Operator's Manual

MMS® Inspection DPM

Gage type High

Coating Thickness | Material Analysis | Nanoindentation | Material Testing

MMS® Inspection DPM
Gage type High

Gage for measurement and determination of ambient climatic variables as drew point, relative humidity, air and surface temperatures

Document no. 932-516

Issue date 2019-09-09 (for software version 1.0.0+3)

Manufacturer

Helmut Fischer GmbH	Phone: +49 (0) 70 31 3 03 - 0
Institut für Elektronik und Messtechnik	Fax: +49 (0) 70 31 3 03 - 710
Industriestraße 21	www.helmut-fischer.com
D-71069 Sindelfingen	mail@helmut-fischer.com

On our home page www.helmut-fischer.com you will find the addresses of our sole agencies and subsidiary companies around the globe.

Quality Assurance System of the Helmut Fischer GmbH

DIN EN ISO/IEC 17025	Calibration lab accredited for certified mass per unit area standards
DIN EN ISO 9001:2015	Management system certified by Swiss Association for Quality and Management Systems (SQS)

© 2019 by Helmut Fischer GmbH Institut für Elektronik und Messtechnik, Germany.

This document is protected by copyright. All rights reserved. This document may not be reproduced by any means (print, photocopy, microfilm or any other method) in full or in part, or processed, multiplied or distributed to third parties by electronic means without the written consent of Helmut Fischer GmbH Institut für Elektronik und Messtechnik.

Subject to correction and technical changes.

MMS® is a registered trade mark of the Helmut Fischer GmbH Institut für Elektronik und Messtechnik in Germany and other countries.

Note: Designations not marked with ® or ™ may also be protected by law.

1 Safety information

If you use the gage as intended and observe the safety information, it will not present any danger.

Please read and follow this Operator's Manual and observe the safety information. Also observe generally applicable safety and accident prevention regulations.

1.1 Intended use

Only accessories approved or recommended by the manufacturer may be connected to the gage.

Any use beyond this is not the intended use. The risk of damage ensuing therefrom is borne solely by the user.

1.2 Environmental conditions

Storage and transport temperature: 0 … +60 °C

Temperature

When exposed to sunshine, the areas behind glass windows (e.g. in an automobile) can easily reach temperatures in excess of +60 °C. This can cause damage to the gage.

▶ Do **not** keep or store the gage and accessories behind glass panes, or near to heat sources such as radiators etc.!

Acid

The gage and accessories are **not** acid-proof.

▶ Do **not** place the gage or accessories in contact with acids or liquids which contain acid!

Potentially explosive environment

The gage and accessories are **not** suitable for use in potentially explosive environments.

▶ Operate the gage and accessories only outside of potentially explosive areas!

1.3 Safety of the electrical equipment

Only accessories approved or recommended by the manufacturer may be connected to the gage!

USB cable

Damaged USB cable

Kinking or pinching the USB cable can result in a broken wire. Data transmission is then no longer possible.

▶ Connect only an undamaged USB cable with a max. length of 3 m to the gage.

▶ Always coil up the USB cable for storage.

Batteries/rechargeable batteries

- Use the following alkaline or lithium battery type: Mignon, 1.5 V, LR6 - AA

or

- Use the following NiMH rechargeable battery type: Mignon, 1.2 V, HR6 - AA

Servicing and repairs

Modifications, repairs as well as maintenance and service work on the gage and accessories may be carried out only by service personnel authorized by the manufacturer.

Exception: Changing the batteries/rechargeable batteries.

2 Description

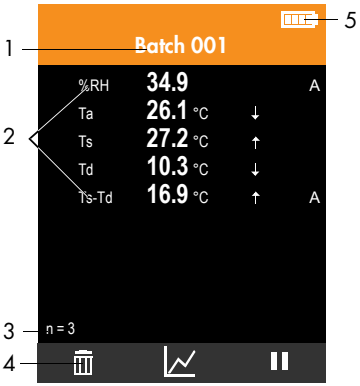
The gage model MMS Inspection DPM is for continuously measuring air temperature and humidity to determine the dew point. You can log these climate values over a prolonged period and emit an optical warning if specification limits are exceeded. To measure the surface temperature continuously, you can connect a magnetic temperature probe to the gage.

