.000005, 0.00001, 0.00005, 0.0001, 0.0005, 0.001	±10 μ"	MarTest Mounting Shaft 3/8" diameter	4305875
Metric	25 mm	0.0001, 0.0005, 0.001, 0.005, 0.01, 0.1	±0.2 μm	Adapter Bushing (8 mm to .375") diameter	BU-197
				MarCheck Angle Display Stand	5350403
Description	Values				
Display Power	110V - 60 Hz, 240V - 50 Hz				
Dimensions Calibrator	18" x 6" x 8"				
H x W x D (approx)	460 x 153 x 204 mm				
Readout	10" x 7" x 2.0"				
H x W x D	260 x 180 x 50 mm				
Weight - Calibrator	37 lbs. / 17 kg				
Weight - MarCheck	3 lbs. / 1.4 kg				
				Also available:	
				Universal Centering Support 800b	4305893
				MarTest Dovetail Mounting Shaft 4 mm diameter	4305885
				Foot Switch for data transfer	5360322
				RS232 Null Modem Cable 10 feet long	7024634
				Dial Indicator Inspection Software QMSOFT®	5350196



Test Indicators



Dial Comparator



QMSOFT Software QM-DIAL

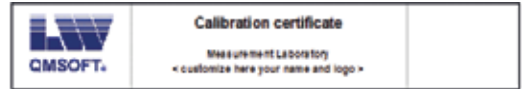
Features

The inspection program QMSOFT®/QM-DIAL is used for computer aided inspection of dial gages, dial indicators and dial test indicators. It was designed to support the inspection of these dial gages according to the worldwide mostly used standards. The QM-DIAL program includes a module to carry out the inspection according to the German standards **(DIN 878, DIN 879, DIN 2270)** inclusive the rules according to the **VDI/VDE/DGQ-standard**, the American standard **ANSI/ASME B89.1.10M-1987**, the British standards **BS 907 / BS 2795** and the Australian standard **AS 2103-1978**, the Korean and Japanese standards **KS B 5206, KS B 5207, KS B 5238, JIS B 7503, JIS B 7533** and the standard **JMAS 2001** and also the French standard **NF E 11-050**.

Order no. 5350196

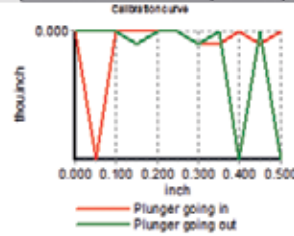
Accessories

RS232 Null Modem cable 10 feet long	7024634
Foot Switch for data transfer	5360322



Gauge type: 1224	Dial gauge
Identify number: 0.00000 mm	0.001000 mm
Type of gauge: 0.00000 mm	0.00000 mm
Measuring range: 0.00000 mm	0.00000 mm
Resolution: 0.00000 mm	0.00000 mm
Start of inspection: 0.00000 mm	0.00000 mm
End of inspection: 0.00000 mm	0.00000 mm
Inspection step: 0.00000 mm	0.00000 mm
Uncertainty: 0	

Evaluation of measurements:	Parameter	Tolerance (Thou/inch)	Actual values (Thou/inch)	Exclusion (Thou/inch)
	Deviations - one revolution	1.000	0.000 -0.010	-
	Deviations - at first 2 1/2 revolutions	1.000	0.000 -0.010	-
	Deviations - 2 1/2 through 10 revolutions	2.000		-
	Discrimination error	0.330	0.010	-
	Repeatability: at 25% (Ø 120000 mm)	0.200	0.010	-
	Repeatability: at 50% (Ø 250000 mm)		0.000	-
	Repeatability: at 75% (Ø 370000 mm)		0.000	-



Validation: **usage**
 Inspection procedure: Dial gauge type A (ARME)
 Measuring uncertainty: 0.4 µm = 0.9 µm x L (Length, mm)
 Inspection device and traceability: Dial Gauge Test Instrument Steinmeyer Feinmess SurinAR® Nr. 1060
 Certified Number 010-08-01-001
 Gauge block set No. 31828 Calibration Number: LUV-470109001010-05
 Inspection date: 6/11/2014
 Next inspection date: 6/28/2014

Dial Indicator Calibrator

Features

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

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

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



400B-3 Dial Indicator Calibrator



Technical Data

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

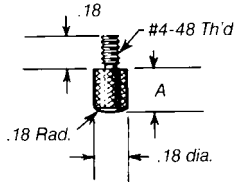
- Normally furnished:
BU-112 Bushing (.218" I.D. to .375" O.D.)
AD-58 Bushing (.275" I.D. to .375" O.D.)
BU-197 Bushing (8 mm I.D. to .375" O.D.)

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

Contact Points

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

Regular



Hardened Steel (inch)

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

Hardened Steel (Metric***)

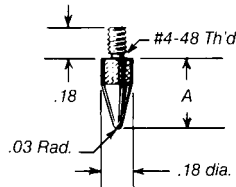
Dimension A	Order no.	Dimension A	Order no.
6 mm	EPT-1037-W1	15 mm	EPT-1037-W3
10 mm	EPT-1037-W2	20 mm	EPT-1037-W4
12 mm	EPT-1037-W6	25 mm	EPT-1037-W5

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

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

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

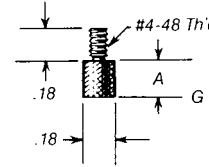
Tapered



Hardened Steel (inch) Tungsten Carbide (inch)

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

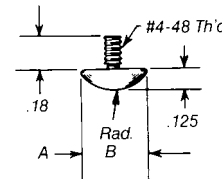
Flat End



Hardened Steel (inch)

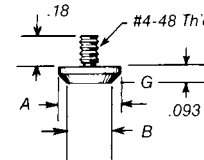
Dimension A	Order no.	Dimension A	Order no.
1/8"	AL-19	6 mm	EAL-1016-W1
1/4"	AL-673	10 mm	EAL-1016-W2
3/8"	AL-20	15 mm	EAL-1016-W3
1/2"	AL-21	20 mm	EAL-1016-W4
5/8"	AL-22	25 mm	EAL-1016-W5
3/4"	AL-23	Tungsten Carbide	
7/8"	AL-24	1/4"	AL-51
1"	AL-25	Set of 8 Steel	
		1/8" to 1"	AL-55

Button



Hardened Steel (inch)			Tungsten Carbide		
Dim. A	Dim. B	Order no.	Dim. A	Dim. B	Order no.
.375"	.250"	PT-227	.375"	.250"	PT-120
.500"	.375"	PT-619			

Wide Face



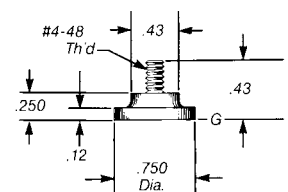
Hardened Steel (inch)			Hardened Steel (Metric***)		
Dim. A	Dim. B	Order no.	Dim. A	Dim. B	Order no.
.356"	.250"	AL-502	9.04	6.35	EAL-1020-W1
.500"	.375"	AL-1510	12.7	9.5	EAL-1020-W2
.615"	.500"	AL-520	15.6	12.7	EAL-1020-W3
.731"	.625"	AL-44	18.6	15.9	EAL-1020-W4

Tungsten Carbide (inch)			Tungsten Carbide (Metric***)		
Dim. A	Dim. B	Order no.	Dim. A	Dim. B	Order no.
.356"	.250"	AL-1730	9.04	6.35	EAL-1021

Extra Wide Face






Hardened Steel






(inch)	Order no.
AL-291	
(metric) 2252940	





MarCator Dial Indicators (DIN Style)

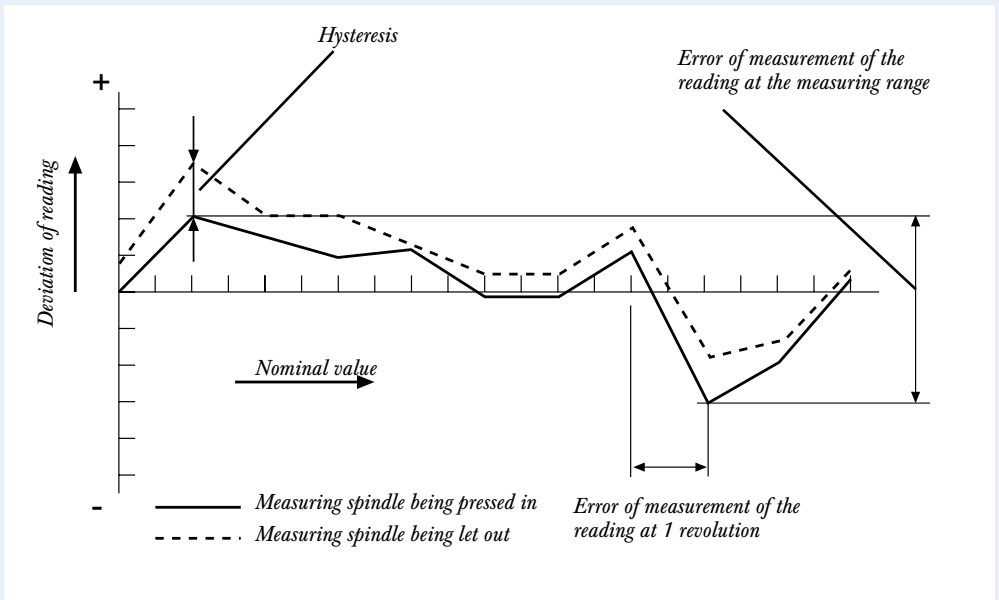
OVERVIEW









Precision Small Dial Indicators					
Model	803 A	805 A	803 S	803 SW	
					
Range	3 mm	5 mm	3 mm	3 mm	
Readings	0.01 mm	0.01 mm	0.01 mm	0.01 mm	
Dial style	0-50	0-100	0-50	0-50	
Standard for metrological characteristics	DIN 878	DIN 878	DIN 878	DIN 878	
<i>DIN EN ISO 463</i>					
Limit value for measurement error at the reading	{ Meas. range 1 revolution 1/2 revolution 1/10 revolution	10 µm	12 µm	10 µm	10 µm
		9 µm	9 µm	9 µm	9 µm
		8 µm	8 µm	8 µm	8 µm
		5 µm	5 µm	5 µm	5 µm
Limit value for	Repeatability	3 µm	3 µm	3 µm	3 µm
Limit value for	Hysteresis	3 µm	3 µm	3 µm	3 µm
Shockproof			●	●	
Measuring force	0.7 - 1.1 N	0.7 - 1.1 N	0.7 - 1.1 N	0.7 - 1.7 N	
Order no.	4324050	4324060	4324000	4326000	

Precision Dial Indicators					
Model	810 A	810 AT	810 S	810 SW	
					
Range	10 mm	10 mm	10 mm	10 mm	
Readings	0.01	0.01	0.01	0.01	
Dial style	0-100	0-100	0-100	0-100	
Standard for metrological characteristics	DIN 878	DIN 878	DIN 878	DIN 878	
<i>DIN EN ISO 463</i>					
Limit value for measurement error at the reading	{ Meas. range 1 revolution 1/2 revolution 1/10 revolution	15 µm	15 µm	15 µm	15 µm
		10 µm	10 µm	10 µm	10 µm
		9 µm	9 µm	9 µm	9 µm
		5 µm	5 µm	5 µm	5 µm
Limit value for	Repeatability	3 µm	3 µm	3 µm	3 µm
Limit value for	Hysteresis	3 µm	3 µm	3 µm	3 µm
Shockproof			●	●	
Measuring force	0.7 - 1.3 N	0.7 - 1.3 N	0.7 - 1.3 N	0.7 - 1.6 N	
Order no.	4311050	4311060	4311000	4315000	

