

SURFACE AND CONTOUR TESTING WITH THE NEW MARSURF FAMILY

- Short measuring times thanks to high axis speeds
- Simple, fast mounting and changeover thanks to innovative clamping system
- Wide range of probes for virtually any measuring task

This is what we mean by **EXACTLY.**

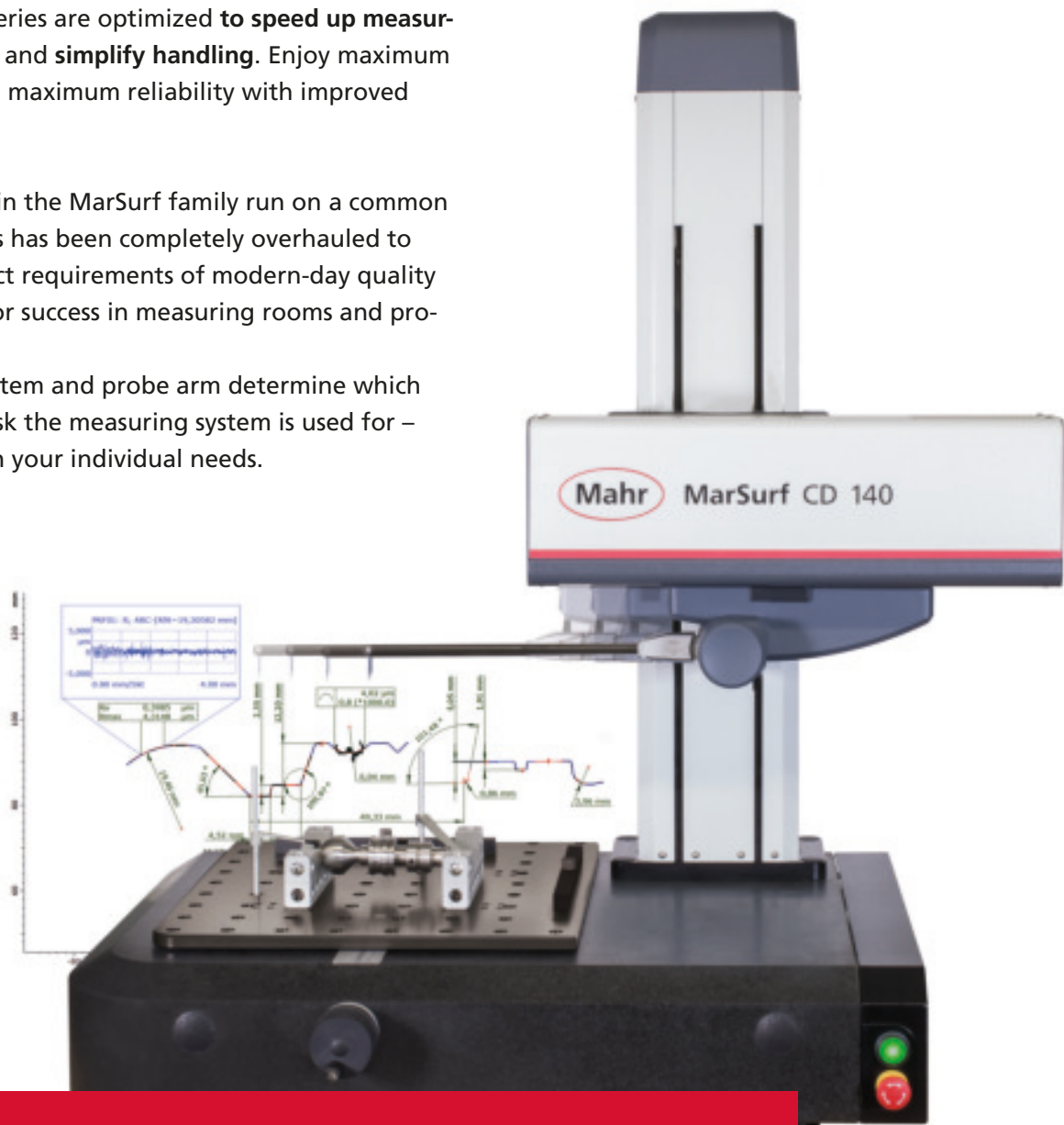
- 0 +

Mahr

EXACTLY

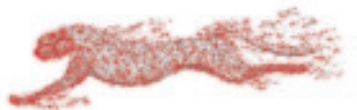
Roughness, contour – or both!

The probe system and probe arm determine which measuring task the measuring system is used for – depending on your individual needs.



- Short measuring times thanks to high axis speeds and automated measuring sequences
- Simple, fast mounting and changeover thanks to innovative clamping system
- Magnetic mount for changing the probe arm quickly without the need for tools
- Wide range of probes for virtually any measuring task
- Spacious support plate and large measuring range: ideal for measuring large workpieces

Systems at a glance



Best performance and precise results in every sprint 4

Maximum flexibility for improved efficiency 6

The right probe arm for every measuring task 8



MarSurf CD 140 / MarSurf CD 280

Contour measurement and roughness measurement
from Rz 2 µm

10



MarSurf GD 140 / MarSurf GD 280

Roughness and waviness measurement

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MarSurf VD 140 / MarSurf VD 280

Combined roughness and contour measurement

14



Measuring and evaluation software 16

Accessories: Calibration masters, clamps etc. 17

Best performance and precise results in every sprint

With their extremely fast CNC axes and a highly dynamic probe system, machines from the MarSurf CD, MarSurf GD and MarSurf VD series break all speed records. Even when it comes to handling, the instruments are optimized to save your valuable time.

Easy changeover

The **magnetic mount** and **one-time calibration** mean that probe arms can be changed quickly and easily. This saves time when switching to a different measuring task.

Time-saving positioning

Just a few hand movements are required for flexible positioning of workpieces on the large support plate. Thanks to the 50 mm bore grid, the integrated TY-axis and the plug-in guide stops, your workpiece is in the correct position in a flash. **Set up your measuring station in half the time!**



Quick axes

Z-axes with full CNC-capability and high-speed X-axes enable **positioning speeds of up to 50 mm/s in Z-direction and up to 200 mm/s in X-direction**. This means that the MarSurf instruments are particularly fast at getting to the start point of any measurement.

