

Instruction and Operation Manual

S505

Dew Point Meter (Portable)



Dear Customer,

Thank you for choosing our product.

Please read the operating instructions in full and carefully observe it before starting up the device. The manufacturer cannot be held liable for any damage that occurs as a result of non-observance or non-compliance with this manual.

Should the device be tampered with in any manner other than a procedure that is described and specified in the manual, the warranty is cancelled and the manufacturer is exempt from liability.

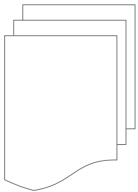
The device is designed exclusively for the described application.

SUTO offers no guarantee for the suitability for any other purpose. SUTO is also not liable for consequential damage resulting from the delivery, capability or use of this device.

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1 Safety Instructions



Please check if this instruction manual matches with the product type.

Please observe all notes and instructions indicated in this manual. It contains essential information which must be observed before and during installation, operation and maintenance. Therefore this instruction manual must be read carefully by the technician as well as by the responsible user / qualified personnel.

This instruction manual must be available at the operation site of the dew point meter at any time. In case of any obscurities or questions, regarding this manual or the product, please contact the manufacturer.

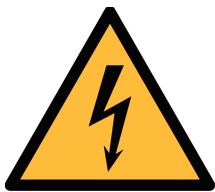


WARNING!

Compressed air!

Any contact with quickly escaping air or bursting parts of the compressed air system can lead to serious injuries or even death!

- Only use pressure tight installation material.
- Avoid that persons get hit escaping air or bursting parts of the instrument.
- The system must be pressureless during maintenance work.



WARNING!

Voltage used for supply!

Any contact with energized parts of the product, may lead to a electrical shock which can lead to serious injuries or even death!

- Consider all regulations for electrical installations.
- The system must be disconnected from any power supply during maintenance work.
- Any electrical work on the system is only allowed by authorized qualified personal.

**ATTENTION!****Permitted operating parameters!**

Observe the permitted operating parameters, any operation exceeding this parameters can lead to malfunctions and may lead to damage on the instrument or the system.

- Do not exceed the permitted operating parameters.
- Make sure the product is operated in its permitted limitations.
- Do not exceed or undercut the permitted storage and operation temperature and pressure.

General safety instructions

- It is not allowed to use the product in explosive areas.
- Please observe the national regulations before/during installation and operation.

Remarks

- It is not allowed to disassemble the product.
- Always use spanner to mount the product properly.

**ATTENTION!****Measurement values can be affected by malfunction!**

The product must be installed properly and frequently maintained, otherwise it may lead to wrong measurement values, which can lead to wrong results.

Storage and transportation

- Make sure that the transportation temperature of the dew point meter is between -30 ... +70°C.
- For transportation it is recommended to use the packaging that comes with the sensor.
- Please make sure that the storage temperature of the sensor is between -40 ... +65°C.
- Avoid direct UV and solar radiation during storage.
- For the storage the humidity must be <95% rH, no condensation.

2 Registered Trademarks

SUTO®

Registered trademark of SUTO ITEC

MODBUS®

Registered trademark of the Modbus Organization, Hopkinton, USA

HART®

Registered trademark of the HART Communication Foundation, Austin, USA

3 Application

The S505 is a dew point meter which is designed to monitor the dew point in industrial application within the permissible operating parameters. These parameters can be found in the technical data section.

The S505 can measure and display the following values:

- Dew point of the compressed air or gas.
- Temperature of the compressed air or gas.
- Pressure of the compressed air or gas.

The default factory settings are: dew point in °C Td. temperature in °C, and pressure in bar.

The S505 dew point meter is mainly used in compressed air systems in industrial environment.

The S505 dew point meter is not developed to be used in explosive areas. For the use in explosive areas please contact the manufacturer.

