OPERATING MANUAL

TG50Ex

Temperature-Guard

Pt100/Pt1000
Thermocouple J, K, N, S

umn_fam_tg50ex_vs2.08_en

senseca

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1 Product description

1.1 Features

- Input intrinsically safe ATEX II (1) G [Ex ia] IIC/IIB
  ATEX II (1) D [Ex iaD]
  Pt100, Pt1000 and thermocouple J, K, N und S
- Measuring range programmable
- Basic accuracy 0.1 % +/- 1 Digit
- Simulator function
- Fault monitoring for break of wire and short-circuit in the measuring circuit
  Programmable fault function : Analog output min. or max. overflow
- Alarm outputs min. or max. function
- 2 alarm outputs (relay SPDT)
- Isolated analog output 0/4 ... 20 mA; 0/2 ... 10 V DC
- Full 3-port isolation

1.2 General

The Temperature-Guard TG50Ex offers intrinsically safe inputs for direct connection of temperature probes RTD (Pt100,Pt1000) and thermocouples type J, K, N or S which are installed in the explosion endangered area.
Simple programming, to 2 alarm outputs (SPDT) and optional available fully free programmable isolated analog output 0/4 ... 20 mA; 0/2 ... 10 V DC offers a lot of solutions for temperature monitoring. Peak value indication for minimum and maximum measured temperature are stored in the background and can be read out from the display at any time.

1.3 Short information

Programming	The device is programmed by frontal buttons, in connection with the LCD display.
Input	Pt100/Pt1000, 3-wire connection or thermocouple type, J, K, N or S.
Alarm outputs	The alarm outputs can be programmed as max. or min. function. Switch-on delay and switch-off delay time is programmable from 1 s up to 9 h. The switching status is displayed through LED´s.
Fault function	A fault in the measuring circuit could be monitored (break of wire/short-circuit). The switching function of the analog and alarm output(s) is programmable in case of an fault.

