
Instructions



Pocket Surf[®]

Portable Surface Roughness Gages

MAHR GMBH, GERMANY • MAHR FEDERAL INC., USA

Description

The Pocket Surf® gage is a portable battery-powered instrument for checking surface roughness with the measured values displayed on a digital readout. The instrument can be used in the laboratory, an inspection area, in the shop, or wherever on-site surface roughness gaging is required.

A **Pocket Surf kit** is furnished in a fitted case, and includes a Pocket Surf unit with a General Purpose Probe † and a 125μ"/3,2μm (nominal) Reference Specimen † plus:

- **EBY-1014** 9-volt Alkaline Battery
- **EPL-1681** Riser Plate, for calibrating the gage with the Reference Specimen.

† Part Numbers listed in "Models" table on next page.



Even though this gage is designed and built to withstand the rigors of handling and use, it is a precision instrument and should be treated with care to assure measurement accuracy and reliable performance.

Note: U.S. Patent No. 4,776,212
Product design and specifications subject to change without notice.
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Specifications

Measuring Ranges	R_a — 1 μ " to 250 μ "/0,03 μ m to 6,35 μ m R_v — 8 μ " to 999 μ "/0,2 μ m to 25,3 μ m R_{max} — 8 μ " to 999 μ "/0,2 μ m to 25,3 μ m R_z — 8 μ " to 999 μ "/0,2 μ m to 25,3 μ m
Display Resolution	1 μ "/0,01 μ m
Measurement Accuracy	Meets ASME B46.1, ISO and DIN standards and MIL specifications
Digital Readout	3-digit LCD display, with "Battery" icon
Traverse Length (Selectable)	See table on page 9.
Evaluation Length (Selectable)	See table on page 9.
Traverse Speed	.2"/5,08mm per second
Cutoff	.030"/0,8mm; 2 RC filter
Probe Type	Piezoelectric
Maximum Stylus Force (within displacement range)	1500mgf/15.0mN
Power	9-volt consumer-type alkaline battery
Battery Capacity	Approx. 2500 measurements, depending on frequency/degree of usage
Operating Temperature	50° to 113°F/10° to 45°C
Storage Temperature	-4° to 149°F/-20° to 65°C

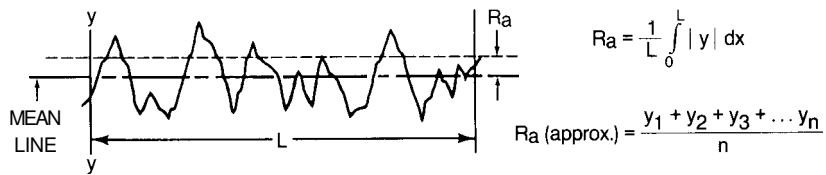
Note: R_{max} and R_z per DIN 4768

Models

	Pocket Surf Kit Model No.
EGH-1019 Probe and PMD-90101 Certified Reference Specimen	EMD-1500-311
EGH-1019 Probe and EMD-90010 Precision Reference Specimen	EMD-1500-312
EGH-1026 Probe and PMD-90101 Certified Reference Specimen	EMD-1 500-321
EGH-1026 Probe and EMD-90010 Precision Reference Specimen	EMD-1500-322

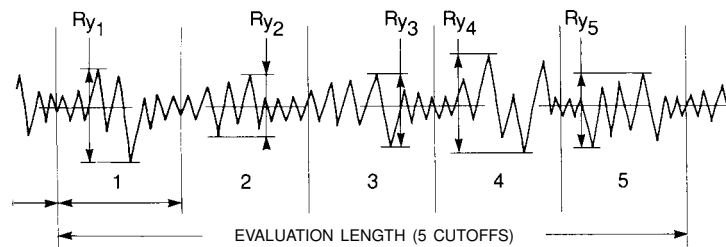
PocketSurf Measurement Parameters

R_a Roughness Average—the arithmetic average height of roughness irregularities measured from a mean line within the evaluation length (L).



$R_{\max}$ Maximum Roughness Depth (per DIN) — the largest of the 5 maximum peak-to-valley roughness depths in 5 successive sampling lengths. In the illustration below, $R_{\max} \text{ (DIN)} = R_{y4}$.

R_z Mean Roughness Depth (per DIN) — also known as R_{tm} — the mean of 5 maximum peak-to-valley roughness depths in 5 successive sampling lengths.



$$R_z \text{ (DIN)} = R_{tm} = \frac{R_{y1} + R_{y2} + R_{y3} + R_{y4} + R_{y5}}{5}$$

