OPERATING MANUAL
ECO 123-AIR
Precision ambient thermometer with alarm

INSTRUFIBER
Fibra Óptica Cabo Rede Instrumentação Energia Ferramenta

senseca

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Contents

1.1 About this documentation

1.2 Foreword

Read this document carefully and familiarize yourself with the operation of the device before you use it.

Keep this document ready to hand and in the immediate vicinity of the device so that it is available to the personnel/user for reference at all times in case of doubt.

The user must have carefully read and understood the operating manual before beginning any work.

1.3 Legal notices

The liability and warranty of the manufacturer for damages and consequential damages are voided with misuse, disregarding this document, disregarding safety notices, assignment of inadequately qualified technical personnel and arbitrary modifications of the device.

This document is entrusted to the recipient for personal use only. Any impermissible transfer, duplication, translation into other languages or excerpts from this operating manual are prohibited.

The manufacturer assumes no liability for print errors.

1.4 Further information

Software version of the device: V1.2 or later

For the exact product name, refer to the type plate on the rear side of the device.

Note

For information about the softwareversion, press and hold the ON button to switch on the device for longer than 5 seconds. Theseries is shown in the main display and the software version of the device is shown in thesecondary display.

2 Safety

2.1 Explanation of safety symbols

⚠ Danger!

This symbol warns of imminent danger, which can result in death, severe bodily injury, or severe property damage in case of non-observance.

⚠ Caution!

This symbol warns of potential dangers or harmful situations, which can cause damage to the device or to the environment in case of non-observance.

Note

This symbol indicates processes, which can have a direct influence on operation or can trigger an unforeseen reaction in case of non-observance.

2.2 Foreseeable misuse

The fault-free function and operational safety of the device can only be guaran-teed if applicable safety precautions and the device-specific safety instructions for this document are observed.

If these notices are disregarded, personal injury or death, as well as property damage can occur.

⚠ Danger! Incorrect area of application!

In order to prevent erratic behavior of the device, personal injury and property damage, the device must be used exclusively as described under intended use.

- Do not use in safety. Emergency Stop devices!
- The device is not suitable for use in explosion-prone areas!
- The device must not be used for diagnostic or other medical purposes on patients!
- Not suitable for use with requirements on functional safety, e.g. SIL!

2.3 Safety instructions

⚠ **Caution!** Risk of injury at the temperature sensor!

Empty batteries and batteries of inferior quality can leak more easily, which can destroy the device.

□ Please also observe the instructions in the chapter “Operation and maintenance”.

Note

- This device does not belong in children's hands!
- Make sure that no dirt gets into the openings of the sensor head. If this is the case, carefully unscrew the cap. Improper handling can damage the temperature sensor!

2.4 Intended use

The device measures the ambient or air temperature; it can be held in the hand (pivoting movement increases the response speed) or placed vertically or horizontally on a flat surface. Protect the sensor from moisture and dirt!

2.5 Qualified personnel

For commissioning, operation and maintenance, the relevant personnel must have adequate knowledge of the measuring process and the significance of the measurements. The instructions in this document must be understood, observed and followed.

In order to avoid any risks arising from interpretation of the measurements in the concrete application, the user must have additional expertise. The user is solely liable for damages/danger resulting from misinterpretation due to inadequate expertise.

3 The device at a glance

LCD Display

Front view

Sensor head

3.1 Display elements

	Battery indicator	Evaluation of the battery status
	Unit display	Display of units or type of mode, min/max/hold
	Main display	Measurement of the current temperature or value for min/max/hold
	Auxiliary display	Measurement of the current temperature in min/max/hold mode with unit

3.2 Operating elements

On / Off button

Press briefly	Switch on the device Activate / deactivate lighting
Long press	Switch off the device Reject changes in a menu

Up / Down button

Press briefly	Display of the min/max value Change value of the selected parameter
Long press	Reset the min/max value of the current measurement
Both simultaneously	Rotate display, overhead display

Function button

Press briefly	Freeze measurement (Hold) Call up next parameter
Long press, 2s	Start menu “configuration”, (ONF appears in the display

Operating status device is in measured value display
device is in a menu

4 Operation

4.1 Opening the configuration menu

1 Press the Function key for 2 seconds to open the Configuration menu.
2 (ONF appears in thedisplay. Release the Function key.

