Operating Instructions

for

Digital Indicating Unit

Frequency input 0,01 Hz to 999,99 kHz

Connection for Namur-, NPN-, PNP- and TTL-sensors

Model: DAG-S4F…, 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.

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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.

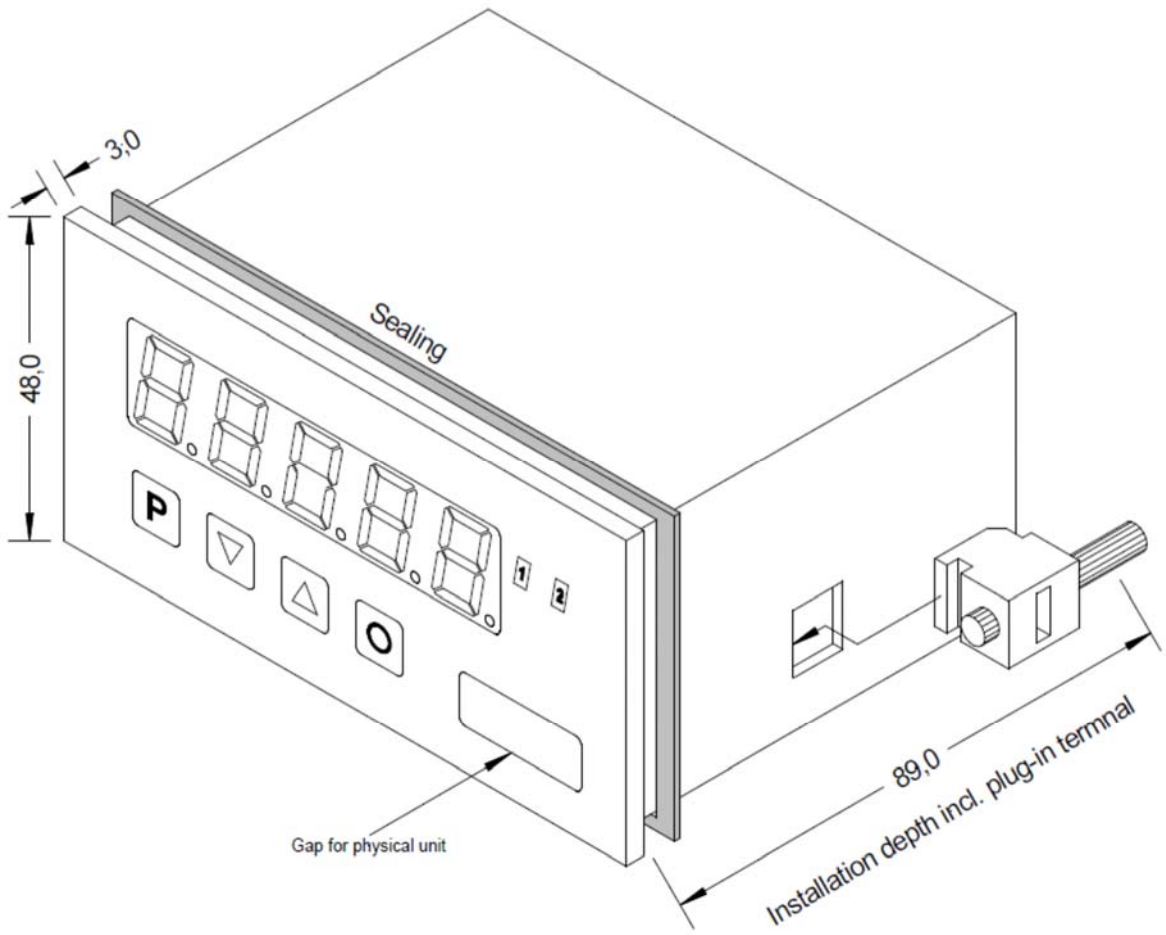
Scope of delivery:
The standard delivery includes:
- Digital Indicating Unit model: DAG-S4F

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. Assembly

Please read the Safety advices on page 45 before installation and keep this user manual for future reference.



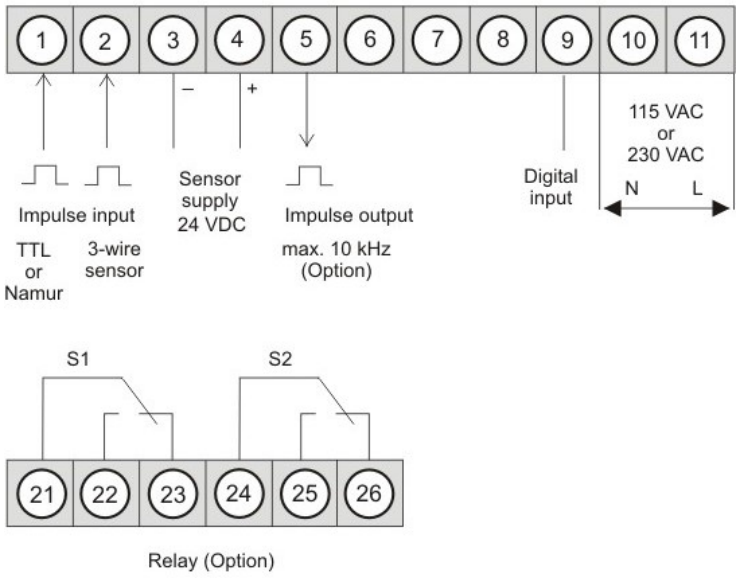
1. After removing the fixing elements, insert the device.
2. Check the seal to make sure it fits securely.
3. Click the fixing elements back into place and tighten the clamping screws by hand. Then use a screwdriver to tighten them another half a turn.

CAUTION! The torque should not exceed 0.1 Nm!

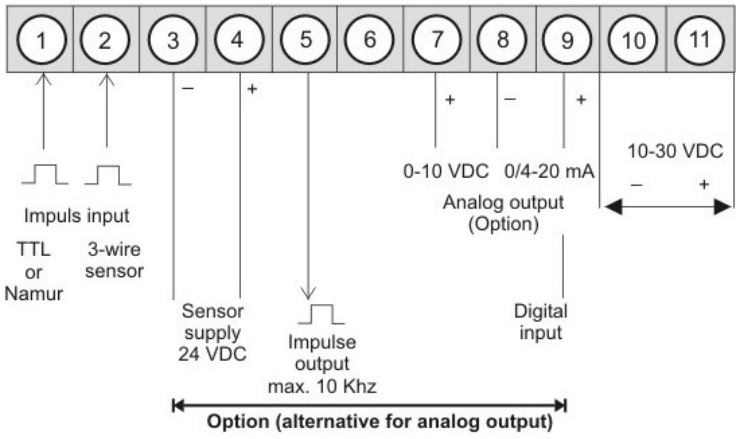
The dimension symbols can be exchanged before installation via a channel on the side!

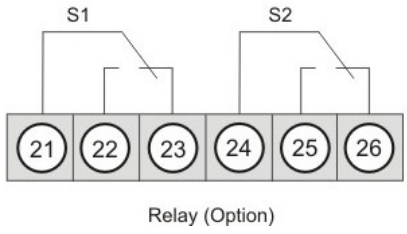
6. Electrical connection

DAG-S4F0… with power supply 230 VAC
DAG-S4F4… with power supply 115 VAC



DAG-S4F3… with power supply 10-30 VDC



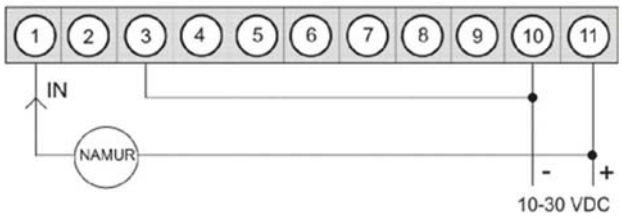


Attention!

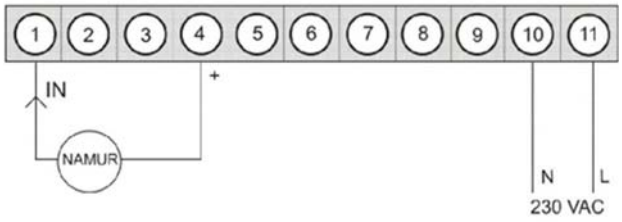
For devices with sensor supply, terminal clamps 4 and 8, as well as 3 and 7 are connected galvanically in the device.

