33846 Length measuring bench Precimar SM 60

Mahr

Design

- The Precimar SM 60 is an easy-to-use small lengths measuring bench for fast, precise external measurements on workpieces
- Simple design of the device
- Quick adaptation to new workpieces
- Freely selectable measuring equipment (e.g. digital dial gauge)
- Integrated coupling protects the measuring equipment
- Use of a wide range of different measuring attachments

Note:

Optional accessories available on request.

33846

NEW

Technical data:	
Application range:	0 - 60 mm
Measuring range movable sleeve:	25 mm
Measuring surfaces Ø:	6 mm H7
Measuring force (without dial gauge or measuring probe):	1 N +/- 0.2 N
Parallelism of the measuring surfaces:	< 1 µm
Large support table, infinite height adjustment:	dia. 60 mm
Mount for dial gauge or measuring probe:	dia. 8 mm

Type	33846	...
Precimar SM 60		101

33890 Surface specimen plate sets

RUGOTEST

Design

The roughness is divided into 12 classes - N0 to N11.

Applications

For comparative test of the surface quality by visual and tactile examination (with fingernail), in accordance with the standards **ISO/R468, ISO 2632/1 1975 and NFE 05-051.**

Note:

These specimen plates rationally illustrate the various surface types that are achieved with machines that are used in industry.

33890 101

Applications

For the full range of machining methods: roll milling, grinding, face milling, lapping, planing/lathing, honing. Incl. tables for the various machining types.

33890 101

33890 107

33890 110

Area of application	Number of Reference sample	Dimensions of the specimen plates mm	Comparison ranges Ra µm	ISO roughness categories	33890	...
General	27	120 x 90	0.05–12.5	N 2–N 10		101
Blasting	18	120 x 90	0.80–25.0	N 6–N 11		103
Planing	6	110 x 50	0.80–25.0	N 6–N 11		106
Lathing	6	110 x 50	0.40–12.5	N 5–N 10		107
Face milling	6	110 x 50	0.40–12.5	N 5–N 10		108
Flat-sanding	8	130 x 50	0.025–3.2	N 1–N 8		109
Round grinding	8	130 x 50	0.025–3.2	N 1–N 8		110
Spark erosion	6	110 x 50	0.40–12.5	N 5–N 10		111

Roughness measuring devices and accessories

33902 - 33903 Mobile roughness measuring device Waveline W5

JENOPTIK

33902

Design
- Large colour display with tolerance assessment
- Probe position display for precise alignment of the measuring instrument
- Intuitive click wheel operation for parameter selection and operation of all device functions
- Illuminated probe protection
- Internal memory for 5 measuring programs and max. 10,000 measurement results
- Integrated li-ion battery for up to 800 measurments
- USB and Bluetooth interface
- Replaceable skid-type probe
- Scanning paths in accordance with ISO/JIS/MO-TIF, max. 17.5 mm
- Cut-off: 0.25/0.8/2.5 mm
- Filter: phase-correct profile filter, double Gaussian filter, Ls filter
- Measurement and evaluation of the following roughness parameters:
  Ra, Rz, Rmax (Rt), Rq, RSm, Rmr(c), Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, R, AR, Rx, Rp, Rpm, RZ(JIS), Ry, tp, RPc, R3z.

Scope of delivery:
- Waveline W5
- Roughness probe T1E (2 µ/90°) with measuring range +/- 100 µm
- Supporting prism for small shafts
- USB cable
- Charger
- Operating instructions
- Factory calibration certificate
- In case

33903 101
Waveline PRINTER P5
- Thermal printer with Bluetooth interface for logging the parameters
- Measurement conditions and roughness profiles as a graphic presentation with high resolution
- Including 5 rolls of thermal paper, charger and storage case

Note:
Thermal paper for printer P5
see art. no. 33930 120.