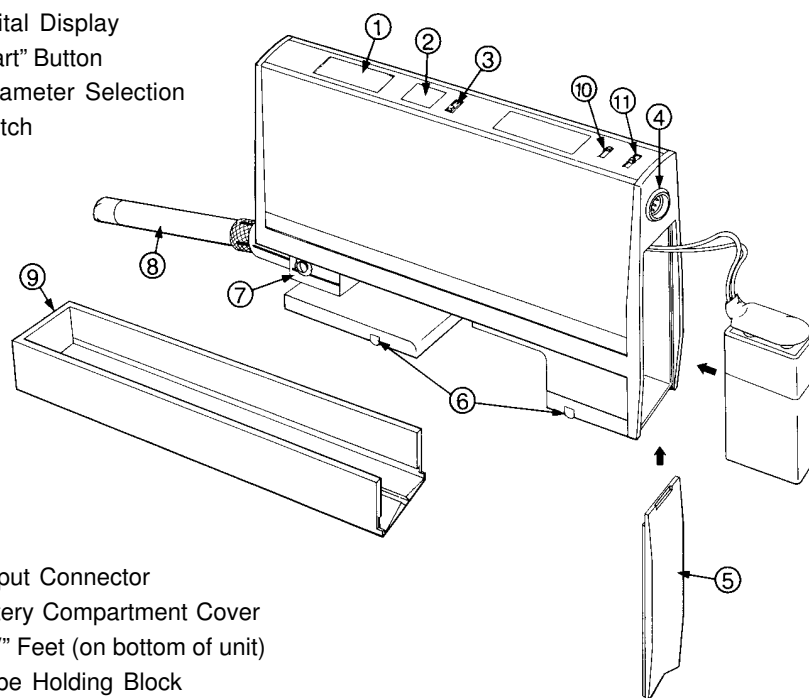
Note: To fully meet the requirements of DIN 4768 for $R_{\max}$ and R_z , probes having a stylus radius of .0002"/5 μ m are available for use with Pocket Surf models.

PocketSurf Measurement Parameters (continued)

R_y Maximum Roughness Depth — For the Evaluation Length equalling one cutoff, it is the vertical distance between the highest peak and the deepest valley within the sampling length. For the Evaluation Length equalling 3 cutoffs, it is the largest of the 3 maximum peak-to-valley roughness depths in 3 successive sampling lengths.

Pocket Surf Features

- ① Digital Display
- ② "Start" Button
- ③ Parameter Selection Switch



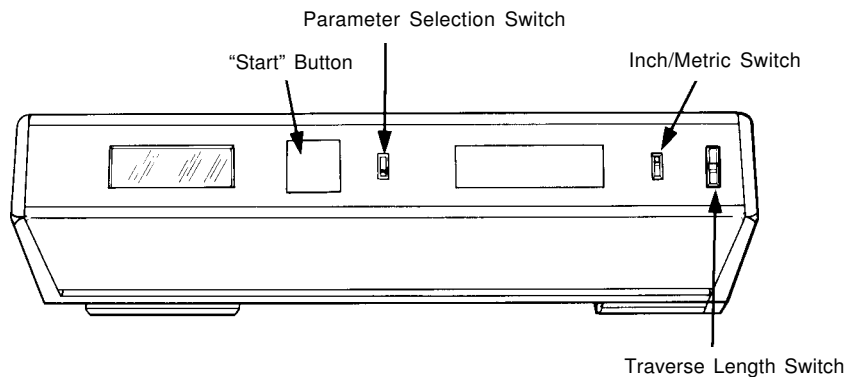
- ④ Output Connector
- ⑤ Battery Compartment Cover
- ⑥ 2 "V" Feet (on bottom of unit)
- ⑦ Probe Holding Block
- ⑧ Probe
- ⑨ Protective Cover
- ⑩ Inch/Metric Switch
- ⑪ Traverse Length Switch

Battery Installation/Replacement (Alkaline only)

1. Remove Protective Cover ⑨ from Pocket Surf base and slide Battery Compartment Cover ⑤ off end of Pocket Surf unit.
2. Install/replace battery and replace Battery Compartment Cover.
3. Press and release "Start" button to check battery condition (see next section).

Duracell #MN/1604 and Eveready® Energizer® #522 or other equivalent 9-volt alkaline batteries are suitable replacements. Avoid non-alkaline or rechargeable batteries because these types do not have sufficient power.

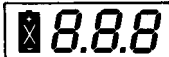
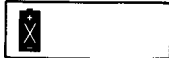
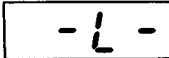
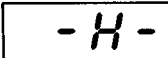
Pocket Surf Controls and Digital Display



1. Set Inch/Metric Switch for inch (μ) or metric (μm).
Set Traverse Length Switch for 1, 3 or 5. Refer to Traverse Length section for details.
Set Parameter Switch to desired parameter -- R_a , R_{max} , or R_z . If the Traverse Length Switch is set to positions 1 or 3, the R_{max} selection will actually calculate R_y . Also, the R_z selection will not be calculated for positions 1 or 3, since a full 5 cutoffs are required per DIN for both R_{max} and R_z .

Pocket Surf Controls and Digital Display (continued)

In addition to displaying the measured roughness value, the digital readout also signals other conditions:

2. Immediately after pressing and releasing the “Start” button, the readout should display the “Battery” icon and “all 8’s” (full display), indicating satisfactory battery condition for normal operation.
3. A “low” (weak) battery is indicated by only the “Battery” icon being displayed on the LCD readout — no other characters displayed. A dead battery (or none installed) results in no display at all. In either instance, remove and replace the battery as directed in **Battery Installation/Replacement** section on page 7.
4. When taking a measurement, an “-H-” or an “-L-” may appear, indicating that the measured value is out of range, either too high or too low. Refer to **Specifications** section on page 3 for parameter measuring ranges.
5. If the display “blinks” when a measurement is made, it indicates that the displayed value has been contaminated by three or more off-scale peaks or valleys during the measurement. For example, the probe may have traversed over a scratch or other random irregularity on the surface. Measure again, with the probe positioned at a different place on the surface.
6. If a malfunction or other error occurs during operation, the readout will display an error code: “E1”, “E2”, “E3”, “E4” or “E5L”. Refer to **Maintenance & Troubleshooting** section on page 24 for details.

