# CS iTEC

# Instruction and operation manual

# S 201

## Dew point sensor

**CS iTEC**

Dear Customer,

thank you for choosing our product.

The operating instructions must be read in full and carefully observed before starting up the device. The manufacturer cannot be held liable for any damage which 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 which is described and specified in the manual, the warranty is cancelled and the manufacturer is exempt from liability.
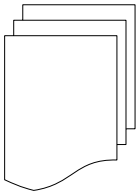
The device is destined exclusively for the described application.

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

# Table of contents

# 1. Safety instructions

**Please check if this instruction manual accords to the product type.**

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

This instruction manual has to be available at the operation site of the dew point sensor at any time. In case of any obscurities or questions, regarding this manual or the product, please contact the manufacturer.
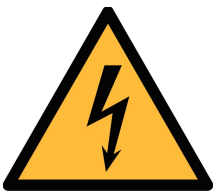
**WARNING!**

**Compressed air!**

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

- Do not exceed the maximum permitted pressure range (see sensors label).

- 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.

**WARNING!**

**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.
- The product should be maintained and calibrated frequently, at least annually.

**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 sensor without display is between -30°C... 70°C and with display between -10°C... 60°C.
- For transportation it is recommended to use the packaging which comes with the sensor.
- Please make sure that the storage temperature of the sensor is between -10°C... 50°C.
- Avoid direct UV and solar radiation during storage.

- For the storage the humidity has to be <90%, no condensation.

## 2. Application

The S 201 is a dew point sensor 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 S 201 can measure the following values:

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

The default factory settings are: temperature in °C, Humidity in % and dew point in °Ctd. Other units can be programmed by the optional display or the service kit.

The S 201 dew point sensor is not developed to be used in explosive areas. For the use in explosive areas please contact the manufacturer.

The S 201 dew point sensor is mainly used in compressed air systems in industrial environment.

## 3. Features

- Dew point sensor for low dew point applications down to -60°Ctd.
- Long term stability.
- Graphic display.
- Relay output.
- IP65 casing provides robust protection in rough industrial environment.
- Very fast response time ensures safe and reliable indication whenever dew points are out of valid ranges.
- Can be installed directly into dryers through G ½" thread.
- High accuracy of ± 2°Ctd dew point.

# 4. Technical Data

## 4.1 General

| | |
|---|---|
| CE | |
| Parameters | Standard unit dew point: °Ctd<br>Standard unit temperature: °C<br>other units: °F, K<br>Standard unit humidity: % |
| Principle of measurement | Capacitive method |
| Sensor | polymer |
| Measuring medium | Non-corrosive gases |
| Measuring range | Dew point: -60°Ctd... 20°Ctd<br>Relative humidity: 0... 99.9 %<br>Temperature: -30°C... 70°C |
| Ambient temperature | 0°C... 50°C |
| Operating pressure | -0.1...5.0 MPa |
| Housing material | PC + ABS |
| Material of the sensor head and the screwing | Stainless steel sinter filter pore size < 30 μm |
| Protection class | IP65 |
| Dimensions | See dimensional drawing on the next page |
| Display | 128 x 64 pixel, with blacklight |
| Screwing thread | G ½" thread (ISO 228/1);<br>UNF 5/8" thread (on request) |
| Weight | 0.23 kg |

## 4.2 Electrical Data

| | |
|---|---|
| Power supply | 12... 30 VDC / 100 mA |

## 4.3 Output-Signals

| | |
|---|---|
| Analog output | Signal: 4... 20 mA, 3 wire |
| Analog output scaling | 4 mA = -60°Ctd<br>20 mA = 20°Ctd |