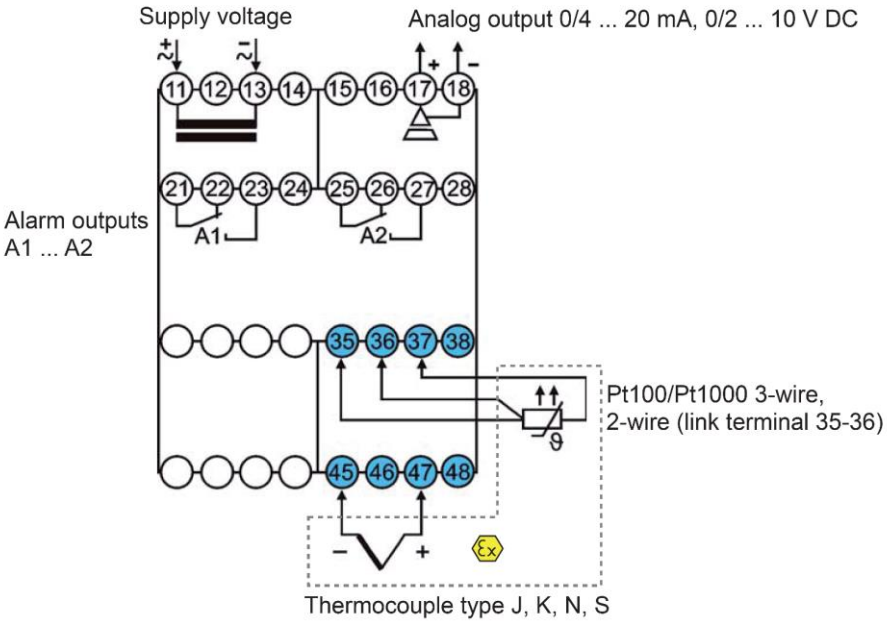
2 Technical data

Power supply	
Supply voltage	230 V AC ±10 %, 115 V AC ±10 %, or 24 V DC ±15 % U_m = 253 V AC or 125 V DC (Terminals 11 and 13)
Power consumption	< 5 VA
Operating temperature	-10 ... +55 °C (14 ... 131 °F)
Rated voltage	250 V between input/relay output/analog output/supply voltage degree of pollution 2, overvoltage category III
Test voltage	4 kV DC between input/relayoutput/analog output/supply voltage
Conformity	CE
Explosion protection	II (1) G [Ex ia] IIC/IIB bzw. II (1) D [Ex iaD]
Approval	TÜV 08 ATEX 554329
Inputs	
Fault detection	Break of wire (RTD,Thermocouple) and short-circuit (only RTD)
Input	Pt100 (3-wire) -100.0 ... 600.0 °C / -100 ... 600 °C Pt1000 (3-wire) -100.0 ... 300.0 °C / -100 ... 300°C (Terminals 35, 36, 37) Thermo couple (TC) Type J -100.0 ... 800.0 °C / -100 ... 800 °C Type K -150 ... 1200 °C Type N -150 ... 1200 °C Type S -50 ... 1600 °C cold junction compensation integrated (Terminals 46 and 47)
Basic accuracy	<0,1 %, ±1 Digit
Temperature coefficient	0,01 %/K
Safety data	
Max. voltage (no load) U_0	1,4 V
Max. short circuit current I_0	2,5 mA
Max. power consumption P_0	3 mW

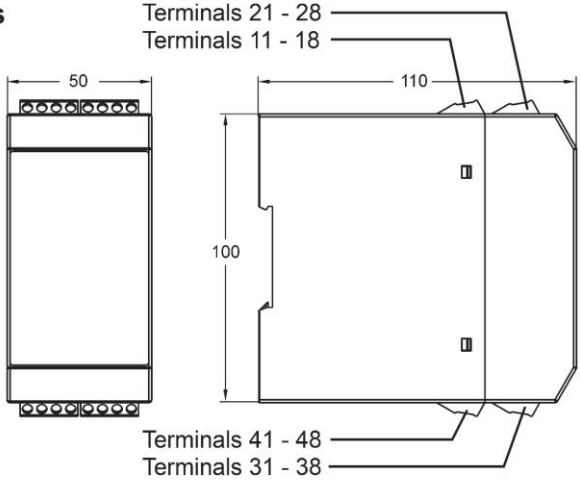
Resistance	5600 Ω		
Characterisitc curve	trapezoidal		
Internal inductivity	4 µH		
Internal capacity	135 nF		
Explosion protection	**Ex**	**ia/IIC**	**ia/IIB**
Maximal ext. inductivity		100 mH	100 mH
Maximal ext. capacity		25 µF	120 µF
Outputs			
Alarm outputs A1-A2	Relay SPDT < 250 V AC < 250 VA < 2 A cos φ ≤0.3, < 300 V DC < 40 W <2 A (Terminals 21, 22, 23; 25, 26, 27)		
Analog output	0/4 ... 20 mA burden < 500 Ω; 0/2 ... 10 V burden >500 Ω, galv. isolated, output changes automatically (burden impedance dependent)		
Accuracy	0.2 %; TK 0.01 %/K For connection at electrical equipment with supply voltage of max. 230V (Terminals 17 and 18)		
Fault function	For break of wire or short-circuit detection -belongs to the model • E Analog output 0 mA, < 3.6 mA or > 21.5 mA programmable • E Alarm output(s) min. or max. function programmable		
Display	Graphic LCD-Display 128x64 pixels, white background illuminated		
Case	Polyamide (PA) 6.6, UL94V-0, DIN rail mounting TH 35		
Weight	approx. 450 g		
Connection	Screw terminals 0.14 2.5 mm² (AWG 26 .. 14)		
Protection	Case IP30, terminals IP20, German BGV A3		

3 Connection diagram and dimensions

Connection diagram

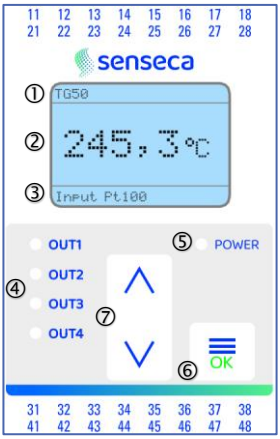


Dimensions



4 Controls and indicators

①Device name
②Measured value
③Input signal
④Alarm output A1...A4
⑤Power-ON LED
⑥Parameter button
⑦Up/down buttons



Description

The operation of the device is implemented in 2 levels. The required parameter is called up with the button . The selection within a parameter and the setting-adjustment of a value is implemented with the buttons and .

