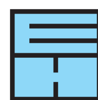


E+H
Metrology GmbH

MX 203-8-37

Contactless Wafer Geometry Gauge

Features

- Contactless operation due to capacitive sensors
- No moving parts during the measurement
- Resolution 0.1 micrometers
- Maximum measuring time per wafer: 8 Seconds
- Evaluation and data base program for PCs included
- Quick and easy recalibration
- Optional module for **stress** evaluation

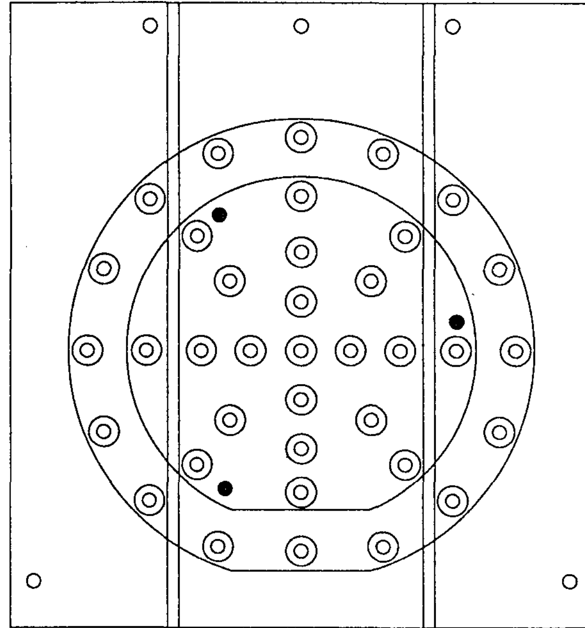
Description

The MX 203 is a compact desktop instrument for the measurement of the geometry of silicon wafers. The gauge is based on two plates mounted opposite each other. Each plate contains a set of contactless capacitive sensors, they are arranged in a star-shaped pattern. On a kind of drawer, the wafer is manually inserted into the air gap between the two plates, then positioned on three resting pins for the measurement. The sensors measure the distances to the wafer surface, the results are sent to the connected PC via the serial interface. Based on these distance values, our supplied PC software computes the following wafer characteristics:

- **Thickness** related: Center-, Average-, Min.-, Max.- and Local Thickness, TTV
- **Flatness** related: Local FPD, max. neg. FPD, max. pos.FPD, TIR
- **Warp** related: Local Warp, Total Warp, Bow
  Local Stress, Average Stress, Center Stress (Commercial options)

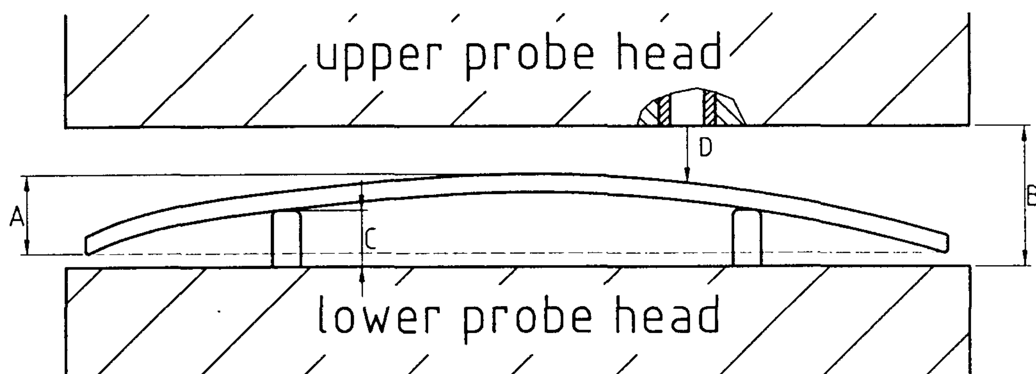
MX203-8-37 Specifications

(Standard Version)



Measurement Range

Wafer Diameters	150 mm	200 mm
Measuring Points	21	37
Warp Range)	200 µm	300 µm
Thickness Range	400 - 1000 µm max.	
Thickness & Warp ('A')		1000 µm



Total Distance ('B')	2500 µm
Resting Point Height ('C')	600 µm
max. Distance ('D')	1700 µm

Sensor Characteristics

Measuring Range of One Sensor	1725 µm
Resolution	14 bits

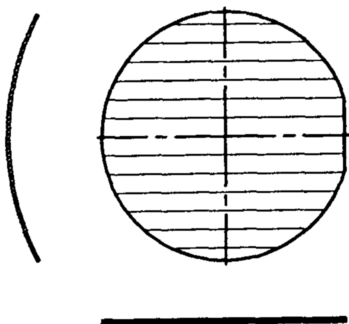
Gauge Accuracy (at calibration temperature)

Absolute Thickness Accuracy	±0.5 µm
TTV	±0.3 µm
Precision	±0.15 µm (1σ)
Bow-bf / Warp Accuracy	± (3 µm + 5% of reading)
Bow-bf / Warp Precision	± (1 um + 1% of reading) (1σ)
Warp according to ASTM, Warp and Bow-bf gravity-corrected	

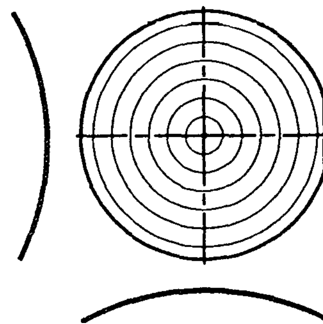
Measuring Time	max. 8 sec. / wafer
Dimensions	Width 470 mm
	Height 190 mm
	Depth 410 mm
Weight	40 kg
Mains	110 - 240 V selectable, 50/60 Hz
Power Consumption	20 W

Three Basic Wafer Shapes

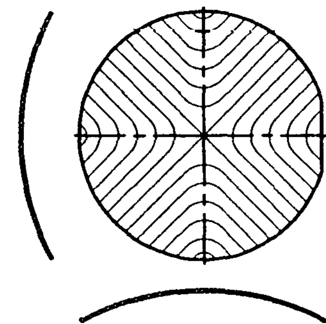
cylindric



cup- or bell- formed shaped



saddle



(Crook of first order)