OPERATING MANUAL

MR50

Monitoring Relay

Standard signals

0/4 ... 20 mA, 0/2 ... 10 V DC

umn_fam_mr50_vs2.08_de

senseca

Table of Contents

1 Product information

Features

- Input standard signals 0/4 ... 20 mA, 0/2 ... 10 V DC
- Measuring range programmable
- Basic accuracy 0.1 % +/- 1 Digit
- Installed units:

  mV, V, mA, A, Ω, kΩ, µS/cm, mS/cm, °C, °F, min, rpm, bar, mbar, hPa, mm, cm, m, %, °, l, l/min, m^3, m^3/h, ppm custom units programmable
- Simulator function
- Fault monitoring for break of wire in the measuring circuit
- Programmable fault function

  Analog output min. or max. overflow

  Alarm outputs min. or max. function
- Integrated transmitter supply 24 V DC max. 30 mA
- 4 alarm outputs (relay SPDT)
- Isolated analog output 0/4 ... 20 mA; 0/2 ... 10 V DC
- Full 3-port isolation

1.2 General

The Monitoring Relay MR50 has inputs for industry standard signals 0/4 ... 20 mA and 0/2 ... 10 V DC. Measuring value and programmed unit are shown in the display. The integrated transmitter supply offers direct connection of loop powered sensors.

Simple programming, up to 4 alarm outputs (SPDT) and optional available fully isolated free programmable analog output 0/4 ... 20 mA; 0/2 ... 10 V DC meets the demand for different applications. Peak value indication for minimum and maximum measured values are stored in the background and can be read out from the display at any time.

1.3 Short information

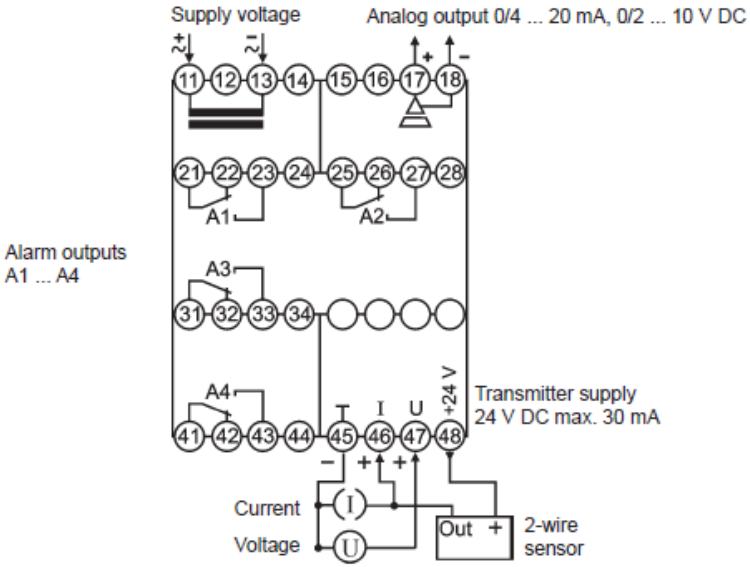
Programming	The device is programmed by frontal buttons, in connection with the LCD display.
Inputs	Standard signal 0/4 ... 20 mA and 0/2 ... 10 V DC
Alarm outputs	The alarm outputs can be programmed as max. or min. function. Switch-on delay and switch-off delay time is programmable from 1 s up to 9 h. The switching status is displayed through LED´s.
Fault function	A break of wire in the measuring circuit could be monitored. The switching function of the analog and alarm output(s) is programmable in case of a fault.

