überreicht durch / presented by :
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Progr. Universal-Transmitter PMT 50

Signal conditioning - linearization - output characteristic transformation

Features

- Input for standard signals, resistance/poti or Pt100/Pt1000 and thermocouples J, K, N, S
- Measuring range programmable
- Installed units:
  mV, V, mA, A, Ω, kΩ, µS/cm, mS/cm, °C, °F, min-1, rpm, bar, mbar, hPa, mm, cm, m, %, °;
  custom units programmable
- Transmitter supply 24 V DC max. 30 mA
- Linearization or transformation of output characteristic via 32 base-points programmable
- Basic accuracy <0.2 %
- Teach-In and simulator function
- Analog output 0/4 ... 20 mA; 0/2 ... 10 V DC
- 2 alarm outputs (relay SPDT)
- Fieldbus connection MODBUS RTU/ASCII RS485/Profibus DP
- Full 3-port isolation

General

The programmable universal transmitter PMT50 operates with analog input signals. The device convert input signals to analog output 0/4 ... 20 mA; 0/2 ... 10 V DC. Optional a serial interface is available. The integrated transmitter supply allows the feeding of 2-and 3-wire sensors. The device offers a linearization function for any sensor curves and a simulator function. 4 alarm outputs for monitoring are available.

Short information

Programming	The device is programmed via frontal buttons, in association with the LCD display.
Inputs	Industry standard signals or RTD (Pt100/Pt1000), resistance, 3-wire connection, thermo-couple Typ, J, K, N, 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.
Teach-In function	The input signals for start- and end value or the values of the characteristic curve will be stored automatically. Only the corresponding display values have to be entered manually.

Technical data

Power supply

Supply voltage : 230 V AC ±10 %, 115 V AC ±10 %, or 24 V DC ±15 %
Power consumption : max. 5 VA
Operating temperature : -10 ... 55 °C (14 ... 131 °F)
Rated voltage : 250 VAC acc. to DIN EN 60664-1
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

Standardize IEC61326 05/2004			**Result**
IEC 61000-4-2 (ESD) IEC 61000-4-3 (E-field) IEC 61000-4-8 (Magnetic filed)	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, ±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
CISPR16-1/16-2	Radiated interference		Passed

Inputs

Model 1

Input : 0/2 ... 10 V, 0/4 ... 20 mA
Basic accuracy : <0.1 %, ±1 Digit
Temperature coefficient : 0.01 %/K
Transmitter supply : 24 V DC max. 30 mA

Model 2

Input : resistance 0 ... 100 kΩ, potentiometer 1 ... 100 kΩ
Basic accuracy : <0.2 %, ±1 Digit
Temperature coefficient : 0.01 %/K

Model 3

Input : Pt100 (3-wire) -100.0 ... 600.0 °C / -100 ... 600 °C
Pt1000 (3-wire) -100.0 ... 300.0 °C / -100 ... 300°C
: Thermoelemente
Typ J -100.0 ... 800.0 °C / -100 ... 800 °C
Typ K -150 ... 1200 °C
Typ N -150 ... 1200 °C
Typ S 0 ... 1600 °C

Basic accuracy : <0.1 %, ±1 Digit
Temperature coefficient : 0.01 %/K

Outputs

Alarm outputs A1-A4 : Relay SPDT < 250 V AC < 250 VA < 2 A cosφ ≥ 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)

Fieldbus

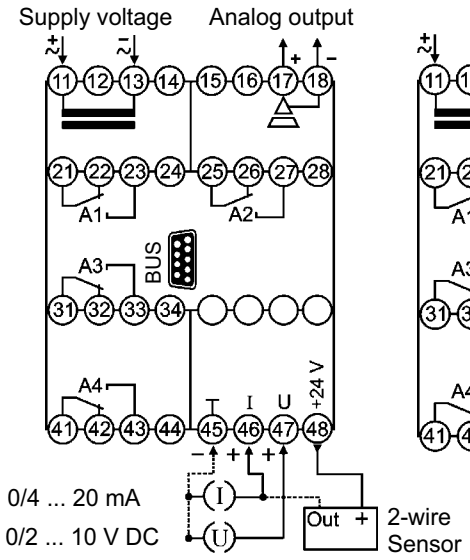
Modbus : RS485, RTU or ASCII max. 38400 Baud
Profibus : Profibus DP
Connection : 9pol. D-SUB connector socket in the front

Display : Graphic LCD-Display 128x64 pixels, white background illuminated

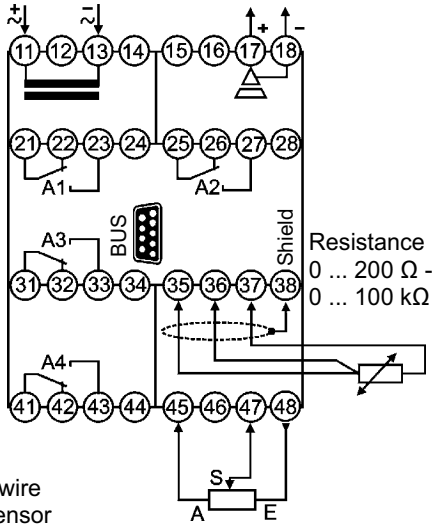
Case : Polyamide (PA) 6.6, UL94V-0, DIN rail mounting TS 35
Weight : Approx. 450 g
Connection : Screw terminals 0.14 ... 2.5 mm² (AWG 26 .. 14)
Protection : Case IP30, terminals IP20, German BGV A3