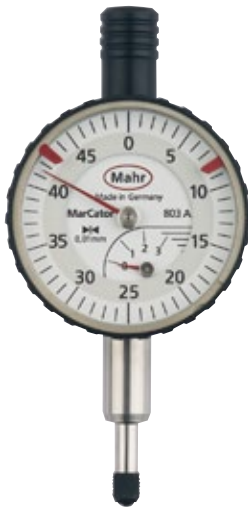
803 SB	803 AZ
	
0.4 mm (±0.2)	.120"
0.01 mm	.0005"
0-20-0	0-20
DIN 878	Factory standard
9 μm	.0004"
8 μm	
5 μm	.0002"
3 μm	.00012"
3 μm	.00012"
●	
0.9 - 1.1 N	0.7 - 1.1 N
4324250	4324900

Metrological characteristics

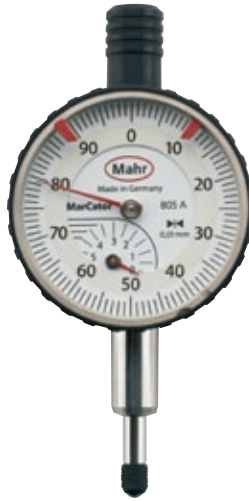


810 SB	810 SM	810 SRM	810 AZ	810 AU	810 AX	810 AG	810 SV
							
0.8 mm (±0.4)	1 mm	5 mm	.400"	10 mm	10 mm	10 mm	40 mm
0.01	0.001	0.001	.0005"	0.01	0.1	0.01	0.01
0-40-0	0-100	0-100	0-45	100-0	0-10	0-100	0-100
DIN 878	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
7 μm	4 μm	10 μm	.0005"	15 μm	50 μm	17 μm	25 μm
6 μm	3 μm	5 μm		10 μm	50 μm	15 μm	15 μm
6 μm	2 μm	3 μm		9 μm	30 μm	10 μm	10 μm
5 μm	1 μm	2 μm	.0002"	5 μm	15 μm	5 μm	5 μm
3 μm	1.5 μm	3 μm	.00012"	5 μm	15 μm	3 μm	3 μm
3 μm	1.5 μm	3 μm	.00012"	5 μm	15 μm	5 μm	6 μm
●	●	●					●
0.7 - 1.1 N	1.3 - 1.8 N	1.2 - 1.7 N	0.9 - 1.5 N	1.0 - 1.8 N	0.7 - 1.3 N	1.3 - 2.2 N	0.8 - 1.8 N
4317000	4311070	4311080	4311900	4329050	4331000	4322000	4321000

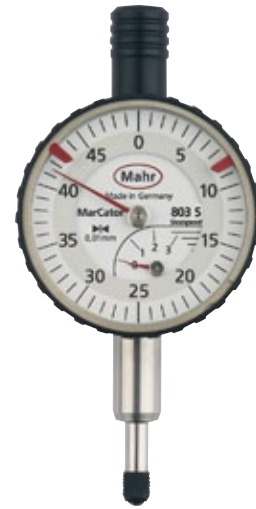
Precision Small Dial Indicators 803 / 805 DIN style



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 are delivered in plastic case

Technical Data

	Range	Readings	Dial face dia.	Overtravel	Mounting shank dia.	Measuring force	Accuracy	Order no.
	mm	mm	mm	mm	mm	N	DIN 878	
803 A	3	0.01	34	0.1	8h6	0.7 - 1.1	●	4324050
805 A	5	0.01	34	0.1	8h6	0.7 - 1.1	●	4324060
803 S	3	0.01	34	0.1	8h6	0.7 - 1.1	●	4324000
803 SW	3	0.01	34	0.1	8h6	0.7 - 1.7	●	4326000
803 SB	0.4 (±0.2)	0.01	34	4.5	8h6	0.9 - 1.1	●	4324250
803 AZ	.120"	.0005"	1.4"	.008"	8h6	0.7 - 1.1		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

Small 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 (ca. 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:

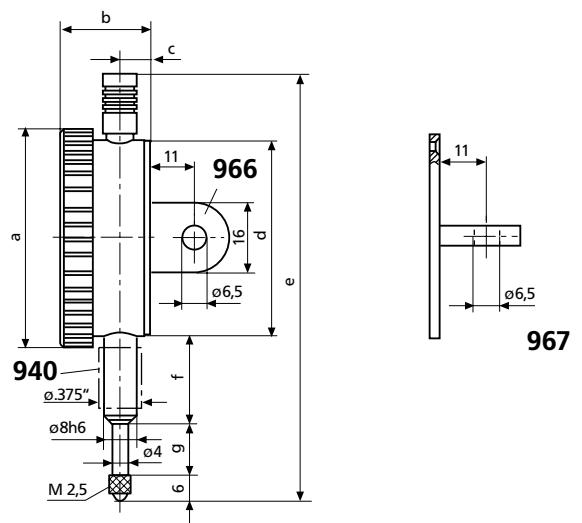
- The scope of supply includes an Adapter Bush 940 for adapting mounting shank 8h6 mm to inch bore .375"

Dimensions according to DIN EN ISO 463

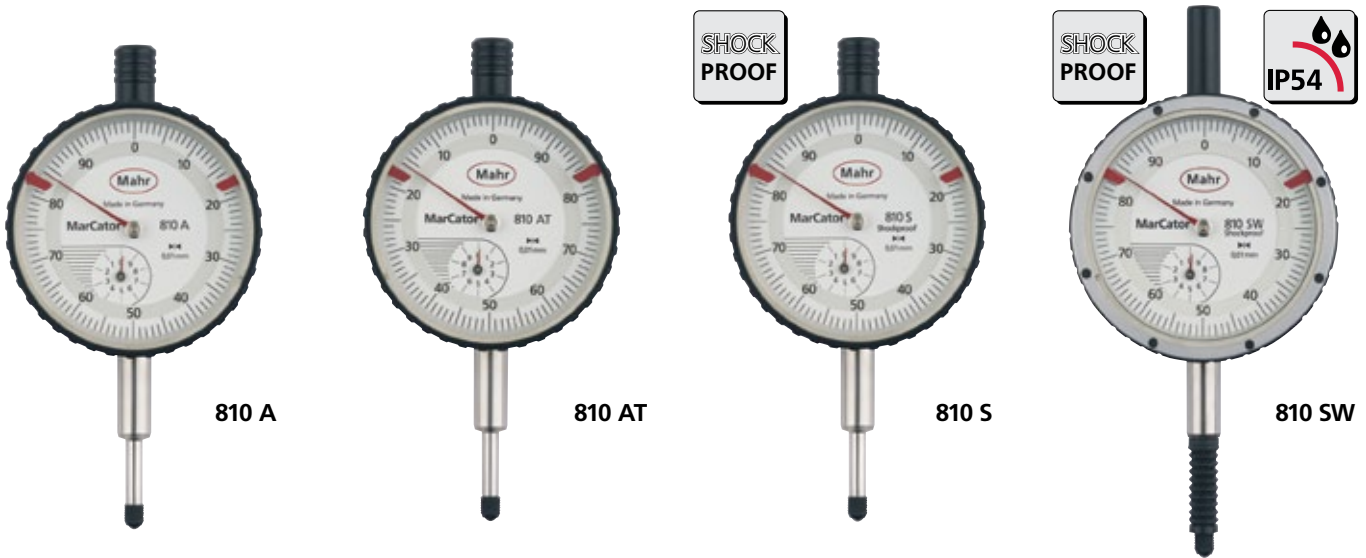
mm	a	b	c	d	e	f	g
803 A	ø 40	20.6	6.8	ø 37	83	15.5	8
805 A	ø 40	20.6	6.8	ø 37	83	15.5	8
803 S	ø 40	20.6	6.8	ø 37	80	15	5.5
803 SW	ø 44	21.6	7.1	ø 37	86	15	11
803 SB	ø 40	20.6	6.8	ø 37	83	15.5	8
803 AZ	ø 40	20.6	6.8	ø 37	83	15.5	8

Accessories

	Order no.	
Adapter Bush for adapting mounting shank 8h6 mm to inch bore .375"	940	4310103
Splash Guard Cover for bezel dia. 40 mm	956	4373021
Mounting Lugs Bore perpendicular to mounting shank	966	4375020
Bore parallel to mounting shank	967	4375021



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 protective measuring spindle cap

All indicators are delivered in plastic case

Technical Data

	Range	Readings	Dial face dia.	Overtravel	Mounting shank dia.	Measuring force	Accuracy	Order no.
	mm	mm	mm	mm	mm	N	DIN 878	
810 A	10	0.01	50	0.1	8h6	0.7 - 1.3	●	4311050
810 AT	10	0.01	50	0.1	8h6	0.7 - 1.3	●	4311060
810 S	10	0.01	50	0.1	8h6	0.7 - 1.3	●	4311000
810 SW	10	0.01	50	0.1	8h6	0.7 - 1.6	●	4315000
810 SB	0.8 (±0.4)	0.01	50	9	8h6	0.7 - 1.1	●	4317000
810 SM	1	0.001	50	4	8h6	1.3 - 1.8		4311070
810 SRM	5	0.001	50	0.1	8h6	1.2 - 1.7		4311080
810 AZ	.400"	.0005"	2"	.004"	8h6	0.9 - 1.5		4311900

Accessories

	Order no.		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			
Bore perpendicular to mounting shank	961		4375010
Bore parallel to mounting shank	962		4375011

Precision Dial Indicators 810 DIN style



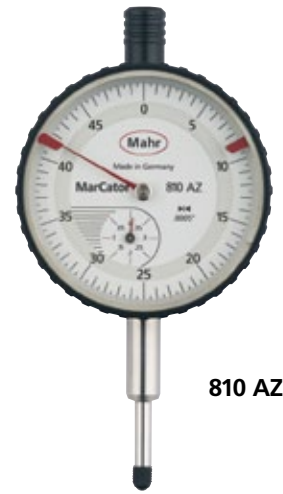
810 SB



810 SM



810 SRM



810 AZ

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 (ca. 9 mm) for easier insertion of test items in measuring devices
- Hermetically sealed protective measuring spindle cap

Dial Indicator 810 SM Shockproof with reading 0.001 mm

- 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 0.001 mm

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

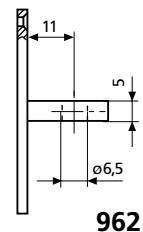
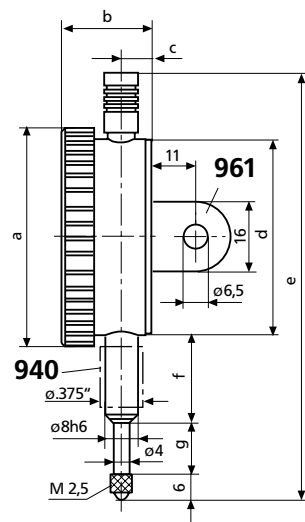
Dial Indicator 810 AZ Inch version

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 according to DIN EN ISO 463

