

# Temperature-Guard TG 50Ex

**Pt100/Pt1000 - Thermocouple J, K, N, S**



## 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, 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



## 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.

## Short information

Programming	The device is programmed by frontal buttons, in connection with the LCD display.
Inputs	RTD (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.

## Technical data

### Power supply

Supply voltage : 230 V AC  $\pm 10\%$ , 115 V AC  $\pm 10\%$ , or 24 V DC  $\pm 15\%$   
 $U_m$  253 V AC or 125 V DC  
 (Terminals 11 and 13)

Power consumption : max. 5 VA

Operating temperature : -10 ... 55 °C (14 ... 131 °F)

Rated voltage : 250 V AC acc. to EN 60664-1:2007  
 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

CE -conformity : ATEX-directive 94/9/EG


EN 60079-0:2006

EN 60079-11:2007

EN 61241-0:2006

EN 61241-11:2006

Standardize EN 61326-1:2013			Result
IEC 61000-4-2 (ESD) IEC 61000-4-3 (E-field) IEC 61000-4-8 (Magnetic field)	Case	4 kV/8 kV contact/air 10 V/m 30 A/m	B A dispensed with
IEC 61000-4-11 (Voltage dip) IEC 61000-4-4 (Burst) IEC 61000-4-5 (Surge) IEC 61000-4-6 (HF- current feed)	AC power supply connection	0.5 period, $\pm 100\%$ 2 kV 1 kV L/N, 2 kV L,N/PE 3 V	A A A A
IEC 61000-4-4 (Burst) IEC 61000-4-5 (Surge) IEC 61000-4-6 (HF- current feed)	DC power supply connection	2 kV 1 kV L/N, 2 kV L,N/PE 3 V	A A A
IEC 61000-4-4 (Burst) IEC 61000-4-5 (Surge) IEC 61000-4-6 (HF- current feed)	Input/output, signal/control	1 kV 1 kV L/N/PE 3 V	A B A
CISPR11	Radiated interference		Passed

**Explosion protection** :  II (1) G [Ex ia] IIC/IIB or 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 :  $< 0.1\%$ ,  $\pm 1$  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  $\Omega$

Characterisitic curve : trapezoidal

Internal inductivity : 4  $\mu$ H

Internal capacity : 135 nF

**Explosion protection** **Ex** **ia/IIC** **ia/IIB**

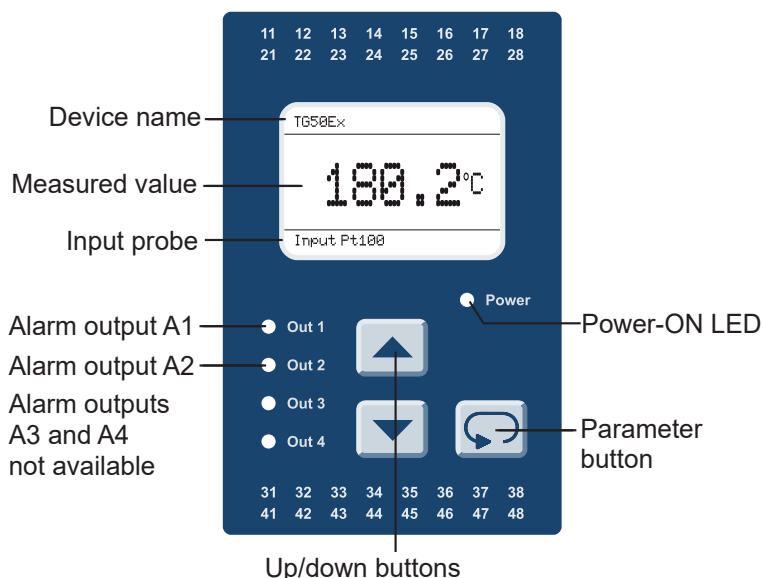
Maximal ext. inductivity : 100 mH 100 mH

Maximal ext. capacity : 25  $\mu$ F 120  $\mu$ F




Continue page 3



## Controls and indicators



## 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 device 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 current 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 10.

