



USE AND MAINTENANCE



BE COOL M4

4-way digital manifold

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1.0 IMPORTANT INFORMATION

1.1 About this manual

- ◊ This manual describes the operation, features, and maintenance of the digital manifold BE COOL M4.
- ◊ 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

Magnets on the back of the instrument can damage credit cards, hard drives, mechanical watches, pacemakers, defibrillators and other devices sensitive to magnetic fields.
It is recommended to keep the instrument at least 25 cm away from these devices.



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 putting the instrument into operation.

2.2 Permitted Use of the Product

This chapter describes the application areas for which the multifunction digital manometer can 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 vacuometer 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.

BE COOL M4 should not be used:

- As safety device in safety compelling areas.
- Atex classified areas.
- Refrigerant systems that contain ammonia (NH₃).
- 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 refrigeration system where you are operating.
- Do not use the instrument with third-party battery charger but use only the one provided by Seitron S.p.A.
- Do not attempt to stick the product to metal surfaces-the magnets on the back of the manifold are intended only to keep the support hook attached to the instrument itself.

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 use with inverted polarities.
- 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 in 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:

- Seitron Digital manifold BE COOL M4.
- n°1 T fitting for vacuum measurement
- n°1 bent joint
- n°2 Clamp temperature probes
- n°1 Vacuum measurement tool
- n°4 Flexible hoses for cooling liquid.
- n°1 Battery Charger
- n°1 US plug
- n°1 UK plug
- n°1 EU plug
- n°1 Australia plug
- n°1 Cable USB type A / Type C
- Hard shell case
- Quick guide
- WEEE Instructions
- Simplified EU declaration of conformity

3.2 Typical Use

- Measurement of system temperature and pressure.
- Leak test of system pressure.
- Vacuum measurement.

Compatible refrigerant gases:

R113	R114	R115	R116	R12	R123	R1233ZD	R1234ZE	R1234YF	R124	R125
R13	R134a	R14	R141B	R142B	R143A	R152A	R170	R22	R23	R236FA
R245FA	R290	R32	R401A	R401B	R401C	R402A	R402B	R403B	R404A	R406A
R407A	R407B	R407C	R407D	R407F	R408A	R409A	R410A	R410B	R412A	R413A
R414A	R414B	R416A	R417A	R417C	R420A	R421A	R421B	R422A	R422B	R422C
R422D	R424A	R426A	R427A	R428A	R429A	R434A	R437A	R438A	R441A	R443A
R448A	R449A	R450A	R452A	R452B	R453A	R454A	R454B	R455A	R458A	R500
R502	R503	R507A	R508A	R508B	R514A	R600	R600a	R601a	R718	R744

3.3 Maintenance

- The instrument requires an annual calibration to be performed at the Seitron service center.

4.0 PRODUCT DESCRIPTION

The instrument is featured with:

- 5" touch color display.
- Pairing with App Seitron be cool.
- n°2 plug mini-DIN for NTC temperature sensor or vacuum gauge measure, with safety soft rubber cap.
- USB type C plug for power supply or PC connection, with safety soft rubber cap.
- Collapsible rear hook.
- 'Li-Ion' rechargeable battery pack.
- Gas flow inspection window.
- n°4 knobs which regulate the gas flux toward the instrument.
- n°1 7/16" UNF input, brass. High pressure, for coolant hoses equipped with quick couplings, the passage can be closed with the valve regulator.
- n°1 7/16" UNF input, brass. Low pressure, for coolant hoses equipped with quick couplings, the passage can be closed with the valve regulator.
- n°1 7/16" UNF input, brass. For coolant bottles, with closing cap.
- n°1 5/8" UNF input, brass. For negative pressure pump.

4.1 Operating principle

The instrument is designed for use in the installation and/or maintenance of cooling systems and heat pumps.

This multifunction digital manifold, can perform various tests:

Measurement of system pressure and temperature

Making use of the hose connection to the cooling system and the temperature clamp-on probes (see Chapter 6.0 Connection Diagram), it is possible to measure the pressure and temperature of the high-pressure and low-pressure sides.

Tightness test

By filling the system with nitrogen, it is possible to test for leaks in the circuit by measuring the pressure decay during a set time frame. It is also possible to set an alarm, so that if the pressure decreases by a certain percentage during a set time frame (configurable values) the instrument emits a sound that identifies the leakage situation. The instrument shows the initial pressure, the current pressure, and the pressure difference dP.

Vacuum measurement

By connecting the vacuum gauge and a vacuum pump (not supplied) to the system, it is possible to empty the system of the air present. In this way, you can display on the gauge screen the data on the vacuum that is being created in the system. This vacuum serves to prevent condensation present in the air, from causing oxidation in the metal pipes of the system.

4.2 Connection to the battery charger

Featured with the instrument there is a wall power plug with an output of 5V, 2A for the charging of the internal batteries.

Section 5.1 shows the socket for inserting the battery charger to the instrument.

4.3 Bluetooth® connection

The Seitron BE COOL M4 is featured internally with a Bluetooth® module, which allows the communication with:

- Smartphone or tablet of the latest generation where the operative system Google Android v.4.1 (Jelly Bean) or later is installed, previously installing the app "SEITRON BE COOL" available on the Google Play store and on the Apple App Store.
The maximum transmission range in open field is 30 meters.
- Scale BE COOL B100.

5.0 MECHANICAL DESCRIPTION

5.1 Digital manifold

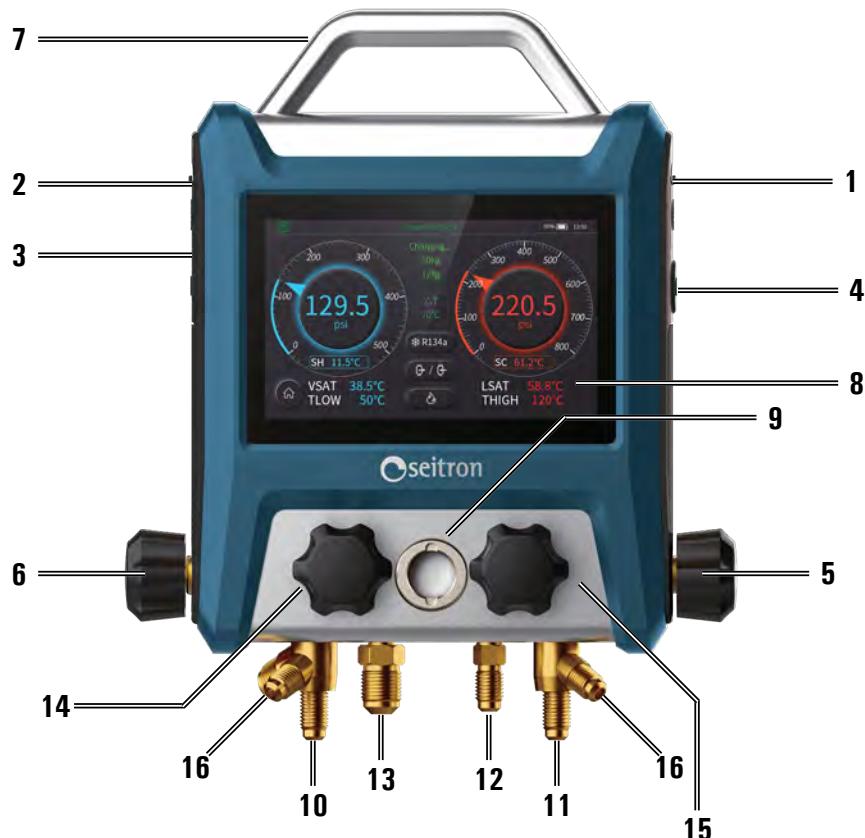


Fig. 1

1	Clamp probe connector for high temperature side (with safety cap)	9	Refrigerant gas flow control window
2	Clamp probe connector for low temperature side (with safety cap) or for vacuum gauge.	10	Low pressure side refrigerant gas pipeline interface (fitting 1/4 SAE)
3	USB type C interface (with safety cap)	11	High pressure side refrigerant gas pipeline interface (fitting 1/4 SAE)
4	Power on/off button	12	Refrigerant gas loading interface (fitting 1/4 SAE)
5	High pressure control valve	13	System vacuum measurement interface (fitting 3/8 SAE)
6	Low pressure control valve	14	Vacuum control valve
7	Metal handle	15	Load control valve
8	5" color IPS capacitive touch screen display	16	Supports for flexible hoses

