

USE AND MAINTENANCE



**BE COOL V1
SMART**

Digital vacuum gauge with T joint

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1.0 IMPORTANT INFORMATION

1.1 About this manual

- ◇ This manual describes the operation, features, and maintenance of the digital vacuum gauge for refrigerant gases BE COOL V1 SMART.
- ◇ Read this operation and maintenance manual before using the instrument. The operator must be familiar with the manual and follow its directions carefully.
- ◇ This operation and maintenance manual is subject to change as a result of technical improvements - *the manufacturer assumes no responsibility for any content or printing errors.*



Respect your environment, think before you print the full manual.

1.2 Safety warnings



WARNING

Read the information carefully and set up appropriate measures to ensure safety so as to avoid any danger to people and property.

Failure to follow these directions may cause danger to people, the plant, or the environment and may result in loss of liability.



WARNING! Ensure proper disposal

Dispose of batteries properly at the end of their life only through the appropriate containers. This device should not be disposed of as municipal waste. Follow the requirements of current national legislation.

2.0 SAFETY

2.1 Security verification

- Use the product within the scope described in the chapter “Permitted Use of the Product.”
- When using the instrument, follow current safety regulations.
- Do not use the instrument if damaged on the case.
- Keep the instrument away from solvents.
- Strictly follow what is described in this manual under “Maintenance” when maintaining the instrument.
- All work not specified in this manual may only be performed by Seitron service centers. On the contrary, Seitron disclaims any responsibility for the normal operation of the instrument and the validity of the relevant approvals.
- Wear safety glasses and suitable gloves when using the product.
- Read the maintenance instructions for the refrigeration system carefully before operating the instrument.

2.2 Permitted Use of the Product

This chapter describes the application areas for which the digital vacuum gauge BE COOL V1 SMART is intended to be used. All the devices off the BE COOL series are portable measurement instruments intended for use in the installation and/or maintenance of refrigeration systems and heat pumps.

THIS INSTRUMENT IS FOR QUALIFIED TECHNICIANS ONLY.

2.3 Unauthorized use of the product

The use of the vacuumeter in application areas other than those mentioned in Section 2.2 “Permitted Use of the Product” is to be considered at the operator’s own risk and the manufacturer assumes no responsibility for the loss, damage, or costs that may result. It is your obligation to read and pay attention to the instructions in this operation and maintenance manual.

The product should not be used:

- As safety device in safety compelling areas.
- Atex classified areas.
- Do not use the product if damaged. Do not try to repair it in order not to cause other damages. If the instrument is damaged inform directly the customer care service of Seitron S.p.A. (customer.care@seitron.it).
- Strictly follow the instruction provided with the refrigeration system where you are operating.

2.4 Precautions for using the Li-Ion battery pack

Pay attention while handling the battery pack inside the instrument; incorrect or improper use could result in serious harm and/or breakage:

- Do not short-circuit: make sure that the terminals are not in contact with metal or other conductive materials during transportation and storage.
- Do not expose batteries to liquid substances.
- Do not burn the batteries or expose them to temperatures above 60°C.
- Do not try to remove the battery.
- Do not damage the instrument or pierce the battery. Improper use can cause damage and internal short-circuits that are not always externally visible. If the battery pack has been damaged or taken hits against a hard surface, regardless of the condition of the outer casing:
 - Stop using it;
 - Dispose of the battery according to the local waste standards.
- Do not use leaking or damaged batteries.
- Charge batteries only inside the instrument.
- In case of abnormal operation or if there are signs of overheating, remove the battery pack from the instrument immediately. Warning: the battery pack may be hot.
- Do not use the instrument during thunderstorms to avoid being struck by lightning and running the risk of causing personal injury and property damage.

3.0 GENERAL FEATURES

3.1 Package is featured with

Package contents consist of:

- Digital vacuum gauge Seitron **BE COOL V1 SMART**.
- T joint.
- Fabric case.
- Spare parts bag with n° 2 O-ring and N°3 cotton filters
- Quick guide.
- WEEE instructions.
- Simplified Declaration of Conformity.

3.2 Typical Use

This instrument is for measuring minimum pressures in the vacuum range, i.e., vacuum, during installation or maintenance of cooling systems or heat pumps.

Typically, within a cooling system or heat pump, it is necessary to empty the system itself of moisture and foreign matter; in order to do this a vacuum pump is used, which, combined with the instrument BE COOL V1 SMART, allows to maintain and exercise the operation of the said systems.

4.0 TECHNICAL FEATURES

Power supply:	Li-Ion battery, rechargeable, 1000 mAh with USB Type C input
Measuring range:	1 - 19000 micron
Units of measurement:	micron, mTorr, inHg, Pa, Torr, KPa, mbar, psia
Accuracy:	1 .. 10000 micron: ±10% rdg ±10 micron
	10001 .. 19000 micron: ±20% rdg
Resolution:	1 .. 400 micron: 1 micron
	400 .. 3000 micron: 10 micron
	3000 .. 10000 micron: 100 micron
	10000 .. 19000 micron: 250 micron
Usage temperature:	-10 .. 50°C / 14 .. 122 °F
Storage temperature:	-20 .. 60 °C / 14 .. 140 °F
Fitting:	1/4 SAE male
Connection:	Bluetooth®
Maximum pressure load:	27.5 bar

5.0 OPERATION

5.1 Preliminary operations

Remove the instrument from the packaging used for shipment and inspect it. Check that the contents correspond to what was ordered. If you notice any signs of tampering or damage, report it immediately to the SEITRON Service Center or its Representative Agent, retaining the original packaging. The serial number and model number of the instrument are listed on the product label of the instrument. It is recommended that both data be reported for any request for technical intervention or technical and application clarification. Seitron maintains an archive at its headquarters with historical data on each instrument. A full battery recharge cycle is recommended before first use.

5.2 Instrument power up

The instrument is internally equipped with a high-capacity Li-Ion rechargeable battery. In case the battery is too low to proceed with measurements, it is possible to continue to operate by connecting the included battery charger, which will simultaneously power the instrument and recharge the battery.

CAUTION
IF THE INSTRUMENT IS NOT USED FOR A LONG TIME, IT IS BEST TO STORE IT AFTER A FULL RECHARGE CYCLE; IT IS ALSO RECOMMENDED TO PERFORM A RECHARGE CYCLE AT LEAST ONCE EVERY 3 MONTHS.

5.2.1 Internal battery charge level

The display constantly shows the charge status of the internal battery using the symbol in the upper right of the display.