DAG-S4F…devices with frequency / impulse input

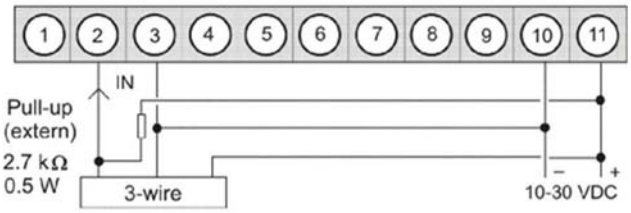
Namur



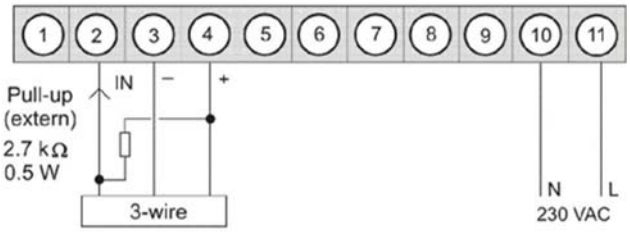
Namur



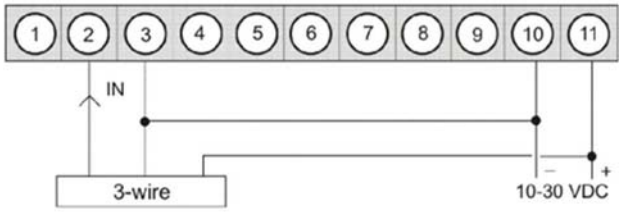
3-wire NPN



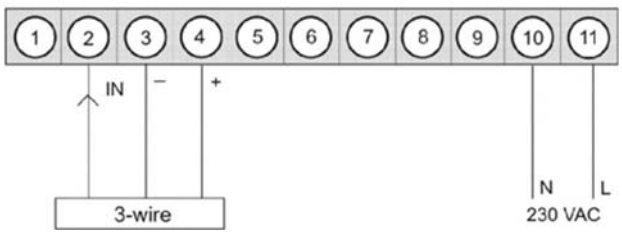
3-wire NPN



3-wire PNP



3-wire PNP



7. Function and operation description

Operation
The operation is divided into three different levels.

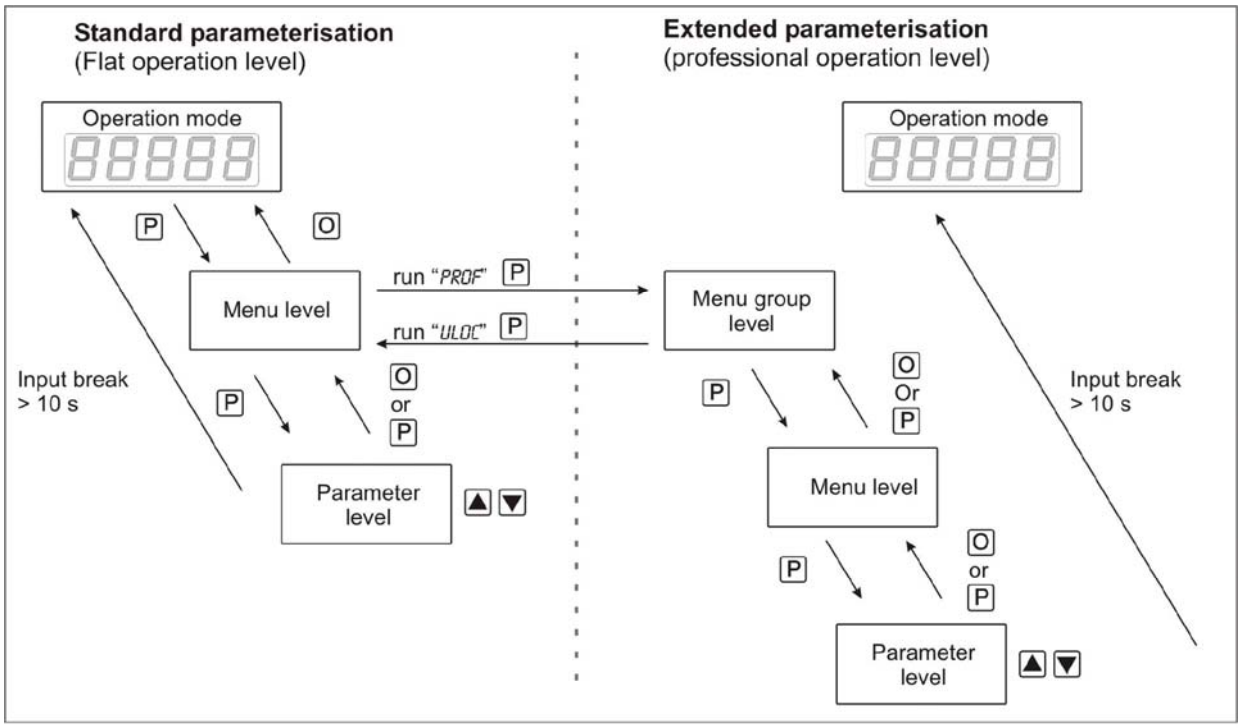
Menu level (delivery status)
This level is for the standard settings of the device. Only menu items which are sufficient to set the device into an operation are displayed. To get into the professional level, run through the menu level and parameterize **"prof"** under menu item **RUN**.

Menu group level (complete function volume)
Suited for complex applications as 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. By pressing the **[0]-key** (zero-key) it leads to a break-off of the value input and to a change into the menu level. All adjustments are saved automatically by the device and changes into operating mode, if no further key operation is done within the next 10 seconds.

Level	Key	Description
Menu level	P	Change to parameterisation level and deposited values.
	▲ ▼	Keys for up and down navigation in the menu level.
	O	Change into operation mode.
Parameterisation level	P	To confirm the changes made at the parameterization level.
	▲ ▼	Adjustment of the value / the setting.
	O	Change into menu level or break-off in value input.
Menu group level	P	Change to menu level.
	▲ ▼	Keys for up and down navigation in the menu group level.
	O	Change into operation mode or back into menu level.

Function chart



Underline:

P **Takeover** ▲ **Value selection (+)**

O **Stop** ▼ **Value selection (-)**

8. Setting up the device

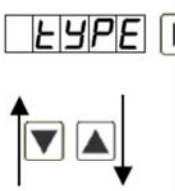
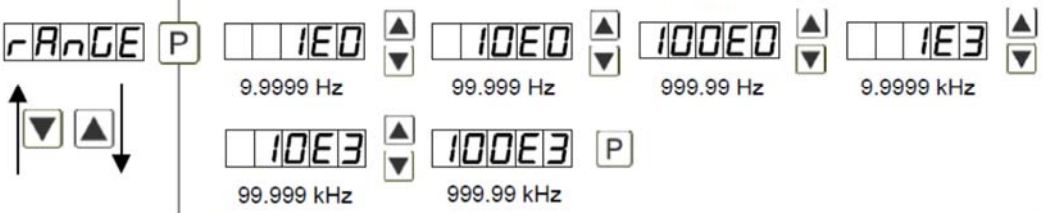
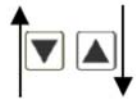
8.1 Switching-on

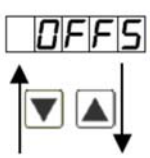
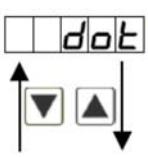
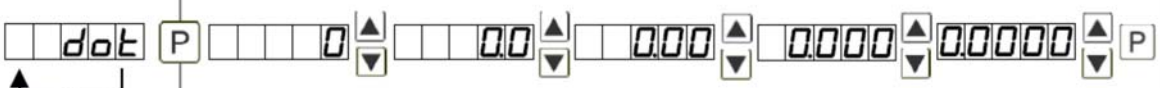
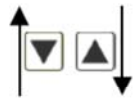
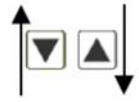
Once the installation is complete, you can start the device by applying the voltage supply. Before, check once again that all electrical connections are correct.

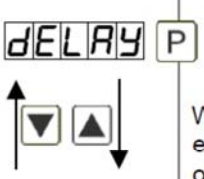
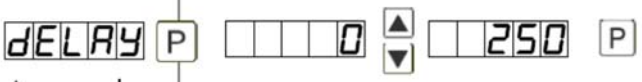
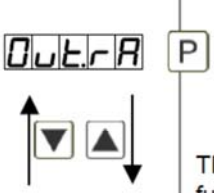
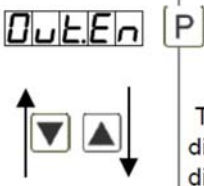
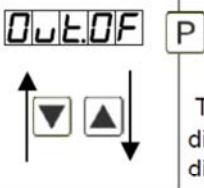
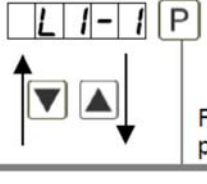
Starting sequence
For 1 second during the switching-on progress, the segment test **(8 8 8 8 8)** is displayed, followed by an indication of the software type and, after that, also for 1 second, the software version. After the starting sequence, the device switches to operation / display mode.

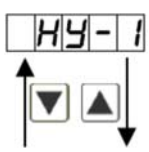
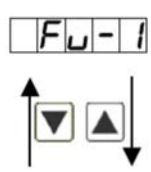
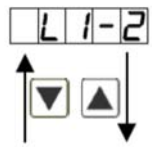
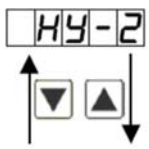
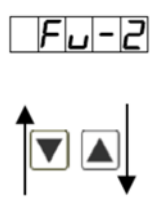
8.2 Standard parameterization (Flat operation level)

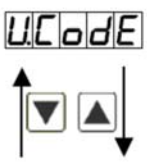
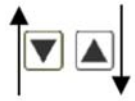
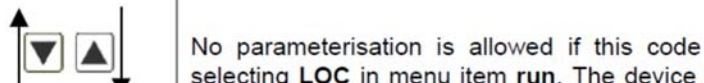
To parameterize the display, press the **[P]** key in operating mode for 1 second. The display then changes to the menu level with the first menu item **TYPE**.