Traverse Length

There are three traverse lengths available. For measuring short surfaces such as o-ring grooves, short lands and shoulders use Switch Positions 1 or 3.

Nominal Traverse Length	Evaluation Length	Number of Cutoffs/ Switch Position
.075"/2,0mm	.030"/0,8mm	1
.135"/3,5mm	.090"/2,4mm	3
.195"/5,0mm	.150"/4,0mm	5

Cutoff equals .030"/0,8mm.

Gage Operation

The PocketSurf gage will operate in any one of four different probe positions (see illustration on next page). Selection of the proper probe position depends on the application.

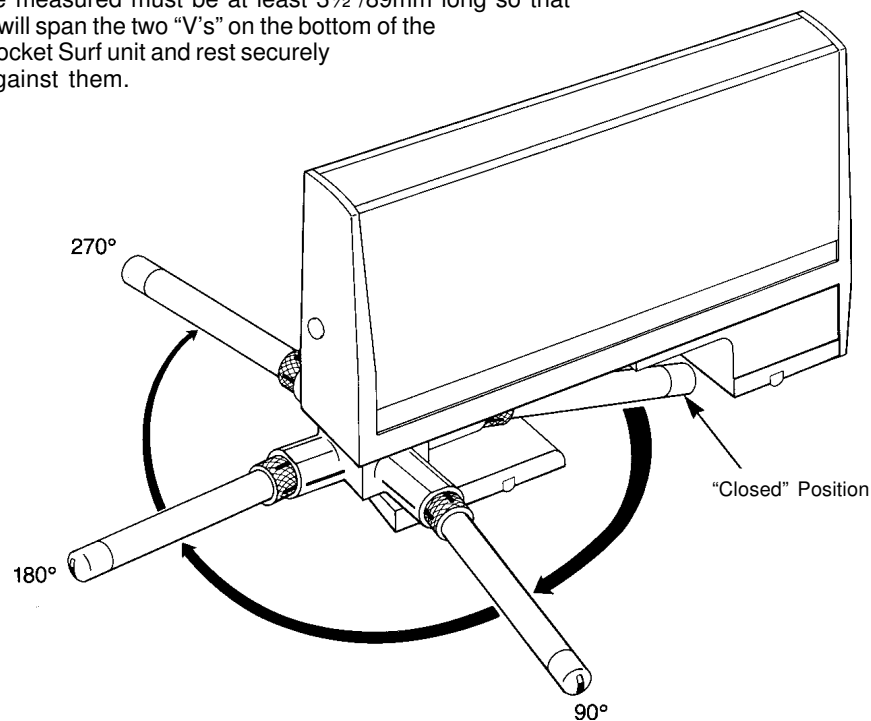
When changing probe positions, gently grasp the probe by its body; never handle the probe by its skid and stylus end.

Prior to operating the gage, its calibration should be checked. Refer to the **Calibration** section for details.

Important: During the measuring cycle, the probe stylus and skid should be in contact with a surface, and the setup should be properly aligned (as outlined in the following sections). Otherwise, any readings obtained are not valid and are not to be used for measurement or gage performance evaluation purposes.

“Closed” Position

The Pocket Surf gage can be hand held or placed on a surface in any attitude; it will operate in virtually any position — horizontally, vertically, at any angle in between, even upside-down. In the “Closed” probe position, the gage can measure flat surfaces or cylindrical surfaces (O.D.’s) down to $\frac{1}{4}$ ”/6,35mm in diameter. However, the workpiece or surface to be measured must be at least $3\frac{1}{2}$ ”/89mm long so that it will span the two “V’s” on the bottom of the Pocket Surf unit and rest securely against them.

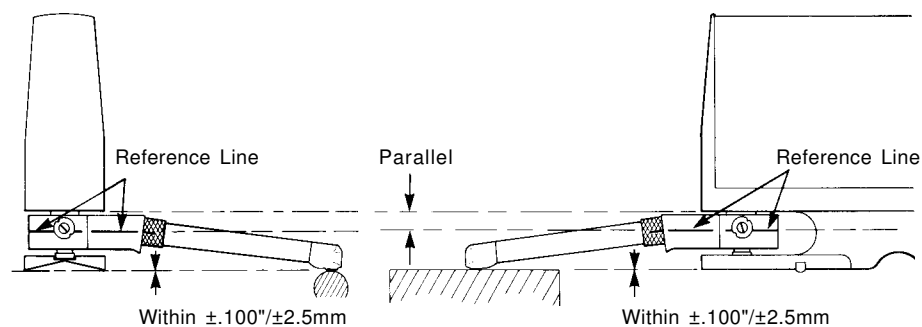


For workpieces or surfaces less than $3\frac{1}{2}$ ”/89mm long (too short to span the “V’s”), use of EAS-2584 Bottom Plate (an optional accessory) is recommended.

Other Probe Positions

To use the gage in the other probe positions — 90°, 180° or 270°, the PocketSurf unit and probe must be carefully aligned to the workpiece surface to be measured. The base of the PocketSurf unit must be at approximately the **same elevation** (within $\pm.100"/\pm2.5\text{mm}$) as the surface being measured, and the axis of probe traverse must be **parallel** to the surface being measured.

With the probe positioned on the workpiece surface to be measured, carefully adjust the gage and workpiece setup so that the black, scribed Reference Line on the Probe Mounting Block is **parallel** to the bottom of the PocketSurf housing and parallel to the work surface. This ensures that the probe skid and stylus are flush on the surface, even though (except for the Small Bore Probes) the probe body will be at an angle to the surface.



