

Operating Instructions
for
Digital Indicator and Controller for Panel
Mounting

Pt100 2-/3-/4-wire -200°C...850°C / -328°F...1562°F

Model: DAG-M12



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

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2. Note

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 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) 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

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

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 Indicator and Controller for Panel Mounting model: DAG-M12

4. Regulation Use

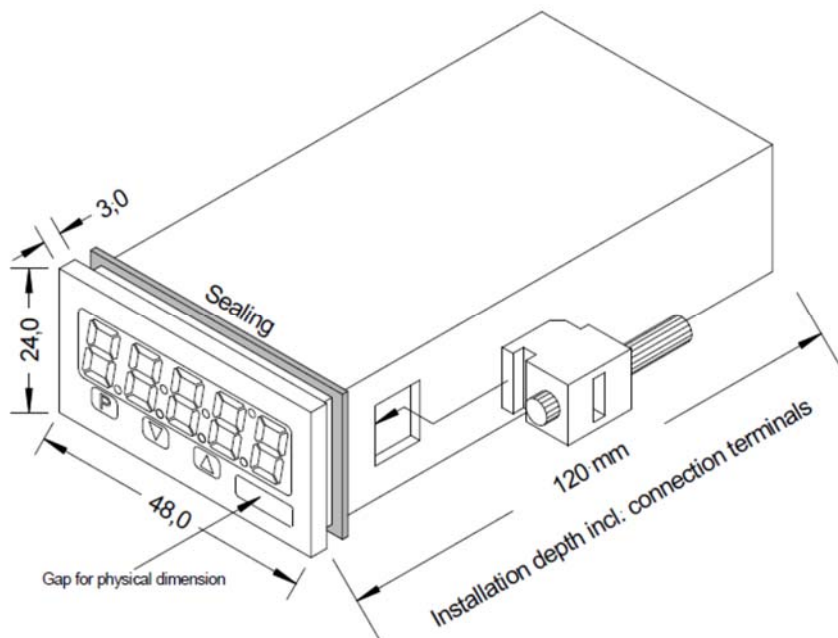
Any use of the device, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Brief description

The panel meter instrument **DAG-M12** is a 5-digit device for Pt100 temperature sensors and a visual threshold value monitoring via the display. The configuration happens via three keys at the front. The integrated programming interlock prevents unrequested changes of parameters and can be unlocked again with an individual code. Optional an analog output for further processing in the equipment is available. And on demand two free adjustable setpoints with which threshold values can be controlled and reported to a superior master display. The electrical connection is done via plug-in terminals on the back side. Selectable functions like e.g. the recall of the min/max-value, a direct threshold value regulation during operation mode, complete the modern device concept.

6. Assembly

Please read the Safety advices on page 24 before installation and keep this user manual for future reference.

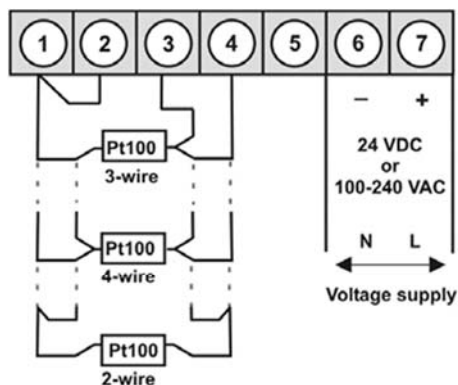


1. After removing the fixing elements, insert the device.
2. Check the seal to make sure it fits securely.
3. Click the fixing elements back into place and tighten the clamping screws by hand. Then use a screwdriver to tighten them another half a turn.

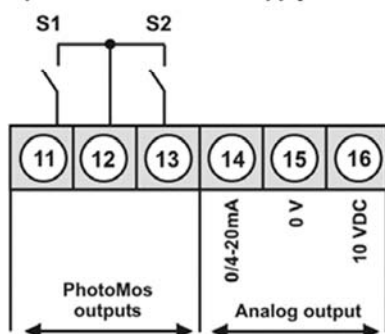
CAUTION! The torque should not exceed 0.1 Nm!

7. Electrical connection

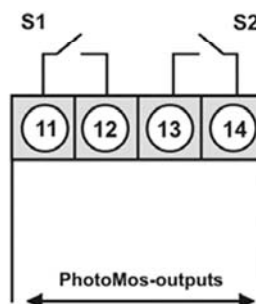
Type DAG-M123000R
Supply of 24 VDC



Options: device with a supply of 24 VDC



Options: device with a supply of 100-240 VAC



8. Function description and operation

Operation

The operation is divided into two different levels.

Menu level (delivery status)
















The menu level is for the standard settings of the device. Only menu items which are sufficient to set the device into operation are displayed. To get into the professional level, run through the menu level and parameterize **prof** under menu item **RUN**.

Menu group level (complete function volume)