Button combinations (press buttons simultaneously):

+ 1 parameter back

+ Parameter is set to "0" or minimum value.

After the switching on the supply voltage, the device initializes itself. In the display the message indicating de- vice type and software version is shown. After the initialization, the device is running in the working level. The peak value storage is called up and the setpoints of the alarm outputs can be programmed.

The configuration level is called up by activation of the button for 2 seconds. In this case, all parameters which determine the properties of the device are programmed. After the last menu item, or if no button is pressed for longer than 2 minutes, a skip-back into the working level is implemented automatically and the cur- rent measured value is indicated in the display. The configuration level can be exited at any time by holding down button for 2 seconds.

Error reports

In case of occurring faults, the messages are shown on the display in plain text. This simplifies location of the error. See explanation page 17

Operational startup reference!

The device is preset with an ex-works default setting. Therefore, it must be adapted to each special application. See Page 11.

Danger! Requirements

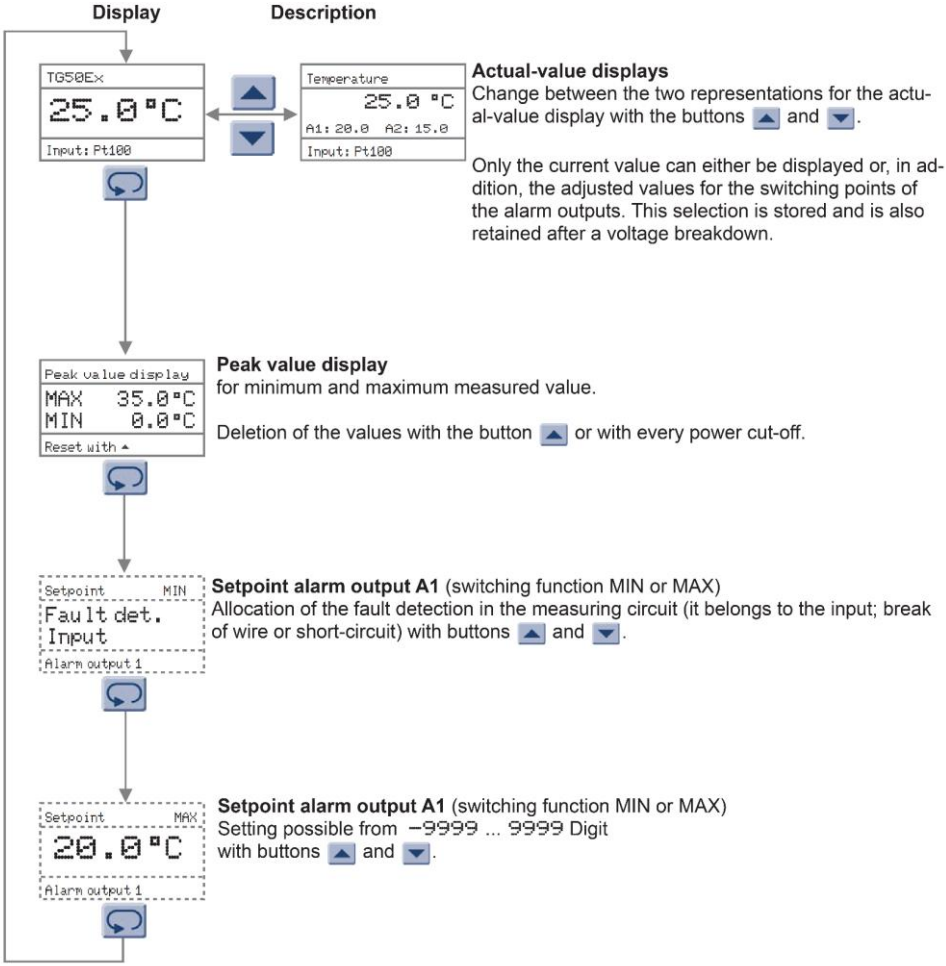
- It is necassary to keep the conditions of the ATEX EC-Type Examination Certificate.
- The device must be installed in dry and good monitored rooms.
- If the intrinsinc safety input is connected to the dust hazardous area of zone 20 or 21, it has to be ensured that the corresponding devices in this circuit have the requirements of catagory 1D or 2D.
- Reparing and design modifications are only allowed at works.