Connection diagrams

Model PMT50-1
Standard signals

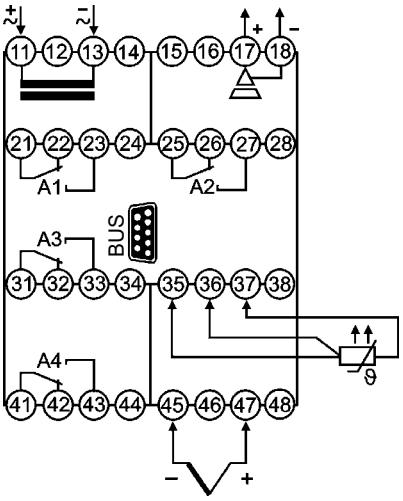


Model PMT50-2
Resistance; potentiometer



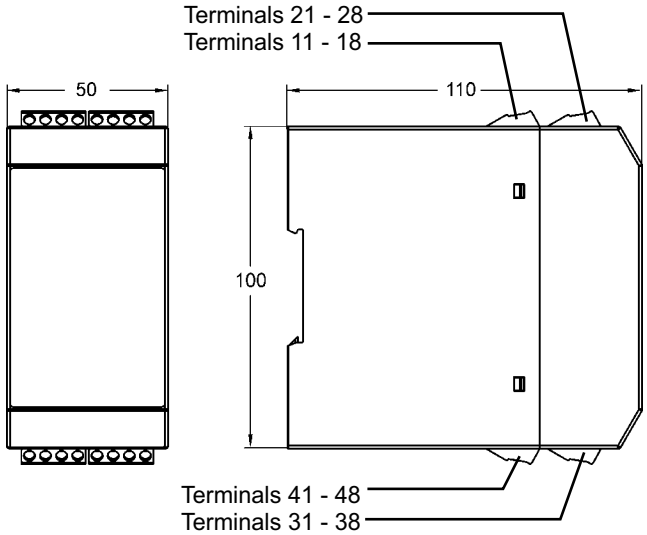
Poti
1 kΩ ... 100 kΩ,
slider current <1 µA

Model PMT50-3
Pt100,Pt1000; thermocouples



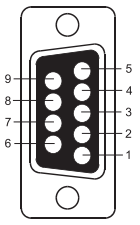
Pt100/Pt1000 3-wire,
2-wire (link terminal 35-36)
Thermocouples J, K, N, S

Dimensions



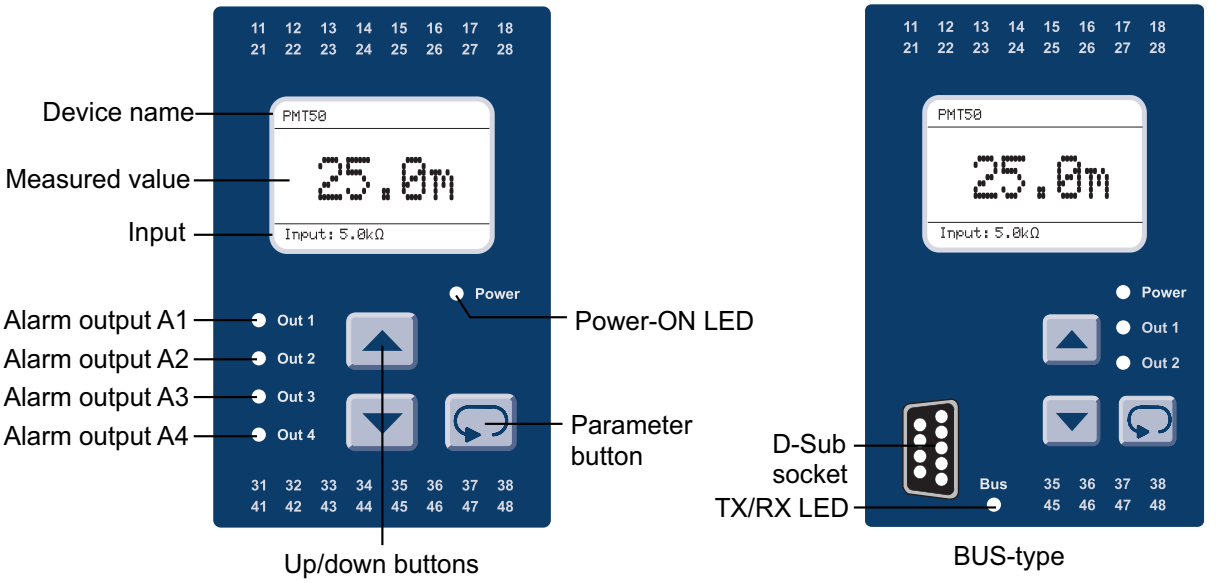
Bus connection (serial interface)

9pol. D-Sub connector in the front



Modbus		
PIN	**Signal**	**EIA/TIA-485 Name**
5	TXD1	B
9	TXD0	A
1	Common	C/C´
Profibus		
3	RxD/TxD-P	
5	DGND	
6	VP/+5V max 10 mA	
8	RxD/TxD-N	

Control 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 14.