Menu level	Parameterisation level
	**Selection of the input signal, TYPE:** If the scaling of the device is done via **SEnS.F** (Sensor calibration), the frequency range needs to be preset under **rAnGE** and is adjusted by application of the final value /initial value. If **FrEqU** (Factory calibration) is prefered, the final value needs to be entered under **End** and the final frequency needs to be entered under **EndA**. Under **OFFS** the initial value needs to be entered and under **OFFSA** the initial frequency. There is no application of the measuring signal. Confirm the selection with **[P]** and the display switches back to menu level.
	Setting the measuring range end value, END:  9.9999 Hz 99.999 Hz 999.99 Hz 9.9999 kHz 99.999 kHz 999.99 kHz Choose between six different frequency ranges. Confirm the selection with **[P]** and the display switches back to menu level.
	**Setting the measuring range final value, END:** Set the final value from the smallest to the largest digit with [▲] [▼] and confirm each digit with **[P]**. A minus sign can only be parametrized on the highest value digit. After the last digit, the display switches back to the menu level. If **Sens** was selected as input option, you can only select between **noca** and **cal**. With **noca**, only the previously set display value is taken over, and with **cal**, the device takes over both the display value and the analogue input value.

Menu level	Parameterisation level
	**Setting the measuring range start/offset value, offs:** Enter the start/offset value from the smallest to the largest digit [▲] [▼] and confirm each digit with **[P]**. After the last digit the display switches back to the menu level. If **Sens** was selected as the input option, you can only select between **noca** and **cal**. With **noca**, only the previously set display value is taken over, and with **cal**, the device takes over both the display value and the analogue input value.
	**Setting the decimal point, dot:**  The decimal point on the display can be moved with [▲] [▼] and confirmed with **[P]**. The display then switches back to the menu level again.
	**Setting up the display time, SEC:** The display time is set with [▲] [▼]. The display moves up in increments of 0.1 sec up to 1 sec and in increments of 1.0 sec up to 10.0 sec. Confirm the selection by pressing the **[P]** button. The display then switches back to the menu level again.
	**Rescaling the measuring input values, EndA:** With this function, you can rescale the input value of **e.g. 19.5 mA** (works setting) without applying a measuring signal. If sensor calibration has been selected, these parameters are not available.
	Rescaling the measuring input values, OFFA: With this function, you can rescale the input value of **e.g. 3.5 mA** (works setting) without applying a measuring signal. If sensor calibration has been selected, these parameters are not available.

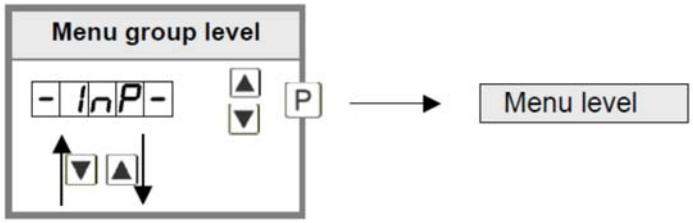
Menu level	Parameterisation level
	**Setting of the impulse delay, dELAY:**  With the impulse delay of 0 – 250 ms (max), frequencies can be collected, which are even smaller than by the predetermined measuring time of the device. If e.g. a delay of 250 seconds is set, this means that the device waits up to 250 seconds for an edge, before it assumes a 0 Hz-frequency. Thus frequencies up to 0.004 Hz can be collected.
	**Selection of analog output, Out.rA:** Three output signals are available: 0-10 VDC, 0-20 mA and 4-20 mA, with this function, the demanded signal is selected.
	**Setting up the final value of the analog output, Out.En:** The final value is adjusted from the smallest digit to the highest digit with **[▲] [▼]** and digit by digit confirmed with **[P]**. A minus sign can only be parametrised on the highest digit. After the last digit, the device changes back into menu level.
	**Setting up the initial value of the analog output, Out.OF:** The final value is adjusted from the smallest digit to the highest digit with **[▲] [▼]** and digit by digit confirmed with **[P]**. A minus sign can only be parametrised on the highest digit. After the last digit, the device changes back into menu level.
	**Threshold values / limit values, LI-1:** For both limit values, two different values can be parameterized. With this, the parameters for each limit value are called up one after another.

Menu level	Parameterisation level
	**Hysteresis for limit values, HY-1:** For all limit values exists a hysteresis function, that reacts according to the settings (threshold exceedance / threshold undercut).
	**Function if display falls below / exceeds limit value, FU-1:** The limit value undercut can be selected with **Louu** (LOW = lower limit value) and limit value exceedance can be selected with **high** (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. See page 29.
	**Threshold values / limit values, LI-2:** For both limit values, two different values can be parameterized. With this, the parameters for each limit value are called up one after another.
	**Hysteresis for limit values, HY-2:** For all limit values exists a hysteresis function, that reacts according to the settings (threshold exceedance / threshold undercut).
	**Function if display falls below / exceeds limit value, FU-2:** A limit value undercut is selected with **Louu** (for LOW = lower limit value), a limit value exceedance with **High** (for HIGH = higher limit value). If e.g. limit value 1 is on a threshold level of 100 and allocated with function **High**, an alarm is activated by reaching of the threshold level. By allocation of limit value **Louu** , an alarm is activated by falling below the threshold value.

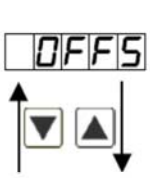
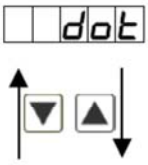
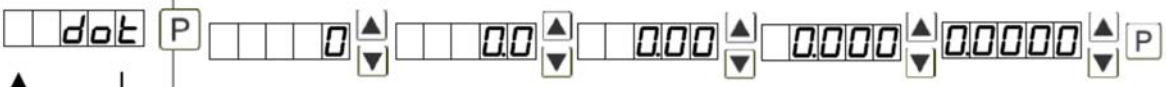
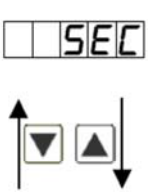
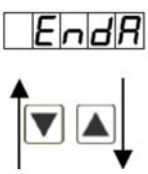
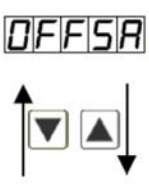
Menu level	Parameterisation level
	**User code (4-digit number-combination, free available), U.CodE:** If this code is set, the user can only choose from a reduced number of parameter sets. He has e.g. no access to the scale of the measuring inputs. Still, a changing of the limit values and the allocation of the analog output are allowed. This reduced parameterisation is activated by selecting **LOC** in menu item **run**. The device confirms the setting with „- - - - -„ and changes into operation mode. By pressing **[P]** for 3 seconds in operation mode, the display shows **COde** and thus confirms the change into the reduced parameterisation. It stays activated as long as the standard parameterisation is activated again by the input of **A.Code** (master code).
	**Master code (4-digit number-combination free available), A.CodE:**  No parameterisation is allowed if this code is set. This function ist activated by selecting **LOC** in menu item **run**. The device confirms the setting with „- - - - -„ and changes into operation mode. By pressing **[P]** for 3 seconds in operation mode, the display shows **COde** and thus confirms the activation of the master code. The user can only come to the parameterisation by the correct input of the number-combination. It stays activated as long as **ULOC** is entered in menu group **run**, this sets the device back into standard parameterisation.
	Activation / deactivation of the programming lock or completion of the standard parameterization with change into menu group level (complete function range), run: With the navigation keys [▲] [▼], you can choose between the deactivated key lock **Uloc** (works setting) and the activated key lock **Loc**, or the menu group level **ProF**. Confirm the selection with **[P]**. After this, the display confirms the settings with **"- - - - -"**, and automatically switches to operating mode. If **Loc** was selected, the keyboard is locked. To get back into the menu level, press **[P]** for 3 seconds in operating mode. Now enter the **CODE** (works setting **1 2 3 4**) that appears using [▲] [▼] plus **[P]** to unlock the keyboard. **FAIL** appears if the input is wrong. To parametrise further functions **ProF** 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 **InP** is shown in the display and thus confirms the change into the extended parameterisation. It stays activated as long as **ULOC** is entered in menu group **RUN** , thus the display is set back in standard parameterisation again.