Note on the representation

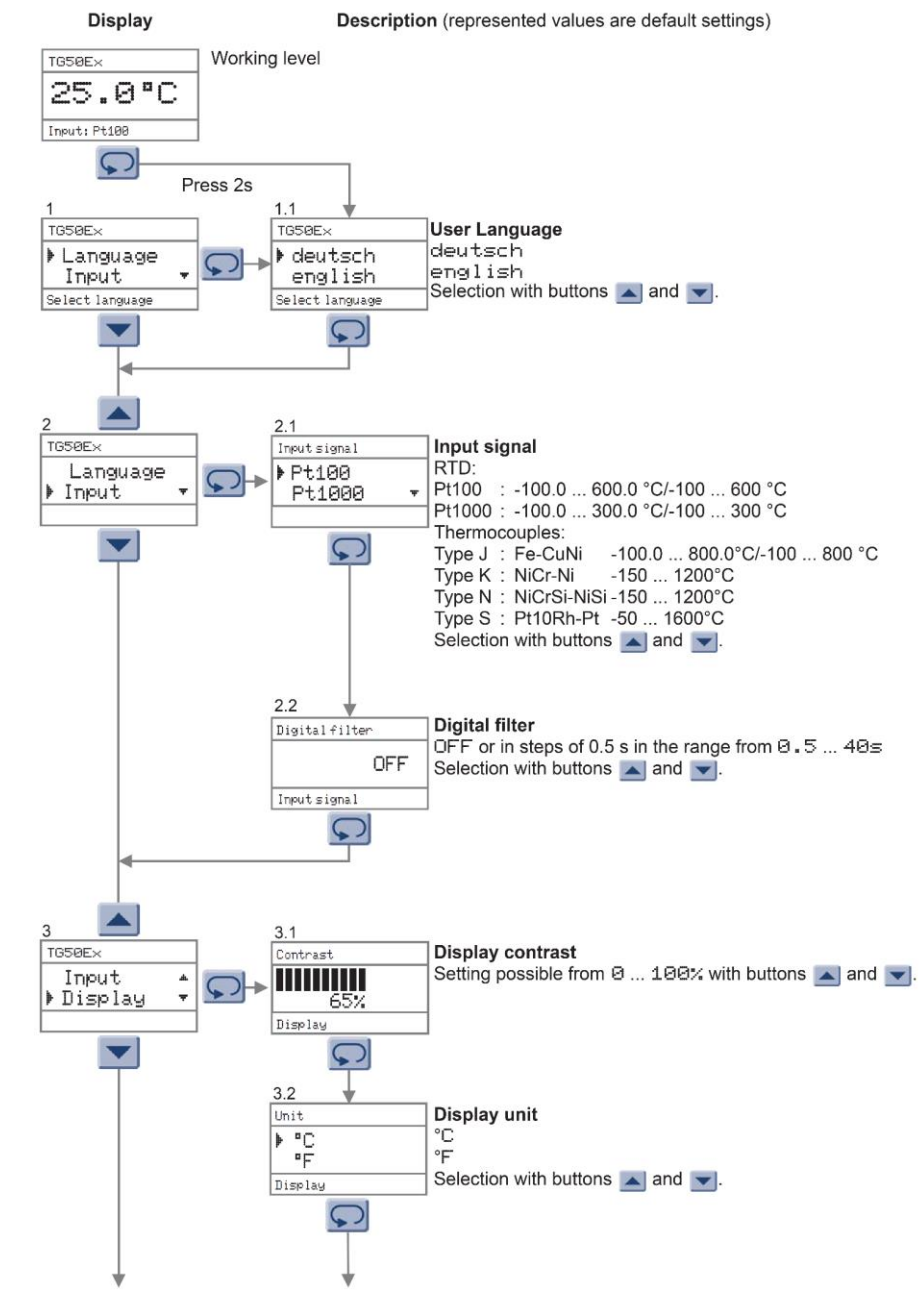
Parameter appears only with corresponding configuration