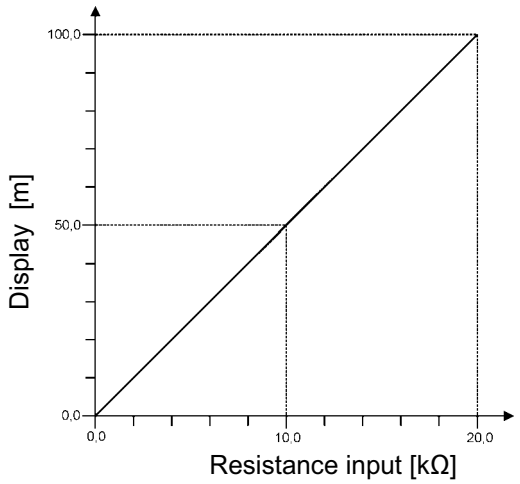
Operational startup reference!

The device is preset with an ex-works default setting. Therefore it must be adapted to each special application. See Page 7.

Explanations for characteristic curve programming

Linear curve (see page 10)

The linear curve needs only one value pair for start- and end value. At this every input value, the corresponding display value has to be assigned. See example:



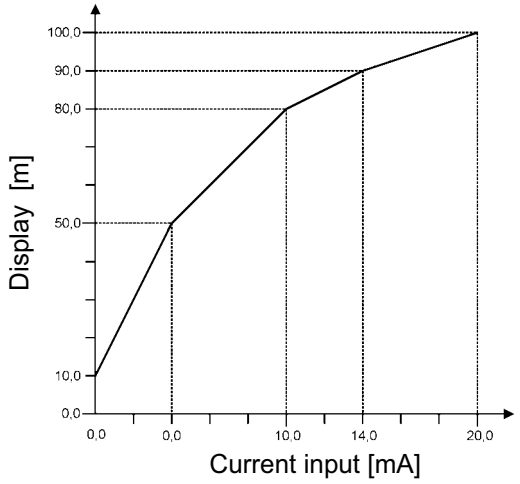
Example:

Input	: Resistance
Start value	: 0.0 kΩ
End value	: 20.0 kΩ
Display	: Height [m]
Start value	: 0.0 m
End value	: 100.0 m

In this example, 4 values for input and diplay range are needed. Every interem value belongs to the curve. Example: an input value of 10.0 kΩ is leading to the display value of 50.0 m.

Non linear curve (see page 11)

The non linear curve can have max. 32 value pairs for input and output to emulate the curve. At this, for every input value a display value can be programmed. Every interem value belongs to the curve.



Example: curve with 5 base-points

Input : 0 ... 20 mA
Display : 0.0 ... 100.0 m

Base-point	Input value	Display value
1	0.0 mA	10.0 m
2	4.0 mA	50.0 m
3	10.0 mA	80.0 m
4	14.0 mA	90.0 m
5	20.0 mA	100.0 m

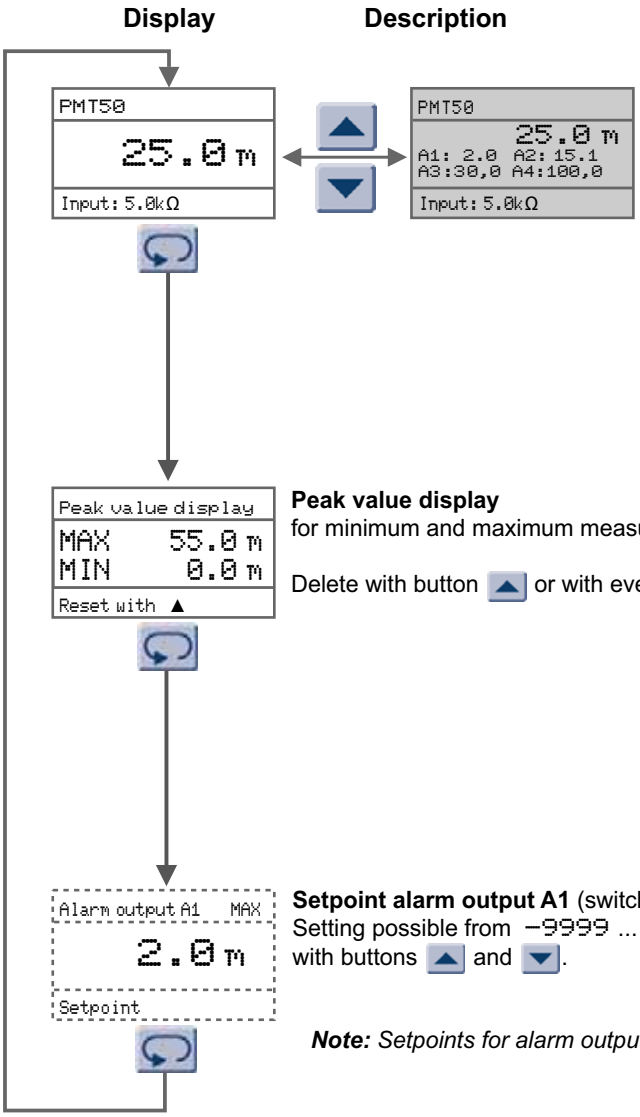
The curve above shows clearly the classification between input signal and display value. This example has 5 value pairs. For every input value the corresponding display value has to be programmed. The procedure is finished, if the button is pressed after the last base-point programming and OFF is selected in the follwing parameter.
At the teach-in programming no manually programming of the input values is necassary. At this, for the measured input values the actual values will be taken over. This method is ideal if the input signal is unknown but the corresponding display value is known (capacity gauging of tanks).

