

## SIMPLE, ACCURATE AND INEXPENSIVE MEASUREMENT. MILLIMESS DIAL COMPARATORS.



The latest information on MILLIMESS products can be found on our website:

[www.mahr.com](http://www.mahr.com), WebCode 207

▶ | Millimes is the "classic" amongst all measuring instrument. For over 60 years the Millimes series of dial comparators has been synonymous with both high precision and extreme robustness. Both maximum accuracy and a minimal reversal span error are obtained through the levers, gears and pinions being supported with jeweled bearings and that the measuring spindle running in a ball bush guide. Millimes is therefore particularly suitable for measuring tasks where the accuracy and the reversal span of a conventional dial indicator are not sufficient. Further advantages of Millimes are the simple handling, the easy reading as well as the movement being absolute shockproof. With a digital comparator with an inductive measuring system combined with most modern state of the art digital technology readings as small as  $0.2 \mu\text{m} / 10 \mu\text{inch}$  are realized. The practical control functions (for example tolerance monitoring or the storage of measuring values for dynamic measurements), the combined analog and digital display as well as the easy to use data transmission rounds off the complete Millimes spectrum. | ◀

## ▶ | Millimes. Digital and Dial Comparators

### Inductive Digital Comparators

**Overview** 6- 2

**Millimes 2100** 6- 4

With background lit digital and analog display

**Millimes 2000 / 2001** 6- 6

With digital and analog display

**μMaxμm® //** 6- 8

With digital display

**Maxμm® ///** 6-10

With digital and analog display, probe

### Mechanical Dial Comparators

**Overview** 6-14

**Millimes 1000 A / 1000 B** 6-17

With large dial

**Millimes 1002 / 1003 / 1003 XL / 1004 / 1010 / 1050** 6-18





Standard versions

**Millimes 1110 N / 1150 N** 6-20

With limit contacts

# Millimes. Digital Comparators (Short range)

## OVERVIEW

Inductive Digital Comparators		2100	2000
			
<b>Catalog page</b>		6 - 3	6 - 5
<b>Measuring range</b>		2.8 mm	1.8 mm
<b>Resolution</b>		mm / <i>inch</i> 0.0005 / <i>.00002"</i> 0.001 / <i>.00005"</i> 0.005 / <i>.0002"</i> 0.01 / <i>.0005"</i>	mm / <i>inch</i> 0.0002 / <i>.00001"</i> 0.0005 / <i>.00002"</i> 0.001 / <i>.00005"</i>
<b>Mounting shank</b>		8h6	8h6
<b>Protection class</b>	IP class acc. IEC 60529		
<b>Functions:</b>			
ON/OFF		●	●
Zero set the display		●	●
Zero set the analog display		●	●
Switch between mm/inch		●	●
Reversal of counting direction		●	●
Enter a numerical value		●	●
Preset		●	●
Data key		●	
Data via control instrument 2000sg		●	●
ABS/REL-switchable		●	●
Tolerance display		●	
Dynamic measuring functions	Min, Max. Max-Min (Tir)	●	
Resolution switchable		●	●
Analog display		●	●
Analog value switchable		●	●
Lock key function		●	
Data output	USB Digimatic Opto RS232C	●	●
Control output		●	



# Millimes 2100

► | The Inductive Digital Comparator **Millimes 2100**. Tolerance monitoring is simplified with the color change in the background lit display. | ◀

### Dynamic measuring functions:

- MAX / MIN for example, finding the reversal point
- MAX - MIN storing values for example when testing concentricity and flatness



### Tolerance function:

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



### Universal SPS Interface

The choice is yours:  
**MarConnect** Data output, choose between USB, Digimatic or RS232C

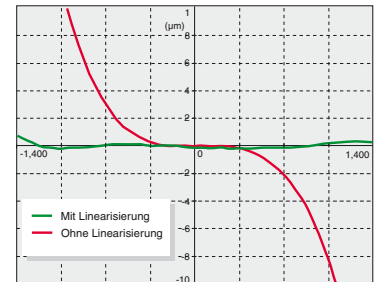


**Control output** can be connected to a SPS

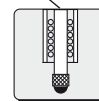


### ABS System

Linearized, inductive **absolute measuring system**. Reference point is not lost when the instrument is switched off



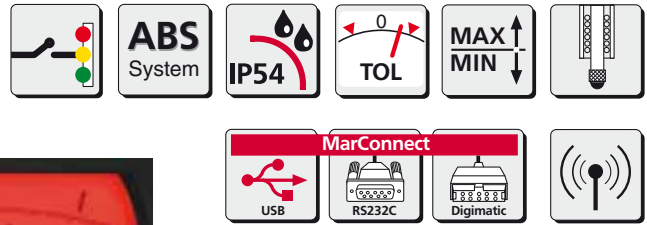
Especially suited for use in a manufacturing environment. Waterproof: **protection class IP54** in accordance to IEC 60529



**High precision** rotary stroke bearings for a longer service life and higher capacity

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

## Inductive Digital Comparator Millimess 2100 with background lit display



### Features

#### Functions:

ON/OFF  
 RESET (zero setting the digital and analog displays)  
 - 0 - (set the analog display to zero)  
 PRESET ( enter any numerical values)  
 DATA (data transmission)  
 mm/inch-switchable  
 Reversal of counting direction  
 RANGE (switch the measuring range and resolution)  
 ABS (reference to electrical zero point)  
 MAX / MIN memory, e.g. ideal to search for the reversal point  
 MAX-MIN e.g. testing concentricity and flatness

TOL (entering tolerance)  
 Tolerance band max. 2.8 mm  
 LOCK: operating functions can be blocked via PC-Software

- Factor can be set / adjusted
- Linearized inductive absolute measuring system
- Measurement electronic is compensated for temperature
- Power supply via the mains power adapter
- MarConnect data output: choose either USB, OPTO RS232C, Digimatic

- Dial Comparator 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 through 280°
- Measuring force spring is interchangeable
- Lower stop is adjustable
- Protection class IP54 according to IEC 60529

- Operating temperature 5 - 40°C
- High contrast background lit LCD with 6.5 mm high digits
- Analog display has a 4 mm long pointer which ensures better visual perception, ideal when checking concentricity and flatness and also to search for the reversal point when measuring bores
- Supplied with: Mains adapter, rubber bellows and spanner for preliminary stroke setting

### Technical Data

Measuring ranges switchable	Resolution switchable	Display range of the analog display	Span of error* G within		Over-travel	Meas. force	Order no.	Order no.
			mm	inch				
±1.0 (.04")	0.0005 / .0002"	±0.015 (.0006")	1µm	2µm	1.8	0.7 - 0.9	4346200	4346201**
±1.4 (.055")	0.001 / .0005"	±0.030 (.0015")						
	0.005 / .0002"	±0.150 (.0060")						
	0.01 / .0005"	±0.300 (.0150")						

\* 1 digit in any zero position  
 \*\* Includes Adapter Bush 940

## Inductive Digital Comparator 2000 / 2001



### Features

#### Extrames 2000

##### Functions:

- ON/OFF
- RESET (Set the digital and analog display to zero)
- 0 - (Set analog display to zero)
- PRESET ( enter any numerical values)
- mm/inch switchable
- Reversal of counting direction
- RANGE (Switch the measuring range and resolution)
- ABS (reference to electrical zero point)