5.2 Accessories



Fig. 2

1	T-fitting for vacuum measurement
2	Vacuum gauge
3	Bent fitting
4	Clamp temperature sensors

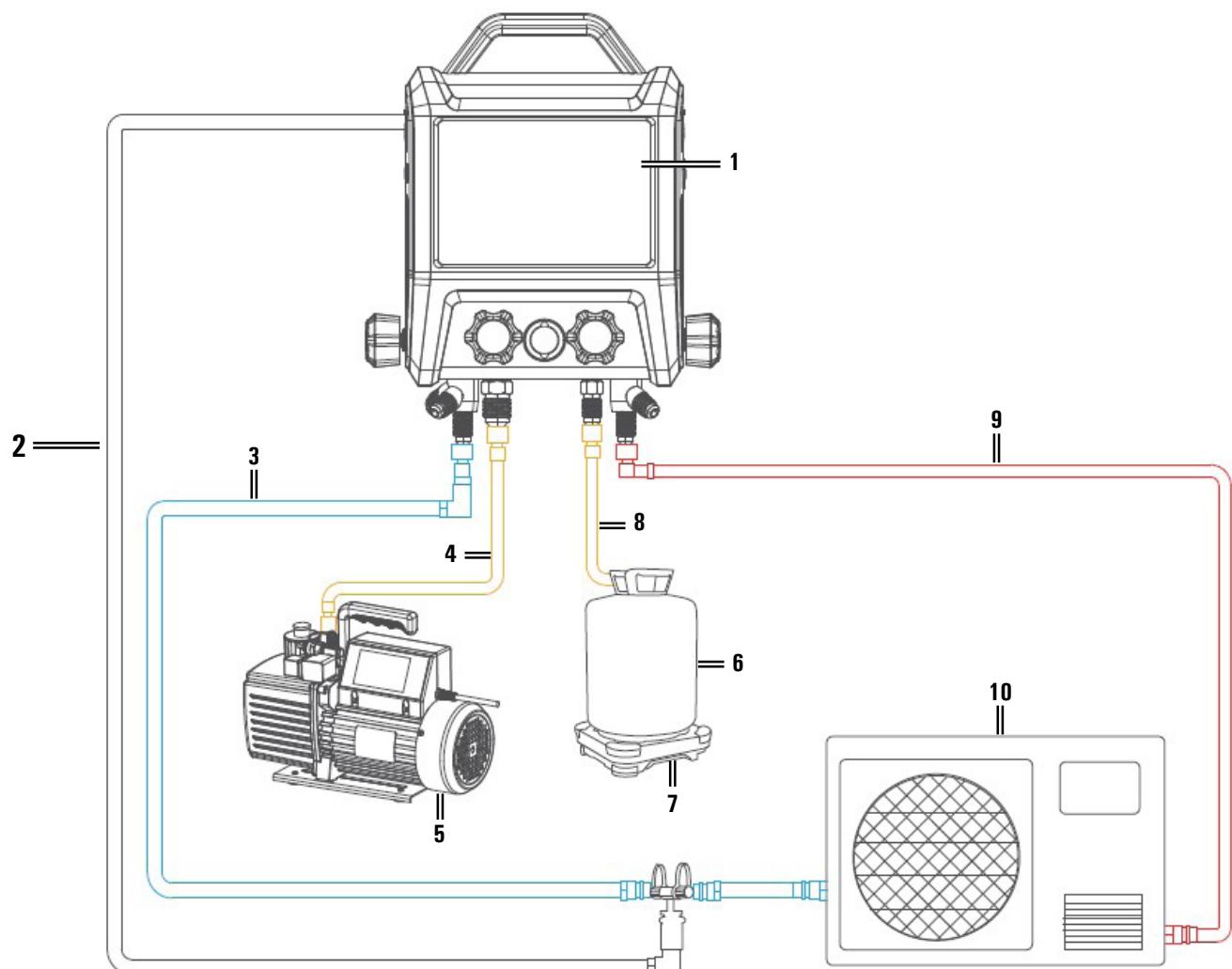
5.3 Clamp probe connectors and/or vacuum gauge plug-in seat



WARNING!

As shown on the image on the left, the connectors of the clamp temperature probes and of the vacuum gauge have to be plugged in making sure that the arrow on the measurement sensor connector is pointing upward.

6.0 CONNECTION DIAGRAM

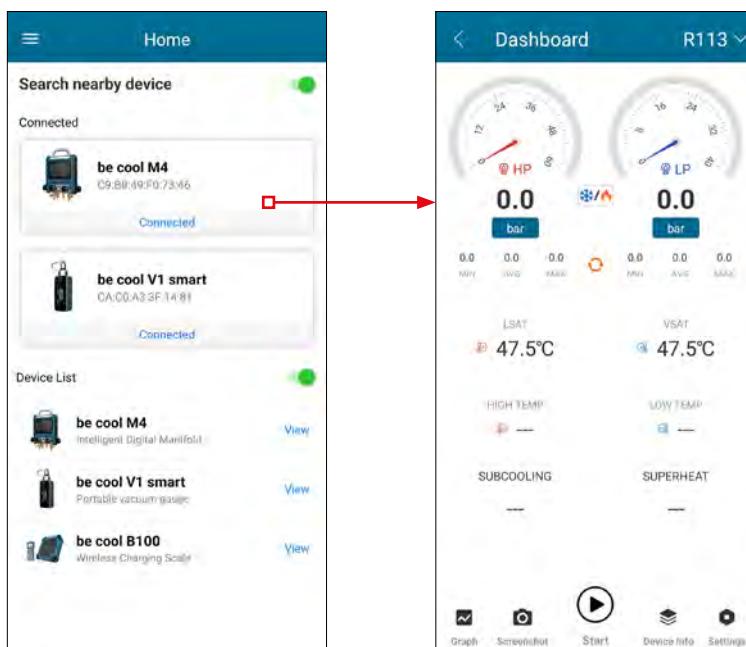


1	Digital manifold
2	Vacuum gauge connection with 6-pin connector
3	Low pressure hose connection
4	Vacuum pump tube connection
5	Vacuum pump
6	Exhaust refrigerant gas collection cylinder
7	Scale to measure the weight of the refrigerant gas cylinder
8	Refrigerant gas discharge connection
9	High pressure hose connection
10	External unit AC (compressor)

7.0 INSTRUMENT - APP PAIRING

1. Connect the BE COOL M4 to the system; see chapter "6.0 Connection diagram".
1. Turn on the BE COOL M4 by long-pressing the button "P" on the right side of the instrument.
2. Switch on the Bluetooth® on the instrument; the BT parameter is in "Settings=>Settings=>Wireless". When the BT is on, the Bluetooth® icon appears.
2. Download the mobile App Seitron be cool from the Google Play Store or App Store.
3. Start the app Seitron Be Cool.
4. Once the app is started activate the function "Look for nearby devices"; when the instrument BE COOL M4 is detected, select it.

When the App has been paired to the instrument, on the BE COOL M4 display, two arrows on the left and right side of the Bluetooth® symbol will appear, and they will be there until the instrument is correctly paired with the app.



WARNING

- THE START AND STOP OF MEASUREMENT RECORDING CAN BE DONE FROM APP OR VIA THE INSTRUMENT'S RECORD PARAMETER.
- ONCE THE RECORDING IS STARTED THROUGH THE APP, IT IS NOT POSSIBLE TO DISCONNECT THE APP FROM THE INSTRUMENT OR MOVE AWAY FROM THE SYSTEM WITH THE MOBILE DEVICE BEING USED; IN THIS CASE, THE TEST DATA WILL NOT BE STORED ON THE INTERNAL MEMORY OF THE INSTRUMENT, AND THEREFORE WILL NOT BE RECOVERABLE EVEN IF YOU LATER REACTIVATE THE COMMUNICATION APP <=> INSTRUMENT.
- ONCE THE RECORDING FROM THE INSTRUMENT IS STARTED, THE TEST DATA WILL BE STORED ON THE INSTRUMENT INTERNAL MEMORY, WHICH WILL BE Fetched LATER BY CONNECTING THE INSTRUMENT TO YOUR PC AND NOT THROUGH THE APP.

8.0 INSTRUMENT MEMORY

The instrument is featured with an internal memory in order to store measurement results.

The icon "REC", which shows up on the screen on the upper left corner of the screen, indicates that the on-going measure is recorded on the internal memory of the instrument.

For all the other details see chapter "10.5 Record".

9.0 OPERATION

9.1 Preliminary operations

Remove the instrument from the packaging used for shipment and inspect the instrument.

Verify that the contents match what was ordered. If you notice signs of tampering or damage, report it immediately to SEITRON Customer care or its representative Agent, keeping the original shipping box. In the nameplate data of the instrument, the serial number and the model of the instrument are written. It is recommended that both data be reported for any request for technical service, spare parts, or technical and application clarification. Seitron keeps at its headquarters an updated version of an archive with the records of all the historical data of each instrument. A full battery charging cycle is recommended before first use.

9.2 Powering the instrument

The instrument is featured with a high-capacity Li-Ion rechargeable battery.

In case the battery is too low to proceed with measurements, it is possible to continue operations by connecting the supplied mains power supply, which will simultaneously power the instrument and recharge the battery. The battery charging cycle takes up to 5 hours to fully charge and ends automatically.