Note on the representation

Parameter appears only with corresponding configuration

Parameter appears only with corresponding equipment version

Working level



Actual-value displays
Change between the two representations for the actual-value display with the buttons ▲ and ▼.

Only the current value can either be displayed or, in addition, the adjusted values for the switching points of the alarm outputs. This selection is stored and is also retained after a grid failure.

Peak value display
for minimum and maximum measured value.

Delete with button ▲ or with every switch-off of the device.

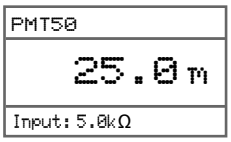
Setpoint alarm output A1 (switching function MIN or MAX)
Setting possible from −9999 ... 9999 Digit
with buttons ▲ and ▼.

Note: *Setpoints for alarm outputs A2 ... A4 have to be configured in the same way.*

Configuration level

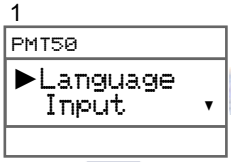
Display

Description

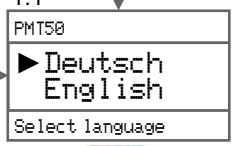


Press 2s

1

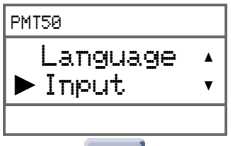


1.1

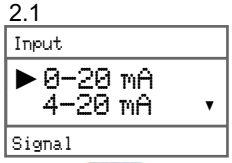


User Language
deutsch
english
Selection with buttons ▲ and ▼.

2



2.1

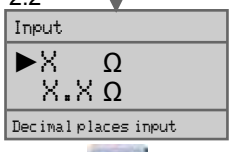


Input signal
For the different devices of the PMT50 are follwing input signals necassary:

Model 1	Model 2	Model 3
0 - 20 mA	Resistance	Pt100
4 - 20 mA	Poti	Pt1000
0 - 10 V DC		Thermo J
2 - 10 V DC		Thermo K
		Thermo N
		Thermo S

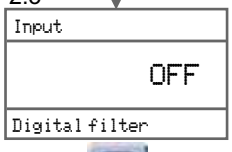
Selection with buttons ▲ and ▼.

2.2



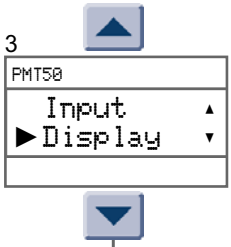
Decimal places resistance input
Parameter 2.2 is only available for model 2, if the input signal resistance is selected.
Selection possible with buttons ▲ and ▼.
The number of the decimal places belongs to the programming of the characteristic curve.

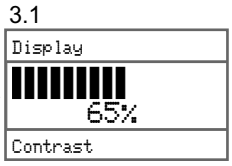
2.3



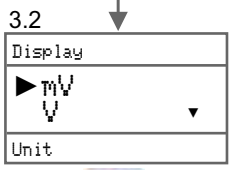
Digital filter
OFF or in steps of 0.5 s in the range from 0.5 ... 40s
Selection with buttons ▲ and ▼.

Continue page 8



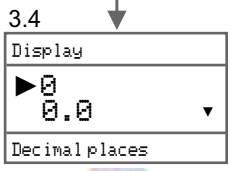


Display contrast
Setting possible from 0 ... 100% with buttons ▲ and ▼.

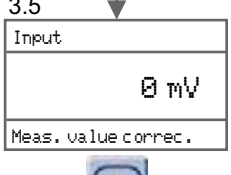


Display unit
The selected unit will be displayed and used for programming of the characteristic curve.
Installed units:
mV, V, mA, A, Ω, kΩ, µS/cm, mS/cm, °C, °F, min⁻¹, rpm, bar, mbar, hPa, kPa, mm, cm, m, %, °
and custom.
custom = max. 4 characters are free programmable.
Selection with buttons ▲ and ▼.