- Comparator can be remotely operated via the interface
- High contrast LCD with 6.5 mm high digits. Analog display has a 4 mm long pointer for better visual perception, ideal when checking concentricity and flatness as well as search for the reversal point when measuring bores
- Operating and display unit (bezel) can be rotated 280°
- Measuring force spring is interchangeable
- Lower stop is adjustable
- Protection class IP54
- Operating temperature 5 - 40°C

- Battery charge level indicator
- Linearized inductive absolute measuring system
- Power supply via either the integrated rechargeable batteries (40 hrs.) or via the mains power adapter
- Rate measuring values are actualized 20 values/second
- MarConnect data output: choose either  
USB  
OPTO RS232C  
Digimatic

- Supplied with:  
Mains adapter, rubber bellows and spanner for preliminary stroke setting

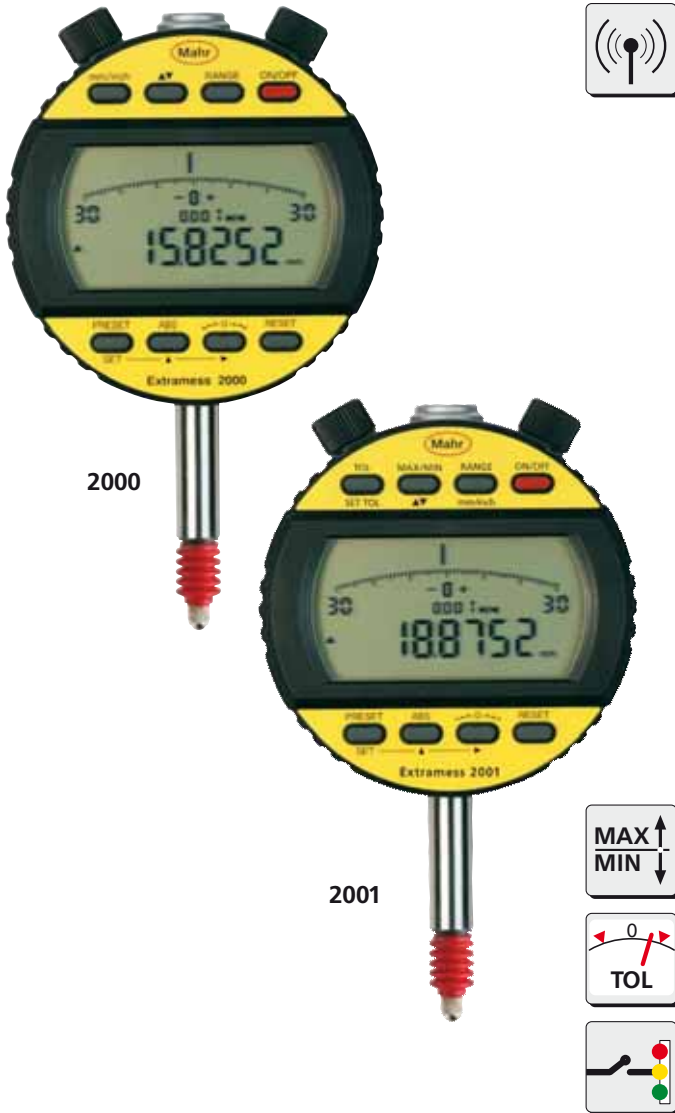
#### Extrames 2001

- Features are identical to Extrames 2000, in addition:
- MAX / MIN memory, e.g. ideal to search for the reversal point
  - MAX-MIN e.g. testing concentricity and flatness
  - TOL (entering tolerance)
  - Tolerance band max. 180 μm

- Factor can be set / adjusted
- Control output compatible to Dial Comparators with limit contacts

- Supplied with:  
Mains adapter, rubber bellows and spanner for preliminary stroke setting

- Block individual operating functions via Software (see accessories)



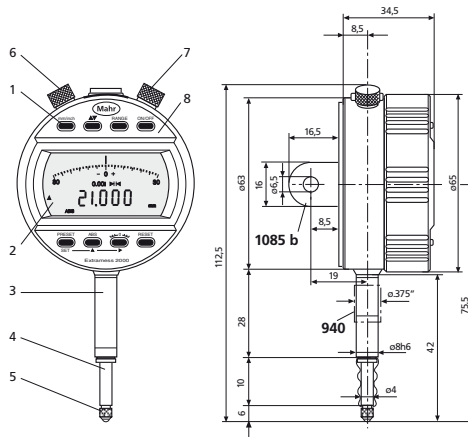
### Technical Data

	Measuring ranges switchable		Resolution and readings	Display range of analog display		Span of error* G	Over-travel	Meas. force	Order no.	
	mm	(inch)		mm	(inch)				230 V	115 V
2000	1.8	(.07")	0.001 / .00005"	± 0.030	(.0015")	0.6	2.4	0.7 - 0.9	4346000	4346900**
	1.8	(.07")	0.0005 / .00002"	± 0.015	(.0006")	0.6	2.4			
	0.8	(.031")	0.0002 / .00001"	± 0.006	(.0003")	0.3	2.9			
2001	1.8	(.07")	0.001 / .00005"	± 0.030	(.0015")	0.6	2.4	0.7 - 0.9	4346100	4346910**
	1.8	(.07")	0.0005 / .00002"	± 0.015	(.0006")	0.6	2.4			
	0.8	(.031")	0.0002 / .00001"	± 0.006	(.0003")	0.3	2.9			

\* 1 digit in any zero position  
\*\* Includes Adapter Bush 940

## Inductive Digital Comparators 2100 / 2000 / 2001

- 1 Operating buttons
- 2 Display
- 3 Mounting shank
- 4 Measuring spindle
- 5 Contact point 901H
- 6 Connection or mains power supply
- 7 Data output
- 8 Rotatable operating and display unit (bezel)



## Control Instrument 2000sg



### Features

- Remote control buttons: RESET, PRESET, RANGE\*
- DATA-button for data transmission, option via foot switch
- Power is supplied by the Extramess
- Connect to the Extramess with the built-in control cable
- Data can be transferred to a PC with an optional data cable
- Splash waterproof according to IP54

**Order no. 4346035**

*\* Function is limited when used in conjunction with the 2100*

### Accessories

<b>Data Connection Cable</b> USB (2 m)	<b>2000 usb</b>	<b>4346023</b>
<b>Data Connection Cable</b> Opto RS232C (2 m), SUB-D jack 9-pin	<b>2000 r</b>	<b>4346020</b>
<b>Data Connection Cable</b> Digimatic (2 m), flat plug 10-pin	<b>2000 d</b>	<b>4346021</b>
<b>Cable</b> to connect control output to an SPS	<b>2000 sps</b>	<b>4346031</b>

### Measuring Force Springs

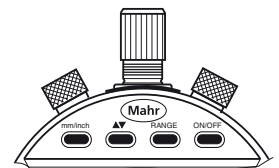
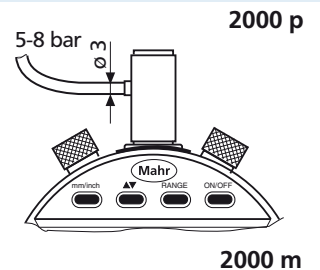
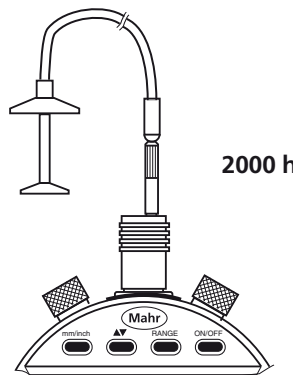
0.25 N	<b>4346050</b>
0.5 N	<b>4346051</b>
0.75 N	<b>4882284</b>
1.0 N	<b>4346052</b>
1.5 N	<b>4346053</b>
2 N	<b>4346054</b>
2.5 N	<b>4346055</b>

