

# **Operating Instructions for**

## **Digital Indicating Unit**

**Thermocouple Type K, B, S, N, E, T, R, L, J**

**Model: DAG-A4T..., 96 x 48 mm**



We don't accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

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## 2. Note

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Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The instruction manuals on our website [www.kobold.com](http://www.kobold.com) are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email ([info.de@kobold.com](mailto:info.de@kobold.com)) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EC machinery directive.

## 3. Instrument Inspection

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Instruments are inspected before shipping and sent out in perfect condition. Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

### **Scope of delivery:**

The standard delivery includes:

- Digital Indicating Unit      model: DAG-A4T

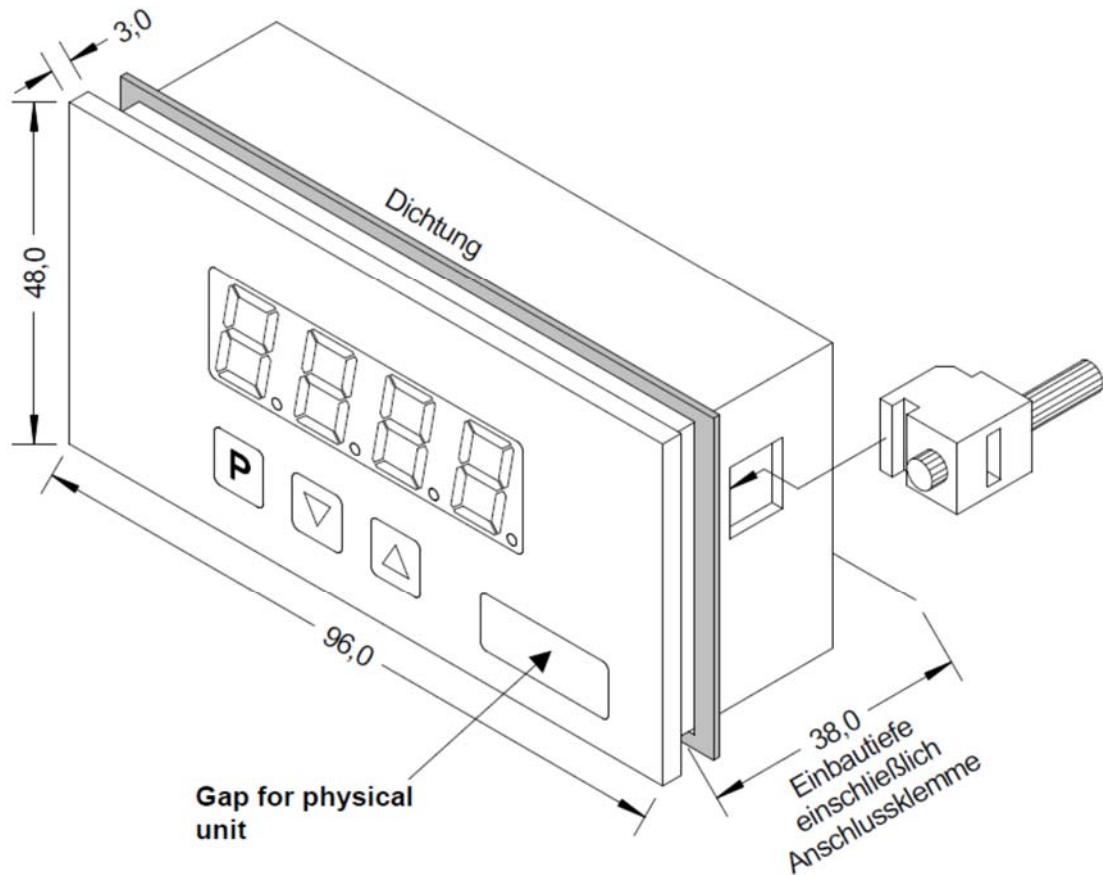
## 4. Regulation Use

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Any use of the device, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

## 5. Assembly

Please read the Safety advice on *page 12* before installation and keep this user manual for future reference.



1. After removing the fixing elements, insert the device.
2. Check the seal to make sure it fits securely.
3. Click the fixing elements back into place and tighten the clamping screws by hand. Then use a screwdriver to tighten them another half a turn.