33902

33903

Type	33902	...	33903	...
Waveline W5 roughness measuring device		101		
Waveline printer P5				101

33925 Mobile roughness measuring device Waveline W10

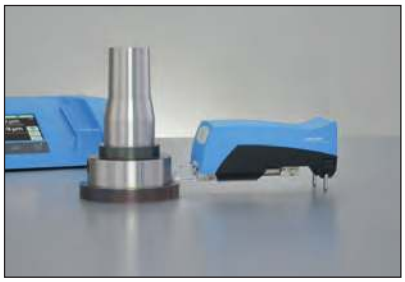
JENOPTIK

Design
- Mobile roughness measuring device of accuracy class 1 for skid measurements
- Measurement of all common roughness parameters with cordless feeding device
- Intuitive operation via 4.3 inch touchscreen
- Integrated thermal printer and integrated roughness standard
- Mains or battery operation
- USB interface for connection to PC
- Eight measuring programmes with extensive programming options offer customised measuring programme functions

Scope of delivery:
- Waveline W10 basic device
- Cordless feeding device LV17 with axial and transverse scanning
- Illuminated probe protection
- Roughness probe T1E 2 µm/ 90°, measuring range 100 µm
- Mains power supply adapter
- 2 rolls of printer paper
- Factory acceptance certificate
- Operating instructions
- Storage case

33925

Technical data:	
Measuring range:	Max. 320 µ (-210/+110) depending on the roughness probe
Probe:	Inductive skid-type probe 2 µm/90 degrees
Scanning path:	17.5 mm (1.5/4.8/ 15 mm)
Number of individual measurement lengths:	1 to 5 selectable
lc:	0.25/0.8/2.5 mm
lamda S filter:	independent of lc, can be switched off
Filter:	ΩDIN EN ISO 11562, DIN EN ISO 16610-21, ISO 13565-1, λs filter in accordance with DIN EN ISO 3274
Sensing speed:	0.15/0.5/1.0 mm/sec, return 3 mm/sec
Surface parameters DIN EN ISO 4287:	Ra, Rz, Rt, Rmax, Rp, Rpm, Rv, RPc, RSm, Rq, RSk, Rku, Rdq, Rdc, Rmr(c)[%], Rmr(c)[µm], R3z, Rz ISO
Surface parameters DIN EN ISO 13565:	Rpk*, Rpk, Rk, Rvk, Rvk*, Mr1, Mr2
Surface parameters MOTIF ISO 12085:	R, Rx, Ar, Nr, CR, CF, CL, W, Wx, Aw, Nw
Surface parameters DIN EN ISO 10049:	RPc, Ra
Special parameters:	Sealing parameters: Rmr(c), Pmr(c) with c = factor x parameter (factor: 0.01–1.00) Parameter: Rt, Tmax, Rz, Ra, Pt, Pmax, Pz, Pa)



Type	33925	...
Waveline W10 roughness measuring device		101

= The specified prices are unit prices. Only sold in the specified packing units. Always specify number of units in order information.

33925 Mobile roughness measuring device Waveline W20

JENOPTIK

Design
- **Complete** – mobile measurement of all common roughness, ripple and profile parameters thanks to free tracer system
- **Automatic** – motorised height adjustment for automatic positioning and lifting of the probe from the workpiece surface
- **Mobile** – built-in battery for operation without external power supply
- **Informative** – display of parameters, profile graphics, Abbott curves and statistical data
- **Easy** – straightforward operation via touchscreen with context-sensitive key functions
- **Practical** – integrated printer for immediate documentation of the measurement results
- **Reliable** – immediate checking of the measuring instrument via the integrated roughness standard

waveline™ 20 feeding device for precise roughness and ripple measurements
- Integrated start button for single-handed operation
- High-precision linear guide for precise straightness and ripple measurements
- Variable measuring speed
- Measurement in all positions (also overhead)
- For all our reference surface probes

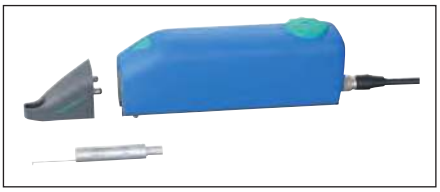
Motorised probe lowering
- Automatic positioning of the probe tip on the workpiece surface and setting of the selected measuring range
- Protection against unwanted damage to the probe tip when changing workpieces as a result of automatic lifting at the end of measurement

Context-sensitive operation via touchscreen
- 8 measuring programmes
- Function key bar with 4 basic functions
- Evaluation of all common roughness, ripple and profile parameters
- Comprehensive options for tolerance evaluation
- Fast and convenient entry of additional user inputs
- Clear presentation of the results: Characteristics, profile representation, interactive Abbott curve representation, comprehensive statistical function

Scope of delivery:
- Waveline W20 basic device
- waveline 20 feeding device
- Probe protection
- Integrated roughness standard with data sheet
- Measuring instrument with factory calibration certificate
- 2 rolls of printer paper
- Charger/100-V to 240-V mains power supply adapter
- USB cable
- Operating instructions
- Storage case