<b>Manual Lifter with cable release</b>	<b>2000 h</b>	<b>4346010</b>
<b>Pneumatic Lifter</b>	<b>2000 p</b>	<b>4346011</b>
<b>Measuring Force Adjuster</b>	<b>2000 m</b>	<b>4346012</b>
<b>Mounting Lug</b> Horizontal/Vertical	<b>1085 b</b>	<b>4336310</b>

<b>Adapter Bush</b> for adapting mounting shank 8h6 mm to inch bore .375"	<b>940</b>	<b>4310103</b>
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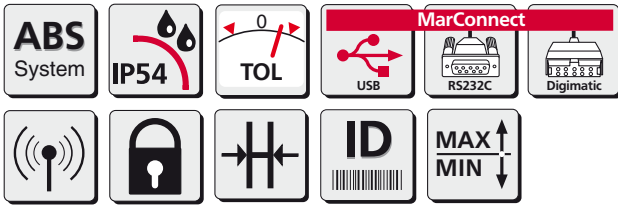
<b>Additional Accessories</b>		<b>Page</b>
<b>Contact Points</b>	<b>901-913</b>	5-52
<b>Special Holder</b>	<b>941</b>	5-53

Accessories for Data Processing see Chapter 11





## Inductive Digital Comparator $\mu$ Max $\mu$ m® II



### Features

#### Functions:

- Inch/Metric – operator selectable with switchable resolution.
- Normal / Reverse Sensing
- Preset capabilities to view actual size
- "Absolute" Transducer – no overspeed errors or constant re-zeroing. Transducer always remembers its location, even if power is off
- High resolution digital readout and analog bar graph – digital display shows deviation from zero or actual dimension size (Preset)
- Lightweight, contamination resistant – ruggedly built to withstand hard use – gasketed case, crystal and stem assemblies resist fluid contamination
- Calibratable – if ever needed – values remembered even after battery change.
- MarConnect data output: USB, OPTO RS232C, Digimatic
- Auto-power down – provides extremely low battery consumption, assuring long life from readily available commercial batteries.
- Increased resolution (0.0002 mm / 10  $\mu$ inch) for today's demanding tolerances
- Unilateral Tolerances
- Go/NoGo Display Feature

#### Mode A:

Actual value + bargraph  
Display of tolerance



#### Mode B:

GO/NOGO display



#### Optional Factory Configured Features:

- Locked Multiplier factor for ratio measurements
- Disabled sleep mode (manual ON/OFF)
- Locked inch or mm display unit
- Power up in inch or mm unit on battery change
- Calibration mode lockout (with password entry)
- Setup mode lockout with password entry

#### Advanced Functions:

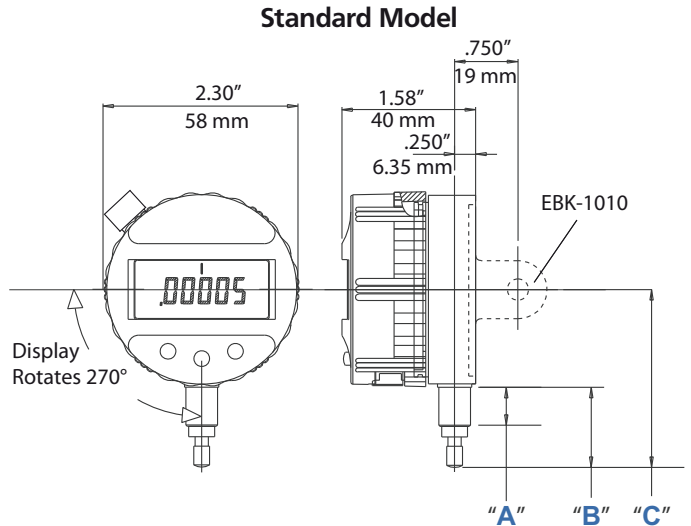
- Dynamic mode operation: Max, Min, TIR
- Two point difference measurement – provides comparison of two readings or measuring locations.
- $\oplus$  - Calculate the distance between 2 measured values
- Multiplier factor for ratio measurements
- Hold function – holds reading on display until ready to resume measuring
- $\text{ID}$  Data output with serial number identification capability
- Data output with selectable continuous output or single request of reading(s)

### Technical Data

Model	Range		Resolution		Accuracy % of digital range	Stem diameter	Stem Length		Order no.
	mm	inch	mm	inch			mm	inch	
Standard						.375"	11.7	.46"	2034101
Standard						.375"	38.0	1.50"	2034103
Standard			0.0002	.00001"	±0.25% over	8 mm	11.7	.46"	2034105
Standard			0.0005	.00002"					
			0.001	.00005"	±0.50 mm / ±.020"	8 mm	38.0	1.50"	2034107
			0.002	.00001"					
Advanced	±1.00	±0.040"	0.002	.00001"	±0.50 mm / ±.020"	.375"	11.7	.46"	2034201
Advanced			0.005	.0002"					
Advanced			0.01	.0005"	±1.00 mm / ±.040"	.375"	38.0	1.50"	2034203
Advanced			0.02	.001"					
Advanced					±1.00 mm / ±.040"	8 mm	11.7	.46"	2034205
Advanced						8 mm	38.0	1.50"	2034207
Advanced Perpendicular						.375"	11.7	.46"	2034401

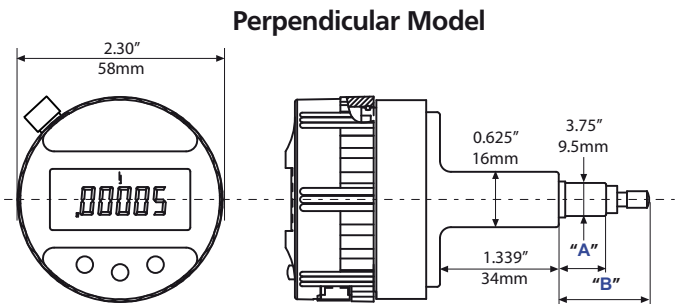
## Technical Data

<b>Display Range:</b>	±1.067 mm / <b>±.042"</b>
<b>Spindle Range:</b>	-1.25 to 1.50 mm / <b>-.050 to +.060"</b>
<b>Resolution:</b>	0.0002 mm / <b>.00001"</b>
<b>Accuracy:</b>	±0.5 mm range: 1.25µm (0.25%)
<b>(% of range)</b>	±1.0 mm range: 5.0µm (0.50%)
	<b>±.020" range: 50µin (0.25%)</b>
	<b>±.040" range: 200µin (0.50%)</b>
<b>Gaging Force:</b>	85 to 122 g (grams) - at center of travel
	<b>3 to 4 oz (ounce)</b> - at center of travel
<b>Weight:</b>	170 g / <b>6 oz</b>
<b>Spindle Velocity:</b>	Unrestricted
<b>Temperature Operating:</b>	5° to 54°C / <b>40° to 130°F</b>
<b>Storage:</b>	-17° to 60°C / <b>0° to 140°F</b>
<b>Repeatability:</b>	± 1 LSD (Least Significant Digit)
<b>Battery Life:</b>	6000 hours
	~12 months normal usage*
	<i>* normal usage= 12 hr/day x 7 day/wk</i>
<b>Contact Point:</b>	( <b>PT-223</b> radiused tip, 4-48 thread, furnished on 0.375" dia. Stem model)
	<b>EPT-1037-W1</b> radiused tip, M2.5 thread furnished on 8 mm dia. stem model
<b>Power:</b>	3 volt lithium coin cell (2 per unit), type CR 2450. Order no. <b>EBY-1018</b>
<b>Display:</b>	Rotates through 270°