**CAUTION!** The torque should not exceed 0.1 Nm!

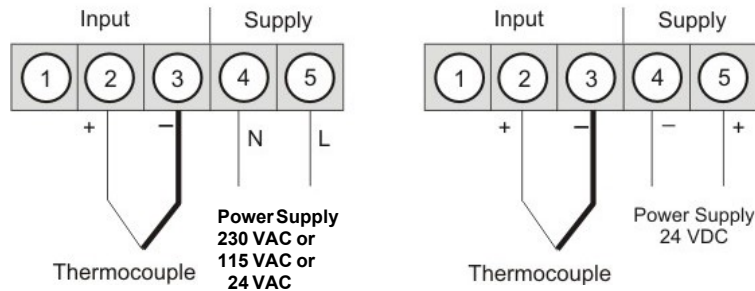
**The dimension symbols can be exchanged before installation via a channel on the side!**

## 6. Electrical connection

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DAG-A4T0... with power supply 230 VAC  
DAG-A4T4... with power supply 115 VAC  
DAG-A4T2... with power supply 24 VAC

DAG-A4T3... with power supply 24 VDC



### Advice:

The galvanic insulation in devices with temperature sensors that do not have a galvanic connection to an extrinsic potential, can be cancelled by a bridge from terminal 3 to 4 and this stabilize the device against external failures.

Devices with a VAC supply need a connection from terminal 3 to signal ground.

## 7. Function and operation description

### Operation







The operation is divided into two different levels.

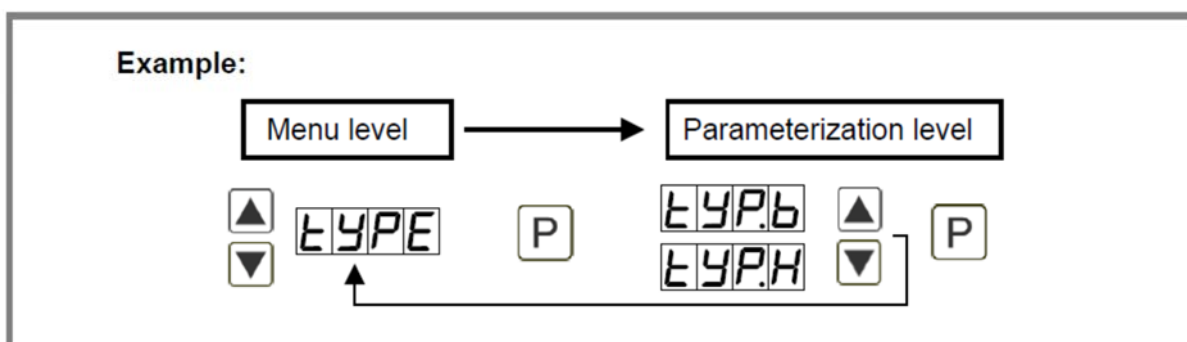
### Menu-Level

Here it is possible to navigate between the individual menu items.

### Parameterization-Level

The parameters stored in the menu item can be parameterized here. Functions that can be adjusted or changed are always indicated with a flashing of the display. Adjustments made at the parameterization level should be always confirmed by pressing the **[P]** key to save them. However, the display automatically saves all adjustments and then switches to operation mode if no further keys are pressed within 10 seconds.

Level	Button	Description
Menu level		Change to parameterization level with the relevant parameters
	 	For navigation at the menu level
Parameterization level		To confirm the changes made at the parameterization level
	 	To change the value or setting



## 8. Setting up the device

### 8.1 Switching on

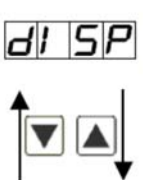

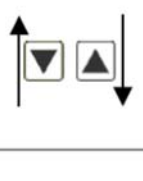

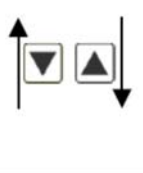

Once the installation is complete, you can start the device by applying the current loop. Check beforehand once again that all the electrical connections are correct.

#### Starting sequence




















For 1 second during the switch-on process, the segment test (8 8 8 8) is displayed, followed by an indication of the software type and, after that, also for 1 second, the software version. After the start-up sequence, the device switches to operation / display mode.