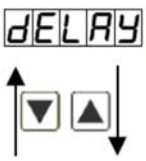
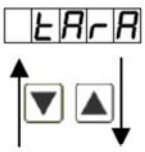
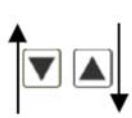
8.3 **Extended parameterization** (Professional operation level)

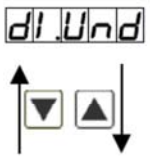
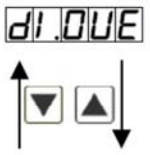
8.3.1 Signal input parameters



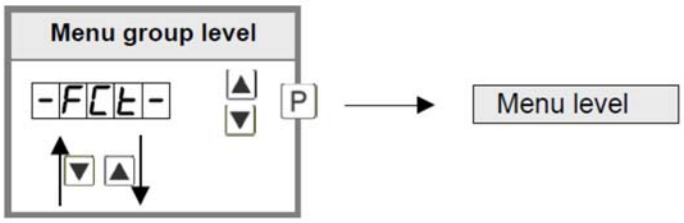
Menu level	Parameterisation level
tYPE P SEnS.F FrEqU P If the scaling of the device is done via **SEnS.F** (Sensor calibration), the frequency range needs to be preset under **rAnGE** and is adjusted by application of the final value /initial value. If **FrEqU** (Factory calibration) is preferred, the final value needs to be entered under **End** and the final frequency needs to be entered under **EndA**. Under **OFFS** the initial value needs to be entered and under **OFFSA** the initial frequency. There is no application of the measuring signal. Confirm the selection with **[P]** and the display switches back to menu level.	**Selection of input signal tYPE:**
rAnGE P 1E0 9.9999 Hz, 10E0 99.999 Hz, 100E0 999.99 Hz, 1E3 9.9999 kHz, 10E3 99.999 kHz, 100E3 999.99 kHz P Choose between six different frequency ranges. Confirm the selection with **[P]** and the display switches back to menu level.	**Setting the measuring range end value, END:**
End P 8 P 8 P 8 P 8 P 8 noCA / CAL P Set the final value from the smallest to the highest digit with [▲] [▼] and confirm each digit with **[P]**. A minus sign can only be parametrized on the highest value digit. After the last digit, the display switches back to the menu level. If **Sens** was selected as input option, you can only select between **noca** and **cal**. With **noca**, only the previously set display value is taken over, and with **cal**, the device takes over both the display value and the analogue input value.	**Setting the measuring range final value, END:**

Menu level	Parameterisation level
	**Setting the measuring range start/offset value, offs:** Enter the start/offset value from the smallest to the highest digit [▲] [▼] and confirm each digit with **[P]**. After the last digit the display switches back to the menu level. If **Sens** was selected as the input option, you can only select between **noca** and **cal**. With **noca**, only the previously set display value is taken over, and with **cal**, the device takes over both the display value and the analogue input value.
	**Setting up the decimal point, dot:**  The decimal point of the device can be adjusted with [▲] [▼]. With **[P]** the selection is confirmed and the device changes into menu level.
	**Setting up the measuring time, SEC:** The measuring time is set with [▲] [▼]. Thereby you jump until 1 second in 0.1 steps and until 10.0 seconds in 1.0-steps. With **[P]** the selection is confirmed and the device changes into menu level.
	**Rescaling the measuring input values, EndA:** With this function, you can rescale the input value of **e.g. 19.5 mA** (works setting) without applying a measuring signal. If sensor calibration has been selected, these parameters are not available.
	**Rescaling the measuring input values, OFFA:** With this function, you can rescale the input value of **e.g. 3.5 mA** (works setting) without applying a measuring signal. If sensor calibration has been selected, these parameters are not available.

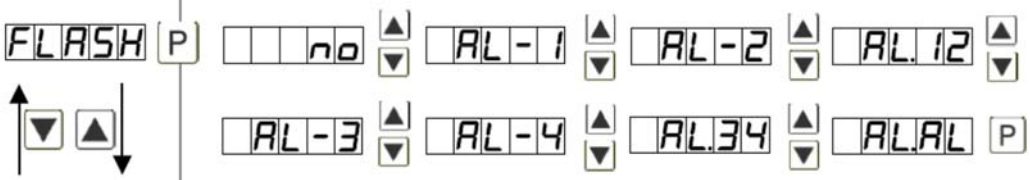
Menu level	Parameterisation level
	**Setting of the impulse delay, dELAY:** With the impulse delay of 0 – 250 ms (max), frequencies can be collected, which are even smaller than by the predetermined measuring time of the device. If e.g. a delay of 250 seconds is set, this means that the device waits up to 250 seconds for an edge, before it assumes a 0 Hz-frequency. Thus frequencies up to 0.004 Hz can be collected.
	**Setting up the tare/offset value, tArA:** The given value is added to the linerarized value. In this way, the characteristic line can be shifted by the selected amount.
	Number of additional setpoints, SPCt: 30 additional setpoints can be defined to the initial- and final value, so linear sensor values are not linearised. Only activated setpoint parameters are displayed.
	Display values for setpoints, dIS.01 … dIS.30: Under this parameter setpoints are defined according to their value. At the sensor calibration, like at Endwert/Offset, one is asked at the end if a calibration shall be activated.
	**Analog values for setpoints, InP.01 … InP.30:** These setpoints are displayed at works setting (4-20 mA) only. Here, demanded analog values can be choosen freely. The input of steadily rising analog values needs to be done self-contained.

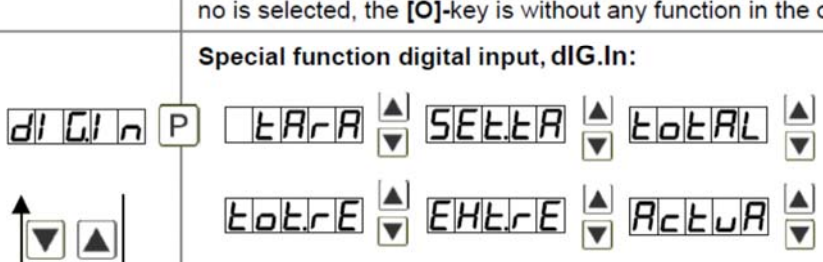
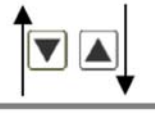
Menu level	Parameterisation level
	**Device undercut, dl.Und:** With this function the device undercut (_ _ _ _ _) can be defined on a definite value. Exception is input type **4-20 mA**, it already shows undercut at a signal <1 mA, so a sensor failure is marked.
	**Display overflow, dl.OUE:** With this function the display overflow (¯ ¯ ¯ ¯ ¯) can be defined on a definite value.
	Back to menu group level, rEt: With **[P]** the selection is confirmed and the device changes into menu group level **„–INP-“**.

8.3.2 General device parameters

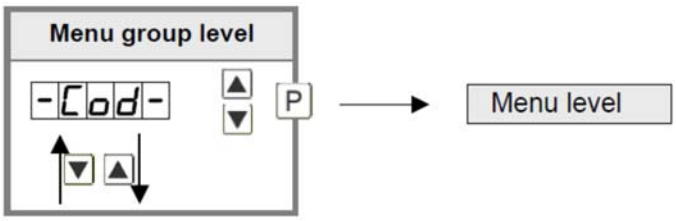


Menu level	Parameterisation level
dI.SEC P	**Display time, DISEC:** 0.01 0.09 then 01.0 10.0 P The display is set up with [▲] [▼]. Thereby you jump until 1 second in 0.1 steps and until 10.0 seconds in 1.0-steps. With **[P]** the selection is confirmed and the device changes into menu level.
round P	**Rounding of display values, round:** 00001 00005 00010 00050 P This function is for instable display values, where the display value is changed in 1-, 5-, 10- or 50-steps. This does not affect the resolution of the optional outputs. With **[P]** the selection is confirmed and the device changes into menu level.
ArItH P	**Arithmetic, ArItH:** no rEZIP rAdIC SQUAr P Reciprocal Root extraction Square With this function the calculated value, not the measuring value, is shown in the display. With **no** , no calulation is deposited. With **[P]** the selection is confirmed and the device changes into menu level.
ZEr0 P	**Zero point tranquilisation, ZErO:** 0 P 0 P At the zero point tranquilisation, a value range around the zero point can be preset, so the display shows a zero. If e.g. a 10 is set, the display would show a zero in the value range from -10 to +10; below continue with -11 and beyond with +11.

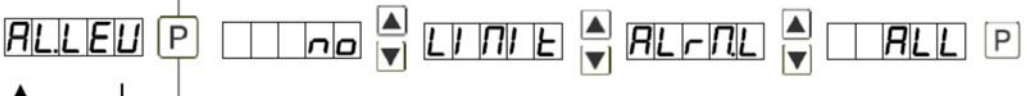
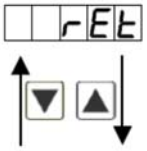
Menu level	Parameterisation level
	Display, dISPL: With this function the current measuring value, Min-/Max value, totaliser value or the process-controlled Hold-value can be allocated to the display. With **[P]** the selection is confirmed and the device changes into menu level.
	Display flashing, FLASH:  A display flashing can be added as additional alarm function either to single or to a combination of off-limit condition. With **no**, no flashing is allocated.
	Assignment (deposit) of key functions, tASt: For the operation mode, special functions can be deposited on the navigation keys [▲] [▼], in particular this function is made for devices in housing size 48x24 which do not have a 4th (**[O]** key). If the MIN-/MAX-memory is activated with EHtr, all measured MIN/MAX-values are safed during operation and can be recalled via the navigation keys. The values get lost by re-start of the device. If the threshold value correction LI.12 or LI.34 are choosen, the values of the threshold can be changed during operation without disturbing the operating procedure. With tArA the device is set temporarily on a parametrised value. The device acknowledges the correct taring with oo0oo in the display. Set.tA adds a defined value on to the currently displayed value. Via totAL the current value of the totaliser can be displayed for approx. 7 seconds, after this the device jumps back onto the parametrised display value. If tot.rE is deposited, the totaliser can be set back by pressing of the navigation keys [▲] [▼], the device acknowledges this with ooooo in the display. By allocation on EHt.rE the MIN/MAX-memory is deleted. At ActuA the measuring value is shown for approx. 7 seconds, after this the device jumps back on the parametrised display value. If **no** is selected, the navigation keys are without any function in the operation mode.