| Relay output | NO, 32 VDC, 500 mA |
|---|---|

## 4.4 Accuracy

| Accuracy | ± 2°Ctd dew point ( see table below) |
|---|---|
| Repeatability | ± 0.5°C |
| Stated accuracy at | Ambient/process temperature 23°C ± 3°C<br>Process temperature 23°C ± 3°C<br>Ambient/process humidity <90%, no condensation<br>Airflow > 1 l/min at sensor tip |
| Accuracy:<br> | Valid working range:<br> |
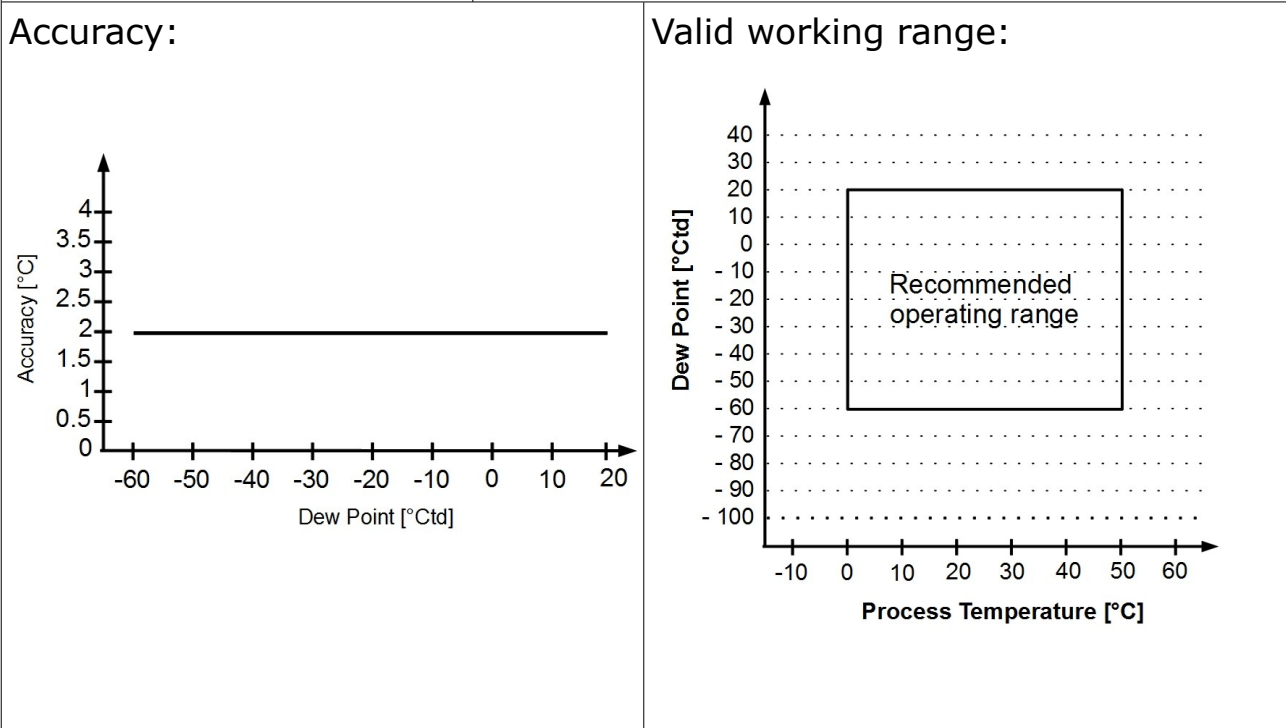
# 5. Dimensional drawing
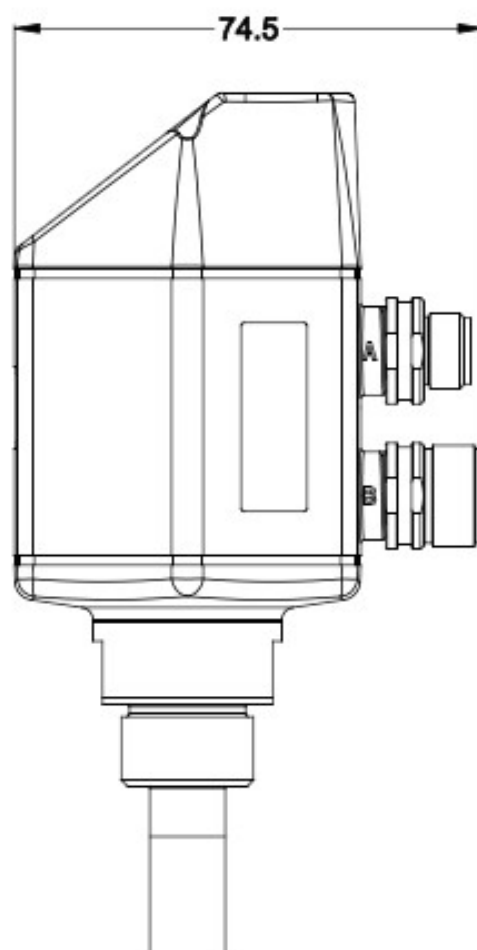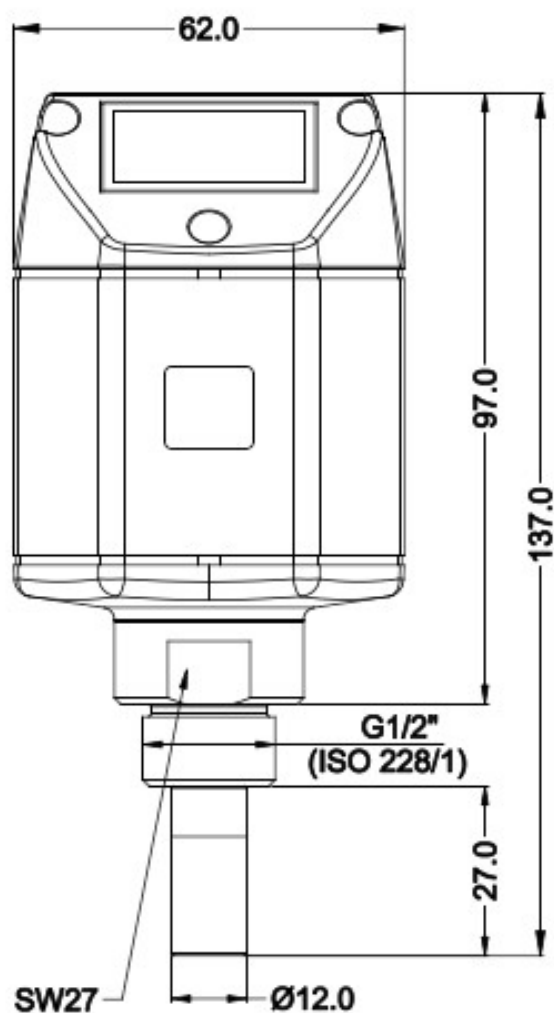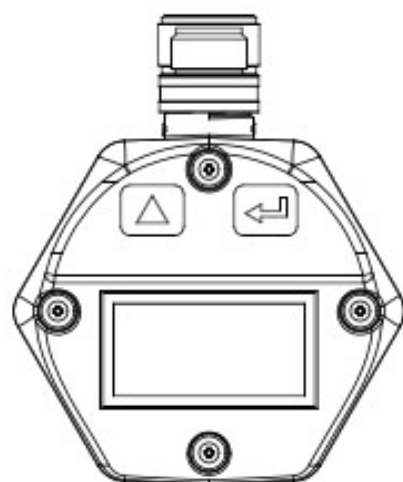
# 6. Determination of the installation point