## Operational startup reference!

The device is preset with an ex-works default setting. Therefore it must be adapted to each special application. See Page 6.



## Requirements

- It is necessary to keep the conditions of the ATEX EC-Type Examination Certificate.
- The device must be installed in dry and good monitored rooms.
- If the intrinsic 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 category 1D or 2D.
- Repairing and design modifications are only allowed at works.

## Note on the representation

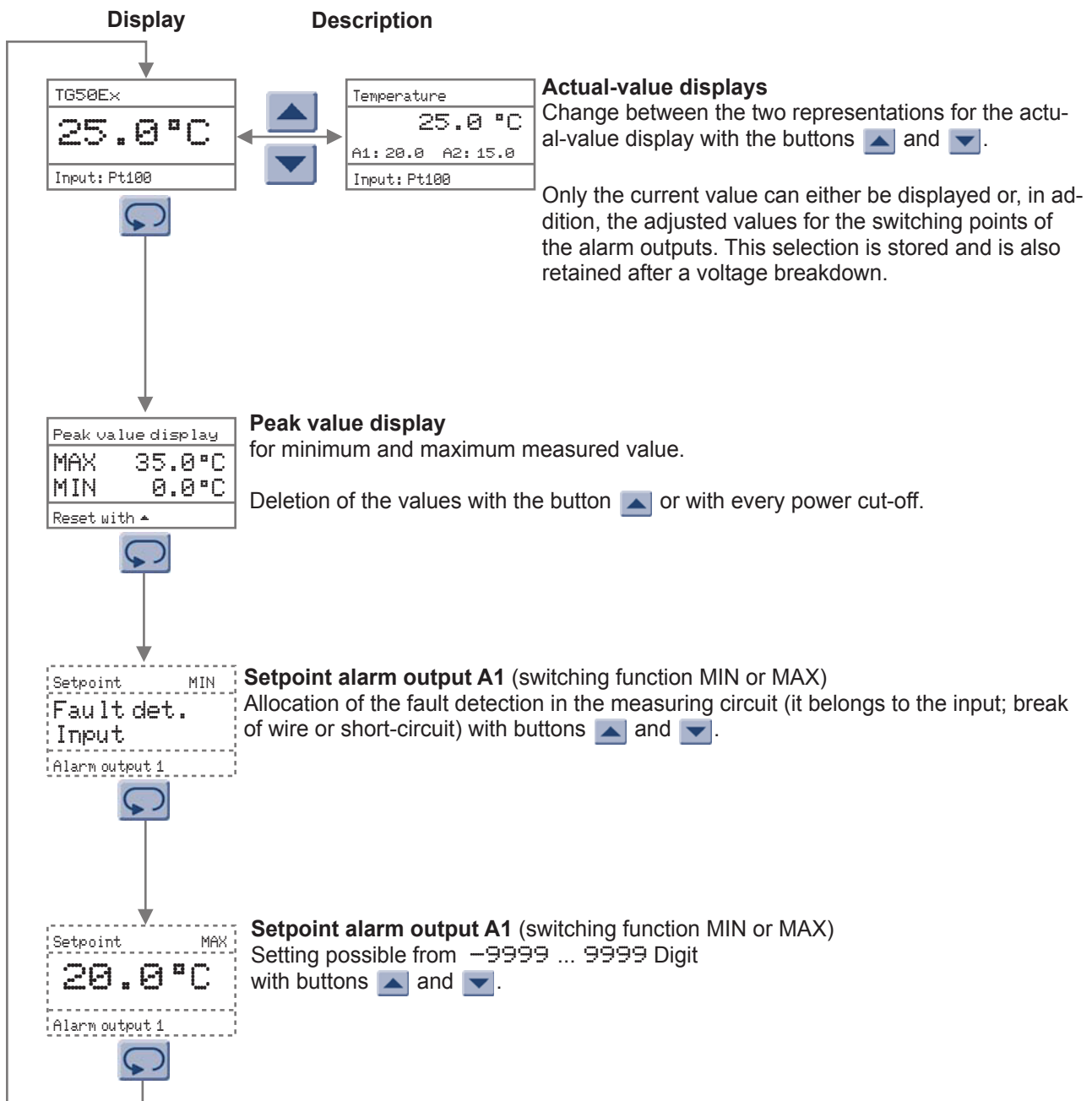


Parameter appears only with corresponding configuration



Parameter appears only with corresponding equipment version