33925 201
Scope of delivery:
- Roughness probe TKL300L 2 µm/90°, measuring range 300 µm

33925



Type	33925	...
Waveline W20 roughness measuring device		201
Waveline W20 roughness measuring device (without roughness probe)		301

33910 Evovis software for Waveline W5+W10+W20

JENOPTIK

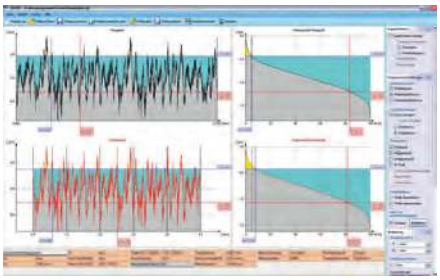
Design
PC-based evaluation program
for mobile roughness measuring devices:
- Waveline W5 (art. no. 33902 101), Waveline W10 (art. no. 33925 101) and Waveline W20 (art. no. 33925 201+301)
- HOMMEL-ETAMIC T1000basic, T1000wave from production year 1999
- Can run under Windows 7/64 bit, Windows XP

Performance features:
- Test plan creation
- Measurement and evaluation
- Automatic creation of results tables
- Logging/log editor
- Multi-print function
- Automatic measurement processes
- Object management / network diagram
- System settings
- Available languages: German, English, French, Spanish, Polish, Russian, Chinese

Evaluations:
- All common parameters in accordance with DIN EN ISO 4287, 13565, MOTIF ISO 12085, JIS B601, ASME B46 DIN EN 10049
- Filter in accordance with DIN EN ISO 11562, 3274, ISO 13565-1, robust Gaussian filter ISO 16610-31
- Evaluation of P/R/W profiles
- Interactive Abbott curve
- Comprehensive log editor
- Powerful online help

Scope of delivery:
Data carrier CD, software licence file, USB dongle

33910



Type	33910	...
Waveline Evovis mobile software		201

Roughness measuring devices and accessories

33903 - 33930 Accessories for Waveline W5+W10+W20 roughness measuring devices

JENOPTIK

33903 103
HS300 height measuring stand for W5+W10+W20
- With cast-iron stand base and ground three-point mounting
- Height adjustment range 300 mm, tilt range +/- 180°

Note:
An adapter W5 (art. no. 33903 104) is needed to mount mobile roughness measuring devices W5+W10.

33903 104
Adapter W5 for HS300
Applications
For mounting Waveline W5+W10 mobile measuring devices on the HS300 height measuring stand.

33903 106
Probe T1E (2 µm/90°) for W5+W10
- With skid for measuring on flat surfaces, shafts and in holes

33903 107
Probe T1E oil-resistant (2 µm/90°) for W5+W10
- With skid for measuring on flat surfaces, shafts and in holes

33903 108
Probe T3E (5 µm/90°) for W5+W10
- With skid for measuring on flat surfaces, shafts and in holes

33930 105
Probe T1K (5 µm 90°) for W5+W10
- With narrow skid for measuring on convex and concave surfaces, e.g. grooves on roller bearings. Skid radius = 0.2 mm

33930 106
Probe T1E oil-resistant (5 µm/90°) for W5+W10
- With skid for measuring on flat surfaces, shafts and in holes

33930 107
Probe T1E (5 µm/90°) for W5+W10
- With skid for measuring on flat surfaces, shafts and in holes

33930 108
Probe TK050 (2 µm/90°) for W5+W10
- With offset skid for holes from 2 mm diameter

33930 109
Probe T1D (5 µm/90°) for W5+W10
- With probe tip before the skid, for measuring in the immediate vicinity of front faces, blind holes and recesses

33930 122
Probe set TKU300 with 2 µm for W20
- Basic probe TKU300
- Probe arm for holes from 4 mm
- Probe arm for measuring directly on front faces
- Probe arm for grooves
- Probe depth 10 mm

Note:
Other probes available on request.

33930 112
Probe extension AZZ 55
- Extension for 6-pin probe, length 55 mm, shaft Ø approx. 11 mm

33930 113
Roughness book, theory and practice

33930 118
Stationary measuring station for W5+W10+W20
With T-groove, including measuring stands, measuring plate and continuously adjustable swivelling device +/- 180°, height adjustment range 300 mm. Dimensions (L x W x H) 400 x 280 x 483 mm.