WARNING

THE INSTRUMENT IS SHIPPED WITH A CHARGE VALUE OF NO MORE THAN 30% AS REQUIRED BY CURRENT AIR TRANSPORTATION REGULATIONS. PERFORM A FULL CHARGE CYCLE BEFORE USE. CHARGING IS RECOMMENDED TO BE PERFORMED AT AMBIENT TEMPERATURE BETWEEN 10°C AND 30°C.

5.2.2 Use with external power supply

The instrument can work with fully discharged batteries by connecting the instrument to any phone power supply or PC.



WARNING

LOW VOLTAGE POWER CONNECTOR: USB TYPE A SOCKET + CONNECTION CABLE WITH TYPE C PLUG.

5.3 Power On/Off

STATUS	ACTION	FUNCTION
Instrument off	Press and hold (> 2sec) the on/off button.	The instrument turns on
Instrument on	Press and hold the on/off button for a long time (> 3sec.).	The instrument shuts down

6.0 PRODUCT DESCRIPTION

6.1 Key function



Fig. 1

On/off key
(long press)

Button to change the vacuum measurement unit
(brief press)

6.2 Display interface



Fig. 2

1	<p>Battery charge indicator</p> <p>Indicates the charge level of the internal battery; if the indicator is empty, the remaining charge is less than 5%. In this case, it is recommended to recharge the instrument.</p>
2	<p>Bluetooth icon</p> <p>When the Bluetooth icon is lit, it indicates that an external device is connected to the instrument via the Seitron be cool App.</p>
3	<p>REC icon</p> <p>When the REC icon is lit, it indicates that measurement recording has been started; data is stored on the instrument's internal memory.</p>
4	<p>Vacuum measurement display</p> <p>Displays the vacuum measurement measured by the instrument. The measurement unit (microns, mTorr, inHg, Pa, Torr, kPa, mbar, psia) can be configured by briefly pressing the on/off button on the instrument or from the Seitron be cool App.</p>
5	<p>Temperature display:</p> <p>TH₂O = Water evaporation temperature</p> <p>Tamb = Room temperature</p> <p>$\Delta T = T_{amb} - T_{H_2O}$</p> <p>The temperature unit of measure (°C or °F) is configurable from the Seitron be cool App.</p>

6.3 Wiring diagram



Connection to the high pressure side of the system

Male fitting 1/4 SAE


Fig. 3



WARNING!

- **DANGER OF INJURY FROM HIGH-PRESSURE, HOT, COLD OR TOXIC REFRIGERANT GASES!**
- **WEAR GOGGLES AND PROTECTIVE GLOVES.**
- **BEFORE ANY MEASUREMENT, MAKE SURE THE REFRIGERANT HOSES ARE INTACT AND PROPERLY CONNECTED. WHEN CONNECTING HOSES, AVOID USING TOOLS AND TIGHTEN HOSES ONLY BY HAND (MAX. TIGHTENING TORQUE 5.0NM / 3.7FT*LB).**
- **OBSERVE THE PRESSURE MEASURING RANGE SPECIFIED IN THIS MANUAL AT THE CHAPTER "TECHNICAL DATA".**
- **MOSTLY IN THE SYSTEMS WITH THE R744 REFRIGERATION GAS, KEEP IN MIND THAT THESE GASES ARE OFTEN USED AT HIGHER PRESSURE!**

7.0 INSTRUMENT - APP PAIRING

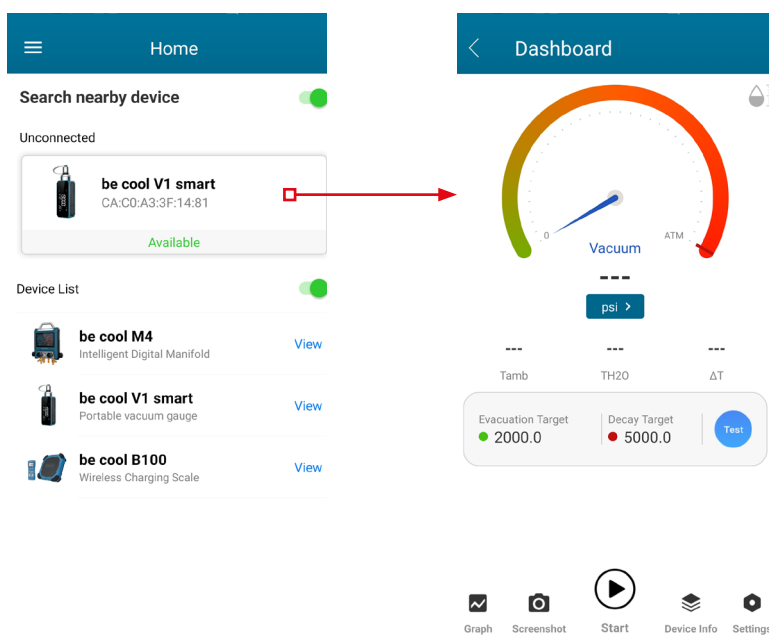
1. Turn on the BE COOL V1 SMART by a long-press the key “” placed on the top part of the instrument.

The instrument when it detects the room pressure shows the screen “- . . . -”, otherwise shows a pressure value included inside the range 0 and 19000 micron.

2. Download the app mobile Seitron be cool from Google Play Store or App Store.
3. Start the Seitron Be Cool application.
4. Once the app is started activate the function “Search nearby device”; when the instrument BE COOL V1 SMART is detected, select it.

When the app is paired with the instrument, on the display of the BE COOL V1 SMART the Bluetooth icon is on and remains lit as long as the instrument remains properly associated with the App.

5. Connect the BE COOL V1 SMART to the system.



WARNING

- START / STOP THE RECORDING CAN BE PERFORMED ONLY FORM THE APP.
- WHEN THE RECORDING IS STARTED, IT IS POSSIBLE TO DISCONNECT THE APP FROM THE INSTRUMENT AND TO WALK AWAY FROM THE SYSTEM; ON THIS CASE THE DATA FROM THE TEST KEEP TO BE RECORDED IN THE INTERNAL MEMORY OF THE INSTRUMENT, WHICH WILL BE AVAILABLE AT A LATER TIME BY PAIRING THE APP TO THE INSTRUMENT.

8.0 INSTRUMENT MEMORY

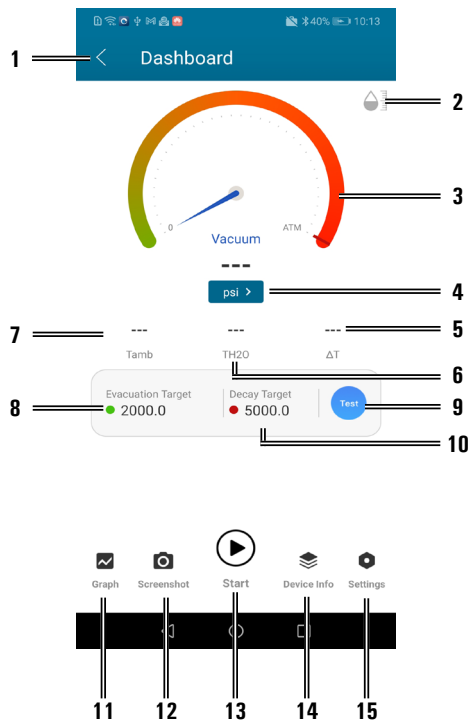
The instrument is featured with an internal memory able to store the recordings of the vacuum measurements.