Parameter	Values	Meaning
		
AL.	**Alarm** OFF	
	ON	No alarm active
		Alarm via text insertion, acoustic signal and flashing of the background lighting
	BEEP	Alarm via text insertion and acoustic signal
	L,TE	Alarm via text insertion and flashing of the back-ground lighting
AL.LO	**Min. alarm limit** *(only available if AL <> off)*	
	-25.0 .. AL.X,	a min. alert is triggered if the value falls below this value. (at °F: -13.0 .. AL.Hi)
AL.XI	**Max. alarm limit** *(only available if AL <> off)*	
	AL.LO .. 70.0	If the value is exceeded, a max. alarm is triggered. (at °F: AL.Hi .. 158.0)
POFF	**Shut-off time** OFF	
		No automatic shut-off
	15,30,60,120, 240	Automatic shut-off after a selected time in minutes, during which no buttons have been pressed
L,TE	**Backlight**	
	OFF	Backlight deactivated
	15, 30, 60, 120, 240	Automatic shut-off of the backlight after a select-ed time in seconds, during which no buttons have been pressed
	ON	No automatic shut off of the backlight

Parameter	Values	Meaning
UN,T	**Display unit**	
	°C	Temperature display in °C
	°F	Temperature display in °F
IN,T	**Factory settings**	
	NO	
	YES	Use current configuration
		Reset device to factory settings. After confirming with the function-button, the display shows: IN,T DONE

4.2 Adjustment of the measuring input

The temperature input can be adjusted with the zero point correction and the gradient correction. If an adjustment is made, you change the pre-adjusted factory settings.
This is signaled with the display text T.OF or T.SL when switching on.

1 Switch the device off.

2 Hold the down button and press the On/Off button briefly to switch on the device and open the Adjustment menu.

3 The display showsthe first parameter. Release the down button.

Parameter	Values	Meaning
		
T.OF	**Zero point correction**	
	0.00	No zero point correction
	-5.00 ... 5.00	Zero point correction in °C. (at °F -9.00 .. 9.00)
T.SL	**Gradient correction of the temperature**	
	0.00	No gradient correction of the temperature
	-5.00 ... 5.00	Gradient correction in %

Formula used by device:
Temperature = °C: Display = (measured value - T.OF) * (1 + T.SL / 100)
Temperature = °F: Display = (meas. value - 32 °F - T.OF) * (1 + T.SL / 100) + 32 °F

5 Measurement Basics

5.1 Measuring instructions

For fast measurements of ambient air: Hold device by the outstretched arm and sway back and forth (to fan) to accelerate the air exchange and the temperature matching.

As soon as the measured value is quite stable, it can be read off. It may make sense to press the hold key to “freeze” all values and therefore read them off easily.

5.2 Possible measuring errors

5.2.1 Cooling / evaporation

When measuring the air temperature, the probe should be dry, otherwise the temperature measured will be too low.

5.2.2 Response time

An adequate wait time must be observed for the measuring process before reading the measured value. The response time t_{90} describes the time in which the displayed measured value reached 90% of the end value.

5.2.3 Heat radiation (e.g. breathing air, body heat, sun)

If the device is held in the hand during the measurement, both temperature and humidity are altered by the body heat. To minimize this influences the device should be held as far away from the sensor as possible and a direct contact with the exhaled air should be avoided. Most accurate measurements are achieved, if the device is set down and the measured value (as soon as it is stable) is read at adequate distance.

When setting the device down, ensure that it is not exposed to any other heat source or, for example, in the sun.

6 Operation and maintenance

6.1 Operating and maintenance notices

Note

- The device and temperature probe must be handled with care and used in accordance with the technical data. Do not throw or strike.
- Plugs and sockets must be protected from soiling.
- If the device is stored at a temperature above 50 °C, or is not used for an extended period of time, the batteries must be removed. Leaks from the batteries are avoid-ed as a result.

6.2 Battery

6.2.1 Battery indicator

If the empty frame in the battery display blinks, the batteries are depleted and must be replaced. However, the device will still operate for a certain length of time.

If the BAT display text appears in the main display, the battery voltage is no longer adequate for operation of the device. The battery is fully depleted.

6.2.2 Changing battery

⚠ **Danger!** Danger of explosion!

Using damaged or unsuitable batteries can generate heat, which can cause the batteries to crack and possibly explode!

- Only use high-quality and suitable alkaline batteries!

⚠ **Caution!** Damage!

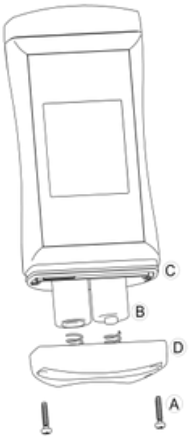
If the batteries have different charge levels, leaks and thus damage to the device can occur.

- Only use high-quality and suitable alkaline batteries!
- Do not use different types of batteries!
- Remove depleted batteries immediately and dispose of them at a suitable collection point.

Note

Unnecessary unscrewing endangers the protection against moisture and should therefore be avoided.