In order to maintain the accuracy stated in the technical data, the sensor must be installed correctly. The air must flow on to the sensor tip, otherwise it will lead to wrong measurement values. For further instructions, please read the next chapter carefully.
Please consider that enough space exists at your site for a adequate installation as described in this manual.

**ATTENTION!**

**Wrong measurement is possible, if the sensor is not installed correctly.**

- The sensor is for indoor use only! At an outdoor installation, the sensor must be protected from solar radiation and rain.

- It is strongly recommend not to install S 201 permanently in wet environment as it exists usually right after a compressor outlet.

# 7. Installation

Before installing the sensor, please make sure that all components listed below are included in your package.

| Qty | Description | Item No. |
|-----|-------------|----------|
| 1 | Sensor | S699 0406 |
| 2 | M12 plug | C219 0059 |
| 1 | Instruction manual | No P/N |
| 1 | Calibration certificate | No P/N |

## 7.1 Installation Requirements

The flowing air or gas has to pass the sensor tip for a proper measurement. This can be realized with a measurement chamber. For a installation without measuring chamber you need to concern the installation depth which is described in the next chapter.

## 7.2 Installation Procedure

The following steps explain the procedure of an appropriate installation.

**Installation of the sensor with measurement chamber**

Dew point sensor

Measurement chamber
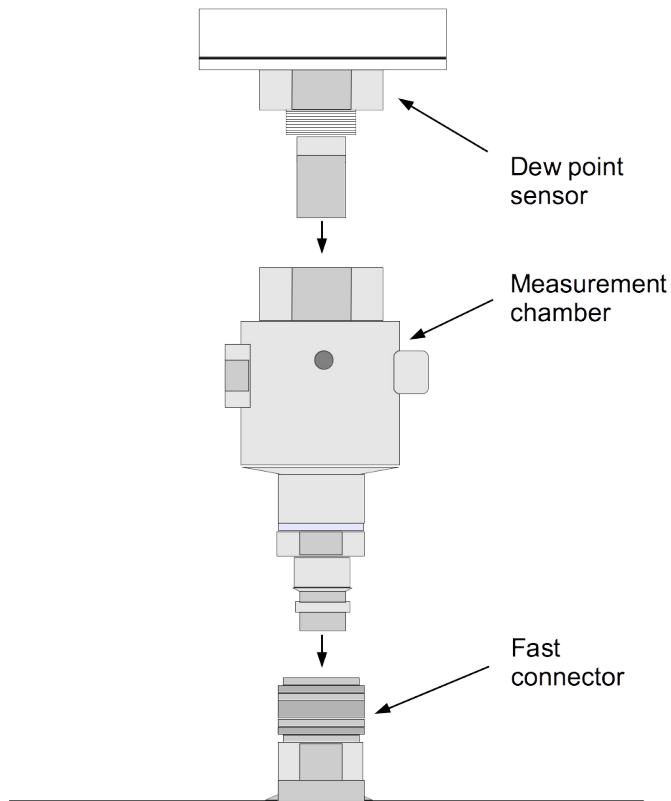
Fast connector

1. connect the sensor with the measurement chamber.

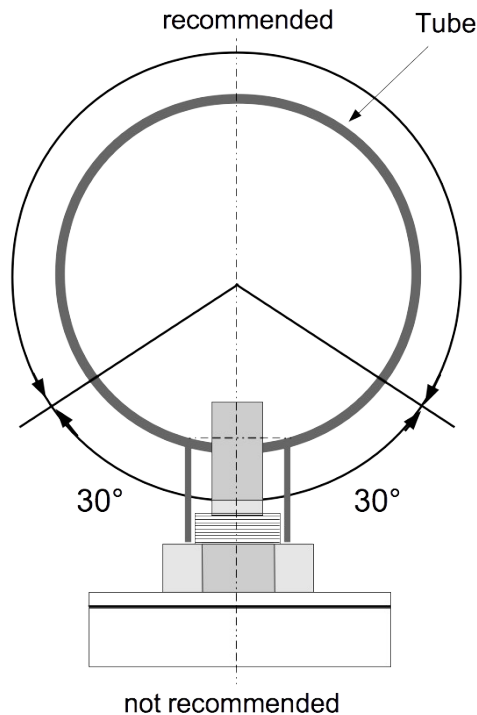2. Connect the sensor and the measurement chamber with the fast connector.