### 8.2 Standard parameterization

To be able to parameterize the display, press the **[P]** key in operating mode for 1 second. The display then changes to the menu level with the first menu item **TYPE**.

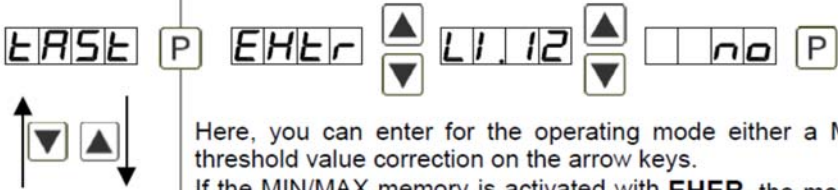
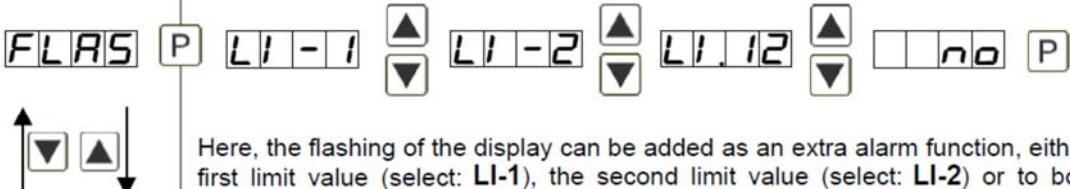
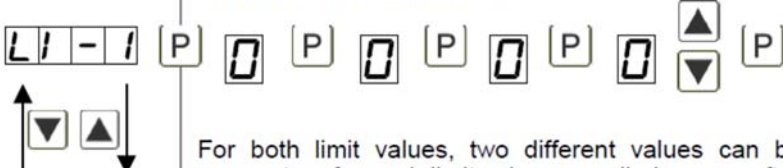

Menu level	Parameterization level
	<b>Type of temperature measurement, DISP:</b>  <p>The temperature can be displayed in °C or in °F. Confirm the selection with <b>[P]</b> and the display switches back to menu level.</p>
	<b>Selection of the thermocouple, TYPE:</b>  <p>As input versions there are 9 thermocouple types (L, J, K, B, S, N, E, T, R) to choose from. Set the end value from the smallest to the largest digit with <b>[▲]</b> <b>[▼]</b> and confirm each digit with <b>[P]</b>.</p>
	<b>Setting the decimal point, DOt:</b>  <p>The decimal point on the display and the physical unit can be moved with <b>[▲]</b> <b>[▼]</b>. If e.g. temperature measurement in °C is selected, then you can choose between 0°C and 0.0°C in the parameterization level. Confirm with <b>[P]</b>, the display then switches back to the menu level again.</p>

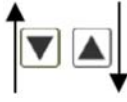




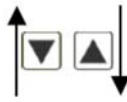


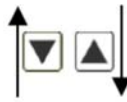


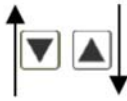









Menu level	Parameterization level
	<p><b>Impedance matching, dot:</b></p> <p>OFFS P 8 P 8 P 8 P 8  P </p> <p>The value for the sensor calibration is from the smallest to the highest digit selectable with [] [] and confirmed with [P]. After the last digit the display switches back to the menu level again. The value calibration for a temperature measurement in °C can be adjusted between -20.0 and +20.0 and in °F between -36.0 and +36.0. If the type of the measurement is changed later, then the value is rounded.</p>
	<p><b>Setting the display time, SEC:</b></p> <p>SEC P 0.1   0.9 then 1.0   10.0 P</p> <p>The display time is set with [] []. The display moves up in increments of 0.1 up to 1 second and in increments of 1.0 to 10.0 seconds. Confirm the selection by pressing the [P] button. The display then switches back to the menu level again.</p>
	<p><b>Activation / deactivation of the programming lock and completion of the standard parameterization, run:</b></p> <p>run P UL0C   LOC P</p> <p>With the aid of the [] [] keys, you can choose between the deactivated key lock <b>Uloc</b> (works setting) and the activated key lock <b>Loc</b>. Make the selection with [P]. After this, the display confirms the settings with "- - -", and automatically switches to operating mode. If <b>Loc</b> was selected, the keyboard is locked. To get back into the menu level, you must press [P] for 3 seconds in operating mode. You must now enter the <b>CODE</b> (works setting 1 2 3 4) that appears using the [] [] keys plus [P] to unlock the keyboard. <b>FAIL</b> appears if the input is wrong.</p>