180° “Extended”

In the 180° “Extended” position, the PocketSurf gage can measure flat Surfaces, large cylindrical or O.D. surfaces and inside diameters. Because there is some leeway permitted in the elevation between the base of the Pocket Surf unit and the surface to be measured, the gage can be used to measure surfaces that are raised slightly above or recessed slightly below (within $\pm .100"/\pm 2.5\text{mm}$) adjacent surface(s).

Be sure the two “V’s” on the bottom of the PocketSurf unit sit firmly on the adjacent workpiece surface.

Inside diameters larger than 1.1"/28,0mm may be measured up to a depth (in-reach) of 2.0"/50mm using a General Purpose Probe. For smaller inside diameters down to 1/8"/3,2mm an optional Small Bore Probe is required. For most I.D. measurements, the Pocket Surf unit cannot be hand held; it must be mounted on a stand such as the optional EAS-2426 Universal Stand or EAS-2496 Height Stand. Refer to **Optional Accessories** section for additional information.

90° and 270° Positions



Both the 90° and 270° positions can be used, in conjunction with a suitable stand or fixture for holding the PocketSurf unit, to measure surfaces (such as crankshaft pins and journals) that cannot be accessed with the probe in its “Closed” or 180° “Extended” positions.

The 90° probe position is also used for measuring small workpieces with the EAS-2421 Vee Fixture. Refer to the **Vee Fixture** section on page 17 for specific instructions.

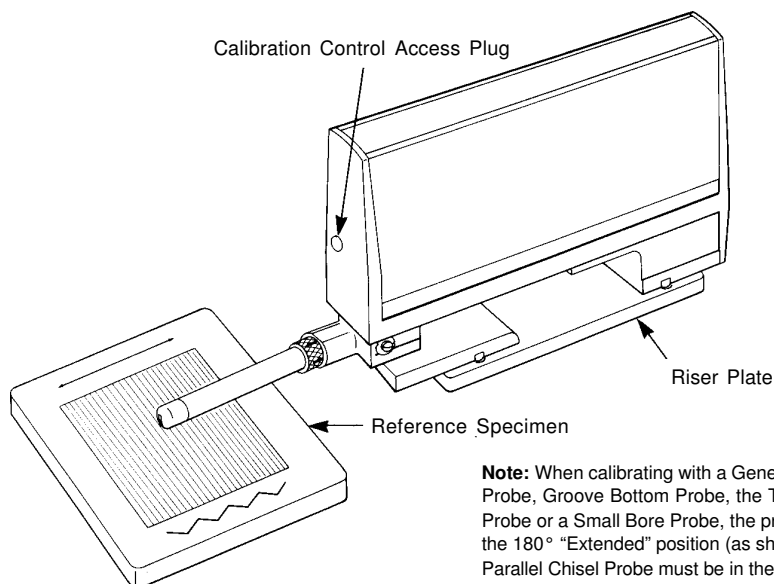
Calibration

The Pocket Surf gage is calibrated using the Reference Specimen and the EPL-1681 Riser Plate supplied with the PocketSurf Kit.

Set the Parameter Selection Switch to " R_a ". The other two parameters, R_{max} and R_z will automatically be calibrated when R_a is calibrated.

Set the Traverse Length Switch to position 5 because a full 5 cutoffs are required for proper calibration of the instrument.

1. To elevate the Pocket Surf base to the same height as the surface of the Reference Specimen, place the Pocket Surf unit on the Riser Plate so that the two "V's" on the bottom of the Pocket Surf Unit sit in the shallow recesses of the Riser Plate. Align the Reference Specimen so that the gage probe will traverse across it in the direction of the double-ended arrow. Take a reading from the center of the specimen.



Note: When calibrating with a General purpose Probe, Groove Bottom Probe, the Transverse Chisel Probe or a Small Bore Probe, the probe should be in the 180° "Extended" position (as shown above). The Parallel Chisel Probe must be in the 90° or 270° position and the setup rearranged so that the probe will traverse the Specimen in the direction of the arrow.

Calibration (continued)

If the reading is within $\pm 4\mu$ "/ $\pm 0,1\mu$ m of the value stated on the label on the bottom of the specimen*, calibration is within tolerance.

If the reading differs from the value stated on the label (or on a Report of Calibration certificate) by more than $\pm 4\mu$ "/ $\pm 0,1\mu$ m, take additional readings around the central area of the Reference Specimen. If the readings still differ by more than the allowable tolerance, recalibrate the PocketSurf unit following the procedure below.

2. Remove the Calibration Control Access Plug.
3. Using a jeweler's screwdriver, carefully adjust the Calibration Control.
 - clockwise to increase** the displayed R_a value, or
 - Counterclockwise to decrease** the displayed R_a value.
4. After adjusting the calibration control, re-measure the Reference Specimen to assure that the Pocket Surf unit is within the calibration tolerance.

5. Replace the Calibration Control Access Plug.

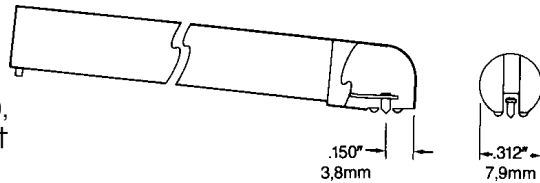
To check the condition of the probe stylus, a "double patch" Reference Specimen (optionally available) is recommended. A "double patch" Specimen can also be used for calibration of the gage; however, **be sure to use only the 125μ "/ 3.17μ m section of the specimen for calibration purposes**. Be careful not to use the other section of the "double patch" Specimen for calibration as it could introduce serious errors into the gage's roughness readings. The 20μ "/ 0.5 section is only to be used for checking probe stylus condition.