CAUTION

If you are not going to use the instrument for a long time, it is best to store it after a full recharge cycle; it is also recommended that a recharge cycle be performed at least once every 3 months.

9.2.1 Internal battery charge level

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

- Drained battery: the battery symbol turns red and is completely empty.
- Battery fully charged: the battery symbol turns green and has all the notches lit inside it.



WARNING!

THE INSTRUMENT IS SHIPPED WITH A CHARGE VALUE OF NO MORE THAN 30% AS REQUIRED BY CURRENT AIR TRANSPORT REGULATIONS.

PERFORM A FULL 5-HOUR CHARGING CYCLE BEFORE USE.

IT IS RECOMMENDED TO CHARGE AT AN AMBIENT TEMPERATURE BETWEEN 10°C AND 30°C.

9.2.2 Use with external power supply

The instrument can work with fully discharged batteries by connecting the external power supply given in the package.



WARNING!

LOW VOLTAGE OUTPUT IS 5 VOLTS WITH DELIVERABLE CURRENT OF 2A.

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

9.3 Power On/Off

STATUS	ACTION	FUNCTION
Instrument off	Press the on/off key	Instrument turns on
Instrument on	Press and hold the on/off key for a long time (> 3sec.)	Instrument turns off

9.3.1 Instrument Home Page

When the instrument start up is completed, the display shows the home page screen.

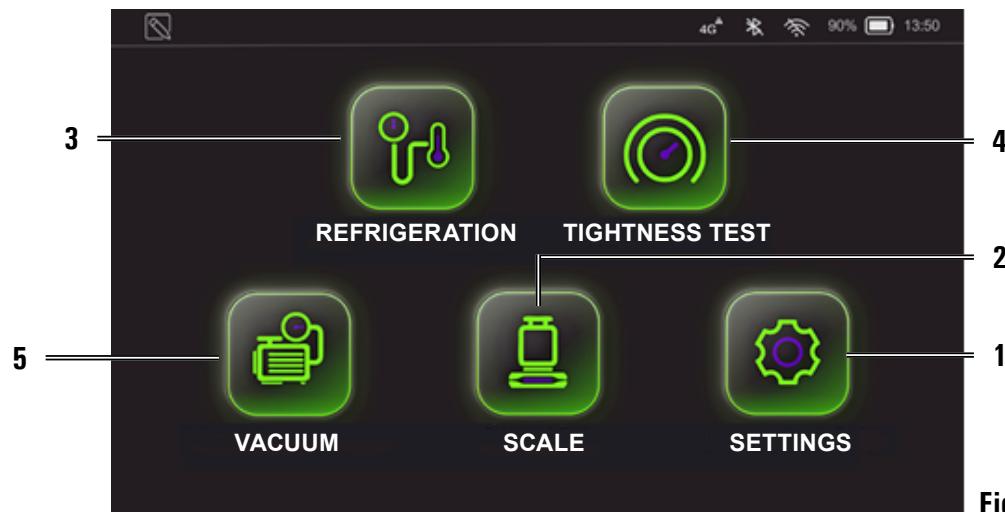


Fig. 3

Touch the icon to access the related function.

The status bar at the top of the page displays the time, battery charge indicator, Bluetooth® connection and registration status.

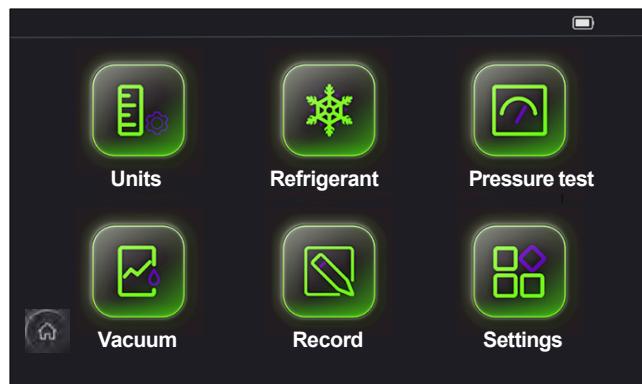
If the Bluetooth® icon is off, it means that Bluetooth® is disabled, and if the icon is on, it means that the Bluetooth® connection has been enabled.

Similarly, if the recording icon “” is on, means recording has been started, on the contrary, the instrument is not recording the measurement.

1	Accesses the configuration menu; the user can set the several instrument parameters. FOR ALL DETAILS REFER TO CHAPTER 10.0.
2	This page shows the weighing of the exhaust refrigerant gas cylinder connecting the instrument to the scale BE COOL B100, through the “settings” menu. FOR ALL DETAILS REFER TO CHAPTER 11.0.
3	Performs pressure and temperature measurement of both sides of the system (high and low pressure). FOR ALL DETAILS REFER TO CHAPTER 12.1.
4	Perform the refrigeration system tightness test. FOR ALL DETAILS REFER TO CHAPTER 12.2.
5	Performs vacuum measurement of the system. FOR ALL DETAILS REFER TO CHAPTER 12.3.

10.0 SETTINGS

The “settings” screen (1 of Fig. 3) allows you to set a number of system variables, namely:



10.1 Units

In this sub-menu you can select units for the following physical measures: Weight - Temperature - Pressure - Vacuum. To go back press the arrow at the bottom left of the screen; any changes made will be saved automatically.

10.2 Refrigerant

In this sub-menu it is possible to select from the “favorites” table, the type of refrigerant gas in use in the tested system. If the refrigerant is not in the list of favorites it will be necessary to add it by selecting the gas from the “Refrigerant” table, and it will be automatically added to the favorites section; a maximum of 20 favorite refrigerants can be added. **Note:** In case the “favorite” refrigerants exceed the number of 20, the last refrigerant in the list will be deleted, while the newly selected one will be returned as the first one.

10.3 Pressure test

In this sub-menu you can set the parameters affecting the leak test (also accessible from the “Leak test settings” button (7 of Fig. 6). These parameters are: **Leak** (alarm threshold, as a percentage) - **Duration** (duration of leakage test) - **Temp. Compensation** (Enabling/disabling temperature compensation). Parameters are saved automatically.

10.4 Vacuum

In this sub-menu you can set the parameters related to emptying the system (6 of Fig. 5 chapter 12.2 Emptying). These parameters are: **Alarm and duration**. The parameters are saved automatically.

10.5 Record

In this sub-menu, it is possible to enable/disable measurement logging and set the regular data storage interval. When the BE COOL M4 is storing the measures, the icon on the upper left corner of the screen is switched on “”. The data are saved in the memory of the digital manifold in a .csv file format. In order to export the .csv file, connect the BE COOL M4 to the PC, using the provided USB cable, and access the external device “Manifold”.

With the “DELETE” key, all data in memory can be erased.

WARNING. Data recording is automatically paused when the memory space is full. It is recommended to export data often in order to avoid information loss.

10.6 Settings

In this sub-menu you can change the instrument parameters shown below.

Brightness: display brightness is set.

Backlight: Turning off the backlight since the last action on the display (15 seconds .. 15 minutes).

Auto off: Auto power off of the instrument (OFF / 5 ... 30 minutes).

Language: Language setting.

Wireless: Turns the Bluetooth® on/off in order to be connected to the App Seitron be cool and turns on/off the BE COOL B100 scale connection.

Zero: Performs the zero of the pressure sensor.

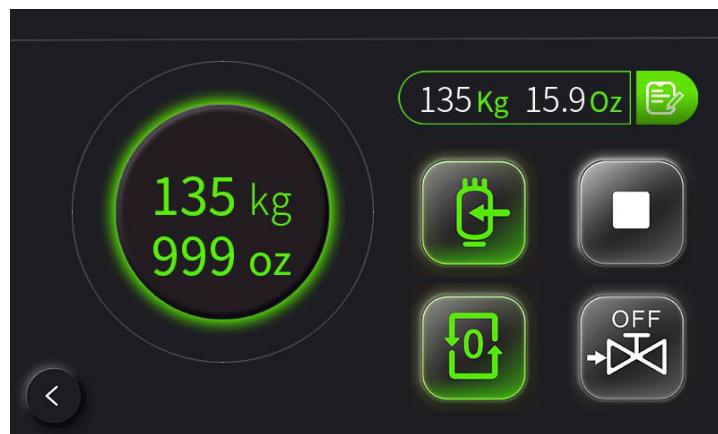
Reset: Resets the instrument to default conditions.

11.0 SCALE

It is possible to connect the scale BE COOL B100 to the manifold BE COOL M4..

In order to pair the manifold with the scale it is necessary to proceed as follows:

1. Access "Settings" menu of the instrument.
2. Tap the "Wireless" icon.
3. Turn on the Bluetooth® (BT).
4. Switch on the "scale link" switch button.
5. Turn on the scale.
6. The manifold => scale pair is automatic and signaled by the scale with the emission of a Beep and the lighting of the green LED.
7. Tapping the "Balance" icon on the main page of the instrument displays the scale data directly on the BE COOL M4.