Menu level	Parameterisation level
	Special function [O]-key, tASt.4: For the operation mode, special functions can be deposited on the **[O]-**Taste. This function is activated by pressing the key. With tArA the device is set temporarily on a parametrised value. The device acknowledges the correct taring with **oo0oo** in the display. Set.tA adds a defined value on to the currently displayed value. Via totAL the current value of the totaliser can be displayed for approx. 7 seconds, after this the device jumps back on the parametrised display value. If tot.rE is deposited, the totaliser can be set back by pressing of the navigation keys [▲] [▼], the device acknowledges this with ooooo in the display. EHt.rE deletes the MIN/MAX-memory. If HOLD has been selected, the moment can be hold constant by pressing the **[O]-**key, and is updated by releasing the key. **Advice:** Hold is activated only, if HOLD is selected under parameter DISPL. ActuA shows the measuring value for approx. 7 seconds, after this the device jumps back onto the parametrised display value. At AL-1 …AL-4 an output can be set and therewith e.g. a setpoint adjustment can be done. If no is selected, the **[O]-**key is without any function in the operation mode.
	Special function digital input, dIG.In:  In operation mode, the above shown parameters can be laid on the optional digital input, too. Function description see **tASt.4**.
	**Back to menu group level, rEt:** With **[P]** the selection is confirmed and the device changes into menu group level **„– fct –“**.

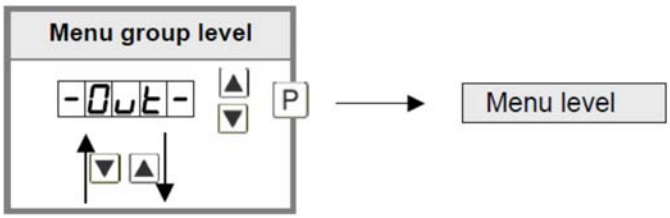
8.3.3 Safety parameters

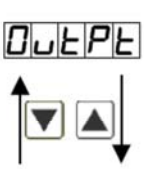
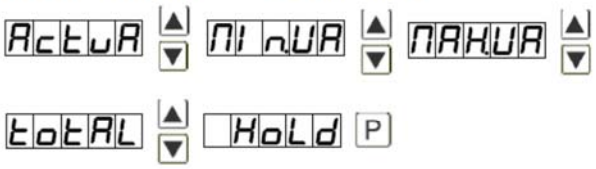


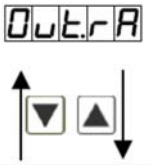
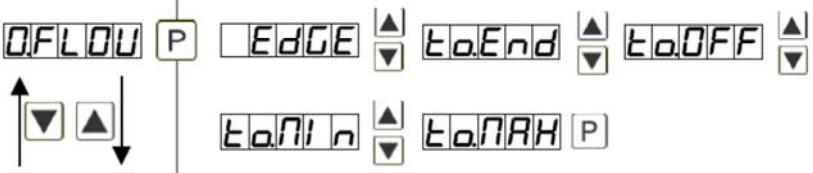
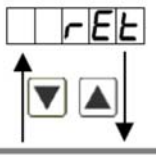
Menu level	Parameterisation level
UCodE P 0 P 0 P 0 P 0 P	**User code U.Code :** Via this code reduced sets of parameter can be set free. A change of the **U.CodE** can be done via the correct input of the **A.CodE** (master code).
ACodE P 1 P 2 P 3 P 4 P	**Master code, A.Code:** By entering **A.CodE** the device will be unlocked and all parameters are released.
OutLE P no En-OF OutEO ALL P	**Release/lock analog output parameters, Out.LE:** Analog output parameters can be locked or released for the user: - At **En-oF** the initial or final value can be changed in operation mode. - At **Out.EO** the output signal can be changed from e.g. 0-20mA to 4-20mA or 0-10VDC. - At **ALL** analog output parameters are released. - At **no** all analog outpout parameters are locked.

Menu level	Parameterisation level
	**Release/lock alarm parameters, AL.LEU:** This parameter describes the user relase/user lock of the alarm. - **LIMIt**, here only the range of value of the threshold values 1-4 can be changed. - **ALrM.L**, here the range of value and the alarm trigger can be changed. - **ALL**, all alarm parameters are released. - **no**, all alarm parameters are locked.
	**Back to menu group level, rEt:** With **[P]** the selection is confirmed and the device changes into menu group level **„– fct –“** .

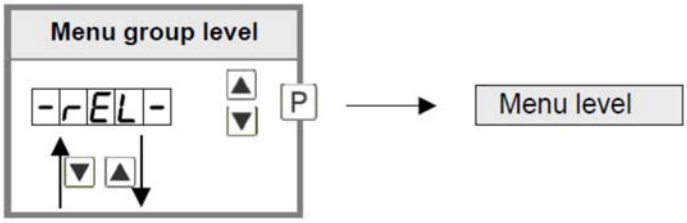
8.3.4 Analogue output parameters



Menu level	Parameterisation level
	**Selection reference analog output, OutPt:**  The analog output signal can refer to different functions, in detail this are the current measuring value, Min-value, Max-value or totaliser-/sum-function. If **HoLd** is selected the signal of the analog output will be hold and processed just after deactivation of HOLD. With **[P]** the selection is confirmed and the device changes into menu level.

Menu level	Parameterisation level
	**Selection analog output, Out.rA:** There are 3 output signals availabe: 0-10 VDC, 0-20 mA and 4-20 mA. With this function the demanded signal can be selected.
	Setting up the final value of the analog output, Out.En: The final value can be adjusted from the smallest to the highest digit with **[▲] [▼]**. Confirm each digit with **[P]**. A minus sign can only be parametrized on the highest value digit. After the last digit, the display switches back to the menu level.
	Setting up the initial value of the analog output, Out.OF: The initial value can be adjusted from the smallest to the highest digit with **[▲] [▼]**. Confirm each digit with **[P]**. A minus sign can only be parametrized on the highest value digit. After the last digit, the display switches back to the menu level.
	Overflow behaviour, O.FLoU:  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 **EdGE**, that means the analog output runs on the set limits e.g. 4 and 20 mA, or **to.OFF** (input value smaller than initial value, analog output jumps on e.g. 4 mA), **to.End** (higher than final value, analog output jumps on e.g. 20 mA). If **to.MIn** or **to.MAX** is set, the analog output jumps on the smallest or highest 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.
	**Back to menu group level, rEt:** With **[P]** the selection is confirmed and the device changes into menu group level **„– out –“** .

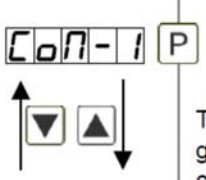
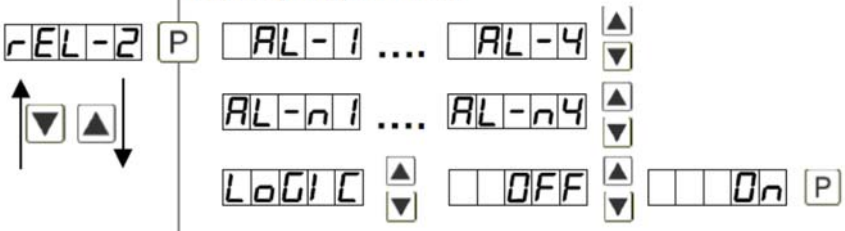
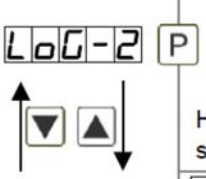
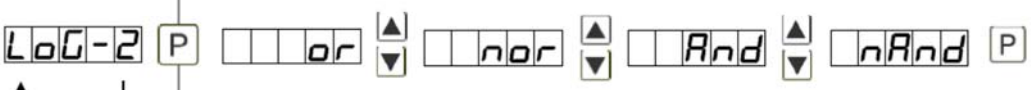
8.3.5 Relay functions