*Or on the Report of Calibration certificate which accompanies a "Certificate" Reference Specimen.

PocketSurf Probes

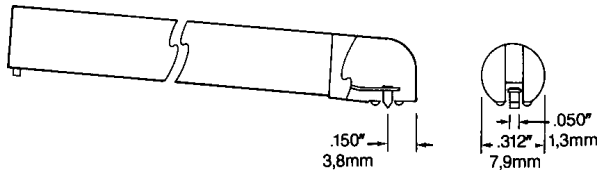
General Purpose Probe

(normally furnished) — For most surface roughness applications.
90° conical diamond stylus —
.0004"/10 μ m radius for EGH-1019,
.0002"/5 μ m radius for EGH-1026.†



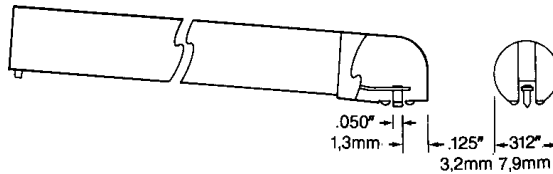
Transverse Chisel Probe

EGH-1020-W1 (optional) — For gaging sharp edges or small O.D.'s where the probe moves parallel to the axis of traverse.
90° sapphire chisel stylus,
.0004"/10 μ m radius.



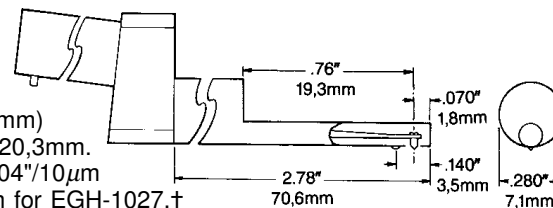
Parallel Chisel Probe

EGH-1020-W2 (optional) — For outside diameters smaller than 1/4"/6.35mm (placed in the EAS-2421 "V" Fixture), or measuring sharp edges with the probe in the 90° or 270° position (perpendicular to the axis of traverse).
90° sapphire chisel stylus,
.0004"/10 μ m radius.



Small Bore Probe (optional) —

For measuring small bores (min. inside diameter of 1/8"/3.2mm) up to a depth ("in-reach") of .80"/20.3mm.
90° conical diamond stylus —.0004"/10 μ m radius for EGH-1021, .0002"/5 μ m for EGH-1027.†



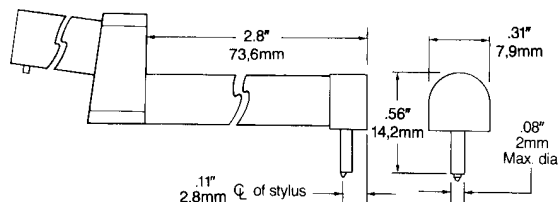
Small Bore Probes and the Groove Bottom Probe can only be used in the 180° "Extended" position with the Pocket Surf unit supported in a height stand or other suitable fixture; they are not intended to be used in any other position.

† Yellow dot at connector end signifies .0002"/5 μ m radius.

PocketSurf Probes (continued)

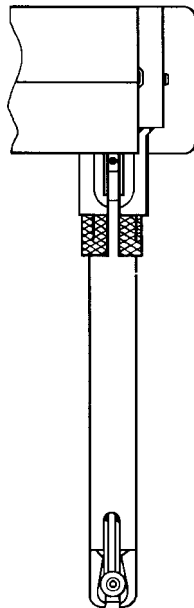
Groove Bottom Probe

EGH-1028 (optional) — For measuring the bottoms of “O” ring grooves, recesses and holes to depths of 1/4”/6,35mm. Also used for short lands and shoulders. 90° conical diamond stylus—.0004”/10μm radius.



The Groove Bottom Probe can only be used in the 180° “Extended” position with the Pocket Surf unit supported in a height stand or other suitable fixture; they are not intended to be used in any other position.

Probe Replacement



1. Turn the PocketSurf unit upside down and swivel the Probe to its 90° “Extended” position.
2. Loosen the knurled Locking Collar by turning it counterclockwise approximately 2 1/2 turns, until the access slot is aligned with the Probe Pin slot in the Probe Mounting Block. Grasping the probe by its body section, carefully withdraw the Probe from its Mounting Block and the knurled Locking Collar.

Do not grasp the probe by its skid and stylus end.

Caution: Do not remove the knurled Locking Collar from the Probe Mounting Block; loosen it only enough to slide the Probe out easily.

3. Reverse the procedure to install a Probe, aligning the Pin on the bottom of the probe body with the access slot in the Locking Collar.