Short measuring times

The highly-dynamic probe system finds the perfect balance between rigidity and dynamics. **Which means you benefit from maximum accuracy at high measuring speeds of up to 10 mm/s.**

PERSONAL BEST!

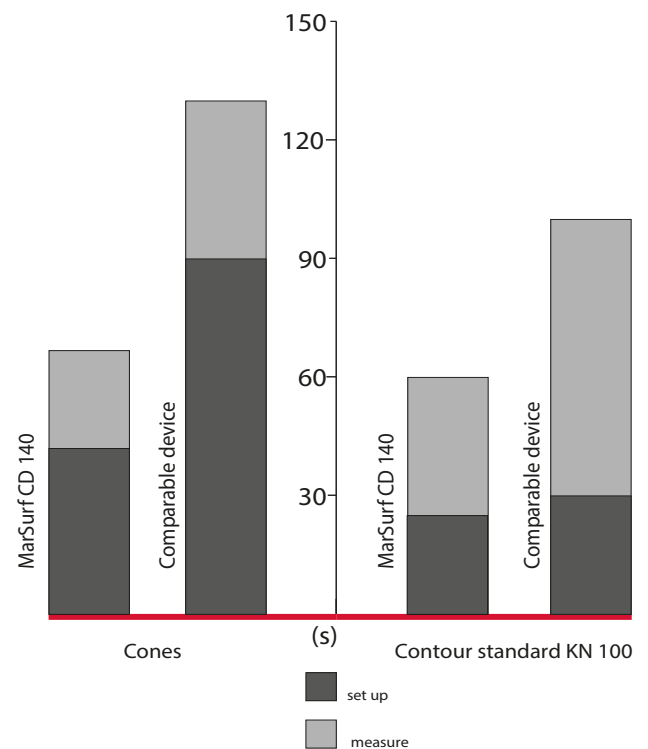
Contour and surface measurement has never been as speedy as now. Our MarSurf CD 140 leads the way:

> 40%

time saving when analyzing a real workpiece

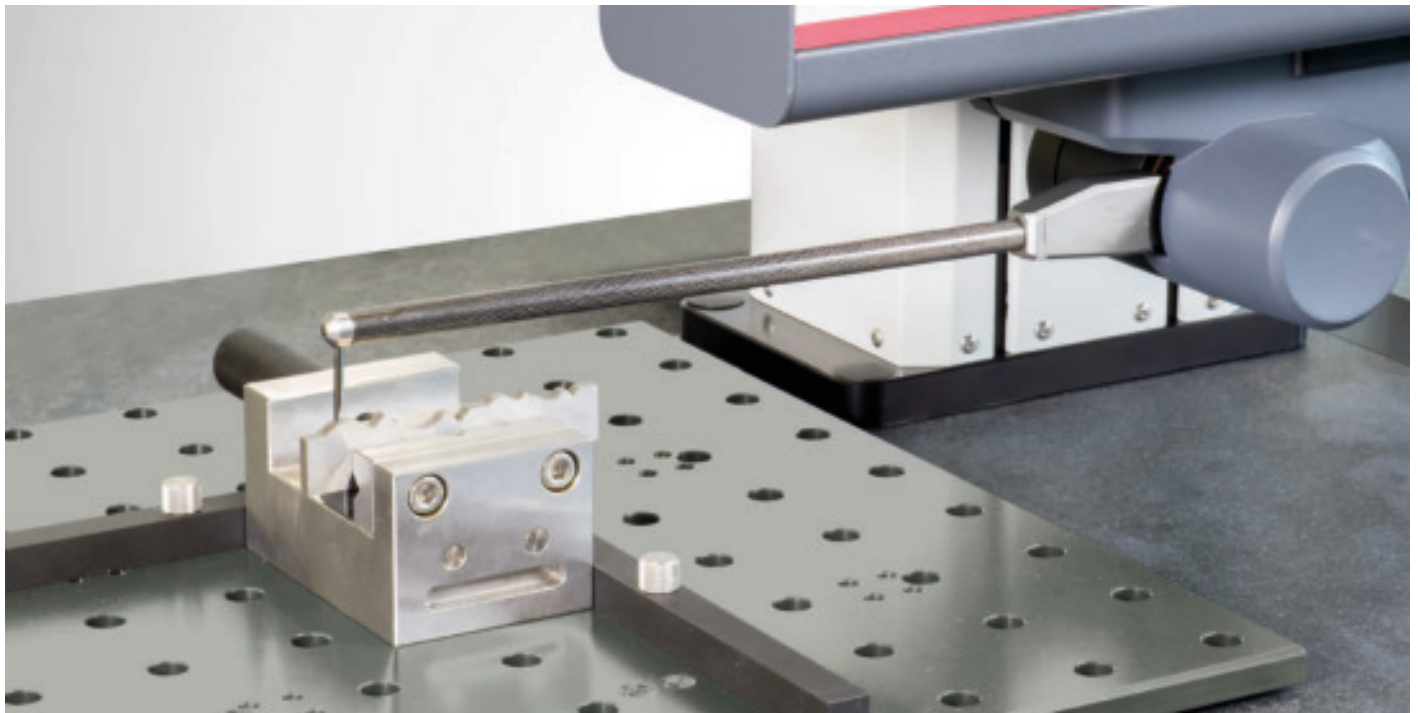
> 65%

time saving when testing a contour standard

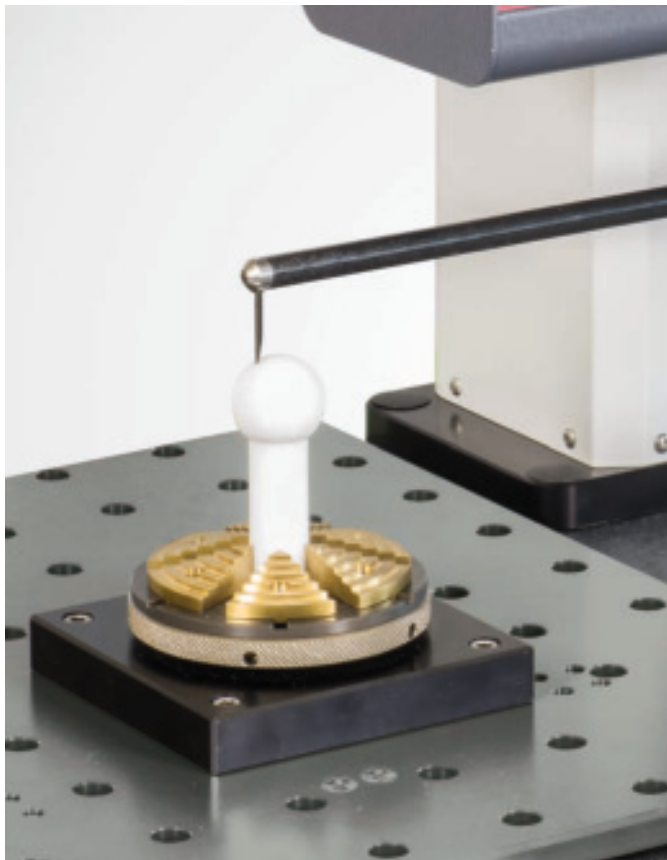


Ground-to-ground time of the new MarSurf CD 140 compared to a similar device.

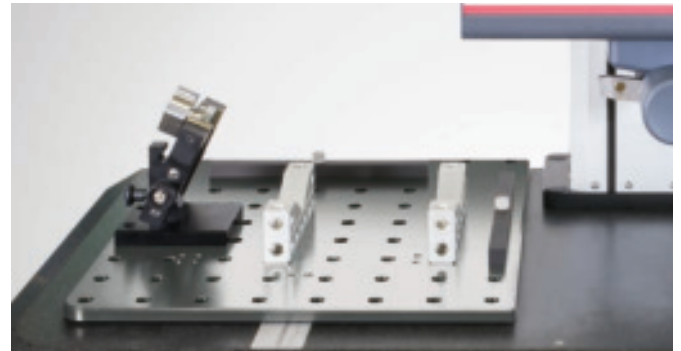
...m of MarSurf
50mm bore
existing work-
and also serves as
workpieces.



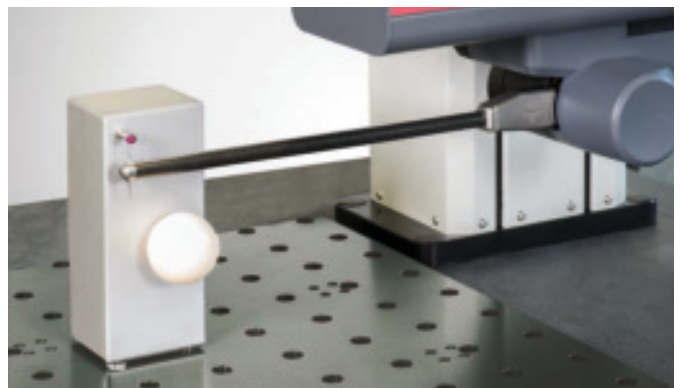
Plug-in guide stops with parallel vise – for securing workpieces at right angles to the measuring axis



Jaw chuck – e.g. for holding hip joints



Maprox precision clamp and prism blocks for quick securing of rotationally symmetrical workpieces



Greater reliability: user-guided calibration process with 2-sphere calibration standard

The right probe arm for every measuring task

A wide range of probes makes the instruments from the MarSurf CD, MarSurf GD and MarSurf VD series suitable for almost any measuring task. **Select the probe arm best suited to your requirements – for excellent and precise measuring results.** Switch from one probe arm to another with just a few hand movements.

Variable tracing forces

The contacting force of the contour probe system can also be individually tailored to the relevant measuring task. The extremely low measuring force from 4 mN means that particularly “delicate” probe arms can be used, for example for small holes. **Tip: The C11 contour measuring system can also be used to measure roughness.**

Automatic probe arm detection

All of the new CPG probes for contour measurement **come equipped with an integrated chip, which enables automatic detection.** This prevents measurement errors.

Attractive

The magnetic mount of all probe arms means that the probe arm can be quickly converted for a new measuring task – without the need for any tools. Your measuring station is ready for action with just a few hand movements.



Contour probe arm with double stylus



Contour probe arm for holes from 3 mm in diameter



Contour probe arm for roughness measurement

Specialists for special tasks

Even unusual and challenging measuring tasks are no problem – with the right probe arm. The best example here is extra long probe arms (up to 490 mm in length), **which can even handle measuring tasks with a large measuring stroke. Particularly slim versions also reach small holes** – from 2 mm diameter for contour measurement and from 0.8 mm for roughness measurement.

Proven benefits

Mahr's tried and tested BFW 250 probe arm system is used for roughness measurements. **It allows you to benefit from a wide selection of probes, many years of expertise and precise measuring results.**

Roughness probe system BFW 250 with BFW probe arms

- Fast and simple probe arm switchover with magnetic mount – no recalibration required
- Easy switch from standard to perpendicular measurement without a tool or adapter
- Proven quality for reliable, precise measuring results

C11 contour probe system with CPG probe arms

- Quickly change the probe system without tools thanks to a magnetic mount – no recalibration required
- Automatic probe arm detection prevents measurement errors and speeds up measuring sequences
- The new probe arm system combines robustness and dynamics – for precise measuring results even in harsh manufacturing environments
- Special probe for more demanding measuring tasks – for example with 490 mm length for a measuring stroke up to 100 mm
- Measurement of double contours e.g. for determining diameters
- One-off, automatic calibration of probe arms



Contour probe arm for
100 mm measuring range or
for deep holes



Roughness probe arm for holes from
0.8 mm diameter measurement



You can find more information about the probe arms
in our probe arm catalogs

Contour measurement: unprecedented precision and speed

Measuring stations from the MarSurf CD series set new standards when it comes to contour testing.

Shorter measuring times, flexible applications and easy handling mean greater efficiency for your quality assurance.

The new probe system combines robustness and precision. The variable contacting force even allows you to measure roughness from $R_z\ 2\ \mu\text{m}$ with the MarSurf CD. The low workpiece height and the integrated TY-adjustment also ensure a stable footing. Measuring stations from the MarSurf CD series therefore deliver reliable and precise results, even when used close to production. The low contacting error of $0.75\ \mu\text{m}$ allows for minimal production tolerances.