Parameter appears only with corresponding equipment version

5 Working level



6 Configuration level



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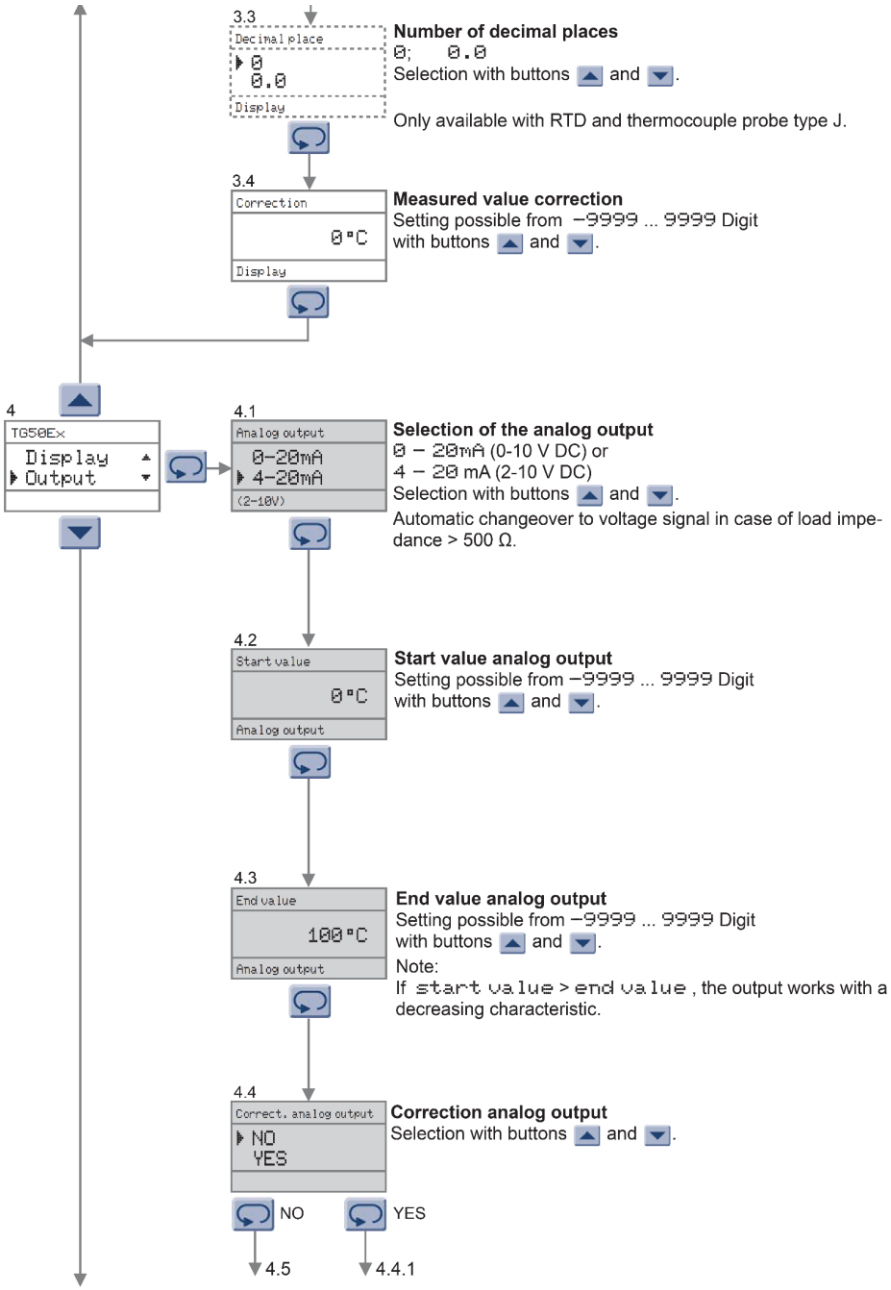