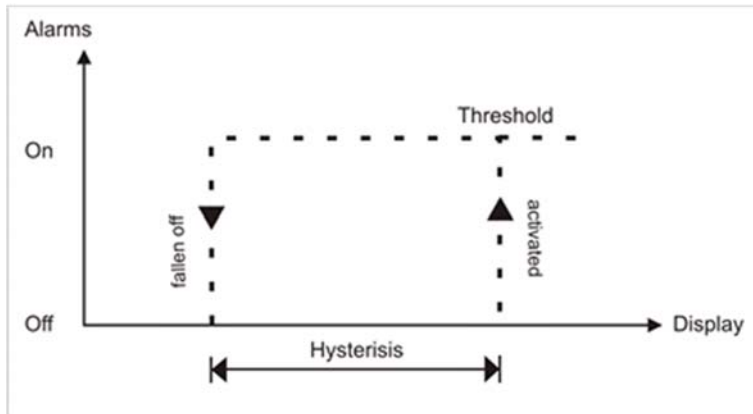
## 8.3 Extended parameterization

By pressing the [▲] & [▼] buttons during standard parameterization for 1 second, the display switches to the extended parameterization mode. Operation is the same as in standard parameterization.

Menu level	Parameterization level
	<b>MIN/MAX value inquiry - Assignment of key functions, Tast:</b>  Here, you can enter for the operating mode either a MIN/MAX value inquiry or a threshold value correction on the arrow keys. If the MIN/MAX memory is activated with <b>EHER</b> , the measured MIN/MAX values will be saved during operation and can be called up via the arrow keys [▲] [▼]. The values are lost if the device is restarted. If the threshold value correction <b>LI.1</b> is selected, the limit values can be changed during operation without hindering the operating procedure. If <b>No</b> is parameterized, the arrow keys [▼] [▲] have no function in operating mode.
	<b>Flashing of display, FLAS:</b>  Here, the flashing of the display can be added as an extra alarm function, either to the first limit value (select: <b>LI-1</b> ), the second limit value (select: <b>LI-2</b> ) or to both limit values (select: <b>LI-12</b> ). With <b>No</b> (works setting), no flashing is assigned at all.
	<b>Limit values / Limits, LI-1:</b>  For both limit values, two different values can be parameterized. With this, the parameters for each limit value are called up one after the other.
	<b>Hysteresis for limit values, HY-1:</b>  For all limit values, a hysteresis function exists that reacts according to the settings (threshold exceedance / threshold undercut).

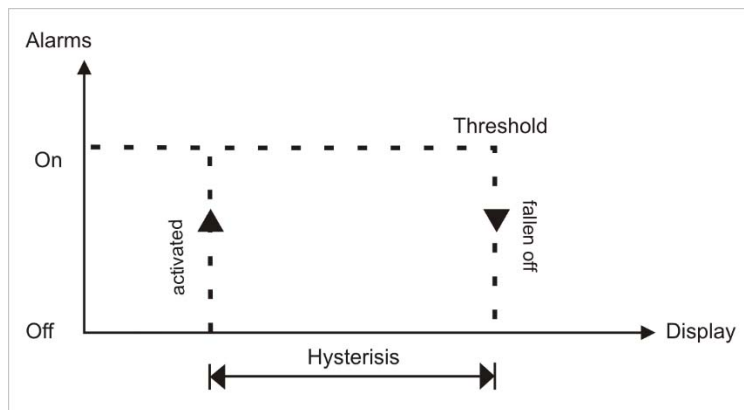
Menu level	Parameterization level
	<p><b>Function if display falls below / exceeds limit value, FU-1:</b></p> <p><b>Fu-1</b> P <b>HI GH</b>   <b>LoUu</b>   P</p> <p>The limit value undercut can be selected with <b>LoUu</b> (LOW = lower limit value) and limit value exceedance can be selected with <b>high</b> (HIGH = upper limit value). If e.g. limit value 1 is on a switching threshold of 100 and occupied with function „high“, the alarm will be activated by reaching the threshold. If the limit value is allocated to „Low“, an alarm will be activated by undercut of the threshold.</p>
	<p><b>Limit value /Limits, LI-2:</b></p> <p><b>LI-2</b> P 0 P 0 P 0 P 0   P</p> <p>For both limit values, two different values can be parameterized. With this, the parameters for each limit value are called up one after the other.</p>
	<p><b>Hysteresis for limit values, HY-2:</b></p> <p><b>HY-2</b> P 0 P 0 P 0 P 0   P</p> <p>For all limit values, a hysteresis function exists that reacts according to the settings (threshold exceedance / threshold undercut).</p>
	<p><b>Function if display falls below / exceeds limit value, FU-2:</b></p> <p><b>Fu-2</b> P <b>HI GH</b>   <b>LoUu</b>   P</p> <p>To indicate if the value falls below the lower limit value, <b>LoUu</b> can be selected (LOW = lower limit value) and if it goes above the upper limit value, <b>high</b> can be selected (HIGH = upper limit value). LOW corresponds to the quiescent current principle and HIGH to the operating current principle.</p>
	<p><b>Setting the code, CODE:</b></p> <p><b>Code</b> P 1 P 2 P 3 P 4   P</p> <p>With this setting, it is possible to select an individual code (works setting 1 2 3 4) for locking the keyboard. To lock/release the key, proceed according to menu item <b>run</b>.</p>