This operator's manual describes the following gage versions in the MMS Inspection DPM series:

- High variant
  USB and WiFi interfaces, data storage for 250 000 measured readings in 2500 batches, displays the measurement acquisition (optically and acoustically) as well as by vibrating the gage

Additional information can be found in the data sheet, page 9

2.1 Measurement view (example)



Example of the measurement view with trend display (↑/↓) and active alarm function (A)

1 Batch name

2 Currently measured and calculated climate values with units of dimension

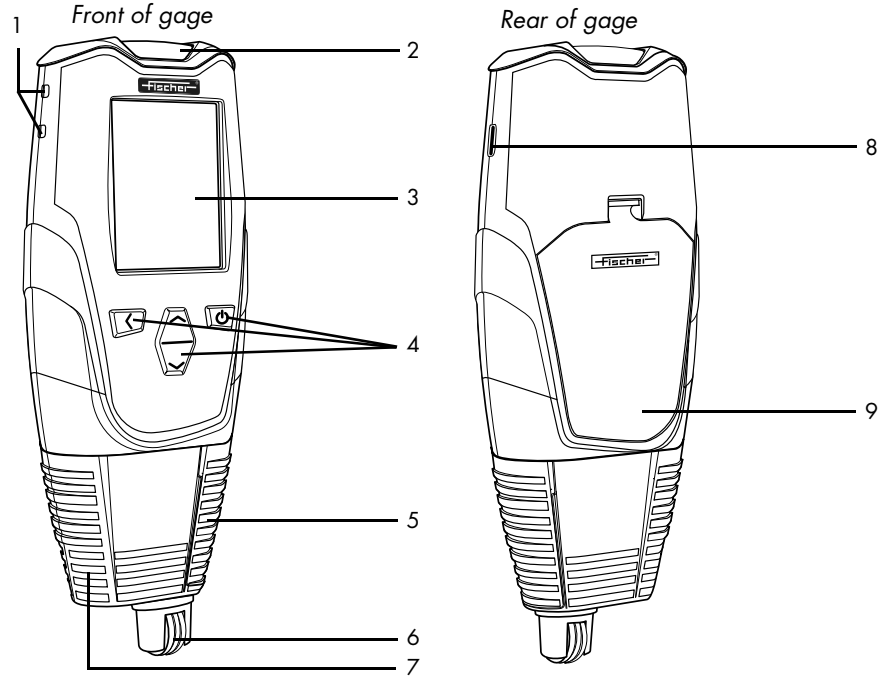
3 Number of times the displayed climate values have been saved

4 Key assignment line (example: delete icon, icon for opening the line chart and statistics of all climate factors, hold function icon)

5 Battery indicator

A list of all display symbols and texts can be found starting on page 29.

2.2 Gage



1 Eyelets for a carrying strap

2 Signal lamp to indicate measurement acquisition and limit violations

3 Display

4 Keys, On/off key, for description see page 5

5 Type K connection below the cover for connecting a type K (magnetic) temperature probe. When a temperature probe is connected, the function of the gage surface temperature probe (6) is automatically switched off.

6 Gage surface temperature probe (protective cap in scope of supply)

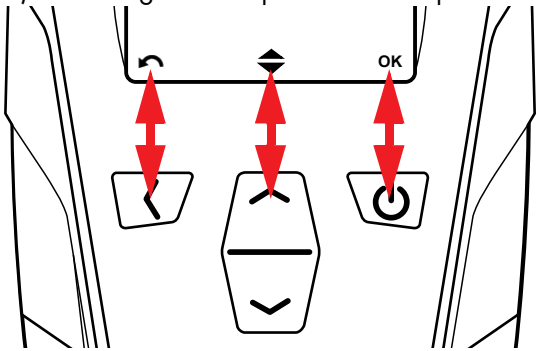
7 Air temperature and humidity probes protected by the housing grille
8 USB port
9 Battery compartment cover

Gage dimensions can be found in the data sheet, page 12

2.3 Keys

There are 4 keys for operating the gage.

The bottom line of the display always shows the functions of the 4 keys (see illustration below). The assignment depends on the opened menu page.



The function shown on the display is assigned to the key directly underneath (example).

The ⏻ key has two functions:

- It switches the gage on and off when the key is held for at least 1 s
- Function shown in the bottom line of the display

The ∨ key has two functions:

- It moves the cursor/mark down when ⬍ is shown in the bottom line of the display
- It opens the main menu when ⬍ is **not** shown in the bottom line of the display

A description of the remaining key symbols can be found starting at page 29

2.4 Menus - function overview

Main menu

Statistics >	Display of the statistics for the opened batch	

Batch Modify > Settings and entries for the opened batch	MEASURE >	Switch to the measurement view
	Tolerance Limits >	Activation of specification limit monitoring and setting the limits for all measurands
	Alarm settings >	Settings for all measurands
	Auto Logging >	Setting the automatic log interval
	Batch Infos >	
	Temperature Units >	°C / °F

Batches >	New >
	List of saved batches (After a batch has been selected, it can be opened, copied or deleted.)

