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TRIMOS

mini-VERTICAL

ELECTRONIC

Mode d'emploi

Gebrauchsanweisung

Instructions for use

Istruzioni d'uso

TRIMOS SA

Fabrique d'instruments de mesure de précision

5, av. Longemalle

CH-1020 Renens (Suisse)

Tél. 021/636 06 05 - Télex 454 054 trim - Fax 021/635 93 57

INSTRUCTIONS FOR USE

1. INSTRUMENT CONSTRUCTION

A. Cast iron base of functional design (hammered finish lacquer coating). Alternatively a granite base can be supplied.
B. Measuring column, of hard chromed steel and precision ground.
C. Guide bar.
D. Scale, wear resistant. Patented **SYLVAC** measuring system.
E. Measuring carriage, movement is axially controlled by ball races, contains the **SYLVAC** electronic display unit (easily interchangeable), handwheel and probe holder attachment.
F. Display (LCD digital display, height 8 mm/.315").
G. **«ON/OFF»** switch.
H. Press button key for **«mm/inch»** conversion (true metric/inch conversion).
I. **«O»**, zero setting of the digital display at any position of the measuring carriage.
K. Preselection press button key. By holding this button the displayed value counts upwards (plus).
L. Preselection press button key. By holding this button the displayed value counts downwards (minus).
M. Battery compartment, cover fixed by 2 screws.
N. Data output, serial (for Interface RS 232).
O. Locking knob (to lock the measuring carriage during the scribing process).
P. Handwheel with crank for easy displacement of the measuring carriage.
R. Pre-load ring for setting a constant measuring pressure in either direction.
S. Locking lever for fine ajustment.
T. Fine ajustment screw.
U. Knurled screws for locking the probe holder.
V. Adjustable probe holder (TVM 1) with connector (TVM 1.1) for probes and scriber.
W. Connector (TVM 1.1) for probes, having 8 mm location bore.
X. Probes (interchangeable).
Y. Locking screw to fix the counter weight during transport.
Z. Four screws, fixing the electronic display unit.

2. SPECIFICATIONS

	TVM 300/300 G	TVM 600/600 G
Measuring range	: 0 - 320 mm	0 - 620 mm
Resolution	: 0,01 mm / .0005"	0,01 mm / .0005"
Measuring accuracy over the complete range, max. error	: 0,03 mm	0,04 mm
Measuring pressure (under pre-load) approx.	: 3 N (300 grams)	3 N (300 grams)
Max. displacement velocity of measuring carriage	: 1 m/sec. - 40"/sec.	1m/sec. - 40"/sec.

Measuring system	: built-in **SYLVAC** measuring system, patented	built-in **SYLVAC** measuring system, patented
Display	: LCD digital display height 8 mm / .315"	LCD digital display height 8 mm / .315"
Power supply (battery, Si-Oxyd)	: 1 × 1,5 V	1 × 1,5 V
Battery life	: approx. 8000 operational hours	approx. 8000 operational hours
Dimensions		
TVM with Cast-Iron base:		
total height	: 513 mm / 20.2"	813 mm / 32"
size	: 180 × 102 mm 7.08" × 4.02"	200 × 140 mm 7.87" × 5.5"
weight	: 6,2 kg / 13.67 lbs	10,5 kg / 23.15 lbs
TVM with Granite base:		
total height	: 558 mm / 21.97"	858 mm / 33.78"
size	: 200 × 300 mm 7.87" × 11.8"	200 × 300 mm 7.87" × 11.8"
surface accuracy	: grade A (5µm / .0002")	grade A (5µm / .0002")
weight	: 14 kg / 30.87 lbs	18,3 kg / 40.4 lbs

3. DELIVERY

The **TRIMOS** mini-VERTICAL with digital read-out is supplied with the following standard equipment:

- Main probe holder, length 150 mm / 5.9" (TVM 1) with intermediate connector (TVM 1.1) having 8 mm / .315" bore for location of probes, lever dial indicators etc, and probe ∅ 8 mm / .315" (TVM 2).
- One battery.
- Protection cover.
- Instructions for use.
- Test and guarantee certificate.