4 Features

- Measures dew point, temperature and pressure.
- 3 sensor solution available:
 - Sensor Q: -100 ... -30°C Td for trace moisture applications
 - Sensor P: -50 ... +50°C Td for standard applications.
 - Sensor Q+P: Covering the full range of dew point measurement.
- Fast response time.
- Modern colour touch screen interface.
- Data logger, USB interface, Bluetooth connection to portable printer.
- Measuring / parking chamber, designed for fast sensor response.
- Application software included.

5 Technical Data

5.1 General

| CE | |
|--------------------------|--|
| Parameters | Standard unit dew point: °C Td Standard unit temperature: °C other units: °F, K Standard unit humidity: % rH Standard unit pressure: bar |
| Principle of measurement | Capacitive method, Oscillating crystal |
| Sensor | Sensor Q: QCM technology Sensor P: Polymer |
| Measuring medium | Non-corrosive gases |
| Measuring range | Sensor Q: -100 ... -30°C Td Sensor P: -50 ... +50°C Td Pressure: -0.1 ... 1.5 MPa Temperature: -30 ... +50°C |
| Operating temperature | 0 ... 50°C |
| Operating pressure | -0.1 ... 1.5 MPa * |

| | |
|-------------------|--|
| Relative humidity | 0 ... 90% rH |
| Casing material | PC + ABS |
| Charging time | 7 h (if switched on), 4 h (if switched off) |
| Protection class | IP30 |
| Dimensions | See dimensional drawing on the page 10 |
| Display | 2.8" colour graphic display |
| Weight | 0.7 kg (with measuring chamber), 0.45 kg (without measuring chamber) |

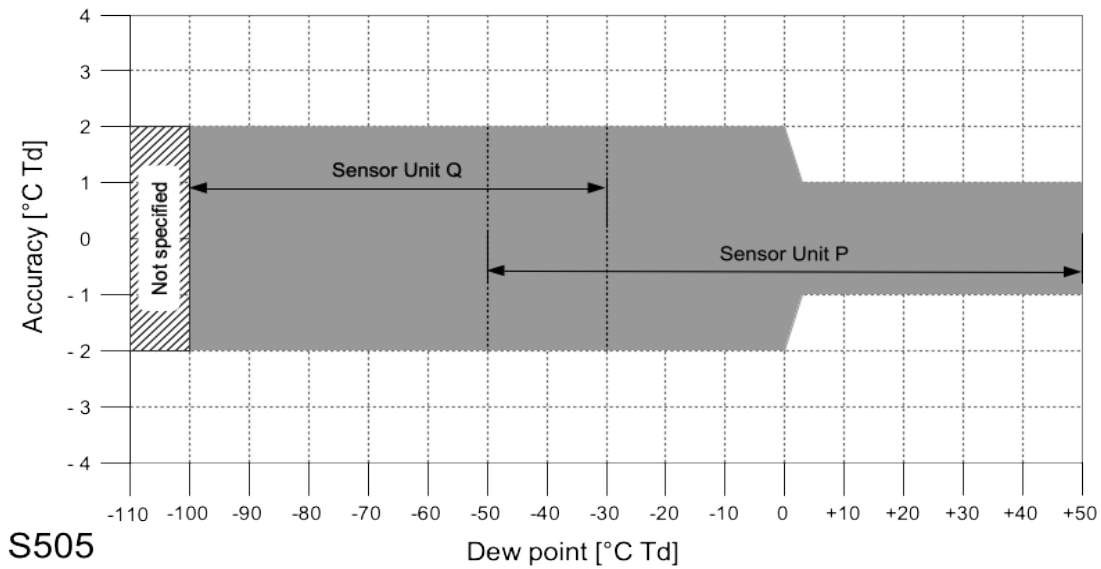
* At least 0.3 MPa is needed for the measuring chamber supplied with the instrument. For low-pressure measuring below 0.3 MPa, choose the optional bypass measuring chamber A699 3501.