The “**REC**” icon available on the display of the instrument indicates that the current measure is recorded on the instrument memory.

If the “**REC**” icon is blinking, shows that the instrument memory is full and aims to signal to the user that the measure is not sotred.

On this case, in order to import the data on the memory of the instrument it is necessary to pair the Seitron be cool App to the instrument and proceed as shown on chapter “7.1.6 Historical data reading”.

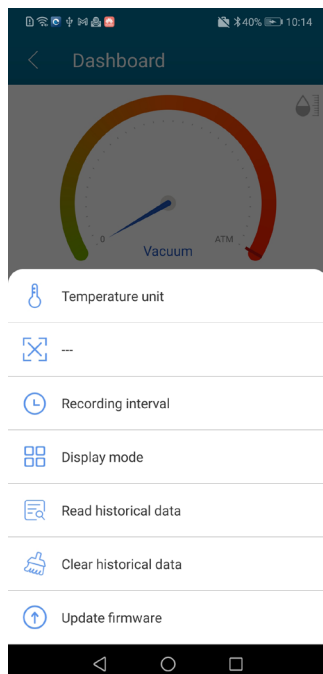
9.0 SEITRON BE COOL APP INTERFACE



1	Back to main screen
2	Water status indicator
3	Vacuum status indicator
4	Vacuum measurement unit setting
5	Temperature difference (T _{amb} - T _{H₂O})
6	Water saturation temperature
7	Ambient temperature
8	Vacuum target value
9	Setting of test time and start measurement
10	Decay target value
11	View graph
12	Performs screenshot
13	Start / Pause recording
14	Device information
15	Settings (see chapter 7.1)

Fig. 4

9.1 Settings



9.1.1 Temperature measurement unit setting

It is possible to change the unit of measurement with which the instrument takes the temperature measurement:

1. **From Seitron be cool App**, select the "Settings" menu and then select the "Temperature measurement unit" parameter; a window will open on which you can select the needed measurement unit. After selecting it, press OK to make the change effective.

Note: The measurement unit is updated both on the app and on the instrument at the same time.

9.1.2 Recording

The test recording is started; "REC" icon is shown on the instrument display; data will be saved in the instrument memory.

When the recording phase is started, it is possible to disconnect the App from the instrument, which will continue the recording of the measure OFFLINE; the "REC" icon keeps to be lit up.

In order to interrupt the recording, it is necessary to pair the instrument to the App and click "log out".

If the 'REC' icon blinks on the screen of the instrument, it indicates that the instrument memory is full and so the current measure cannot be stored.

On this case, in order to import the data stored in the App it is necessary to pair the Seitron App be cool to the instrument and proceed as shown on chapter "9.1.6 Historical data reading".

9.1.3 Log out

The recording of the previously started test is stopped; the "REC" icon on the display is turned off.

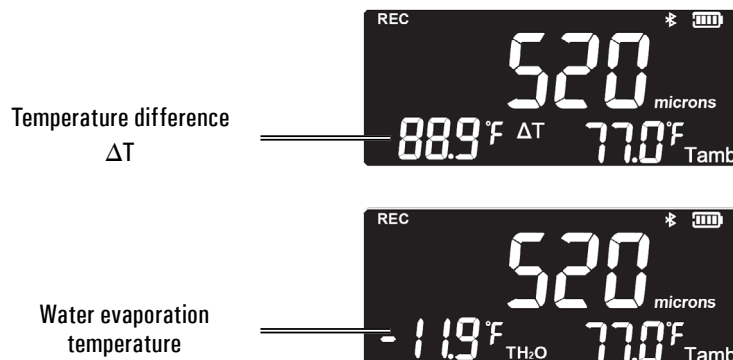
9.1.4 Recording intervall

This parameter is used to set the data acquisition interval; a window will open on which you can select the needed interval. After selecting, press OK to make the change effective.

9.1.5 Instrument display modes

By using this parameter it is possible to choose between two options: display water evaporation temperature (TH₂O) or The difference between the ambient temperature (Tamb) and the evaporation temperature of water (TH₂O) distinguished by the symbol ΔT.

Selecting this parameter opens a window on which you can select the needed mode then press OK to make the change effective.



9.1.6 Historical data reading

This parameter is used to import on the mobile device, the data into the memory of the instrument.

The data to be imported into the App can be selected based on two events:

- All data in the record
- Data recorded after this start

When the operation is finished, the measurements can be viewed in the "Report" menu where they can be exported in PDF, or EXCEL formats or associated with the customer and/or system via the "Job" menu (see Chapter 7.9 Menus).

By importing the data, they are not deleted from the instrument memory.

9.1.7 Cancel history data

With this menu it is possible to erase the data on the instrument memory.

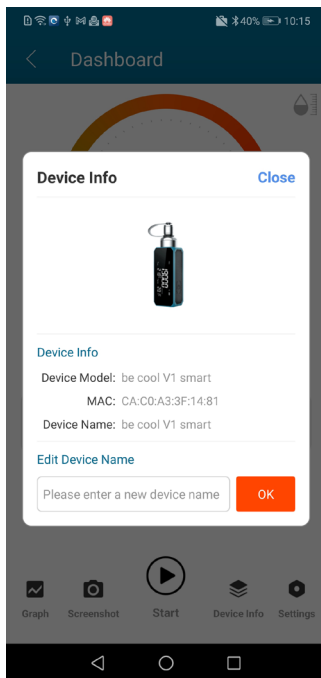
The data to be deleted can be selected depending on two events:

- All data in the record
- Data recorded after this start

9.1.8 Firmware update

Access this menu to download and install the latest updated firmware version on the instrument.

9.2 Device info



This menu provides information about the instrument paired with the App:

- Device model
- MAC: instrument unique MAC address, in order to locate the instrument you want to pair with the App.
- Device name: Seitron code of the instrument. You can change the name to locate it more easily by clicking on "Edit Device Name."

9.3 Start / Stop

Pressing the "Start" key it starts the test recording.