Custom unit
Only appears if custom is selected
Maximal 4 characters are programmable (see character set below).
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 4 characters are entered or no more characters wanted, the parameter custom unit will excited automatically.
Character set:
␣ 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
. ? ! , : _ % / \ + - * [ ] ( ) < = > " • ← → ↑ ↓ ◄ ► ▲ ▼ °
µ Ω Δ ^{1} ^{2} $^{-1}$ $^{-2}$

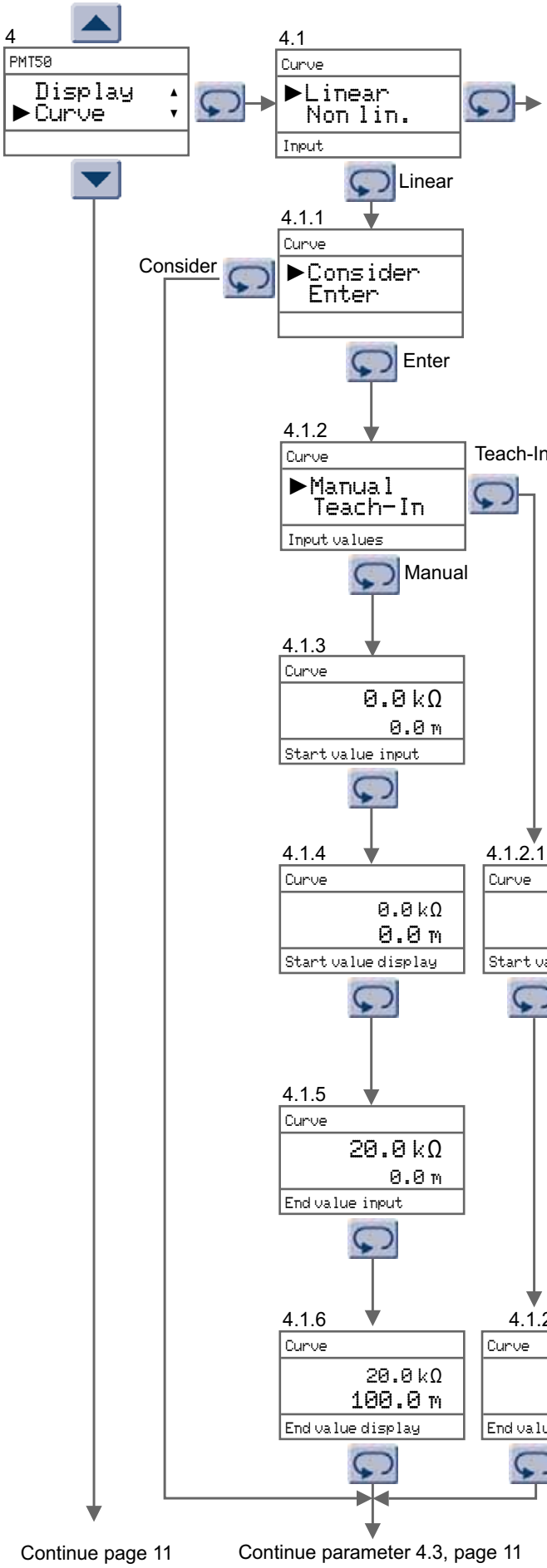


Number of decimal places
For the different models are following decimal places selectable:
Model 1: 0; 0.0; 0.00; 0.000
Model 2: 0; 0.0; 0.00; 0.000
Model 3: 0; 0.0
Selection with buttons ▲ and ▼.



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

Continue page 9



Linear
Start- and end value für input and display must be programmed. The display values are linear to the input signal.

Curve Non lin. see parameter 4.2 page 10
Selection with buttons ▲ and ▼.

Selection linear curve programming

Manual	Measuring and display values have to be entered.
Teach-In	The measured value will be overtaken automatically. The corresponding display value has to entered manual.

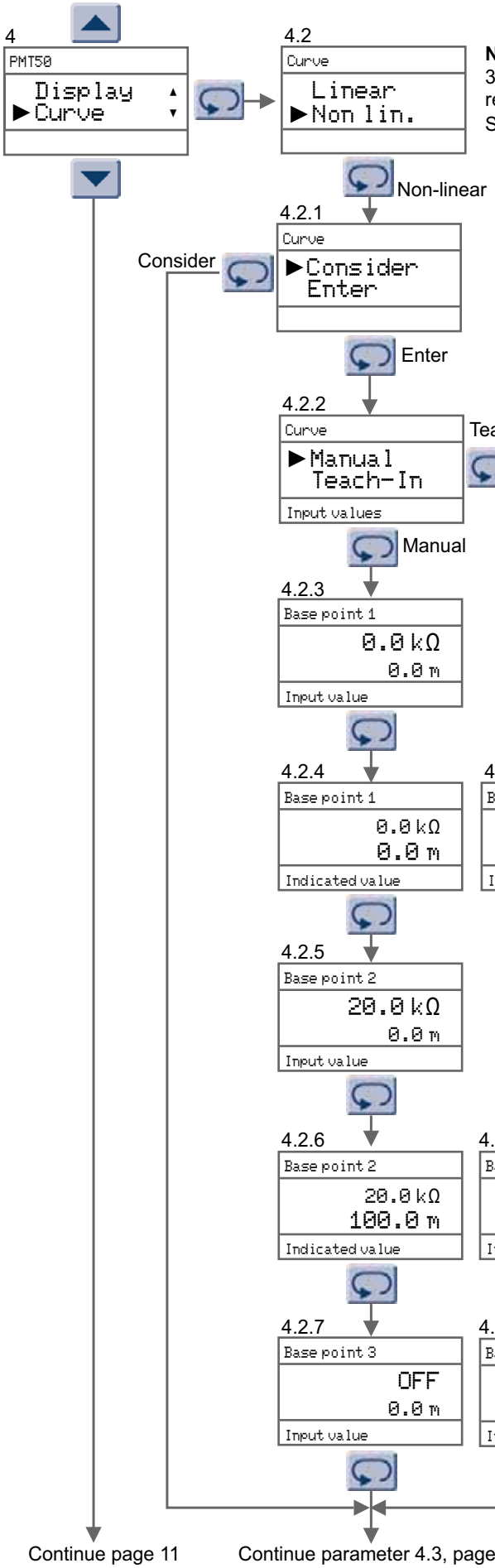
Selection with buttons ▲ and ▼.