Speedy measurements and changeover

- Short measuring times thanks to high positioning and measuring speeds
- Z-axis with full CNC-capability for automated operation
- Quickly change the probe system without tools thanks to a magnetic mount – no recalibration required
- Automatic probe arm detection speeds up measuring sequences and prevents measurement errors
- Optional: Control of TY-axis with CNC-drive for automatic operation

Flexible and versatile

- Workpiece support plate can hold even large workpieces
- Large measuring range for versatility – 70 mm as standard, maximum 100 mm by using extra long probe arms
- Maximum handling flexibility thanks to support plate with 50 mm bore dimension and plug-in guide stops
- Wide range of probe arms and accessories
- Roughness measurement from $R_z\ 2\ \mu\text{m}$ possible

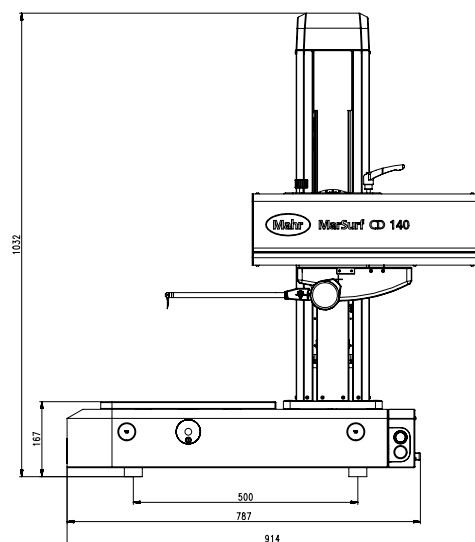


Technical data

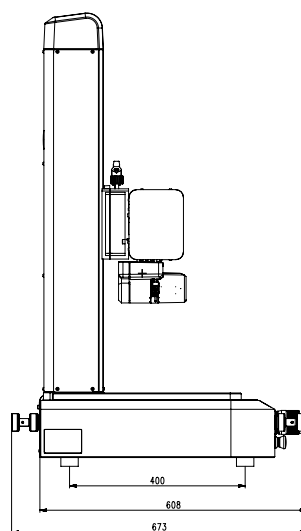
	MarSurf CD 280	MarSurf CD 140
Probe arm length	210 mm; 350 mm; 490 mm	210 mm; 350 mm; 490 mm
Traversing length (in X)	up to 280 mm	up to 140 mm
Positioning speed	0.02 - 200 mm/s (in X)	0.02 - 200 mm/s (in X)
Measuring speed	0.02 - 10 mm/s	0.02 - 10 mm/s
Resolution	max. 6 nm (with 210 mm probe arm)	max. 6 nm (with 210 mm probe arm)
Guide deviation	0.35 µm / 60 mm 0.4 µm / 140 mm 0.75 µm / 280 mm	0.35 µm / 60 mm 0.4 µm / 140 mm
Measuring range mm	70 mm (in Z with 350 mm probe arm) max. 100 mm (with 490 mm probe arm)	70 mm (in Z with 350 mm probe arm) max. 100 mm (with 490 mm probe arm)
Contacting error / radius form deviation	0.75 µm	0.75 µm

Different machine models

Machine	ID no.	X-axis 140 mm	X-axis 280 mm	Z-axis 350 mm	Z-axis 600 mm	Angle adjustment
MarSurf CD 140 BG 11	6269000	x		x		
MarSurf CD 140 BG 12	6269001	x		x		x
MarSurf CD 140 BG 21	6269002	x			x	
MarSurf CD 140 BG 22	6269003	x			x	x
MarSurf CD 280 BG 11	6269004		x	x		
MarSurf CD 280 BG 12	6269005		x	x		x
MarSurf CD 280 BG 21	6269006		x		x	
MarSurf CD 280 BG 22	6269007		x		x	x



MarSurf CD 140 BG 22



Roughness and waviness: measuring results in record time

The MarSurf GD series includes the powerful, new reference measuring stations you can trust for roughness and waviness testing. **The instruments boast short measuring times, superb flexibility and maximum safety for machine, workpiece and user alike.** Measuring stations from the MarSurf GD series deliver reliable and precise results, even when used close to production.



Advantages

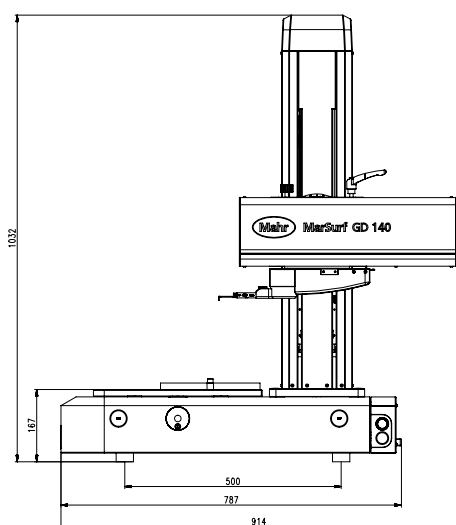
- Very short measuring times thanks to high positioning and measuring speeds (up to 200 mm/s in X and 50 mm/s in Z)
- Z-axis with full CNC-capability for automated operation
- Contact and zeroing across Z-axis in Z+ and Z-
- Quickly change the probe arm without tools thanks to magnetic mount
- Easily switch from standard to perpendicular measurement without a tool or adapter - even for upside down measurements
- 390 mm x 430 mm support plate can hold even large workpieces
- Maximum flexibility in handling thanks to support plate with 50 mm bore dimension and plug-in guide stops
- Proven quality and wide range of probe arms from the BFW-250 probe system
- Extensive accessories for maximum versatility