5.2 Electrical Data

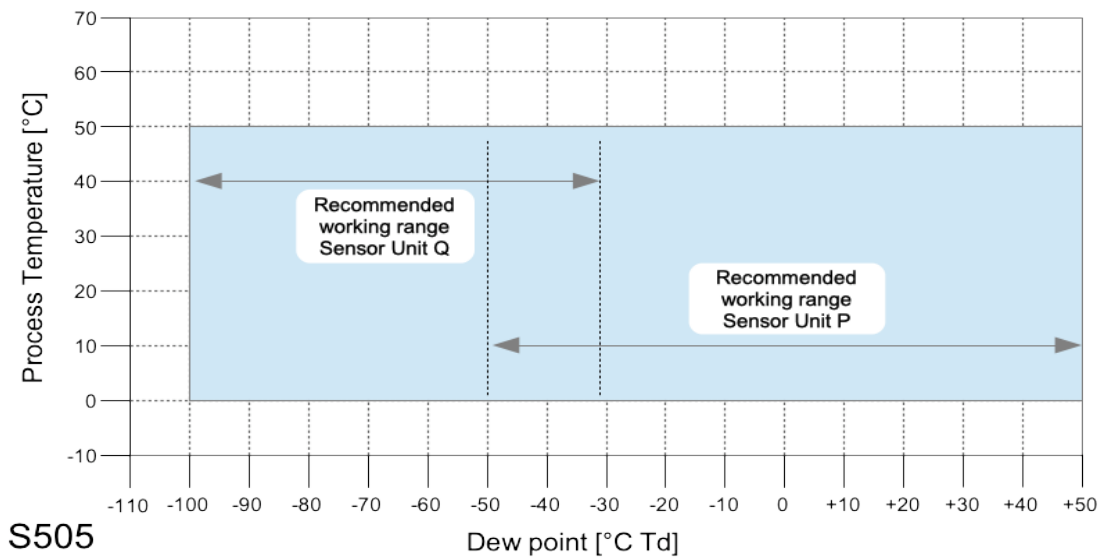
| | |
|--------------|-----------------------|
| Power supply | USB charger: 5 V, 2 A |
|--------------|-----------------------|

5.3 Accuracy

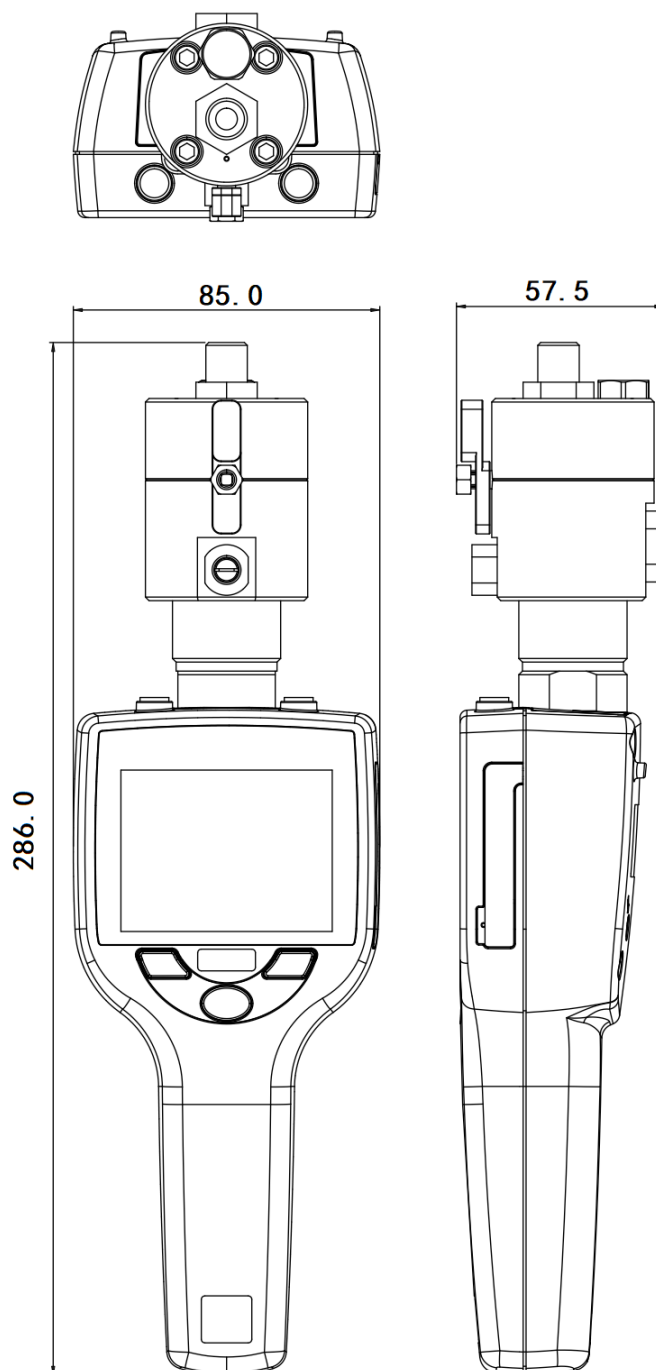
| | |
|--------------------|---|
| Accuracy | Dew point: $\pm 2^{\circ}\text{C Td}$ @ -50°C Temperature: $\pm 0.3^{\circ}\text{C}$ Pressure: $\pm 0.005\text{ MPa}$ |
| Repeatability | $\pm 0.5^{\circ}\text{C}$ |
| Stated accuracy at | Ambient/process temperature: $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Ambient humidity: 0 ... 80% rH, no condensation |
| Accuracy: | |



