

- A. Operation of MiniTest 100
- B. Operation of MiniTest 300
- C. Initializing Functions
- D. Data Transfer
- E. Error Messages

Operating Instructions for

**MiniTest 100F, 100N, 100FN
MiniTest 300F, 300N, 300FN**

The instruments comply with
DIN 50981, 50982, 50984

ISO 2178,2360

ASTM B499, B244

BS5411

SS184160

Application

The gauges are designed for quick, accurate and non-destructive coating thickness measurement. The principle of magnetic induction (F) is suitable for measuring all non-magnetic coatings such as paint, enamel, chrome, copper and zinc applied to commercial quality steel (St33...St 60). The eddy current principle (N) allows measurement of all insulating coatings such as paint, plastics and anodizing applied to non-ferrous metals.

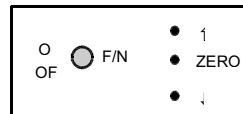
Supply Schedule

- Instrument including interface
- Plastics case
- Zero standard(s)
- 2 Coating thickness standards (foils)
- Photo battery
- Operating instructions in German/English

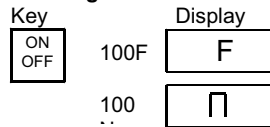
Optional Accessories

- Rubber case
- Leather carrying case
- MiniPrint data printer including battery charger and connecting cable
- MiniTest cable for connecting PC (9 or 25 pin) incl. data transfer program

A. Operation of MiniTest 100F, 100N, 100FN

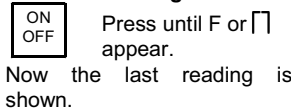


1. Switching On 100F or 100N



Now the last reading is shown.

2. Switching On 100FN

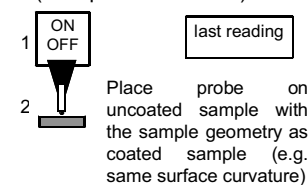


Now the last reading is shown.

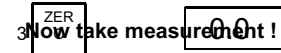
3. Switching Off



4. Zero Calibration (One-point calibration)

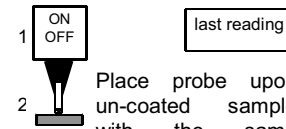


Place probe on uncoated sample with the sample geometry as coated sample (e.g. same surface curvature)

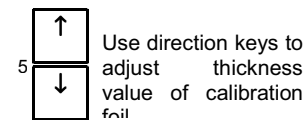
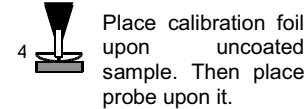
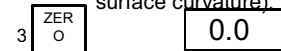


Note: Repeat steps 2. and 3. to evaluate mean of zero calibration.

5. Two-Point Calibration



Place probe upon un-coated sample with the same geometry as coated sample (e.g. same surface curvature)



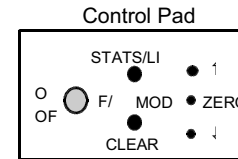
Now take measurement!

Note:

Repeat steps 4. and 5. to calculate mean of calibration.

Even if thickness value is displayed immediately, direction keys must be pressed, for instance 1 digit up and 1 digit down.

B. Operation of MiniTest 300F, 300N, 300FN



1. Basic Calibration

Switching on/off, one-point and two-point calibration are the same procedures as for MiniTest 100F, 100N, 100FN.

2. Statistical Evaluation

The MiniTest 300 line features statistical evaluation of measuring series. 3 Modes are available for using 3 different kinds of statistics and storage functions.

Mode -1-:
Single value statistics of 1 measuring series with 60 single values in memory.

Mode -2 -:
Block value statistics taken from 30 blocks max.

Mode -3 -:
Single value statistics taken from 12 measuring series max.

3. Statistics Modes

Mode -1 -
Single value statistics taken from 1 measuring series.

Statistics can be evaluated from a maximum of 999 readings.

Memory content in *Mode -1 -*

Single values

Statistical values

x_1, \dots, x_{60} = max. 60 single values can be stored

n = number of readings (999 max)

\bar{x} = mean value

s = standard deviation

x_{\max} = highest single value

x_{\min} = lowest single value

Mode -2 -

Block value statistics of 30 blocks (or groups) max.

In this mode, 5 readings are grouped in one block. After 5 readings, a sound beeps (-žž). From each block, the 5th reading is shown and mean and standard deviation are calculated and stored.

On addition, from all mean values of a block, the block value statistics are evaluated and stored.

Storage content in *Mode -2 -*
Single value statistics

$n = 5^*$

n = number of readings per block*

\bar{x} = mean value of block

s = standard deviation

* factory setting of the gauge: $n = 5$. Other settings possible from 5...32.