Note:
An adapter W5 (art. no. 33903 104) is needed to mount mobile roughness measuring devices W5+W10.

33930 119
Roughness standard RNDH 3 for W5+W10+W20
Geometry standard made of nickel.
Triangular/sinusoidal grooves.
Including factory certificate.
Ra: approx. 3.2 µm,
Rz: approx. 10.0 µm.

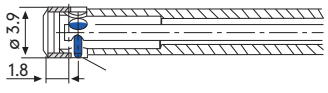
33930 120
Thermal paper for W10 and printer P5

33930 121
Clamping shank 8x46/M6 for W5+W10

33930 123
Adapter W20
Applications
For mounting the waveline 20 feeding device on height measuring stand HS300.

33903 103

33930 106-107



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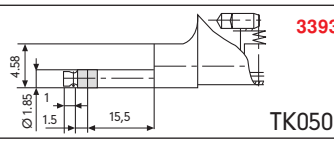

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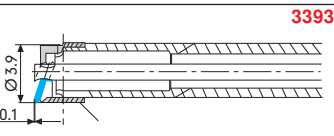

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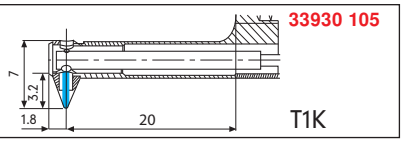
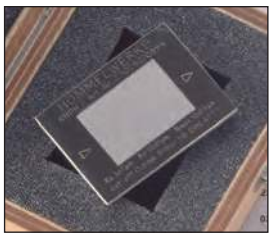


33930 122

33930 118

33930 119



33903 ...	
Height measuring stand HS300	103
Adapter W5 for HS300	104
Probe T1E (2 µm/90°)	106
Probe T1E, oil resistant (2 µm/90°)	107
Probe T3E (5 µm/90°)	108

33930 ...	
Probe T1K (5 µm/90°)	105
Probe T1E, oil resistant (5 µm/90°)	106
Probe T1E (5 µm/90°)	107
Probe TK050 (5 µm/90°)	108
Probe T1D (5 µm/60°)	109
Probe set TKU 300	122

33930 ...	
Probe extension AZZ 55	112
Roughness book	113
Stationary measuring station	118
Roughness standard RNDH 3	119
Thermal paper (10 rolls)	120
Clamping shank 8x46/M6	121
Adapter W20 for HS300	123

= The specified prices are unit prices. Only sold in the specified packing units. Always specify number of units in order information.

33932 Mobile roughness measuring device MarSurf PS 10

Mahr

33932 102
MarSurf PS 10
Design
- Large, illuminated, rotating 4.3 inch TFT touch display
- Easy and intuitive operation: As easy as using a smartphone
- Removable feeding device
- Integrated calibration standard (removable)
- Calibration function: dynamic, Ra, Rz and RSm
- Data backup as TXT, X3P and PDF file
- Start button is also the home button for direct access to the home screen
- Calculation of 31 core sizes
- Gaussian filter in accordance with ISO 16610-21 (previously ISO 11562)
- Special filter in line with DIN EN ISO 13565-1
- ls filter in accordance with DIN EN ISO 3274 (can be deactivated)
- Automatic function for standardised selection of filters and scanning path
- USB interface, MarConnect, microSD card
- Internal memory, expandable with microSD card
- 16 available languages
- switchable between µm/µinch

Scope of delivery:
- Feeding device with tracing lengths up to 17.5 mm
- Skid probe with measuring range of 350 µm, 2 µm/90° diamond tip, probing force 0.7 mN
- Standard (integrated and removable)
- Probe protection
- Height adjustment
- Power supply with 3 adapters
- USB cable
- Bag
- Factory calibration certificate

33932 102

33932 430
adapters
Applications
For mounting the MarSurf PS 10
in measuring stands/scribers with Ø 8 mm.

33932 430

33932 431
Design
Mount for complete MarSurf PS 10
on measuring stands.