Programming
Input of the measured value for start value of the characteristic curve, with buttons ▲ and ▼.
The Teach-In procedure overtake this value automatically.

Input of the value, which is displayed for the measured start value, with buttons ▲ and ▼.
The Teach-In procedure overtakes this value automatically as start value for the input signal.

Input of the value, which is displayed for the measured end value, with buttons ▲ and ▼.
The Teach-In procedure overtake this value automatically

Input of the value, which is displayed for the measured end value, with buttons ▲ and ▼.
The Teach-In procedure overtakes this value automatically as end value for the input signal.



Non linear
32 pair values for input and display values are programmable. Thereby every arbitrary characteristic curves are programmable
Selection with buttons ▲ and ▼.

Selection non linear curve programming
Manual Measuring and display values have to be entered.
Teach-In The measured value will be overtaken automatically. The corresponding display value has to entered manual.
Selection with buttons ▲ and ▼.

Programming
Manual:
For every base point an input value with the corresponding display value has to be programmed.

Teach-In:
The Teach-In procedure needs only the display value. The corresponding input value will be overtaken automatically.
Input of the values with buttons ▲ and ▼.

End of programming
The curve programming procedure will be finished by pressing the button ▼ until OFF is displayed.

Continue page 11
Continue parameter 4.3, page 11

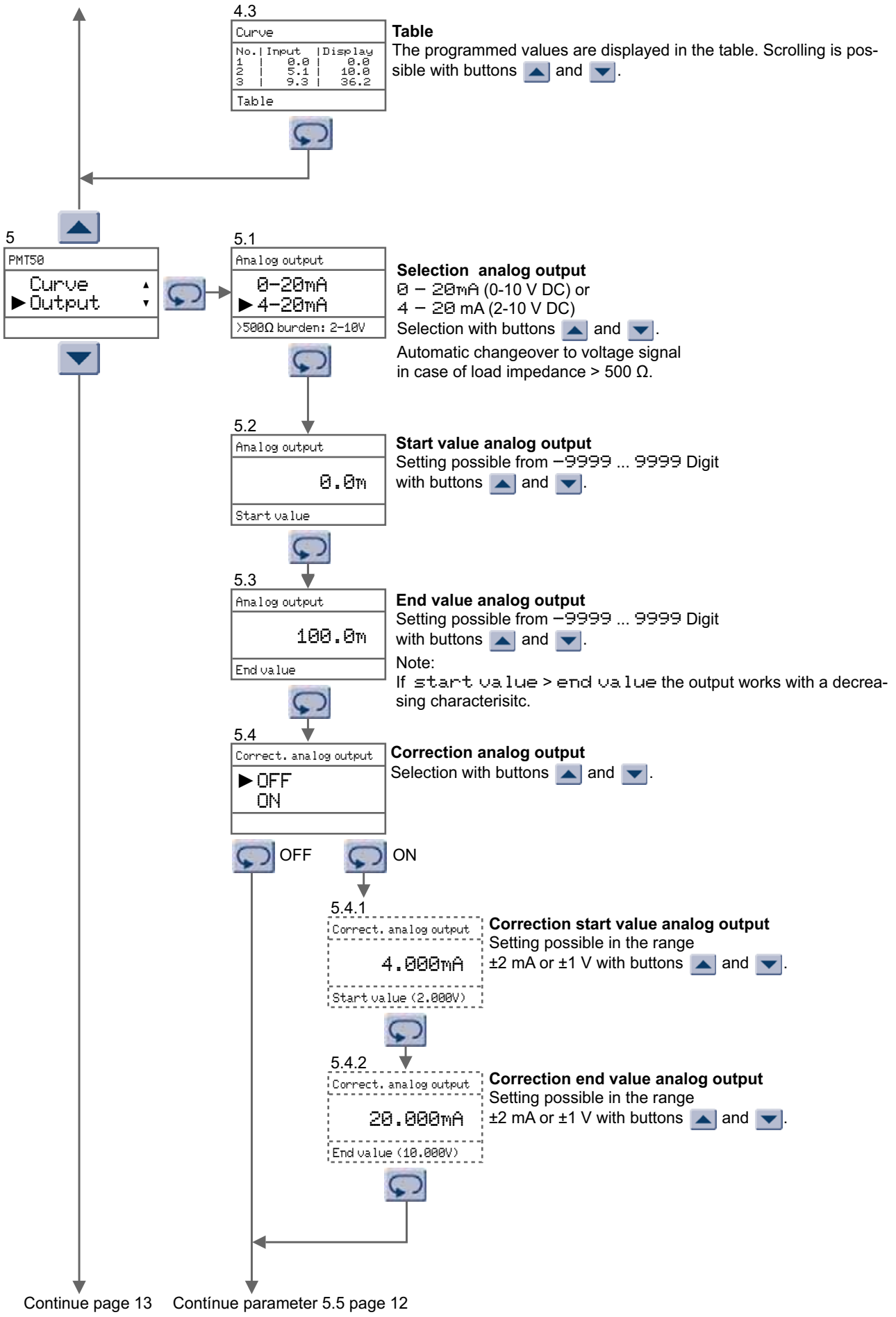


Table
The programmed values are displayed in the table. Scrolling is possible with buttons ▲ and ▼.