For contact points please refer to pages 5-25, 5-27, 5-25 & 5-53

Dimensions mm / inch	A	B	C
	11.7 / <b>.46"</b>	24.1 / <b>.95"</b>	53.6 / <b>2.11"</b>
	38.0 / <b>1.50"</b>	57.2 / <b>2.25"</b>	86.6 / <b>3.41"</b>



## Accessories

	Order no.		Order no.
<b>Backs:</b>		<b>Other Hardware:</b>	
<b>Flat Back</b> (Standard on all models)	<b>EBK-1018</b>	<b>Splash Cover</b>	<b>ECV-1307-W2</b>
<b>Post Back</b> (.5" dia. x 1" long)	<b>EBK-1012</b>	<b>Adaptor Bushing</b> (8 mm to 3/8")	<b>BU-197</b>
<b>Lug Back</b> (Horizontal / Vertical)	<b>EBK-1010</b>	<b>Thread Adaptor</b> (M2.5 to 4-48 thread)	<b>AD-185</b>
<b>Screw Back</b> (11/16" dia x .5", 1/4-28 thread)	<b>EBK-1013</b>	<b>Spring</b> (for lighter gaging force: 35g)	<b>SP-351</b>
<b>Adj. Slide Back</b> (0.5" slot, 1/4-20 thread)	<b>EBK-1016</b>		
<b>Adj. Rack Back*</b>	<b>EBK-1014</b>		
<i>* used on AT-28 or AT-116 - Sold separately.</i>			
<b>Data Interface:</b>			
<b>USB Cable</b> (for MarCom or PC, 2 m length)	<b>4346023</b>		
<b>RS232 Cable</b> (10 pin plug, 2 m length)	<b>4346020</b>		
<b>Digimatic Cable</b> (10 pin plug, 2 m length)	<b>4346021</b>		
<b>Transmitter</b> (Mahr t, used w/ FM1 Receiver)	<b>2121369</b>		

For further mounting accessories refer to page 6-13

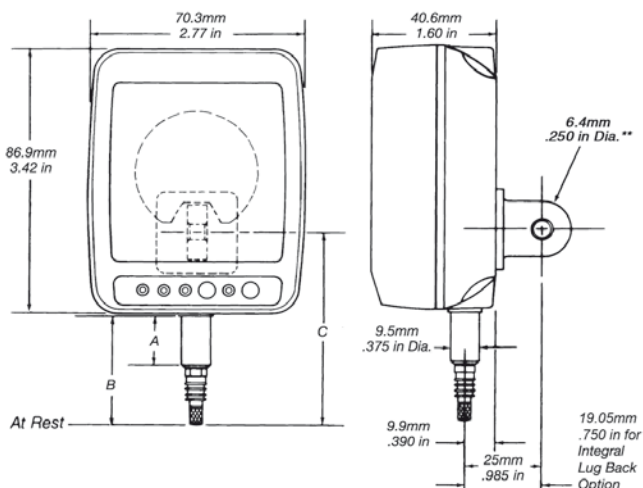
## Maxum® III Digital Comparator

### Features

- Features both digital display for accuracy and readability and unique fan analog display for trend and change
- User configurable in inch / metric units, normal / reverse sensing, resolution, analog scale, and tolerance setup & display
- Dynamic Capabilities: Min, Max, TIR, Hold, Reset
- Absolute Transducers - no overspeed errors. . . . no missed counts. . . . no missed readings
- Auto power down - provides extremely low battery consumption, assuring long life from readily available commercial batteries
- Data output - 3 formats - Maxum, serial, or digimatic
- Both integral and remote readout versions available
- Easily used on Snap Gages, Bore Gages, Comparator Stands, and Fixture Gages
- Special options available: setup mode or calibration lockout, remote external power, 4:5 ratio, 12 o'clock mounted integral transducer, integral vertical or horizontal lug back, 1.5, 2.0 or 3.0 inch stem length, and more. . . .
- IP54 protection
- Easy to select, order and operate!



### Technical Data



For short range indicators – Standard Stem Length  
(± 1.0 mm / ± .040" range indicators)

A	B	C
17 mm / .670"	36 mm / 1.42"	63.5 mm / 2.50"

For long range indicators – Standard Stem Length  
(± 1.99 mm / ± .100" range indicators)

22 mm / .87"	47 mm / 1.84"	73 mm / 2.87"
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For both short and long range indicators –  
Long Stem Lengths

38 mm / 1.5"	57 mm / 2.25"***	84.6 mm / 3.33"***
51 mm / 2"*	70 mm / 2.75"***	97.3 mm / 3.83"***
76 mm / 3"*	95 mm / 3.75"***	123 mm / 4.83"***

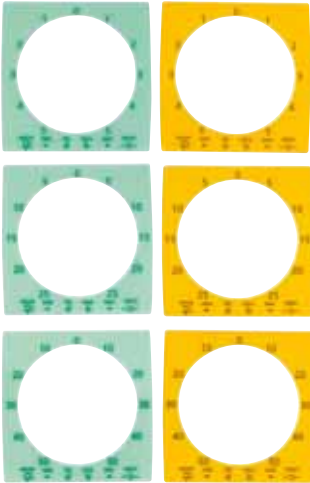
\* Special Order Lengths

\*\* Back supplied with remote indicating unit only

\*\*\* For long stem lengths add .220" to above lengths

Easily designed into your applications . . . full-size MaxumIII® Indicator and accessories, tracing templates or CAD files available on request.

