


# MarCal. The new Generation with the Reference-System


## WATERPROOF CALIPERS

▶ | The water-proof digital caliper **MarCal** 16 EWR, with protection class IP67 and the Reference Lock-Function, ensures both accurate and reliable results even in the most toughest workshop conditions. | ◀


The high-contrast display with 8.5 mm high digits enables accurate, fatigue free reading of the measurement results.

**Universal SPC-interface** (optional). You have a choice of **MarConnect** data outputs, select either **USB**, **Digimatic** or **Mahr Opto RS232**







USB



RS232C

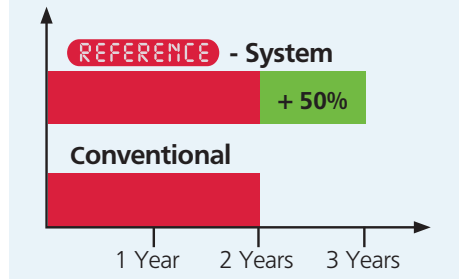


Digimatic

 The **Reference-Lock-Function** prevents operating error caused by accidental usage of the operating buttons.



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 to up to 50%**.



Lapped measuring faces for accurate measurement.




MarCal calipers have **lapped guide way surfaces**, these guarantee an even and sensitive run of the slide.

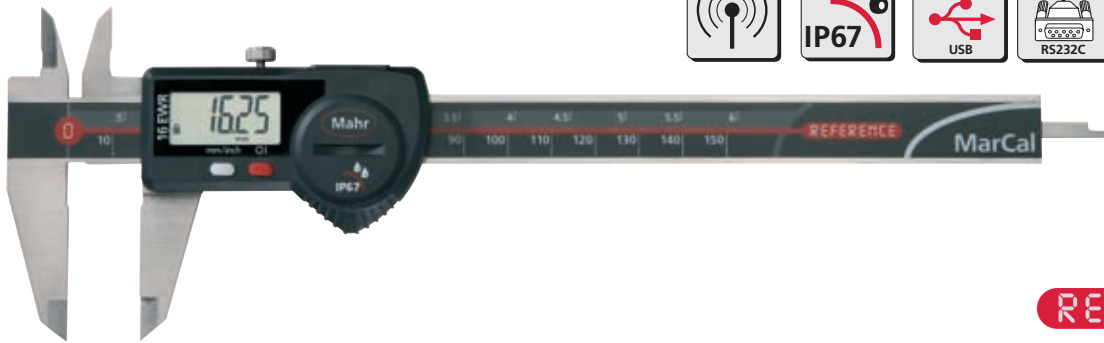
Surface of the guide way



Code Initials	<b>IP</b>	International Protection
First digit	<b>6</b>	Dust-tight
Second digit	<b>7</b>	Protected against temporary immersion in water

 Protection class **IP67** in accordance to IEC 60529, the water proof measuring system **FPS** (Fluid Protected measuring System) with a sealed housing.

## Digital Caliper MarCal 16 EWR with data output





REFERENCE

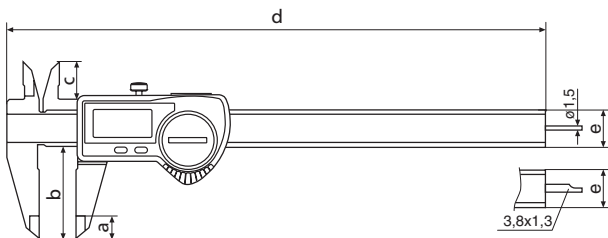
### Features

#### Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reference-Lock/Unlock
- DATA (Data transmission via connection cable)
- Auto-ON/OFF
- Excellent resistance against dust, coolants and lubricants, protection class IP67
- MarConnect data output, choose alternatively: USB, OPTO RS232C or Digimatic
- Dirt wipers are integrated in the slide
- Life of the battery up to 3 years
- Max measuring speed 2.5 m/s (100"/s)
- High contrast LCD with 8.5 mm high digits
- Lapped guide way
- Slide and beam made of hardened stainless steel
- Measuring blades for inside measurement
- Step measuring function
- Locking screw
- Supplied with: Case, battery, operating instructions