Technical data

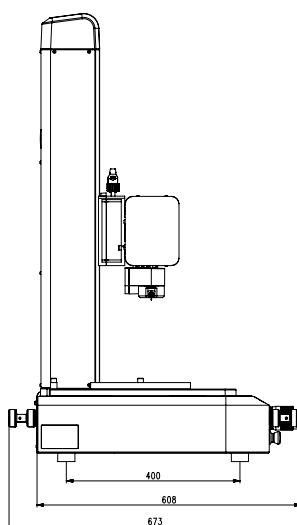
	MarSurf GD 280	MarSurf GD 140
Probe arm length	45 mm (x 1) 67.5 mm (x 1.5) 90 mm (x 2) 112.5 mm (x 2.5) 135 mm (x 3)	45 mm (x 1) 67.5 mm (x 1.5) 90 mm (x 2) 112.5 mm (x 2.5) 135 mm (x 3)
Traversing length (in X)	up to 280 mm	up to 140 mm
Positioning speed	0.02 - 200 mm/s (in X)	0.02 - 200 mm/s (in X)
Measuring speed	Up to 10 mm/s	Up to 10 mm/s
Resolution	Measuring range 1: 2 nm Measuring range 2: 0.2 nm	Measuring range 1: 2 nm Measuring range 2: 0.2 nm
Guide deviation	0.2 µm / 60 mm 0.4 µm / 140 mm 0.75 µm / 280 mm	0.2 µm / 60 mm 0.4 µm / 140 mm
Measuring range mm	500 µm (±250 µm) for 45 mm probe arm length 1500 µm (±750 µm) for 135 mm probe arm length	500 µm (±250 µm) for 45 mm probe arm length 1500 µm (±750 µm) for 135 mm probe arm length

Different machine models

Machine	ID no.	X-axis 140 mm	X-axis 280 mm	Z-axis 350 mm	Z-axis 600 mm	Angle adjustment
MarSurf GD 140 BG 12	6269010	x		x		x
MarSurf GD 140 BG 22	6269011	x			x	x
MarSurf GD 280 BG 12	6269012		x	x		x
MarSurf GD 280 BG 22	6269013		x		x	x

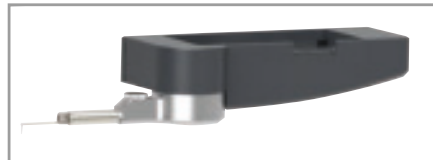


MarSurf GD 140 BG 12



Combined contour and roughness measurement: the professional allrounder

Measuring stations from the MarSurf VD series combine contour and roughness measurements in one system. **Perfect for those who want to perform a wide range of measuring tasks on one system to keep purchase costs to a minimum.** The inserted probe system determines which measuring task the instrument is used for. **Shorter measuring times, flexible applications and easy handling** of the instruments also mean greater efficiency for your quality assurance.



Roughness probe system



Advantages

- Short measuring times thanks to high positioning and measuring speeds
- Z-axis with full CNC-capability for automated operation
- Probe system can be changed directly during operation to reduce changeover times
- Large workpiece support plate, bore dimension can hold even large workpieces
- Maximum handling flexibility thanks to support plate with 50 mm bore dimension and plug-in guide stops
- Low workpiece height and integrated TY-adjustment ensure a stable footing
- Extensive accessories for maximum versatility
- Upside-down measurements possible
- Quickly ready to operate and high operational reliability thanks to probe system with digital interface



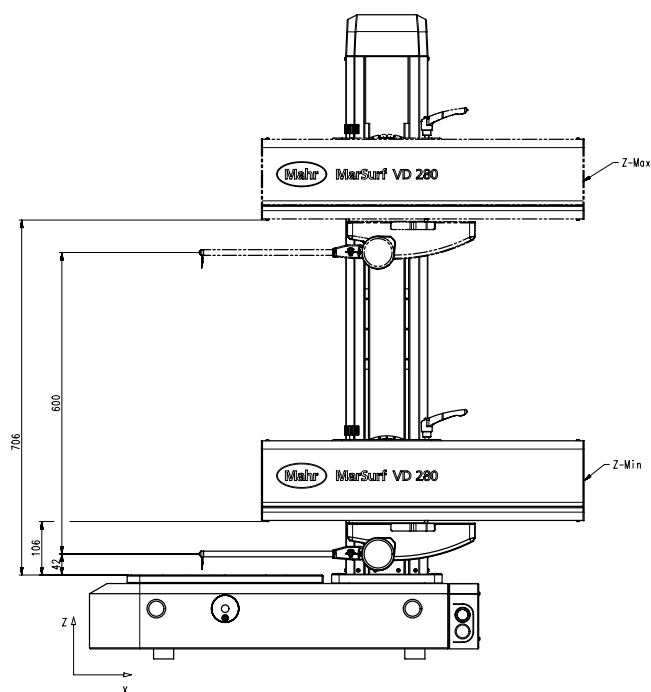
Probe system with digital interface

Technical data

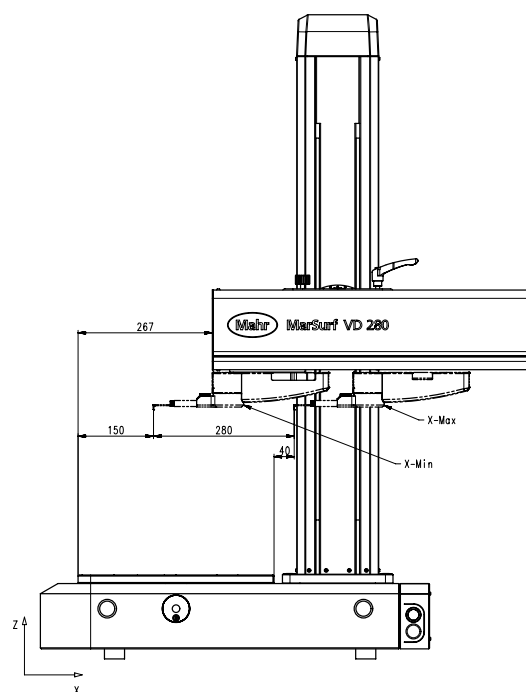
	MarSurf VD 280	MarSurf VD 140
Traversing length (in X)	up to 280 mm	up to 140 mm
Positioning speed	0.02 - 200 mm/s (in X)	0.02 - 200 mm/s (in X)
Measuring speed	up to 10 mm/s	up to 10 mm/s
Guide deviation	0.35 µm / 60 mm 0.4 µm / 140 mm 0.75 µm / 280 m	0.35 µm / 60 mm 0.4 µm / 140 mm
Measuring range mm	Probe system BFW 250 500 µm (±250 µm) with 45 mm long probe arm 1500 µm (±750 µm) with 135 mm long probe arm Probe system C 11 70 mm with 350 mm long probe arm max. 100 mm with 490 mm long probe arm	Probe system BFW 250 500 µm (±250 µm) with 45 mm long probe arm 1500 µm (±750 µm) with 135 mm long probe arm Probe system C 11 70 mm with 350 mm long probe arm max. 100 mm with 490 mm long probe arm