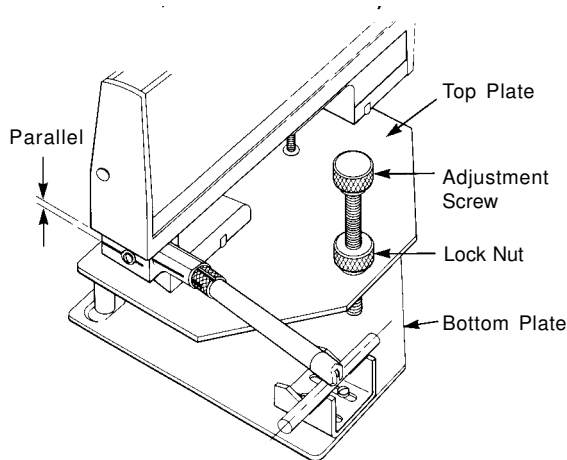
Note: Make sure that the Probe is fully inserted into the Probe Mounting Block (so that the electrical connector is completely engaged) before tightening the Locking Collar. **Finger tighten only.**

4. Check the gage’s calibration after changing Probes.

EAS-2421 VEE Fixture

The EAS 2421 Vee Fixture is used for measuring cylindrical (O.D.) parts up to approximately 1"/25mm in diameter that are too small to be accommodated in the gage's "Closed" probe position mode. The fixture consists of two parts — a Top Plate for holding the PocketSurf unit and a Bottom Plate with a Vee for holding the workpiece.

With the Vee Fixture, the probe is used in its 90° position. Either a General Purpose Probe or an optional Parallel Chisel Probe (which is recommended for cylindrical parts less than 1/4"/6,35mm in diameter) can be used.



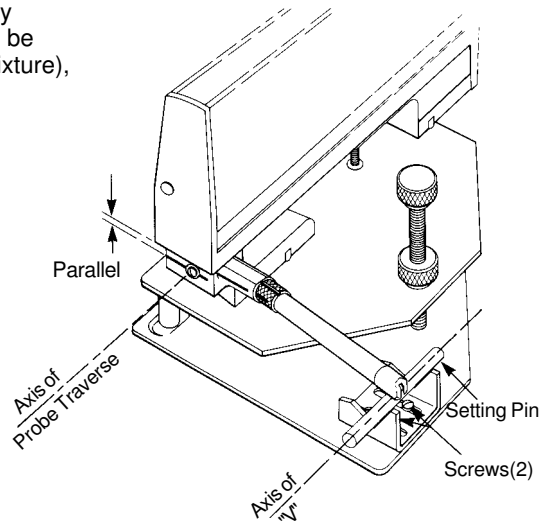
1. Mount the Pocket Surf unit, with the probe in its 90° position, to the fixture's Top Plate using the captive screw in the Top Plate. The screw mates with the tapped hole in the bottom of PocketSurf housing.
2. Place the cylindrical workpiece to be measured across the Vee on the Bottom Plate.
3. Position the Top Plate, with the Pocket Surf unit attached to it, on the fixture's Bottom Plate so that the Top Plate's two legs rest in the recesses in the Bottom Plate and the probe stylus and skid rest on the top of the workpiece.
4. Use the fixture's Adjustment Screw to raise or lower the Top Plate so that the Reference Line on the Probe Mounting Block is parallel to the bottom of the Pocket Surf housing (as outlined in the **Gage Operation** section). When correctly adjusted, tighten the knurled Lock Nut on the Adjustment Screw to secure the setup.

Vee Fixture Alignment

For accurate measurement with the Vee Fixture, the axis of the Vee must be aligned parallel to the axis of probe traverse and at the proper distance from the PocketSurf unit so that the probe skid and stylus travel precisely along the top ("crown" or "high spot") of the workpiece.

The Vee Fixture was set, at the factory, for correct parallelism and distance to accommodate its normal range of cylindrical workpiece sizes from 1/8"/13,2mm up to approximately 1"/25mm in diameter. If, for some reason, the factory setting has been disturbed, or another workpiece fixture is installed in place of the normally furnished Vee, its alignment must be reset. To adjust the Vee (or other fixture), use the following procedure.

1. Slightly loosen the two screws that secure the Vee to the fixture's Bottom Plate just enough so that the Vee can be repositioned with a little effort.
2. Place the 1/8"/3,2mm diameter Setting Pin, PS-145, in the Vee and proceed to measure it like a regular workpiece (steps 3 and 4 from previous page). Closely observe the path of the probe skid and stylus on the Setting Pin during the traverse.



Vee Fixture Alignment (continued)

3. Carefully adjust the position of the Vee so that the probe skid and stylus travel precisely along the top ("crown" or "high spot") of the Setting Pin throughout the entire traverse (measurement stroke). Make several passes to ensure that the Vee is properly adjusted, and that the probe skid and stylus do not wander off the top of the Setting Pin during the traverse.
4. Once the Vee is properly adjusted, remove the Top Plate (with the PocketSurf unit on it) from the Bottom Plate, and remove the Setting Pin from the Vee. Securely tighten the two screws in the bottom of the Vee. Be very careful not to disturb the position of the Vee in performing this step.
5. Place the Setting Pin back in the Vee and place the Top Plate (with the Pocket Surf unit) back on the Bottom Plate, with the probe skid and stylus resting on the top of the Setting Pin. Make two or three more traverses to ensure that proper alignment of the Vee was maintained after it was secured.

Alternate Vee's or other fixturing, fabricated by the user to accommodate specific workpieces, can be substituted for the normally furnished Vee.

Optional Accessories

EAS 2426 Universal Stand

The EAS 2426 Universal Stand is a heavy duty, fully adjustable, multiposition comparator stand for staging the PocketSurf unit in any position relative to the workpiece surface to be measured. The stand will accommodate workpieces ranging in height from flush with the stand's work surface up to 8.4"/215mm high, and can be used with or without additional workpiece fixturing.

