

OPERATION MANUAL

Digital Thermometer Type 8856



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1. FOREWORD

Dear Customer,

We thank you for having purchased the digital thermometer and are very glad that you decided a product of **B+B Thermo-Technik GmbH**. We hope this product will fully satisfy you and will assist you effectively in your work.

This Device has been developed to be technically highly up-to date. This product has been designed in accordance with the regnant European and German national directives and rules. For a proper and effective usage of the product the customer shall observe the following Operating Instructions. In the case that against one's expectations any trouble occurs which you can not resolve yourself, please contact our service centers or our authorized dealer. We will provide you rapid and competent help to minimize the risk of long time outfalls.



The following operating Instruction is an indispensable part of this Product. It contains important advices for the starting up and further use of the device.

2. GENERAL INFORMATION

This Operation Manual is intended to serve as an aid in the proper setup, installation and operating of the digital thermometer. All essential details of the equipment and all actions required on the unit are clearly presented and explained. We thus ask that you read this manual carefully before proceeding to work with the equipment. Keep this manual available for ready reference in a convenient and conspicuous location near the equipment.

3. SYMBOLS EMPLOYED

Sign	Meaning	Notice
	Advice	It is necessary to read the following advices before using the product. The used symbols in the manual acts first of all as eye catcher for security risks. The symbols do not replace the security advices. The text must be read completely.
	Necessarily to observe	This symbol designates important advices and tips which are necessary for the success of a procedure. They have to be followed in order to get good results.

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Warning Signs	Meaning	Warning Signs	Meaning
	This symbol advises the user of danger for persons, material or environment. The text gives information that must be necessarily followed to avoid any risks		Caution against electromagnetic fields (BGV A8, GUV-V A8/W12)
	Caution against hot surfaces (BGV A8, GUV-V A8/W26) and hot liquids or substances		Caution against severe cold (BGV A8, GUV-V A8/W17)
	Caution against liquids and hot substances		Caution against dangerous high electrical voltage (BGV A8, GUV-V A8/W08)
	Caution against dangerous explosive substances (BGV A8, GUV-V A8/W02)		Caution against dangerous explosive atmosphere (BGV A8, GUV-V A8/W21)
	Caution against moving machines (W29) Caution against moving parts		Electronic waste

4. SAFETY INSTRUCTIONS

B+B Thermo-Technik GmbH assume no liability for damages occurred through failure to observe these security advices. A usage of non conform to the instructions given in this manual can damage the device.



The use of the measurement system must be restricted to qualified personal.

The system is not adequate for use in atmosphere with explosion risk.



Do not use the system in a high electric or magnetic field area.



Test this equipment prior to each use.

The system must be operated only within the limits given in the technical Data.



Exposing the system to hot temperatures (higher than the operating temperature) will cause damages in the electronic circuits and also damage the housing.

Ensure that all settings are correct, according to the connected thermocouple.

5. INTENDED USE

The use of the unit in fields other than those indicated under "SAFETY INSTRUCTIONS" is not allowed for safety reasons.

This operation manual does not substitute any operation manual of used and / or connected accessory to the unit.

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6. DISPOSAL



This unit has been marked in accordance with the European Directive 2002/96/EC on waste electrical and electronic equipment (WEEE).

At the end of its useful operating life, dispose of the unit as electrical scrap

Please ask either B+B Thermo-Technik GmbH or your specialist dealer for information on your local collection point. Within the scope of application of this Directive, B+B Thermo-Technik GmbH is responsible for proper disposal of this unit

7. SCOPE of DELIVERY

1 x Digital Thermometer type 8856

1 x Thermocouple type K

1 x 9V Battery

1 x Hard Plastic Case

1 x Operating Manual

8. DEVICE DESCRIPTION

Digital Thermometer, with RS232 Interface and additional external 9VDC power supply plug, for use with maximal two thermocouples of type K / J / T / R / S / E

9. INSTALLATION / USAGE

Display:

- 1) **REC** – Indicates an active recording session
- 2) **MAX/MIN** – Displays the Max / Min recorded temperature value
- 3) **HOLD / REL** – Illuminates during an active recording session and during Reset of the primary display
- 4) **BAT** – Indicates a Low Battery
- 5) **°C / °F** – Shows the chosen temperature reading
- 6) **T1 – T2 Channel** – Shows the chosen primary and secondary input selection
- 7) **Primary Display** – Shows the selected primary input
- 8) **K / J / T / R / S / E** – Indicates the chosen thermocouple type
- 9) **Secondary Display** - Shows the selected secondary input
- 10) **Plugs for thermocouple** – T1 left side / T2 right side
- 11) **Relative time** – Shows relative time hours, minutes und seconds (H/M/S), during an active recording session and the recorded time of the stored Min and Max values.
- 12) **RS232 Interface**
- 13) **9VDC Input-Plug**

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Function:

The thermometer will display all LCD segments when it is first turned on, for approximately 3 seconds. It will provide information with either one or both thermocouples plugged in.

Numerous viewing combinations are available.

The LCD is divided into three distinct sections; one large (Primary) top screen and two smaller bottom screens (Secondary and Relative Clock).

The three display areas keeping you constantly updated with the temperature measurements and relative time information. You have a number of options regarding how and what information is presented on the LCD.

- Temperature readings can easily toggled between Centigrade and Fahrenheit at the push of the button
- The back light illuminates the LCD for viewing in low light areas.
- The "HOLD" button will freeze the primary display data while allowing the secondary displays to continue updating information about selected functions along with Low Battery indicator is also displayed as appropriate.
- The thermometer will default to the last mode selected after power-cycle.



Note: If no thermocouples are plugged in, four dashes (----) will appear in the temperature data screens.

Auto Power Off (Sleep Mode):

The unit will shut down automatically after approximately 20 minutes using. For recording or operating over a longer period of time you, the sleep mode can be disabled by pressing "REC / HOLD" simultaneous by turning on the unit with the "POWER" button. An "n" will appear in the centre of the display, at which time you may release the buttons. The disabled sleep mode, will be invalid after power-cycle the unit.

Thermocouple Type Selection:

To chose the correct type of thermocouple you need to press "REC" simultaneous with the "POWER" button for 2 or more seconds until only "K" appears in the display. By pressing the "°C/°F" button the type of probe will cycles through K (default setting) => J => T => R => S => E. The current mode is displayed on the left side in the LCD. By pressing the "REC" button, an "S" will appear on the display and the new type is stored. This setting will be stored in the unit after power-cycle.

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Mode Options:

Mainly all default settings of the unit may be deleted and replaced with programmable user selectable start-up modes. The display will default to the mode last used during operation (exception: disabled Auto Power Off).

The following table lists the modes of operation that can be invoked by pressing the buttons indicated. The tables assumes your unit has been powered on with two connected thermocouples (type K) installed and is set to display (default setting) T1 on the primary display and record off.

Taste	Function / Display:
	Turns the unit on and off
REL HOLD	By pressing the primary display (T1, T2 or T1 – T2) will freeze with indication "HOLD" on the top of the LCD. Press "REC/HOLD" for two or more seconds – "REL" appears on the top of the LCD and primary display will be reset to 000.0 (relative temperature). Relative temperature can also be recorded. By pressing "REL/HOLD" again the units returns to default.
Channel	Pressing "CHANNEL" switches the primary display from T1 (default) to T2 (secondary display shows T1). Pressing "CHANNEL" again the display switches to T1-T2; Secondary display now alternates between T1 and T2. Pressing "CHANNEL" again and the unit returns to default settings.
LAMPE / Symbol	Back Light will illuminate the LCD for approximately 30 seconds.
°C / °F	Toggles between Fahrenheit (default) and Centigrade. The current mode is always indicated in the display.
REC	Pressing „REC“ starts the relative clock in the lower right screen and „REC“ is displayed in the upper left of the LCD. During this recording session also MIN and Max values will be stored in the unit. All other button functions are locked out except Power and Backlight. T1, T2, or T1 – T2 is displayed in the primary screen; The secondary screen continues updating. Press "REC" momentarily aging and the unit cycles through MAX and MIN (maximum and minimum recorded temperatures) and back to current temperature. The record mode is displayed in the LCD. Press and hold "REC" for three seconds to turn off the record function.

10. MAINTANANCE

Replacing Battery

Replace the installed battery when:

- The „BAT“ icon appears on the right side of the LCD
- The unit will not power on
- Using the back-light causing the „BAT“ icon to appear



Even if the battery was recently replaced, it may be necessary due to various effects to exchange the battery again. Please check its output voltage level if you get no response from your instrument.