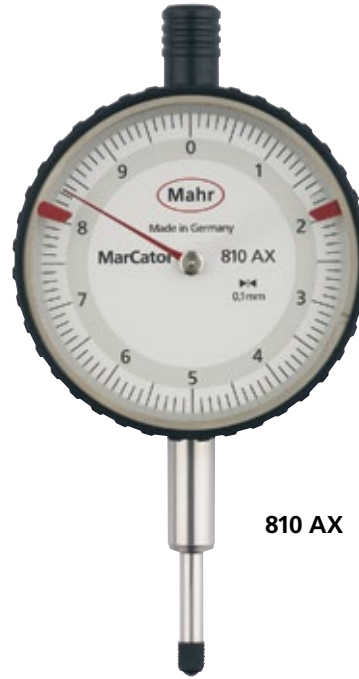
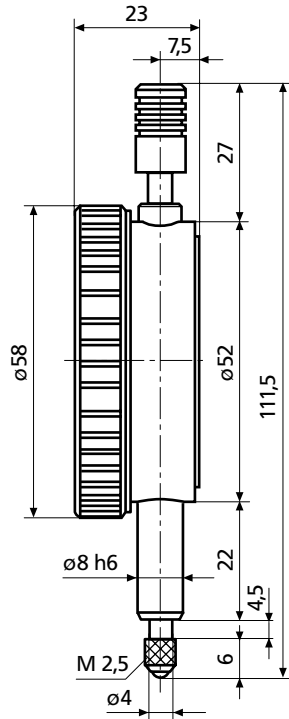
mm	a	b	c	d	e	f	g
810 A/AT	∅ 58	23	7.5	52	112	21	16
810 S	∅ 58	23	7.5	52	111.5	22	15
810 SW	∅ 61	24.15	7.9	52	127.6	22	22.1
810 SB	∅ 58	23	7.5	52	120	22	15
810 SM	∅ 58	25	8.5	52	111.5	22	15
810 SRM	∅ 58	23	7.5	52	111.5	22	15
810 AZ	∅ 58	23	7.5	52	111.5	22	15



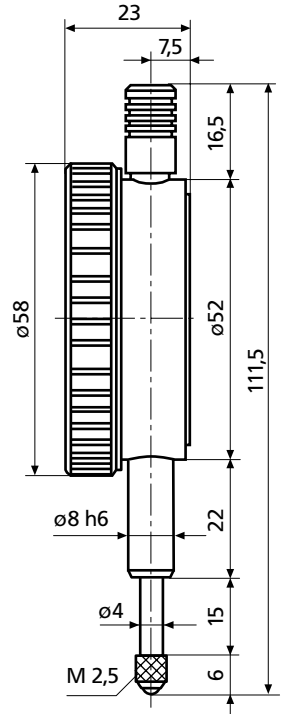
Precision Dial Indicators 810



810 AU



810 AX



Features

Dial Indicator 810 AU

with a reversed measuring force direction

- Chrome-plated housing
- Adjustable tolerance markers
- Scale on the dial increases counter clockwise (+ 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

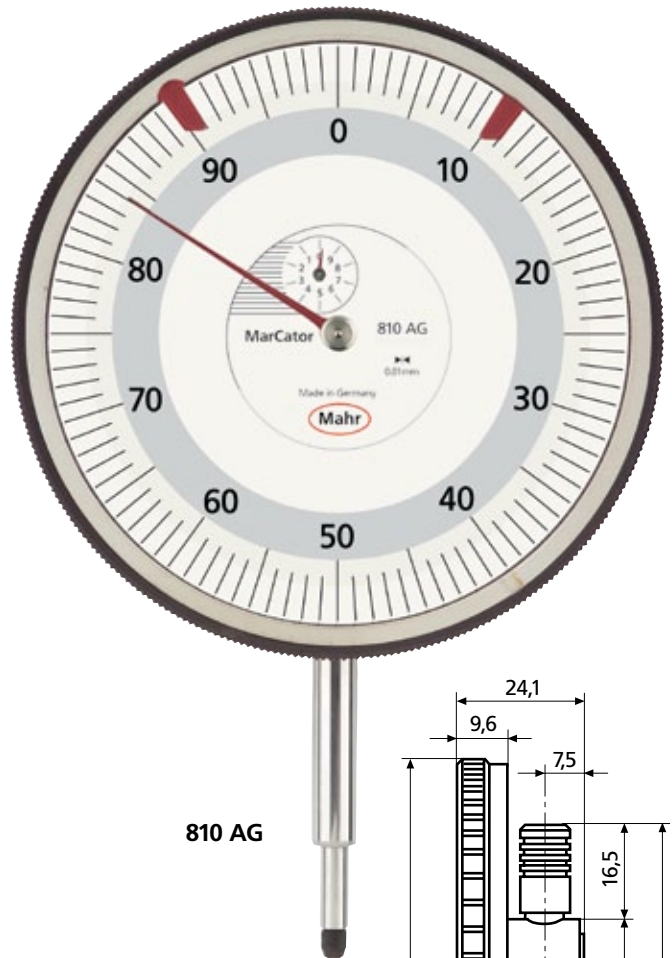
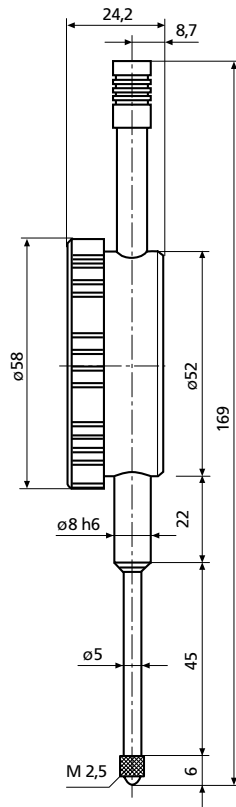
Technical Data

	Range	Readings	Dial face	Overtravel	Mounting	Measuring	Order no.
	mm	mm	dia.	mm	shank	force	
			mm		dia.	N	
810 AU	10	0.01	50	0.1	8h6	1 - 1.8	4329050
810 AX	10	0.1	50	0.5	8h6	0.7 - 1.3	4331000
810 SV	40	0.01	50	0.1	8h6	0.8 - 1.8	4321000
810 AG	10	0.01	108	0.1	8h6	1.3 - 2.2	4322000

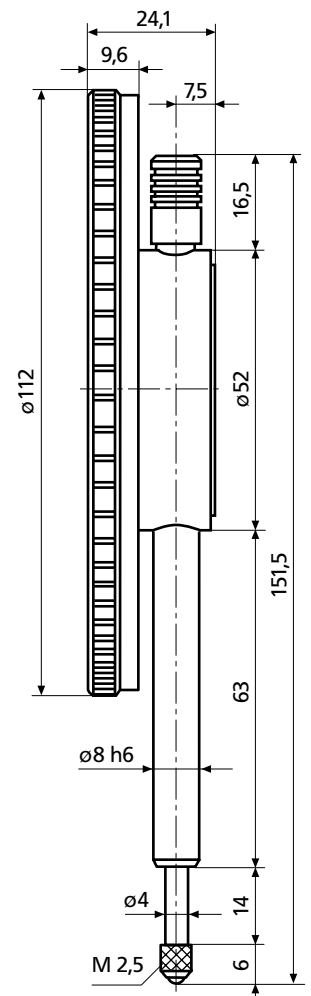
Precision Dial Indicators 810



810 SV



810 AG



Features

Long Range Dial Indicator 810 SV

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 dia. 58 mm











955 4373020

Mounting Lug to mount on mounting shank of all versions

963 4375002

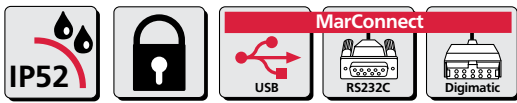
MarCator. Digital Indicators (Long range)

OVERVIEW

Functions of Digital Indicators		1075 R	1075 R	1075 R	1086 R	1086 ZR
						
Catalog page		5 - 38	5 - 38	5 - 38	5 - 44	5 - 46
Measuring ranges	mm / inch	12.5 / .5"	12.5 / .5"	12.5 / .5"	12.5 / .5" 25 / 1 50 / 2" 100 / 4"	12.5 / .5" 25 / 1
Resolution	metric inch metric inch metric inch metric inch	0.01 mm .0005"	0.005 mm .0001"	0.001 mm .00005"	0.01 mm .0005"	0.01 mm .0005"
Mounting shank		8h6	8h6	8h6	8h6	3/8"
Protection class	IP class acc. to IEC 60529					
Functions:						
ON/OFF		●	●	●	●	●
Set display to zero		●	●	●	●	●
Switch between mm/inch		●	●	●	●	●
Reversal of counting direction		●	●	●	●	●
Enter numerical value	PRESET	●	●	●	●	●
Data		●	●	●	●	●
ABS/REL-switchable					●	●
Tolerance display					●	●
Dynamic measuring functions	MIN. MAX MAX-MIN (TIR)					
Search for reversal point	START/STOP					
Factor set / adjust					●	●
Analog display						
Switch the analog value						
Key lock function LOC		●	●	●	●	●
Data output:	USB	●	●	●	●	●
	Digimatic	●	●	●	●	●
	Opto RS232C	●	●	●	●	●
	Integrated wireless				●*	●*
Control output:						

* Ri version

Digital Indicators 1075 R



Features

- Functions:**
- ON/OFF
 - RESET (Set display to zero)
 - mm/inch
 - Reversal of counting direction
 - PRESET (for entering a numerical value)
 - DATA (data transmission with a data connection cable)
 - LOCK-Function: Individual buttons can be locked
 - Auto-OFF (selectable)
- Immediate measurement due to the Reference system
 - Max measuring speed 1.5 m/sec (60"/sec)
 - MarConnect Data output: choose either USB, OPTO RS232C, Digimatic
 - High contrast Liquid Crystal Display with 12 mm high digits
 - Operating temperature 10-40°C
 - Class of protection IP52 according to IEC 60529

