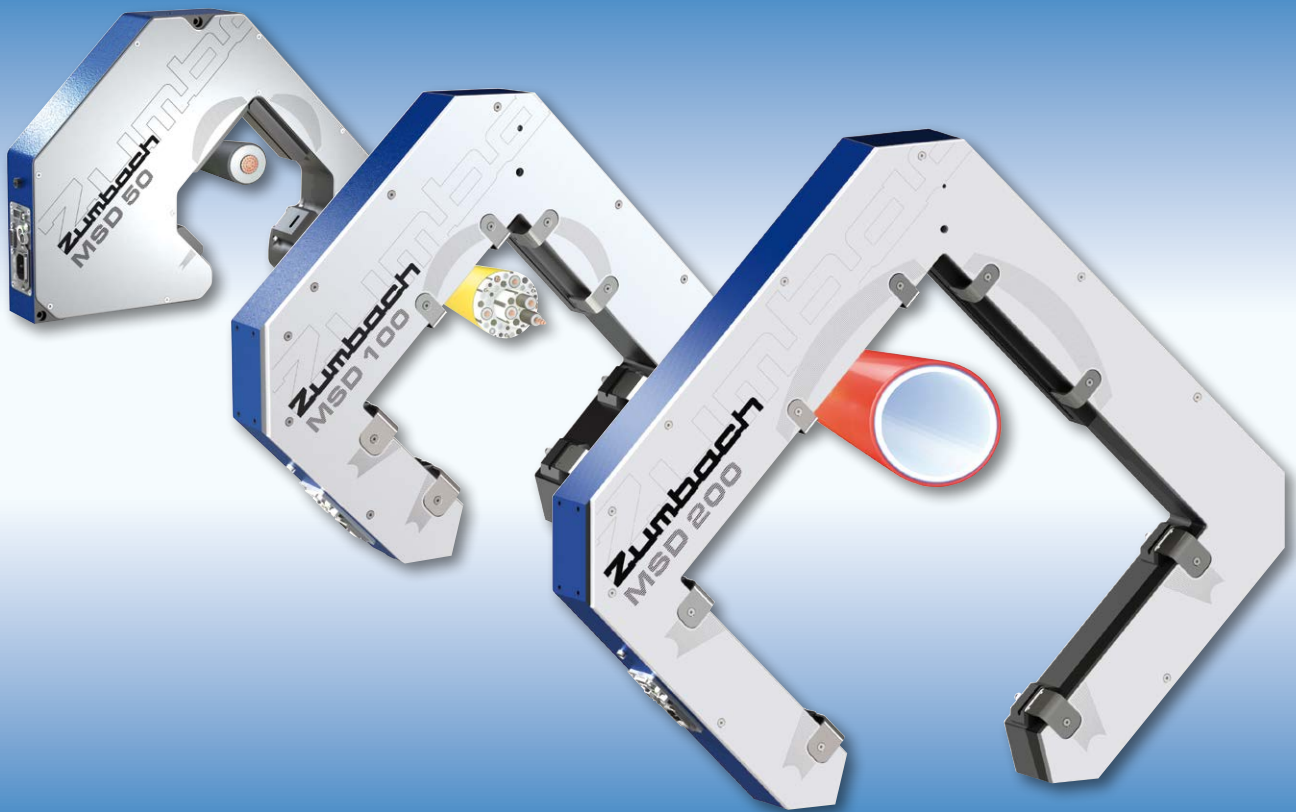


# Zumbach

SWISS PRIME MEASURING SINCE 1957

## MSD 50 / 100 / 200 Diameter Gauges



A Novel Kind of Diameter Measurement  
Based on "Multi-Source Device" Technology

## MSD SERIES – A NEW ZUMBACH CONCEPT



With the MSD diameter gauges, ZUMBACH introduces a new series of measuring heads for on-line diameter and ovality measurement and control. This new line complements the high-precision laser diameter measuring heads of the ODAC® series. The MSD models achieve their ideal efficiency in terms of price and performance specifically for applications in the cable and plastics industry.