Different machine models

Machine	ID no.	X-axis 140 mm	X-axis 280 mm	Z-axis 350 mm	Z-axis 600 mm	Angle adjustment
MarSurf VD 140 BG 12	6269020	x		x		x
MarSurf VD 140 BG 22	6269021	x			x	x
MarSurf VD 280 BG 12	6269022		x	x		x
MarSurf VD 280 BG 22	6269023		x		x	x



MarSurf VD 280 BG 22

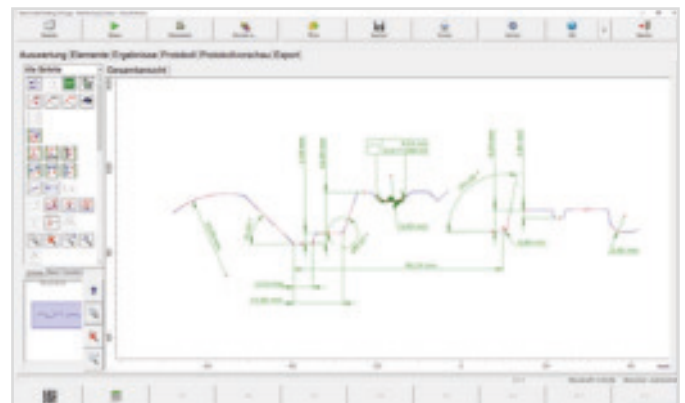


MarWin: intelligent software for efficient work

MarWin universal measuring and evaluation software offers the best foundation for profitable work with the new MarSurf instruments. The combination of first-class hardware and intuitive, user-friendly software accelerates and simplifies the job in hand. This improves your flexibility and efficiency – and prepares your quality assurance for the future.

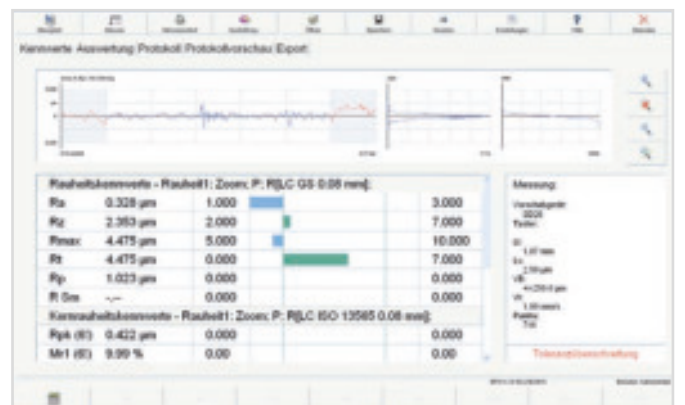
MarWin for contour measurement

MarWin EasyContour is our solution for simple and intuitive contour measurement and evaluation. The measuring assistant will guide you specifically to your measuring data. Many measuring tasks – for example for calculating radii, arc lengths, distances, angles etc. – are already pre-programmed for you. One particular highlight is the patented “tangential elements” function. This helps evaluate the tangential transitions between radii and straight lines easily and independently of the user.



MarWin for roughness measurement

MarWin EasyRoughness is the simple way to perform roughness evaluations in compliance with the standards – for example ISO, JIS, Motif, ASME. Our software wizard will guide you to accurate measuring data step by step. Evaluation algorithms for all of the main roughness parameters are already pre-programmed. If you have additional requirements, you can simply use the “user-defined parameters” option to expand the portfolio of tasks of your measuring station yourself.



2-in-1 solution for contour and roughness

Measure contours on a roughness measuring station – and vice versa. You can do this using various software options. Your measuring station will be transformed into a combi device which can be used to evaluate roughness and contours in one go. Up until now, this has only been possible with much more expensive measuring stations.

Universal work and documentation tool

MarWin runs on the Windows® 10 operating system. You can also combine the software with all of the other MarWin applications and thus benefit from the advantages of this universal software on all Mahr instruments. Other MarSurf instruments available on the market are also compatible, ensuring data exchange at all levels.

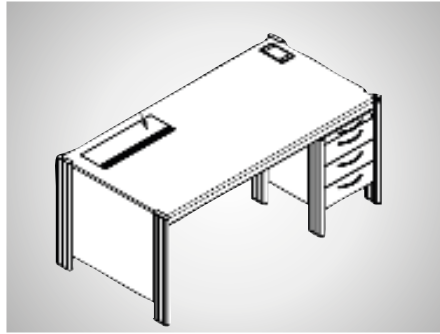
Accessories



MarControl
Order no. 6821000

Manual control panel for MarSurf CD, GD and VD.
The manual control panel helps you operate the measuring station.

- Variable manual control of axes
- Variable limitation of path speed during the creation and testing of automatic measuring sequences
- Selection of measuring programs using function keys
- Contacting of workpiece
- Start and cancelation of automatic measuring sequences

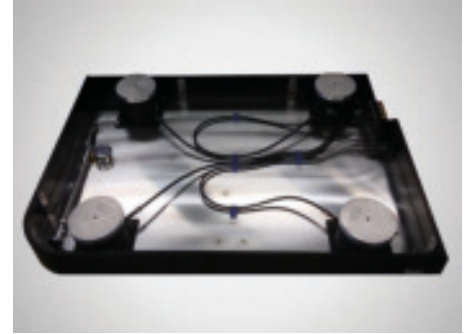


Equipment table
Order no. 6830144

Dimensions:
1710 mm x 870 mm x 740 mm

Max. loading capacity: 250 kg

- Continuous plate
- PC shelf
- Drawer unit on right

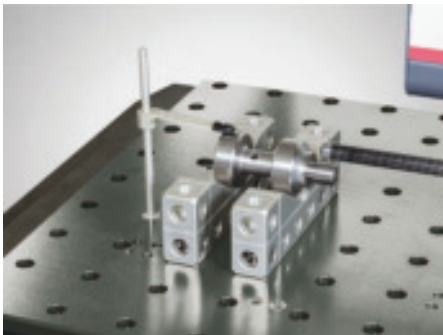


Air damping system for base bed
Order no. 7003717

Consisting of:

- 4 x FAEBI 75-60 PUN H6 BO
- 1x air pump

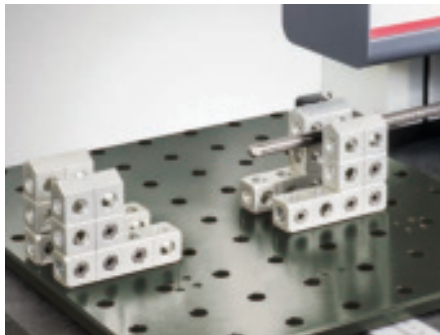
Damping system can be operated with a minimum size of 775 mm x 535 mm on any equipment table (250 kg load required). Fully assembled.



Vee-block set AF 25
Order no. 6820001

Consisting of:

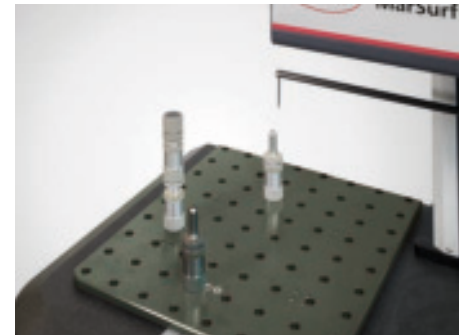
- 2x vee-block 120 ° AF25 standard version
- 4x combi lock bolt, shortened, AF25
- 4x lock SW5 AF25, standard lock
- 1x pin wrench 14/17
- 3x retainer column with retainer spring



Delta block set AF 25
Order no. 6820002

Consisting of:

- 4x delta block 120 °, AF25 form 3, natural
- 4x cuboid 25x25x100, AF25, natural anodized
- 8x combi lock bolt, shortened, AF25
- 6x lock bolt AF25
- 12x lock SW5 AF25, standard lock
- 4x socket, Ø12.5, AF25 with collar
- 2x retainer column with thread M6 L=125



Screw jack set
Order no. 6820004

Consisting of:

- 4x screw jack with fine pitch thread
- 4x mounting plate 24x1, AF25 M6
- 2x centering tip M24x1, h=50
- 3x centering fixture M24x1, Ø32, h=53
- 2x magnetic fixture M24x1 without ball joint
- 2x spacer M24x1, Ø32, natural anodized
- 1x molded cap M24x1, for putty compound, natural
- 1x putty compound 100g in plastic box
- 1x pin wrench 14/17 for attachment

Accessories



DK accessory box
Order no. 6820020

Accessory box with DK clamping elements consisting of:

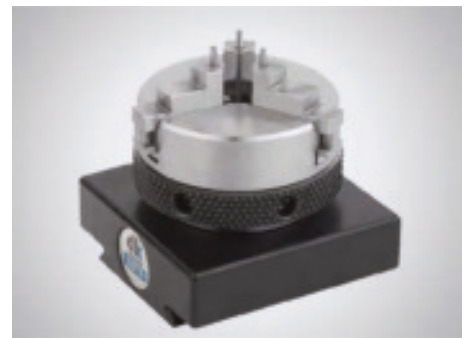
- 1x base plate for DK systems SWA 39 (order no.: 6820021)
- 1x quick clamp swivel unit +90/-55° (order no.: 6820022)
- 1x precision three-jaw chuck 50 mm (order no.: 6820023)
- 1x precision vise 5 mm (order no.: 6820024)
- 1x vee-block 120° with variable stop (order no.: 6820028)
- 1x spring compressor with attachment for vee-block (order no.: 6820026)
- 1x quick clamp angle element 45° (order no.: 6820025)



Quick clamp swivel unit +90° / -55°
Order no. 6820022

- Stepless swivel
- Swiveled via a worm gear
- Angle adjustment with 2° precision scaling
- Repeatability <0.05°
- Fitted to quick-change adapter SWA 39
- Hard-coated, aluminum material, worm gear made of steel

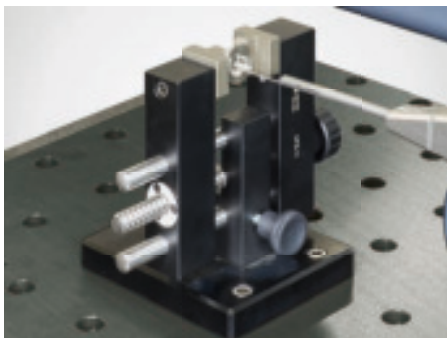
An additional base plate (order no.: 682002) and another holder (e.g. order no.: 6820023, 6820024 or 6820025) are required for use.



Precision three-jaw chuck 50 mm
Order no. 6820023

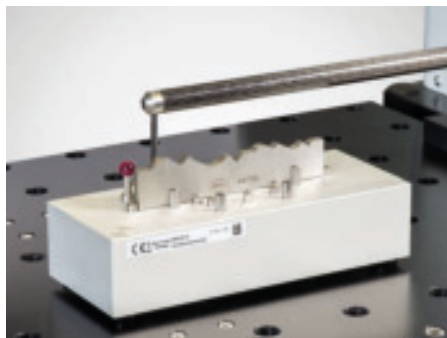
- SWA 39
- 2 mm pins
- Reversible clamping jaws

An additional base plate (order no.: 6820021) is required for use.



Precision clamp UZS 15
Order no. 9059081

Maprox centering vise UZS 15, including 2 sets of aluminum standard jaws

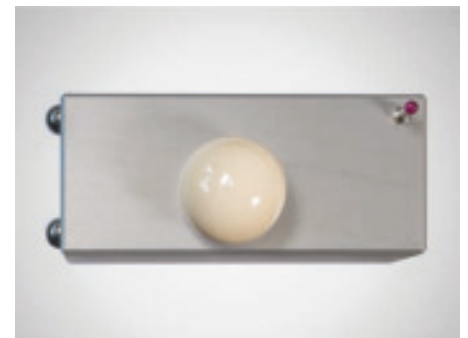


Contour standard KN 100
Order no. 6820125

Radii, distances and angles can be tested with micrometric precision.