## 9. Functional principle of the set points



### Limit value exceedance „High“

By limit value exceedance the alarm S1-S2 is off below the threshold and on on reaching the threshold.



### Limit value undercut „Low“

By limit value undercut the alarm S1-S2 is on below the threshold and switched off on reaching the threshold.

### Alarms / optical setpoint display

An activated set point can be optically indicated by flashing of the 7-segment display.

Functional principle of the alarms	
Alarm	Deactivated, display value
Threshold	Threshold/limit value for switch over
Hysteresis	Width of the window between the thresholds
Function	Limit value exceedance / limit value undercut

## 10. Factory settings

### 10.1 Default values

Parameter	Menu items				Default
TYPE	TYPE.L	to	TYPE.r		TYPE.L
DISP	---	or	---	F	---
dot	---	to	0.0C		---
OFFS	-20.0	to	20.0		000.0
SEC	---	to	10.0		0 1.0
run	ULOC		L0C		ULOC
ERSt	---	no	EHt.r	L1.12	---
FLAS	---	no	L1-1	L1-2	---
L1-1	4999	to	9999		020.0
HY-1	0000	to	9999		000.0
Fu-1	Lowu		HI 9H		HI 9H
L1-2	4999	to	9999		030.0
HY-2	0000	to	9999	L1 12	000.0
Fu-2	Lowu		HI 9H		HI 9H
Code	0000	to	9999		1234

### 10.2 Reset to default values

To return the unit to a **defined basic state** a reset can be carried out to the default values.

The following procedure should be used:

- Switch off the power supply
- Press the button [P]
- Switch on voltage supply and press [P] button until “- - -” is shown in the display.

With reset, the default values of the program table are loaded and used for subsequent operation. This puts the unit back to the state in which it was supplied.

**Caution! All application-related data are lost.**



## 11. Safety advice

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Please read the following safety advice and the assembly *chapter 5* before installation and keep it for future reference.

### Proper use

The **DAG-A...-device** is designed for the evaluation and display of sensor signals.



**Danger! Careless use or improper operation can result in personal injury and / or damage to the equipment.**

### Control of the device

The panel meters are checked before dispatch and sent out in perfect condition. Should there be any visible damage, we recommend close examination of the packaging. Please inform the supplier immediately of any damage.

### Installation



The **DAG-A...-device** must be installed by a suitably **qualified specialist** (e.g. with a qualification in industrial electronics).