## Technical Data



Description	Short Range	Long Range		
<b>Digital range</b>				
<b>Standard</b>	±1.00 mm/ <b>±.040"</b>	±1.99 mm/ <b>±.100"</b>		
<b>Reduced</b>	±0.199 mm/ <b>±.0199"</b>	None		
<b>Digital resolution</b>	0.005 mm/ <b>.0005"</b>	0.005 mm/ <b>.0005"</b>		
<b>Switchable</b>	0.001 mm/ <b>.0001"</b> 0.001 mm/ <b>.00005"</b> 0.0005 mm/ <b>.00002"</b>	0.001 mm/ <b>.0001"</b>		
<b>Analog range</b>	5 or 25 or 50	25 or 50		
<b>Analog resolution</b>	0.01 mm/ <b>.001"</b>	0.01 mm/ <b>.001"</b>		
<b>Switchable</b>	0.005 mm/ <b>.0005"</b> 0.001 mm/ <b>.0001"</b>	0.005 mm/ <b>.0005"</b>		
<b>Total spindle travel</b>	3.04 mm/ <b>.120"</b>	6.35 mm/ <b>.250"</b>		
<b>Pre-Travel*</b>	0.3 mm/ <b>.010"</b>	1.06 mm/ <b>.020"</b>		
<b>Over-Travel*</b>	0.8 mm/ <b>.030"</b>	1.31 mm/ <b>.030"</b>		
<b>Accuracy</b>				
<b>Standard range</b>	0.5% of Total Range	0.35% of Total Range		
<b>Reduced range</b>	0.25% of Total Range	N/A		
<b>Repeatability</b>	±One Least Digit	±One Least Digit		
<b>Gaging force</b>	3 - 4 oz / 85 - 112 grams, preloaded			
<b>Operation temperature</b>	10° to 55°C / 50° to 130°F			
<b>Storage temperature</b>	-20° to 65°C / -4° to 149°F			
<b>IP Rating</b>	54			
<b>Weight</b>	approx. 385 g / 13.6 oz.			
<b>Battery life</b>	approx. 4000 hours			
<b>Power</b>	3.0 volt Lithium battery (type CR123A or equivalent) Mahr Federal Order Number: <b>2239138</b>			
<b>Contact point</b>	(Normally furnished – PT-223) for 0.375" dia. Stem, <b>.250"</b> long, radiused tip, 4-48 thread; (EPT-1037-W1) for 8 mm dia. stem, 6 mm long, radiused tip, M2.5 thread.			
<b>Stem length</b> mm / <i>inch</i>	<b>Stem diameter</b>	<b>Data output</b>	<b>Order no. Short range</b>	<b>Order no. long range</b>
17 mm/ <b>.670"</b>	<b>.375"</b>	No Output	<b>2033101</b>	<b>2033102**</b>
38 mm/ <b>1.50"</b>	<b>.375"</b>		<b>2033103</b>	<b>2033104</b>
17 mm/ <b>.670"</b>	8 mm		<b>2033105</b>	<b>2033106**</b>
38 mm/ <b>1.50"</b>	8 mm		<b>2033107</b>	<b>2033108</b>
17 mm/ <b>.670"</b>	<b>.375"</b>	Digital Output 6 pin (D, E1)	<b>2033111</b>	<b>2033112**</b>
38 mm/ <b>1.50"</b>	<b>.375"</b>		<b>2033113</b>	<b>2033114</b>
17 mm/ <b>.670"</b>	8 mm		<b>2033115</b>	<b>2033116**</b>
38 mm/ <b>1.50"</b>	8 mm		<b>2033117</b>	<b>2033118</b>
17 mm/ <b>.670"</b>	<b>.375"</b>	Digital Output with Hold / Reset 10 pin (E2)	<b>2033121</b>	<b>2033122**</b>
38 mm/ <b>1.50"</b>	<b>.375"</b>		<b>2033123</b>	<b>2033124</b>
17 mm/ <b>.670"</b>	8 mm		<b>2033125</b>	<b>2033126**</b>
38 mm/ <b>1.50"</b>	8 mm		<b>2033127</b>	<b>2033128</b>

\* dependent on standard or reduced range selected. Standard range shown.

\*\* Long Range Indicator Stem Length is 0.870" / 22 mm

## Maxµm® III Digital Comparator

### Technical Data

#### Maxµm® III Remote Indicating Unit\*

No Digital Output Port  
 Digital Output -6 pin (D, E1)  
 Digital Output with Hold & Reset -10 pin (E2)

#### Order no.

**2033001**  
**2033011**  
**2033021**



Supplied with Lug back

\* Maxµm® III Remote Indicating Units are NOT compatible with traditional Remote Transducer models EAS-XXXX.

#### Maxµm® III Digital Transducer<sup>®</sup>

##### Digital Transducers

##### Short Range

##### Long Range

Range	±1.00 mm/ <b>±.040"</b>	±1.99 mm/ <b>±.100"</b>
Total Spindle Travel	3.04 mm/ <b>.120"</b>	6.35 mm/ <b>.250"</b>
Pre-Travel**	0.3 mm/ <b>.010"</b>	0.5 mm/ <b>.020"</b>
Over-Travel**	0.8 mm/ <b>.030"</b>	

Gaging Force 3-4 oz / 85-112 grams, preloaded  
 Operation Temperature 10° to 55°C/50° to 130°F  
 Storage Temperature -20° to 65°C/-4° to 149°F

Contact Point (Normally furnished – PT-223) for **0.375"** dia. Stem, **0.250"** long, radiused tip, 4-48 thread; (EPT-1037-W1) for 8mm dia. Stem, 6mm long, radiused tip, M2.5 thread 2033099 has PT-225 - .125" long.

\*\* dependent on standard or reduced range selected. Standard range shown.

Transducer Type	Stem Length	Stem Diameter	Order no. Short Range	Order no. Long Range
Canister	17 mm/ <b>.670"</b>	<b>.375"</b>	<b>2033091</b>	<b>2033092<sup>®</sup></b>
Canister	38 mm/ <b>1.50"</b>	<b>.375"</b>	<b>2033093</b>	<b>2033094</b>
Canister	17 mm/ <b>.670"</b>	8.0 mm	<b>2033095</b>	<b>2033096<sup>®</sup></b>
Canister	38 mm/ <b>1.50"</b>	8.0 mm	<b>2033097</b>	<b>2033098</b>

Pencil Body Diameter = **.375"** **2033099** —

Note: Cable length 4ft

- ① Digital Transducer models 203309X require an adaptor cable for use with traditional DEI-XXXXX Maxµm and Maxµm Plus Indicating Units.
- ② Long Range Indicator Stem Length is 0.870" / 22 mm. See Adaptor Cable selections as follows:

#### Adaptor Cables

#### Order no.

For DEI with 6 pin split connector (Short Range) **2239080**  
 For DEI with 8 pin round connector (Long Range) **2239081**

- Maxµm® and Maxµm Plus Transducers are available as Replacement Parts. Refer to Part Price List for Part Numbers and Pricing.
- Maxµm III Remote Indicating units sold separately from Digital Transducer.
- Any Digital Transducer may be used with a Maxµm III Remote Indicating unit.
- For English or Metric Contact Points visit pages 5-22, 5-27 and 5-52 thru 5-53.
- For alternate cable lengths or extension cables - call Mahr Federal's Technical Assistance Group.
- For special indicator options - call Mahr Federal's Technical Assistance Group.



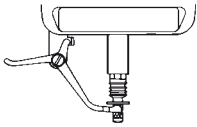
Pencil



Canister

## Accessories

### For Integral Maxµm® Indicators



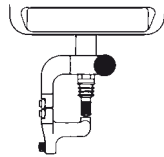
#### Lifting Levers<sup>1)</sup>

Furnished with washer and longer contact point. Left Hand (shown)

**Order no.** EAS-1903\*

Right Hand (not shown)

**Order no.** EAS-1904



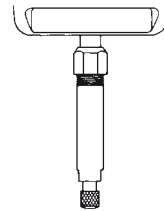
#### Right Angle Attachments

**Lever Type** (not shown)  
(± .187" maximum range)

**Order Model** EAT-1034-W1

**Spring Type** (shown)  
(± .060" maximum range)

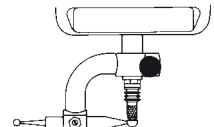
**Order Model** EAT-1035-W1



#### Auxiliary Plunger

3" long, .500" O.D.