Valid working range:



6 Dimensional Drawing



7 Installation

Please make sure that all components listed below are included in your package.

| Qty | Description | Item No. |
|-----|--|-----------------------|
| 1 | Handheld meter with data logger and S4A software | P560 0505 |
| 1 | Sensor unit with ordered option (sensor unit Q, sensor unit P, or sensor unit Q+P) | S699 0502 / S699 0503 |
| 1 | Parking / Measuring chamber | A699 3500 |
| 1 | Teflon hose with quick connector | A554 0003 |
| 1 | USB charger with USB cable | A554 0018 |
| 1 | Transport case | A554 0019 |
| 1 | Calibration certificate | No P/N |
| 1 | Instruction manual | No P/N |

7.1 Installation Procedure

The following steps explain the procedure of an appropriate installation.



1. Define the proper sensor module which is used for the measurement. This depends on the expected measurement value.

- Use the sensor module Q for expected dew point below $-50\text{ }^{\circ}\text{C Td}$.
- Use the sensor module P for expected dew point above $-50\text{ }^{\circ}\text{C Td}$.

2. To change the sensor modules just open the 2 screws at the back of the instrument



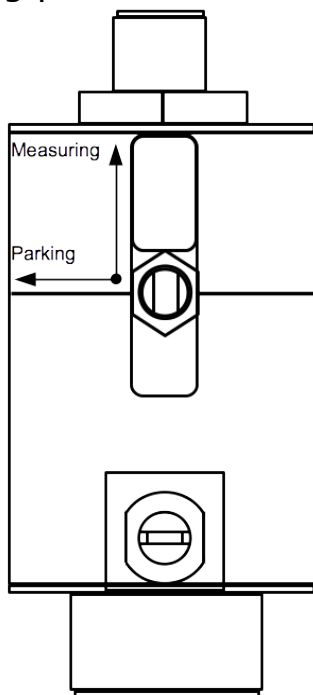
3. Pull the sensor module out. It is recommended to place the protection cap onto the unused sensor module for storage.

Remark

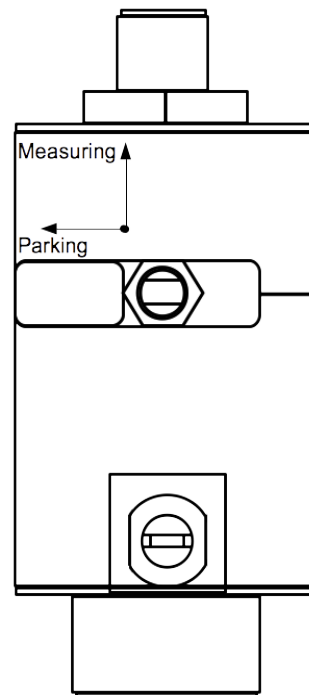
The parking measuring chamber is mounted permanently on the sensor head to keep the sensor dry. To measure, the handle on the chamber must be turned into the "Measuring" position.