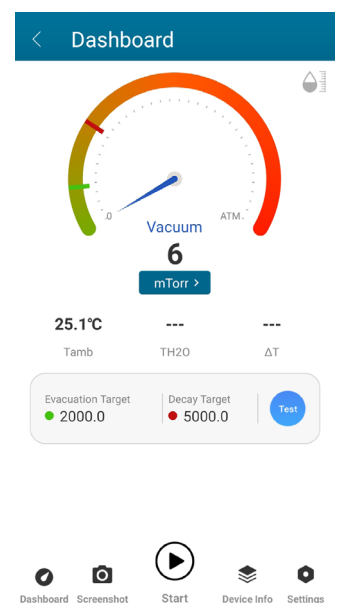
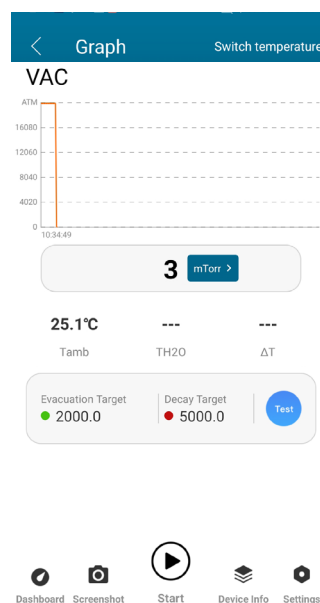
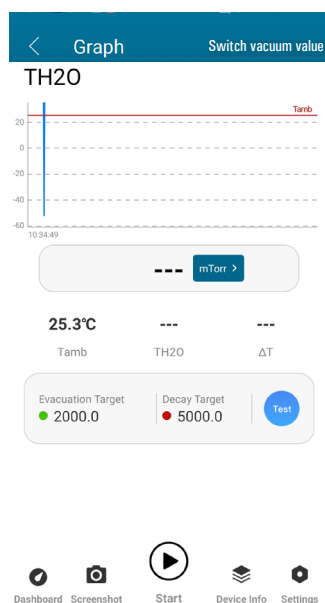
Pressing the "Stop" key ends the recording and asks if you want to save the test results; if you choose to save the test, it will be saved to the memory of the mobile device in use.

On the contrary, the test will not be saved.

9.4 Chart / Dashboard

Normally the App shows the vacuum values "dashboard".

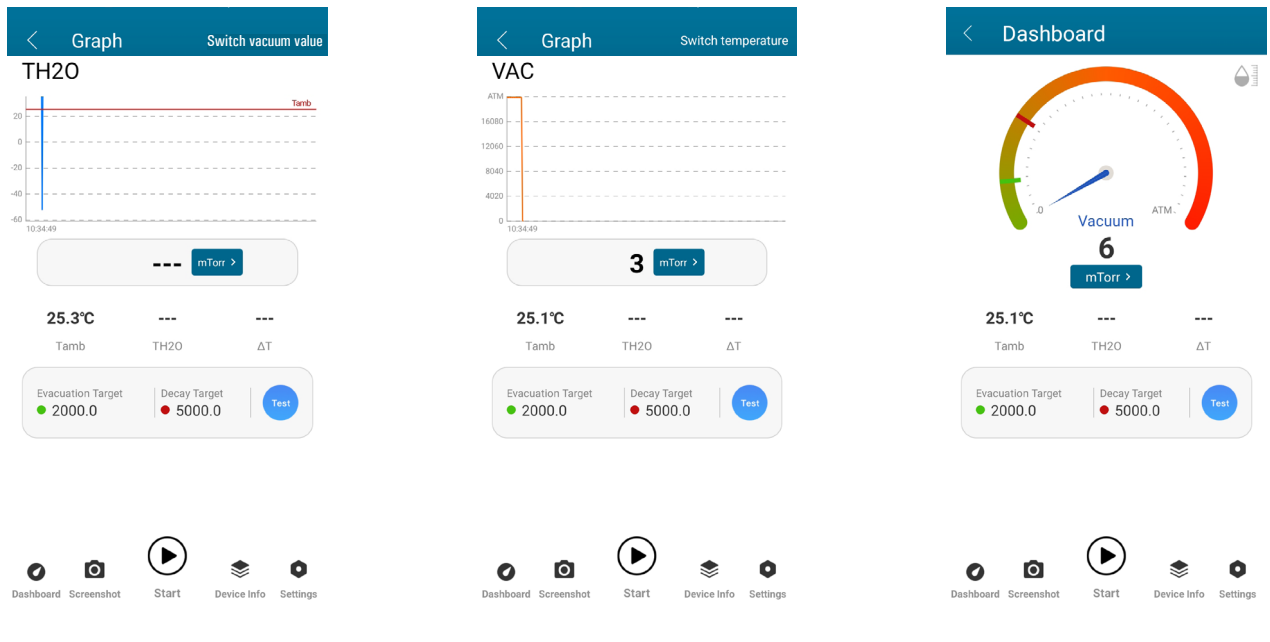
By selecting the "Chart" view, the App displays the measured data in two separate charts: Evaporation Temperature (TH₂O) and Vacuum Value.



9.5 Screenshot

Selecting the “Screenshot” feature allows the App to save the current screenshot in the memory of the mobile device.

Example:



9.6 Water status indicator

The instrument can determine the water status by comparing the ambient temperature with the evaporation temperature of water relative to the vacuum in the system. When the water evaporation temperature is lower than the ambient temperature ($TH_2O < Tamb$), the water is in gaseous form (in vapor form) and the condensate inside the system pipes can be removed more effectively.

Note: If the water state remains liquid after the evacuation target has been reached, it is recommended to keep the vacuum pump on as long as the TH_2O temperature is lower than the room temperature.

	H ₂ O in liquid state
	H ₂ O in vapor state

Fig. 5

9.7 Setting of evacuation target, pressure decay and test duration

The instrument is able to measure the vacuum inside a cooling system using the following three parameters settable from the App Seitron be cool (see icons 8 - 9 - 10 at chapter 9.0):