**Order no.** EAS-1912



#### Hole Attachments

**Short Lever** (shown)  
(1.0" pivot to contact)

**Order Model** EAT-1032-W1

**Long Lever** (not shown)  
(1.87" pivot to contact)

**Order Model** EAT-1033-W1

<sup>1)</sup> (For use on .670" stem length only, DEI-XX1X1)

\* Not for (±.100" / 1.99 mm)

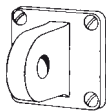


#### Ox-Bow Lifting Lever

**Order no.** LR-40

\* Other Accessories shown are for .375" stem models. Equivalent types are available for most Maxµm models having 8mm stems. Adaptor Bushing (BU-197) may also allow 8mm stem indicators to be used with the above accessories. Full size Maxµm Indicator and accessories tracing templates are available on request.

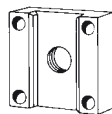
### Backs for Maxµm® Indicators and Remote Indicating Units (Supplied with mounting screws)



#### Lug Back (.250" hole)

Mounts horizontally or vertically.

**Order no.** EBK-1006



#### Adjustable Slide Back

(.500" slot, 1/4-20 thread)

**Order no.** EBK-1007



#### Rack Back

Fits SE-33 (shown) and SE-73.

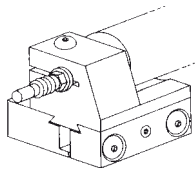
Adjustable Mounting Block (not shown).

**Order no.** EBK-1005

#### Replacement Screws

2-56 x .218"

**Order no.** ESW-1252

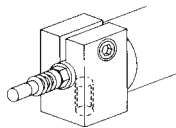


#### Rack Bracket (Shown mounted to SE-33 Adjustable Mounting Block.)

SE-33 and SE-73 Adjustable Mounting Blocks are available separately. SE-33 is supplied with hex-screw adjust. SE-73 is supplied with knob adjust.

**Order Model** EAD-1007-W1 (.375" I.D.)

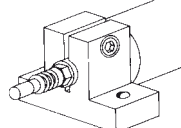
**Order Model** EAD-1007-W2 (8 mm I.D.)



#### Square Bracket

(1/4-20 mounting thread)

**Order Model** AAD-67



#### T Bracket

Flange mounted.

**Order Model** AAD-91

\* Mounting Brackets shown are for .375" stem models. Equivalent types are available for most Maxµm models having 8 mm stems. Adaptor Bushing (BU-197) may also allow 8 mm stem indicators to be used with the above accessories. Full size Maxµm Indicator and accessories tracing templates are available on request.

### Other Maxµm Accessories

#### Data Output Cables for Maxµm III

	Order no.
USB Cable (for MarCom / PC, length 2 m)	2121428
Serial Cable (6 pin to db9 pinF PC)	2239036
Serial Cable (10 pin to db9 pinF PC)	2239038
Digimatic Cable (6 pin to std 10 pin)	2239035
Digimatic Cable (10 pin to std 10 pin)	2239037
Send Data Footswitch used with Serial Cables above.	300-50
Transmitter (Maxµm III t, used w / FM 1 Receiver)	2121368

#### Mating Connectors — Maxµm III Models

	Order no.
For 6 pin data output type (D, E1)	ECN-1521
For 10 pin data output type (E2)	ECN-1689

#### Remote Switch Assembly (for Hold/Reset)







	Order no.
Handswitch (10 pin data output model only)	EAS-2867
Footswitch (10 pin data output model only)	EAS-2868

#### Splashcover for Maxµm III

	Order no.
Battery for Maxµm III	ECV-1307-W1
Overlay Kit for Maxµm III	2239138
Access Key (6 pin)	2239040
Access Key (10 pin)	2240545
	2240547







# Millimess. Dial Comparators

## OVERVIEW

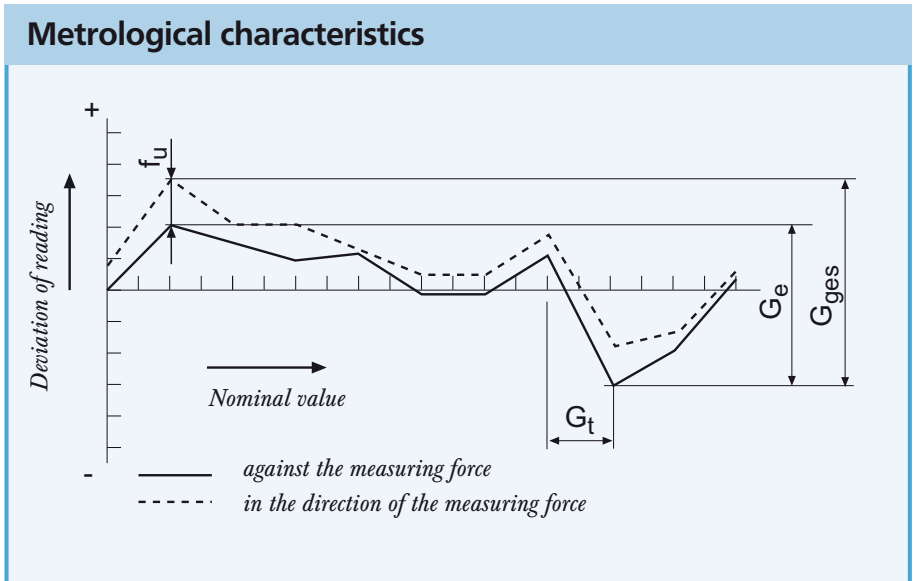
Models				
Metric	1000 A	1000 B	1002	1003
				
Measuring range	± 100 µm	± 50 µm	± 25 µm	± 50 µm
Readings	1 µm	1 µm	0.5 µm	1 µm
Dial style	100-0-100	50-0-50	25-0-25	50-0-50
Accuracy*	Factory standard	Factory standard	DIN 879-1	DIN 879-1
G <sub>ges</sub>	2 µm	2 µm	0.6 µm	1.2 µm
G <sup>e</sup>	1.5 µm	1.5 µm	0.5 µm	1 µm
f <sub>u</sub>	1 µm	1 µm	0.3 µm	0.5 µm
G <sup>t</sup>	0.7 µm	0.7 µm	0.4 µm	0.7 µm
r	0.5 µm	0.5 µm	0.3 µm	0.5 µm
Order no. Standard	4338000 	4339000	4335000	4334000
Order no. Waterproof 			4335005	4334005
Inch			1002 Z	1003 Z
Measuring range			± .0010"	± .0020"
Readings			.00002"	.00005"
Dial style			.001-0-.001	.002-0-.002
Accuracy*			Factory standard	Factory standard
G <sub>ges</sub>			.000025"	.00006"
G <sup>e</sup>			.00002"	.00005"
f <sub>u</sub>			.00001"	.000025"
G <sup>t</sup>			.000014"	.000035"
r			.00001"	.000025"
Order no. Standard			4335900	4334900
Order no. Waterproof 			4335905	4334905