The experience of 55 years with on-line and off-line measurement and control technology has led to a product characterised by the most current and sophisticated technology and functionality as well as by the well-known ZUMBACH accuracy and reliability. Thanks to our new MSD\* technology (pat. pend.) it was possible to build very compact yet accurate measuring heads.

\* = Multi-Source-Device

### Application

The MSD models are suitable everywhere and can be used in all cable manufacturing lines for measuring all kinds of wires and cables. They are indispensable tools in tube and hose extrusion lines for measuring pressure, waste water, heating tubes, etc. as well as all kinds of hoses. MSD devices can also contribute to quality monitoring for cold applications in the steel and metal industry.

### Special Features of the MSD Models

- Cost-effective measurement solutions thanks to an ideal ratio between technology, performance and application
- LEDs of different colours provide the lighting of the axes. There is then no interference between measurement axes, even with simultaneous measurement – and not even with reflective products
- Built-in external light filters to prevent ambient light affecting the measurement
- Active redundant measurement by means of up to 8 LED sources
- KW function (detection of surface defects)
- Robust, as is everything manufactured by ZUMBACH

### Ergonomic Design

By fitment of the optional floor stands, each measuring head model can be swiveled upwards by 90°. This allows for easier working access when needed in confined spaces and simple removal of the measuring head from the production line.



## OPTIONS / ACCESSORIES

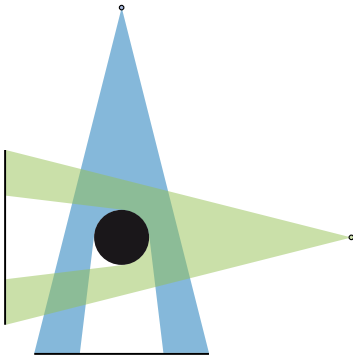
A comprehensive amount of options and accessories is available for the complete range of MSD gauges. It is therefore possible to offer the ideal solution for any application.

- Vertically adjustable stands
- Local display
- Air curtains
- Accessories for the length detection
- Additional analogue interface box
- Various cable lengths

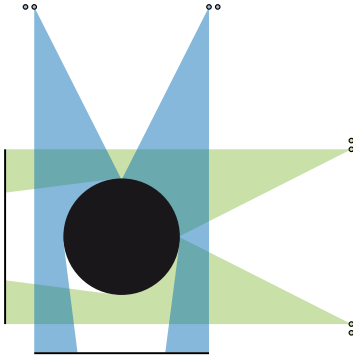
## MEASURING PRINCIPLE

The measuring principle is based on the latest CCD technology with several point-like LEDs as light sources. The shadow of the object to be measured, originating from the various light sources, is projected on a line sensor. The line sensor calculates the position of the shadow, thus resulting in different measuring points. These points generate four fictitious shadow lines, which define a square enclosing the object to be measured.

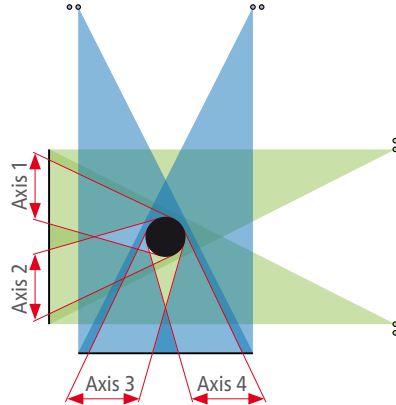
MSD 50



MSD 100 & MSD 200\*



MSD 100 & MSD 200\*



Thanks to the new and unique ZUMBACH concept of up to 8 light sources for the models MSD 100 & MSD 200, multiple shadows on each axis can be evaluated (1 shadow = 1 axis). This allows a multi-axis measurement of smaller products (pat. pend.). Therefore the product must be arranged within the measurement field:

- For MSD 100: within  $\varnothing$  20 mm (.8 in.)
- For MSD 200: within  $\varnothing$  54 mm (2.1 in.)