The timer, located on the top status bar, starts automatically when the user enters this page. The purpose is to record the time spent by the user on this page.



Tares the scale (resets the current weight to zero).



Performs cylinder weighing during refrigerant gas discharge from the system.



Performs cylinder weighing when loading refrigerant gas into the system.



Inactive function.



Stop the operation started.



Displays the last manually set charge or discharge value. Using the "BT" button it is possible to set the value:



12.0 MEASURE

Valve regulator

From the liquid refrigerant pathway point of view, the BE COOL M4 works a traditional four-ways manometer: when you open the valves, the passages are open. Applied pressure is detected with both open and closed valves.

- To open the valve: turn the valve regulator counterclockwise.
- To close the valve: turn the valve regulator clockwise.

Over-tightening of valve regulators:

- **Damage to the PTFE gasket**
- **Mechanical deformation of the valve piston and falling of the PTFE seal**
- **Damage to the thread of the threaded rod and that of the valve screw**
- **Breakage of the valve knob**

Tighten the valve regulators by hand only. Do not use any tools to tighten the valve regulators.

Automatic mode

The manifold automatically detects the difference between the high pressure side and the low pressure side. When the measured pressure on the low pressure side is 1 bar higher than the high pressure side, the low pressure moves from left to right and the high pressure from right to left. This mode has been specifically developed for the conditioning systems which cool and heat at the same time.

Measurement mode



WARNING!

- **DANGER OF INJURY FROM HIGH-PRESSURE, HOT, COLD OR TOXIC REFRIGERANT GASES!**
- **WEAR GOGGLES AND PROTECTIVE GLOVES.**
- **IN ORDER TO SECURE THE INSTRUMENT AND TO PREVENT IT FROM FALLING, ALWAYS SECURE THE INSTRUMENT TO ITS HOOK (DANGER OF BREAKAGE).**
- **BEFORE EACH MEASUREMENT, MAKE SURE THAT THE REFRIGERANT GAS HOSES ARE INTACT AND PROPERLY CONNECTED. TO CONNECT THE HOSES, AVOID USING TOOLS AND TIGHTEN THE HOSES ONLY BY HAND (MAX. TIGHTENING TORQUE 5.0NM / 3.7FT*LB).**
- **OBSERVE THE PRESSURE MEASURING RANGE GIVEN IN THIS MANUAL IN THE "TECHNICAL SPECIFICATIONS" CHAPTER. ESPECIALLY IN SYSTEMS CONTAINING R744 REFRIGERANT, KEEP IN MIND THAT THESE OFTEN OPERATE AT HIGHER PRESSURES!**

12.1 Refrigeration

Pressure and temperature measurement (for charging, discharging, maintenance).

To perform the test, follow the instructions in the following points.

1. Press the power button to turn on the device; when the startup is finished, the home page is shown on the display.
2. Connect the clamp temperature probes on the high and low pressure side of the system (For connection to the instrument see the chapter "6.0 Connection diagram").
3. From the home page of the instrument, tap on the "REFRIGERATION" icon.

The main screen of the refrigeration system pressure and temperature measurement is as follows:



Fig. 4

The light blue gauge identifies the cold branch of the system, i.e., low pressure, while the red gauge identifies the hot branch of the system, i.e., high pressure.

As soon as this screen is accessed, the timer (j) on the status bar automatically starts displaying the time the user spends on this page.

REFERENCE FIG. 4	ICON	FUNCTION
1		Go to home page
2		System refrigerant setting
3		Scale settings BE COOL B100
4		Working mode: refrigeration (low-pressure branch, blue pressure gauge will be placed to the left of the display)
		Working mode set: heating (heat pump - high pressure branch - red pressure gauge, will be placed to the left of the display)
4		Working mode: automatic (automatic refrigeration/heating (heat pump) recognition). In this mode, the instrument, depending on the pressure measured in the two branches of the system, automatically recognizes whether the measurement refers to a refrigeration system or a heat pump. If the low-pressure branch is detected, the blue pressure gauge will be placed to the left of the display, while if the high-pressure branch is detected, it will be the red pressure gauge that will be placed to the left of the display. In this mode you do not have to worry about connecting the pipes in the correct branches, it will be the instrument based on the measurements taken to decide whether to move the low temperature branch measurements to the left of the display and the high temperature ones to the right or vice versa.

4. Set the refrigerant in use in the system under consideration. Once the refrigerant is selected, it will appear inside the clickable icon.

NOTE:

Before proceeding with the test, it is necessary to set the type of refrigerant in use in the system under test in order to avoid errors in temperature calculation.

5. Set the working mode corresponding to the system under test; usually it is the refrigeration mode. Once the working mode is selected, the corresponding symbol will appear within the clickable icon.

6. Pressurize the instrument.

Pressurized the instrument, the measurement is automatically shown on the display and more precisely:

RIFERENCE FIG. 4	FUNCTION
a	Pressure value measured in the low pressure branch (refrigeration)
b	SC: Subcooling (calculated temperature)
c	LSAT: Condensation temperature of the selected refrigerant
d	THIGH: Temperature measured by the clamp probe in the high-pressure branch
e	Pressure value measured in the high pressure branch (heat pump)
f	SH: Overheating (calculated temperature)
g	VSAT: Evaporation temperature of selected refrigerant
h	TLOW: Temperature measured by the clamp probe in the low-pressure branch
i	ΔT : TLOW-THIGH
j	Timer: automatically activated upon entering the page

Clicking directly on the gauge scale allows you to switch between the gauge view and the graph view:



Graph visualization provides a check on the trend of pressure and temperature measurements over a time interval.

12.2 Vacuum

The vacuum procedure consists of removing inert gases and any residual moisture from the refrigeration system in the system pipes.

To perform the test, follow the instructions in the following points.

1. Press the power button to turn on the device; after startup is finished, the home page is displayed.
2. Connect the vacuum gauge (provided) into the left connector of the instrument and all necessary instrumentation to the system to perform the vacuum measurement; for connections, see the chapter "6.0 Connection diagram".
3. From the main page of the instrument, tap the icon "VACUUM".

The main screen is as follows:



Fig. 5

As soon as this screen is accessed, the timer (j) on the status bar automatically starts for the purpose of displaying the time the user spends on this page.

The timer on the status bar at the top center of the screen will reset if the "Time" parameter is changed.

The "Start" (5 of Fig. 5) and "Alarm setting" (6 of Fig. 5) buttons are not yet visible.

4. Using the "Target" parameter arrows, set the vacuum target.
5. Using the "Time" parameter arrows, set the vacuum duration; if the vacuum target has not been reached within the set time, the instrument will play an alarm.
6. Open the low-pressure side valve, the high-pressure side valve, the vacuum valve, and close the loading valve.
7. Turn on the vacuum pump and leave it running until the value set to "Target".

WARNING!

The estimated time remainig "ETR" (2 of Fig. 5) is just a reference for the user.

If the emptying target has been reached within the time set on the "Time" parameter, the buttons will appear " " (5 of Fig. 5) and " " (6 of Fig. 5).

Proceed with the system tightness test.

8. Press the button " " to enter the alarm value setting.
9. Close all valves.
10. Press the button " " to access the tightness test.

The system tightness test will have a duration equal to the value set on the "Time" parameter. The parameters shown in the screen will be changed to "Vel." (1 of Fig. 5, pressure decay rate), "ETR" (2 of Fig. 5, estimated time remaining) and "Target" (3 of Fig. 5, set pressure limit).

During the test, if the pressure drop is greater than the value set to " " a leakage warning will be shown in the refrigeration system. Otherwise, the test is considered passed.

Tapping directly on the gauge scale allows you to switch between gauge and graph view:



Graph visualization provides a check on the progress of pressure measurements over time.

12.3 Tightness test

This test involves measuring the system pressure and ambient temperature for an interval of time. The measurement of these parameters makes it possible to check the pressure tightness of the system, while also using pressure-temperature value compensation (which can be activated).

To perform the test, follow the instructions:

1. Press the power button to turn on the device; after startup is finished, the home page is displayed.
2. Fill the system with the needed amount of Nitrogen.
3. Close the side valve of the high-pressure branch of the manifold.
4. Connect the high-pressure side of the manifold to the system.
5. If you want to carry out the test with temperature compensation, it is necessary to connect the clamp probe to the instrument at the high pressure branch in order to measure the ambient air temperature.

Surface temperature probes can also be used for the temperature-compensated tightness test, but they should not measure any surface temperature. If possible, they should be positioned so that the air temperature is measured.

If no temperature probe is connected, the leak test can be carried out without temperature compensation.

5. From the home page of the instrument, tap on the icon "TIGHTNESS TEST".

The main screen is the one below:



Fig. 6

As soon as this screen is accessed, the timer (j) on the status bar automatically starts in order for the user to know how much time has been sent on this page.