33932 431

Type	Dimensions mm	33932 ...
MarSurf PS 10	160 x 77 x 50	102
Adapter	-	430
Mount for MarSurf PS 10 on measuring stands ST	-	431 NEW

33932 Mobile roughness measuring device MarSurf M 300

Mahr

33932 201
MarSurf M 300
Design
- Wireless Bluetooth connection
- Automatic for standard-compliant device setting
- Integrated thermal printer with excellent print quality
- Output of the R-profile via thermal printer
- Log output at the push of a button or automatically
- Data transfer of the results to the PC via USB interface
- Evaluation of the most common characteristics in accordance with ISO/JIS as well as characteristic curves, characteristic lists (e.g. material share)
- Integrated memory for results and profiles
- Tolerance monitoring
- Printing of R-profile (ISO/ASME/JIS), P-profile (MOTIF), material share curve, results log
- Setting of asymmetrical section levels for peak counting
- 15 available languages
- Units of measure (µm/µinch) and standards (ISO/JIS/ASME/MOTIF) selectable
- Individual measurement lengths and shortened cutoff selectable
- Lock for device setting
- Built-in battery with power management
- Power supply with interchangeable adapters for worldwide use
- Date and time for logging

Scope of delivery:
- Evaluation device M 300
- Feeding device RD 18 with integrated standard
- Standard probe PHT6-350/2 µm (conforming to standards)
- Height adjustment
- Probe protection
- 2x USB cable
- Carry bag

33932 201

Type	Dimensions of feeding device mm	Dimensions of evaluation device mm	33932 ...
MarSurf M 300	130 x 70 x 50	190 x 140 x 75	201

Roughness measuring devices and accessories

33932 Mobile roughness measuring device MarSurf M 300 C

Mahr

33932 301
MarSurf M 300 C

Design
- Automatic for standard-compliant device setting
- Integrated thermal printer with excellent print quality
- Output of the R-profile via thermal printer
- Log output at the push of a button or automatically
- Data transfer of the results to the PC via USB interface
- Evaluation of the most common characteristics in accordance with ISO/JIS as well as characteristic curves, characteristic lists (e.g. material share)
- Integrated memory for results and profiles
- Tolerance monitoring
- Printing of R-profile (ISO/ASME/JIS), P-profile (MOTIF), material share curve, results log
- Setting of asymmetrical section levels for peak counting
- Units of measure (µm/µinch) and standards (ISO/JIS/ASME/MOTIF) selectable
- 15 available languages
- Individual measurement lengths and shortened cutoff selectable
- Lock for device setting
- Built-in battery with power management
- Power supply with interchangeable adapters for worldwide use
- Date and time for logging

Scope of delivery:
- Evaluation device M 300 C
- Cylindrical feeding device RD 18 C
- Standard probe PHT6-350/2 µm (conforming to standards)
- Surface standard PRN10 with Mahr calibration certificate
- Height adjustment
- Probe protection
- USB cable (for connecting to PC)
- Carry bag

Note:
Additional, separate feeding device MarSurf RD18 C2 for transverse scanning for M 300 C is available.

33932 301

Measurement on front faces

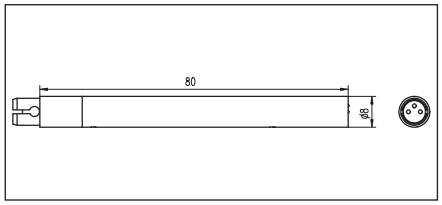
Overhead measuring

Type	Dimensions of feeding device mm	Dimensions of evaluation device mm	33932 ...
MarSurf M 300 C	139 x 26	190 x 140 x 75	301

33932 Accessories for MarSurf PS 10 + M 300 + M 300 C

Mahr

33932 401



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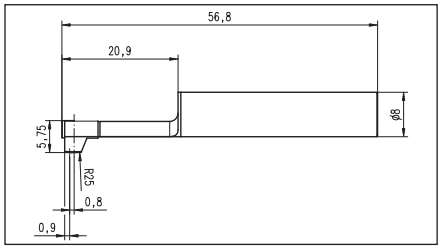

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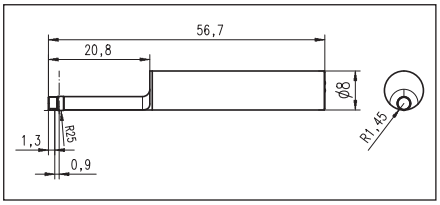

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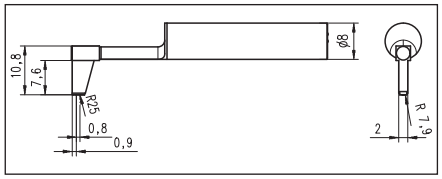