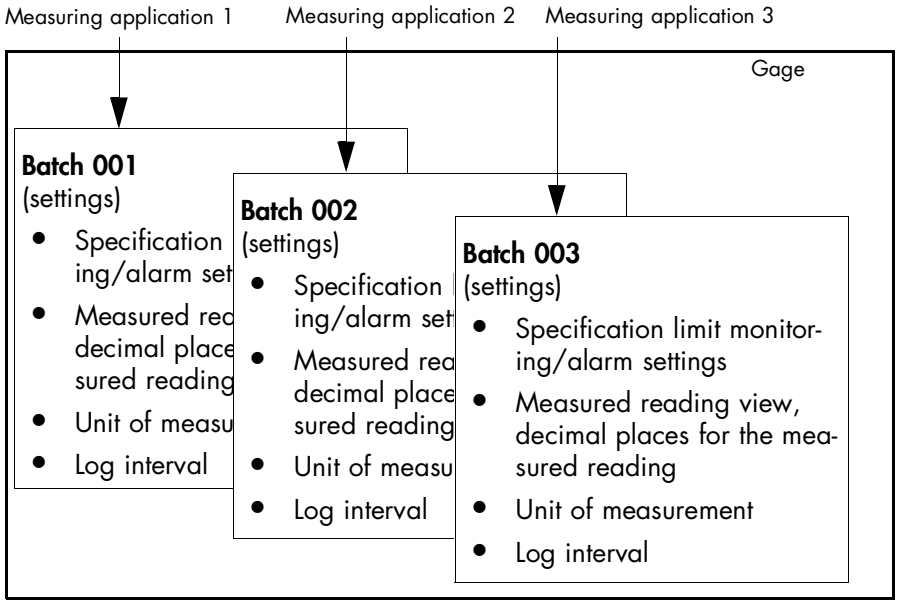
Gage Settings >	Language	Select the display language
	Display Settings >	Brightness
		Rotate display
	Indication Settings >	Key actuation signal
		Audible signal
		Visual signal
		Vibration
	Connections >	USB mode
		WiFi
	Date & Time >	Settings for date, time, time and date format

More Settings >	Measurement units (for new batch) Resolution of the measurement reading display (for new batch) Battery Type
Probe Settings >	Raw data from probe
About >	Information about software version and probe as well as legal information such as copyright, data protection conditions, enhanced labeling

2.5 Gage concept

In order to measure, a batch (file) must be created in the gage for each measuring application. A description of the expressions can be found in Chapter "Glossary".

The key contents of the batch files and calibration file are shown schematically in the figure below:



A measuring application is defined in the gage by a batch file

MMS® Inspection DPM

Monitoring climatic ambient conditions

- Dew Point
- Surface Temperature
- Air Temperature
- Relative Humidity

- Easy and convenient operation
- Compact and robust case

Scale 1:1

MMS® Inspection DPM

Description

The gage models MMS Inspection DPM measure all relevant climatic variables such as relative humidity, air and surface temperature and determine dew point and the temperature difference between dew point and surface temperature from these variables. All these variables may be monitored as well as continuously logged by means of the Log function.

Gage properties

- Ideal for onsite applications (outside and inside) due to the compact size, the light weight and the robust and durable instrument design
- All measurement sensors (humidity, air, surface temperature) are integrated in the gage, for single-handed operation
- Additional temperature sensor can be connected to the gage, e. g., sensor with magnetic support for continuous measurement of surface temperature
- IP65, dust-tight and water repellant and resistant
- Intuitive operation of the menu navigation and graphic display
- The measurement presentation flips automatically and thus allows optimum reading in different measuring positions
- Different languages selectable

Application

Example: Monitoring of the climate ambient conditions, which are required for surface varnishing

Variants	Start	High
	Entry level gage with small data memory for max. 10,000 measured values in one batch, display of measurement acquisition (audible and optical) and USB interface for data transfer	High-end gage with large data memory for 250,000 measured values in 2500 batches, display of measurement acquisition (audible and optical) additional by gage vibration, USB interface and WiFi for data transfer

Metrological Standard Functions	Measurement Tasks
Batch	File containing all metrological function settings necessary for the measurement task as well as the measured readings and evaluations
Chart limits	Scaling of Y chart axis; Adjustable axis values for the variables relative humidity (RH), air temperature (Ta), surface temperature (Ts), dew point (Td) and Ts-Td
Alarm mode	Adjustable alarm limit values, for the variables relative humidity (RH), air temperature (Ta), surface temperature (Ts), dew point (Td) and Ts-Td
Log function	Automatic data logging according to the given time interval
Hold function	Freezing the present displayed values
Measurement reading acquistion/displaying	Continuous measurement capture and displaying
Measurement reading storage	• Automatically according to the given time interval, by means of the Log function • Manually by using the Hold function; you can store the readings shown in the frozen display
Measurement units	°C/°F selectable, %RH
Resolution of measurement reading	Low (up to 1 decimal place), Medium (up to 2 decimal places), High (up to 3 decimal places)

General Features

Data memory

The memory content is preserved even when there is no voltage supply; subsequent viewing of the measured single readings and evaluations