Menu level	Parameterisation level
rEL-1 P	**Alarm relay 1, rEL-1:** AL-1 .... AL-4 AL-n1 .... AL-n4 LoGIC OFF On P Each setpoint (optional) can be linked up via 4 alarms (by default). This can either be inserted at activated alarms **AL1/4** or de-activated alarms **ALN1/4**. If **LOGIC** is selected, logical links are available in the menu level **LoG-1** and **CoM-1**. One can only get to these two menu levels via **LOGIC**, at all other selected functions, these two parameters are overleaped. Via **On/OFF** the setpoints can be activated/de-activated, 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.
LoG-1 P	**Logic relay 1, Log-1** or nor And nAnd P Here, the switching behaviour of the relay is defined via a logic link, the following schema describes these functions with inclusion of **AL-1** and **AL-2**:

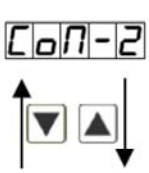
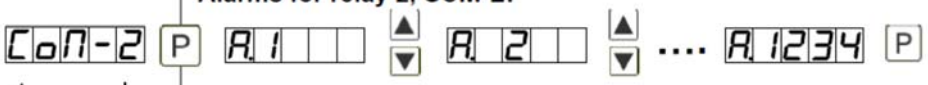
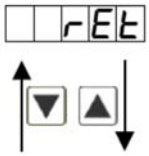
or	$A1 \vee A2$	As soon as a selected alarm is activated, the relay operates. Equates to operating current principle.
nor	$\overline{A1 \vee A2} = \overline{A1} \wedge \overline{A2}$	The relay operates only, if no selected alarm is active. Equates to quiescent current principle.
And	$A1 \wedge a2$	The 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.

With **[P]** the selection is confirmed and the device changes into menu level.

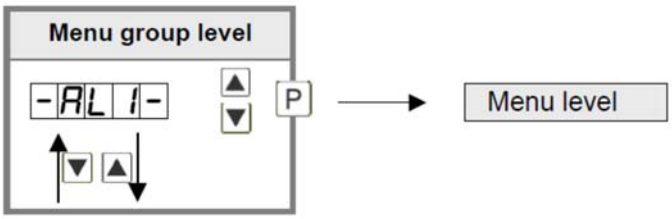
Menu level	Parameterisation level
	**Alarms for relay 1, CoM-1:** The allocation of the alarms to relay 1 happens via this parameter, one alarm or a group of alarms can be chosen. With **[P]** the selection is confirmed and the device changes into menu level.
	Alerting relay 2, reL-2:  Each setpoint (optional) can be linked up via 4 alarms (by default). This can either be inserted at activated alarms **AL1/4** or de-activated alarms **ALN1/4**. If **LOGIC** is selected, logical links are available in the menu level **LoG-2** and **CoM-2**. One can only get to these two menu levels via **LOGIC**, at all other selected functions, these two parameters are overleaped. Via **On/OFF** the setpoints can be activated/de-activated, 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.
	**Logic relay 2, LoG-2:**  Here, the switching behaviour of the relay is defined via a logic link, the following schema describes these functions with inclusion of **AL-1** and **AL-2**:

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.

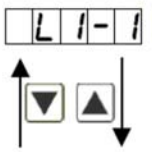
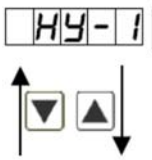
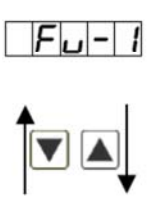
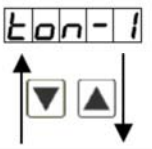
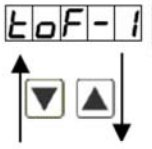
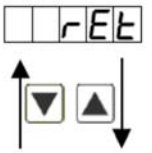
With **[P]** the selection is confirmed and the device changes into menu level.

Menu level	Parameterisation level
	**Alarms for relay 2, CoM-2:**  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.
	**Back to menu group level, rEt:** With **[P]** the selection is confirmed and the device changes into menu group level **„– rel –“**.

8.3.6 Alarm parameters

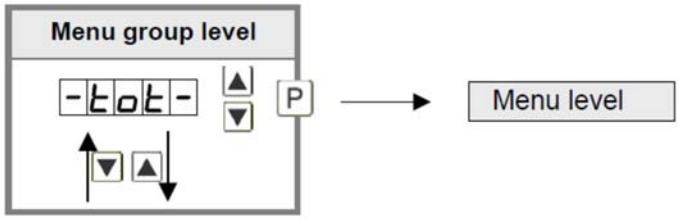


Menu level	Parameterisation level
	Dependency alarm1, ALrM.1: The dependency of alarm 1 can be related to special functions, in detail these are the current measuring value, the MIN-value, the MAX-value or the totaliser-/sum-value. If Hold is selected, then the alarm is hold and processed just after deactivation of HOLD. EHtEr 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.

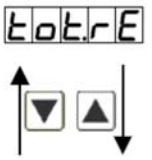
Menu level	Parameterisation level
	**Threshold values / limit values, LI-1:** For both limit values, two different values can be parameterized. With this, the parameters for each limit value are called up one after another.
	**Hysteresis for limit values, HY-1:** For all limit values exists a hysteresis function, that reacts according to the settings (threshold exceedance / threshold undercut).
	**Function if display falls below / exceeds limit value, FU-1:** The limit value undercut can be selected with **Louu** (LOW = lower limit value) and limit value exceedance can be selected with **high** (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.
	**Switching-on delay, ton-1:** For limit value 1 one can preset a delayed switching-on of 0-100 seconds.
	**Switching-off delay, toF-1:** For limit value 1 one can preset a delayed switching-off of 0-100 seconds.
	**Back to menu group level, rEt:** With **[P]** the selection is confirmed and the device changes into menu group level **„– AIi –“** .

The same applies to –AI2– to –AI4–.

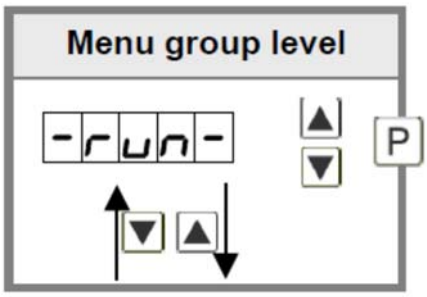
8.3.7 Totalizer (Volume measurement)



Menu level	Parameterisation level
totAL P	**Totaliser state, total:** OFF STEAd tEMP P The totaliser makes measurements on a time base of e.g. l/h possible, here the scaled input signal is integrated by a time and steadily (select **Stead**) or temporarily (select **temp**) safed. If **Off** is selected, the function is de-activated. With **[P]** the selection is confirmed and the device changes into menu level.
t.bASE P	**Time base, t.base:** SEC Min hour P Under this parameter the time base of the measurement can be preset in seconds, minutes or hours.
FActo P	**Totaliser factor, Facto:** 10^0 ... 10^6 P At this the factor (10^0...10^6) respectively the divisor for the internal calculation of the measuring value is assigned.
tot.dt P	**Setting up the decimal point for the totaliser, tot.dt:** 0 0.0 0.00 0.000 0.0000 P The decimal point of the device can be adjusted with the navigation keys **[▲] [▼]**. With **[P]** the selection is confirmed and the devices changes into menu level.

Menu level	Parameterisation level
	**Totaliser reset, tot.re:** The reset value is adjusted from the smallest to the highest digit with the navigation keys **[▲] [▼]** and digit per digit confirmed with **[P]**. After the last digit, the display switches back to the menu level. The activator for the reset is parameter driven via the 4th key or via the optional digital input.
	Back to menu group level, rEt: With **[P]** the selection is confirmed and the device changes into menu group level **„– tot –“** .

8.3.8 Programming lock RUN



Description see page 13, menu level run

8.4 Programmer examples

Examples: Adjustment according to number of sprockets at unknown rotation speed.

- Nearly 100% of the rotation speeds are in the range of 0 to 30.000 r.p.m.
- The number of sprockets varies (without gearing) between 1 and 100.
- In automation, the frequency supply never exceeds 10 kHz (rather 3 kHz).

Assume a rotation speed of 60 r.p.m. at 1 Hz, whereat the real frequency value will not be considered.

Our example complies with a number of sprockets of 64.

Setting up the advice
Based on the default settings of the display, the following parameters need to be changed:

Parameter	Settings	Description
tYPE	FrEqU	Applying of the measuring signal is not applicable.
rAnGE	1E3	Complies with 9.9999 Hz
End	6	Assumed final value
EndA	0.0064	Complies with 64 sprockets

If the frequency needs to be displayed with a position after decimal point, then a 60 has to be selected as final value for this adjustment.

Parameter	Settings	Description
tYPE	FrEqU	Applying of the measuring signal is not applicable.
rAnGE	1E3	Complies with 9.9999 Hz
End	60	Assumed final value
dot	0.0	1 position after decimal point
EndA	0.0064	Complies with 64 sprockets

Example: Rotation speed of a machines shaft
There are 4 sprockets on one machine shaft. Applied in an angle of 90° to each other and to the rotation speed measurement. The sprockets are collected via a proximity switch and evaluated by the frequency device, which shall display the rotation speed in U/min. 0…3600 U/min is preset as rotation speed range of the machine.