The icon 1 of Fig. 6 signals whether temperature compensation is enabled (ON) or disabled (OFF). This option can be changed by tapping the icon " " (Tightness test settings - 7 of Fig. 6) turning off the "Compensation" slider.

Note:

With temperature compensation turned on, the instrument monitors the current ambient temperature in real time to reduce the pressure reading error caused by changes in ambient temperature. In case temperature compensation is turned off, the instrument uses the measured pressure value for calculations.

4. Tap the icon " " (7 of Fig. 6) to set the parameters by which the instrument will perform the tightness test:
 - "Leak": Alarm threshold (in %) below which the instrument reports the system pressure leak.
 - "Duration": Duration of the tightness test (in minutes/hours).
 - "Comp. Temp.": Enabling / Disabling temperature compensation (measured by the probe connected to the instrument).
5. Tap the icon " " (6 of Fig. 6) to start the tightness test.

The countdown starts running for the time set in the "Duration" parameter.

Tapping directly on the gauge scale allows you to switch between gauge and graph view:



The graph display provides a check on the trend of pressure measurements over time.

Tightness test result

The test is considered to be passed if the value of the pressure is maintained above a certain value set on the parameter "Leak" for the entire length of the test.

On the contrary, there is a leakage if the pressure value falls below the value set in the "Leak" parameter; in this case, the instrument signals the alarm.

Shown data table

Pc	Current pressure
Pi	Starting pressure
ΔT	Pc-Pi
Vel.	Pressure decay rate (in %/min)
Allarm	Alarm threshold set in the "Leak" parameter

13.0 SEITRON BE COOL APP INTERFACE

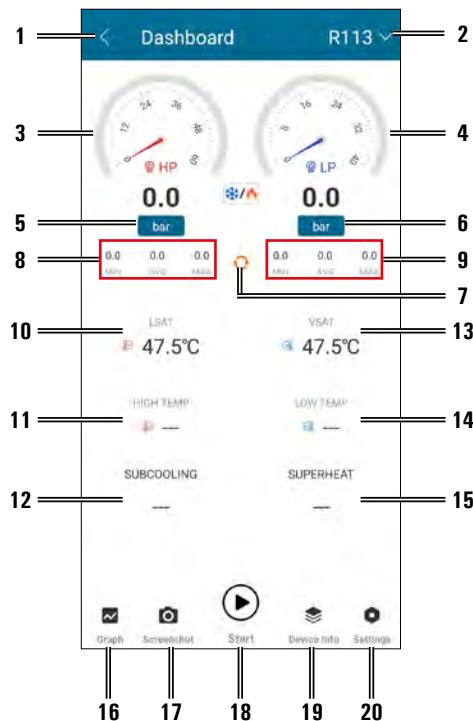
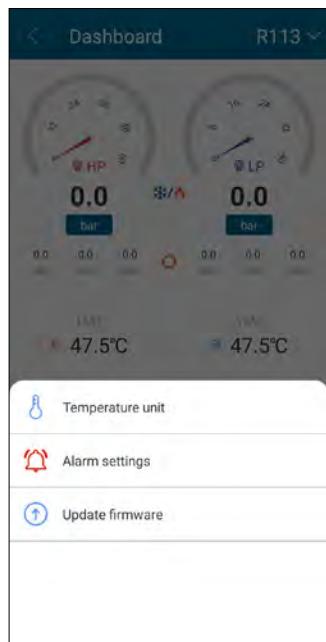


Fig. 4

1	Back to the home screen
2	Setting the refrigerant gas
3	Low pressure branch manometer (cold)
4	High pressure branch manometer (hot)
5	Pressure measurement unit setting
6	Pressure measurement unit setting
7	Update shown temperature
8	Minimum, average and maximum temperature measured by the clamp probe connected on the low-pressure branch
9	Minimum, average and maximum temperature measured by the clamp probe connected on the high-pressure branch
10	Evaporation temperature of the selected refrigerant
11	Minimum temperature detected by the clamp probe connected on the low-pressure branch
12	Overheating (calculated temperature)
13	Condensation temperature of the selected refrigerant
14	Maximum temperature detected by the clamp probe connected on the high-pressure branch
15	Subcooling (calculated temperature)
16	View chart
17	Screenshot
18	Start / Pause Recording
19	Device information
20	Settings (see chapter 12.1)

13.1 Settings



13.1.1 Temperature measurement unit

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

- From the **Seitron be cool**, select the menu “Settings” and then select the parameter “Temperature measurement unit”; a window will be opened on which you can select the desired unit of measurement. After selecting it, press **OK** to make the change effective.

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

13.1.2 Alarm setting

It is possible to enable/disable the measured pressure alarm in the low-pressure branch and/or the high-pressure branch as well as set its alarm limits and unit of measurement.



1	Save the settings made
2	Enabling / Disabling single alarm
3	Measurement unit alarm setting; any change in the individual alarm will be extended to the other alarms as well
4	Value setting

13.1.3 Firmware update

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

More on detail, in order to update the instrument firmware follow the procedure below:

- Once the “Update firmware” button is pressed, the app, shows a pop up, asking “Are you sure to update the firmware?”; tap on **YES**.
- The app downloads the new firmware version; once the download is finished (represented by a loading bar) the app updates the instrument.
 - If it does not work (the pop up is stuck at 0% on the loading bar), repeat the procedure. Close the app and repeat the operations from step 1.
- IMPORTANT:** Do not move away from the instrument during the firmware update process, so as not to lose the Bluetooth connection. Do not turn off the instrument or the application, otherwise the process becomes unstable and may crash.
- The manifold screen has a loading bar that fills as the firmware is downloaded from the application. When the process is complete (the loading bar is full), a “Restart” button appears at the bottom of the screen.
- Press the “Restart” button; the instrument will turn off. Press and release the On/Off button on the manifold to restart the instrument. The screen will show a series of white letters; when finished, the instrument will start normally.
- IMPORTANT:** if the “Restart” button does not work (the instrument does not restart), press and hold the On/Off button for 8 seconds and then release it; the instrument should restart and show the white letters. After the process is completed, the instrument will start normally.
- Now the manifold is updated. Check in the “Settings -> settings” screen that the firmware version has been updated by one.

13.2 Device information



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

- Device model
- MAC: unique instrument MAC address to be used to locate the instrument it is needed to pair with the App.
- Device name: Seitron Code of the instrument. It is possible to change the name in order to locate it more easily by clicking on "Edit Device Name."

13.3 Start / Stop

Pressing the "Start" key starts the recording of the measurement.

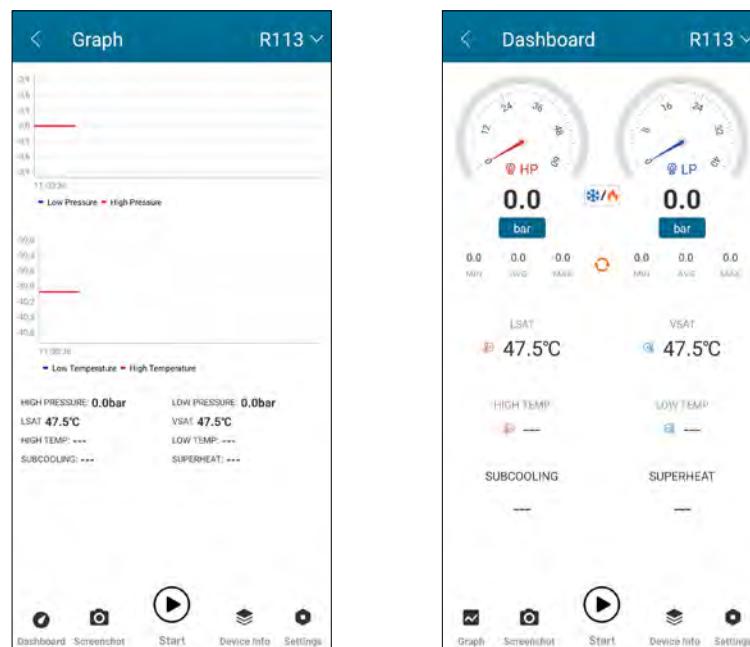
Pressing the "Stop" key ends the recording and asks if you want to save the measurement; if you choose to save the measurement, it will be saved to the memory of the mobile device in use. On the contrary, the test will not be saved.

13.4 Chart / Dashboard

On standard mode the App shows all the pressure measurements data in "dashboard" mode.