- Gage variant Start with memory capacity of max. 10,000 measured readings in 1 batch
- Gage variant High with memory capacity of 250,000 measured readings in 2500 batches

Evaluation

Statistics
Display of mean value, min/ max values, number of stored values, date and time for each variable relative humidity (RH), air temperature (Ta), surface temperature (Ts), dew point (Td) and Ts-Td

Graphic Presentation
Run-Chart, showing the progress of stored readings of each climatic variable

Display of alarm

Limit violation: Audible by 2 short beeps and visual by red illuminated LED; gage variant High: Additional by gage vibration

Languages

German and English

Presettings for batches
Only available in gage variant High

Each new batch is created with a preset measurement unit and resolution for the displayed measured value. You can adapt these presettings to your requirements. However, you can also change the unit of measurement and the resolution for the measured value display at any time in the batch that has already been created.

Display

- Graphic display with automatic flipping measuring presentation view (deactivatable) to read measurement results in many different gage positions
- Setting of brightness and contrast (definable for Office, Sunlight and Night)

Data transfer

- USB: Data transfer of single readings to a PC, Data import to MSExcel via PC-Datex software; You can gratis download the PC-Datex program from Fischer-Homepage

Bluetooth/WiFi only available in gage variant High

- Bluetooth/WiFi: Data transfer of measurements and data transfer of batches to App PHASCOPE® PAINT; Creation and export of reports via App; You can gratis download the App from Google Play Store and Apple App Store

USB port

2.0 Type C

- For service purpose
- For connection to PC for data transfer, max. cable length: 3 m (118 inches)

Wireless interface
Only available in gage variant High

WiFi: WiFi module integrated in gage, Standards IEEE 802.11b/g/n

Bluetooth: Bluetooth module integrated in gage, Bluetooth v4.2 BR/EDR and BLE

Temperature connector

Type K, to connect an external type K temperature sensor, e.g., magnetic surface temperature sensor (606-036)

Admissible climatic conditions during operation

Ambient temperature	Relative Humidity	Altitude of location	Pollution Degree
0 … +50 °C	5 … 85 %RH, at 25 °C (77 °F), non-condensing	up to 2000 m (6561.7 ft (US)) (above sea level)	3

Protection class (housing)

IP65, measurements under water are not permissible

Weight (incl. batteries)

about 259 g

Power supply

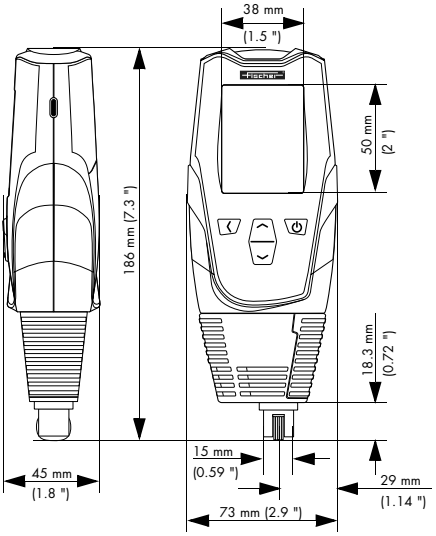
- 2 batteries: Mignon, Alkaline or Lithium, LR6 - AA, 1.5 V
- 2 rechargeable batteries: Mignon, NiMH, HR6 - AA

Battery life
Specifications valid for +20 °C (+68 °F) ambient temperature and Alkaline batteries used

> 8 h for continuous measuring, brightness set to sunlight and deactivated wireless interface

Dimensions

Gage



Spezifications of Sensors	Air temperature (Ta)	Surface temperature (Ts)	relative Humidity (RH)
Measurement range	-20 … +60 °C (-4 … +140 °F)	-20 … +80 °C (-4 … +176 °F)	0 … 100 %RH
Trueness	20 … 50 °C: ± 0.1 °C (68 … 122 °F: ± 0.18 °F)	± 0.5 °C (± 0.9 °F)	± 1.5 %RH
Resolution	0.01 °C (0.018 °F)	0.1 °C (0.18 °F)	0.01 %RH

External Magnetic Surface Temperature Sensor Type K (606-036) - Accessory

Sensor type	K
Measurement range	-40 … +200 °C (-40 …+392 °F)
Trueness	± 2 °C (± 3.60 °F)
Resolution	0.1 °C (0.18 °F)
Diameter of magnetic support	26 mm (1.02 ")

Scope of Supply

Gage; 2 batteries; USB cable type C to type A (1 m (39.4 inches)); guideline

Order Information

MMS Inspection DPM

Gage

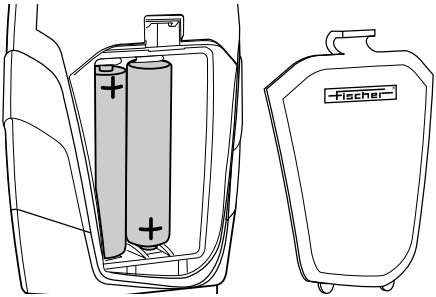
Variant	Order no.	Interface	Memory capacity	Vibration
Start	606-032	USB	max. 10,000 measured values in 1 batch	
High	606-033	USB + WiFi	250,000 measured values in 2500 batches	●

