# Ürün bilgileri

## Yüksek hassasiyetli çok amaçlı form ölçüm makinesi MarForm MMQ 500

**Ürün özellikleri**
Yüksek verimli CNC form test cihazı MarForm MMQ 500




Malzeme no.: **5440901**

### Teknik veriler

| | |
|---|---|
| **Pos.-/Meas. path X-axis** | 280 mm |
| **Pos.-/Meas. path Z-axis** | 470 mm |
| **Positioning speed C-axis** | 0.2 - 20 1/min |
| **Konumlandırma hızı (mm/sn), X ekseni** | 0.5 - 30 mm/s |
| **Positioning speed Z-axis** | 0.5 - 100 mm/s |
| **Workpiece diameter max. (mind moment of inertia max.)** | 530 mm |
| **Linear resolution X-axis (interpolated)** | 5 nm |
| **Linear resolution Z-axis (interpolated)** | 5 nm |
| **Eksenel salgı sapması (µm+µm/mm ölçüm yarıçapı) *** | 0,02 + 0,0001 |
| **Straightness deviation X-axis** | 0.3 µm/100 mm |
| **Straightness deviation Z-axis** | 0.15 µm/100 mm |
| **Çalışma sıcaklığı** | 20 °C |
| **Merkezleme ve doğrultma tablası** | otomatik |
| **Tabla çapı (mm)** | 300 mm |
| **Table load max.** | 80 kg |
| **Moment of inertia max.** | 828000 kg x mm² |
| **Prob sistem tipi** | Temaslı 1D |
| **Special equipment** | CNC table |
| **Depolama ve taşıma sıcaklığı** | -10 °C - 50 °C |
| **Sound pressure level** | < 70 dB(A) |
| **Nem (metin)** | max. 85 % relative humidity; non-condensing |
| **Mains voltage** | 90 - 240 V |
| **Mains frequency** | 50 / 60 Hz |
| **Standart aksesuarları (metin)** | T7W probe system (incl. probe arm 3 x 60 mm) |

# MarForm MMQ 500

## Universal form measuring machine





**Solutions for your measuring tasks in production and the inspection room**

MarForm MMQ 500 enables you to complete the highest level of form measurements. It is extremely reliable, guarantees comprehensive measuring results in a short time, and thus increases your production productivity.

# **Precise measurement** of form and position

Based on the variety of precise measurement options, the MarForm MMQ 500 is the best when it comes to tabletop form testers. The optimized design of the machine ensures that it can be implemented universally guaranteeing maximum utilization. The innovative design of the device makes it extremely easy and safe to operate. You can position all of the components perfectly for your measurement using just one hand. The measuring process itself boasts impressively high speeds. This is because the Z-axis allows movements of up to 100 millimeters/second, making it more than three times faster than conventional measuring machines. The integrated, high-performance MarWin software with its clearly structured user interface provides a user-friendly and secure working environment.

- Universally applicable: from small workpieces that are a few millimeters in size through to heavy components with a weight of up to 80 kg
- Recording the form, position, roughness, contour, and lead in one measuring sequence
- Accurate alignment of workpieces by the automatic centering and tilting table
- Highest axis accuracy even as the tolerances become smaller
- Reliable repeatability even for difficult measuring tasks
- Intuitive software



**High load capacity**

Even heavy workpieces with a weight of up to 80 kg can be measured safely using the particularly high-performance centering and tilting table.

up to

**100** mm/s

positioning speed

up to

**80** kg

table load

**0.01** µm

maximum acuuracy
of the measuring axes

**0.5** µm

centering accuracy of the
centering and tilting table




### Optimized base-to-base time

The Z-axis allows movements of up to 100 mm/s, making it more than three times faster than conventional form measuring instruments.

### Fully automated probe armreplacement

The probe arm unit of the MarForm MMQ 500 holds up to four probe arms at once thus enabling the probe arm to be replaced quickly without any operator intervention.

### More effective alignment

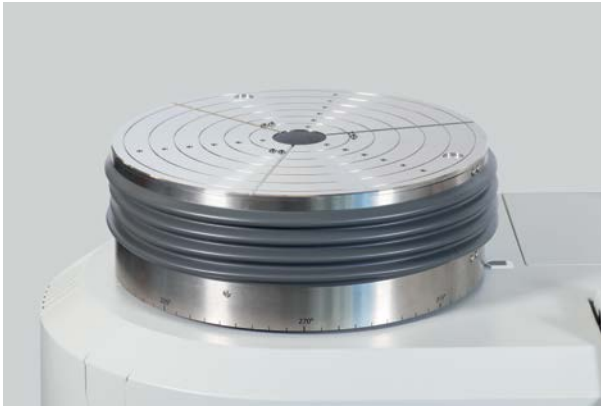
The newly developed centering and tilting table also enables complex workpieces to be aligned easily and quickly.