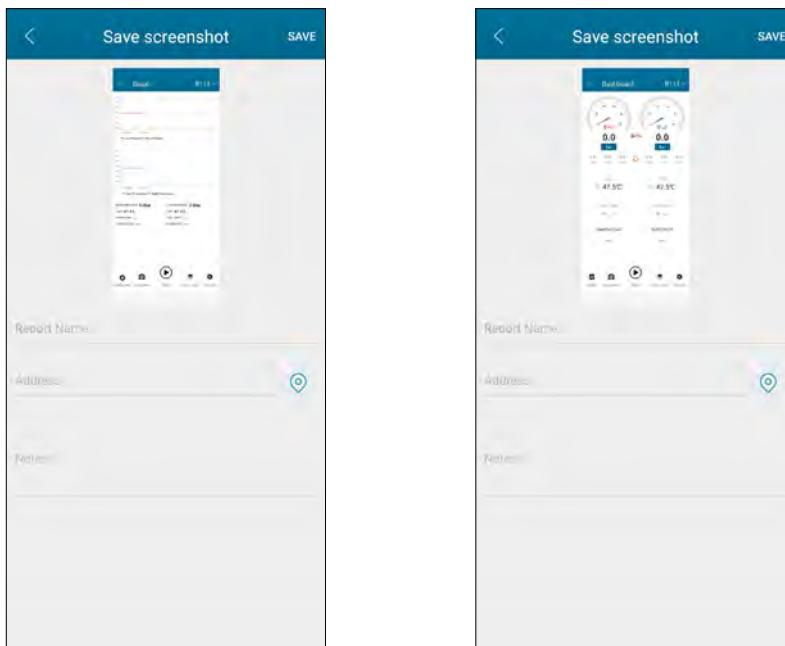
By selecting the "Chart" mode, the App shows the data on two different charts:

- Value of high and low branch pressures
- Minimum and maximum temperature detected by clamp probes connected to the low and high pressure branches, respectively.



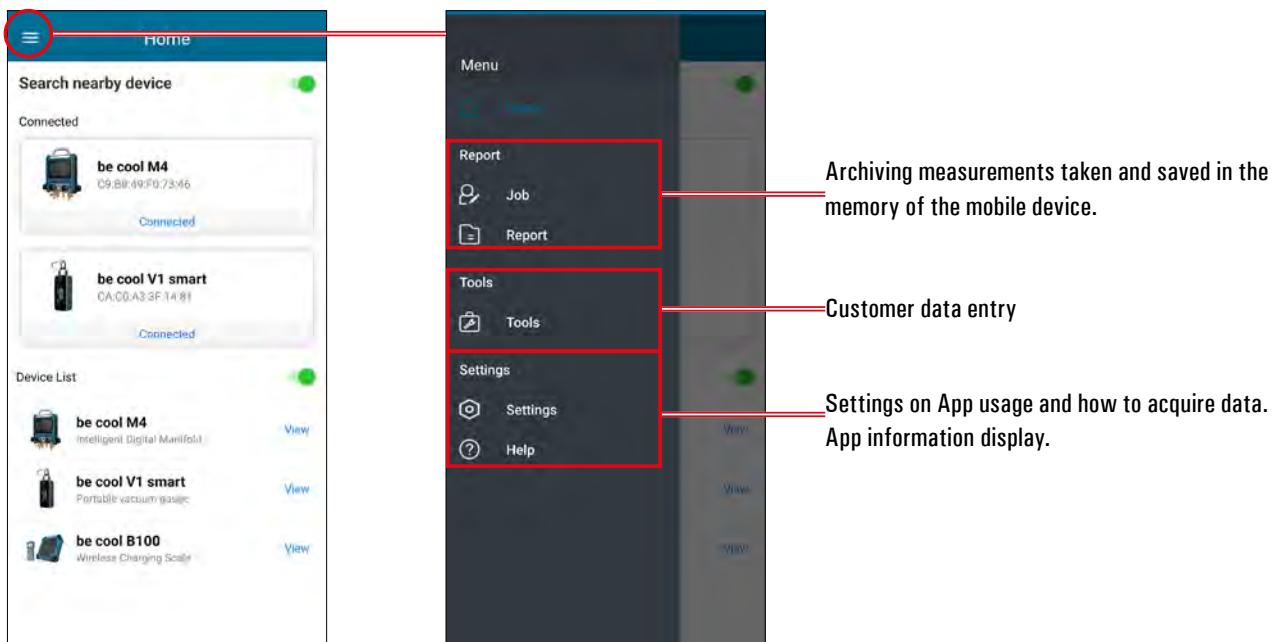
13.5 Screenshot

By selecting the “screenshot” mode, the App allows to store in the instrument memory the current screen, in a .pdf file.
Examples:

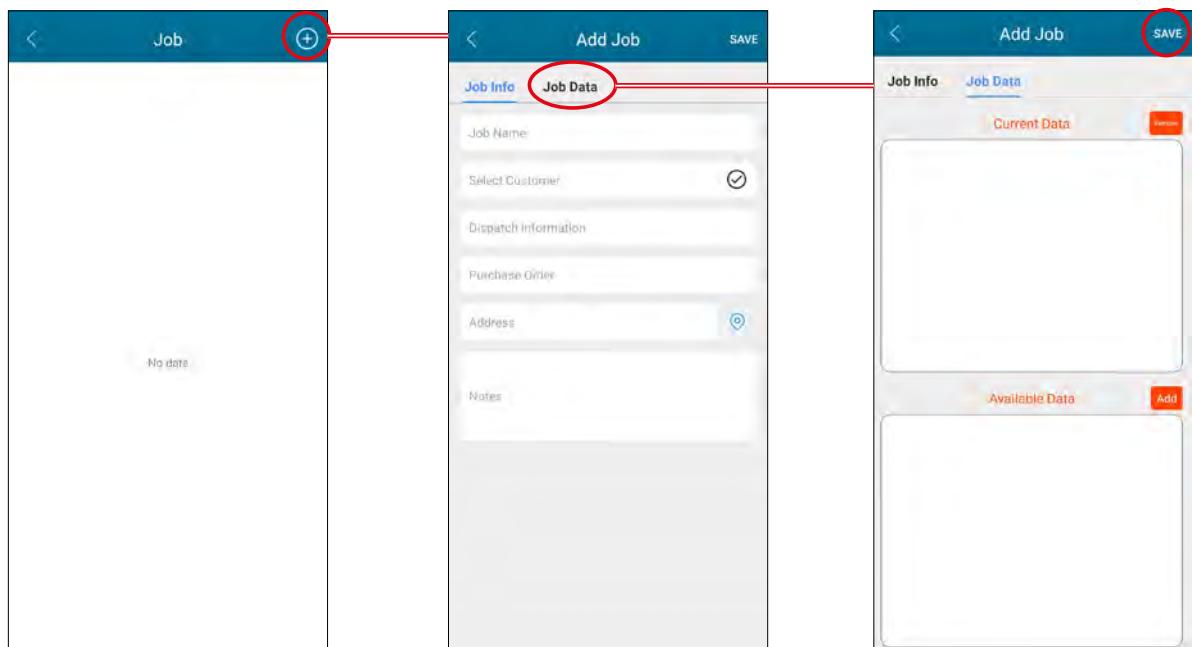


Note: Before pressing the “SAVE” button, you can fill in the various fields in order to properly file the screen you want to capture.