The master meets the requirements of VDI/DE Directive 2629 "Accuracy of contour measuring systems"

DAKKS/DKD calibration including calibration certificate Order no. 6980110
Mahr calibration including calibration certificate Order no. 9964316



Contour standard contour B
Order no. 6820000

For support plate with 50 mm bore dimension

The calibration master consists of two spheres (Ø 6 mm and Ø 45 mm) for calibrating the probe arm and stylus geometry.

It comes with Mahr calibration certificates for both spheres.



Universal standard holder
Order no. 6820010

- Holder for roughness standards (MSS, MRS, MDS, PGN) or holder for contour standard KN 100
- The standard holder comes with the MarSurf GD or MarSurf VD

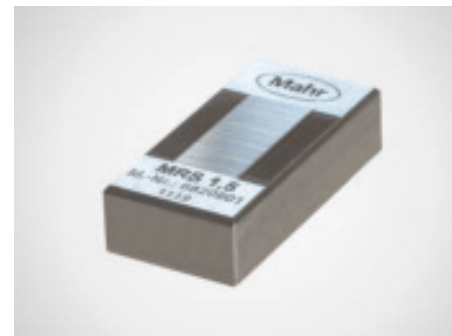


Surface combi standard MSS-3
Order no. 9047438*

Optical flat, depth adjustment groove and roughness field as per ISO 5436-1, cuboid shape with large measuring surface

- $Wt0$, $RZ0 < 25 \text{ nm}$
- Groove depth $Pt \ 12 \text{ }\mu\text{m}$
- Rz , $R_{max} \ 3 \text{ }\mu\text{m}$, $Ra \ 1 \text{ }\mu\text{m}$ $RSm \ 145 \text{ }\mu\text{m}$

MSS-3 with DAkKS/DKD calibration
Order no.: 6980001
MSS-3 with Mahr calibration
Order no.: 9027782

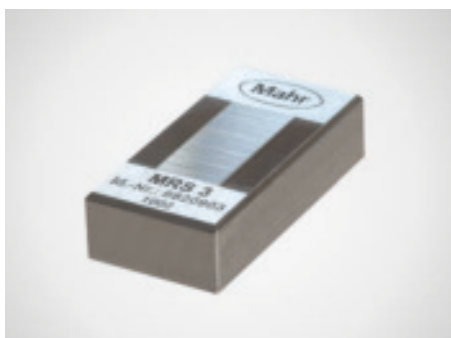


Calibration master MRS 1.5
Order no. 6820901*

Ground roughness standard, ISO 5435-1, type D1, cuboid shape with ground aperiodic profile, stainless steel

- Approx. parameters: $R_{max} \ 1.6 \text{ }\mu\text{m}$, $Rz \ 1.5 \text{ }\mu\text{m}$, $Ra \ 0.3 \text{ }\mu\text{m}$, $Rpk \ 0.2 \text{ }\mu\text{m}$, $Rk \ 0.8 \text{ }\mu\text{m}$, $Rvk \ 0.2 \text{ }\mu\text{m}$, $MR1$, $MR2$

MRS 1.5 with DAkKS/DKD calibration
Order no.: 6820901DKD
MRS 1.5 with Mahr calibration
Order no.: 6820901KAL



Calibration master MRS 3
Order no. 6820903*

ISO 5435-1, type D1, cuboid shape with ground aperiodic profile, stainless steel

- Approx. parameters: $R_{max} \ 3.5 \text{ }\mu\text{m}$, $Rz \ 3.0 \text{ }\mu\text{m}$, $Ra \ 0.5 \text{ }\mu\text{m}$, $Rpk \ 0.3 \text{ }\mu\text{m}$, $Rk \ 1.5 \text{ }\mu\text{m}$, $Rvk \ 0.8 \text{ }\mu\text{m}$, $MR1$, $MR2$

MRS 3 with DAkKS/DKD calibration certificate
Order no.: 6820903DKS
MRS 3 with Mahr calibration certificate
Order no.: 6820903KAL



MDS 1 Mahr depth measurement standard
Order no. 6820431*

ISO 5435-1, type A1, cuboid shape with three depth adjustment grooves, optical flat range

- Approx. parameters:
 $Pt \ 0.2 - 0.4 \text{ and } 1.0 \text{ }\mu\text{m}$
Optical flat range $Rz0 \ 0.02 \text{ }\mu\text{m}$

MDS 1 with DAkKS/DKD calibration
Order no.: 6820431DKS
MDS 1 with Mahr calibration
Order no.: 6820431KAL



MDS 9 Mahr depth measurement standard
Order no. 6820430*

ISO 5435-1, type A1, cuboid shape with three depth adjustment grooves, optical flat range

- Approx. parameters:
 $Pt \ 1.0 - 4.0 \text{ and } 9.0 \text{ }\mu\text{m}$
Optical flat range $Rz0 \ 0.02 \text{ }\mu\text{m}$

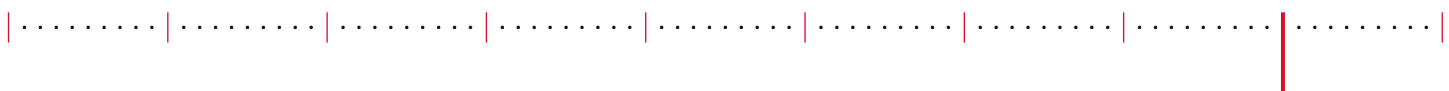
MDS 9 with DAkKS/DKD calibration
Order no.: 6820430DKS
MDS 9 with Mahr calibration
Order no.: 6820430KAL

* master without calibration certificate



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Mahr GmbH
 Carl-Mahr-Straße 1, 37073 Goettingen, Germany
 Reutlinger Str. 48, 73728 Esslingen, Germany
 Tel.: +49 551 7073-800, Fax +49 551 7073-888
info@mahr.com, www.mahr.com



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