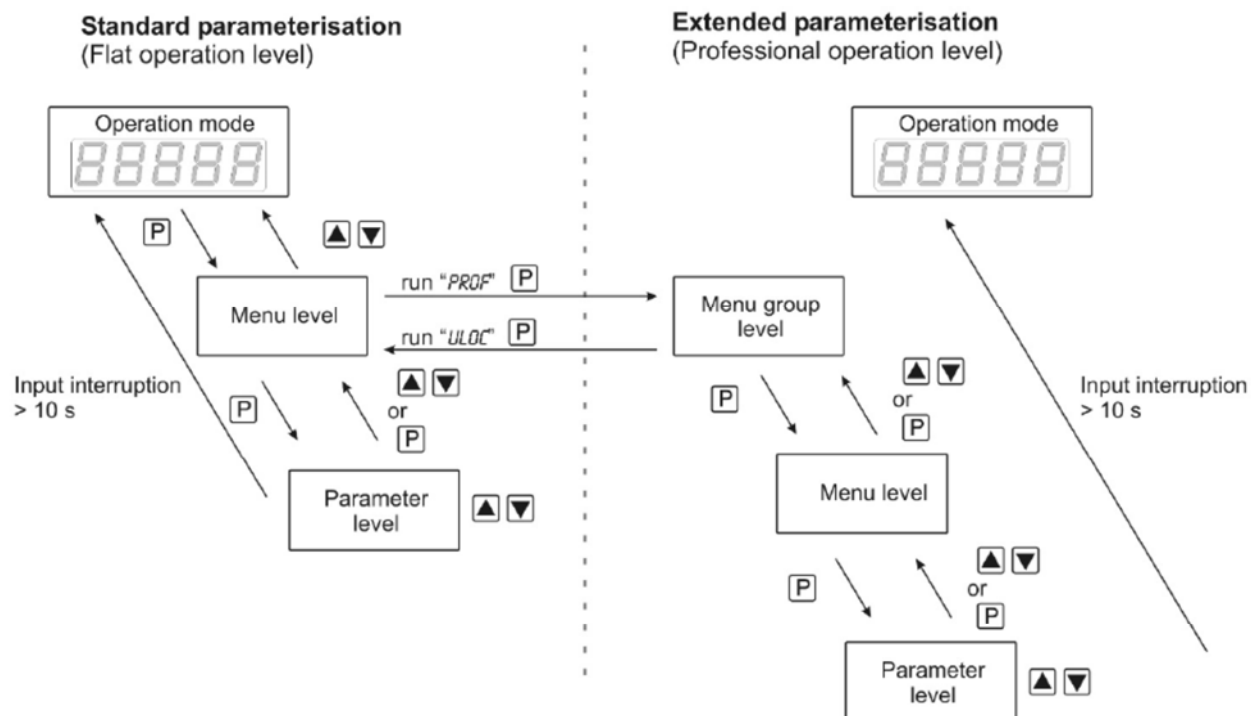
Suited for complex applications e.g. linkage of alarms, setpoint treatment, totalizer function etc. In this level function groups which allow an extended parameterization of the standard settings are available. To leave the menu group level, run through this level and parameterize **uloc** under menu item **RUN**.

Parameterization level

Parameter deposited in the menu item can here be parameterized. Functions, that can be changed or adjusted, are always signalized by a flashing of the display. Settings that are made in the parameterization level are confirmed with **[P]** and thus saved. Pressing the **[0]** key (Zero-key) leads to a break-off of the value input and to change into the menu level. All adjustments are saved automatically by the device and it changes into operating mode, if no further key operation is done within the next 10 seconds.

Level	Key	Description
Menu level		Change to parameterisation level and deposited values.
	 	Keys for up and down navigation in the menu level.
	 	Change into operation mode by pushing both navigation keys at the same time.
Parameterisation level		To confirm the changes made at the parameterization level.
	 	Adjustment of the value / the setting.
	 	Change into menu level or stop of the value input, by pushing both navigation keys at the same time.
Menu group level		Change to menu level
	 	Keys for up and down navigation in the menu group level.
	 	Change into operation mode or return into menu level, by pushing both navigation keys at the same time.

Function chart



Explanation:

- P Take-over
- Breakoff by simultaneously pushing of the navigation keys
- Value selection (+)
- Value selection (-)

9. Setting up the device

9.1 Switching on

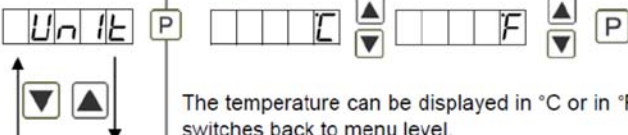
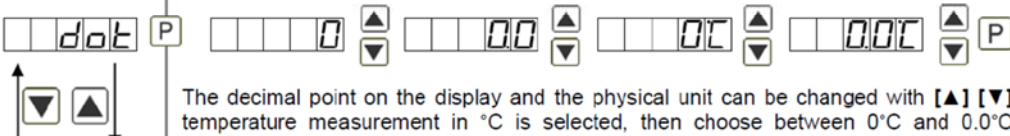

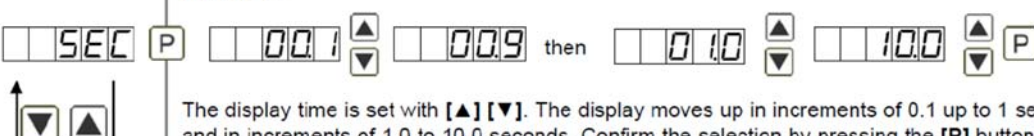
Once the installation is complete, you can start the device by applying the current loop. Check beforehand once again that all the electrical connections are correct.


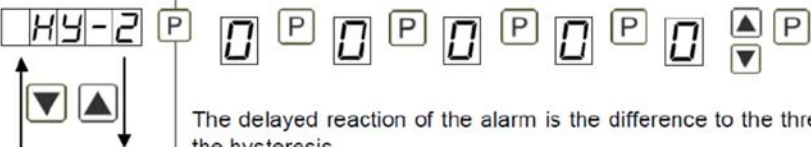
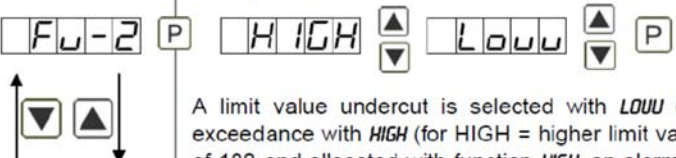
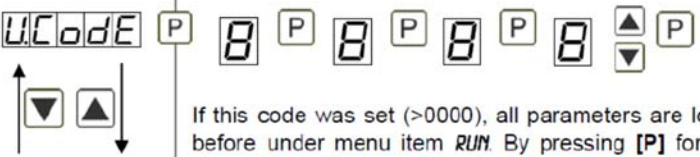
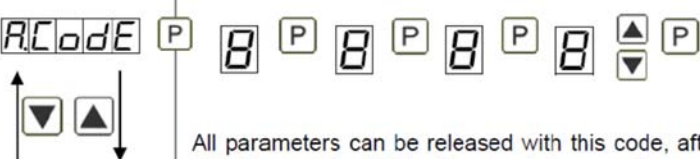
Starting sequence

For 1 second during the switching-on process, the segment test (8 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.