After finishing the measurement, please return it to the "Park" position.

Measuring position



Parking position



**WARNING!**

Do not remove or touch the sinter cap !

The sinter cap protects the sensor element from dust and particles. Wrong handling may effect or even destroy the sensitive sensor element!



4. Connect the teflon hose with the measuring chamber. The hose is connected to the 6 mm connector at the chamber.



5. Connect the tip of the teflon hose with a quick connector. The teflon hose with quick connector is used to connect the measuring chamber to the process.

Remark

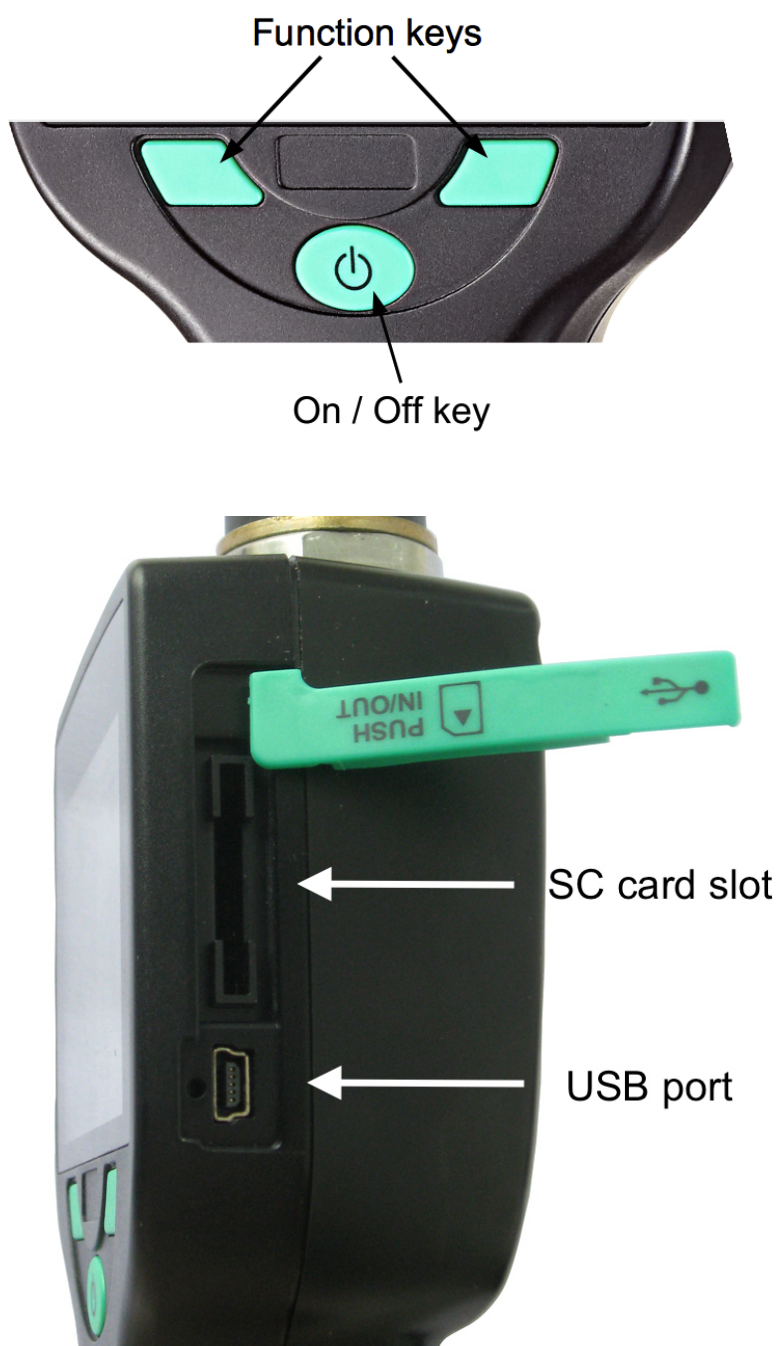
- Please ensure that the teflon hose remains dry and clean. Wet and contaminated hoses can effect the measurement and should be exchanged.