Block value statistics

m = number of blocks (30 max.)

\bar{x} = mean of mean block values

\bar{s} = mean of standard deviation

\bar{x}_{\max} = highest single mean value

\bar{x}_{\min} = lowest single mean value

Mode -3 -

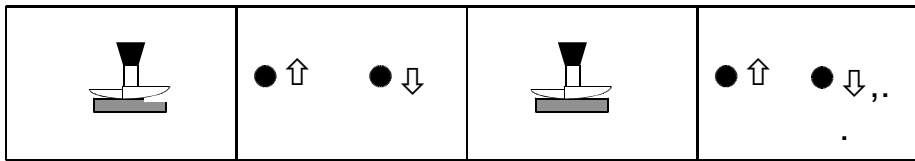
Single value statistics of 12 measuring series max.

From 12 measuring series max, statistics are evaluated and stored. For statistics, a maximum of 999 readings can be used per measuring series.

Memory content in *Mode -3 -*

Single value statistics

$n_1, \bar{x}_1, s_1, x_{\max 1}, x_{\min 1}$
$n_2, \bar{x}_2, s_2, x_{\max 2}, x_{\min 2}$
$n_{12}, \bar{x}_{12}, s_{12}, x_{\max 12}, x_{\min 12}$



4 Mode Switch

Switching from one mode to another always results in deletion of all readings in memory.

Switching from magnetic principle (F) to eddy current principle (N) and vice versa has the same effect as changing mode: deletion of all measuring values.



Press continuously until required mode 1, 2 or 3 appears.



Press briefly for the next mode number to appear. At the same time, a long beep sounds.

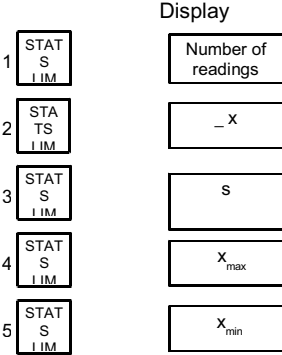
Even after switch-off, the selected mode remains valid. Now follow steps A.4, A.5 or A.6 to carry out calibration and measurement.

5 Taking Measurement in 3 Different Modes

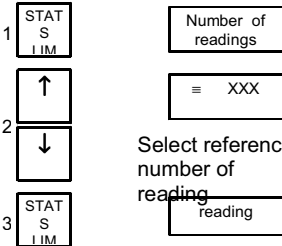
5.1 Taking Measurement in Mode - 1 -

1. Take measurements (After each measurement, lift probe from sample for approx. 1 sec.)

2. Display of statistics

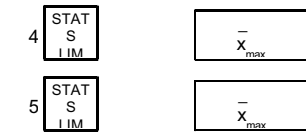
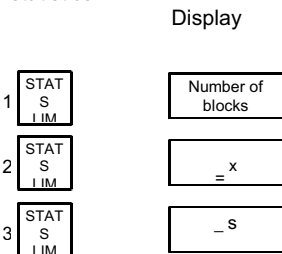


3. Display of single values

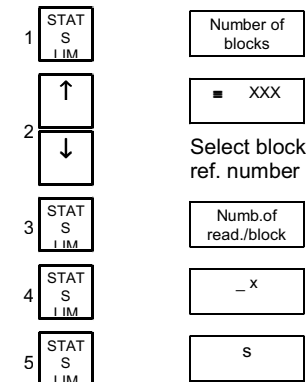


5.2 Taking Measurement in Mode - 2 -

- Take measurement blocks.
- Display of block value statistics:

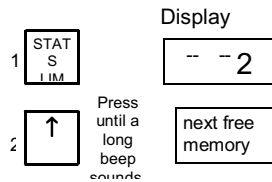


3. Display of statistical values per block

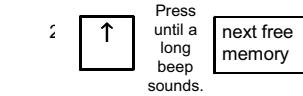
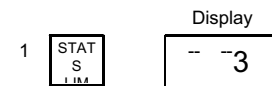


5.3 Taking Measurement in Mode - 3 -

- Take first measuring series. Then proceed as follows:

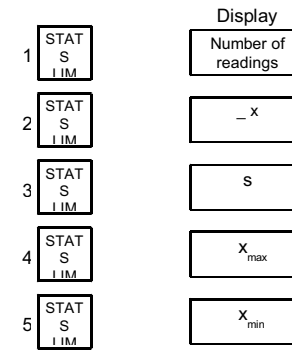


- Take second measuring series. Then proceed as follows:

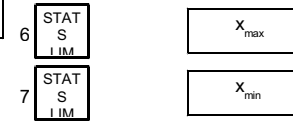
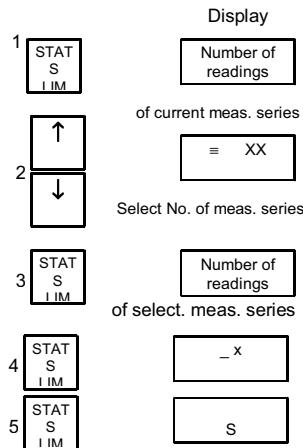


For taking measuring series 3. to 12. proceed as above.