\* Both figures only show the beam trajectory based on 2 light sources. Both the MSD 100 and MSD 200 models are equipped with 4 light source pairs.

## COMMUNICATION – DATA PROCESSING – DISPLAY

All MSD models offer identical, modern interfaces for further data measurement processing and for communicating with ZUMBACH data acquisition, processing and display systems or with other higher order systems:

- J version: Connection to USYS systems of ZUMBACH
- RS version: Serial Host Interface RS-232,-422, -485
- DP version: Profibus DP
- EN version: Ethernet RJ45 + LED, TCP/IP
- PN version: Profinet, 2 x Ethernet RJ45 + LED
- EI version: EtherNet I/P, 2 x Ethernet RJ45 + LED

### Data Acquisition, Processing and Display Systems from ZUMBACH – MSD "J" Versions

Depending on the system, the data from 1-6 MSD gauges can be further processed and displayed.



# TECHNICAL DATA

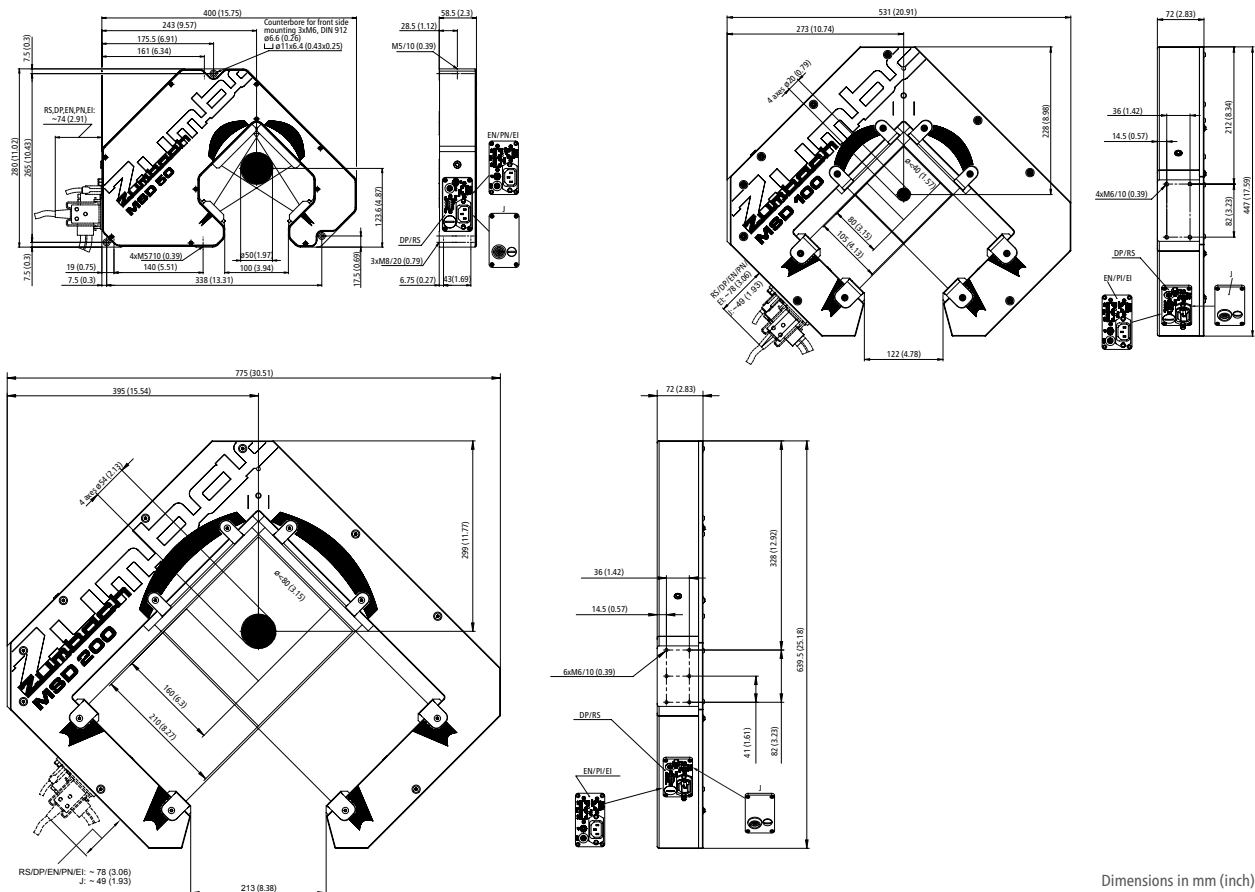
Model	MSD 50	MSD 100	MSD 200
Number of measuring axis	2	2 (4 <sup>1)</sup> )	2 (4 <sup>1)</sup> )
Number of LED sources	2	8	8
Measuring field M <sup>2)</sup>	ø 50 mm (2 in.)	100 x 100 mm (4 x 4 in.)	200 x 200 mm (8 x 8 in.)
Min. object diameter	0.5 mm (.02 in.)	1 mm (.04 in.)	2 mm (.08 in.)
Accuracy centric <sup>3)</sup>	+/- 7 µm (.0003 in.)	+/- 10 µm (.0004 in.)	+/- 18 µm (.0007 in.)
Accuracy measuring field <sup>4)</sup>	1.6 • value of the accuracy		
Repeatability <sup>5)</sup>	2 µm / .00008 in. (0.2 s) 1 µm / .00004 in. (1 s)	2 µm / .00008 in. (0.2 s) 1 µm / .00004 in. (1 s)	2 µm / .00008 in. (0.2 s) 1 µm / .00004 in. (1 s)
Resolution <sup>6)</sup>	0.1 µm (.000004 in.)	0.1 µm (.000004 in.)	0.1 µm (.000004 in.)
Scanning frequency	1000/s	1000/s	1000/s
Weight	7 kg (15.4 lbs.)	15 kg (33 lbs.)	20 kg (40.1 lbs.)
Ambient temperature	Operating: 0...45°C (32...113°F), Transport / Storage: -20...50°C (-4...122°F)		
Max. atmospheric humidity	95% (non condensing)		
Altitude	0...2500 m (0...8200 ft.) over sea level		
Type of protection	Case IP 65, connection plate IP 40		