### Technical Data

Measuring range	Resolution	Error limit G		Depth rod		Friction wheel	Order no.
		mm / inch	mm / inch				
150 (6")	0.01/ .0005"	0.03/ .001"	●	●	●	●	4103064
150 (6")	0.01/ .0005"	0.03/ .001"	●	●	●	●	4103066
200 (8")	0.01/ .0005"	0.03/ .001"	●	●	●	●	4103068
300 (12")	0.01/ .0005"	0.04/ .0015"	●	●	●	●	4103070
150 (6")	0.01/ .0005"	0.03/ .001"	●	●	●	●	4103065
150 (6")	0.01/ .0005"	0.03/ .001"	●	●	●	●	4103067
200 (8")	0.01/ .0005"	0.03/ .001"	●	●	●	●	4103069
300 (12")	0.01/ .0005"	0.04/ .0015"	●	●	●	●	4103071



#### Dimensions

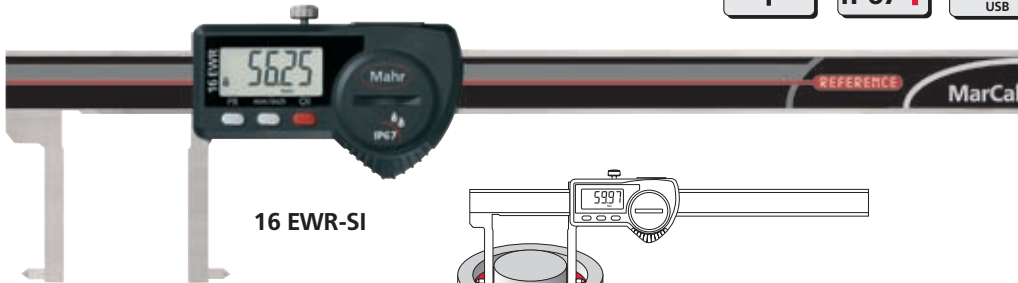
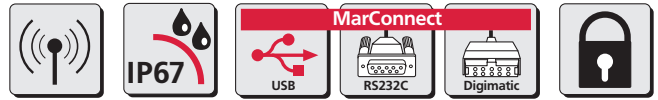
mm	a	b	c	d	e
150	10	40	16	235	16 x 3
200	10	50	19	285	16 x 3.5
300	14	64	19	388	16 x 4

### Accessories

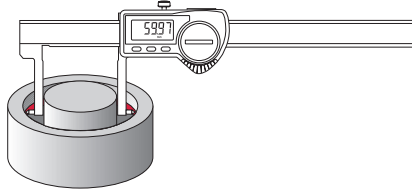
	Order no.
<b>Depth Measuring Bridge</b>	16 Em 4102020
<b>Battery</b> 3V, Type CR 2032	4102520
<b>Data Connection Cable</b> USB (2 m)	16 EXu 4102357
<b>Data Connection Cable</b> Opto RS232C (2 m), with SUB-D jack 9-pin	16 EXr 4102410
<b>Data Connection Cable</b> Digimatic (2 m), Flat plug 10-pin	16 EXd 4102411

Accessories for Data Processing see Chapter 11

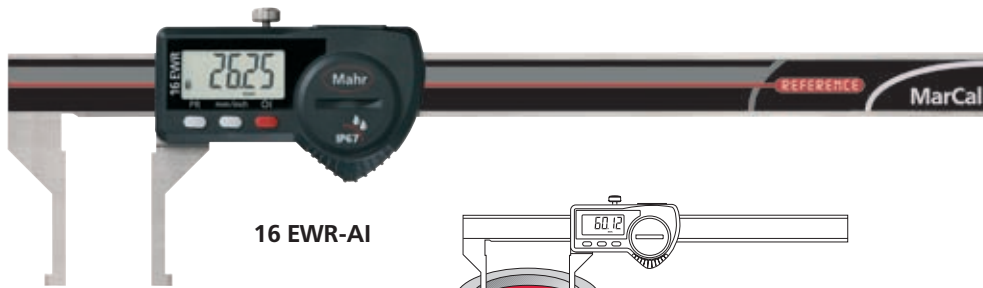
## Digital Caliper MarCal 16 EWR special design



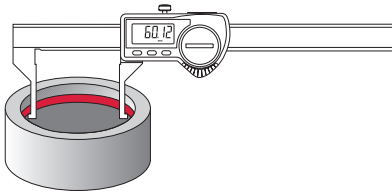
16 EWR-SI



REFERENCE



16 EWR-AI



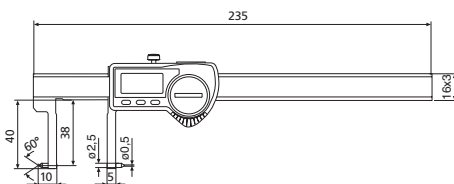
### Features

Features are the same as the MarCal 16 EWR, please refer to Page 1-6, additional features can be found in the Technical Data.