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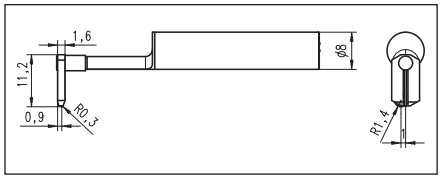

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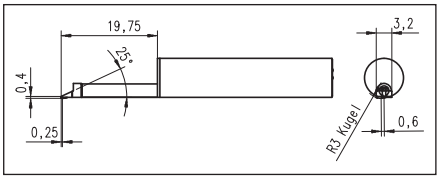

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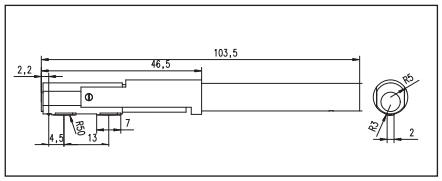


33932 412 / 33932 413

33932 414

33932 415

	33932 ...
Probe extension PHT (80 mm)	401
Standard probe PHT 6-350/2 µm	402
Standard probe PHT 6-350/5 µm	403
Standard probe PHT 6-350/10 µm	404
Probe for holes from 3 mm PHT 3-350	405
Prober for grooves PHT 11-100	406
Probe for concave and convex surfaces PHTR-100	407
Probe for tooth flanks PHTF 0.5-100	408
Probe for sheet metals PT 50	409
Adapter for transverse scanning PHT AQ	410
Prism bracket with prism attachment PS1 php	411

	33932 ...
Mount for MarSurf PS1/RD18 on measuring stands STST-a1	412
Measuring stands 300 mm with cast-iron base ST-D	413
Measuring stand 300 mm with base plate ST-F	414
Measuring stand 300 mm with base plate and T-groove ST-G	415
Swivel mount on Digimar 814 SR 814 Sh	416
Evaluation software SW PS1/M300 Explorer	417
Geometry standard with sinusoidal groove profile PGN 1	418
Geometry standard with sinusoidal groove profile PGN 3	419
Geometry standard with sinusoidal groove profile PGN 10	420
Mount for MarSurf RD 18 C on measuring stands ST PST-a2	421

33933 Mobile roughness measuring device MarSurf M 400 set

Mahr

Evaluation device MarSurf M 400
Design
- Simple. Fast. Innovative
- More and more often, surface evaluations that require free scanning are needed not only in the measuring room, but also in the manufacturing area
- Generally this means higher requirements for user qualification, a greater time expenditure and more adjustment work.
- Offers this required performance range in the line of mobile surface measuring technology at Mahr, with equally simple and fast operability

Feeding device SD 26
Features
- Free scanning with high-precision probe system
- Faster switching of probe arm thanks to magnetic probe-arm holder
- Protection against destruction
- Only a few seconds of set-up time thanks to motorised height adjustment of the feeding device with automatic zero setting
- Flexible handling thanks to wireless Bluetooth connection
- Transparent, clear and simple thanks to brilliant colour display for presentation of results and operator guidance
- Mobile use thanks to mains and battery operation
- Internationally up to date with all common characteristics in accordance with ISO, JIS, ASME, many languages integrated
- Quality documentation thanks to integrated thermal printer for profile and results
- Measuring point density in accordance with standards despite increased measuring speed

Scope of delivery:
- Evaluation device MarSurf M 400
- Feeding device MarSurf SD 26 incl. probe system BFW 250
- Standard probe arm
- 1 roll of thermal paper
- Wide-range power supply with 3 adapters
- 2 x USB cable (for connecting to PC and use with cable)
- Operating instructions
- In transport bag

33933

Technical data:	Evaluation device MarSurf M 400
Profile determination:	Primary, ripple and roughness profile Inductive free tracer system with replaceable probe arms, 2 µm probe tip, measuring force approx. 0.7 mN (standard)
Standards:	DIN/ISO/JIS/ASME/MOTIF selectable
Parameters:	54 pieces
Scanning paths Lt (in accordance with ISO/JIS):	1.75/ 5.6/17.5 mm, automatic, free input
Scanning path (in accordance with MOTIF):	1/2/4/8/12/16 mm
Total distances lm (in accordance with ISO/JIS):	1.25/4.0/12.5 mm
Sensing speed:	0.2/1.0 mm/s
Measuring range:	+/- 250 µm = 8 nm, +/- 25 µm = 0.8 nm (standard probe arm length)
Languages:	15 selectable
Storage options:	max. 30 profiles or max. 40,000 results
	Integrated printer