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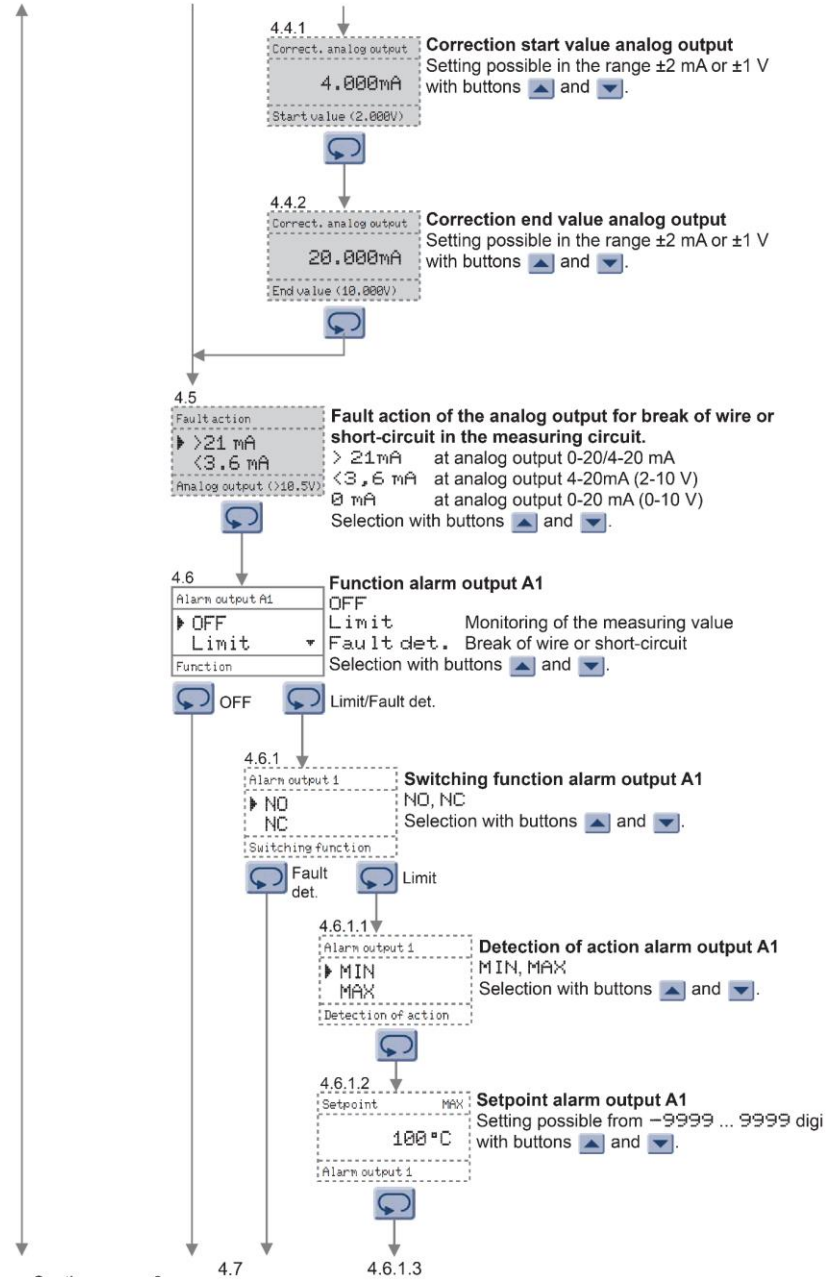