2 Technical data

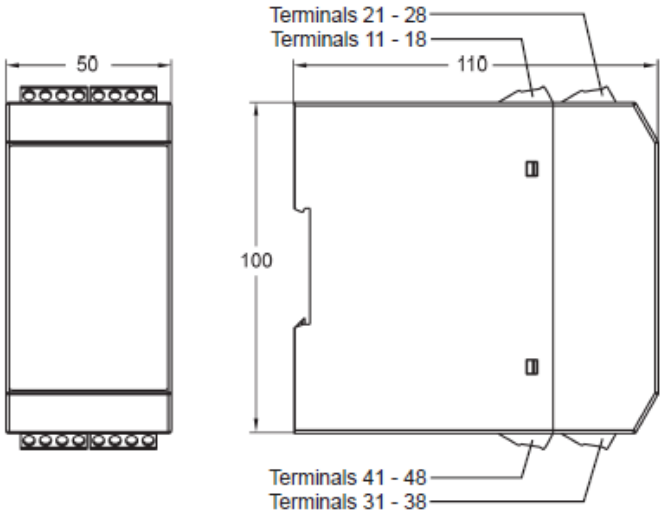
Power Supply	
Supply voltage	230 V AC ±10 %, 115 V AC ±10 %, or 24 V DC ±15 %
Power consumption	< 5 VA
Operating temperature	-10 ... 55 °C (14 ... 131 °F)
Rated voltage	250 VAC, between input/relay output/analog output/supply voltage degree of pollution 2, overvoltage category III
Test voltage	4 kV DC between input/relay output/analog output/supply voltage
Conformity	CE
Input	0/4 ... 20 mA; 0/2 ... 10 V DC
Fault detection	Break of wire in the measuring circuit
Input resistance	Current input 10 Ω, voltage input 10 kΩ
Basic accuracy	<0,1 %, ±1 Digit
Temperature coefficient	0,01 %/K
Transmitter supply	24 V DC max. 30mA
Output	
Alarm outputs A1-A4	Relay SPDT < 250 V AC < 250 VA < 2 A cos$\varphi \geq$ 0,3, < 300 V DC < 40 W <2 A
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
Fault function	For break of wire detection ▸ Analog output 0 mA, < 3.6 mA or > 21.5 mA programmable ▸ 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

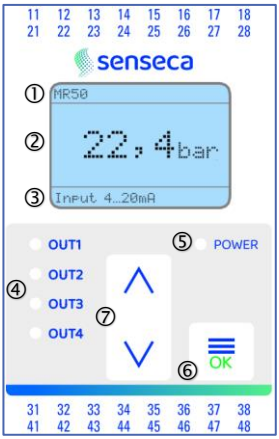


Dimensions



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 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 description page 16.

Operational startup reference!

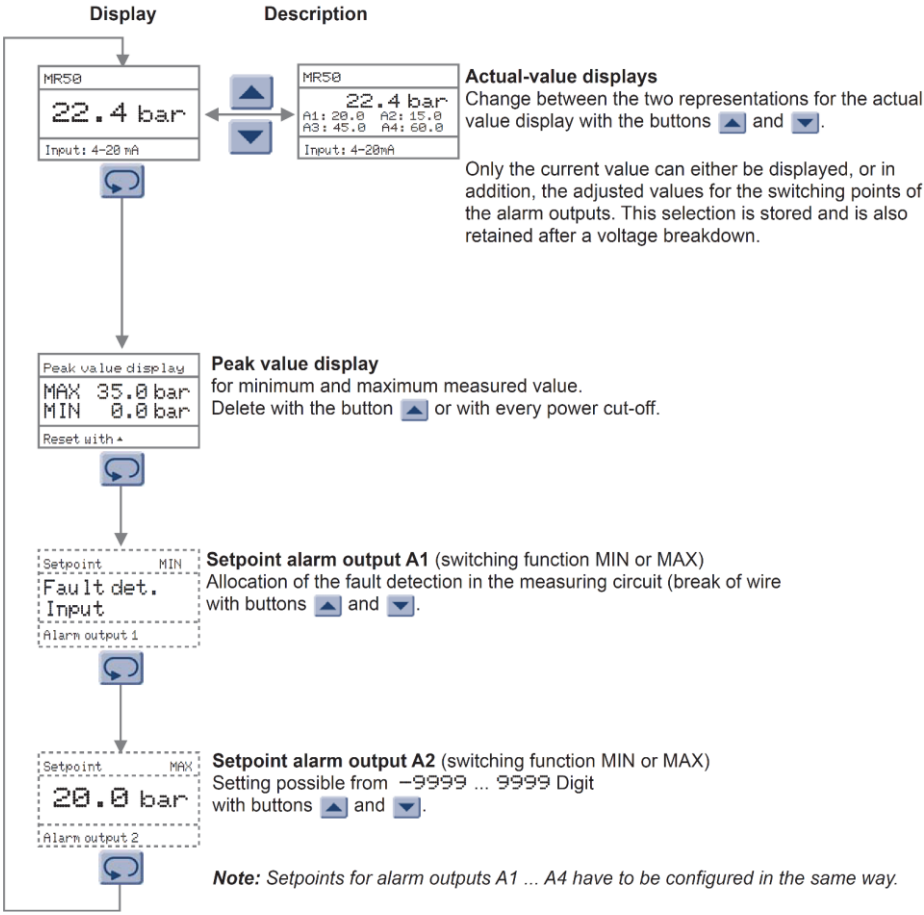
The device is preset with an ex-works default setting. Therefore, it must be adapted to each special application. see page13.