The instument is supplied in a specially designed shockproof box and protected against dirt and dust by a protective cover. Whenever the instrument is transported, the original packing should be used when possible.
During each transit the counter weight should be fixed by means of the locking screw (Y).

ATTENTION: NEVER TURN THE INSTRUMENT UP-SIDE DOWN!

INSTRUCTIONS FOR USE

4. SETTING UP

- Unpack the instrument, lay it down in horizontal position.
  NEVER TURN THE INSTRUMENT UP-SIDE DOWN !
- Release the locking screw (Y) under the base.
- Put the instrument in vertical position.
- Clean the instrument, lubricate the measuring column very lightly with fine oil. (Do not lubricate the scale !)
- Fix corresponding probe holder (V) and probe (X), lock it by means of the two knurled screws (U).
- Unlock the measuring carriage (E) by turning the locking knob (O) counter clockwise.
- Remove the rubber collar.
- Switch on the instrument (ON).
- Check the movement of the measuring carriage by turning the crank of the handwheel (P) and check that all digits light up as soon as the measuring carriage is slightly displaced.

5. MEASURING

NOTE: Do not operate the instrument if inclined from the horizontal plane.

- Free movement of measuring carriage.
- Measuring system metric or inch can be selected.

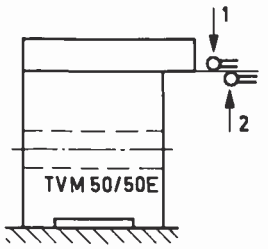
5.1 MEASURING WITH FIXED PROBES.

heights, gaps, thicknesses, diameters (I.D. or O.D.) etc.

These measurements are carried out by activating **THE CONSTANT MEASURING PRESSURE:**

- By turning the pre-load ring (R) counter clockwise to its stop: measuring pressure is set in a downwards direction.
- By turning the pre-load ring (R) clockwise to its stop: measuring pressure is set in an upwards direction.
- With the pre-load ring in neutral position: the measuring carriage is in a free state, i.e. no pressure applied.

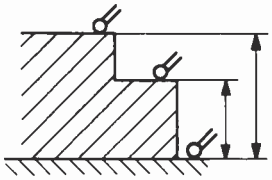
Most of the measurements require the **DETERMINATION OF THE PROBE CONSTANT** (dimension of ball probe, deflections of its shaft caused by the setting of the measuring pressure).



- Set probe on surface 1.
- Set measuring pressure in a downwards direction.
- Press zero button key.
- Remove measuring pressure.
- Set probe from bottom on surface 2.
- Set measuring pressure in an upwards direction.
- The probe constant is displayed.
- Remove measuring pressure.

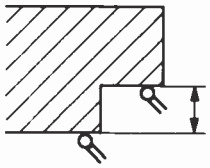
MEASURING OPERATIONS

5.1.1



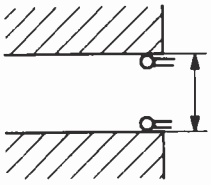
- Set the probe on the base (surface plate or gauge block).
- Set measuring pressure in a downwards direction.
- Press zero button key.
- Remove measuring pressure.
- Set probe on the next surface.
- Set measuring pressure in a downwards direction.
- Value is displayed.
- etc.

5.1.2



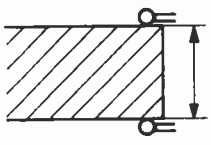
- Set probe from the bottom on surface.
- Set measuring pressure in an upwards direction.
- Press zero button key.
- Remove measuring pressure.
- Set probe from the bottom on the next surface.
- Set measuring pressure in an upwards direction.
- Value is displayed.