7.2 Electrical Connection

Please recharge the dew point meter if the battery is empty. For this use the charger which is included in your delivered package.

8 Operation

8.1 Buttons and Connectors



8.2 Symbols on Screen



The symbol shows the battery status in % of available energy.



The calibration is experted. It is recommended to re-calibrate the sensor unit. For this pleas contact the manufacturer.



General error indication. Please note down the error code and contact the manufacturer.



Bluetooth is active and ready to connect.



USB connection is established.



A connection to the printer is established.



The data logger is active.



The SD card is inserted

8.3 Main Screen



8.4 Basic Operations

The operation is easy and similar. Please try the functions through the touch screen and experience the features of this production.

On the left side of the screen the menu is shown. It includes the follow menu items:

- Settings
- Logger
- Files
- Print
- Bluetooth
- Calibration
- Service

8.5 Data Logger



Description of the function:

Start / Stop Start and stop of the logger.

Sample rate Set the time interval the samples will be recorded. For example 10 sec: The logger will record the measured values every 10 seconds.

Average For greater sampling rates, you can choose to record the average values instead of the present value.

Logger status When logger is running it shows some status information.

Tester name User input for additional information about the person performing the measurement.

Tester name, location and company names can be entered or modified by selecting one entry and keep it pressed for 2 seconds. A window will pop-up where you can choose between edit, new, delete and cancel.

The S505 has two different logger functions. One is the continuous logging with sampling rate and the other one is a single value logging, where you just store the current values on the screen in a file. For this purpose the "Save" button on the main screen must be used.

8.6 File Menu



The file menu is used to view all recorded data. We distinguish between two data files:

- Single record data file (can be printed with CS2).
- Multiple record data file (can be analysed with S4A).

8.7 Print Menu

The print menu looks very much the same as the file menu but it will list only single recording files. Only this files can be printed with the wireless printer.

8.8 Bluetooth Menu

The BT menu is used to establish the connection with the portable printer. In order to establish a connection The S505 and the printer need to be paired.

1. Turn on the printer.
2. Select the S505 menu and tick "Connect to printer"
3. S505 will start to search for the printer. After a few seconds the spinning wheels on the screen should disappear and the printer symbol should be shown at the top of the screen.
4. Click the printer name "CS2_3631".
5. View the printer screen. If the upper left Bluetooth icon displays the word "CON". The printer has been paired with S505 successfully.

9 Application Software

S505 is provided with two free software: S4A and S4C-Handheld. You can download them from <http://www.suto-itec.com>.

9.1 S4A

S4A enables you to collect and analyze measurement data from SUTO devices such as S505.

After downloading and installing the S4A on a computer, connect the S505 to the computer via the USB port. :

- To detect an S505 and view its online measurement data, click the Detect button.
- To read the S505 data files to local folders, click the Read button.
- To display the S505 measurement values recorded in the data files in an intuitive graphical or tabular view, click the Files button.

9.2 S4C-Handheld

S4C-Handheld is the configuration software for the S505. Using the software, you can manage data of the users, which can be assigned to data logging files. You can manage and download the following data to the S505 and finally print it on the portable printer:

- Location names and descriptions.
- Tester name: Identification who performed the measurement.
- Customer name and address.
- Service company name and address.
- Service company logo.
- Firmware update in S505: Please download the latest firmware from our web page.

10 Optional Accessories

10.1 Portable Bluetooth Printer CS2

Using the optional bluetooth printer, you can print out the measurement values, location names and date / time.