Selection analog output
0 – 20mA (0-10 V DC) or
4 – 20 mA (2-10 V DC)
Selection with buttons ▲ and ▼.
Automatic changeover to voltage signal in case of load impedance > 500 Ω.

Start value analog output
Setting possible from −9999 ... 9999 Digit with buttons ▲ and ▼.

End value analog output
Setting possible from −9999 ... 9999 Digit with buttons ▲ and ▼.
Note:
If start value > end value the output works with a decreasing characterisitc.

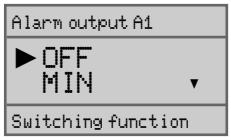
Correction analog output
Selection with buttons ▲ and ▼.

Correction start value analog output
Setting possible in the range ±2 mA or ±1 V with buttons ▲ and ▼.

Correction end value analog output
Setting possible in the range ±2 mA or ±1 V with buttons ▲ and ▼.

Continue page 13
Contínue parameter 5.5 page 12

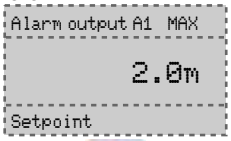
5.5



Switching function alarm output A1
OFF, MIN, MAX
Selection with buttons ▲ and ▼.

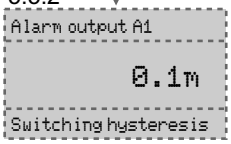
OFF MIN/MAX

5.5.1



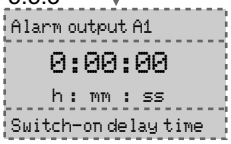
Setpoint alarm output A1
Setting possible from −9999 ... 9999 digit with buttons ▲ and ▼.

5.5.2



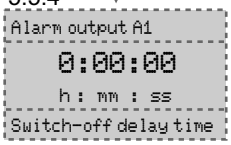
Hysteresis alarm output A1
Setting possible from 1 ... 9999 Digit with buttons ▲ and ▼.

5.5.3



Switch-on delay time alarm output A1
Setting possible from
0:00:00 ... 9:00:00 (h:mm:ss)
with buttons ▲ and ▼.

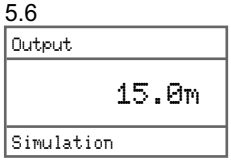
5.5.4



Switch-off delay time alarm output A 1
Setting possible from
0:00:00 ... 9:00:00 (h:mm:ss)
with buttons ▲ and ▼.

Note: *The parameter settings for A2 ... A4 have to be configured in the same way.*