5.1.3



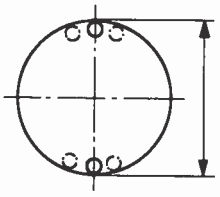
- Set probe on lower surface.
- Set measuring pressure in a downwards direction.
- Press zero button key.
- Remove measuring pressure.
- Set probe on upper surface.
- Set measuring pressure in an upwards direction.
- Value is displayed.
  THE ALREADY DETERMINED PROBE CONSTANT MUST BE ADDED

5.1.4



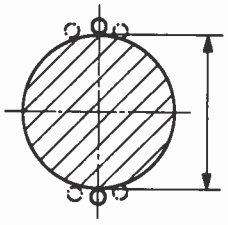
- Set probe from the bottom on surface.
- Set measuring pressure in an upwards direction.
- Press zero button key.
- Remove measuring pressure.
- Set probe from above on the surface.
- Set measuring pressure in a downwards direction.
- Value is displayed.
  THE ALREADY DETERMINED PROBE CONSTANT MUST BE SUBTRACTED

5.1.5



- Set probe near the lowest point.
- Set measuring pressure in a downwards direction.
- Find the lowest point by displacement through the vertical line.
- Press the zero button key.
- Remove measuring pressure.
- Set the probe in direct vertical line on the highest point.
- Set measuring pressure in an upwards direction.
- Value is displayed.
  THE ALREADY DETERMINED PROBE CONSTANT MUST BE ADDED

5.1.6

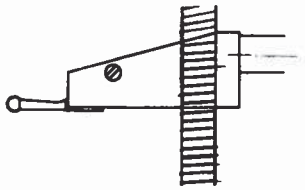


- Set probe near the lowest point.
- Set measuring pressure in an upwards direction.
- Find the lowest point by displacement through the vertical line.
- Press zero button key.
- Remove measuring pressure.
- Set probe near the highest point.
- Set measuring pressure in an upwards direction.
- Find the highest point.
- Value is displayed.
  THE ALREADY DETERMINED PROBE CONSTANT MUST BE SUBTRACTED

5.2 MEASURING WITH BI-DIRECTIONAL PROBE

heights, gaps, thicknesses, diameters (I.D. or O.D.) etc.

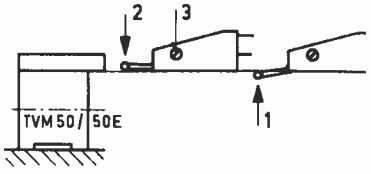
The bi-directional probe TVM 4 is mounted in place of the probe-holder (V) and fixed by means of the two knurled screws (U).



ATTENTION: The probe body must be fixed to allow true vertical movement of the probe. Otherwise incorrect measuring would result.

- Set the lateral part of the probe body against a square surface for parallel adjustment.
- Tighten the two knurled screws (U).

ADJUSTMENT OF THE BI-DIRECTIONAL PROBE:



- Set the probe first from below onto surface 1. Run through the free travel.
- Set measuring pressure in an upwards direction.
- Press zero button key.
- Remove measuring pressure.
- Set probe from above onto surface 2.
- Set measuring pressure in a downwards direction.
- Value is displayed.

If this value does not correspond to «zero», turn the adjustment screw 3 until the display shows «zero» (000.00).

— Repeat the measurement.

NOTE: By measuring from the bottom upwards the bi-directional probe shows a free travel which corresponds to the diameter of the probe ball.

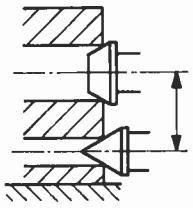
It is necessary to pass through the free travel before setting the measuring pressure.

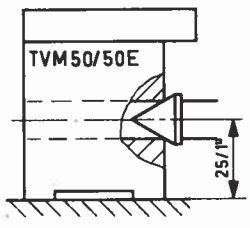
MEASURING OPERATIONS

— For measurements of height, proceed as described in pos. 5.1.1 and 5.1.2.