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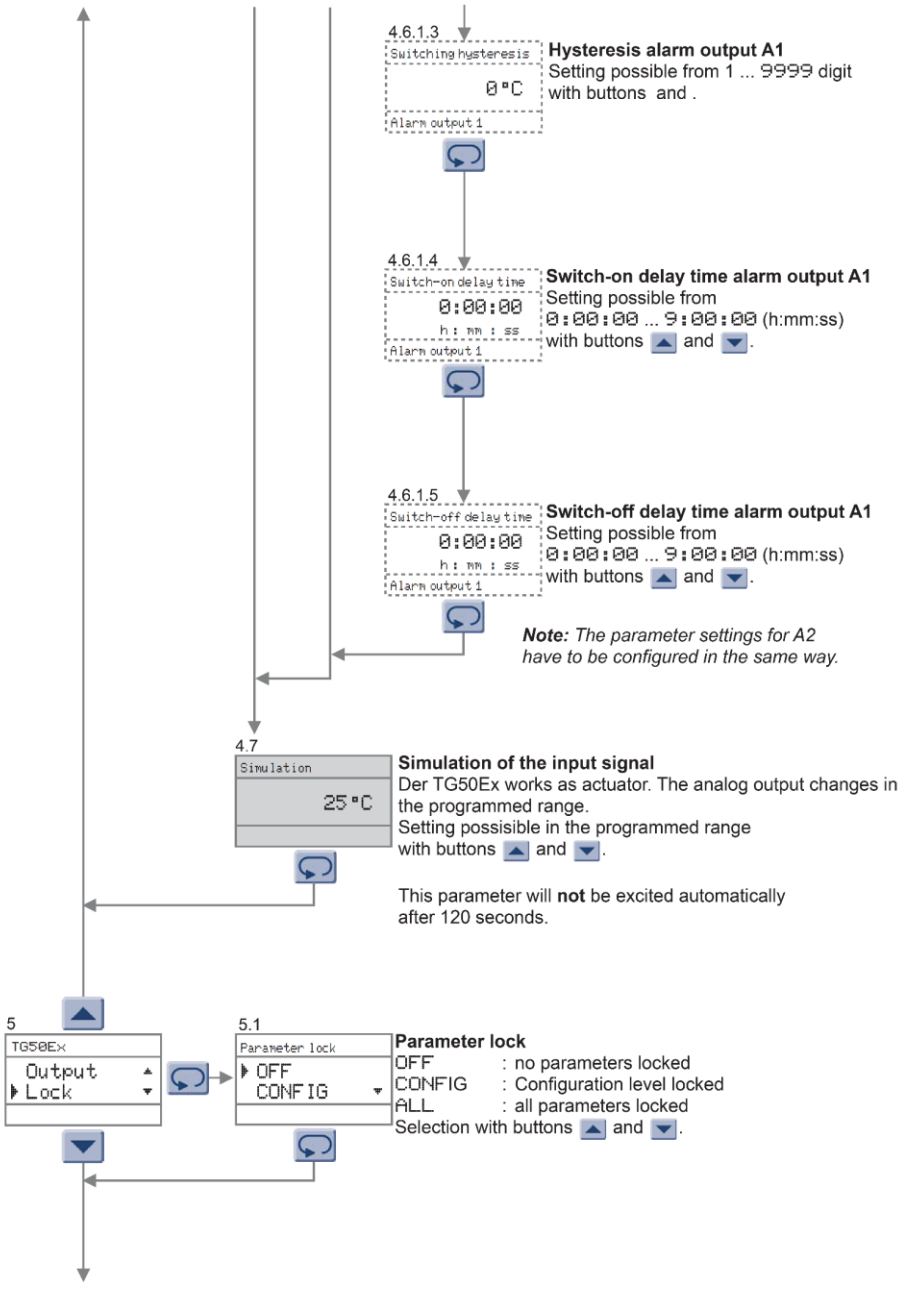