Calculation of the input frequency

Number of sprockets = 4
Rotation speed = 3600 U/min

$$\text{Final frequency [Hz]} = \frac{\text{Final rotation speed } [\frac{U}{\text{min}}]}{60\ [\frac{s}{\text{min}}] \times 1U} \times \text{Number of sprockets}$$

$$\text{Final frequency [Hz]} = \frac{3600\ \frac{U}{\text{min}}}{60\ \frac{s}{\text{min}} \times 1U} \times 4 = 240\ Hz$$

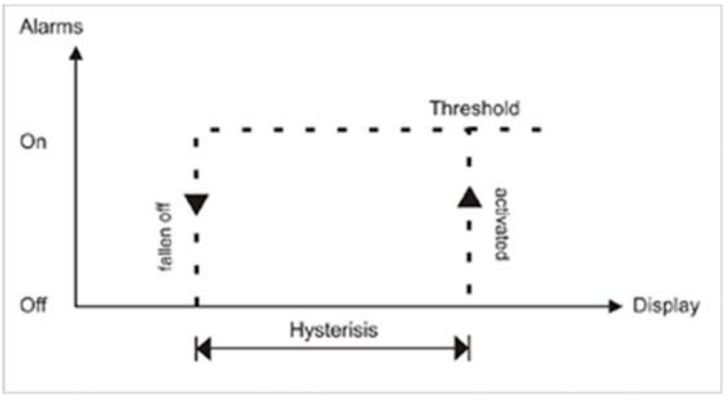
Setting up the device
Based on the default settings of the device, following parameters need to be changed:

Parameter	Settings	Description
tYPE	FrEqU	As the input frequency is known, the device does not need to be applied to the measuring section.
rAnGE	100E0	The final frequency is in the range of 100.00 to 999.99 Hz.
End	3600	A rotation speed of 3600 shall be displayed as final value.
EndA	240.00	The final frequency for display value 3600 is 24.00 Hz.

9. Alarms / Relays

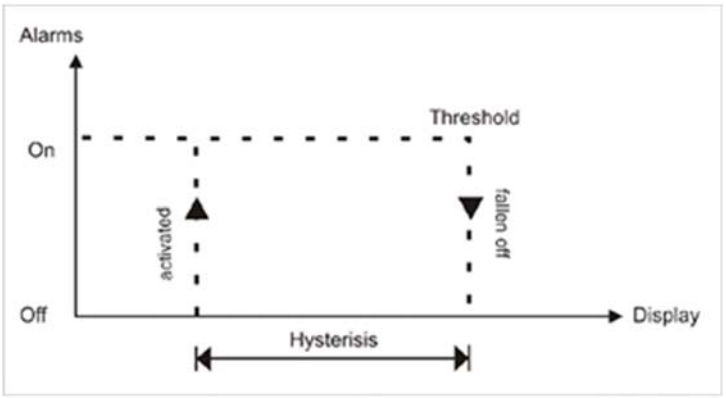
This device has 4 virtual alarms that can monitor one limit value in regard of an undercut or exceedance. Each alarm can be allocated to an optional relay output S1-S2; furthermore, alarms can be controlled by events like e.g. Hold or Min-/Max. value.

Function principle of alarms / relays	
Alarm / Relay x	De-activated, instantaneous value, Min-/Max-value, Hold-value, totaliser 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



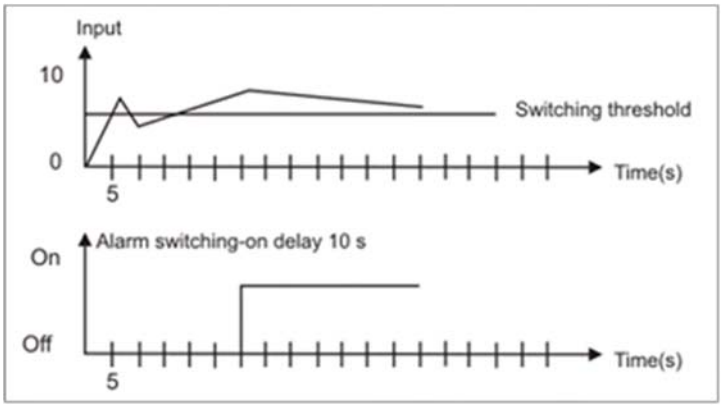
Operating current

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 raching the switching threshold, a short-term exceedance of the switching value does not cause an alarm, respectively does not cause a switching operation oft he relay. The switching-off delay operates in the same way, keeps the alarm / the relay switched longer fort he parameterized time.

10. Factory settings

10.1 Default values

Standard parameterization (flat operation level)

Parameter	Menu items					Default value
tYPE Type of scale	SEnSF Sensor calibration	FrEQU Factory calibration				FrEQU Factory calibration
rAnGE Range of frequency	1E0 0.0000... 9.9999 Hz	10E0 00.000... 99.999 Hz	100E0 000.00... 999.99 Hz	1E3 0.0000... 9.9999 KHz	10E3 00.000... 99.999 KHz 100E3 000.00... 999.99 KHz	100E3 000.00... 999.99 KHz
End Final value	-19999	to	99999			10000
OFFS Offset	-19999	to	99999			0
dot Display of decimal point	0	to	0.0000			0
SEC Measuring time	0.1 0.1 seconds	to	10.0 10.0 seconds			1.0 1.0 seconds
EndA Analog final value	-19999	to	99999			10000
OFFSA Analog initial value	-19999	to	99999			0
dELAY Impulse delay	0 0 s	to	250 250 s			0 0 s
OutrA Analog output range	0-10 0…10 V	0-20 0…20 mA	4-20 4…20 mA			4-20 4…20 mA

Parameter	Menu items					Default value
OUt.En Analog output final value	-19999	to	99999			10000
OUt.OF Analog output initial value	-19999	to	99999			00000
L 1-1 Limit value 1	-19999	to	99999			2000
HY-1 Hysteresis 1	00000	to	99999			00000
Fu-1 Operation type 1	Louu Undercut	HIGH Exceedance				HIGH Exceedance
L 1-2 Limit value 2	-19999	to	99999			3000
HY-2 Hysteresis 2	00000	to	99999			00000
Fu-2 Operation type 2	Louu Undercut	HIGH Exceedance				HIGH Exceedance
U.CodE User code	0000	to	9999			0000
A.CodE Master code	0000	to	9999			1234
run run	ULOC Standard operation	LOC Parameter lock	ProF Professional operation			ULOC Standard operation

Extended parameterization (professional operation level)

Signal input parameters

-InP-

Parameter	Menu items					Default value
tYPE Type of scale	SEnSF Sensor calibration	FrEqU Factory calibration				FrEqU Factory calibration
rAnGE Frequency range	1E0 0.0000... 9.9999 Hz	10E0 00.000... 99.999 Hz	100E0 000.00... 999.99 Hz	1E3 0.0000... 9.9999 KHz	10E3 00.000... 99.999 KHz 100E3 000.00... 999.99 KHz	100E3 000.00... 999.99 KHz
End Final value	-19999	to	99999			10000
OFFS Offset	-19999	to	99999			0
dot Display of decimal point	0	to	0.0000			0
SEC Measuring time	0.1 0.1 seconds	to	10.0 10.0 seconds			1.0 1.0 seconds
EndA Analog final value	-19999	to	99999			10000
OFFSA Analog initial value	-19999	to	99999			0
dELAY Impulse delay	0 0 s	to	250 250 s			0 0 s
tArA Device offset	-19999	to	99999			0 Exceedance

Parameter	Menu items					Default value
SPCt Number of setpoints	00	to	30			00
d1 5.01 Display value 1	-9999	to	99999			
InP.01 Analog value 1	-9999	to	99999			
...						
d 15.30 Display value 30	-9999	to	99999			
InP.30 Analog value 30	-9999	to	99999			
d 1.Und Display underflow	-9999	to	99999			-9999
d 1.OUE Display overflow	-9999	to	99999			99999
rEt						

General device parameters

-FcE-

Parameter	Menu items					Default value
dI.SEC Display time	00.1 0,1 second	to	10.0 10 seconds			01.0 1 second
round To round a value	00001 No rounding	00005 In powers of 5	00010 In powers of 10	00050 In powers of 50		00001 no rounding
ArIth Arithmetic	no no	rE2IP Reciprocal	rAdIE Root extraction	SQUAr Squaring		no no
2Er0 Zero-point slow-down	00 no slow-down	to	99 at x-digit display = zero			00 no slow-down
dISPL Default display	ActuA Current measurand	MI nUA Minimum	MAXUA Maximum	totAL Totaliser	HoLd Hold	ActuA Current measurand
FLASH Flashing at	no no AL-4 Alarm 4	AL-1 Alarm 1 AL.34 Alarm 3 + 4	AL-2 Alarm 2 ALAL Alarm 1…4	AL.12 Alarm 1 + 2	AL-3 Alarm 3	no no
tASt Up-/Down-Key function	no no SEt.tA Set Tara value	EHtr Extremum (min/max) totAL Totaliser value	LI.12 Alarm limit 1+2 tot.rE Totaliser reset	LI.34 Alarm limit 3+4 EHt.rE Extremum reset	tArA Tara function ActuA Display measuring value	no no
tASt.4 Special function 4. key	no no EHt.rE Extremum reset AL-3 Alarm 3	tArA Tara function ActuA Displ.meas. value AL-4 Alarm 4	SEt.tA Set Tara value HoLd Hold	totAL Totaliser value AL-1 Alarm 1	tot.rE Totaliser reset AL-2 Alarm 2	no no