3. Display of statistics of current measuring series



4. Display of statistics of any measuring series



6. Deletion

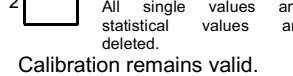
6.1 Deletion of last reading



6.2 Deletion in Mode - 1 -



6.3 Deletion in Mode - 2 -



6.4 Deletion in Mode - 3 -

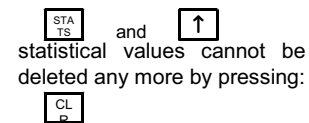


Calibration remains valid.

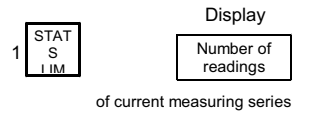
Calibration remains valid.

6.4 Deletion in Mode - 3 -

Only values of current memory in use can be deleted. As soon as a measuring series memory is closed by pressing:



They can only be deleted by carrying out total deletion according to step 5.



Calibration remains valid.

Calibration remains valid.

6.5 Total Deletion

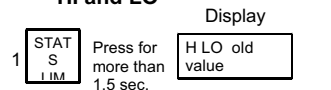
Switching from one mode to another results in deletion of all values in memory. Standard calibration for measuring on flat surfaces is activated.

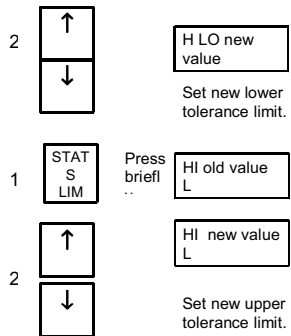
Changing measuring principle (F ↔ N) also results in total deletion.

7. Setting Tolerance Limits (LIM)

If tolerance limits have been set, exceeding such tolerances are signalled by an alarm tone. When exceeding upper tolerance limit (HI), 4 alarm tones will sound, when exceeding lower tolerance limit (LO), 3 alarm tones will sound.

7.1 Setting Tolerance Limits HI and LO





Settings are kept in memory also after switch off. Reset can be achieved by repeating the relevant key combination.

Setting and resetting initializing functions:

- Gauge is switched off.
- Select relevant key (1. to 4.) and press continuously. Then press ON-key and keep on pressing both keys for about 3 sec. until a signal sounds.

- Switching from Metric mode to Imperial mode.



- Switching from single measurement to continuous mode.



- Activating print-out of statistical values. (Only available with MiniTest 300)



- Setting switch off-time from 15 sec to 2 min. (MiniTest 300 only)



D. Data Transfer to Data Printer MiniPrint 4100 or to a PC.

- MiniPrint 4100.

Use connecting cable supplied with the gauge to connect MiniTest gauge and MiniPrint data Printer.

All data shown on the display are printed out including serial number, block reference number, mean value, standard deviation etc.

For printing out readings along with statistical values, proceed as described under C. to activate the relevant initializing function.

- Personal Computer.

The built-in interface at the rear of gauge allows data transfer to a PC. This requires use of a suitable connecting cable. Interface configuration: 1200 Baud, no parity, 8 data bits, 1 stop bit.

An Elektro-Physik data transfer program allows saving data under ASCII file. A separate description of interface can be provided on request.

E. Error Messages

- E01 Defective probe
- E04 Probe or connections for measurement instable
- E05 When switching on, probe must be kept from metal in a distance of at least 5 cm

E10 Measuring value out of measuring range

E11 Measuring values not sufficiently constant

E14 Empty memory (refer to paragraph below)

E15 ZERO-Calibration not possible

BAT Battery failure

Note:

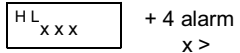
(only refers to MiniTest 300)
If during battery change, power supply is interrupted not longer than 20 sec, all data are kept in memory. If, however, battery change takes more than 20 sec, memory content might be deleted. Error message **E14** appears and gauge switches automatically to statistics mode -1- to be ready for operation.

Technical specification subject to change without notice.

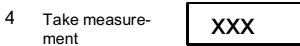
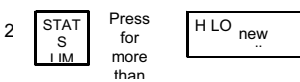
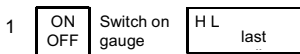
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7.2 Using Tolerance Limits

Take measurement as follows:



7.3 Deactivating Tolerances



C. Initializing

During switch on, functions described below can be set.

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