**Installation of the sensor without measurement chamber**

1/3
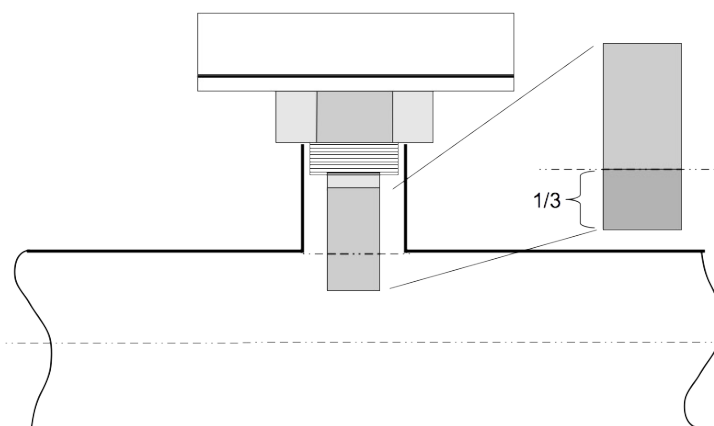
- Install the sensor only if the system is pressureless.

- Not less than 1/3 of the sensor tip should be inside of the pipe. For this please check the size of the nozzle.

- The inner thread has to be G 1/2".

## Remarks

recommended          Tube



30°                    30°

not recommended

Please install the sensor only in the recommended area like you can see in the picture. A upside down installation is not permitted. Please consider that the distance to the vertical level must be >30°.

## Removal of the sensor

To remove the sensor unscrew the sensor from the measurement chamber or from the nozzle. Please observe that the system is pressureless when the sensor is removed.

## 7.3 Electrical connection

The dew point sensor is equipped with tow Connector plugs "A" and "B". The cables are connected to the sensor through the M12 connector.
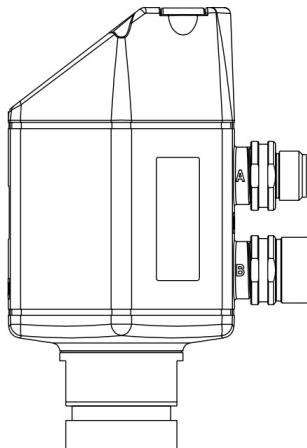
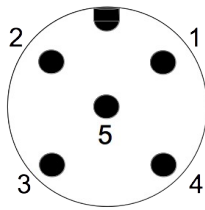Connector plug A

Connector plug B

## Connection pins connector plug M12

2, 1, 5, 3, 4

Connection pins
(view from the clamping side)

## Pin assignment connector plug M12

|  | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 |
|---|---|---|---|---|---|
| Connector plug A | SDI | $-V_B$ | $+V_B$ | +I 4...20 mA | +P pulse |
| Connector plug B | SEL | $-V_B$ | DIR | SW | SW |
| Wire colour | brown | white | blue | black | grey |

### Legend to pin assignment

SDI   Digital signal (internal use)

$-V_B$   Negative supply voltage

$+V_B$   Positive supply voltage

+I   Active 4...20 mA signal

+P   Pulse output

SEL   Internal signal

SW   Isolated pulse switch input/output

DIR   Flow direction input

**ATTENTION!**

**Do not screw the M12 plug using force. Otherwise, it may damage the connecting pins.**

# 8. Signal outputs

## 8.1 Analog output

The sensor has an analog output range of 4... 20 mA. It is a 3-wire active analog output.This output is scaled to:

- 4 mA = -60°Ctd
- 20 mA = 20°Ctd

For other ranges, please contact the manufacturer. The analog output can be allocated to the temperature, the dew point and the humidity.

## 8.2 Relay output

The sensor has an relay output with 32 V and 500 mA. It is possible to monitor e.g. the dew point and give an alarm if a particular value is reached.