Note on the representation

Parameter appears only with corresponding configuration

Parameter appears only with corresponding equipment version

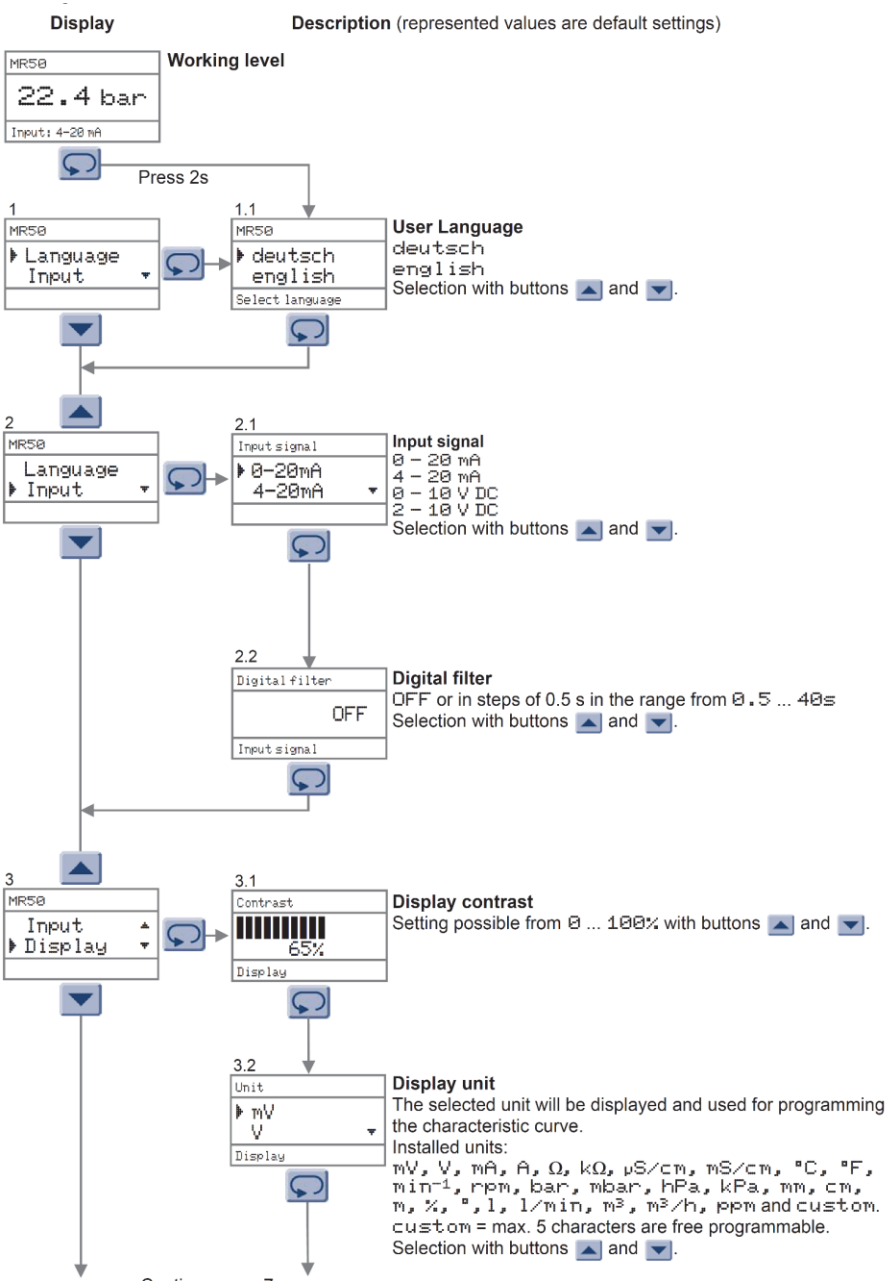
5 Working level



Note

Setpoints for alarm outputs A1 ... A4 have to be configured in the same way.

6 Configuration level



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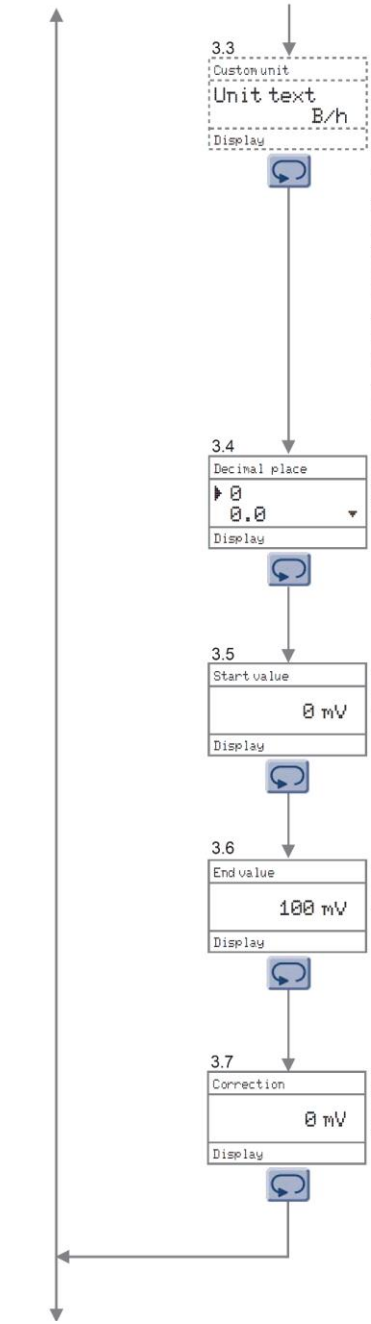

Custom unit
Maximal 5 characters possible (see character set below).
Only appears if `custom` is selected
Scrolling through the characters is possible with buttons ▲ and ▼.
The selected character will be entered with button ↻. After that, the cursor jumps to the next position. Selection procedure as before. If 5 characters are entered or no more character wanted, the parameter `custom unit` will excited automatically.

Characters:
␣ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
ä ö ü ß
. ? ! , : _ % / \ + - * [ ] ( ) < = > " • ← → ↑ ↓ ◄ ► ▲ ▼ °
µ Ω Δ ^{1} ^{2} ^{3} $^{-1}$ $^{-2}$

Number of decimal places
0; 0.0; 0.00; 0.000
Selection with buttons ▲ and ▼.

Start value for display
Setting possible from −9999 ... 9999 Digit
with buttons ▲ and ▼.