9.2 Standard parameterization (Flat operation level)

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	Parameterisation level
	<p>Type of temperature metering, <i>UNIT</i>: Default: °C</p> <p>The temperature can be displayed in °C or in °F. Confirm the selection with [P] and the display switches back to menu level.</p>
	<p>Setting the decimal point, <i>DOT</i>: Default: 0.0</p> <p>The decimal point on the display and the physical unit can be changed with [▲] [▼]. If e.g. temperature measurement in °C is selected, then choose between 0°C and 0.0°C in the parameterisation level. Confirm with [P], the display then switches back to the menu level again.</p>
	<p>Setting the measuring range start / offset value, <i>OFFS</i>: Default: 0.0</p> <p>The value for the sensor calibration is selectable from the smallest to the highest digit 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>Setting the display time, <i>SEC</i>: Default: 1.0</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>

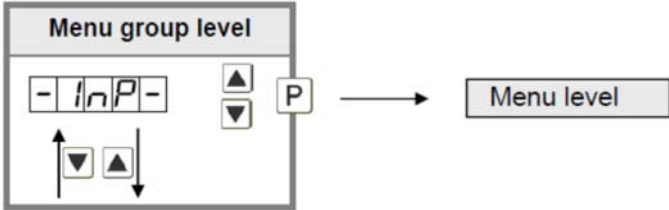
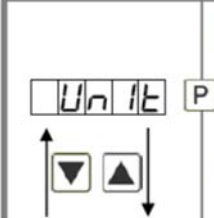

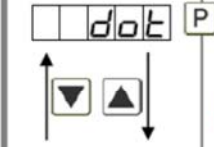

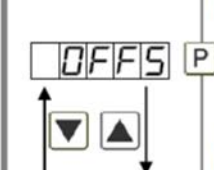

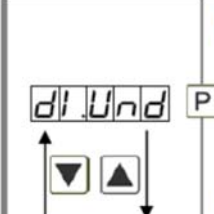

Menu level	Parameterisation level
	<p>Threshold values / limits, <i>L1-2</i>: Default: 300.0</p> <p>This value defines the threshold, that activates/deactivates an alarm.</p>
	<p>Hysteresis for threshold values, <i>HY-2</i>: Default: 0.0</p> <p>The delayed reaction of the alarm is the difference to the threshold value, which is defined by the hysteresis.</p>
	<p>Function if display falls below / exceeds limit value, <i>FU-2</i>: Default: HIGH</p> <p>A limit value undercut is selected with <i>LOW</i> (for LOW = lower limit value), a limit value exceedance with <i>HIGH</i> (for HIGH = higher limit value). If e.g. limit value 1 is on a threshold level of 100 and allocated with function <i>HIGH</i>, an alarm is activated by reaching the threshold level. If the threshold value was allocated to <i>LOW</i>, an alarm will be activated by undercutting the threshold value, as long as the hysteresis is zero.</p>
	<p>User code (4-digit number-combination, free available), <i>U.CODE</i>: Default: 0000</p> <p>If this code was set (>0000), all parameters are locked for the user, if <i>LOC</i> has been selected before under menu item <i>RUN</i>. By pressing [P] for 3 seconds in operation mode, the display shows <i>CODE</i>. The <i>U.CODE</i> needs to be entered to get to the reduced number of parameter sets. The code has to be entered before each parameterisation, until the <i>R.CODE</i> (Master code) unlocks all parameters again.</p>
	<p>Master code (4-digit number-combination, free available), <i>R.CODE</i>: Default: 1234</p> <p>All parameters can be released with this code, after <i>LOC</i> has been activated under menu item <i>RUN</i>. By pressing [P] for 3 seconds in operation mode, the display shows <i>CODE</i> and enables the user to reach all parameters by entering the <i>R.CODE</i>. Under <i>RUN</i> the parameterisation can be activated permanently by selecting <i>ULOC</i> or <i>PROF</i>, thus at an anew pushing of [P] in operation mode, the code needs not to be entered again.</p>

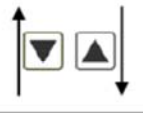


9.3 Programming interlock

Menu level	Parameterisation level
Programming interlock „RUN“	
Activation / deactivation of the programming lock or completion of the standard parameterization with change into menu group level (complete function range), RUN. Default: ULDC	
	<p>With the navigation keys [▲] [▼], choose between the deactivated key lock <i>ULDC</i> (works setting) and the activated key lock <i>LOC</i>, or the change into the menu group level <i>PROF</i>. Confirm the selection with [P]. After this, the display confirms the settings with "- - - -", and automatically switches to operating mode. If <i>LOC</i> was selected, the keyboard is locked. To get back into the menu level, press [P] for 3 seconds in operating mode. Now enter the <i>CODE</i> (works setting 1 2 3 4) that appears using [▲] [▼] plus [P] to unlock the keyboard. <i>FAIL</i> appears if the input is wrong. To parameterize further functions <i>PROF</i> needs to be set. The device confirms this setting with "- - - -", and changes automatically in operation mode. By pressing [P] for approx. 3 seconds in operation mode, the first menu group <i>IMP</i> is shown in the display and thus confirms the change into the extended parameterisation. It stays activated as long as <i>ULDC</i> or <i>LOC</i> is entered in menu group <i>RUN</i>.</p>

