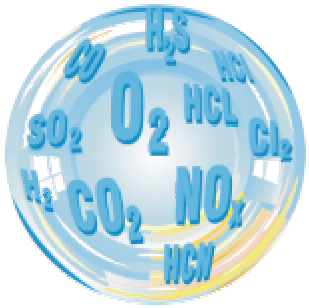


PRECISION PRESSURE METER

maPress

Operating manual

Ver. 0.29

12/2004

madur®

E L E C T R O N I C S

1 CONTENTS

2 MAINTENANCE

Batteries
The maPress uses 4 batteries size AA (1.5 V)

If the instrument is not in use for some time, then the battery will nevertheless be consumed since certain circuits are permanently in use. For this reason the state of charge of the batteries should be checked monthly at least.

Errors
The instrument has a self-check function. Should an error occur it will be shown on the screen ***CONTROL LIST***.

3 OPERATION

3.1 Use of the keyboard

Description of the keys

F1	- Left function key. Carries out the function shown on the display whilst the instrument is switched on.
F3	- Right function key. Carries out the function shown on the display whilst the instrument is switched on.
I	- Centre function key. Switches the instrument on. Carries out the function shown on the display when the instrument is switched on.
🖶	- Starts a print-out.
◉	- Switches the instrument off.
⬅	- On a results screen calls the option ***GRAPHIC***, in text mode shifts the cursor to the left.
➡	- On a results screen calls the option ***MENU***, in text mode shifts the cursor to the right.
⬆	- Moves the cursor upwards in a menu. In text mode increases the value. On a results screen chooses the next screen.
⬇	- Moves the cursor downwards in a menu. In text mode decreases the value. On a results screen chooses the next screen. Entering numbers

Numbers
Numbers are entered as follows:

⬅ und ➡	- move the cursor backwards or forwards to the digit to be changed.
⬆ und ⬇	- increases/decreases the value of the marked digit.

3.2 Basic operation

Getting started

Connect the temperature, pressure or humidity probe to the instrument.

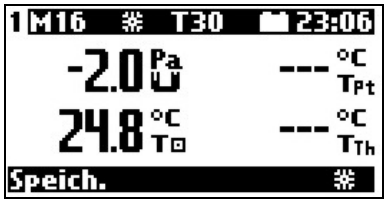
Zero calibration

The instrument performs a zero calibration of the pressure sensor immediately after being switched on.

This process is essential for the accuracy of the pressure measurements.

It is important not to move the instrument during the pressure measurement, especially when high resolution is used. Changes of position will lead to a drift of the zero point.

Results screens



The function keys ***Data*** or ***Esc*** will automatically call up the results screen from any point. Here is an example of a results screen.

Explanation:

The Info bar

The Info bar is at the top of the screen. The signs have the following meanings:

- The number **1** stands for the first results screen. Four results screens can be defined. These can be called up using the up and down keys.
- **M16** shows how many memory spaces are still available. In this case, 16 of the 16 reports are still empty.
- **(✱)** is the hold function. The results will be frozen on the display. They can be viewed, printed or stored in this condition. They will remain unchaged on the display until the HOLD key (✱) is pressed again, or a different display screen is chosen.
- **T30** shows the set averaging time. This can be programmed in fixed steps between 2 and 180 seconds.
- **Battery:** this shows the state of charge of the battery.
- **23:06** shows the current time as set in the analyser.

The menu bar

The menu bar at the base of the display shows the use of the function keys. The possibilities are explained under “MENU”.

Results

All the results of measurements and calculations are shown as averaged values. Averaging time is chosen by the user under ***Menu/Settings*** from 2 – 10 – 20 – 30 – 60 – 120 – 180 seconds, for example, the choice of 60 seconds means that the average of the last 60 seconds is shown on the display.
The content of the individual results screens can be defined by the user. The necessary software, ”control.exe”, is to be found on the utility disk. There are also a few examples of the possibilities there.

Here is a list of all measured or calculated variables that can be shown on the results screens:

- 3 - Temperatures measured by thermocouple (T_{Th}), thermistor (T_{Pt}) and the internal temperature of the instrument ($T_{\boxdot}$)
- 2 - Pressure/differential pressure and flow rate
- 1 - Relative humidity
- 1 – Battery voltage

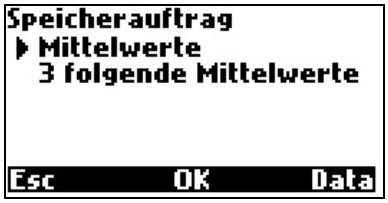
4 MENU

From the results screens the following options can be activated with the keyboard:

- **Store** – Left function key.