# 9. Sensor display

With the Sensor display it is possible to show the temperature, humidity and the dew point. Moreover it shows error messages and it is possible to change the configuration setting of the sensor.
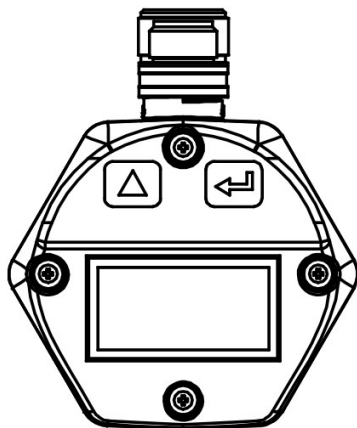
"Enter key" = ⏎

"Up key"   = △

Alarm:
-25.2 °Ctd

By pressing the Enter key the current alarm threshold value can be shown and it will go back to online value automatically in 3 seconds.

## 9.1 Starting process

After power up, the display starts automatically with a initialisation

procedure. During the next eight seconds the display will show the current software version and starts the connection to the sensor. Now the display goes to the standard mode, showing the temperature, humidity and the dew point, alternately.

## 9.2 Error messages

Error:
Auto transmission!

For this case please contact a technician of the manufacturer.

Error:
Communication fail!

As soon as the communication fails, the instrument will show this message. Please restart the power supply in most of the cases this will fix the problem. If the problems still exists please contact a technician of the manufacturer.

Error:
Sensor unmatch!

If the sensor and the display settings are not matching, the instrument will show this message. Please contact a technician of the manufacturer.

## 9.3 Configuration using the display

The S 201 is usually configured ex factory according to the ordered customer settings.
In case of settings have to be changed, please observe the following steps.

Online value
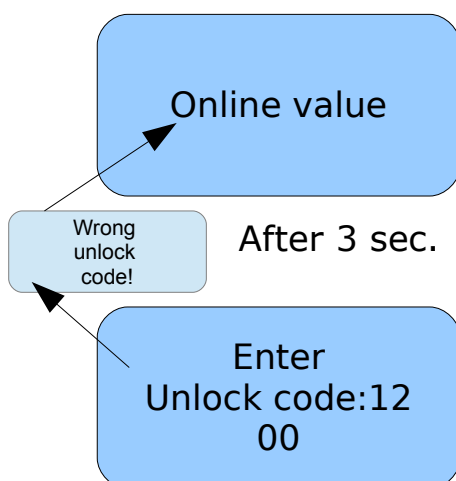
1. At first keep the enter key ( $\frac{A}{Z}$ ) pressed for three seconds.Than the S 201 will ask to enter the unlock key.

Wrong unlock code!

After 3 sec.

Enter
Unlock code:12
00

2. Enter the unlock code "12". Selected digit will be flashing. To modify the digit press up key ( Δ ). Press enter key ( $\frac{A}{Z}$ ) to confirm, shift to the next digit or go to the next page.

Alarm:
-25.2 °Ctd

3. Set alarm. Selected digit will be flashing. To modify the digit press up key ( Δ ). Press enter key ( $\frac{A}{Z}$ ) to confirm, shift to the next digit or go to the next page.

Display temperature?
Yes (No)

5. Adjust to display the temperature. Press up key ( Δ ) to select "Yes" or "No". Press enter key      ( $\frac{A}{Z}$ ) to confirm and go to the next page.

Display humidity?
Yes (No)

6. Adjust to display the humidity. Press up key ( Δ ) to select "Yes" or "No". Press enter key ( $\frac{A}{Z}$ ) to confirm and go to the next page.

Display dew point?
Yes (No)

8. Adjust to display the dew point. Press up key ( Δ ) to select "Yes" or "No". Press enter key ( $\frac{A}{Z}$ ) to confirm and go to the next page.

Display contrast
Up - Change
Enter - Okay

9. Adjust the display contrast. Press up key ( Δ ) to change the contrast. Press enter key ( $\frac{A}{Z}$ ) to confirm and go to the next page.