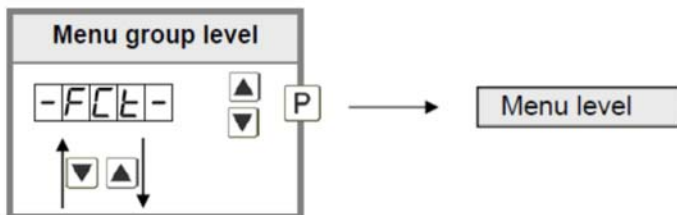
9.4 Extended parameterization (Professional operation level)

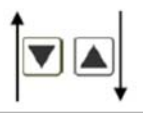



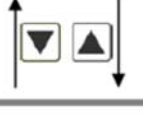

9.4.1 Signal input parameters





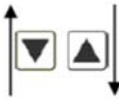


Menu group level	
	
Menu level	Parameterisation level
	<p>Type of temperature metering, UNIT: Default: °C</p>  <p>The temperature can be displayed in °C or in °F. Confirm the selection with [P] and the display switches back to menu level.</p>
	<p>Setting the decimal point, DOT: Default: 0.0</p>  <p>The decimal point on the display and the physical unit can be changed with [▲] [▼]. If e.g. temperature measurement in °C is selected, then choose between 0°C and 0.0°C in the parameterisation level. Confirm with [P], the display then switches back to the menu level again.</p>
	<p>Setting the measuring range start / offset value, OFFS: Default: 0.0</p>  <p>The value for the sensor calibration is selectable from the smallest to the highest digit 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>Device undercut, DIUND: Default: -19999</p>  <p>With this function the device undercut (_ _ _ _) can be defined on a definite value. Exception is input type 4-20 mA, it already shows undercut at a signal <1 mA, so a sensor failure is marked.</p>

Menu level	Parameterisation level
	Display overflow, <i>DI.QUE</i>: Default: 99999  <p>With this function the display overflow ("-----") can be defined on a definite value.</p>
	Back to menu group level, <i>RET</i>: <p>With [P] the selection is confirmed and the device changes into menu group level „-inp-“.</p>

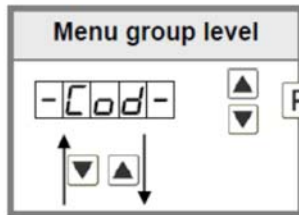
9.4.2 General device parameters



Menu level	Parameterisation level
	Display time, <i>DISEC</i>: Default: 01.0  <p>The display is set up with [▲] [▼]. Thereby it switches until 1 second in increments of 0.1 seconds and until 10.0 seconds in increments of 1.0. With [P] the selection is confirmed and the device changes into menu level.</p>
	Rounding of display values, <i>ROUND</i>: Default: 00001  <p>This function is for instable display values, where the display value is changed in increments of 1, 5, 10 or 50. This does not affect the resolution of the optional outputs. With [P] the selection is confirmed and the device changes into menu level.</p>
	Display, <i>DISPL</i>: Default: ACTUA  <p>With this function the current measuring value or the min/max-value. With [P] the selection is confirmed and the device changes into menu level.</p>

Menu level	Parameterisation level
	<p>Brightness control, <i>LIGHT</i>: Default: 15</p> <p></p> <p>The brightness of the display can be adjusted in 16 levels from 00 = very dark to 15 = very bright via this parameter or alternatively via the navigation keys from the outside. During the start of the device the level that is deposited under this parameter will always be used, even though the brightness has been changed via the navigation keys in the meantime.</p>
	<p>Display flashing, <i>FLASH</i>: Default: <i>NO</i></p> <p></p> <p>A display flashing can be added as additional alarm function either to single or to a combination of off-limit condition. With <i>NO</i>, no flashing is allocated.</p>
	<p>Assignment (deposit) of key functions, <i>TRST</i>: Default: <i>NO</i></p> <p></p> <p>For the operation mode, special functions can be deposited on the navigation keys [▲] [▼], in particular this function is made for devices in housing size 48x24mm which do not have a 4th key ([O]-key). If the min/max-memory is activated with <i>EHTr</i>, all measured min/max-values are saved during operation and can be recalled via the navigation keys. The values get lost by restart of the device. If the threshold value correction <i>LI.12</i> or <i>LI.34</i> is chosen, the values of the threshold can be changed during operation without disturbing the operating procedure. If <i>NO</i> is selected, the navigation keys are without function in the operation mode.</p>
	<p>Back to menu group level, <i>RET</i>:</p> <p>With [P] the selection is confirmed and the device changes into menu group level „-FCT-“.</p>