— For measurement of gaps, thicknesses, diameters proceed as described in pos. 5.1.3 to 5.1.6

NOTE: THERE IS NO ADDING OR SUBTRACTING OF THE PROBE CONSTANT WHEN MEASURING WITH THE BI-DIRECTIONAL PROBE, as opposed to measurements with fixed probes. The probe constant is compensated by the free travel of the ball probe which corresponds to the diameter of the ball.





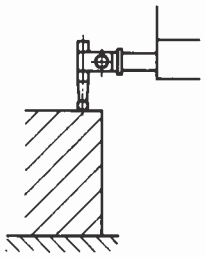
5.3 MEASURING OF CENTERLINE DISTANCES WITH CENTERING CONES

The cone holder is mounted in place of the probe holder (V) and fixed by means of the two knurled screws (U).

— The measuring carriage moves freely, measuring pressure is not required.
— Select the appropriate cone and locate in holder.
— Set the cone into the reference bore (or into the bore of the setting gauge TVM 50 / TVM 50 E).
— Press zero button key or preselection button key.
— Set cone into the next bore.
— Value is dislayed.

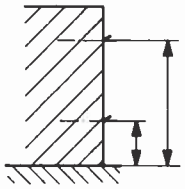
(Interchange cones, according to bore sizes.)

5.4 CHECKING OF PARALLELISM



- Mount appropriate ball probe.
- Set probe on the surface to be checked.
- Set measuring pressure in a downwards direction.
- Press zero button key.
- Pass over the surface.
- Value is displayed.

5.5 MARKING OUT WITH SCRIBER



- Mount scriber.
- Set zero on the base (or on a known value).
- Move the measuring carriage until the approximate value is displayed.
- Lock the measuring carriage by means of the locking lever (S).
- Set the exact value (fine adjustment screw T).
- Tighten firmly the locking knob (O).
- Marking.

6. MAINTENANCE

- The measuring column (B) and scale (D) should be kept clean. Lubricate the measuring column very lightly with fine oil (viscosity 20). Do not lubricate the scale.
- If the instrument is not in use, switch it **«OFF»**.
- When moving the instrument from one workshop location to another carry it only in the vertical position. **NEVER INCLINE THE INSTRUMENT BEYOND THE HORIZONTAL.**

6.1 REPLACEMENT OF THE BATTERY

becomes necessary when the display is flickering. This indicates low power.

- Remove the cover of the battery compartment (two screws).
- Replace the battery (type Si-Oxyd, 1,5 V).
- Place the cover in position and replace the screws.

Battery reference guide (1,5 V)

- UCAR 357 (Union Carbide)
  Eveready 357 (Union Carbide)
  National WL 14
  Seiko SB-B9
  Mallory D 357 (10L 14)
  Bulova 228
  Timex Typ J

6.2 EXCHANGING THE ELECTRONIC DISPLAY UNIT

- Remove the four screws (Z).
- Remove the electronic display unit.
- Remove the protective covering from the electronic grid of the new electronic unit.
- Place the new electronic unit in position.
- Replace the four screws and tighten them uniformly.
- If the instrument is not in use, switch it **«OFF»**.

7. TRANSPORT

If possible, use the original packing.

- Place the instrument in a horizontal position.
  NEVER INCLINE IT MORE!
- Lock the counter-weight by means of the screw (Y) under the base.
- Lock the measuring carriage by means of the locking knob (O).
- Remove the main probe holder (V).
- Protect the instrument against dirt and dust using a protective cover.
- Ensure firm location in packing material before transportation.

8. REPAIRS

All parts of the instrument are interchangeable. Your **TRIMOS** agent has a stock of spare parts or will be able to supply them at short notice. Please contact him in respect of operational problems.
Repairs can only be considered if the instrument is sent to us in clean condition and packed according to our instructions.

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