### Notes on installation

- There must be no magnetic or electric fields in the vicinity of the device, e.g. due to transformers, mobile phones or electrostatic discharge.
- The **fuse rating** of the supply voltage should not exceed a value of **0.5 A N.B. fuse**.
- Do not install **inductive consumers** (relays, solenoid valves etc.) near the device and **suppress** any interference with the aid of RC spark extinguishing combinations or free-wheeling diodes.
- Keep input, output and supply lines separate from one another and do not lay them parallel with each other. Position “go” and “return” lines next to one another. Where possible use twisted pair. So, you receive best measuring results.
- Screen off and twist sensor lines. Do not lay current-carrying lines in the vicinity. Connect the **screening on one side** on a suitable potential equalizer (normally signal ground).
- The device is not suitable for the installation in areas where there is a risk of explosion.
- Any electrical connection deviating from the connection diagram can endanger human life and / or can destroy the equipment.
- The terminal area of the devices is part of the service. Here electrostatic discharge needs to be avoided. Attention! High voltages can cause dangerous body currents.

- Galvanic insulated potentials within one complex need to be placed on a appropriate point (normally earth or machines ground). So, a lower disturbance sensibility against impacted energy can be reached and dangerous potentials, that can occur on long lines or due to faulty wiring, can be avoided.

## 12. Error elimination

	Error description	Measures
1.	The unit permanently indicates overflow. 	<ul style="list-style-type: none"> <li>The input has a very high measurement, check the measuring circuit.</li> <li>The input is open</li> </ul>
2.	The unit permanently shows underflow. 	<ul style="list-style-type: none"> <li>The input has a very low measurement, check the measuring circuit .</li> <li>The input is open.</li> </ul>
3.	The word "HELP " lights up in the 7-segment display.	<ul style="list-style-type: none"> <li>The unit has found an error in the configuration memory. Perform a reset on the default values and re-configure the unit according to your application.</li> </ul>
4.	Program numbers for parameterising of the input are not accessible.	<ul style="list-style-type: none"> <li>Programming lock is activated</li> <li>Enter correct code</li> </ul>
5.	"Err1" lights up in the 7-segment display	<ul style="list-style-type: none"> <li>Please contact the manufacturer if errors of this kind occur.</li> </ul>
6.	The device does not react as expected.	<ul style="list-style-type: none"> <li>If you are not sure if the device has been parameterised before, then follow the steps as written in <i>chapter 5.2.</i> and set it back to its delivery status.</li> </ul>

## 13. Technical Information

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Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

## 14. Order Codes

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Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

## 15. Dimensions

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Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)



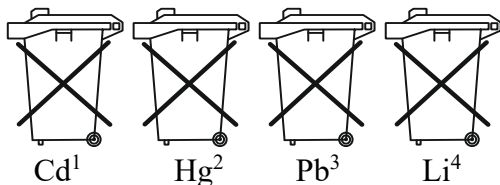
## **16. Disposal**

### **Note!**

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

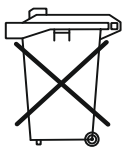
### **Batteries**

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

### **Electrical and electronic equipment**



## 17. EU Declaration of Conformance

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We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

**Digital Indicating Unit      Model: DAG-A4T**

to which this declaration relates is in conformity with the following EU directives stated below:

<b>2014/30/EU</b>	<b>EMC Directive</b>
<b>2014/35/EU</b>	<b>Low Voltage Directive</b>
<b>2011/65/EU</b>	<b>RoHS (category 9)</b>
<b>2015/863/EU</b>	<b>Delegated Directive (RoHS III)</b>

Also, the following standards are fulfilled:

**EN 61010-1:2010+A1:2019+A1:2019/AC:2019**

Safety requirements for electrical equipment for measurement, control and laboratory use

**EN 61326-1:2013**

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

**EN 63000:2018**

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Hofheim, 06 Sept. 2023



H. Volz  
General Manager

J. Burke  
Compliance Manager

## **18. UK Declaration of Conformity**

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We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

**Digital Indicating Unit for Panel Mounting**

**Model: DAG-A4T**

to which this declaration relates is in conformity with the following UK directives stated below:

<b>S.I. 2016/1091</b>	<b>Electromagnetic Compatibility Regulations 2016</b>
<b>S.I. 2016/1101</b>	<b>Electrical Equipment (Safety) Regulations 2016</b>
<b>S.I. 2012/3032</b>	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Also, the following standards are fulfilled:

**BS EN 61010-1:2010+A1:2019**

Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements

**BS EN 61326-1:2013**

Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements

**BS EN IEC 63000:2018**

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Hofheim, 06 Sept. 2023



H. Volz  
General Manager



J. Burke  
Compliance Manager