\* Accuracy of 1004, 1010, 1010 Z, 1050 exceeds DIN 879-1

\*\* Accuracy of 1110 N and 1150 N exceeds DIN 879-3

1003 XL	1004*	1010*	1050*	1110 N**	1150 N**
					
± 130 μm	± 0.13 mm	± 0.25 mm	± 1.5 mm	± 0.25 mm	± 1.5 mm
2 μm	5 μm	0.01 mm	0.05 mm	0.01 mm	0.05 mm
130-0-130	130-0-130	25-0-25	15-0-15		
DIN 879-1	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
2.4 μm	4 μm	8 μm	40 μm	12 μm	60 μm
2 μm	3.5 μm	7 μm	35 μm	6.5 μm	35 μm
1 μm	1 μm	2 μm	10 μm	3.5 μm	17 μm
1.4 μm	3 μm	4 μm	24 μm	5 μm	25 μm
1 μm	1 μm	2 μm	10 μm	0.5 μm	17 μm
<b>4334001</b>	<b>4333000</b>	<b>4332000</b>	<b>4330000</b>	<b>4343100</b>	<b>4342100</b>
<b>4334006</b>	<b>4333005</b>	<b>4332005</b>	<b>4330005</b>	<b>4343105</b>	<b>4342105</b>

1004 Z	1010 Z
± .0050"	± .0100"
.0001"	.0005"
.005-0-.005	.01-0-.01
Factory standard	Factory standard
.00012"	.0004"
.0001"	.00035"
.00003"	.0001"
.00005"	.00025"
.00003"	.0001"
<b>4333900</b>	<b>4332900</b>
<b>4333905</b>	<b>4332905</b>





# Millimess. Dial Comparators

## OVERVIEW

### Design Features

Box type protective housing

Constant measuring force

Measuring spindle can be retracted with either a screw in cable release or with a lifting knob.

Mounting shank and measuring spindle are both made of hardened stainless steel

Measuring spindle is mounted in a high precision ball guide (Types 1000 / 1002 / 1003 / 1004) for minimal hysteresis

Insensitive to lateral forces (side play) acting on the measuring spindle

Lockable fine adjustment screw

Self contained movement, which is both quick and easy to remove and replace

Easy to read scale

Adjustable tolerance markers

Maximum sensitivity and accuracy are ensured by the jeweled movement and in conjunction with the precision gears and pinions

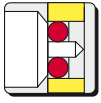
### Shockproof Mechanism

Measuring spindle within the measuring range

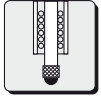
When the measuring range is exceeded the movement will be mechanically decoupled (shown in red)

**SHOCK  
PROOF**

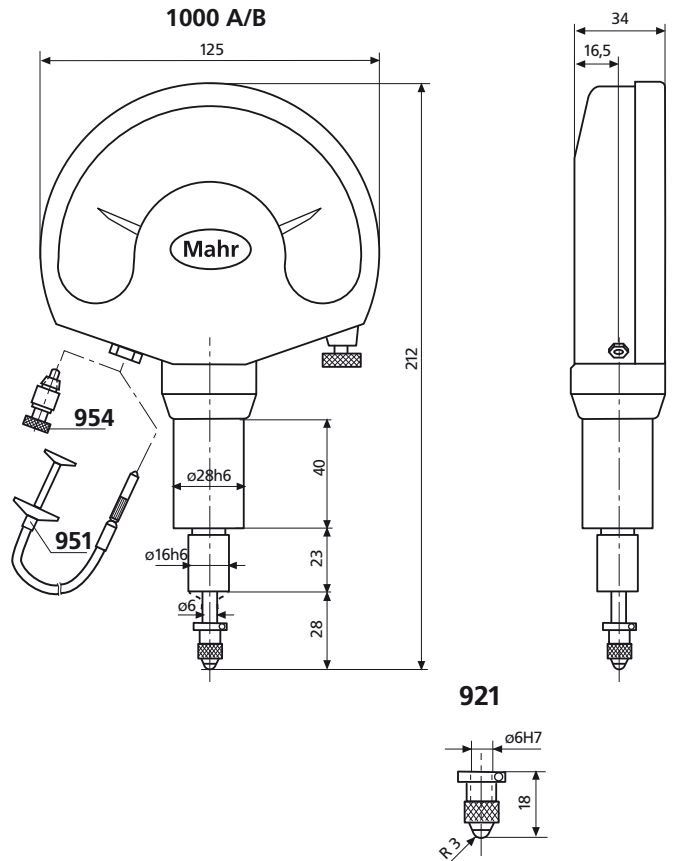
## Mechanical Dial Comparator Large Type Millimess



SHOCK  
PROOF



1000 A



### Features

- Large design
- Easy to read dial
- Shockproof movement
- Jeweled movement bearings
- Measuring spindle is mounted in a high-precision ball guide which precludes play
- Supplied with: Cable Release 951, case

### Accessories

	Order no.
<b>Contact Points</b>	
with Steel ball	921 4362001
with Ruby ball	921 R 4362002
<b>Cable Release</b> to raise the measuring spindle	951 4372000
<b>Lifting Knob</b> for lifting the measuring spindle	954 4372030
<b>Rubber Bellows</b> to seal the open end of the measuring spindle	4338008
<b>Additional Accessories</b>	Page
<b>Precision Stand</b>	824 GT 8-13

### Technical Data

Metric	Measuring range	Reading	Scale division	Over-travel	Measuring force	Order no.
1000 A	± 100 μm	1 μm	1 mm	4 mm	3.5 N	4338000
1000 B	± 50 μm	1 μm	2 mm	4 mm	3.5 N	4339000

## Mechanical Dial Comparators



1002  
DIN 879-1



1003  
DIN 879-1



1004



1003XL  
DIN 879-1



1003T\*\*  
DIN 879-1



### Technical Data

Metric		Measuring range	Readings	Overtravel	Measuring force	Order no. Standard*	Order no. Waterproof**
1002	Supramess	± 25 µm	0.5 µm	2.8 mm	1 N	4335000	4335005
1003	Millimess	± 50 µm	1 µm	2.8 mm	1 N	4334000	4334005
1003	Millimess	± 50 µm	1 µm	2.8 mm	0.3 N	4334075	
1003	Millimess	± 50 µm	1 µm	2.8 mm	0.5 N	4334050	
1003	Millimess	± 50 µm	1 µm	2.8 mm	0.7 N	4334071	
1003	Millimess	± 50 µm	1 µm	2.8 mm	2 N	4334010	
1003	Millimess	± 50 µm	1 µm	2.8 mm	3 N	4334011	
1003 XL	Millimess XL	± 130 µm	2 µm	2.5 mm	1 N	4334001	
1004	Compramess	± 0.13 mm	5 µm	2.5 mm	1 N	4333000	4333005
1010	Zentimess	± 0.25 mm	0.01 mm	2.5 mm	1 N	4332000	4332005
1050	Dezimess	± 1.5 mm	0.05 mm	0.3 mm	1 N	4330000	4330005
<b>Inch</b>							
1002 Z	Supramess	± .0010"	.00002"	.11"	1 N	4335900	4335905
1003 Z	Millimess	± .0020"	.00005"	.11"	1 N	4334900	4334905
1004 Z	Compramess	± .0050"	.0001"	.10"	1 N	4333900	4333905
1010 Z	Zentimess	± .0100"	.0005"	.10"	1 N	4332900	4332905

\* Incl. Plastic Case; Adapter 940 (for inch instruments only)