Scope of supply:
Battery,
Operating instructions

Reference System - Just set once to zero

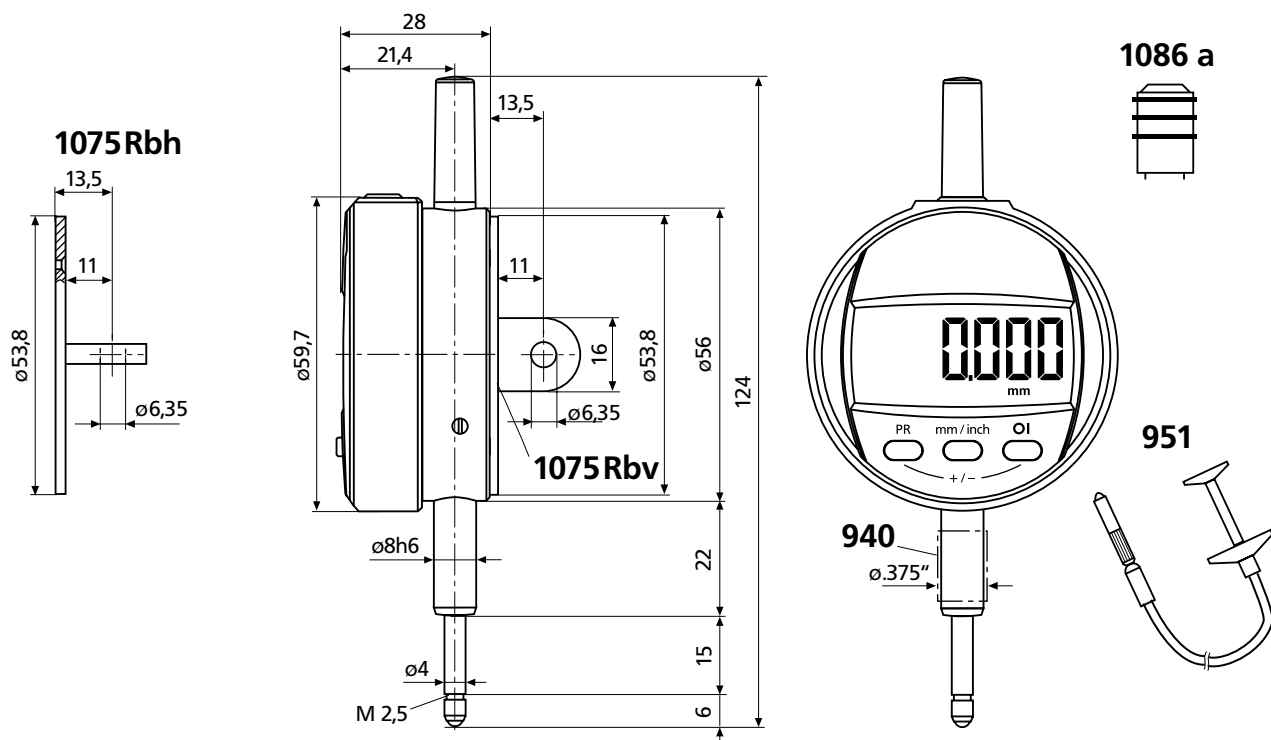
REFERENCE The new Digital Indicators 1075 R are equipped with the innovative Reference-System. The zero position only has to be set one time: once it is set, the zero remains stored for all further measurements. Therefore, when the indicator is switched ON or the measuring spindle is moved the indicator is immediately ready for measurement; thus the need to reset as with a conventional indicator is now obsolete.

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"	0.020	0.5 - 1	180	4336010
12.5	(.5")	0.005	/ .0001"	0.015	0.5 - 1	180	4336020
12.5	(.5")	0.001	/ .00005"	0.005	0.5 - 1	180	4336030

* in any zero point

Technical Data



Shown with Mounting Lug, not included.

Accessories

	Order no.	Additional Accessories	Page
Battery 3V , Type CR 2032	4102520	Contact Points 901-913	5-58
Data Connection Cable USB (2 m)	16 EXu 4102357	Special Holder 941	5-59
Data Connection Cable Opto RS232C (2 m), with SUB-D jack 9-pin	16 EXr 4102410	Sensor Lever 943	5-59
Data Connection Cable Digimatic (2 m). Flat plug 10-pin	16 EWd 4102915	Accessories for Data Processing see Chapter 11	
Adapter Bush for adapting mounting shank 8h6 mm to inch bore .375"	940 4310103		
Cable Release to raise the measuring spindle	951 4372000		
Lifter Protection Cap	1086 a 4337320		
Lug Back , horizontal	1075 Rbh 4336041		
Lug Back , vertical	1075 Rbv 4336042		

MarConnect Integrated Wireless

► | With integrated wireless, you have a new integrated wireless data transmission system from Mahr for the price of a cable. Data acquisition with digital indicators is now even simpler: Simply transmit your measuring data without being tangled up between cables directly into Microsoft Office Excel® or via a keyboard code into any other Windows program. | ◀

Inexpensive



With the integrated wireless receiver up to 8 digital indicators can be connected per i-stick, therefore expensive interface boxes are no longer required. When just attaching a digital indicator you have already a wireless data transmission for the price of a data cable.



Secure data transmission

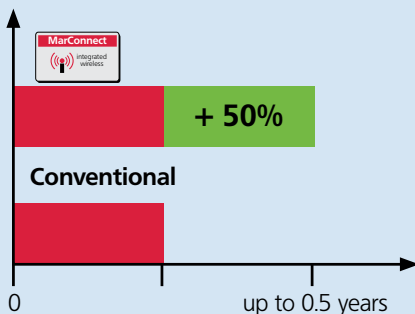


With the integrated wireless your data will be transferred to the digital indicator; this is confirmed with a message in the digital indicator's display to whether the sent data has been transferred correctly, and/or whether you are in the reception range of the i-stick.

Long battery life span



As the wireless interface is integrated in the digital indicator, the digital indicator is extremely energy efficient. In addition contrary to conventional wireless data transmission systems no additional battery is needed.



Simple data transmission



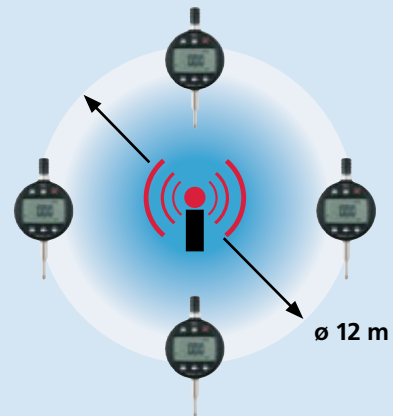
With the i-stick you can simply **transfer your measured values via integrated wireless to the PC**. The measured values are sent directly (as with a data cable) via the MarCom software to Microsoft Office Excel® or by a keyboard code into any other Windows program.



Large freedom of movement



The integrated wireless clearly gives you more **freedom of movement**. When used with a digital indicator in conjunction with a indicating measuring instruments, for example when measuring on or at the machine or with large workpieces you are not obstructed by any cables.



Excellent ergonomics



Compared to a bulky conventional radio transmission which requires a large external transmitter with a separate battery. The integrated wireless transmitter is integrated in the digital indicator.

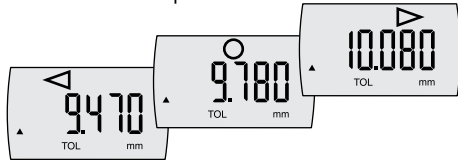
MarCator. Digital Indicators

DIGITAL INDICATORS WITH THE REFERENCE SYSTEM AND INTEGRATED WIRELESS

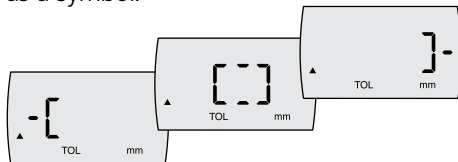
► I Once again Mahr sets a new standard in the digital indicator product segment with the new generation of Digital Indicators **MarCator** 1086 Ri / 1087 Ri Reference. With the new Reference system the MarCator digital indicators can be applied immediately as the zero-position only has to be set once for all further measurements. Also, if you need to document your data, we have our integrated wireless indicators; an integrated energy efficient wireless data transmission system, the optimal solution for transmitting your measured values to a PC.

Clear display

Tolerance is displayed. Displayed is the actual measured value and the tolerance zone position



Tolerance indication without the value in the display. In and Out of tolerance will be indicated in the display as a symbol.



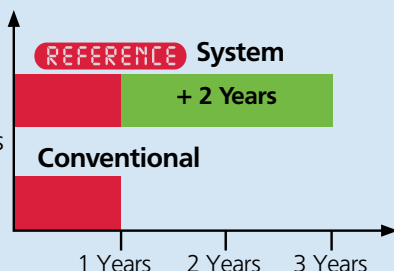
Error free operation



Lock function: This prevents unintentional activation of an operating button. Either all the operating buttons or only certain individual buttons can be locked. If a locked operating button is pressed the "LOC" symbol will appear in the display.

Battery service life is 3 years

The new Reference system is extremely energy efficient as when the caliper is in standby mode; almost no power is required, thus **extending the life of the battery up to 3 years***.



* When Integrated Wireless is deactivated



Universal Data-Interface



• **Integrated Wireless**
The wireless interface for the price of a data



• **USB:** No interface box is required! Simple and inexpensive way to set up a multiple measuring instruments via a USB hub



• **Digimatic:** To connect a Digimatic compatible evaluation instrument



• **Mahr Opto RS232C:** For direct connection to a COM port on a PC

Absolute function:



Digital Indicator can be set in any position to 0.000 without losing the reference to the preset value.

REFERENCE

All our **MarCator** Digital Indicators from the 1086 R(i) and 1087 R(i) series are equipped with the **innovative Reference System**. For further information regarding our Reference System please refer to page 5-38.

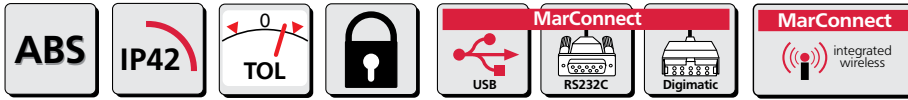


IP-Protection class IP54 (optional)

- Protection cap is sealed
- Rubber bellows for the measuring spindle
- Sealed battery compartment

Code Initial	IP	International Protection
First Numeral	5	Dust protected
Second Numeral	4	Protection against splash water in all directions

Digital Indicators MarCator 1086 Ri



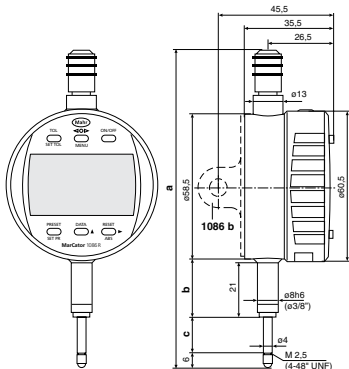
REFERENCE



12,5 mm



25 mm



Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12.5	(.5")	126.3	23	13.5
25	(1")	153.4	26.8	26.5
50	(2")	267.3	40	52
100	(4")	420.3	91	103

Features

Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- <0> (Tolerance GO / NO GO display mode)
- DATA (when connected with a data connection cable)
- Factor (adjustable)

- Integrated Wireless data transmission
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 11 mm high digits
- Operating time approx. 3 years (2000 work. hrs/year)
- Maximum measuring speed 1.5 m/s (60"/s)
- Lifter protection cap on the measuring spindle
- MarConnect data output: choose either: USB, OPTO RS232C, Digimatic or Integrated Wireless
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529

Supplied with:
Battery, operating instructions

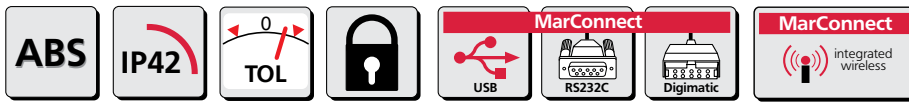
Technical Data

Measuring range	Resolution switchable	Span of error*	MarConnect**	Measuring force	Weight	Mounting shank	Order no.
mm (inch)		mm		N	g		
12.5 (.5")	0.0005 / 0.001 / 0.002	0.005	●	0.65 - 0.90	130	8h6	4337624
25 (1")	/ 0.005 / 0.01 mm	0.005	●	0.65 - 1.15	140	8h6	4337625
50 (2")	.00002" / .00005" /	0.005	●	1.25 - 2.70	190	8h6	4337626
100 (4")	.0001" / .0002" /	0.005	●	1.60 - 3.50	235	8h6	4337627
25 (1")	.0005"	0.005	●	—	140	8h6	4337628

* in any zero point

** To use the integrated wireless function an i-Stick Wireless Receiver is required, see page 5-58

Digital Indicators MarCator 1086 Ri, Resolution 0.01 mm / .0005"