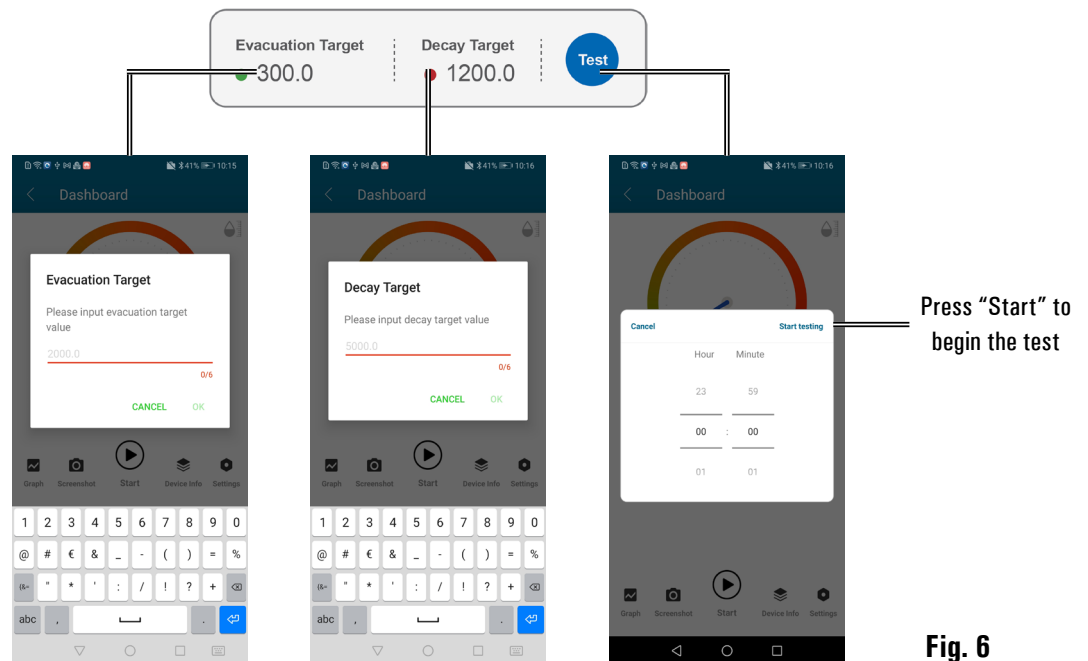



Fig. 6

It is possible to set the evacuation target, decay target and test duration by pressing the evacuation and decay icons and above the “Test” icon, respectively:

- **Evacuation target:** The pressure value that the system must reach to facilitate condensate removal.
- **Pressure decay target:** is a pressure value that takes into account the change in pressure over time; if this change is too sudden or conspicuous, it means that there is a leak or flaw in the system.
- **Test:** test duration.

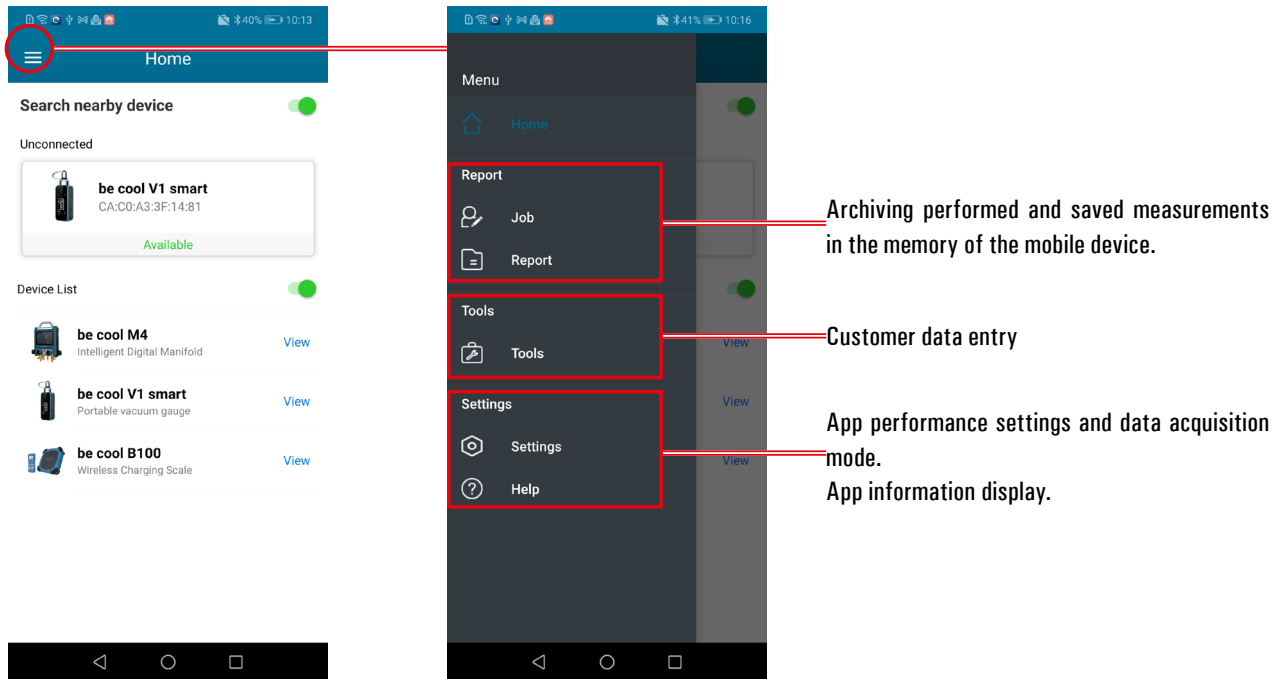
9.8 Pressure measurement setting

It is possible to modify the measurement unit which which the instrument performs the measure of the pressure in two ways:

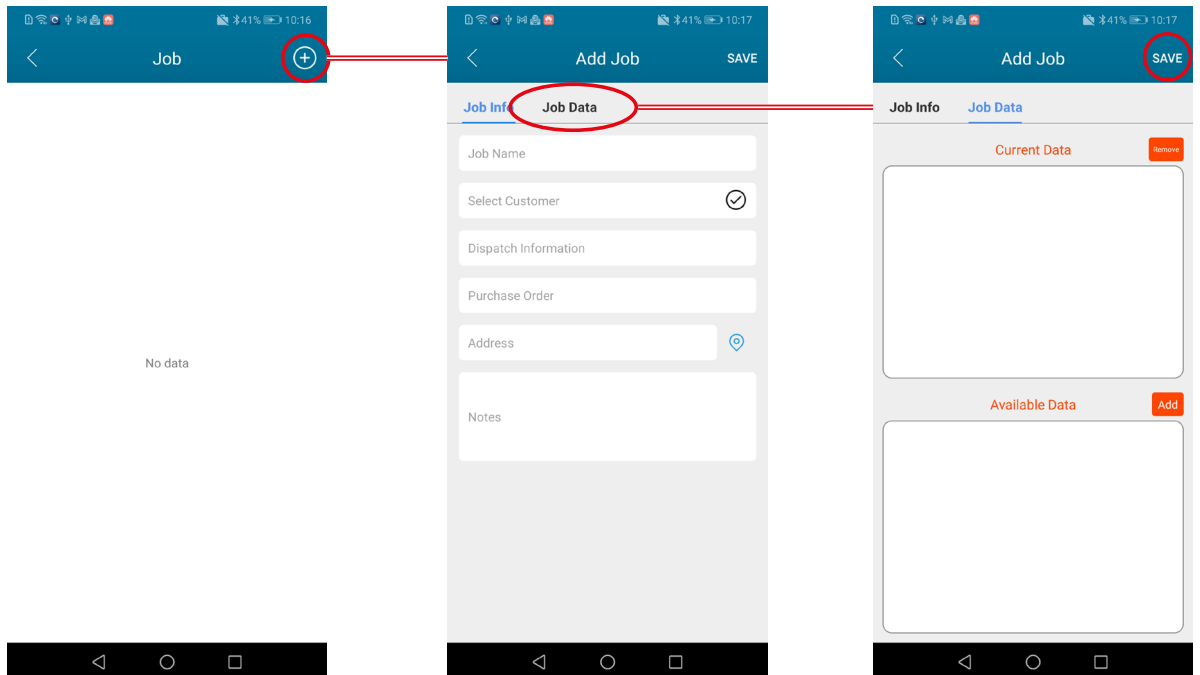
1. Directly from the instrument, by briefly pressing the key “”; at each short press it cycles among the different available measurement units.
2. From the App Seitron be cool, by selecting the icon 4 of Fig. 4 (which shows the current unit of measurement) a window will be opened on which you can select the needed unit of measurement. After selecting it, press OK to make the change effective.