### High measuring certainty

The mechanical bearing is up to 70 times stiffer than on comparable models making it insensitive to external influences.

# **Automatic operation**
# for more productivity

The MarForm MMQ 500 has unique equipment features that make it particularly efficient. This innovative edge offers you a clear advantage to comparable machines available on the market and noticeably increases your production productivity. The flexible machine layout of the MMQ 400 and MMQ 500 range means there are eight versions from which you can select a tailor-made solution that is best suited to your individual requirements for the highest precision.



**Centering and tilting table**

The newly developed centering and tilting table from Mahr with a diameter of 300 millimeters operates fully automatically. This allows you to optimally align the workpieces to be inspected in less time than a manual alignment, thus ensuring any associated mistakes are eliminated. Overall, this automatic alignment optimizes the base-to-base time of your components making your production line even more efficient.

**Probe arm unit**

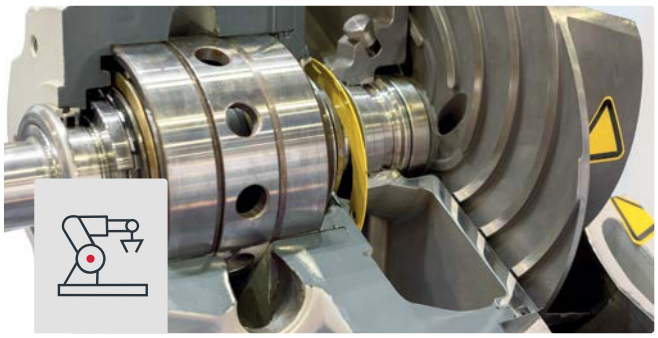
Another feature makes the form measuring machine ideal for automated operation: Its probe arm unit holds up to four probe arms that can be changed automatically by the software without any operator intervention. The time savings and process reliability this feature has to offer also increase productivity considerably.



# Reliable form measurement for **various applications**

Ensure you are well equipped to complete your specific measuring tasks accurately, fast, and ensure they can be replicated regardless of the level of complexity. Regardless of whether you are measuring the form and position, roughness, contour, waviness, or line form – our machine reliably supplies the required measuring result ensuring the quality of your production remains at the highest level.

The following industries, for example, benefit from the efficiency of the MMQ 500:



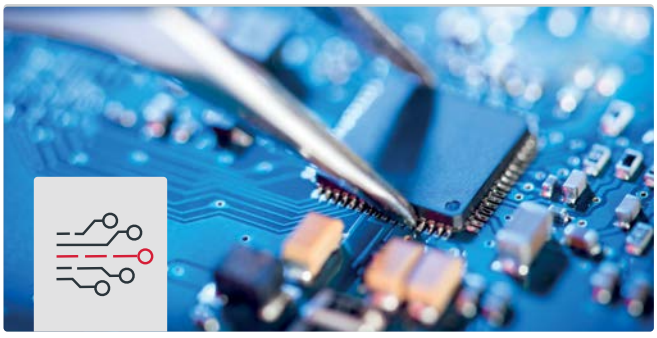
**Mechanical engineering**
Precision bearings, shafts, sockets, rotational bushings, tool holders, tools, hydraulic components