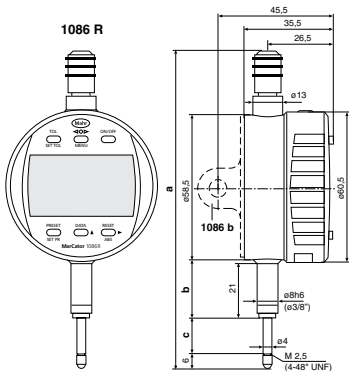
REFERENCE



12,5 mm



25 mm



Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12.5	(.5")	126.3	23	13.5
25	(1")	153.4	26.8	26.5
50	(2")	267.3	40	52
100	(4")	420.3	91	103

Features

Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- <0> (Tolerance GO / NO GO display mode)
- DATA (when connected with a data connection cable)
- Factor (adjustable)

- Integrated Wireless data transmission
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 11 mm high digits
- Operating time approx. 3 years (2000 work. hrs/year)
- Maximum measuring speed 1.5 m/s (60"/s)
- Lifter protection cap on the measuring spindle
- MarConnect data output: choose either: USB, OPTO RS232C, Digimatic or Integrated Wireless
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529

Supplied with:
Battery, operating instructions

Technical Data

Measuring range		Resolution	Span of error*	MarConnect**	Measuring force	Weight	Mounting shank	Order no.
mm	(inch)	mm / inch	mm		N	g		
12.5	(.5")	0.01 / .0005"	0.02	●	0.65 - 0.90	130	8h6	4337134
25	(1")	0.01 / .0005"	0.02	●	0.65 - 1.15	140	8h6	4337135
50	(2")	0.01 / .0005"	0.02	●	1.25 - 2.70	190	8h6	4337136
100	(4")	0.01 / .0005"	0.02	●	1.60 - 3.50	235	8h6	4337137

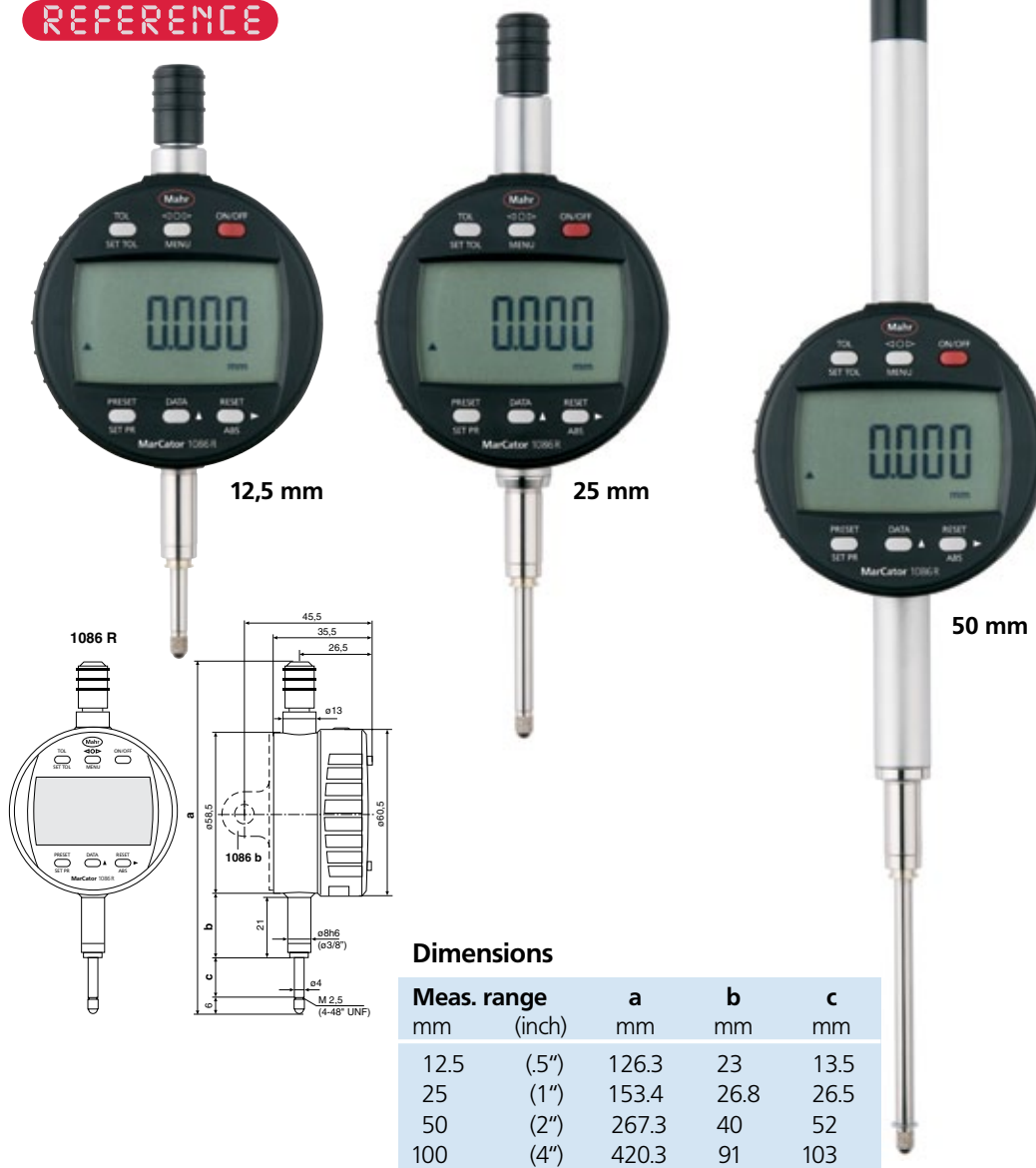
* in any zero point

** To use the integrated wireless function an i-Stick Wireless Receiver is required, see page 5-56.

Digital Indicators MarCator 1086 R / 1086 ZR



REFERENCE



Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12.5	(.5")	126.3	23	13.5
25	(1")	153.4	26.8	26.5
50	(2")	267.3	40	52
100	(4")	420.3	91	103

Features

Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- <0> (Tolerance GO / NO GO display mode)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 11 mm high digits
- Inductive measuring system, battery life ca. 2000 hrs.
- Maximum measuring speed 1.5 m/s (60"/s)
- Lifter protection cap on the measuring spindle
- MarConnect data output: choose either USB, OPTO RS232C, Digimatic
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529

Supplied with:
Battery, operating instructions

Technical Data

Measuring range		Resolution switchable	Span of error*	Repeatability	Measuring force	Weight	Mounting shank	Order no.
mm	(inch)		mm	mm	N	g	dia.	
12.5	(.5")	0.0005 / 0.001 / 0.002 / 0.005 / 0.01 mm .00002" / .00005" / .0001" / .0002" / .0005"	0.005	0.002	0.65 - 0.90	130	8h6	4337620
25	(1")		0.005	0.002	0.65 - 1.15	140	8h6	4337621
50	(2")		0.008	0.002	1.25 - 2.70	190	8h6	4337622
100	(4")		0.009	0.002	1.60 - 3.50	235	8h6	4337623
12.5	(.5")	0.0005 / 0.001 / 0.002 / 0.005 / 0.01 mm .00002" / .00005" / .0001" / .0002" / .0005"	0.005	0.002	0.65 - 0.90	150	3/8"	4337650
25	(1")		0.005	0.002	0.65 - 1.15	160	3/8"	4337651

* in any zero point

Digital Indicators MarCator 1086 R / 1086 ZR, Resolution 0.01 mm / .0005"



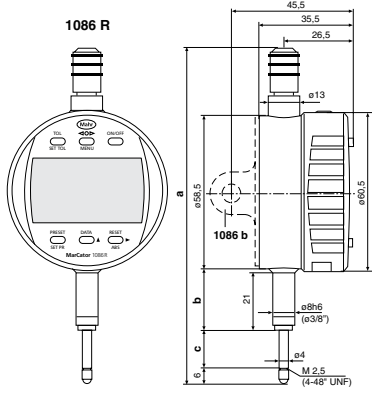
Features

Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- <0> (Tolerance GO / NO GO display mode)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 11 mm high digits
- Inductive measuring system, battery life ca. 2000 hrs.
- Maximum measuring speed 1.5 m/s (60"/s)
- Lifter protection cap on the measuring spindle
- MarConnect data output: choose either USB, OPTO RS232C, Digimatic
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529

Supplied with:
Battery, operating instructions

REFERENCE



Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12.5	(.5")	126.3	23	13.5
25	(1")	153.4	26.8	26.5
50	(2")	267.3	40	52
100	(4")	420.3	91	103

Technical Data

Measuring range		Resolution	Span of error*	Repeatability	Measuring force	Weight	Mounting shank	Order no.
mm	(inch)	mm / inch	mm	mm	N	g	dia.	
12.5	(.5")	0.01 / .0005"	0.02	0.01	0.65 - 0.90	130	8h6	4337130
25	(1")	0.01 / .0005"	0.02	0.01	0.65 - 1.15	140	8h6	4337131
50	(2")	0.01 / .0005"	0.02	0.01	1.25 - 2.70	190	8h6	4337132
100	(4")	0.01 / .0005"	0.02	0.01	1.60 - 3.50	235	8h6	4337133
12.5	(.5")	0.01 / .0005"	0.02	0.01	0.65 - 0.90	150	3/8"	4337155
25	(1")	0.01 / .0005"	0.02	0.01	0.65 - 1.15	160	3/8"	4337156

* in any zero point

Digital Indicators MarCator 1086 WRi / 1086 WR, Waterproof version



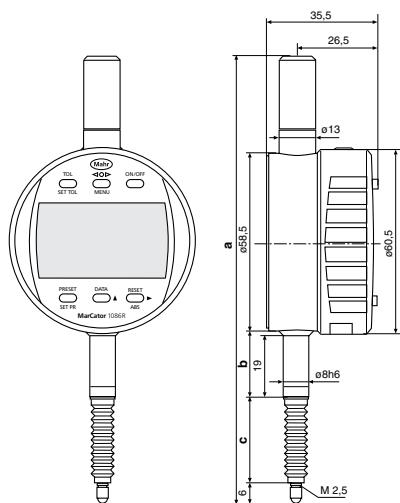
REFERENCE



12,5 mm



25 mm



* Only available in conjunction with 1086 WRi indicators

Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12,5	(.5")	144,3	23	28,6
25	(1")	193,2	26,8	50

Features

Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- <0> (Tolerance GO / NO GO display mode)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Integrated Wireless data transmission*
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 11 mm high digits
- Inductive measuring system, battery life ca. 2000 hrs.
- Maximum measuring speed 1.5 m/s (60"/s)
- Sealed protection cap
- Measuring spindle is sealed with a rubber bellows, thus preventing contamination by liquids and impurities
- MarConnect data output: choose either: USB, OPTO RS232C, Digimatic or Integrated Wireless*
- Operating temperature 10 - 40°C
- Class of protection IP54 in accordance to IEC 60529

Supplied with:
Battery, operating instructions

Technical Data

Measuring range		Resolution switchable	Span of error*	Repeatability	Measuring force	Weight	Order no.	
mm	(inch)						WR	WRi**
12.5	(.5")	0.0005 / 0.001 / 0.002 / 0.005 / 0.01 mm / .0002" / .0005" / .0001" / .0002" / .0005"	0.005	0.002	0.65 - 1.40	135	4337640	4337142
25	(1")						0.005	0.002