Accessory for MMS Inspection DPM

Product	Order no.	Description
Surface temperature sensor	606-036	Magnetic surface temperature sensor, type K, self-adhesive on ferrous materials, cable length: 2 m (78.74 "), connection plug type K

3 Set up

3.1 Installing batteries



Battery polarity

Observe the correct polarity when inserting the batteries!

Damage to the gage

The use of defective batteries or the wrong type of battery causes damage to the gage. Leaking batteries destroy the gage's electronics.

- ▶ Use only undamaged batteries.
- ▶ Use only the following battery types:
  Alkaline, 1.5 V, AA - LR6
  Lithium 1.5 V, AA - LR6
  NiMH rechargeables, 1.2 V, AA - HR6

Rechargeable batteries cannot be charged in the gage

Individual rechargeable batteries in the gage cannot be charged via the USB port

- ▶ Use a commercially available charger to charge individual rechargeable batteries.

3.2 Switching on the gage

- ▶ Press the ⏻ key for approx. 1 s.

  The display shows the main menu or Measurement view for the batch that was open at shutdown.

3.3 Switching off the gage

- ▶ Press the ⏻ key for approx. 1 s.

What you can do next

- Setting the language: **Main Menu (V) > Gage Settings > OK > Language >** *Select the desired language* **> OK > 2 x** ↶
- Create a new batch, page 17

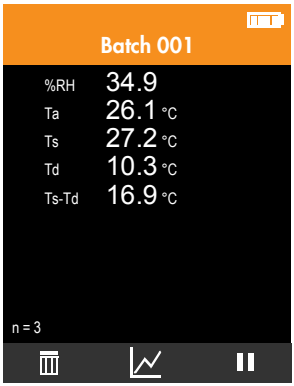
4 Getting started

All the settings relevant to measuring and logging the surface temperature, the ambient atmosphere and measured readings themselves are saved in a file. Such a file is called a batch.

In the batch, you define the measurement procedure, e.g. specification limit and alarm monitoring for certain factors during the measurement.

3 steps to the measurement

1. Switch on the gage,
2. Open a batch or create a new one
   - Opening a batch, see page 18
   - Creating a new batch, see page 17
3. Logging measurements, temperatures and climate values, see page 19



After the gage is switched on, the Measurement view (example) for the batch that was open at shutdown appears

5 Settings for measurement

In order to measure, you need to create and open a batch (measuring application file). In a batch, you define the measuring application and settings for the measurement procedure, e.g. specification limit and alarm monitoring for certain factors during the measurement.

If any parameter changes, there is a new measuring application and you have to create a new batch.

Overview of the possible settings you have to make before a measurement

5.1 Creating a new batch

Each batch contains some presets for the measurement procedure.

The preset selection is based on the requirements in a directive/standard or according to customer specifications.

Before you start

- The gage is switched on (⏻ key)

Creating a new batch

1. **Main Menu** (∨) **> Batches > OK > New > OK**

This completes the creation process for a new batch.

What you can do next

- Measure, see Page 19
- Rename a batch; see page 23

5.2 Opening a batch

Before you start

- The gage is switched on (⏻ key)

Opening an existing batch

1. **Main Menu** (∨) **> Batches > OK**
2. Select the desired batch from the list: ⬍
3. **OK**
4. **MEASURE > OK**

Measurement view for the selected batch opens.

What you can do next

- Measure, see Page 19

6 Measurement

The gage model MMS Inspection DPM is for continuously measuring temperature and humidity to determine the dew point and the difference between surface temperature and dew point. You can log all these climate factors over a prolonged period and emit an optical warning if specification limits are exceeded.

The following factors are measured: air temperature (Ta), relative humidity (%RH) and surface temperature (Ts)

From the measured factors, the dew point (Td) and the difference between surface temperature and dew point (Ts-Td) are calculated.

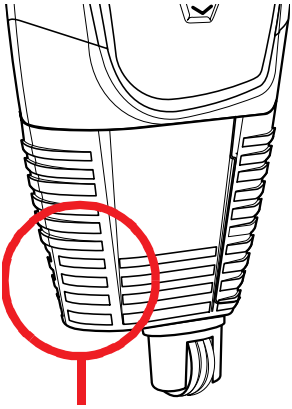
All measured and calculated climate factors are saved simultaneously (manually or continuously).

Notes on measuring

Measurement errors

Measurement errors occur if ambient air cannot flow through the housing grille in the lower area of the gage!