**Automotive industry**
Steering, brake system, gearbox, motor

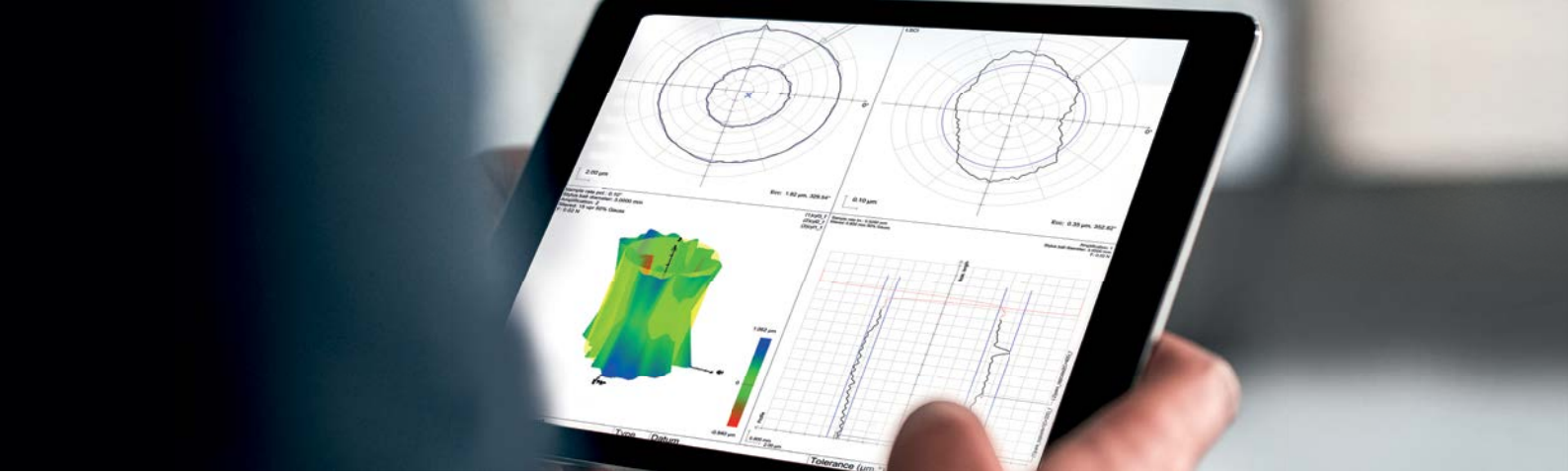


**Medical technology**
Hip joint endoprosthesis



**Electronics**
Commutators, rotor shafts

Other areas of applications include calibration laboratories where the MMQ 500 is used to trace industrial measurements.





# **Optimum support** for your form measuring tasks

The MarForm MMQ 500 from Mahr not only provides innovative hardware for your form measuring tasks but also supplies the perfectly matched measurement and evaluation software with the MarWin platform. It has established itself in more than sixty countries and is used by many Mahr reference customers.

MarWin is the main basic software module for various Mahr product ranges including the measuring machines from the MarForm range. You will benefit from the intuitive, cascaded Easy, Advanced, or Professional user guidance and comprehensive options to analyze and further process the data. You can thus, for example, evaluate the bar-to-bar variation on commutators, monitor freeforms on cams, or analyze the dominant roundness waviness on crankshaft bearings. In addition, you can also add specific options to the software at any time, ensuring the MMQ 500 is a future-proof investment.

**Accessories for your individual requirements**

Mahr provides special accessories for the MarForm MMQ 500 thus expanding your options and giving you even greater flexibility to adapt the measuring machine to your requirements:

- Probe arms
- Clamps
- Equipment table
- Measuring cabinet
- Testing and calibration standards

For further information, get in touch with your contact in the Mahr Sales department.

Technical data

# **MarForm** MMQ 500

Item no. 5440901

| | |
|---|---|
| **Roundness measuring device, C-axis** | |
| Roundness deviation (µm+µm/mm measuring height)** | 0.02 + 0.0005 |
| Roundness deviation (µm+µm/mm measuring height)* | 0.01 + 0.00025 |
| Axial run-out deviation (µm+µm/mm measuring radius)** | 0.04 + 0.0002 |
| Axial run-out deviation (µm+µm/mm measuring radius)* | 0.02 + 0.0001 |
| Measuring speed (rpm) | < 0.2 bis 20 |
| Positioning speed (°/s) | < 1.2 bis 120 |
| Rotational speed (rpm) | 0.2 – 15 |
| Angle resolution (scale) | 32,768,000 |
| **Centering and tilting table** | Automatic, diameter 300 mm |
| Table load capacity, centered (N) | 800 |
| Centering accuracy (µm) | 0.5 |
| Traverse path X/Y centering axis (mm) | +/- 5 |
| Traverse path A/B tilting axis (°) | +/- 2 |
| **Vertical unit, Z-axis** | Motorized, measuring path 470 mm |
| Straightness deviation / 100 mm measuring path (µm)** | 0.15 |
| Straightness deviation / total measuring path (µm)** | 0.3 |
| Parallelism deviation Z-/C-axis in tracing direction (µm) | 0.6 |
| Conicity error Z-/C-axis, measuring path (µm) | 0.5 |
| Measuring speed (mm/s) | < 0.1 - 30 |
| Positioning speed (mm/s) | < 0.5 - 100 |
| Linear resolution (µm) | 0.005 |
| **Horizontal unit, X-axis** | Motorized, measuring path 280 mm |
| Straightness deviation / av. 100 mm measuring path (µm)** | 0.3 |
| Straightness deviation / total measuring path (µm)** | 0.8 |
| Perpendicularity X-/C-axis (µm) | 2 |
| Measuring speed (mm/s) | < 0.1 - 10 |
| Positioning speed (mm/s) | < 0.5 - 30 |
| Linear resolution (µm) | 0.005 |

* Values as maximum deviation from LSC reference circle, filter 15 undulations/revolution.
** All values in accordance with DIN ISO 1101 at 20°C ±1°C in a vibration-neutral environment, filter 15 undulations/revolution LSC or 2.5 mm LSS, 5 rpm or 5 mm/s and standard probe arm with ball diameter 3 mm. Proof at the standard using error separation techniques.

We reserve the right to make changes to the technical data.

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We reserve the right to make changes to our products, especially due to technical improvements and further developments.
All illustrations, numerical values, etc. are therefore subject to change.

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