- ❒ **Zero P** – Centre function key.
- ❒ **Hold (✱)** – Right function key.
- ❒ **Graphics** – Arrow left.
- ❒ **Menu** – Arrow right.
- ❒ **Print** – Key with a page shown on it.
- ❒ **Switch off (◉)** – Pressing the round, red key will switch the instrument off completely.
- ❒

4.1 Storing results



The option ***STORE*** can be reached from any results screen by pressing the left function key. The results on the screen are stored in a buffer and remain there until stored permanently.

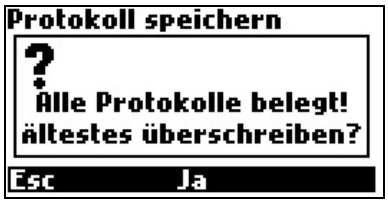
The results are stored in the form of reports. This is a collection of all the results.Two forms of memory stare are possible:

Averaged results

The averaged values are stored with the averaging time set under ***MENU/SETTINGS*** between 2 and 180 seconds.

3 sets of averaged results

The averaged results will be stored. The averaging times that can be set under **Menu/Settings** are 2, 10, 20, 30, 60, 120 and 180 seconds.



If all 16 memory spaces are occupied, this screen will appear:

ESC

The storing will be stopped and the instrument will automatically return to the results screen.

Yes

The oldest report will be deleted and the new one stored in its place.

If the data is stored there will be a request for the customer number (identification number for the protocol). This number will appear on the protocol.

After this number has been entered (in the example **0102**)and confirmation with **OK**, the following screen will appear for a short time.

This finishes the memory function and the instrument returns automatically to the ***Results*** screen. The number on the confirmation screen (here, #**0029**) is not the number of the protocol (1…16). It is a process number automatically generated by the instrument.

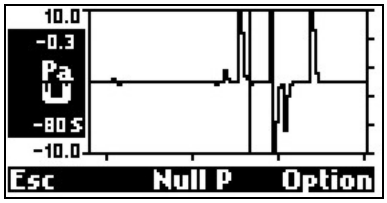
4.2 Null P

This command zeroes the pressure sensor, meaning that the current value of the pressure sensor is taken to be zero. This command should always be carried out before starting measurements.

4.3 Hold (✳)

The command freezes the results on the screen. They can still be printed or stored, but will remain unchanged until either the Hold key is pressed again or a different screen is chosen.

4.4 Graphics



In order to prepare a graphic display, the instrument stores the 2 second values of the last 90 results, giving the information from the last 180 seconds. The current value is to be found on the right side of the display, the oldest value on the left side. In the course of time the display will scroll from right to left.

The symbols on the left have the following meanings:

- ❒ Maximum value for the Y-axis (here, 10.0)
- ❒ Current value or, when the marker is activated, the value under the marker (here, 0.3).
- ❒ The units used. Appears automatically with the values (here, Pa).
- ❒ The parameter (here, differential pressure). The up/down keys can be used to select other parameters.
- ❒ Marker point (-80 s means that the marker is on a point that was measured 80 seconds earlier).
- ❒ Minimum value for the Y-axis (here, -10.0).

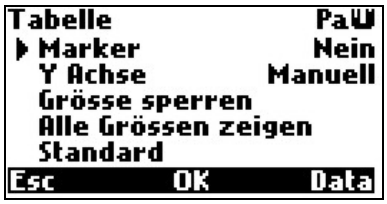
The menu bar:

ESC

Leaves the graphics and returns to the results screen.

Option

Opens a window for the graphics settings. The follwoing screen appears:



Marker

The marker can be switched on or off.

Y Axis

The type of scale can be chosen from the following options:

- Automatic scaling – is calculated by the instrument
- Manual scaling – the user can set the manual scaling using the PC programme.
- Full scale – the scale is equal to the complete range of the parameter.

Lock parameter

After confirming with **OK** the parameter is no longer shown as a graphical display. The display can be reactivated with **Show all parameters** or from the Pc programme.

Show all parameters

After confirming with **OK**, the graphical display will be able to show all measured and calculated values.