- ▶ Keep the housing grille in the lower area of the gage clear. Avoid covering with hands, material or other objects.
- ▶ Allow ambient air to flow unhindered through the housing grille in the lower area of the gage.
- ▶ Observe the instructions for handling the gage during a measurement, described in Chapter "Correctly holding the gage during the measurement" on page 21



The probes for air temperature und relative humidity are protected by the housing grille

Measured readings outside the specification limits are displayed in red and indicated by an illuminated red LED.

The gage vibrates during measurement acquisition if this is activated in the gage settings.

6.1 Before you start

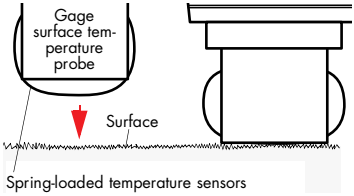
- The gage is switched on (⏻ key)
- Temperature probe
  - The gage surface temperature probe is used: The protective cap has been removed
  - A magnetic surface temperature probe is used (example): The temperature probe is connected to the gage
- The required batch is opened (key in the main menu, see also page 18)

6.2 Measurement procedure

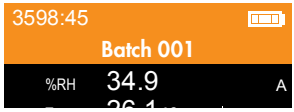
- **Air temperature (Ta)**, measured continuously
- **Relative humidity (%RH)**, measured continuously.
- **Surface temperature (Ts)**

  Measuring with the gage surface temperature probe: Press the surface probe on the surface until the value for Ts hardly changes any more.

  Alternatively, you can measure the surface temperature by connecting a Type K surface probe to the gage



- **To manually save all climate factors**: ❚❚ > 💾
- **To continuously log all climate factors** (log function): ❚❚ > ▶

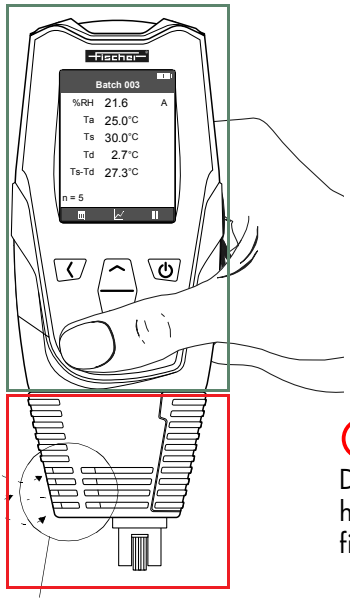
  The top left corner of the window shows the remaining time in minutes up to the next save (e.g.: save interval 3600 min (= 6 h), every 3600 minutes, the climate factors measured and calculated at this point in time are saved; remaining time to the next save is 3598 minutes and 45 seconds)

- Stop continuous logging (log function): ■

During the measurement you can also:

- Delete the measured readings: 🗑
- View the measurement curve for the measurands in a line chart: 📈

6.3 Correctly holding the gage during the measurement



Air and humidity probes within the housing grille

The display screen is to be understood only as an example

- Keep your hand in the area of the orange gage housing at all times, this is marked by the green rectangle in the figure to the left. This prevents the housing grille from being covered and the heat radiating from your hand falsifying the measurement.

i Further examples can be found on the next page.

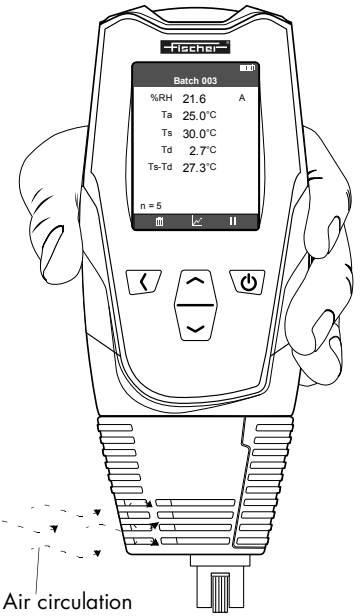
ATTENTION - Measurement error

Do **not** hold the lower black gage area in your hand, this is marked by the red rectangle in the figure to the left!

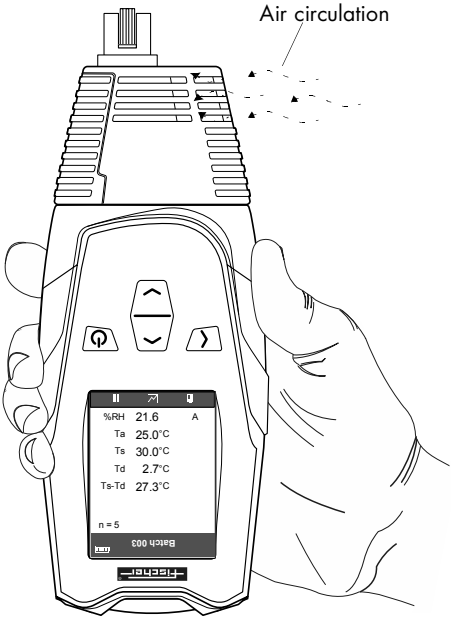
- ▶ Keep the housing grille in the lower area of the gage clear. Avoid covering with hands, material or other objects.
- ▶ Allow ambient air to flow unhindered through the housing grille in the lower area of the gage.