End value for Display
Setting possible from −9999 ... 9999 Digit
with buttons ▲ and ▼.

Measured value correction
Setting possible from −9999 ... 9999 Digit
with buttons ▲ and ▼.

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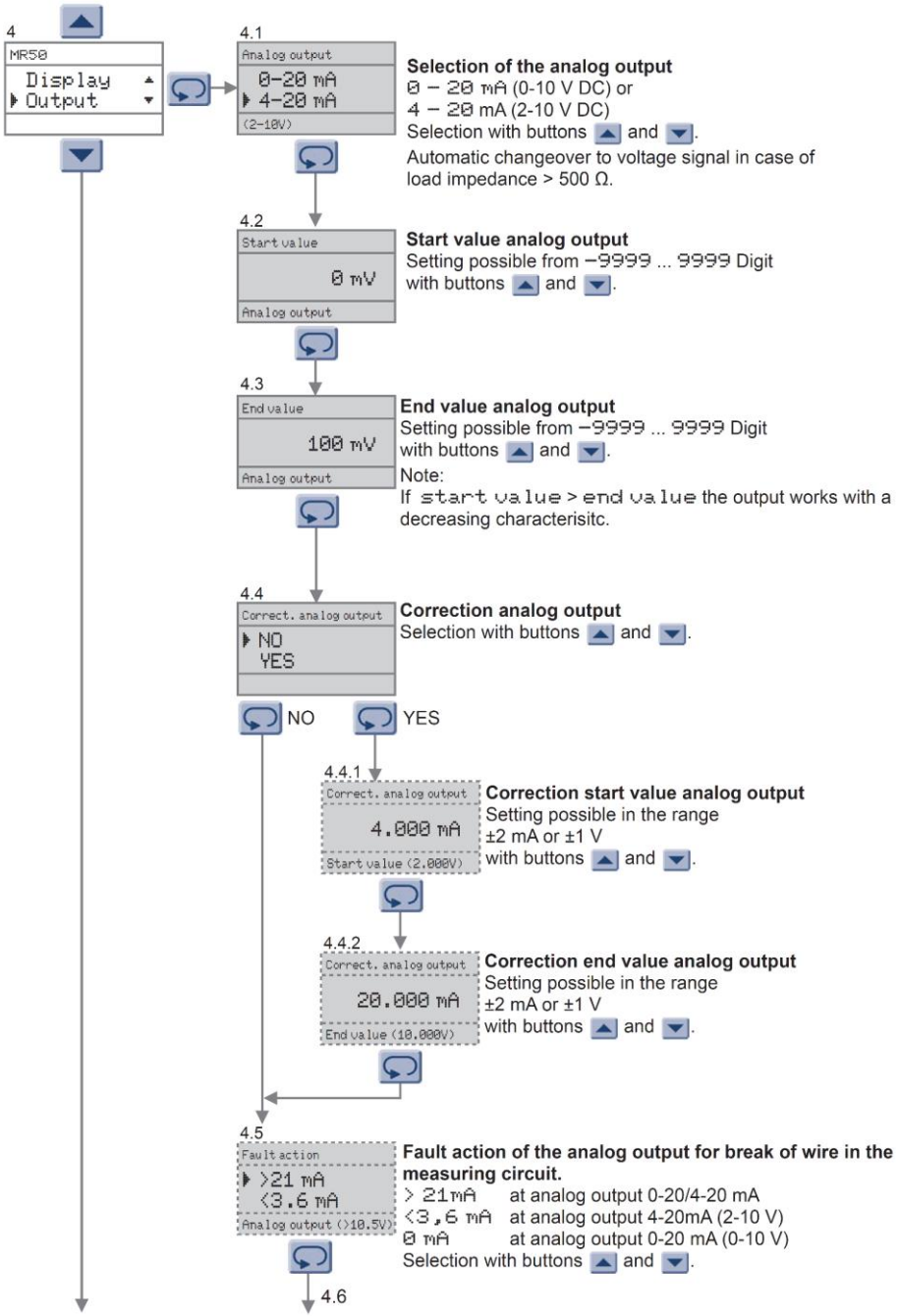