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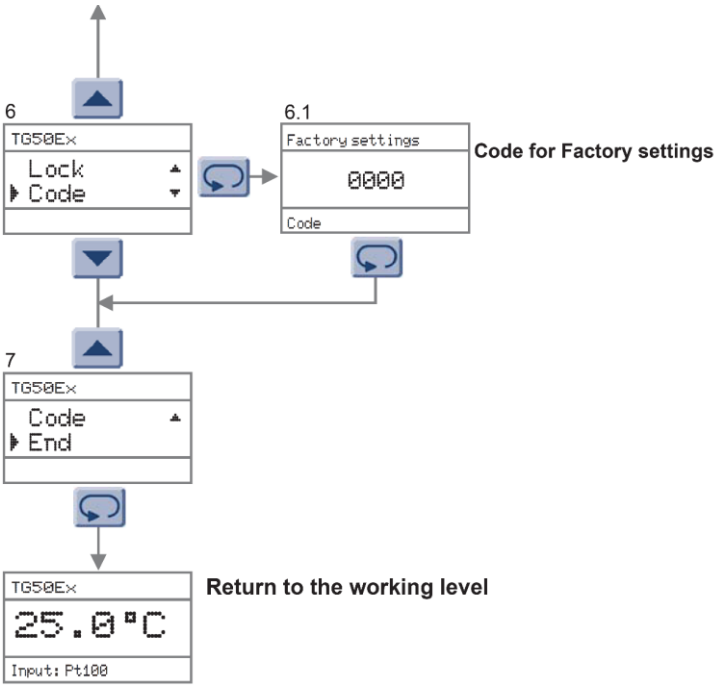
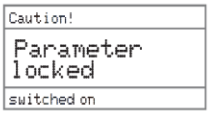
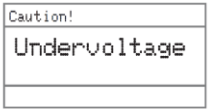

6
TG50Ex
Lock
Code
6.1
Factory settings
0000
Code
Code for Factory settings
7
TG50Ex
Code
End
TG50Ex
25.0°C
Input: Pt100
Return to the working level

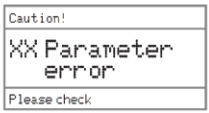
7 Error reports



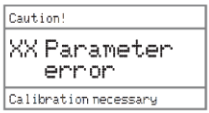
The parameter can not be changed, because the parameter lock for the configuration level, or work and configuration level, is activated.



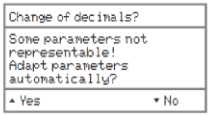
Supply voltage to low



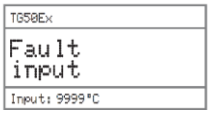
At the check-up of the parameter memory, XX errors are detectet. The incorrect parameter are resetted to the factoty settings. Please check and correct parameters if necessary.



As before, but the factory settings are incorrect. The device must be checked at works.

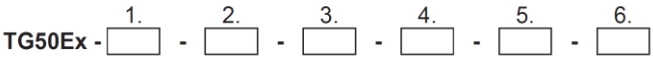


Change of decimal places
While changing number of decimal places, some parameters can be converted, but however, not represented!
Selection "No" : Change of the decimal places is not carried out.
Selection "Yes" : Decimal places are changed automatically, where the affected parameters are set to the maximum possible value. A subsequent verification of the accepted parameters is absolutely necessary.



Break of wire or short-circuit in the measuring circuit.
Text Input: 9999°C is flashing.

8 Ordering code



1. Input			
3	Pt100	3-wire	-100,0 ... 600,0 °C/-100 ... 600 °C
	Pt1000	3-wire	-100,0 ... 300,0 °C/-100 ... 300 °C
	Thermocouple	J (Fe-CuNi)	-100,0 ... 800,0 °C/-100 ... 800 °C
		K (NiCr-Ni)	-150 ... 1200 °C
		N (NiCrSi-NiSi)	-150 ... 1200 °C
		S (Pt10Rh-Pt)	-50 ... 1600 °C
	Inputs intrinsically safe	ATEX II (1) G [Ex ia] IIC/IIB ATEX II (1) D [Ex iaD]	
2. Alarm outputs			
2R 2 relay outputs		A1, A2 SPDT	
3. Alarm outputs			
00 not installed		(not available)	
4. Analog outputs			
00 not installed			
AO Analog output		0/4 ... 20 mA; 0/2 ... 10 V DC	
5. Supply voltage			
0 230 V AC ± 10 % 50-60 Hz 1 115 V AC ± 10 % 50-60 Hz 5 24 V DC ± 15 %			
6. Options			
00 without option			

Works configuration according to customer specifications.

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