The printer is delivered with one free paper roll. You can order more if needed.

| | | | |
|-----------------|----------------|--------------------------|-------------------------------------|
| Power | : 100 ... 240V | BT transmission distance | : ≤10 m |
| Automatic sleep | : 5 seconds | Width | : 58 mm paper roll, 48mm print area |



10.1.1 Paper Loading

1. Remove the seal on the paper.
2. Press the "OPEN" button to open the cover.
3. Put the paper in the paper bin, and then the cover with small piece of paper exposed.

10.1.2 Basic Operations

- Press and hold the printer power button for 3 seconds to turn on or off
- Press and hold the setting button to enter the setting interface to change the settings.

| Menu | Function | Default setting |
|-----------------|--|-----------------|
| Print selftest | To print the selftest | Not applicable |
| Print | To select the print mode: Normal, Fast, Precise | Normal |
| Auto feed | To set if closing the cover will automatically feed the paper. | No |
| Auto reprint | To turn on/off auto reprint | Yes |
| Darkness | To set the print density: -1,0,1 | 0 |
| BT INFO | To check the bluetooth information, including name, address, and number of bytes received and sent | Not applicable |
| SYS INFO | To check the system information | Not applicable |
| Restore factory | To restore factory settings | Not applicable |
| Language | To set the language to Chinese or English | Chinese |

Note:

Setting button: To switch setting items

Feed button: To change the setting value.

Save and exit: Press the power button or no operation on any buttons for 10 seconds. The printer will automatically save settings and exit the setting status.

- When the printer is turned on, if there is no button operation or data transmission within 5 seconds, the printer will automatically enter the sleep state.

Note: The printer wakes up when the power or "OPEN" button is pressed or the printer receives any data.

10.2 Measuring Chambers

10.2.1 Standard Measuring Chamber (A699 3500)

The S505 is supplied with a measuring chamber (Item no. A699 3500) with a pressure range of 0.3 ... 1.5 MPa.

This measuring chamber is used to connect the compressed air to the sensor using a 6 mm hose. The measuring chamber comes with a parking function with which the sensor element can be kept in a dry environment when it is not used. This helps decrease the response time of the sensor whenever a new measurement is started.

On the measuring chamber there is a handle, indicating if the chamber is currently in the parking or measuring position.

Before starting the measurement, please turn the handle to the "Measuring" position. An internal valve is switched and the sensor is now connected to the compressed air source, and the dry cell is sealed in a separate chamber.

After the measurement is finished, please turn the handle to the "Parking" position.

Remark: To work properly, this measuring chamber type (A699 3500) needs a minimum inlet pressure of 0.3 MPa. For lower pressure applications, the by-pass measuring chamber shall be used (A699 3501).

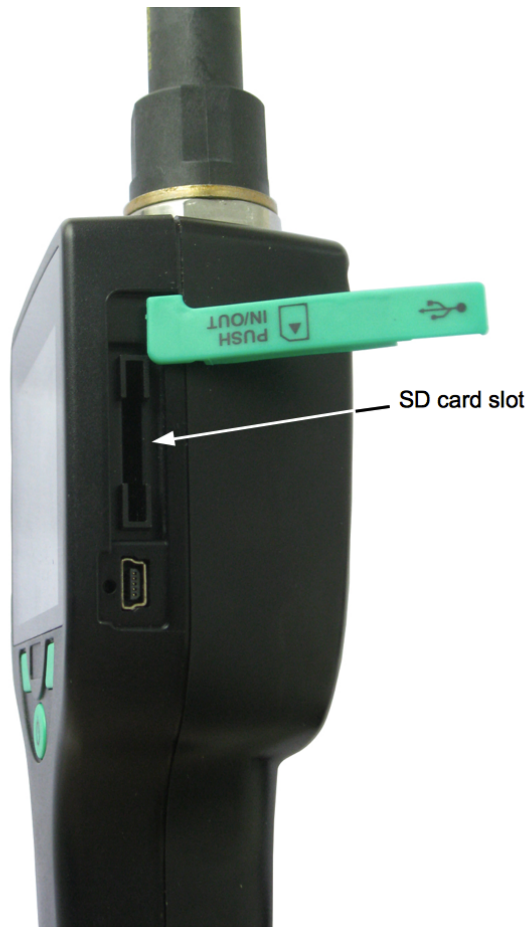
10.2.2 By-Pass Measuring Chamber (A699 3501)