Note: Either way, the unit of measurement will be updated on both the App and the instrument in real time.

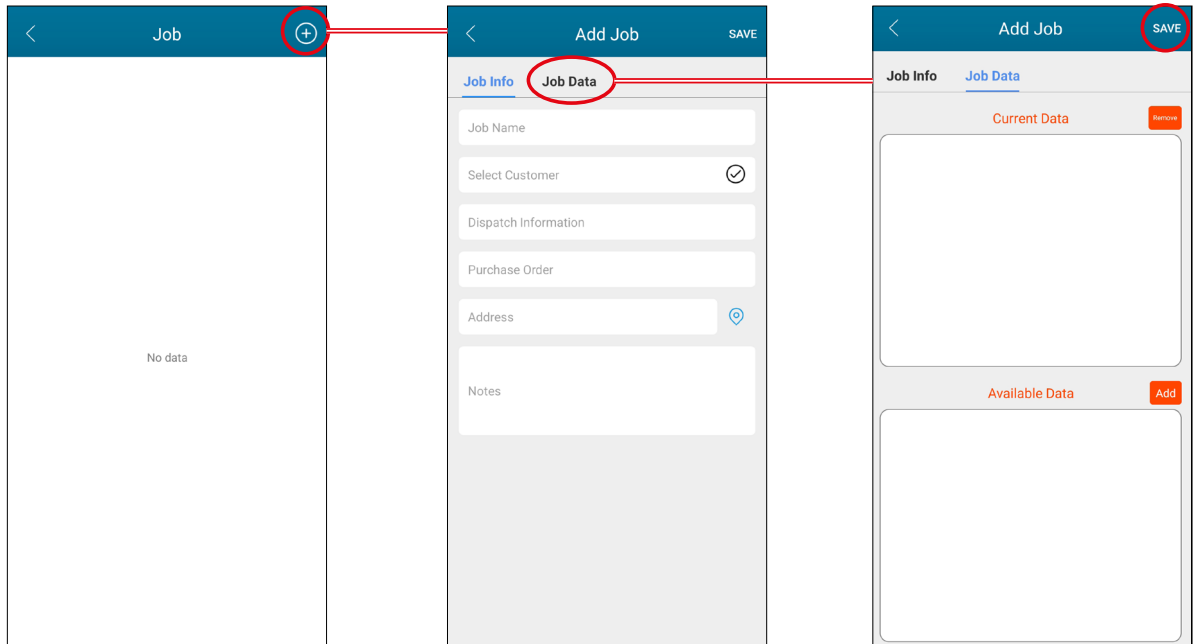
9.9 Menu



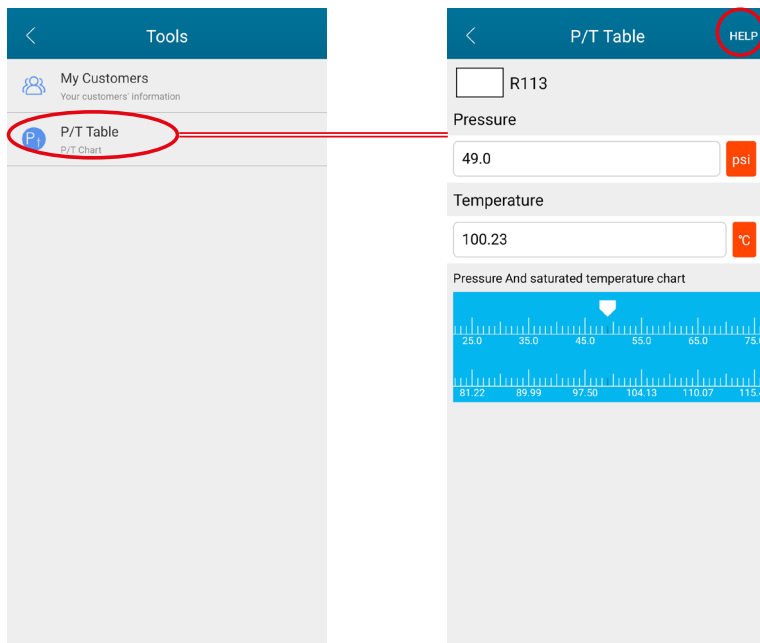
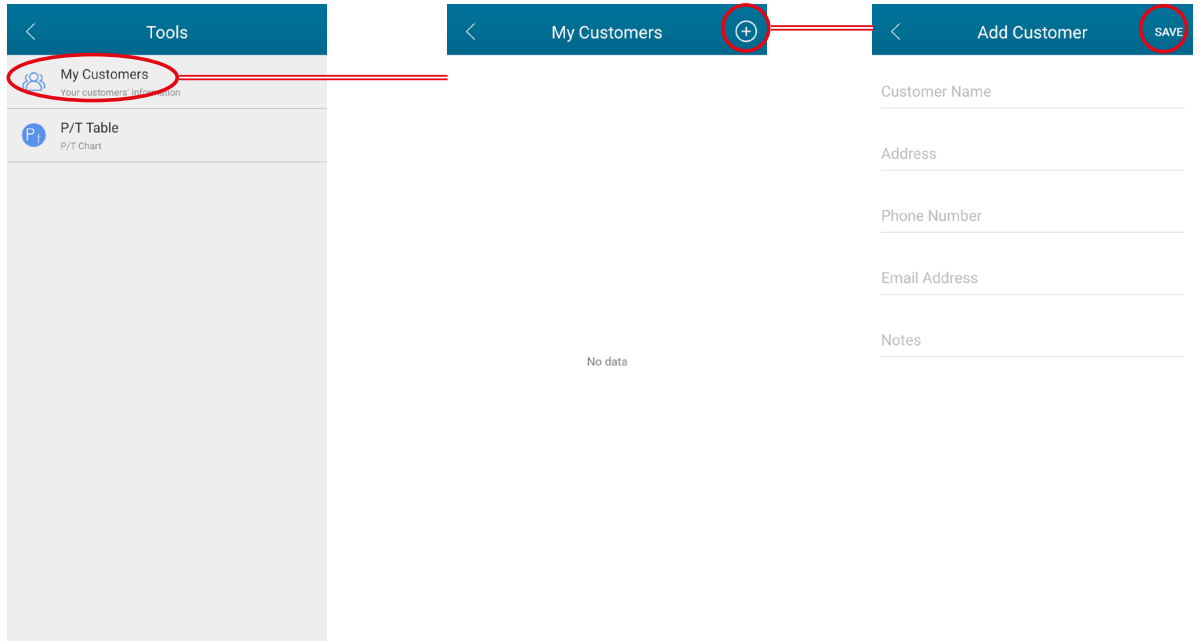
9.9.1 Job (measurement archive)