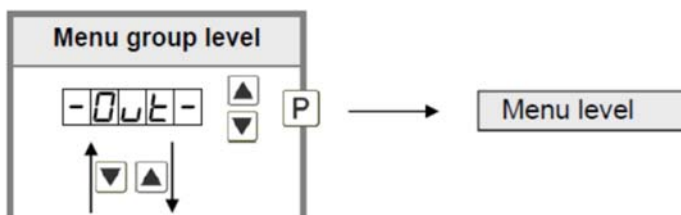
9.4.3 Safety parameters

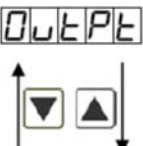

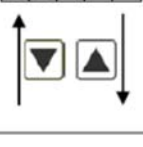

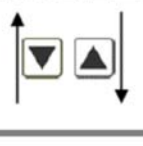



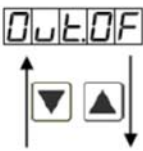

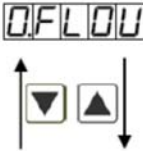

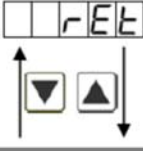
Menu level	Parameterisation level
	<p>User code <i>U.CODE</i>: Default: 0000</p> <p><i>UCode</i> P 0 P 0 P 0 P 0 P 0 ▲ P ▼</p> <p>Via this code, reduced sets of parameters can be released. A change of the <i>U.CODE</i> can be done via the correct input of the <i>R.CODE</i> (master code).</p>
	<p>Master code, <i>R.CODE</i>: Default: 1234</p> <p><i>RCode</i> P 1 P 2 P 3 P 4 ▲ P ▼</p> <p>By entering <i>R.CODE</i>, the device will be unlocked and all parameters are released.</p>
	<p>Release/lock analog output parameters, <i>OUT.LE</i>: Default: <i>ALL</i></p> <p><i>OUT.LE</i> P <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <i>no</i> ▲ <i>En-OF</i> ▲ <i>OUT.EO</i> ▲ <input type="checkbox"/> <i>ALL</i> ▲ P ▼</p> <p>Analog output parameters can be locked or released for the user:</p> <ul style="list-style-type: none"> - <i>En-OF</i>: the initial or final value can be changed in operation mode - <i>OUT.EO</i>: the output signal can be changed from e.g. 0-20 mA to 4-20 mA or 0-10 VDC - <i>ALL</i>: analog output parameters are released - <i>NO</i>: all analog output parameters are locked
	<p>Release/lock alarm parameters, <i>AL.LEU</i>: Default: <i>ALL</i></p> <p><i>AL.LEU</i> P <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <i>no</i> ▲ <i>LIMIT</i> ▲ <i>ALFNL</i> ▲ <input type="checkbox"/> <i>ALL</i> ▲ P ▼</p> <p>This parameter describes the user release/user lock of the alarm:</p> <ul style="list-style-type: none"> - <i>LIMIT</i>: here only the range of value of the threshold values 1-4 can be changed - <i>ALFNL</i>: here the range of value and the alarm trigger can be changed - <i>ALL</i>: all alarm parameters are released - <i>NO</i>: all alarm parameters are locked

Menu level	Parameterisation level
	<p>Back to menu group level, RET:</p> <p>With [P] the selection is confirmed and the device changes into menu group level „-COD-“.</p>

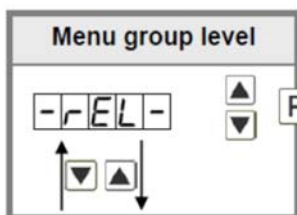
9.4.4 Analogue output parameters







Menu level	Parameterisation level
	<p>Selection reference analog output, <i>OUTPT</i>: Default: <i>ACTUA</i></p> <p>  </p> <p>The analog output signal can refer to different functions, in detail this are the current measurand, min/max-value. With [P] the selection is confirmed and the device changes into menu level.</p>
	<p>Selection analog output, <i>OUTRA</i>: Default: <i>4-20</i></p> <p>  </p> <p>Available are 3 output signals: 0-10 VDC, 0-20 mA and 4-20 mA. With this function the demanded signal can be selected.</p>
	<p>Setting up the final value of the analog output, <i>OUTEN</i>: Default: <i>850.0</i></p> <p>  </p> <p>The final value can be adjusted from the smallest to the largest digit with [▲] [▼]. Confirm each digit with [P]. A minus sign can only be parameterized on the leftmost digit. After the last digit, the display switches back to the menu level.</p>

Menu level	Parameterisation level
	<p>Setting the initial value of the analog output, <i>OUT.DF</i>: Default: <i>-200.0</i></p>  <p>The initial value is adjusted from the smallest to the highest digit with [▲] [▼] and confirmed digit per digit with [P]. A minus sign can only be parameterized on the leftmost digit. After the last digit the device changes back into menu level.</p>
	<p>Overflow behaviour, <i>O.FLOU</i>: Default: <i>EDGE</i></p>  <p>To recognise and evaluate faulty signals, e.g. by a controller, the overflow behaviour of the analog output can be defined. As overflow can be seen either <i>EDGE</i>, that means the analog output runs on the set limits e.g. 4 and 20 mA, or <i>LO.OFF</i> (input value smaller than initial value, analog output switches on e.g. 4 mA), <i>LO.END</i> (higher than final value, analog output switches on e.g. 20 mA). If <i>LO.NI n</i> or <i>LO.NAH</i> is set, the analog output switches on the least significant or leftmost possible binary value. This means that values of e.g. 0 mA, 0 VDC or values higher than 20 mA or 10 VDC can be reached. With [P] the selection is confirmed and the device changes into menu level.</p>
	<p>Back to menu group level, <i>RET</i>:</p> <p>With [P] the selection is confirmed and the device changes into menu group level „-OUT-“.</p>