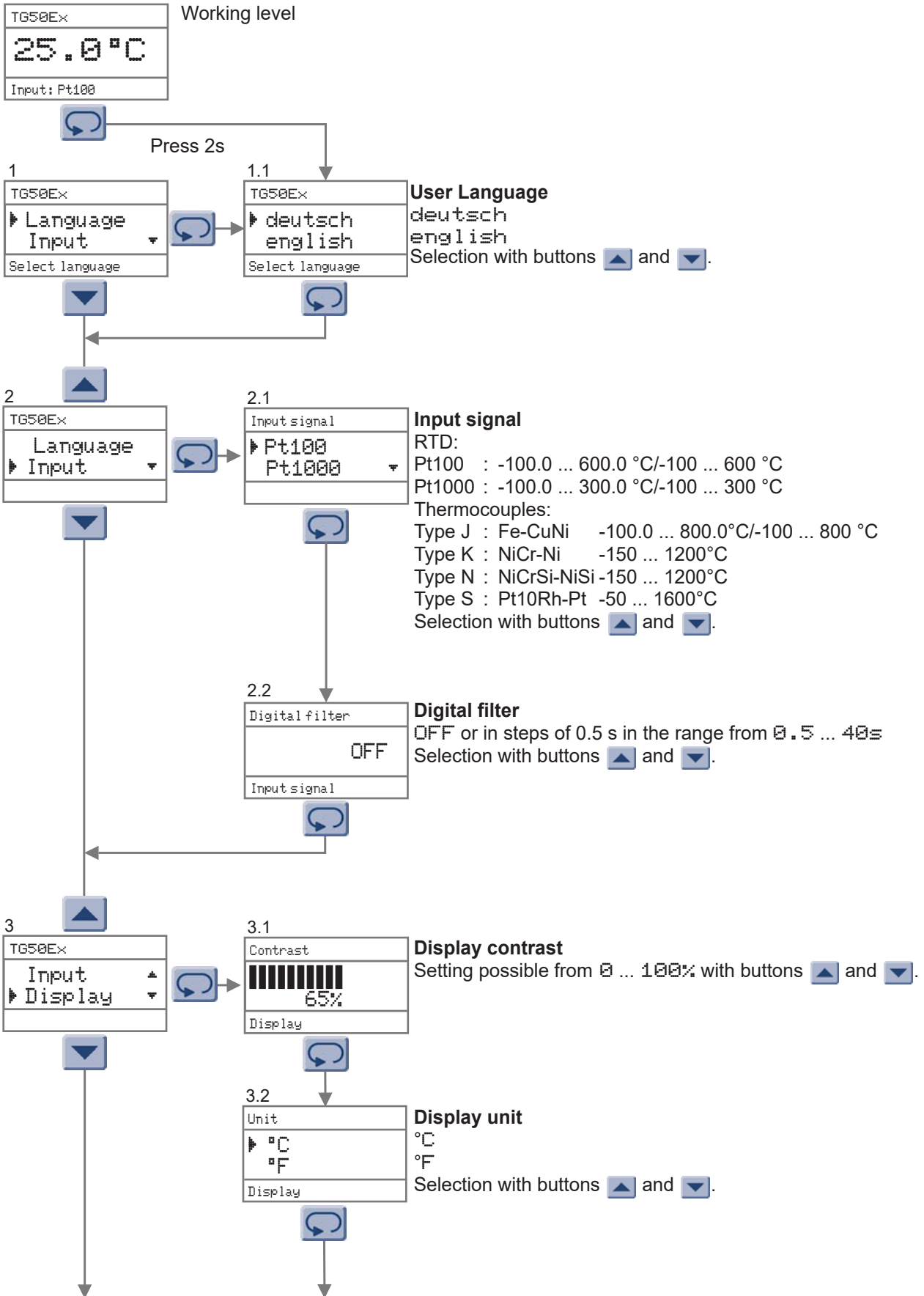
## Working level



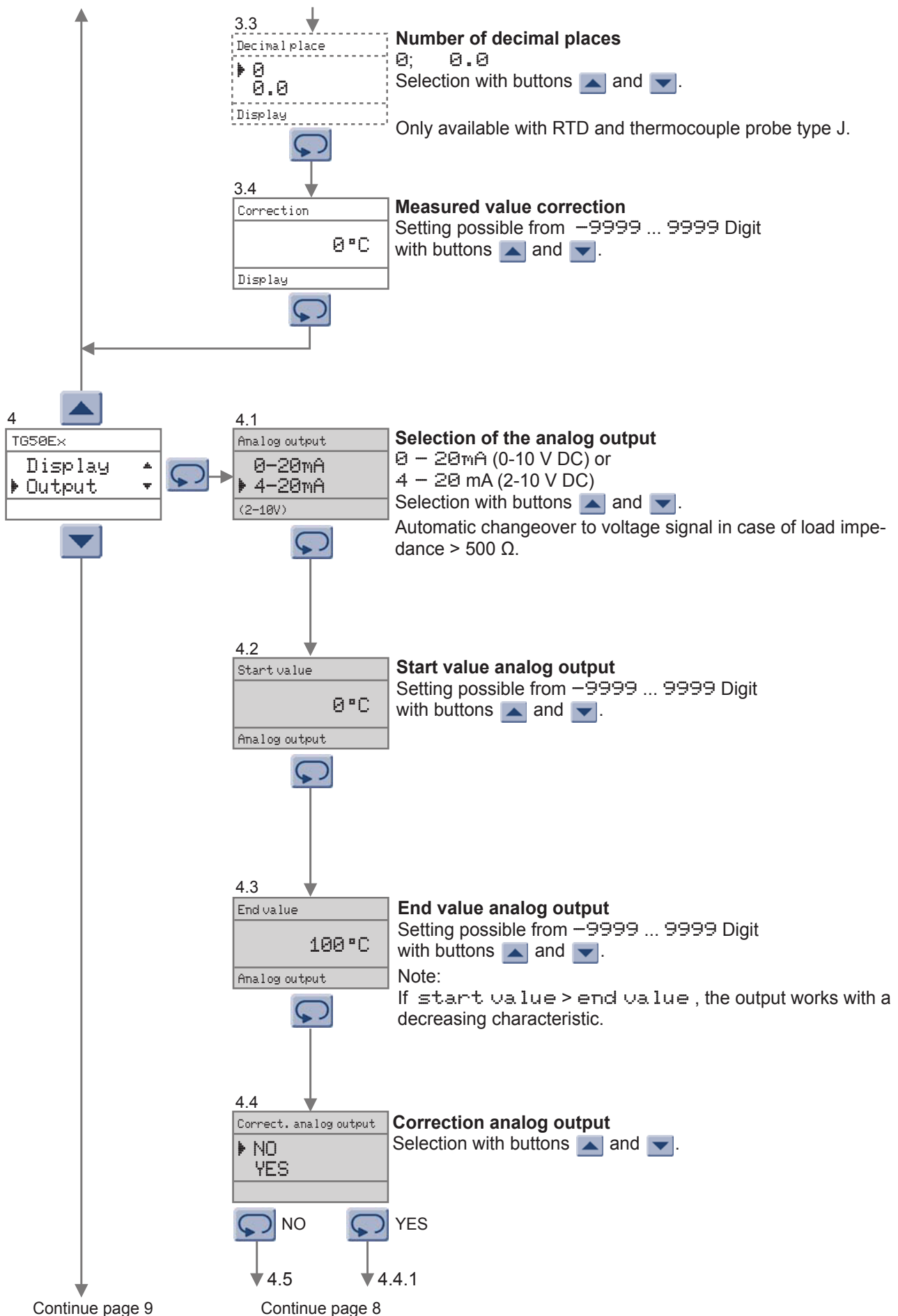
## Configuration level

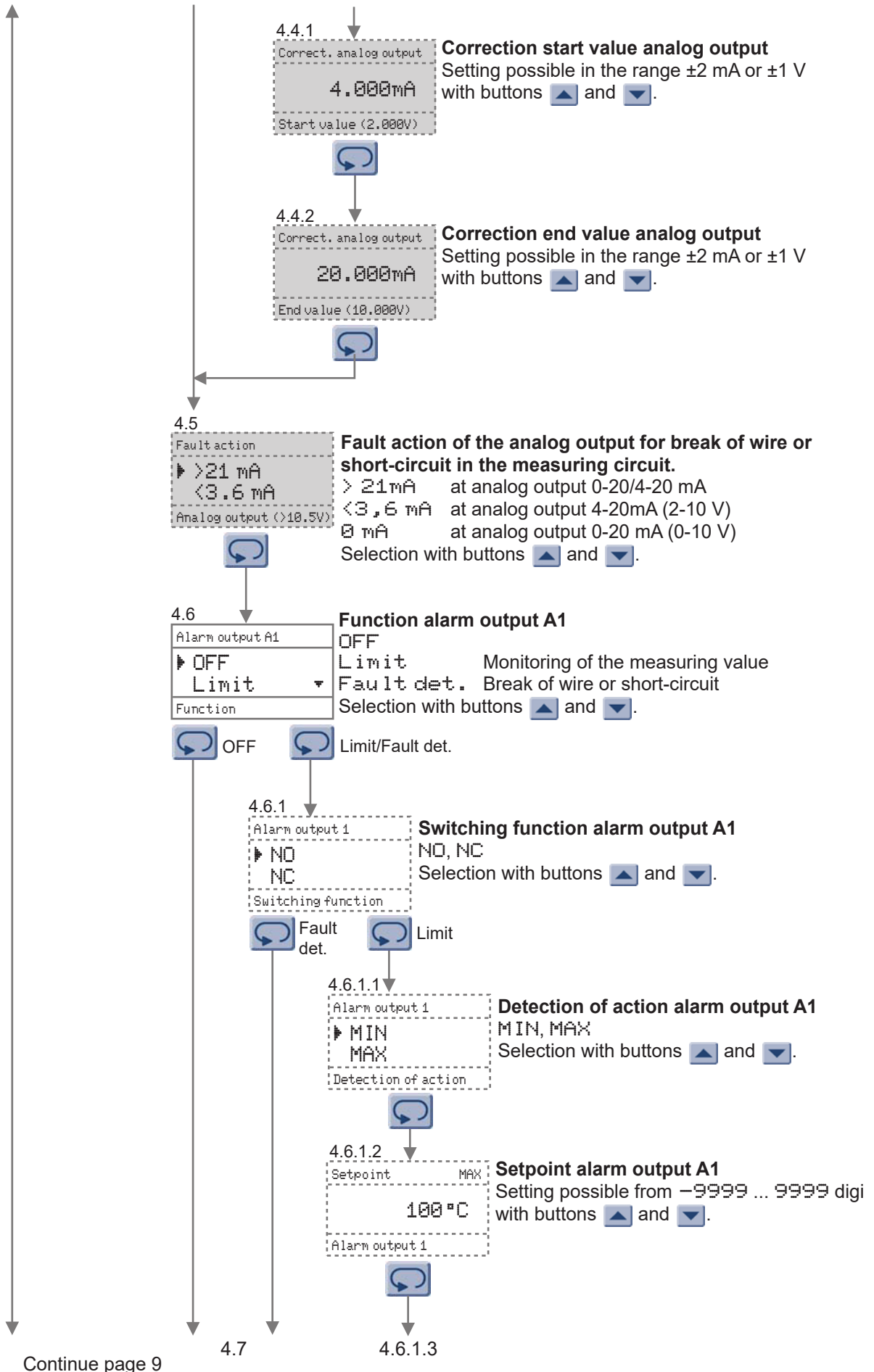
### Display

Description (represented values are default settings)