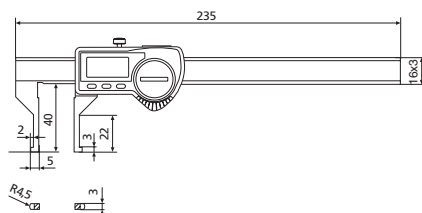
### Technical Data

	Measuring range		Resolution	Error limit G	Order no.	Type
	mm	(inch)				
16 EWR-SI	20 - 170	(.8 - 6.7")	0.01/ .0005"	0.03	4103078	Outwardly angled anvils
16 EWR-AI	10 - 160	(.4 - 6.3")	0.01/ .0005"	0.03	4103080	Outwardly angled measuring jaws

16 EWR-SI



16 EWR-AI



### Accessories

Battery, Data Connection Cables see Page 1 - 6

Accessories for Data Processing see Chapter 11

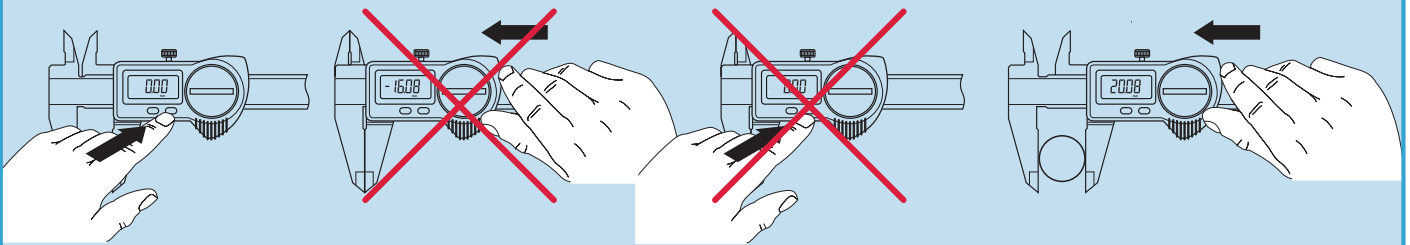
## MarCal - The innovative Reference-System

### Just set once to zero

All Mahr digital calipers with this logo **REFERENCE** are equipped with the innovative Reference-System. The zero position just has to be set once: after setting the zero position, the zero remains stored for all further measurements. Therefore, once the caliper is switched ON or the slide is moved the caliper is immediately ready for measurement. The need to reset to zero with a conventional caliper once the caliper is switched on has now become obsolete.

### Conventional

- ① Switch ON      ② Close the measuring jaws      ③ Set to zero      ④ Results of measurement



### **REFERENCE** - System

- ① Switch ON      ② Results of measurement



Press the ON key or move the slide

## IP-Protection classes

First digit is the degree of protection according to IEC 60529		Second digit is the degree of protection according to IEC 60529 (approximate)	
Protection against particles, contaminants and dust		Protection against wet conditions (fluids)	
<b>0</b>	Not protected	<b>0</b>	Not protected
<b>1</b>	Particles > 50.0 mm	<b>1</b>	Falling water drops - vertical
<b>2</b>	Particles > 12.5 mm	<b>2</b>	Falling water drops - tilted < 15°
<b>3</b>	Particles > 2.5 mm	<b>3</b>	Spray water < 60°
<b>4</b>	Particles > 1.0 mm	<b>4</b>	Water splashing from all directions
<b>5</b>	Dust protected	<b>5</b>	Water jets from all directions
<b>6</b>	Dust tight	<b>6</b>	Powerful water jets
		<b>7</b>	Temporary immersion in water
		<b>8</b>	Continuous immersion in water



**Example:**  
**IP67** means that the product is "Dust tight" and is protected against "Temporary immersion in water".