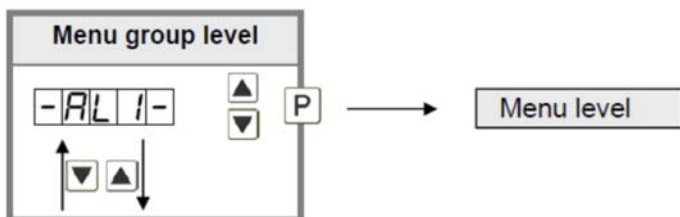
9.4.5 Relay functions



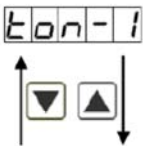

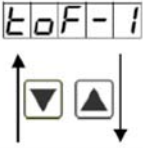

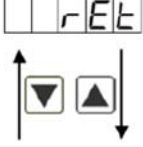
Menu level	Parameterisation level												
<div><div>REL-1</div><div><div>▲</div><div>▼</div></div><div><div>▲</div><div>▼</div></div></div>	<p>Alarm relay 1, REL-1: Default: <i>AL-1</i></p> <div><div>AL-1</div>....<div>AL-4</div><div>▲</div><div>▼</div><div>AL-n1</div>....<div>AL-n4</div><div>▲</div><div>▼</div></div> <div><div>LOGIC</div><div>▲</div><div>▼</div><div>OFF</div><div>▲</div><div>▼</div><div>On</div><div>▲</div><div>▼</div><div>P</div></div> <p>Each setpoint (optional) can be linked up via 4 alarms (by default). This can either be inserted at activated alarms <i>AL-1/4</i> or deactivated alarms <i>ALn1/4</i>. If <i>LOGIC</i> is selected, logical links are available in the menu level <i>LOG-1</i> and <i>COM-1</i>. Access to these two menu levels is via <i>LOGIC</i>, at all other selected functions, these two parameters are overleaped. Via <i>ON/OFF</i> the setpoints can be activated/deactivated, in this case the output and the setpoint display are set/not set on the front of the device. With [P] the selection is confirmed and the device changes into menu level.</p>												
<div><div>LOG-1</div><div><div>▲</div><div>▼</div></div><div><div>▲</div><div>▼</div></div></div>	<p>Logic relay 1, LOG-1 Default: <i>OR</i></p> <div><div>or</div><div>▲</div><div>▼</div><div>nor</div><div>▲</div><div>▼</div><div>And</div><div>▲</div><div>▼</div><div>nAnd</div><div>▲</div><div>▼</div><div>P</div></div> <p>The switching behaviour of the relay is defined via a logic link, the following schema describes these functions with inclusion of <i>AL-1</i> and <i>AL-2</i>. This parameter can only be selected if <i>LOGIC</i> was selected under <i>REL-1</i>.</p> <table><tr><td><div>or</div></td><td>$A1 \vee A2$</td><td>As soon as a selected alarm is activated, the relay operates. Equates to operating current principle.</td></tr><tr><td><div>nor</div></td><td>$\overline{A1 \vee A2} = \overline{A1} \wedge \overline{A2}$</td><td>The relay operates only, if no selected alarm is active. Equates to quiescent current principle.</td></tr><tr><td><div>And</div></td><td>$A1 \wedge A2$</td><td>The relay operates only, if all selected alarms are active.</td></tr><tr><td><div>nAnd</div></td><td>$\overline{A1 \wedge A2} = \overline{A1} \vee \overline{A2}$</td><td>As soon as a selected alarm is not activated, the relay operates.</td></tr></table> <p>With [P] the selection is confirmed and the device changes into menu level.</p>	<div>or</div>	$A1 \vee A2$	As soon as a selected alarm is activated, the relay operates. Equates to operating current principle.	<div>nor</div>	$\overline{A1 \vee A2} = \overline{A1} \wedge \overline{A2}$	The relay operates only, if no selected alarm is active. Equates to quiescent current principle.	<div>And</div>	$A1 \wedge A2$	The relay operates only, if all selected alarms are active.	<div>nAnd</div>	$\overline{A1 \wedge A2} = \overline{A1} \vee \overline{A2}$	As soon as a selected alarm is not activated, the relay operates.
<div>or</div>	$A1 \vee A2$	As soon as a selected alarm is activated, the relay operates. Equates to operating current principle.											
<div>nor</div>	$\overline{A1 \vee A2} = \overline{A1} \wedge \overline{A2}$	The relay operates only, if no selected alarm is active. Equates to quiescent current principle.											
<div>And</div>	$A1 \wedge A2$	The relay operates only, if all selected alarms are active.											
<div>nAnd</div>	$\overline{A1 \wedge A2} = \overline{A1} \vee \overline{A2}$	As soon as a selected alarm is not activated, the relay operates.											
<div><div>COM-1</div><div><div>▲</div><div>▼</div></div><div><div>▲</div><div>▼</div></div></div>	<p>Alarms for relay 1, COM-1: Default: <i>A1</i></p> <div><div>A1</div><div>▲</div><div>▼</div><div>A2</div><div>▲</div><div>▼</div><div>...</div><div>A1234</div><div>▲</div><div>▼</div><div>P</div></div> <p>The allocation of the alarms to relay 1 happens via this parameter, one alarm or a group of alarms can be chosen. With [P] the selection is confirmed and the device changes into menu level.</p>												