9.9.2 Report (consultation of posted jobs)

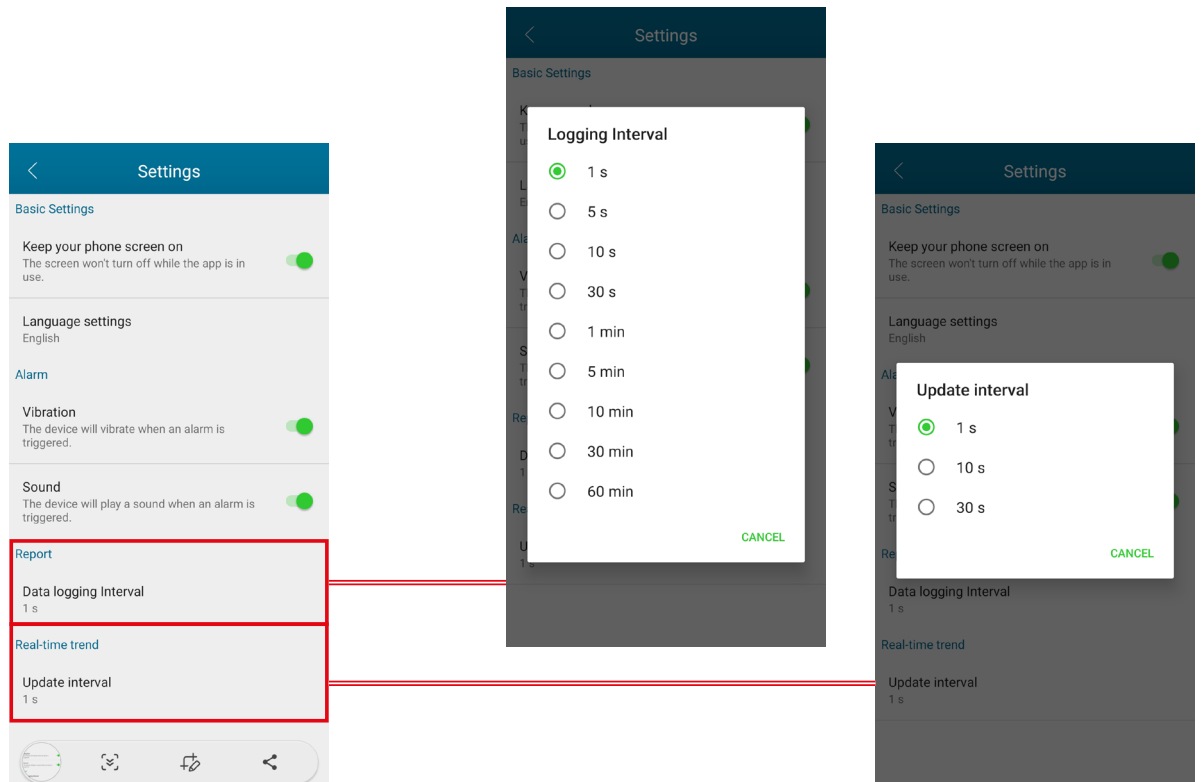


9.9.3 Instruments (Insert / consult customers database)



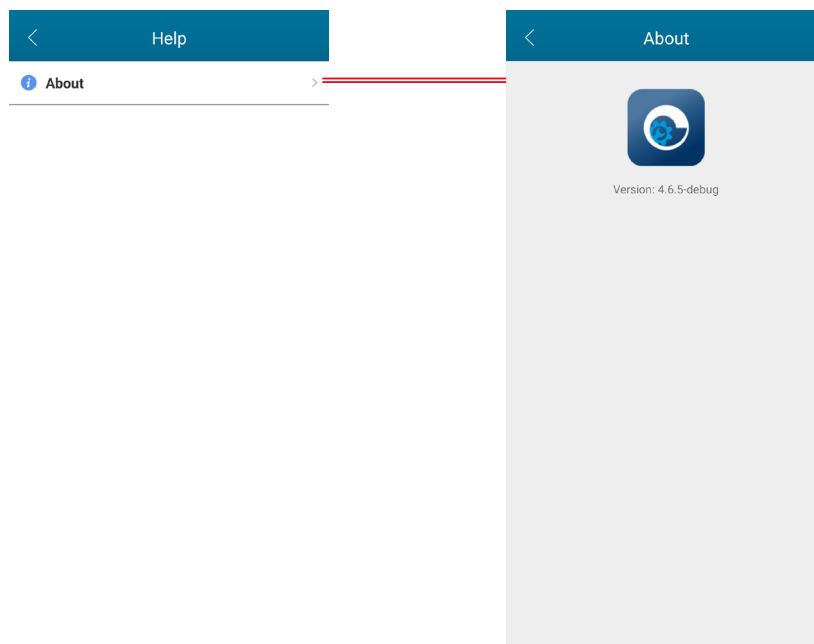
9.9.4 Settings

This parameter is used to set the data acquisition test interval and the update interval of the displayed data; a window will be opened on which the needed interval can be selected. After selecting, the change is saved automatically.