Further examples - How to correctly hold the gage during the measurement

Example 1



Example 2



The display screens are to be understood only as examples

7 Assigning/changing batch names

Assign a unique name for the batch.

Keep in mind that many batch files are stored in the gage. A unique name makes the selection process easier.

Procedure

1. **Main Menu (∨) > Batches > OK >**
2. Select the desired batch from the list: ▲▼
3. **OK**
4. Change name:
   - Move cursor by means of the ↶ and **OK** keys
   - Select the desired character by means of the ▲▼ keys
   - Delete character: Select space
5. Exit the *Rename* input window:
   a Move the cursor entirely to the right using the **OK** key The character ↵ appears at the right edge of the display.
   b Press **OK** to exit the input window.
6. • Switch to Measurement view: **MEASURE > OK**
   - Return to the main menu: **2 x** ↶

8 Data transfer

The following data can be transferred from the gage:

- Batch files into the App PHASCOPE PAINT, see page 24
  You can download the app for free from the Google Play Store or Apple App Store.
- Single readings in an Excel file via PC-Datex, see page 26
  You can download the program PC-Datex for free from the Fischer-Homepage.

8.1 Transfer batch files in the PHASCOPE PAINT app

Before you start

- The PHASCOPE PAINT app is installed in the used mobile device. You can use the app on any mobile device (smart phone, tablet) with a Android (as of 5.0) or IOS (as of 9.0) operating system. You can download the app for free from the Google Play Store or Apple App Store.

Procedure

1. Establish a WiFi connection between the Smartphone and the gage:
   a Gage: **Main menu (v) > Gage Settings > Connections > WiFi > Enable AP > OK**
   The WiFi interface of the gage is now activated. (•) shows the activated WiFi connection (WLAN connection) in the header line.
   b Smartphone:
   - Activate the WLAN/WiFi connection
   - Select the gage ID: MMsc_....

2. Import the batch files in the app:
   a Open the PHASCOPE PAINT app in the smart phone.
   b App: Open the data manager: ≡ **> Data Manager**
   c App: Tap on ⬇.

All batch files are be transferred from the gage to the PHASCOPE PAINT app. The data transfer is now finished.

What you can do next

- Use the PHASCOPE PAINT app to export the data as follows:
  - CSV file, for measurement blocks, e.g., for import to MS Excel. Date and time of measurement block creation and measurement capture, single readings, tolerance specification limits, if in the selected application set, are always exported.

  - pdf file, for reports

    Date and time of measurement block creation and measurement capture, tester name, single readings, tolerance specification limits, if in the selected application set, are always reported in the file. The photo will be displayed in the report, if a photo is assigned for the single reading or measurement block. Description, comment and histogram are only reported if set so under Menu overview ( ) > Settings > Export.
- Make further measurements with the gage, see page 19
- Delete readings of the open batch in the gage: **Main menu (v) > > > All Readings > OK**

8.2 Transfer single readings online to an Excel file via PC-Datex

The data is transferred directly from the gage to the computer via an USB cable connection.

i For further processing of the data transferred from the gage commercially as well as internally developed data processing programs can be used. Information on the data import and further processing can be found in the corresponding program manuals.

i You can download the program PC-Datex for free from the Fischer-Homepage.

Before you start

- Excel is installed on the computer with the program PC-Datex as an Add-In
- The gage is switched on and the desired batch is open in the gage, which measured values should be transferred to the computer while measuring.

Procedure

1. Activate the data export via USB interface in the gage:

   Main menu (v) > Gage Settings > Connections > USB Mode > PC-Datex > OK

   - Return to main menu: **2 x** ↶

2. Connect the gage with the computer via USB interfaces. Use the supplied USB cable or another commercially USB cable with Type C/A connectors Maximal usable USB cable length: 3 m (118 ").
3. PC: In the PC-Datex Add-In under „Interface“, select the used COM interface (e.g. COM20) to which the gage is connected
4. PC: Tap in an Excel field
5. PC: Tap on button **Online** in the PC-Datex Add-In to start the online data transfer
6. Gage: Measure

   While measurement the single readings are transferred to the open Excel table sheet, one column per block.