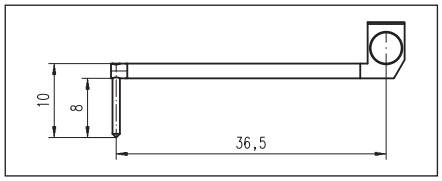
Technical data:	Feeding device SD 26
Measurement path:	26 mm
Tilt adjustment:	+/- 1.5° (alignment function with user guide in the evaluation device)
Interfaces:	USB slave, MarConnect (RS232)

Type	33933 ...
MarSurf M 400 set	101

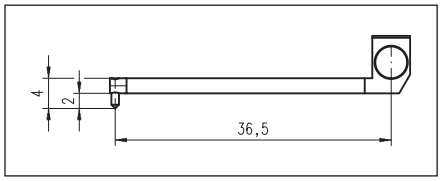
33933 Probe system BFW 250 for MarSurf M 400 set

Mahr

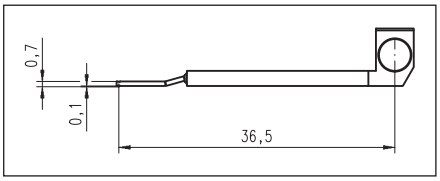
33933 105



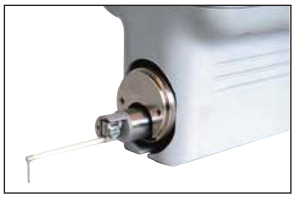
33933 106



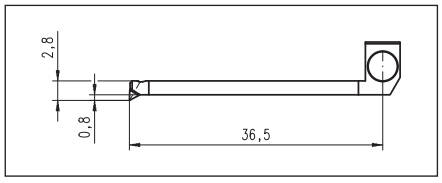
33933 107



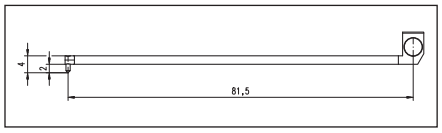
	33933 ...
Probe for holes from 11 mm BFW A 10-45-2/90°	105
Probe for holes from 4 mm BFW A 4-45-2/90°	106
Probe for holes from 0.8 mm BFW A 0.7-45-2/90°	107



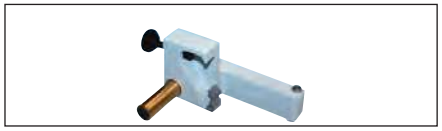
33933 108



33933 109



33933 115



	33933 ...
Probe with inclined tip BFW A 2.8-45-2/60°-s32°	108
Probe for holes from 4.5 mm measuring range +/-500 µm BFW A 4-90-2/90°	109
Mount for Marsurf SD 26/SD 26 C on measuring stands ST-D/-F/-G	115

Measuring instruments in pocket format

Info

Roughness measuring device MarSurf XR 1

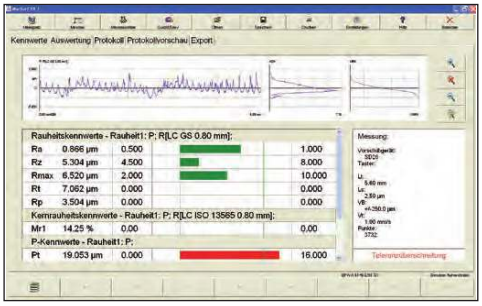
Compact
- Few components
- Touchscreen operation
- MarWin software in combination with mobile feeding devices
- Powerful basic software

Cost-effective
- Low entry price

Comfortable
- Self-installation by customer
- Plug & play
- Software can be expanded with software options
- Multiple feeding devices can be connected via cable or Bluetooth

Measurement of a knee joint
with the feeding device MarSurf RD 18 and the skid probe system PHTR-100

Measurement of a graduated shaft
with the feeding device MarSurf SD 26 and/or MarSurf RD 18



MarSurf XR1 software
The MarWin software platform offers the user the option of using a service that is characterised by ease of use, with a wide range of measuring and selection criteria.

Data transfer of the feeding devices to the PC
- Connection of any number of feeding devices using a feeding device adapter
- Alternatively: For the feeding devices MarSurf RD 18 and MarSurf SD 26, a connection with the PC via the Bluetooth interface is possible. A one-off connection is sufficient. When starting the measuring programme, the feeding device linked with it will start.

= The specified prices are unit prices. Only sold in the specified packing units. Always specify number of units in order information.