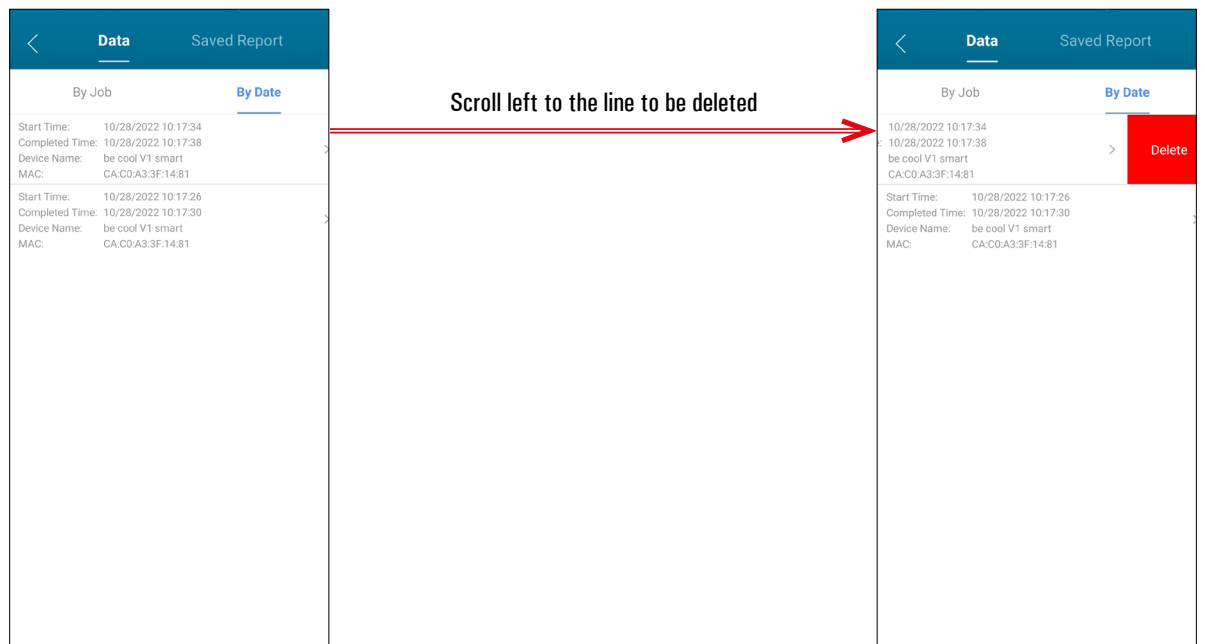
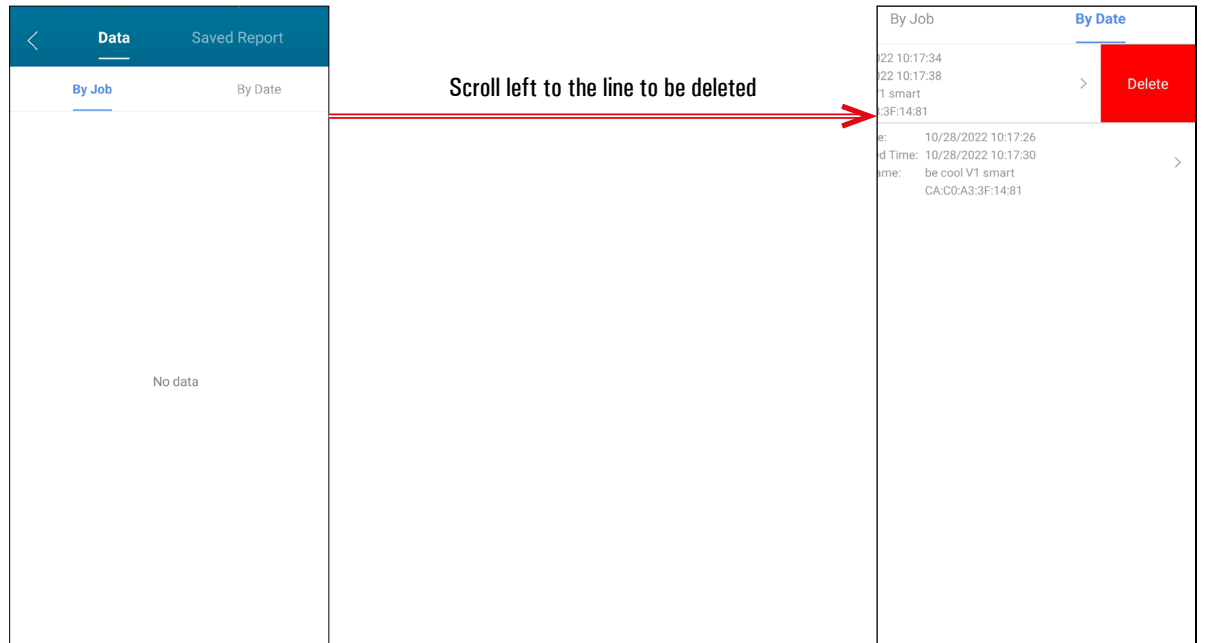
9.9.5 Help

In this menu you will find information about the version of the App installed on your mobile device.

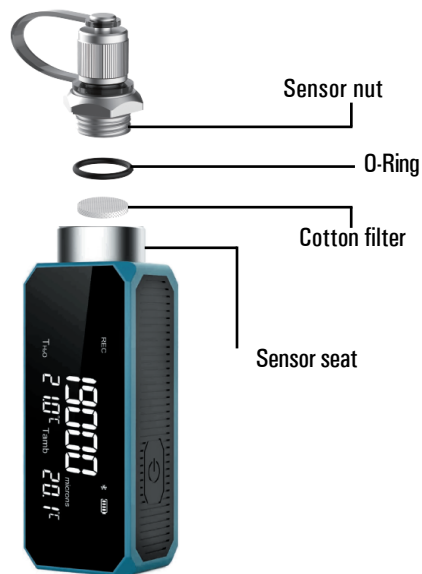


9.10 Measurements deletion

To delete the measurements taken and saved on the mobile device, proceed as shown in some examples below:



10.0 MAINTENANCE



To service the instrument, proceed as follows:

1. Turn off the instrument.
2. Remove the sensor nut and the cotton filter.
3. Check if the cotton filter is dirty and if it is the case clean it with a paper towel. If it is not possible to clean it, replace it with a new one.
4. Check the integrity of the O-Ring and if it is too damaged replace it. If it is needed to replace it, before performing the operation, lubricate the O-Ring.
5. Place back the cotton filter and close the instrument ring with a wrench.
6. If the sensor inside its housing is dirty, proceed as follows:
 - Pour acetone or alcohol (>70%) into the sensor chamber with a dropper or syringe. Close the sensor ring and carefully shake the instrument.
 - Unscrew the sensor ring and empty the liquid inside. Repeat the operation 3 or 4 times.

11.0 WARRANTY

The user is guaranteed against the product's defects of conformity according to the European Directive 2019/771 as well as the Seitron warranty terms, available online on the website www.seitron.com.

We invite the user to visit our website and check the latest version of technical documents, manuals and catalogs.

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