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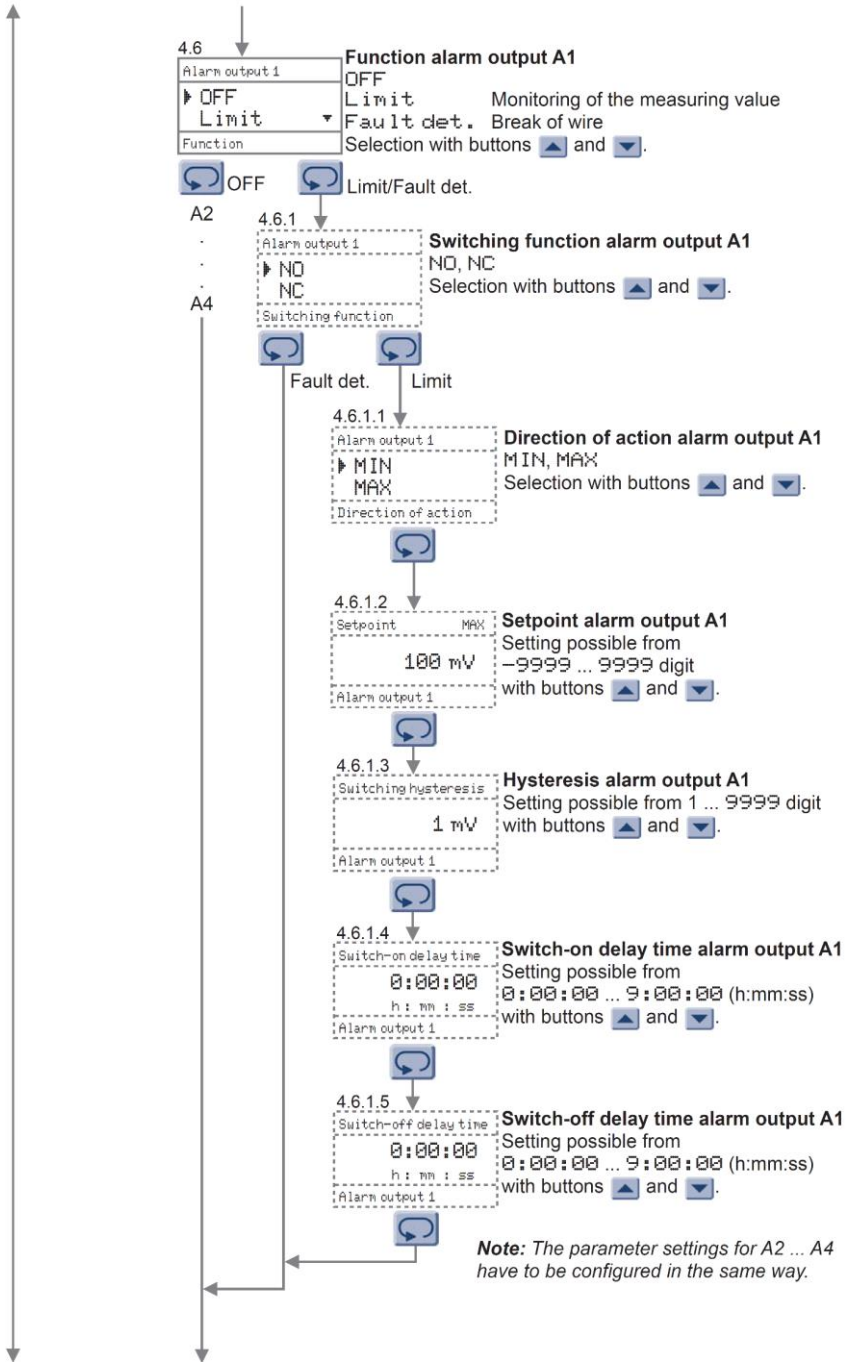