Finish data transfer

► PC: In the PC-Datex Add-In tap on button **Cancel** of the PC-Datex window

What can you do next

- Open another batch, see page 18
- Make further measurements with the gage, see page 19
- Delete readings of the open batch in the gage: **Main menu (v) >**  **>**  **> All Readings > OK**

9 Glossary

Batch

A file for organizing and controlling the measurement data. All the settings relevant to the measurement and the measured readings themselves are saved in a file. In the gage such a file is called a batch. In a batch, you define the measuring application and settings for the measurement procedure, e.g. specification limit and alarm monitoring for certain factors during the measurement.

Measuring application

A measuring application is determined by requirements in directives/standards and according to customer specifications. In accordance with these requirements, the measurement settings are saved in a batch in the gage. If the requirements and hence the measurement settings change, there is a new measuring application and you have to create a new *Batch*.

Coefficient of variation V [%]

Percent variation of a *series of measurements*, i. e. standard deviation in terms of the mean value. V [%] is a characteristic process constant. A sudden change in V [%] indicates a change in process conditions.

9.1 Glossary - Display symbols

Batches menu, contains a list of already created batches and the **New** function for creating a new batch.

Batch Modify menu, contains a list of alterable batch settings

Statistics menu, contains statistics displays for the open batch.

- Comprehensive statistics covering all measured readings and measurement blocks
- Statistics for the individual measurement blocks
- Graphical representation of all measured readings in a progress diagram
- Lists of individual values in a block

Gage Settings menu, contains a list of alterable gage settings

Identifies information and requests for action

Identifies warnings

Battery status indicator (example: fully charged)

The power supply for the gage is via the USB connection

On/off switch, parameter is active

On/off switch, parameter is not active

Selector switch, option is activated

Selector switch, option is deactivated

A An alarm for the measurand is active

↑/↓ Trend display, increasing/decreasing values

9.2 Glossary - Display texts

9.2.1 Keypad Functions

OK Confirms the selection/setting

✓ Confirm the message/information

× Cancels the setting process and returns to the previous menu page

↷ Forward, skips the next step in the routine

↶ Back

- Returns to the previous menu page, altered settings are applied
- Moves the cursor to the left when the name is entered

Switches to Measurement view

Moves the cursor

- Moves the selection marking
- Increases/decreases the numerical value displayed

··· Opens another menu page for a option selection

→ Turn page

Opens the Delete function

Opens the line charts (measurement curves) and the statistics of the climate factors

%RH, Ta, Ts, Td, Ts-Td Scrolls through the measurement curves (line charts) and statistics of the respective climate factors

Activates the retaining function that freezes the measurement display

▶ Starts the log function, starts automatic value logging

■ Stops the log function, stops automatic value logging

Saves the values in the frozen measurement display

9.2.2 Display texts - Evaluation / statistics

Max • Largest single reading measured

Min • Smallest single reading measured

n Number of single readings measured

USL Upper specification limit

>USL Number of measured readings above the upper specification limit

R The range R equals the difference between the largest measurement reading (maximum) and the smallest measurement reading (minimum) in a series of measurements

s Standard deviation from mean value

LSL Lower specification limit

<LSL Number of measured readings below the lower specification limit

V[%] Coefficient of variation, percent variation of a series of measurements, standard deviation in terms of the mean value

$\bar{x}$ Arithmetic mean value from n single readings

10 About

In this menu you will find all device information, information about the device status, the software and legal information.

Navigation

- ⇕ : Select the desired parameter/batch
- × : Confirms selection
- → : Scrolls forward through the page
- ↶ : Exit page, scrolls back to the previous page

Call up menu

▶ **Main menu (V) > Gage Settings > OK > About > OK**

Call up FCC-ID

▶ **Hauptmenü (V) > Gage Settings > OK > About > OK > 4 x →**

What can you do next

- Switch to measurement view : 2 x ↶ > ⍗
- Perform further gage settings: 1 x ↶
- Return to main menu: 2 x ↶

11 Legal Informations

In this chapter you will find all statements on country-specific regulations and directives

11.1 USA, FCC (Federal Communications Commission)

FCC ID: 2ATFE-MMSINSPEC00

FCC Regulations

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Information about Specific Absorption Rate (SAR)

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the United States.

During SAR testing, this device was set to transmit at its highest certified power level in all tested frequency bands, and placed in positions that simulate RF exposure in usage near the body. Although the SAR is determined at the highest certified power level, the actual SAR level of the device while operating can be well below the maximum value. This is because the Device is designed to operate at multiple power levels so as to use only the power required to reach the network.

The exposure standard for wireless devices employing a unit of measurement is known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg.

The FCC has granted an Equipment Authorization for this model Device with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines. SAR information on this model Device is on file with the FCC and can be found under the Display Grant section of www.fcc.gov/oet/ea/fccid after searching on FCC ID: 2ATFE- MMSINSPEC00.

For this device, the highest reported SAR value for near the body is 0.001134 W/kg. While there may be differences between the SAR levels of various devices and at various positions, they all meet the government requirements.

www.helmut-fischer.com