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Exchange Battery:

1. Remove the connected thermocouples from the top of the unit
2. Lay the unit face down on a clean and flat surface
3. Remove the screw from the battery case cover by using a cross slot screwdriver
4. Remove the battery case cover of the unit
5. Exchange the 9VDC battery. Observing indicated polarity of the plug and battery.
6. Push the battery case cover back on the unit and fix it gently with the cross drive screw



Batteries may not be disposed via standard garbage. Batteries need to be disposed by designated collection points or via your specialist dealer. Please observe the instructions of the battery manufacturer!

11. TROUBLE SHOOTING

Symptom:

Unit does not turn on

Possible causes:

Battery low voltage

Battery not installed correctly

External power supply without output

Remedy:

Replace battery

Ensure clip grips battery posts tightly

Check external power supply

Symptom:

Dashes appear in primary and / or secondary display

Possible causes:

No thermocouple is connected

Connected thermocouples are not properly connected with input plugs

The connected sensor isn't a thermocouple (e.g. resistance temperature sensor)

Remedy:

Connect a thermocouple with the unit

Check the connection of the thermocouple with the unit

Replace the incorrect sensor with a thermocouple

Symptom:

Relative clock will not start when pressing „REC“ button

Possible causes:

Thermocouple is not connect properly with the unit

Remedy:

Check the connection of the thermocouple with the unit

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Symptom:

Temperature drifts from known value in a controlled environment

Possible causes:

Thermocouple type does not match with unit setting

Moisture, corrosion or debris on thermocouple

Defective thermocouple

Remedy:

Change unit setting to correct thermocouple setting

Clean and dry thermocouple blades – Allow thermocouple plug to air-dry

Confirm defect thermocouple with known good one and replace if necessary

Symptom:

Unit turn off during recording

Possible causes:

Auto Power off is enabled

Remedy:

Follow procedure outlined in this operating manual under “Auto Power Off”

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12. TECHNICAL DATA

General Technical Data	
Operating Temperature	0 ... +50 °C (32 ... 122°F)
Approved Humidity	0 ... 85% rF (RH)
Measuring Range	Type K -200° C ... +1370° C (-328° F ... +2498°F) Type J -200° C ... +760° C (-328° F ... +1400°F) Type T -200° C ... +390° C (-328° F ... +734°F) Type R, S 0° C ... +1760° C (+32° F ... +3200°F) Type E -200° C ... +1000° C (-328° F ... +1832°F)
Resolution	Type K 0,1°C: -200°C ... +650°C 1°C: +640°C ... +1370°C 0,1°F: -328°F ... +1000°F 1°F: +990 ... +2498°F Type J 0,1°C: -200°C ... +500°C 1°C: +490°C ... +760°C 0,1°F: -328°F ... +940°F 1°F: +930 ... +1400°F Type T 0,1°C: -200°C ... +390°C 0,1°F: -328°F ... +734°F Type R, S 0,1°C: 0°C ... +1000°C 1°C: +990°C ... +1760°C 0,1°F: +32°F ... +1000°F 1°F: +990 ... +3200°F Type E 0,1°C: -200°C .. +380°C 1°C: +370°C .. +736°C 0,1°F: -328°F .. +720°F 1°F: +710 .. +1832°F
Accuracy	Type K, J, T, E $\pm(0,1\% + 0,7^{\circ}\text{C})$ $\pm(0,1\% + 1,4^{\circ}\text{F})$ Type R, S $\pm(0,3\% + 0,7^{\circ}\text{C})$ $\pm(0,1\% + 1,4^{\circ}\text{F})$
Power Supply internal	9VDC Battery
Power Supply external	9VDC plug
Weight:	320g (11,29oz)
Interface	RS232
Dimensions	72 x 182 x 30mm (B x H x T) 2,83" x 7,17" x 1,18" (w x h x d)
Digital Thermometer 0560 8856	Digital Thermometer, with RS232 Interface and additional external 9VDC power supply plug, for use with maximal two thermocouples of type K / J / T / R / S / E
Accessory 0554 1016	RS232 Interface Software

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13. GENERAL QUESTIONS

If you still have questions concerning this product of B+B Thermo-Technik GmbH, please do not hesitate to contact us at:

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We wish you a successful measuring!

Your Temperature-Partner
B+B Thermo-Technik GmbH

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