Upside Down?
Yes (No)

10. Set the display orientation. Press up key ( Δ ) to select "Yes" for upside down or "No" for normal view. Press enter key ( $\frac{A}{Z}$ ) to confirm. The settings will be saved automatically.

System reset

11. Online value will be shown in three seconds automatically.

**Notes:**

- To abort the entry process keep the enter key pressed for three seconds.

- Online value will be shown automatically if there is no key pressed for more than 20 seconds.

# 10. Optional extra accessories

## 10.1 Measuring chambers

There are different types of measuring chambers for example Measuring chamber with fast connector, by-pass-by chamber with in and out connection, measuring chamber for dryer installation or high pressure chamber. For more information please contact your retailer or the manufacturer.

## 10.2 Service kit

The service kit is used to connect the sensor with the PC. Sensor parameters such as analog output scaling, alarm values, units etc. can be easily changed by using the service kit.

The diagram below shows the connection when using the optional service kit. Please ensure that also in this case the power supply of either S 201 or of the service kit is connected because the USB port is not supplying enough power.
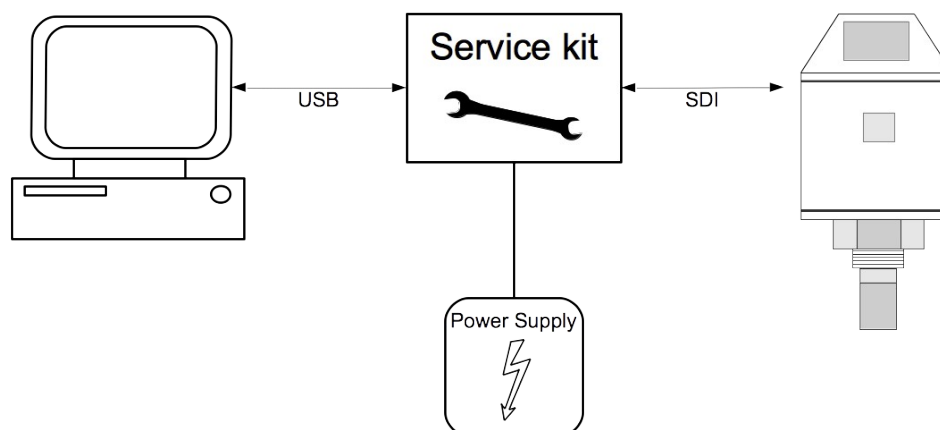


# 11. Calibration

It is recommended to calibrate respectively adjust the sensor annually. For this please contact the manufacturer. Please check the date of the last calibration in the attached calibration certificate.

# 12. Maintenance

Please observe from time to time the sinter cap. If it appears to be dirty, it is recommended to replace it for this please contact the manufacturer.

**ATTENTION!**

**A dirty/wet/contaminated sinter cap or sensor tip may lead to a longer response time and to wrong measurements.**

# 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.

# 14. Warranty

CS-iTEC provides a warranty for this product of 24 months covering the material and workmanship under the stated operating conditions from the date of delivery. Please report any findings immediately and within the warranty time. If faults occurring during the warranty time CS-iTEC will repair or replace the defective unit, without charge for labour and material costs but there is a charge for other service such as transport and packing costs.

Excluded from this warranty is:

- Damage caused by:

  ○ Improper use and non-adherence to the instruction manual.

  ○ Use of unsuitable accessories.

  ○ External influences (e.g. damage caused by vibration, damage during transportation, excess heat or moisture).

The warranty is cancelled:

- If the user opens the measurement instrument without a direct request written in this instruction manual.

- If repairs or modifications are undertaken by third parties or unauthorised persons.

- If the serial number has been changed, damaged or removed.

Other claims, especially those for damage occurring outside the instrument are not included unless responsibility is legally binding.

Warranty repairs do not extend the period of warranty.

**ATTENTION!**

**Batteries have a reduced warranty time of 12 month.**

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