Menu level	Parameterisation level												
	<p>Alarm relay 2, REL-2: Default: <i>RL-2</i></p> <p>REL-2 P AL-1 AL-4 AL-n1 AL-n4 LOGIC OFF On P</p> <p>Each setpoint (optional) can be linked up via 4 alarms (by default). This can either be inserted at activated alarms <i>AL-1/4</i> or deactivated alarms <i>ALN/4</i>. If <i>LOGIC</i> is selected, logical links are available in the menu level <i>LOG-1</i> and <i>CON-1</i>. Access to these two menu levels is via <i>LOGIC</i>, at all other selected functions, these two parameters are overleaped. Via <i>ON/OFF</i> the setpoints can be activated/deactivated, in this case the output and the setpoint display are set/not set on the front of the device. With [P] the selection is confirmed and the device changes into menu level.</p>												
	<p>Logic relay 2, LOG-2: Default: <i>OR</i></p> <p>LOG-2 P or nor And nAnd P</p> <p>The switching behaviour of the relay is defined via a logic link, the following schema describes these functions with inclusion of <i>AL-1</i> and <i>AL-2</i>. This parameter can only be selected if <i>LOGIC</i> was selected under <i>REL-1</i>.</p> <table><tr><td>or</td><td>$A1 \vee A2$</td><td>As soon as a selected alarm is activated, the relay operates. Equates to operating current principle.</td></tr><tr><td>nor</td><td>$\overline{A1 \vee A2} = \overline{A1} \wedge \overline{A2}$</td><td>The relay operates only, if no selected alarm is active. Equates to quiescent current principle.</td></tr><tr><td>And</td><td>$A1 \wedge A2$</td><td>The relay operates only, if all selected alarms are active.</td></tr><tr><td>nAnd</td><td>$\overline{A1 \wedge A2} = \overline{A1} \vee \overline{A2}$</td><td>As soon as a selected alarm is not activated, the relay operates.</td></tr></table> <p>With [P] the selection is confirmed and the device changes into menu level.</p>	or	$A1 \vee A2$	As soon as a selected alarm is activated, the relay operates. Equates to operating current principle.	nor	$\overline{A1 \vee A2} = \overline{A1} \wedge \overline{A2}$	The relay operates only, if no selected alarm is active. Equates to quiescent current principle.	And	$A1 \wedge A2$	The relay operates only, if all selected alarms are active.	nAnd	$\overline{A1 \wedge A2} = \overline{A1} \vee \overline{A2}$	As soon as a selected alarm is not activated, the relay operates.
or	$A1 \vee A2$	As soon as a selected alarm is activated, the relay operates. Equates to operating current principle.											
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And	$A1 \wedge A2$	The relay operates only, if all selected alarms are active.											
nAnd	$\overline{A1 \wedge A2} = \overline{A1} \vee \overline{A2}$	As soon as a selected alarm is not activated, the relay operates.											
	<p>Alarms for relay 2, CON-2: Default: <i>R. 2</i></p> <p>CON-2 P R.1 R.2 R.1234 P</p> <p>The allocation of the alarms to relay 2 happens via this parameter, one alarm or a group of alarms can be chosen. With [P] the selection is confirmed and the device changes into menu level.</p>												
	<p>Back to menu group level, RET:</p> <p>With [P] the selection is confirmed and the device changes into menu group level „-REL-“.</p>												

9.4.6 Alarm parameters

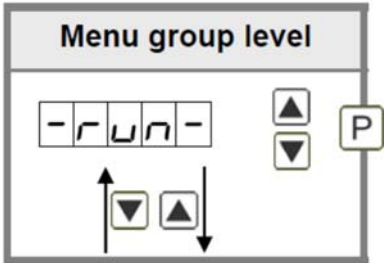


Menu level	Parameterization level
	Dependency alarm 1, ALRA.1: Default: <i>ACTUA</i> <p>The dependency of alarm 1 can be related to special functions, in detail these are the current measurand, the min-value or the max-value. <i>ENTER</i> causes the dependency either by pressing the [O]-key on the front of the housing or by an external signal via the digital input. With [P] the selection is confirmed and the device changes into menu level.</p> <p>Example: By using the maximum value <i>ALRA.1 = MAXUA</i> in combination with a threshold monitoring <i>FU-1 = HIGH</i>, an alarm confirmation can be realised. Use the digital input for confirmation.</p>
	Threshold values / limit values, LI-1: Default: <i>200.0</i> <p>The limit value defines the threshold, that activates/deactivates an alarm.</p>
	Hysteresis for threshold values, HY-1: Default: <i>0.0</i> <p>The delayed reaction of the alarm is the difference to the threshold value, which is defined by the hysteresis.</p>
	Function for threshold value undercut / exceedance, FU-1: Default: <i>HIGH</i> <p>A limit value undercut is selected with <i>LOW</i> (for LOW = lower limit value), a limit value exceedance with <i>HIGH</i> (for HIGH = higher limit value). If e.g. limit value 1 is on a threshold level of 100 and allocated with function <i>HIGH</i>, an alarm is activated by reaching the threshold level. If the threshold value was allocated to <i>LOW</i>, an alarm will be activated by undercutting the threshold value, as long as the hysteresis is zero.</p>

Menu level	Parameterization level
	Switching-on delay, <i>TON-1</i>: Default: 000  Preset a delayed switching-on of 0-100 seconds for limit value 1.
	Switching-off delay, <i>TOF-1</i>: Default: 000  Preset a delayed switching-off of 0-100 seconds for limit value 1.
	Back to menu group level, <i>RET</i>: With [P] the selection is confirmed and the device changes into menu group level „-AL1-“.

The same applies to -AL2- to -AL4-.

Programming interlock run



Description see page 10 menu level RUN

10. Reset to factory settings

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

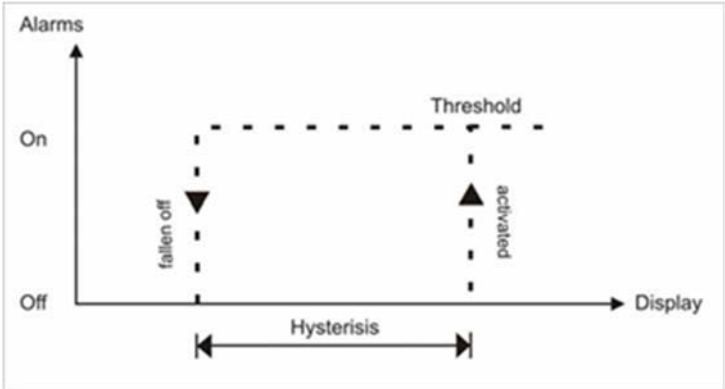
With reset, the default values of the program table are loaded and used for subsequent operation. This sets the device back to the state in which it was supplied.

CAUTION! All application-related data are lost.