The by-pass measuring chamber can be purchased optionally and provides a pressure range of 0.01 ... 1.0 MPa. It has the same advantages as the chamber A699 3500, but instead of purging the air into the environment, it comes with a 6 mm quick connector as the outlet. This enables the chamber to be used in a by-pass measurement.

This chamber should be used in one of the following situations:

- The process application does not allow to purge air into the environment.
- The inlet pressure is below 0.3 MPa.

10.3 4G SD Card



The data logger can record a maximum 100 million values, which are stored on a SD card (optional).

- Memory size: 4G
- Number of files: max. 512 files
- Medium: SD card

11 Calibration

The dew point calibration is not necessary when you receive a new instrument. The new instrument is calibrated ex work and measures accurately. The user dew point calibration should only be performed by professionals. Please contact your service before performing a user calibration.

The exact calibration date is printed on the certificate which is supplied together with the sensor. The accuracy of the sensor is regulated by the on site conditions, parameters like oil, high humidity or other impurities can affect the calibration and furthermore the accuracy. However we recommend to calibrate the instrument at least once per year. The calibration is excluded from the instruments warranty. For this please contact the manufacturer.

If the instrument has a slight drift due to ageing, temperature or other effects a dew point and pressure calibration can be performed.

11.1 Dew Point Calibration

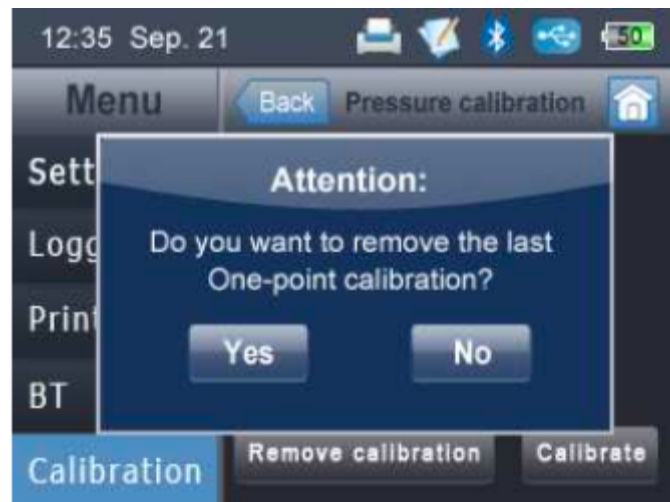
Performing a dew point calibration is critical and the following considerations should be taken:

- Perform dew point calibration at the working point. For example if you measure around -40°C Td do the calibration at that point.
- Do not perform calibration at too high dew points, as it will cause big errors at low dew points!
- We recommend calibration between -40°C Td and -55°C Td.
- Use highly precise reference measuring instruments.
- Maintain conditioning time of about 1 hour minimum.

Please use the calibration function and select "dew point calibration". Follow the steps on the screen.



If there is any doubt about correct calibration process and result, the calibration can be removed at any time. Please follow the instruction on the screen.



11.2 Pressure Calibration

If the instrument is not showing 0 pressure at ambient condition, it is recommended to perform a fast zero calibration. For that purpose please use the calibration function and select "pressure calibration". Follow the steps on the screen.



12 Maintenance

To clean the sensor and its accessories it is recommended to use moist cloth only.



ATTENTION!

Do not use isopropyl alcohol to clean the sensor and its accessories !

13 Disposal or Waste



Electronic devices are recyclable material and do not belong in the household waste.

The sensor, the accessories and its packings must be disposed according to your local statutory requirements.

The dispose can also be carried by the manufacturer of the product, for this please contact the manufacturer.

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