* in any zero point

** To use the integrated wireless function an i-Stick Wireless Receiver is required, see page 5-58. .001 mm/.0005" resolution only

Digital Indicators MarCator 1086 WRi / 1086 WR, Waterproof version, resolution 0.01 mm / .0005"



Features

Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- <0> (Tolerance GO / NO GO display mode)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Integrated Wireless data transmission*
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 11 mm high digits
- Inductive measuring system, battery life ca. 2000 hrs.
- Maximum measuring speed 1.5 m/s (60"/s)
- Sealed protection cap
- Measuring spindle is sealed with a rubber bellows, thus preventing contamination by liquids and impurities
- MarConnect data output: choose either: USB, OPTO RS232C, Digimatic or Integrated Wireless*
- Operating temperature 10 - 40°C
- Class of protection IP54 in accordance to IEC 60529

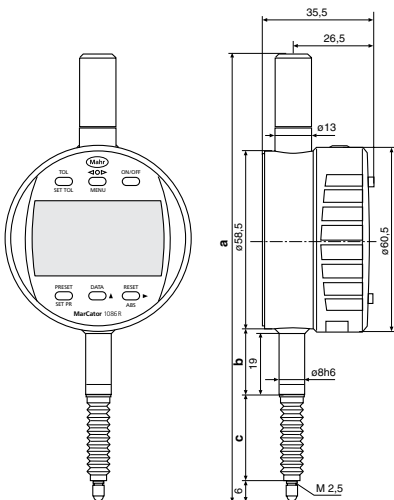
REFERENCE



12,5 mm



25 mm



Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12.5	(.5")	144.3	23	28.6
25	(1")	193.2	26.8	50

Supplied with:
Battery, operating instructions

* Only available in conjunction with 1086 WRi indicators

Technical Data

Measuring range		Resolution		Span of error*	Repeatability	Measuring force		Weight	Order no.	Order no.
mm	(inch)	mm	/ inch	mm	mm	N	g		WRi**	WR
12.5	(.5")	0.01	/ .0005"	0.02	0.01	0.65 - 1.40	135		4337147	4337145
25	(1")	0.01	/ .0005"	0.02	0.01	1.00 - 2.25	145		4337148	4337146

* in any zero point

** To use the integrated wireless function an i-Stick Wireless Receiver is required, see page 5-56

Digital Indicators MarCator 1087 Ri with analog display

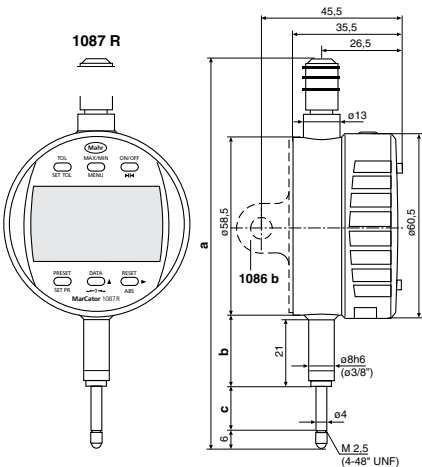


REFERENCE



Features

- Functions:**
- ON/OFF
 - RESET (Set display to zero) mm/inch
 - Reverse the counting direction
 - PRESET (Allows the entry of any value using set buttons)
 - TOL (Enter tolerance limit values)
 - Tolerance band max. 1.6 mm
 - MAX/MIN memory, ideal for searching the reversal point
 - TIR (MAX-MIN) ideal for testing concentricity and flatness
 - ABS (Display can be set to zero, without losing the reference to the Preset value)
 - 0 (Set analog display to zero)
 - DATA (when connected with a data connection cable)
 - Factor (adjustable)
 - Integrated Wireless data transmission
 - Immediate measurement due to the Reference system
 - Individual buttons can be locked - Lock Function
 - Operating and display unit (bezel) can be rotated 280°
 - High contrast LCD with 8.5 mm high digits
 - Operating time approx. 3 years (2000 work. hrs/year)
 - Maximum measuring speed 1.5 m/s (60"/s)
 - MarConnect data output: choose either: USB, OPTO RS232C, Digimatic or Integrated Wireless
 - Operating temperature 10 - 40°C
 - Class of protection IP42 in accordance to IEC 60529



** Only available in conjunction with 1086 WRi indicators*

Analog display

Readings		Display range	
mm	inch	mm	inch
0.001	.00005	± 0.02	± .001
0.002	.0001	± 0.04	± .002
0.004	.0005	± 0.08	± .01
0.01	.001	± 0.2	± .02

Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12.5	(.5")	126.3	23	13.5

Technical Data

Measuring range	Resolution switchable	Span of error*	MarConnect integrated wireless **	Measuring force	Weight	Mounting shank	Order no.
mm (inch)		mm		N	g		
12.5 (.5")	0.0005 / 0.001 / 0.002 / 0.005 / 0.01 mm	0,005	●	0.65 - 0.90	140	8h6	4337663
25 (1")	.00002" / .00005" / .0001" / .0002" / .0005"	0,005	●	0.65 - 1.15	150	8h6	4337665

* in any zero point

** To use the integrated wireless function an i-Stick Wireless Receiver is required, see page 5-56

Digital Indicators MarCator 1087 R, with analog display



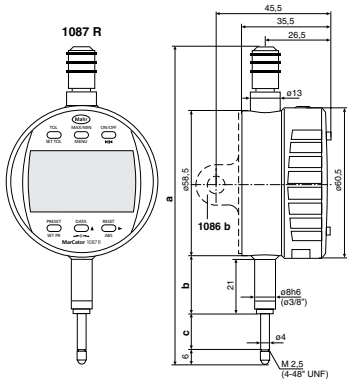
REFERENCE



12,5 mm



25 mm



Dimensions

Meas. range	a	b	c
mm (inch)	mm	mm	mm
12.5 (.5")	126.3	23	13.5
25 (1")	153.4	26.8	26.5

Analog display

Readings		Display range	
mm	/ inch	mm	/ inch
0.001	/ .00005	± 0.02	/ ± .001
0.002	/ .0001	± 0.04	/ ± .002
0.004	/ .0005	± 0.08	/ ± .01
0.01	/ .001	± 0.2	/ ± .02

Features

Functions:

- ON/OFF
- RESET (Set display to zero) mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- Tolerance band max, 1.6 mm
- MAX/MIN memory, ideal for searching the reversal point
- TIR (MAX-MIN) ideal for testing concentricity and flatness
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- 0 (Set analog display to zero)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 8.5 mm high digits
- Inductive measuring system, battery life ca. 2000 hrs.
- Maximum measuring speed 1.5 m/s (60"/s)
- MarConnect data output: choose either USB
OPTO RS232C
Digimatic
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529

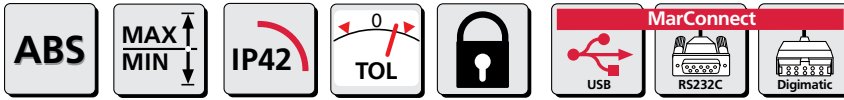
Supplied with:
Battery, operating instructions

Technical Data

Measuring range	Resolution switchable	Span of error*	Repeatability	Measuring force	Weight	Mounting shank	Order no.
mm (inch)		mm	mm	N	g		
12.5 (.5")	0.0005 / 0.001 / 0.002 / 0.005 / 0.01 mm	0.005	0.002	0.65 - 0.90	140	8h6	4337660
25 (1")	.00002" / .00005" / .0001" / .0002" / .0005"	0.005	0.002	0.65 - 1.15	150	8h6	4337661

* in any zero point

Digital Indicators MarCator 1087 ZR, with analog display



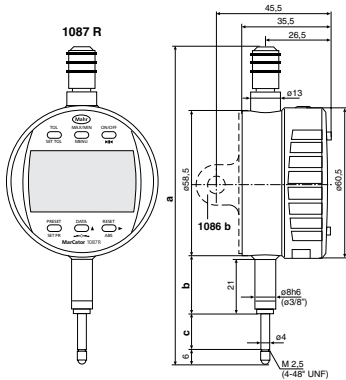
REFERENCE



12,5 mm



25 mm



Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12.5	(.5")	126.3	23	13.5
25	(1")	153.4	26.8	26.5

Analog display

Readings		Display range	
mm	/ inch	mm	/ inch
0.001	/ .00005	± 0.02	/ ± .001
0.002	/ .0001	± 0.04	/ ± .002
0.004	/ .0005	± 0.08	/ ± .01
0.01	/ .001	± 0.2	/ ± .02

Features

Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- Tolerance band max, 1.6 mm
- MAX/MIN memory, ideal for searching the reversal point
- TIR (MAX-MIN) ideal for testing concentricity and flatness
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- 0 (Set analog display to zero)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 8.5 mm high digits
- Inductive measuring system, battery life ca. 2000 hrs.
- Maximum measuring speed 1.5 m/s (60"/s)
- MarConnect data output: choose either USB
OPTO RS232C
Digimatic
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529

Supplied with:
Battery, operating instructions

Technical Data

Measuring range	Resolution switchable	Span of error*	Repeatability	Measuring force	Weight	Mounting shank	Order no.
mm (inch)		mm	mm	N	g		
12.5 (.5")	0.0005 / 0.001 / 0.002 / 0.005 / 0.01 mm .00002" / .00005" / .0001" / .0002" / .0005"	0.005	0.002	0.65 - 0.90	150	3/8"	4337670
25 (1")		0.005	0.002	0.65 - 1.15	160	3/8"	4337671

* in any zero point

MarCator 1088

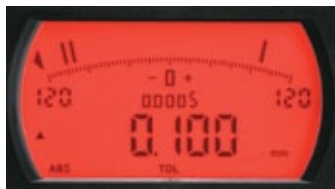
► | The Digital Indicator **MarCator** 1088. Tolerance monitoring is simplified with the changing of the color in the background lit display. | ◀

Dynamic measuring functions

- **MAX-MIN**-Function ideal for testing flatness and concentricity
- **MAX** and / or **MIN** for searching the reversal point



Tolerance function: clearly visual tolerance excess due to the change of color in the background lit display.



Universal Data-Interface



- **USB**
No interface box is required! Simple and inexpensive way to set up a multiple measuring instruments via a USB hub



- **Digimatic**
To connect a Digimatic compatible evaluation instrument



- **Mahr Opto RS232C**
For direct connection to a COM port on a PC



Control output can be connected to a SPS



Absolute function: Digital Indicator can be set in any position to 0.000 without losing the reference to the preset value.