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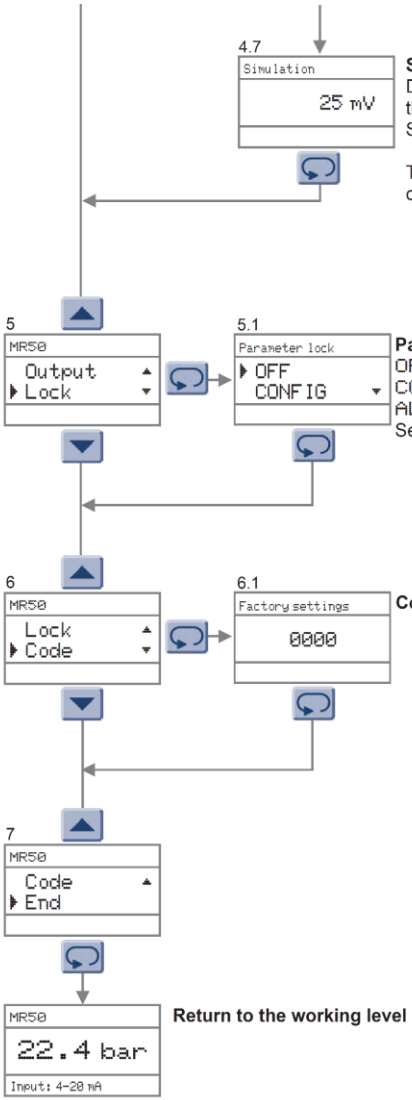


Simulation
Der MR50 works as actuator. The analog output changes in the programmed range.
Setting possible with buttons and .

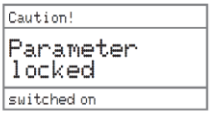
This parameter will **not** be excited automatically after 120 seconds.

Parameter lock
OFF : no parameters locked
CONFIG : Configuration level locked
ALL : all parameters locked
Selection with buttons and .

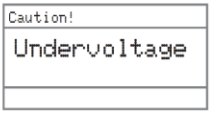
Code for Factory settings

Return to the working level

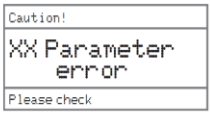
7 Error reports



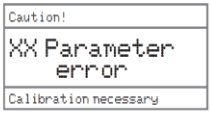
The parameter can not be changed, because the parameter lock for the configuration level, or work and configuration level, is switched on.



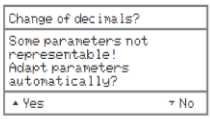
Supply voltage to low



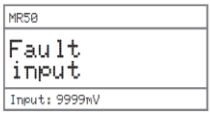
At the check-up of the parameter memory, XX errors are detectet. The incorrect parameter are resetted to the factoty settings. Please check and correct parameters if necessary.



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

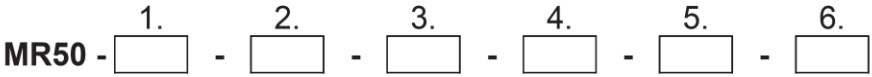


Change of decimal places
While changing number of decimal places, some parameters can be converted, but however, not represented!
Selection "No" : Change of the decimal places is not carried out.
Selection "Yes" : Decimal places are changed automatically, where the affected parameters are set to the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



Break of wire in the measuring circuit.
Text Input: 9999mV is flashing.

8 Ordering code



1.Input	
1 Standard signals 0/4 ... 20 mA; 0/2 ... 10 V DC Transmitter supply 24 DC V max. 20 mA	
2. Alarm outputs	
2R 2 relay outputs	A1, A2 SPDT
3. Alarm outputs	
00 not installed	
2R 2 relay outputs	A3, A4 SPDT
4. Alarm 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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