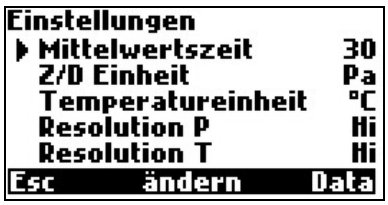
Standard

After confirming with OK, the instrument will show the important measured and calculated parameters.

4.5 Menu

The option ***MENU*** can be reached from the results screen using the ***Right*** key.

4.5.1 Settings



the menu option ***Settings*** allows the following changes to be made:

Averaging time

The following averaging times can be set using the key ***change*** or the keys ***left*** and ***right***.

2 – 10 – 20 – 30 – 60 – 120 – 180 seconds.

Pressure unit

Pressure can be shown in 4 different units: hPa, Pa, mmH_2O und inH_2O.

Temperature unit

Temperature can be shown in both: °C and °F.

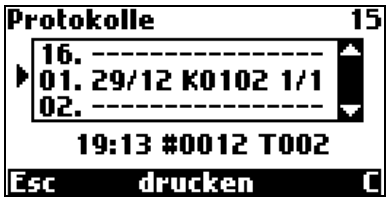
Resolution P

The resolution of the pressure measurement can be switched between Lo and HI.

Resolution T

The resolution of the temperature measurement can be switched between Lo and HI.

4.5.2 Reports



The menu option ***Reports*** gives the following possibilities:

Print

The report marked with an arrow is printed over the IR interface.

C - erase

The erase screen, as shown here, will appear.

All

All reports will be erased.

Yes

The marked report will be erased.

4.5.3 Clock/calendar

This option allows the following settings to be changed:

Time

The time on the internal clock can be set.

Date

The date on the internal clock can be set.

Date format

Two formats are possible: **Day – Month – Year** and **Month – Day – Year**.

4.5.4 Service

The option ***Service*** has the following possibilities:

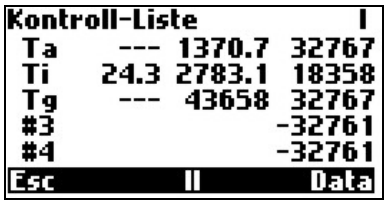
The options are called up in the usual way:

4.5.4.1 Info

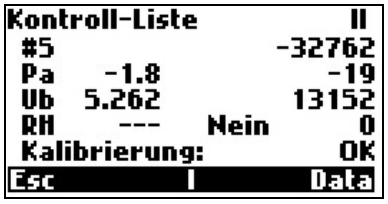
The screen ***INFO*** Shows a number of instrument specific settings.

4.5.4.2 Control list

The option ***Control list*** shows all signals measured by the instrument. This is used for service purposes only. The ***Control list*** is split into two screens, marked I and II.



This screen appears when the option is opened.



The key marked **II** will call up the second screen.

4.5.4.3 Pressure calibration

An accurate pressure meter and source of stable low pressures is needed to calibrate the pressure sensor.

Changing the calibration values will automatically erase the old values. If this option is used carelessly, then the instrument can be rendered practically useless. Hence, this option should only be used if the necessary equipment is available and working correctly.

Calibration procedure

This screen will appear when the option is opened.

The symbols on the screen have the following meanings:

Measured

The current signal from the pressure sensor and the corresponding pressure.

Stored

The last stored calibration values (pressure and signal).

Calibration pressure

Calibration pressure in [Pa].

The key ***Change*** allows the value of calibration pressure to be set.

Apply the calibration pressure to the instrument and wait for a stable value on the display (around 1 minute). Store the calibration value with the key **OK**.

4.5.4.4 Language

The instrument is supplied with the capability of displaying the data in a number of languages. German and English are always present.

4.6 Printer

Pressing the print key will open this screen. The results or screens that were last viewed are kept in the memory for printing if needed. At the right of the screen is a number which can be set between 1 and 8.

The number can be changed using the keys left and right. This number defines the print form for the values. Using the computer software **control.exe** it is possible to change the forms 1 to 4 as desired. Forms 5 to 8 are set in the factory and cannot be changed. Forms 5, 6 and 7 are for measured values and forms 7 and 8 are for the reports. How to change a form can be found in the on-line help section of the **control.exe** programme.

Averaged values

The form chosen will be used to print the last set of calculated averages.

Report

The chosen form will be used to print a report.

Screen contents

The content of the last screen viewed will be printed.

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E L E C T R O N I C S