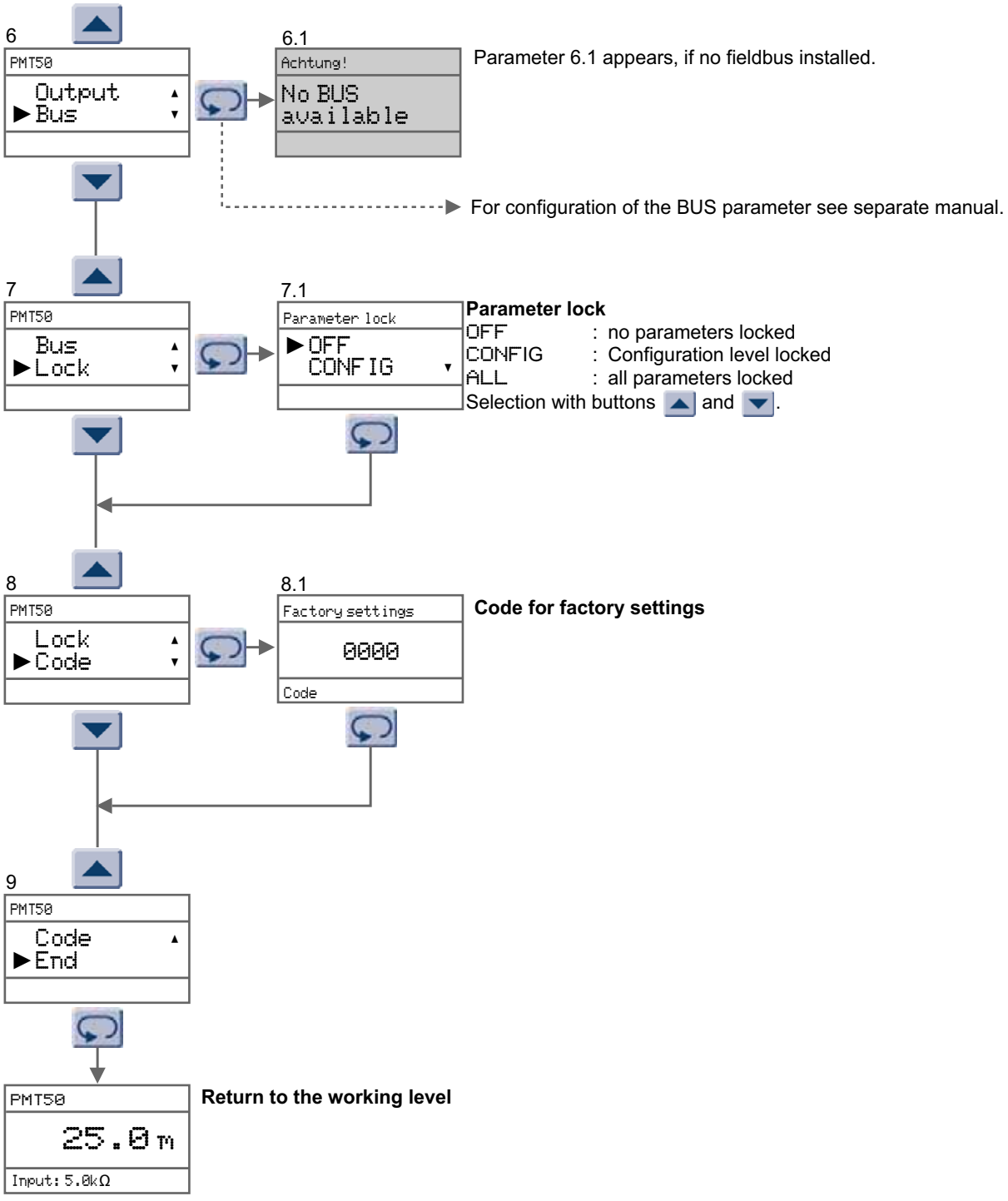
5.6

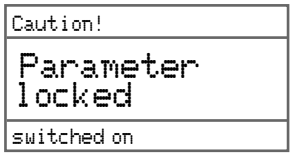
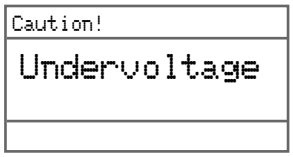
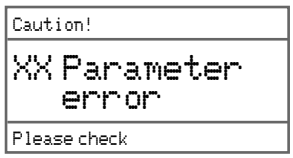
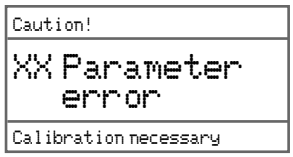
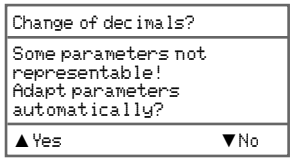
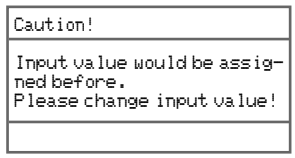


Simulation of the input signal
Der PMT50 works as actuator. The analog output changes in the programmed range.
Setting posssible with buttons ▲ and ▼.

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

Continue page 14


6
PMT50
Output
▶Bus
6.1
Achtung!
No BUS
available
Parameter 6.1 appears, if no fieldbus installed.
For configuration of the BUS parameter see separate manual.
7
PMT50
Bus
▶Lock
7.1
Parameter lock
▶OFF
CONFIG
Parameter lock
OFF : no parameters locked
CONFIG : Configuration level locked
ALL : all parameters locked
Selection with buttons and .
8
PMT50
Lock
▶Code
8.1
Factory settings
0000
Code
Code for factory settings
9
PMT50
Code
▶End
PMT50
25.0 °C
Input: 5.0kΩ
Return to the working level

Error reports	Description
	
	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.
	At the base-point programming the input value is assigned to an display value before.

Ordering code

PMT50 - 1. ☐ - 2. ☐ - 3. ☐ - 4. ☐ - 5. ☐ - 6. ☐

1. Model/Input

1	Standard signals 0/4 ... 20 mA; 0/2 ... 10 V DC		
2	Resistance from 0 ... 200 Ω up to 100 kΩ, Poti 1 kΩ ... 100 kΩ		
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 (FeCu-Ni)	-100.0 ... 800.0 °C/-100 ... 800 °C
		K (NiCr-Ni)	-150 ... 1200 °C
		N (NiCrSi-NiSi)	-150 ... 1200 °C
		S (Pt10Rh-Pt)	0 ... 1600 °C

2. Analog output

AO	0/4 ... 20 mA, 0/2 ... 10 V DC, galv. isolated

3. Alarm outputs

00	not installed	
2R	2 relay outputs	A1, A2 SPDT

4. Alarm outputs/BUS configuration

00	not installed	
2R	2 relay outputs	A3, A4 SPDT
MB	Modbus RTU/ASCII	RS485
PB	Profibus DP	

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

05	without option

Custom configuration

10/07-V1_0-01

Ihr kompetenter Ansprechpartner / Your competent contact partner : * seit 1958 *
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