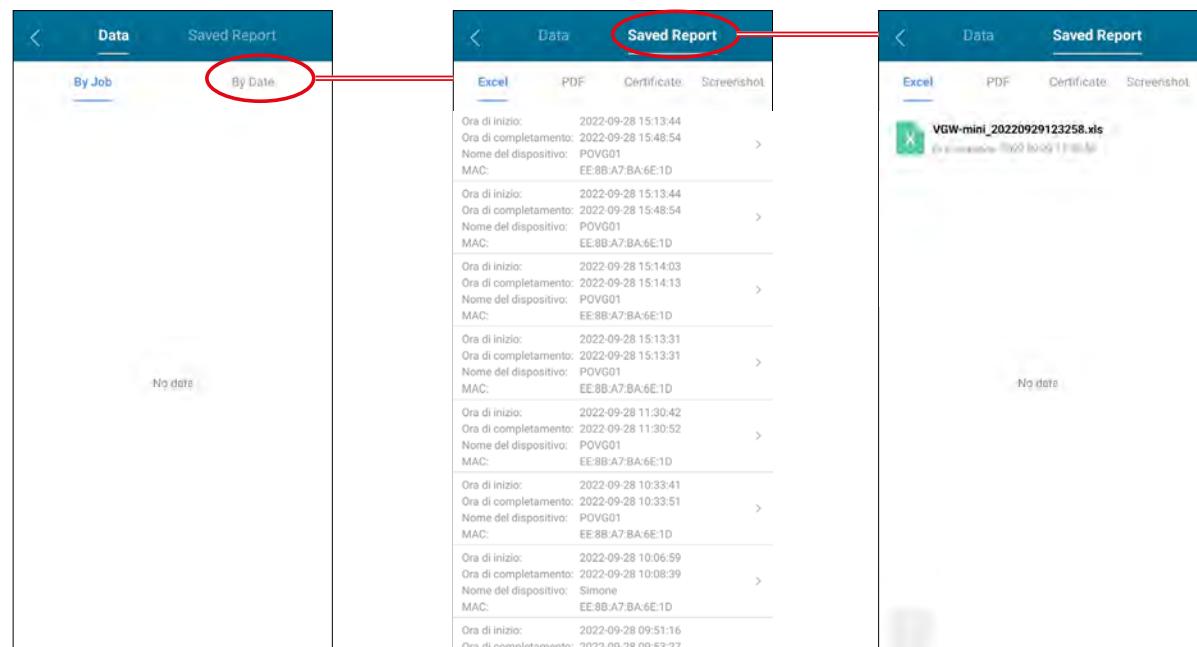
13.6 Menu



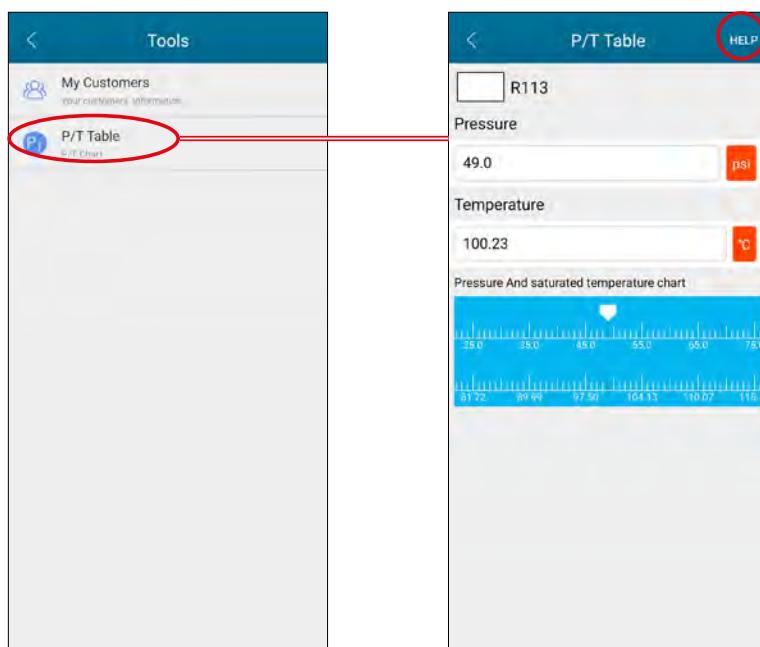
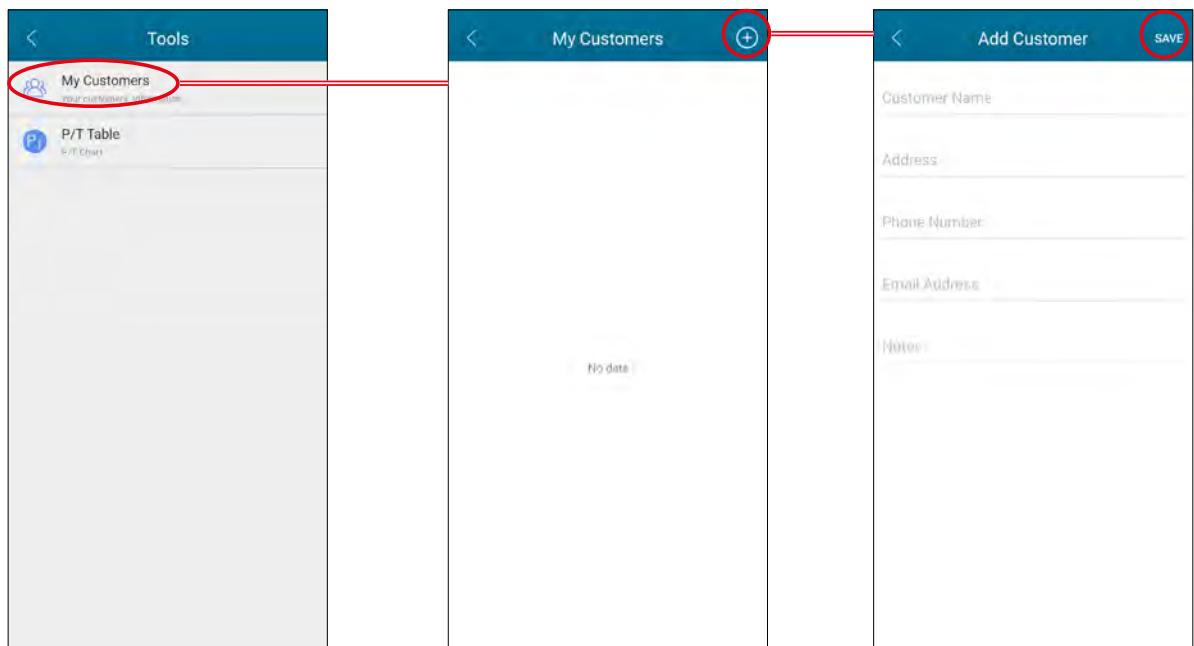
13.6.1 Job (archiving of measures)