- ① Column Clamp — to adjust height (Elevation) and radial position around column (thru 360°)
- ② Tilt — to adjust PocketSurf bracket in plane parallel to column (thru 360°)
- ③ Tilt — to adjust PocketSurf bracket in plane perpendicular to column (thru 90°)

The probe can be in its 90°, 180° "Extended" or 270° positions. The stand's 360° Column Clamp and Bracket can be positioned anywhere vertically and radially on the column, permitting the stand to be used as a height stand on a surface plate or other suitable work surface to measure workpieces positioned adjacent to it.



A typical application using the Universal Stand. Note that the bracket with the PocketSurf unit is tilted, using adjustment ②, to align with the tapered workpiece surface being measured.

Optional Accessories

EAS 2426 Universal Stand (cont'd)

1. Mount the Pocket Surf unit in the bracket on the Stand using the captive screw in the base of the bracket. The screw mates with the tapped hole in the bottom of the Pocket Surf housing. Tighten the screw using a screwdriver or coin; do not overtighten.
2. Using the appropriate controls, adjust the setup so that the base of the PocketSurf bracket (and the bottom of the Pocket Surf housing) is parallel to the surface to be measured and the probe skid and stylus are barely in contact with surface. Use the Fine Adjustment to make the black, scribed Reference Line on the Probe Mounting Block parallel to the bottom of the Pocket Surf housing (as outlined in the **Gage Operation** section).
3. Once the setup is correctly adjusted, and the probe is properly positioned on the workpiece surface, gently press and release the "Start" button on the Pocket Surf unit to make the measurement.

EAS-2567 Column Clamp & Bracket

The EAS-2567 Column Clamp & Bracket is the same Column Clamp and Bracket assembly furnished with the EAS-2426 Universal Stand, and can be used on any height stand or comparator stand having a 1¼"/32mm diameter column.

Follow the same setup/adjustment instructions as for the EAS-2426 Universal Stand.

Do not place the probe in the "closed" position with the Pocket Surf mounted on the EAS-2426 Universal Stand. Damage to the probe stylus will result.

Optional Accessories

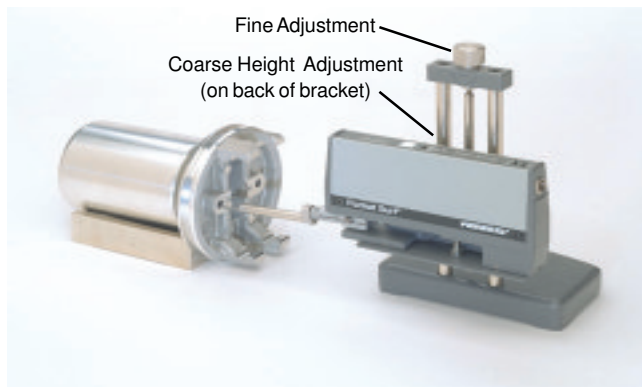
EAS-2496 Height Stand

The EAS-2496 Height Stand is intended to be used on a surface plate or other suitably flat surface to measure workpiece surfaces ranging in height (elevation) from flush with the work surface to a maximum height of approximately 4 3/8"/110mm. The PocketSurf probe can be in either its 90° or 180° "Extended" position.

1. Mount the PocketSurf unit in the bracket on the Height Stand using the captive screw in the base of the bracket. The screw mates with the tapped hole in the bottom of the PocketSurf housing. Tighten the screw using a screwdriver or coin; **do not overtighten**.
2. Position the Height Stand so that the probe is above the workpiece surface to be measured. Use the Coarse Height Adjustment to bring the probe skid and stylus barely in contact with the surface. Use the Fine Adjustment to make the black, scribed Reference Line on the Probe Mounting Block parallel to the bottom of the PocketSurf housing (as outlined in the **Gage Operation** section).
3. Once the setup is correctly adjusted, and the probe is properly positioned on the workpiece surface, gently press and release the "Start" button on the PocketSurf unit to make the measurement.

Do not place the probe in the "closed" position with the PocketSurf mounted on the EAS-2496 Height Stand. Damage to the probe stylus will result.

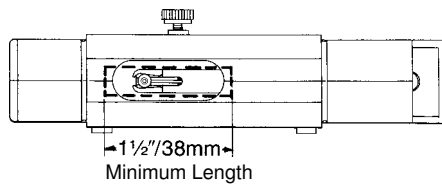
Photograph shows typical application using Small Bore Probe.



Optional Accessories

EAS-2584 Bottom Plate

When measuring workpiece surfaces with the Pocket Surf probe in the “Closed” position, the EAS-2584 Bottom Plate will accommodate cylindrical workpieces too short (less than $3\frac{1}{2}$ "/89mm long) to span the “V’s” on the bottom of the Pocket Surf housing.



The Bottom Plate accommodates cylindrical workpieces from $\frac{1}{4}$ "/6,35mm diameter up to $1\frac{1}{2}$ "/38mm long — long enough to span the slot lengthwise and sit securely in the “V” of the Bottom Plate.

To install the Bottom Plate, remove the Protective Cover from the Pocket Surf unit and turn the Pocket Surf unit upside down. Loosen the Clamping Screw on the side of the Bottom Plate and position the Bottom Plate over the base of the Pocket Surf unit between the two “V’s”. Tighten the Clamping Screw **finger tight only; do not overtighten.**

Maintenance & Troubleshooting

Protection & Storage

To protect the gage when not in use, always return the probe to its "Closed" position and replace the Protective Cover on the Pocket Surf unit. Also, when not in use, always keep the Pocket Surf unit and its accessories in the fitted carrying case.