Protection class IP54 according to IEC 60529. Especially suited for use in a manufacturing environment (excludes measuring range 50 mm)

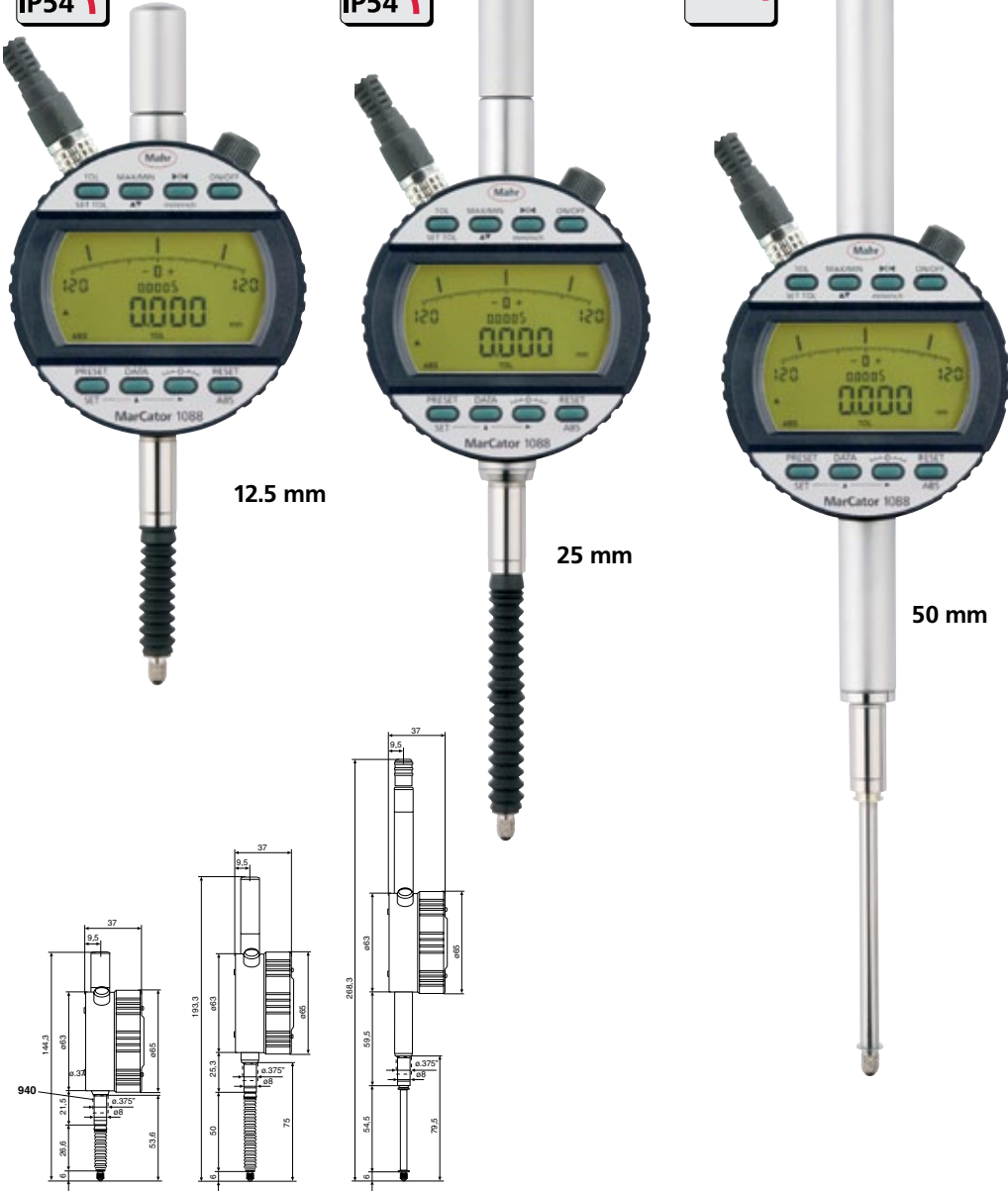
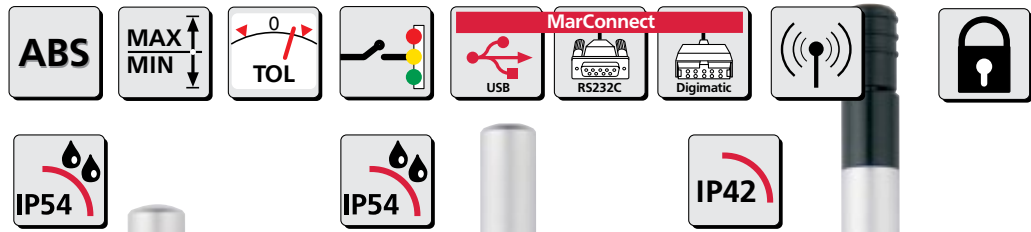


Code Initial	IP	International Protection
First Numeral	5	Dust protected
Second Numeral	4	Protection against splash water in all directions

Analog display

Readings (switchable)		Display range	
mm	inch	mm	inch
0.001	.00005"	± 0.030	± .0015"
0.002	.0001"	± 0.060	± .0030"
0.005	.0005"	± 0.150	± .0150"
0.01	.001"	± 0.30	± .030"

Digital Indicators MarCator 1088 / 1088 W, with analog display



- ### Features
- Functions:**
- ON/OFF
 - RESET (set digital and analog displays to zero)
 - 0 - (set analog display to zero)
 - PRESET (enter any numerical values)
 - DATA (data transmission)
 - mm/inch-switchable
 - Factor (adjustable)
 - Reversal of counting direction (switch value in digital display)
 - MAX/MIN memory, ideal for searching the reversal point
 - MAX-MIN memory, e.g. for testing flatness and concentricity
 - TOL (Enter tolerance limit values)
 - Tolerance band max, 1.6 mm
 - LOCK: operating functions can be blocked via PC-Software
 - Power supply via the main power adapter
 - MarConnect data output: USB, OPTO RS232C, or Digimatic
 - Can be remotely operated via the interface (Opto RS232C)
 - Control output compatible to Dial Comparators with limit contacts
 - Operating and display unit (bezel) can be rotated 280°
 - Class of protection IP54 in accordance to IEC 60529
 - Operating temperature 5 - 40°C
 - High contrast backlit LCD with 6.5 mm high digits
 - Analog display with 4 mm pointer ensures better visual recognition, ideal when checking concentricity or flatness as well as searching for the reversal point when measuring bores
 - Supplied with: Mains adapter, rubber bellows, operating instructions

Technical Data

Measuring range	Resolution	Measuring force	Span of error*	Protection class	Order no.	Order no.
mm	mm / inch	N	mm		230 V	115 V
12.5	0.001 / .00005"	0.65 - 1.40	0.005	IP54	4337000	4337010
25	0.001 / .00005"	1.00 - 2.25	0.005	IP54	4337001	4337011
50	0.001 / .00005"	1.25 - 2.7	0.008	IP42	4337002	4337012

* in any zero point

Digital Indicator MarCator 1087 BRi for 2 point inside measurement



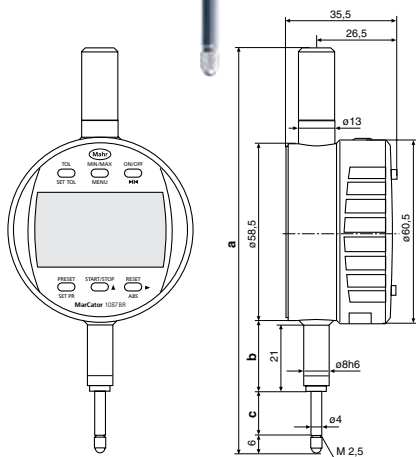
Features

- Functions:**
- ON/OFF
 - RESET (Set the display to zero) mm/inch
 - Reversal of the counting direction
 - PRESET (Allows the entry of any value using set buttons)
 - TOL (Enter tolerance limit values)
 - Tolerance band max. 1.6 mm
 - START/STOP for searching the reversal point
 - MAX/MIN memory, ideal for searching the reversal point
 - ABS (Display can be set to zero, without losing the reference to the Preset value)
 - 0 (Set analog display to zero)
 - DATA (when connected with a data connection cable)
 - Factor (adjustable)
 - Integrated Wireless data transmission
 - Immediate measurement due to the Reference system
 - Individual buttons can be locked - Lock Function
 - Operating and display unit (bezel) can be rotated 280°
 - High contrast LCD with 8.5 mm high digits
 - Operating time approx. 3 years (2000 work. hrs/year)
 - Max. meas. speed 1.5 m/s (60"/s)
 - Sealed protection cap
 - MarConnect data output: choose either: USB, OPTO RS232C, Digimatic or Integrated Wireless
 - Operating temperature 10 - 40°C
 - Class of protection IP42 in accordance to IEC 60529
 - Supplied with: Battery, Operating instructions

REFERENCE



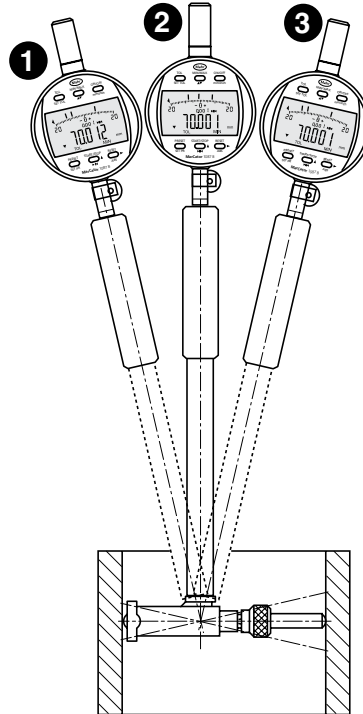
12,5 mm



Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12.5	(.5")	126.3	23	13.5

Example of application



With a 2 point inside measuring instrument the point of reversal is automatically determined through rocking back and forth. The actual value is detected and stored by the MIN function and indicated in the display (3).

Analog display

Readings		Display range	
mm	/ inch	mm	/ inch
0.001	/ .00005	± 0.02	/ ± .001
0.002	/ .0001	± 0.04	/ ± .002
0.004	/ .0005	± 0.08	/ ± .01
0.01	/ .001	± 0.2	/ ± .02

Technical Data

Measuring range	Resolution switchable	Span of error*	MarConnect**	Measuring force	Weight	Mounting shank	Order no.
mm (inch)		mm		N	g		
12.5 (.5")	0.0005 / 0.001 / 0.002 / 0.005 / 0.01 mm .00002" / .00005" / .0001" / .0002" / .0005"	0.005	●	0.65 - 0.90	140	8h6	4337664

* in any zero point

** To use the integrated wireless function an i-Stick Wireless Receiver is required, see page 5-56

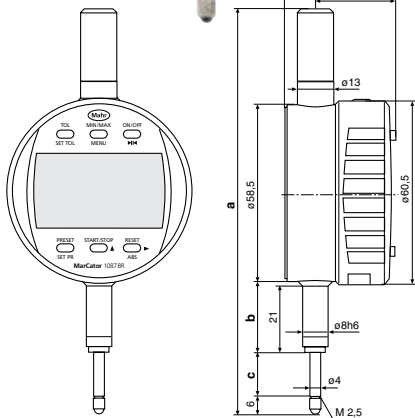
Digital Indicator MarCator 1087 BR for 2 point inside measurement



REFERENCE



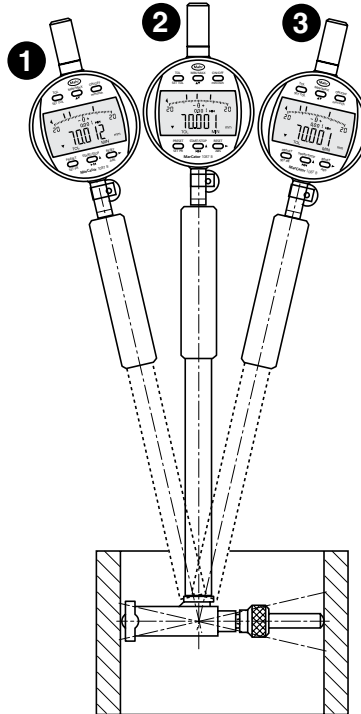
12,5 mm



Dimensions

Meas. range		a	b	c
mm	(inch)	mm	mm	mm
12.5	(.5")	126.3	23	13.5

Example of application



With a 2 point inside measuring instrument the point of reversal is automatically determined through rocking back and forth. The actual value is detected and stored by the MIN function and indicated in the display (3).