13.6.2 Report (consultation of inserted works)

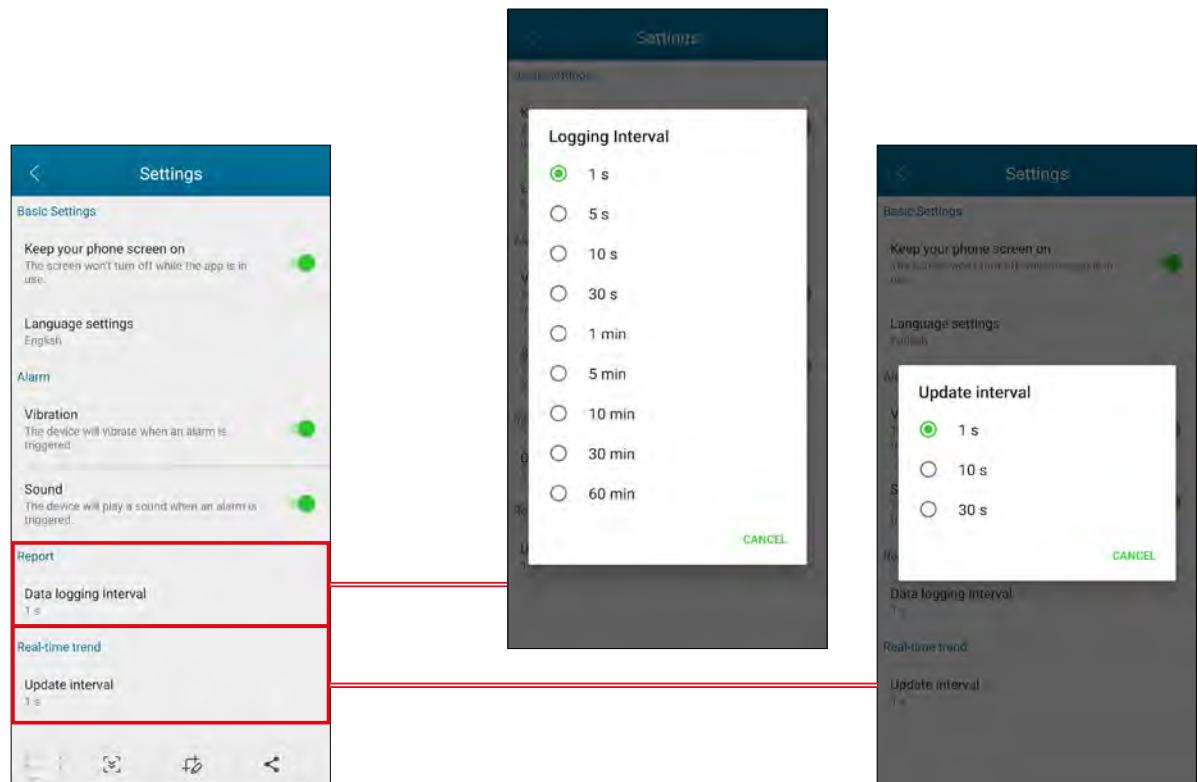


13.6.3 Instruments (Insert / customer database consultation)



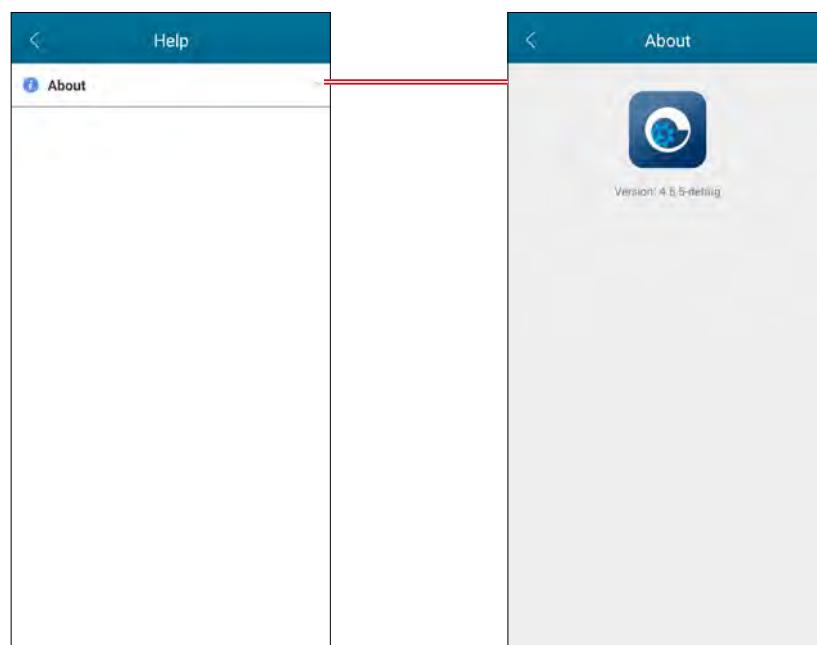
13.6.4 Settings

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



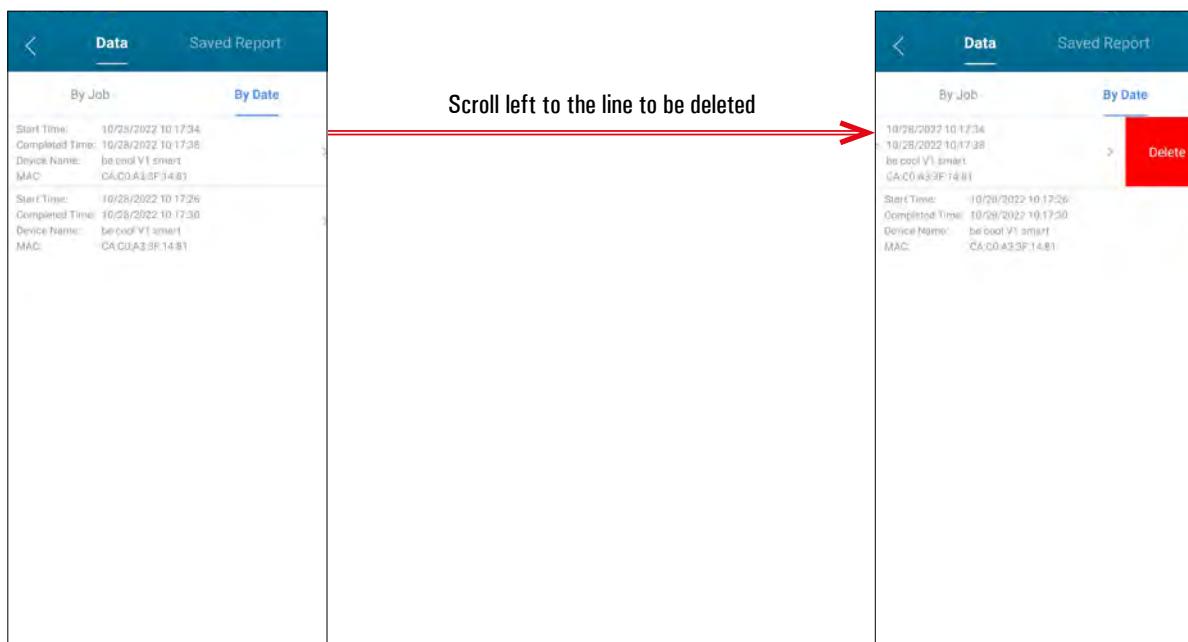
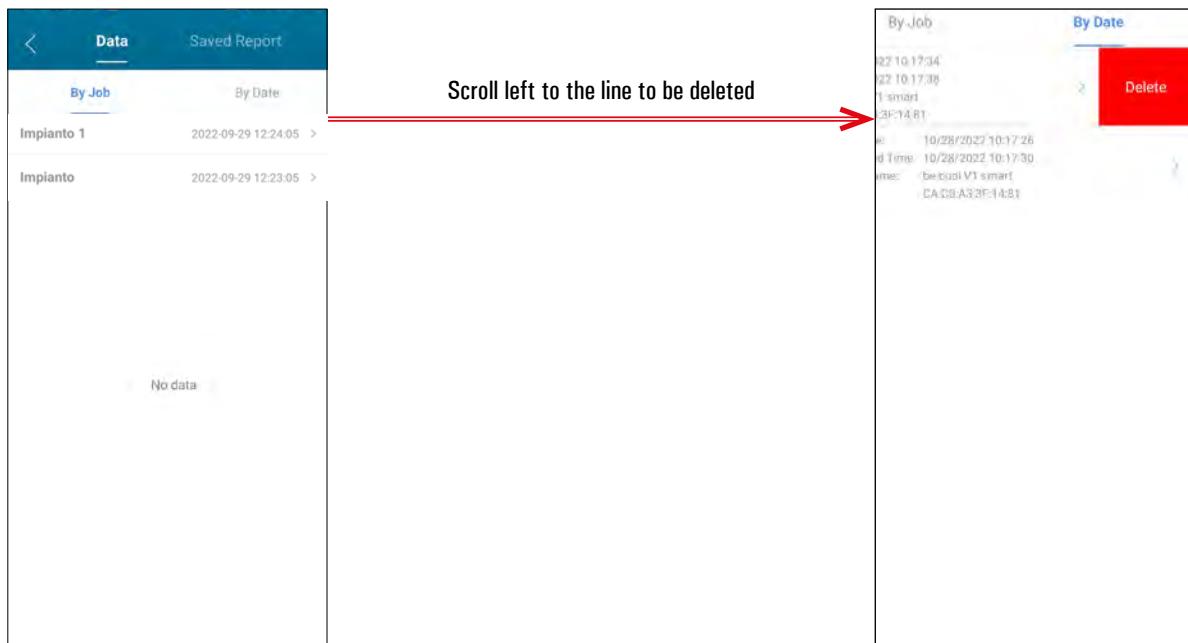
13.6.5 Help

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



13.7 Measurement deletion

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



14.0 TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE / SOLUTION
The device does not turn on.	Connect the instrument to the power supply and try to turn it on after 5 minutes.
The touch screen of the device does not work.	Make sure the ambient temperature is in the operating range of the instrument (-14 .. 122°F, -10 .. 50°C).
The measured temperature shows " ... ".	Check whether the connector of the clamp-on temperature probe is properly inserted into the connector of the instrument, or whether the detected temperature does not exceed the measuring range of the instrument.
The pressure measurement shows "E02."	The pressure sensor needs to be recalibrated.
La misura della pressione è imprecisa.	The pressure measurement is inaccurate.
The vacuum measurement shows " ... "	Either the system has massive leakage or the data transmitted by the vacuum probe connected to the instrument is abnormal.
There is no response to touches on the screen by the interface.	The system is blocked. Restart the instrument by pressing and holding the power button for at least 7 seconds.

15.0 TECHNICAL FEATURES

Digital pressure gauge:

Power supply:	5V 2A
Battery capacity:	5000 mAh
Pressure measurement range:	-15.5..800 psi / -1.0..55.2 bar / -0.1..5.5 MPa / -1.0..5.5MPa / -1.0..56.2 kg/cm2
Accuracy:	± 0,5 % FS
Resolution:	0.5 psi / 0.03 bar / 0.003 MPa / 0.03 kg/cm2
Sampling rate:	0.5 seconds
Measurement unit:	psi, kg/cm2, cmHg, inHg, bar, kPa, MPa
Overload:	1000 psi / 69 bar / 6.8 MPa / 70 Kg/cm2
Pressure measurement fittings:	1/4 SAE*3 3/8 SAE*1
Sensor interface:	PS/2*2
USB interface:	Type C (for data export and battery charging)
Recording time:	800 hours (30 second intervals)
Display type:	Capacitive touch screen 5" IPS
Maximum distance	
Bluetooth communication:	30 meters
Operating temperature:	-14 .. 122°F / -10 .. 50°C
Storage temperature:	-4 .. 140°F / -20 .. 60°C

Vacuum gauge

Vacuum measurement rang:	1 .. 19000 micron
Accuracy: 1 .. 10000 micron:	±10% rdg ±10 micron
10001 .. 19000 micron:	±20% rdg
Resolution: 0 .. 400:	1 micron
400 .. 3000:	10 micron
3000 .. 10000:	100 micron
10000 .. 19000:	250 micron
Vacuum measurement units:	micron, inHg, Torr, psia, mbar, mbar, mTorr, Pa, kPa
Interface:	1/4SAE port

Clamp-on temperature probes:

Measuring range:	-40 .. 302 °F / -40 .. 150 °C
Accuracy:	±1.8°F / ±1.0°C
Resolution:	0.2 °F / 0.1 °C
Measurement unit:	°F / °C / K
Interface:	PS/2

16.0 WARRANTY

In the interest of continuous development of its products, the manufacturer reserves the right to make changes in technical data and performance without prior notice. The consumer is guaranteed against product conformity defects according to the European Directive 2019/771 as well as the Seitron warranty policy document. The full text of the warranty is available from the seller upon request

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