Parameter	Menu items					Default value
d IG. In Digital input	no no	tArA Tara function	SEt.tA Set Tara value	totAL Totaliser value	tot.rE Totaliser reset	no no
	EHt.rE Extremum reset	ActuA Display measuring value	HoLd Hold	AL-1 Alarm 1	AL-2 Alarm 2	
	AL-3 Alarm 3	AL-4 Alarm 4				
rEt						

Safety parameters

-Cod-

Parameter	Menu items					Default value
U.CodE User code	0000	to	9999			0000
A.CodE Administrator code	0000	to	9999			1234
Out.LE Analog output level	no Not changeable	En-OF Range of value	OuT.EO Range of value & source	ALL All parameters		ALL All parameters
ALLEU Alarm level	no Not changeable	LIMIt Limit value	ALrM.L Range of value & source	ALL All parameters		ALL All parameters
rEt						

Analogue parameters

-Out-

Parameter	Menu items					Default value
OutPt	ActuA	MI nUA	MAXUA	totAL	HoLd	ActuA
Source	Current measurand	Minimum	Maximum	Totaliser	Hold	Current measurand
Out.rA	0-10	0-20	4-20	x seconds no traffic		4-20
Output range	0...10 mA	0...20 mA	4...20 mA			4...20 mA
Out.En	-19999	to	99999			10000
Final value						
Out.0F	-19999	to	99999			00000
Initial value						
0.FLOU	EdGE	to.End	to.OFF	to.MIn	to.MAX	EdGE
Overflow behaviour	Run to limit value	Jump to final value	Jump to start	Jump to smallest value	Jump to biggest highest value	Jump to limit value
rEt						

Relay functions

-rEL-

Parameter	Menu items					Default value
rEL-1	AL-1	to	AL-4			AL-1
Relay function1	at Alarm 1		at Alarm 4			at Alarm 1
	AL-n1	to	AL-n4			
	not Alarm 1		not Alarm 4			
	LoGIC	OFF	on			
	via Logic	released	acrivated			
LoG-1	or	nor	And	nAnd		or
Logic relay 1	active if at least 1 alarm	active if no alarm	active if all alarms are	active if at least 1 alarm is not		active if at least 1 alarm

Parameter	Menu items					Default value
CoN-1 Alarm combination relay 1	A.1 Alarm 1 and so on to	A.2 Alarm 2 A.1234 Alarm 1+2+3+4	A.12 Alarm 1 + 2	A.3 Alarm 3	Alarm 1 + 3	A.1 Alarm 1
rEL-2 Relay function 2	AL-1 at Alarm 1 AL-n1 not Alarm 1 LoGIC via Logic	to to OFF released	AL-4 at Alarm 4 AL-n4 not Alarm 4 on activated			AL-2 at Alarm 2
LoG-2 Logic relay 2	or active if at least 1 alarm	nor active if no alarm	And active if all alarms are	nAnd active if at least 1 alarm is not		or active if at least 1 alarm
CoN-2 Alarm combination relay 2	A.1 Alarm 1 to	A.2 Alarm 2 A.1234 Alarm 1+2+3+4	A.12 Alarm 1+2	A.3 Alarm 3	A.13 Alarm 1+3	A.2 active if at least 1 alarm
rEt						

Alarm parameters

-AL 1-

Parameter	Menu items					Default value
ALrN.1 Alarm source 1	ActuA Current measurand EHtEr External input (DigIn/Tast4)	MI nUA Min. measurand	MAXUA Max. measurand	totAL Totaliser	HoLd Hold	ActuA Current measurand
L1-1 Limit value 1	-9999	to	99999			2000
HY-1 Hysteresis 1	00000	to	99999			00000
Fu-1 Function 1	Louu Undercut	HIGH Exceedance				HIGH Exceedance
ton-1 Activation delay 1	000 no	to	100 100 seconds			000 no
toF-1 De-activation delay 1	000 no	to	100 100 seconds			000 no
rEt						

-AL2-

Parameter	Menu items					Default value
ALrN2 Alarm source 2	ActuA Current measuring value EHtEr External input (DigIn/Tast4)	MI nUA Min. measuring value	MAHUA Max. measuring value	totAL Totaliser	HoLd Hold	ActuA Current measuring value
L 1-2 Limit value 2	-19999	to	99999			3000
HY-2 Hysteresis 2	00000	to	99999			00000
Fu-2 Function 2	Louu Undercut	H IGH Exceedance				H IGH Exceedance
ton-2 Activation delay 2	000 no	to	100 100 seconds			000 no
toF-2 De-activation delay 2	000 no	to	100 100 seconds			000 no
rEt						

-AL3-

Parameter	Menu items					Default value
ALrN3 Alarm source 3	ActuA Current measuring value EHtEr External input (DigIn/Tast4)	MI nUA Min. measuring value	MAHUA Max. measuring value	totAL Totaliser	HoLd Hold	ActuA Current measuring value
L1 -3 Limit value 3	-19999	to	99999			4000
HY-3 Hysteresis 3	00000	to	99999			00000

Parameter	Menu items					Default value
Fu-3 Function 3	LoUU Undercut	HIGH Exceedance				HIGH Exceedance
ton-3 Activation delay 3	000 no	to	100 100 seconds			000 no
toF-3 De-activation delay 3	000 no	to	100 100 seconds			000 no
rEt						

-AL4-

Parameter	Menu items						Default value
ALrN4 Alarm source 4	ActuA Current measuring value EHtEr External input (DigIn/Tast4)	MI nUA Min. measuring value	MAXUA Max. measuring value	totAL Totaliser	HoLd Hold		ActuA Current measuring value
LI -4 Limit value 4	-9999	to	99999				5000
HY-4 Hysteresis 4	00000	to	99999				00000
Fu-4 Function 4	LoUU Undercut	HIGH Exceedance					HIGH Exceedance
ton-4 Activation delay 4	000 no	to	100 100 seconds				000 no
toF-4 De-activation delay 4	000 no	to	100 100 seconds				000 no
rEt							

Totalizer (Volume measuring)

Parameter	Menu items					Default value
totAL Totaliser state	OFF Off	StEAd Permanent saving	tEMP Quick saving			OFF Off
tbASE Time base	SEC Seconds	Min Minutes	hour Hours			SEC Seconds
FACto Divisor	1 0^0 10^0=1	to	1 0^6 10^6			1 0^0 10^0=1
tot.dt Decimal places	0	to	0.0000			0
tot.rE Totaliser reset	00000	to	99999			00000
rEt						

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 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. Technical Information

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

12. Order Codes

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

13. Dimensions

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

14. Safety advices

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

Proper use

The **DAG-S4…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-S4…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 can 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 an appropriate point (normally earth or machines ground). So, a lower disturbance sensibility against impacted energy can be reached and dangerous potentials, that occur on long lines or due to faulty wiring, can be avoided.

15. Error elimination

	Error description	Measures
1.	The unit permanently indicates overflow. 	• The input has a very high measurement, check the measuring circuit. • With a selected input with a low voltage signal, it is only connected on one side or the input is open. • Not all of the activated setpoints are parameterised. Check if the relevant parameters are adjusted correctly.
2.	The unit permanently shows underflow. 	• The input has a very low measurement, check the measuring circuit . • With a selected input with a low voltage signal, it is only connected on one side or the input is open. • Not all of the activated setpoints are parameterised. Check if the relevant parameters are adjusted correctly.
3.	The word "**HELP** " lights up in the 7-segment display.	• 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.
4.	Program numbers for parameterising of the input are not accessible.	• Programming lock is activated • Enter correct code
5.	"**Err1**" lights up in the 7-segment display	• Please contact the manufacturer if errors of this kind occur.
6.	The device does not react as expected.	• If you are not sure if the device has been parameterised before, then follow the steps as written in *chapter 5.2.* and set it back to its delivery status.

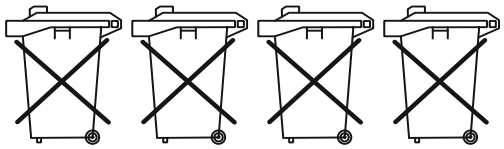
16. Disposal

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.

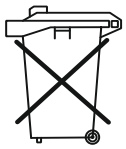
Batteries

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

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

Digital Indicating Unit for Panel Mounting **Model: DAG-S4F**

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, 17 Jan. 2023

H. Volz
General Manager

M. Wenzel
Proxy Holder

18. UK Declaration of Conformity

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

Digital Indicating Unit for Panel Mounting **Model: DAG-S4F**

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