Analog display

Readings		Display range	
mm	/ inch	mm	/ inch
0.001	/ .00005	± 0.02	/ ± .001
0.002	/ .0001	± 0.04	/ ± .002
0.004	/ .0005	± 0.08	/ ± .01
0.01	/ .001	± 0.2	/ ± .02

Features

Functions:

- ON/OFF
- RESET (Set the display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- Tolerance band max. 1.6 mm
- START/STOP for searching the reversal point
- MAX/MIN memory, ideal for searching the reversal point
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- 0 (Set analog display to zero)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 8.5 mm high digits
- Operating time approx. 3 years (2000 work. hrs/year)
- Max. meas. speed 1.5 m/s (60"/s)
- Sealed protection cap
- MarConnect data output: choose
 - USB
 - OPTO RS232C
 - Digimatic
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529
- Supplied with: Battery, Operating instructions

Technical Data

Measuring range	Resolution switchable	Span of error*	Repeatability	Measuring force	Weight	Mounting shank	Order no.
mm (inch)		mm	mm	N	g		
12.5 (.5")	0.0005 / 0.001 / 0.002 / 0.005 / 0.01 mm .00002" / .00005" / .0001" / .0002" / .0005"	0.005	0.002	0.65 - 0.90	140	8h6	4337662

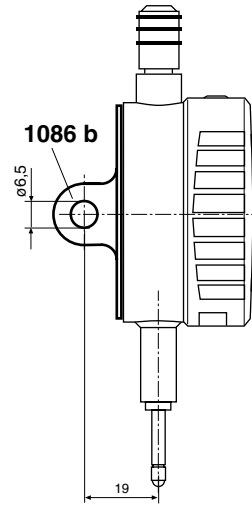
* in any zero point

Accessories for MarCator 1086 R / Ri, 1087 R / Ri and 1088

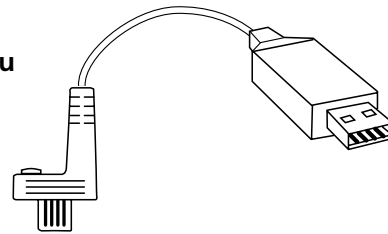
Accessories for MarCator 1086 R / Ri and 1087 R / Ri

	Order no.
Battery 3V , Type CR 2450	4884464
Data Connection Cable USB (2 m) incl. MarCom Standard	16 EXu 4102357
Data Connection Cable Opto RS232C (2 m), with SUB-D jack 9-pin	16 EXr 4102410
Data Connection Cable Digimatic (2 m), Flat plug 10-pin	16 EWd 4102915
Mounting Lug	1086 b 4337421
Adjustable Mounting Back	2246308
Rubber bellows for 1086 W - 12.5 mm	4337472
Rubber bellows for 1086 W - 25 mm	4337474

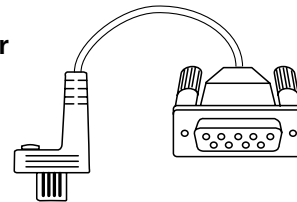
Accessories for Data Processing see Chapter 11



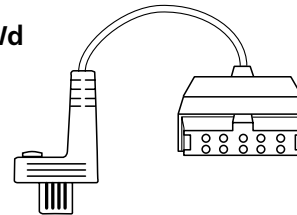
16 EXu



16 EXr



16 EWd



Accessories for MarCator 1086 Ri and 1087 Ri

	Order no.
i-Stick Wireless Receiver incl. MarCom Standard Software	4102220
Software MarCom Professional 4.0	4102552
Software MarCom Standard 3.1	4102551

Accessories for Data Processing see Chapter 11

i-Stick



Accessories for MarCator 1088

		Order no.
Data Connection Cable USB (2 m)	2000 usb	4346023
Data Connection Cable Opto RS232C (2 m), with SUB-D jack 9-pin	2000 r	4346020
Data Connection Cable Digimatic (2 m), Flat plug 10-pin	2000 d	4346021
Cable to connect control output to an SPS	2000 sps	4346031
Mounting Lug	1085 b	4336310
Rubber bellows for 1088 W - 12.5 mm		4337472
Rubber bellows for 1088 W - 25 mm		4337474
Control Instrument for remote control operation	2000 sg	4346035

Accessories for Data Processing see Chapter 11

Accessories for MarCator 1086 R, 1087 R and 1088

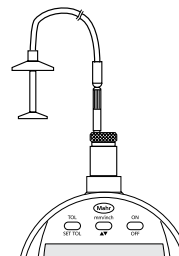
		Order no.
Cable Release for measuring ranges 12.5 and 25 mm	1085 a	4336311
Pneumatic Lifter for measuring ranges 12.5 and 25 mm	1082 p	4336237
Pneumatic Lifter for measuring ranges 50 and 100 mm	1082 p	4336230

Additional Accessories

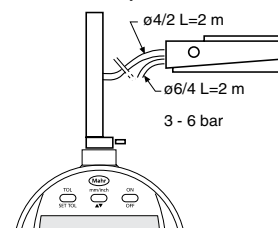
		Page
Contact Points	901-913	5-58
Special Holder	941	5-59
Sensor Lever	943	5-59

Accessories for Data Processing see Chapter 11

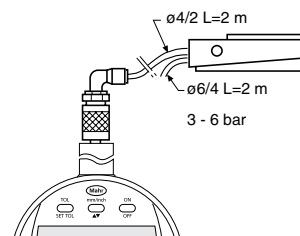
1085 a



1082 p (12.5/25)



1082 p (50/100)



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

Length mm	902	902 H	903	903 H
	Steel	Carbide contact face	Steel	Carbide tipped
	Order no.	Order no.	Order no.	Order no.
4	4360007	-	4360070	-
6	4360009	-	4360071	4360101
8	4360010	4360040	4360072	4360102
10	4360011	4360041	4360073	4360103
12	4360012	4360042	4360074	4360104
15	4360013	4360043	4360075	4360105
20	4360014	4360044	4360076	4360106
25	4360015	4360045	4360077	4360107
30	4360016	4360046	4360300	4360110
35	4360017	4360047	4360078	4360108
40	4360019	4360049	4360310	4360111
45	4360026	4360050	4360303	-
50	4360018	4360048	4360079	4360109
55	4360031			
65	4360035			
75	4360020			
85	4360036			
95	4360029			

Ball Contact Point 906 H

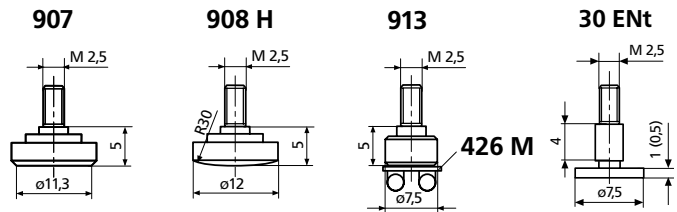
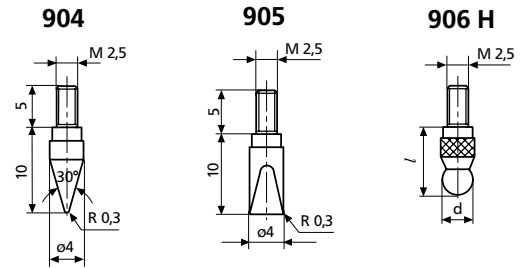
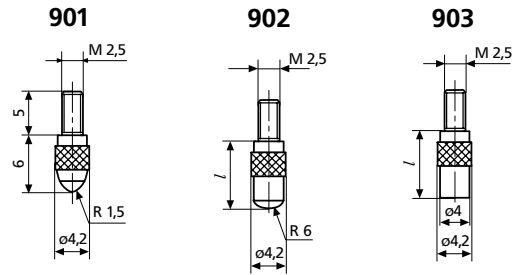
with carbide ball, accuracy ball dia. 0/-6µm

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			

Contact Rollers 909

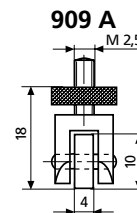
Concentricity error 3 µm

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



Special Contact Points

	Order no.
Conical Contact Points, Steel	904 4360130
Carbide tipped	904 H 4360131
Wedge Shaped Contact Points, Steel	905 4360140
Carbide tipped	905 H 4360141
Flat Contact Points, Steel, A = 1 cm²	907 4360200
Carbide tipped, dia. 7 mm	907 H 4360201
Spherical Contact Points, Steel	908 4360210
Carbide tipped	908 H 4360211
Flat Contact Point, for mounting Pin Gage Holder 426 M for measuring threads using three-wire method	913 4360400
Disc Type anvil thickness 0.5 mm, hardened	30 ENT 4126310
Disc Type anvil thickness 1 mm, hardened	30 ENT 4882022



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

Measuring Attachment 910 H

		Order no.
with parallel adjustable carbide blades	910 H	4360230

Pin Contact Point 911

dia. 1.5 mm, flat

Length <i>l</i> mm	Order no.	Length <i>l</i> mm	Order no.
15	4360280	35	4360284
20	4360281	40	4360285
25	4360282	50	4360286
30	4360283		

Pin Contact Point 911 H

		Order no.
Carbide tipped, dia 1 mm, flat	911 H1	4360240
Carbide tipped, dia 1.5 mm, flat	911 H2	4360241

Measuring Spindle Extensions 912

Length <i>l</i> mm	Order no.	Length <i>l</i> 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

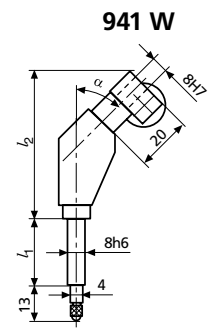
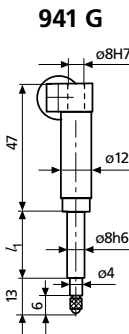
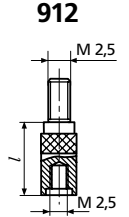
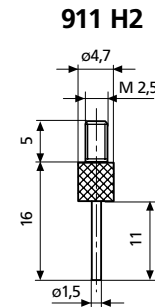
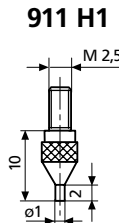
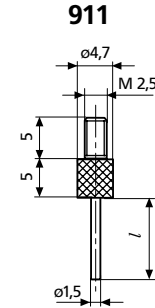
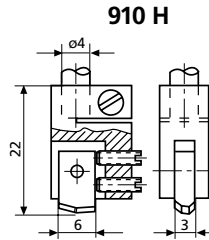
length <i>l</i> ₁ mm	Order no.
25	4365000
50	4365001
75	4365002

Angular Holder 941 W

Order no.	<i>l</i> ₂ mm	Order no.	<i>l</i> ₂ mm	Order no.	<i>l</i> ₂ mm
Angle $\alpha=45^\circ$	} 53.7	Angle $\alpha=60^\circ$	} 49.3	Angle $\alpha=90^\circ$	} 34.5
Order no.		Order no.		Order no.	
Order no.		Order no.		Order no.	

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 ± 1 mm	4367000



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