- Read the following handling instructions before replacing batteries and follow them step by step.
- If disregarded, the device could be damaged or the protection from moisture could be diminished.



1 Unscrews the Phillips screws (A)and remove the cover.

2 Carefully replace the two Mignon AA batteries (B). Ensure that the polarity is correct! It must be possible to insert the batteries in the correct position without using force.

3 The O-ring (C) must be undamaged, clean and positioned at the intended depth.

4 Fit the cover (D) on evenly. The O-ring must remain at the intended depth!

5 Tighten the Phillips screws (A).

7 Error and system messages

Display	Meaning	Possible causes	Remedy
----	Measurement far outside of the measuring range Temperature sensor defect	• Measurement outside of the measuring range • Temperature sensor or device defect	□ Stay within allowable measurement range □ Send in for repair
No display, unclear characters or no response when buttons are pressed	Battery depleted System error Device is defective	• Battery depleted • Error in the device	□ Replace battery □ Send in for repair
BAT	Battery depleted	• Battery depleted	□ Replace battery
ERR.1	Measuring range exceeded	• Measurement too high • Temperature sensor or device defect	□ Stay within allowable measurement range □ Send in for repair
ERR.2	Measuring range is undercut	• Measurement too low • Temperature sensor or device defect	□ Stay within allowable measurement range □ Send in for repair
SYS ERR	System error	• Error in the device	□ Switch device on/off □ Replace batteries □ Send in for repair

8 Technical data

Measuring range	-25.0 .. +70.0 °C (-13.0 .. +158.0 °F).
Accuracy	± 0.5 % of measured value ± 0.5 °C
Response time t_{90}	approx. 15 sec. (at air 2 m/s)

Measuring cycle	approx. 2 measurements per second
Display	3-line segment LCD, additional symbols, illuminated (white, luminous duration adjustable)
Standard functions	Min/max/hold, alarm (optical and acoustic) ~~Offset and gradient correction~~
Adjustment	
Housing	~~Break-proof ABS housing~~
Protection rating	~~IP20~~
Dimensions L*W*H	~~108 (141) * 54 * 28 mm, without (with) sensor head~~
Weight	~~~ 126 g incl. batteries~~
Nominal temperature	~~25 °C~~
Operating conditions	~~-20 to 50 °C; 0 to 95 %RH (temporarily condensing)~~
Storage temperature	~~-20 bis 70 °C~~
Current supply	~~2 * AA batteries (mignon)~~
Current requirement	~~approx. 0.4 mA, approx. 2 mA with backlight~~
Battery life	~~Service life > 5000 hours with alkaline batteries~~ (without backlighting)
Battery indicator	4-stage battery status indicator, Replacement indicator for depleted batteries: "BAT" The device switches off automatically if this is activated
Auto-power-OFF function	

Directives and standards	The devices conform to the following Directives of the Council for the harmonization of legal regulations of the Member States: 2014/30/EU EMC Directive 2011/65/EU RoHS Applied harmonized standards: EN IEC 61326-1:2021 Emission limits: Class B Immunity according to table A.1 Additional errors: < 1 % FS EN IEC 63000:2018 The device is intended for mobile use and/or stationary operation in the scope of the specified operating conditions without further limitations.

9 Disposal

Separation by material and recycling of device components and packaging must take place at the time of disposal. The valid regional statutory regulations and directives applicable at the time must be observed.

Note

The device must not be disposed of with household waste. Return it to us, freight prepaid. We will then arrange for the proper and environmentally-friendly disposal.

Private end users in Germany have the possibility of dropping off the device at the municipal collection center.

- Batteries must be removed beforehand!
- Please dispose of empty batteries at the collection points intended for this purpose

10 Service

10.1 Manufacturer

If you have any questions, please do not hesitate to contact us.

10.2 Calibration and adjustment service

The purpose of the calibration is to verify the precision of the measuring device by comparing it with a traceable reference.

Both ISO calibration certificates and DAkkS calibration certificates are available from Senseca.

Explanation

- The ISO standard 9001 is applied for the iso-calibration certificates.
- These certificates area affordable alternative to the DAkkS calibration certificates and provide information of the traceable reference, a list of individual values and documentation.
- The DAkkS calibration is based on DIN EN ISO/17025, the accreditation basis is recognized worldwide. These certificates offer high-quality calibration and consistently high quality. The DAkkS calibration includes any necessary adjustment with the purpose of minimizing a deviation of the measuring device.
- The device is delivered with a test report.
  This confirms that the measuring device has been adjusted and tested, without making any statement about the accuracy of a temperature sensor.
- Only the manufacturer can check the basic settings and make corrections if necessary.

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