\*\* IP54, Incl. Plastic Case, Splash Guard Cover 957, Rubber Bellows (only for 1002/1003/1004); Adapter 940 (for inch instruments only)

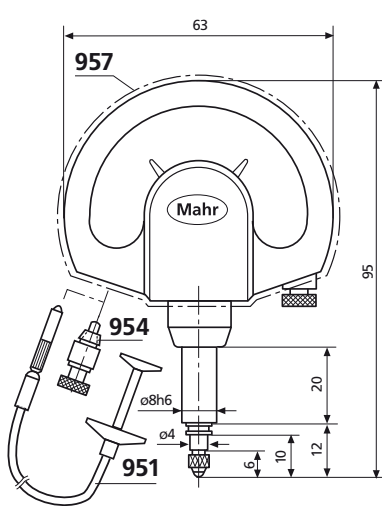
## Mechanical Dial Comparators



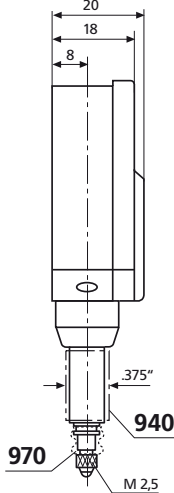
1010



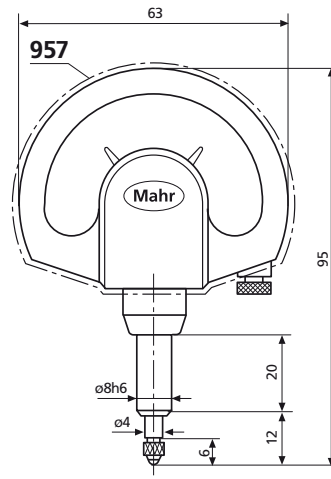
1050



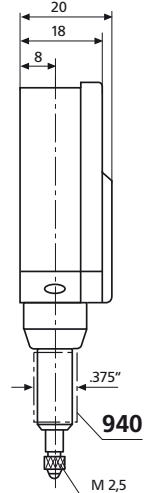
1002/1003/1004



940



1010/1050

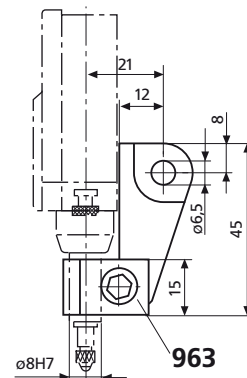


940

## Accessories

	Order no.
<b>Adapter Bush</b> for adapting mounting shank 8h6 mm to inch bore .375"	940 4310103
<b>Cable Release</b> to raise the measuring spindle	951 4372000
<b>Lifting Knob</b> for lifting the measuring spindle	954 4372030
<b>Splash Guard Cover</b>	957 4373030
<b>Rubber Bellows</b> for 1002/1003/1004 to seal the open end of the measuring spindle	970 4334786
<b>Mounting Lug</b> to mount on mounting shank 8h6 mm	963 4375002

Additional Accessories	Page
Contact Points	901-913 5-52
Special Holder	941 5-52
Sensor Lever	943 5-53



963

## Mechanical Dial Comparators with limit contacts



1110 N



1150 N

### Features

- Can be applied for example as tolerance control or as a precision contactor in automatic control systems
- Design features are identical with Mechanical Dial Comparators, but with the addition of adjustable limit contacts; made from high-grade precious metal
- Limit contacts are particularly well protected against vibration and mechanical overload

### Technical Data

	Measuring range	Readings	Over-travel	Measuring force	Order no. Standard*	Order no. Waterproof**
Metric						
1110 N Elzentimess	± 0.25 mm	0.01 mm	2.3 mm	2 N	4343100	4343105
1150 N Eldezimess	± 1.5 mm	0.05 mm	0.3 mm	1.5 N	4342100	4342105

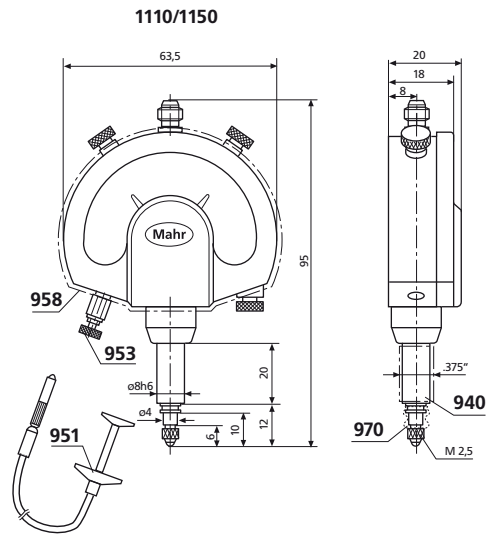
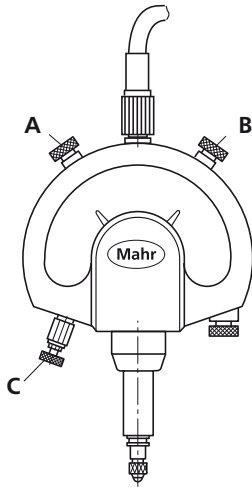
\* Incl. Plastic Case, Setting Knob 953, Cable (1.2m)

\*\* IP54, Incl. Plastic Case, Splash Guard Cover 957, Rubber Bellows (only for 1110)

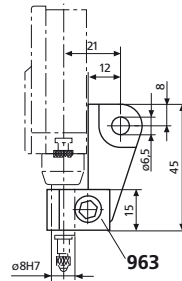
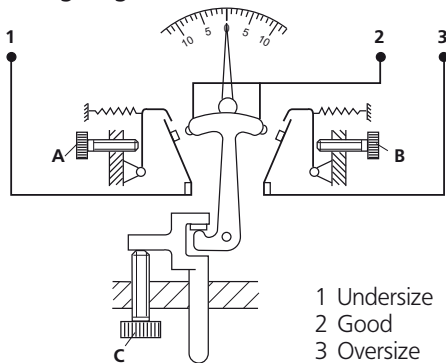
## Mechanical Dial Comparators with limit contacts

### Electrical Specifications

	Contact uncertainty with non-inductive load of 10 mA/24V	max. contact rating	max. contact voltage	max. contact current
<b>1110 N</b>	+/- 1,5 µm	240 mW	24 V	100 mA
<b>1150 N</b>	+/- 7 µm			



### Wiring diagram



### Accessories

	Order no.		Order no.
<b>Connection Cable</b> (1.2 m), axial	4345695	<b>Splash Guard Cover</b>	958 4373031
<b>Connection Cable</b> (5 m), axial	4345694	<b>Rubber Bellows</b> to seal the open end of the measuring spindle	970 4334786
<b>Adapter Bush</b> for adapting mounting shank 8h6 mm to inch bore .375"	940 4310103	<b>Mounting Lug</b> to mount on mounting shank 8h6 mm	963 4375002
<b>Cable Release</b> to raise the measuring spindle	951 4372000		
<b>Setting Knob</b> for setting the limit contacts without an additional setting standard	953 4372020	<b>Additional Accessories</b>	<b>Page</b>
<b>Lifting Knob</b> for lifting the measuring spindle	954 4372030	<b>Contact Points</b>	901-913 5-52
		<b>Special Holder</b>	941 5-52
		<b>Sensor Lever</b>	943 5-53