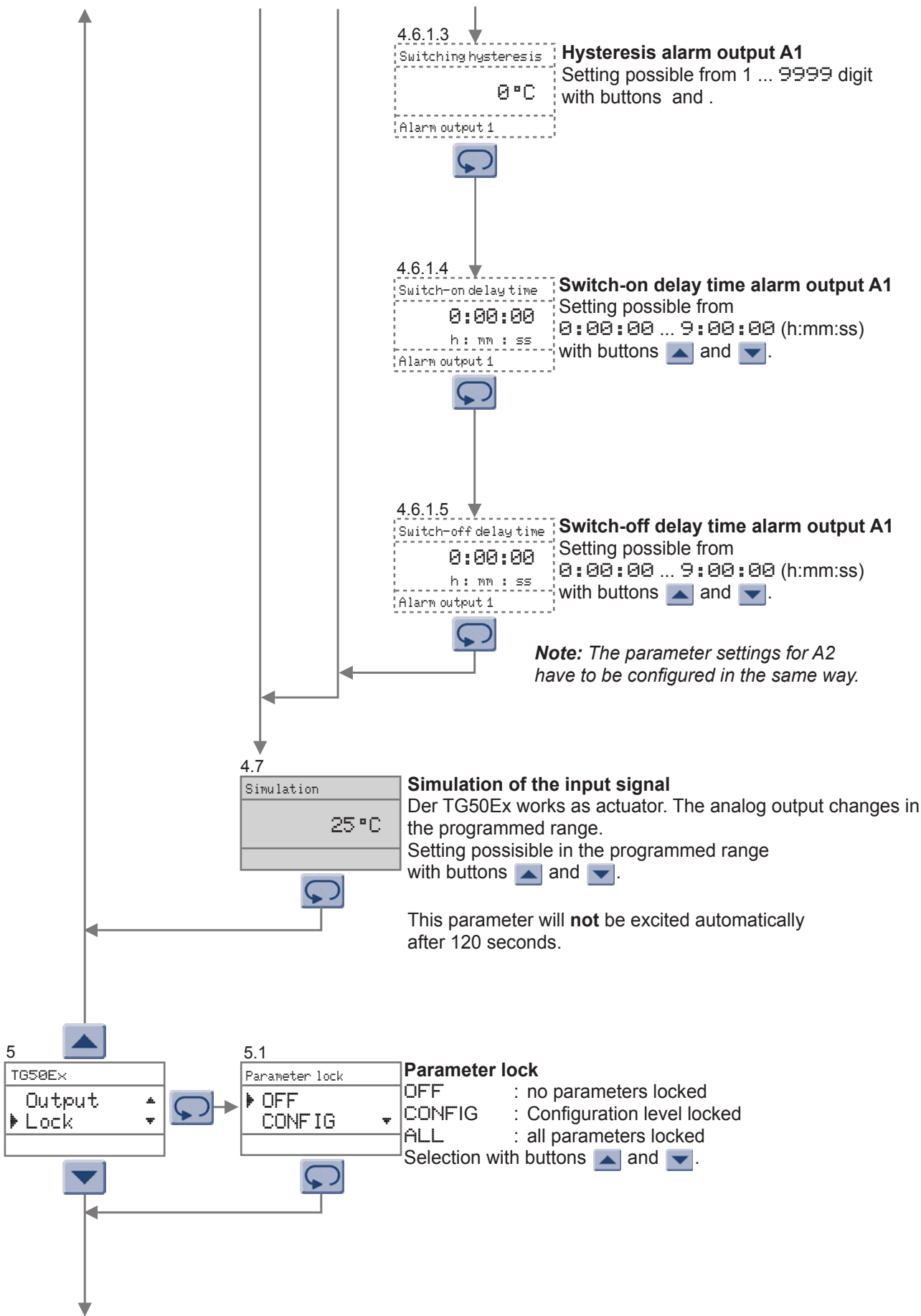


Continue page 7

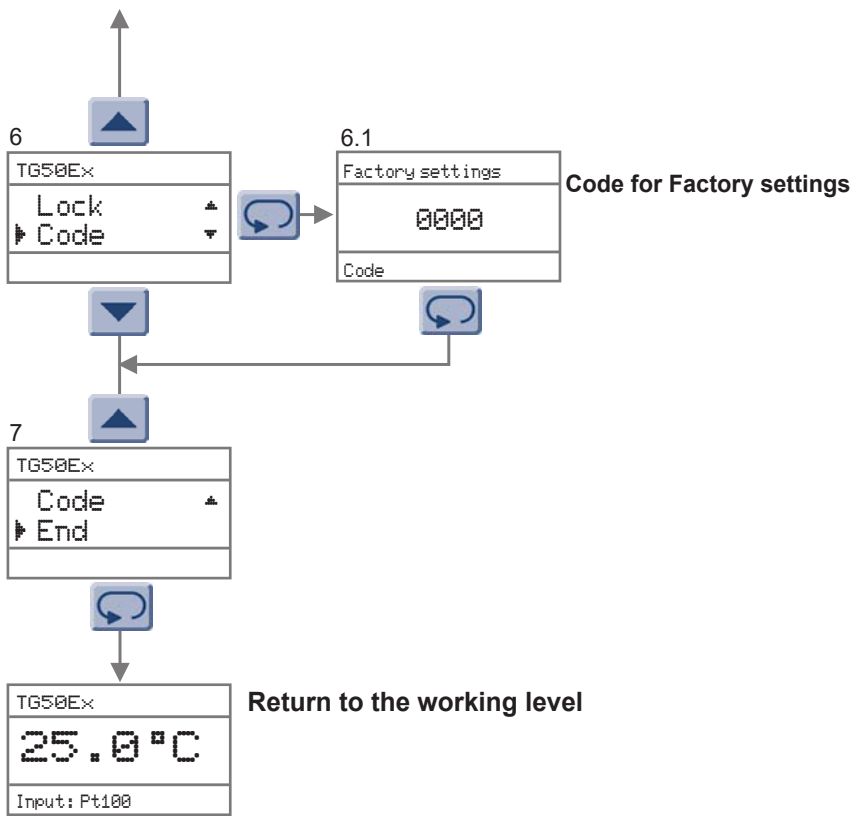








continue page 10



## Error reports

## Description

Caution!
Parameter locked
switched on

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

Caution!
Undervoltage

Supply voltage to low

Caution!
XX Parameter error
Please check

At the check-up of the parameter memory, XX errors are detected. The incorrect parameter are reset to the factory settings. Please check and correct parameters if necessary.

Caution!
XX Parameter error
Calibration necessary

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

Change of decimals?
Some parameters not representable! Adapt parameters automatically?
▲ Yes                      ▼ No

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.

TG58Ex
Fault input
Input: 9999°C

Break of wire or short-circuit in the measuring circuit.

Text Input: 9999 °C is flashing.

## Ordering code

TG50Ex -  1. -  2. -  3. -  4. -  5. -  6.

### 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 output

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.