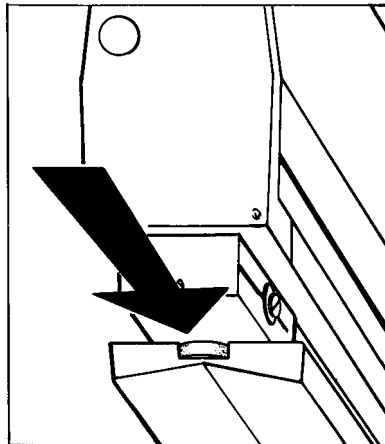
Cleaning

To clean the Pocket Surf unit, use a soft, lint free cloth moistened with a mild, non abrasive, liquid or foam cleaning agent. **Do not spray any liquid or foam cleaners directly onto the Pocket Surf unit. Do not use petroleum-based solvents or cleaning fluids.**

Using a magnifier, periodically inspect the probe skid and stylus area for dust, dirt or other contamination. To clean the probe skid and stylus, use a soft (camel's hair), artist's brush moistened with denatured alcohol. Point the skid and stylus end of the probe downwards to the floor to permit dirt to flow out.

Gently brush the ruby skid and diamond stylus tip to remove any foreign matter. Clean the brush well in denatured alcohol and repeat the cleaning process until all contamination has been removed. **Do not use isopropyl ("rubbing") alcohol.**

Using denatured alcohol in a "squeeze" bottle with a small nozzle opening, carefully bathe the bearing slot beneath the Probe Mounting Block to remove any dust, dirt or other contamination. To prevent damage to the self lubricating bearing, **do not use anything sharp, pointed or hard to scrape foreign matter from the slot or the bearing. Do not lubricate.**



Maintenance and Troubleshooting (continued)

Error Messages

- E1 — Motor did not start.
- E2 — Motor failed to accelerate to proper operating speed.
- E3 — Motor failed to maintain proper operating speed.
- E4 — Excessive traverse length.
- E5L — Traverse Length 1 or 3 selected for R_z .

If error message “E5L” is displayed on the digital readout, it indicates that the Traverse Length Switch is set for positions 1 or 3 and the Parameter Selection Switch is set for R_z . Due to DIN standards, R_z can only be calculated on the 5 cutoff position.

If error message “E1” or “E4” is displayed on the digital readout, it usually indicates an internal electrical or mechanical malfunction requiring repair; see the **Repairs** section on page 26.

If error message “E2” or “E3” is displayed on the digital readout, it usually indicates that a malfunction has occurred in the probe traverse which prevented or interfered with normal movement. One or more of the following conditions may be the cause:

1. An obstruction or excessive pressure on the probe or the Probe Holding Block.
2. Dust, dirt or other contamination around the probe skid and stylus, and/or in and around the bearing and its slot beneath the Probe Holding Block.
3. A weak battery (but not weak enough to cause the “low” battery signal to be displayed on the readout).

To remedy these conditions:

1. Make sure the workpiece is clean and dry, and the surface to be measured is free from gross defects.
2. Make sure the gage and workpiece setup is properly adjusted, with the surface to be measured at approximately the same elevation as the base of the PocketSurf unit and parallel to it, and the Reference Line on the Probe Mounting Block parallel to the bottom edge of the PocketSurf housing (as outlined in the **Gage Operation** section on page 9).

Maintenance & Troubleshooting (continued)

3. Clean the probe skid and stylus area.
4. Clean the bearing slot beneath the Probe Mounting Block.
5. Replace the battery. Alkaline batteries are only to be used.

Repairs

If none of the above remedies work, and an error message persists — particularly “E1” or “E4”, contact Mahr Federal Inc. Service Department for assistance and repair information.

Do not disassemble the Pocket Surf unit or attempt any further remedies or repairs.

Digital Output

The Pocket Surf digital output feature permits measurement results to be transmitted to an external device such as a printer, computer or data collection system.

The connector in the Pocket Surf unit is a Switchcraft® #TB3M receptacle with three pins. Many manufacturers of data collection equipment can supply the appropriate connectors and cables to interface to their devices. For users who wish to make their own cable, the mating connector is a Switchcraft® #TA3FL (or equivalent). Recommended maximum cable length is 12"/300mm; use of longer cables may result in some degree of transmission loss.

The PocketSurf output is a TTL level, ASCII data stream of 16 characters at a baud rate of 1200 bps. The characters are asynchronous and consist of 10 bits: 1 Start Bit — 7 Data Bits — (No Parity Bit) — 2 Stop Bits. No "handshaking" or control characters are used.

For further information and specifications concerning the Pocket Surf digital output, contact the Surface Finish Marketing Group at Mahr Federal Inc. in Providence. Request "Pocket Surf Digital Output Data Sheet A-548".

Also available:

EAS-2739 Vee Adaptor
EAS-2839 Bore Attachment
(see separate instructions)

Shipping address

for returning the Pocket Surf for repair:

Mahr Federal Inc.
1139 Eddy Street
Providence, RI 02905, U.S.A.
Att: Repair Department



Mahr Federal Inc.
1144 Eddy Street
Providence, RI 02905 U.S.A.
Phone: + 1 401/784-3100
Fax: +1 401/784-3246
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