- 1) 4 axes for smaller products:  
MSD 100: measuring field ø 20 mm (.8 in.)  
MSD 200: measuring field ø 54 mm (2.1 in.)
- 2) M is the measuring field height. In practice, the largest object diameter equal measuring field height minus biggest error, minus instability of position.
- 3) Valid for object diameter bigger than "min. object ø" and smaller than 95% of the measuring field M. The centre of this object is in the middle of measuring field M.
- 4) The measured borders of the object must be within the measuring field.
- 5) Values within +/- 3 Sigma (99.7%) / U<sub>95</sub>
- 6) System resolution is the smallest practical value for the last digit of the display.

Versions	J	RS	DP	EN	PN
Port 1	J interface	RS-232/-422/-485	RS-232/-422/-485	RS-232/-422/-485	RS-232/-422/-485
Port 2		RS-232/-422/-485 (galv.)	PROFIBUS DP	Ethernet RJ45 + LED	2 x Ethernet RJ45 + LED
Port 3		LOC 01	LOC 01	LOC 01	LOC 01
Port 4		Digital input, analog interface AI 4-ODAC	Digital input, analog interface AI 4-ODAC	Digital input, analog interface AI 4-ODAC	Digital input, analog interface AI 4-ODAC
Status LED	✓	✓	✓	✓	✓
Supply	Via USYS	85...265 VAC, 47...63 Hz	85...265 VAC, 47...63 Hz	85...265 VAC, 47...63 Hz	85...265 VAC, 47...63 Hz

• All technical data are subject to change without notice

# DIMENSIONS



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