11. Alarms / Relays

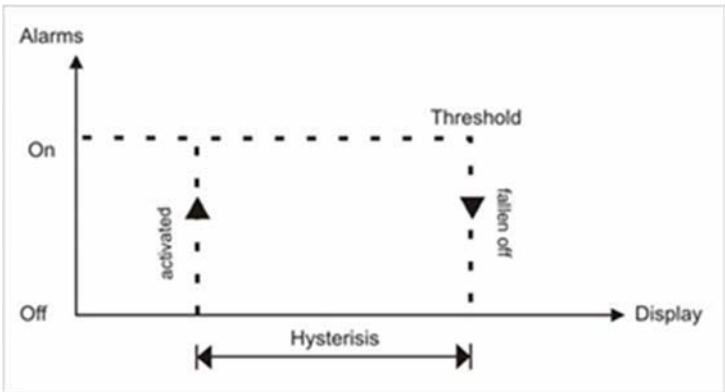
This device has 4 virtual alarms that can monitor one limit value in regard of an undercut or exceedance. Each alarm can be allocated to an optional relay output S1-S2. Furthermore, alarms can be controlled by events like e.g. min/max value.

Function principle of alarms / relays	
Alarm / Relay x	Deactivated, instantaneous value, min/max-value
Switching threshold	Threshold / limit value of the change-over
Hysteresis	Broadness of the window between the switching thresholds
Working principle	Operating current / Quiescent current



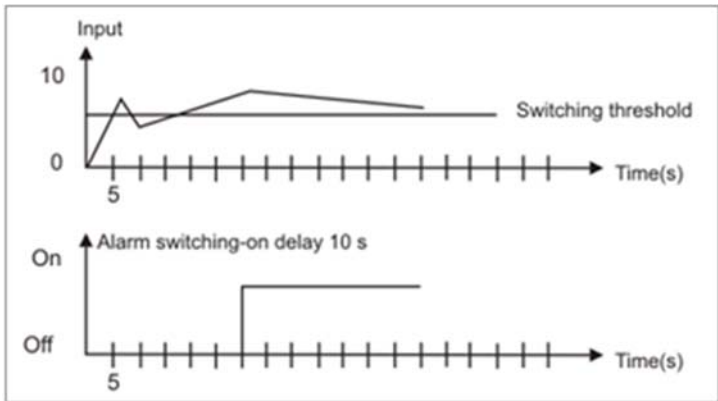
Operating current

By operating current the alarm S1-S2 is off below the threshold and on on reaching the threshold.



Quiescent current

By quiescent current the alarm S1-S2 is on below the threshold and switched off on reaching the threshold.



Switching-on delay

The switching-on delay is activated via an alarm and e.g. switched 10 seconds after reaching the switching threshold, a short-term exceedance of the switching value does not cause an alarm, respectively does not cause a switching operation of the relay. The switching-off delay operates in the same way, keeps the alarm / the relay switched longer for the parameterized time.

12. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

13. Order Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

14. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

15. Safety advices

Please read the following safety advices and the assembly *chapter 6* before installation and keep it for future reference.

Proper use

The **DAG-device** is designed for the evaluation and display of Pt100 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-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 each other and do not lay them parallel with each other. Position “go” and “return lines” next to one another. Where possible use twisted pair. So, the best measuring results can be received.
- 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 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 isolated potentials within one complex need to be placed on an 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.

16. Error elimination

	Error description	Measures
1.	The unit permanently indicates overflow. 	<ul style="list-style-type: none"> The input has a very high measurement, check the measuring circuit. The input is open.
2.	The unit permanently shows underflow. 	<ul style="list-style-type: none"> The input has a very low measurement, check the measuring circuit. The input is open.
3.	The word "HELP" lights up in the 7-segment display.	<ul style="list-style-type: none"> The unit has found an error in the configuration memory. Perform a reset on the default values and reconfigure the unit according to your application.
4.	Program numbers for parameterising of the input are not accessible.	<ul style="list-style-type: none"> Programming lock is activated Enter correct code
5.	"ERR1" lights up in the 7-segment display	<ul style="list-style-type: none"> Please contact the manufacturer if errors of this kind occur.
6.	The device does not react as expected.	<ul style="list-style-type: none"> If you are not sure if the device has been parameterised before, then follow the steps as written in <i>chapter 6</i>. and set it back to its delivery status.

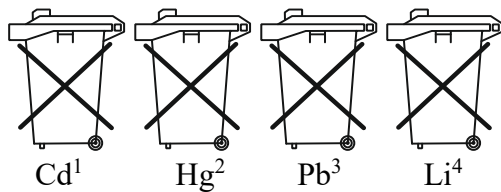
17. Disposal

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.

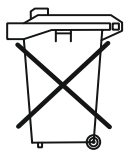
Batteries

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



18. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Digital Indicating Unit model: DAG-M12

to which this declaration relates is in conformity with the standards noted below:

EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

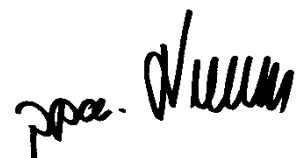
Also, the following EC guidelines are fulfilled:

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

Hofheim, 02 Febr. 2023



H. Volz
General Manager



M. Wenzel
Proxy Holder

19. UK Declaration of Conformity

We, KOBOLD Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Digital Indicating Unit

model: DAG-M12

to which this declaration relates is in conformity with the standards noted below:

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.

Also, the following UK guidelines are fulfilled:

S.I. 2016/1091

Electromagnetic Compatibility Regulations 2016

S.I. 2016/1101

Electrical Equipment (Safety) Regulations 2016

S.I. 2012/3032

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Hofheim, 06 June 2023

H. Volz
General Manager

M. Wenzel
Proxy Holder