CODIX 564

Process Controllers
for Temperature Sensors

english

for Thermocouples J, K, N, R, S, T, E, B
mV range sensors
Resistance thermometers PT100
Resistance sensors up to 500 Ω

Order code

6.56X.X1X.X0X

- Further outputs (optional)
  - 0 = none
  - 9 = analogue output (only for DC version)
- Supply voltage
  - 0 = 100 … 240 V AC ± 10%
  - 3 = 10 ... 30 V DC
- Outputs
  - 0 = Relays
- Front
  - 0 = Kübler version
  - A = Neutral version
- Input type
  - 4 = Temperature
  - 5 = Analogue
  - 6 = Strain-gauge

Table of Contents (German is the original version.)

1 Preface

Please read this instruction manual entirely and carefully before installation and start-up. Please observe all warnings and advice, both for your own safety and for general plant safety. If the device is not used in accordance with this instruction manual, then the intended protection can be impaired.

2 Safety instructions and Warnings

Please use the device only if its technical condition is perfect. It should be used only for its intended purpose. Please bear in mind safety aspects and potential dangers and adhere to the operating instructions at all times.
Defective or damaged devices should be disconnected from the mains immediately and taken out of operation.
The device shall not be opened. Use the repair service of the manufacturer.
Only connect the device to the electricity networks provided to that purpose.
The safety of the system in which the device is integrated is the responsibility of the installer.
Disconnect all electricity networks prior to any installation or maintenance work.
Use exclusively cables approved in your country and designed for your temperature and power ranges.
Installation and service work shall be carried out exclusively by qualified personnel.
The device must compulsorily be protected with approved external fuses. The value of these fuses can be found in the technical information.

This symbol is used on the device to remind of the existence of dangers, which are referred to in this manual.

2.1 Use according to the intended purpose

The purpose of the Process Control devices is to display measured values, as well as to monitor limit values (alarms). The application areas for this device lie in industrial processes and controls.
The application area for this device lies in industrial processes and controls, in the fields of manufacturing lines for the metal, wood, plastics, paper, glass, textile and other like industries. Over-voltages at the terminals of the device must be kept within the limits of Over-voltage Category II.
The device must only be operated when mounted in a panel in the correct way and in accordance with the section “Technical Data”.

The device is not suitable for use in hazardous areas and for areas excluded in EN 61010 Part 1. If the device is used to monitor machines or processes in which, in the event of a failure of the device or an error made by the operator, there might be the risk of damaging the machine or causing an accident to the operators, it is your responsibility to take the appropriate safety measures.

The device has been designed for indoor operation. It may nevertheless be used outdoors, provided the technical data is adhered to. In this case, take care to provide suitable UV protection.

2.2 Mounting in a control panel

CAUTION

Mount the device away from heat sources and avoid direct contact with corrosive liquids, hot steam or similar.

Provide a free space of 10mm all around the device for its ventilation.

The device should be mounted so that the terminals are out of the reach of the operator and cannot be touched by him. When mounting the device, consider the fact that only the front side is classified as accessible for the operator.

Mounting instructions

1. Remove the mounting clip from the device.
2. Insert the device from the front into the panel cut-out, ensuring the front-panel gasket is correctly seated.
3. Slide the fixing clip from the rear onto the housing, until the spring clamps are under tension and the upper and lower latching lugs have snapped into place.

Note: *In case of proper installation, IP65 can be reached on the front side.*

2.3 Electrical Installation

DANGER

The device must be disconnected from any power supply prior to any installation or maintenance work. Make sure that no more voltages LIABLE TO CAUSE AN ELECTROCUTION are present.

AC-powered devices must only be connected to the low-voltage network via a switch or circuit breaker installed close to the device and marked as their disconnecting device.

Installation or maintenance work must only be carried out by qualified personnel and in compliance with the applicable national and international standards.

Take care to separate all extra-low voltages entering or exiting the device from hazardous electrical conductors by means of a double or reinforced insulation (SELV circuits).

DANGER

The device must be protected externally for its proper operation. Information about the prescribed fuses can be found in the technical information.

The relay outputs are not protected internally in the device. Without suitable protection of the relay outputs, undesired heat development or even fire may occur. The relay outputs must be protected externally by the manufacturer of the plant. It must also be made sure that, even in case of a malfunction, the values stated in the technical data are under no circumstances exceeded.

- During installation, make sure that the supply voltage and the wiring of the output contacts are both fed from the same mains phase, in order not to exceed the maximum permitted voltage of 250V.
- The cables and their insulation must be designed for the planned temperature and voltage ranges. Regarding the type of the cables, adhere to the applicable standards of the country and of the plant. The cross sections allowed for the screw terminals can be found in the technical data.
- Before starting the device, check the cables for proper wiring and tightening. The screws of unused screw terminals must be screwed to the stop, so that they cannot loosen and get lost.
- The device has been designed for overvoltage category II. If higher transient voltages cannot be excluded, additional protection measures must be taken in order to limit the overvoltage to the values of CAT II.

Advice on noise immunity

All connections are protected against external sources of interference. The installation location should be chosen so that inductive or capacitive interference does not affect the device or its connecting lines! Interference (e.g. from switch-mode power supplies, motors, clocked controllers or contactors) can be reduced by means of appropriate cable routing and wiring.

Measures to be taken:

- Use only shielded cable and control lines. Connect shield at both ends. The conductor cross-section of the cables should be a minimum of 0.14 mm².
- The shield connection to the equipotential bonding should be as short as possible and with a contact area as large as possible (low-impedance).
- Only connect the shields to the control panel, if the latter is also earthed.
- Install the device as far away as possible from noise-containing cables.
- Avoid routing signal or control cables parallel to power lines.

2.4 Cleaning and maintenance

The front side of the unit should only be cleaned using a soft damp (water!) cloth. Cleaning of the embedded rear side is not planned and is the responsibility of the service personnel or of the installer.

In normal operation, this device is maintenance-free. Should the device nevertheless not operate properly, it must be sent back to the manufacturer or to the supplier. Opening and repairing the device by the user is not allowed and can adversely affect the original protection level.

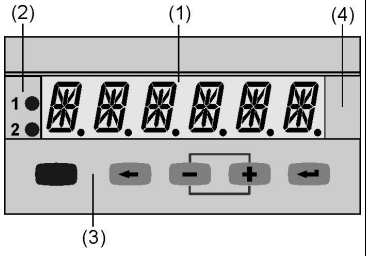
3 Description

Digital panel meter for displaying measured values, as well as monitoring limit values in industrial applications.

- 6-digit 14-segment LED display, 14 mm, for displaying measured values and dialogs
- Running text can be switched on as Help Text
- Language for the Help Text selectable as English or German
- Signal input for thermocouples J, K, N, R, S, T, E, B or mV range sensors
- Signal input for resistance thermometer (RTD) PT100 or resistance sensors up to 500 Ω
- Sampling rate 10 readings per second
- Digital filter (1st order) for smoothing display fluctuations with unstable input signals
- Customised linearisation for 100 mV and 500 Ω measuring ranges possible
- MIN/MAX memory function
- 2 Relay outputs (changeover contacts) for limit monitoring
- Start delay for relay outputs after Power ON
- Versions for supply voltage 10 ... 30 V DC and 100 … 240 V AC ± 10%
- Auxiliary power supply 24 V / 30 mA with AC supply
- Programmable via the front keys
- Multifunction key and two multifunction inputs, function programmable

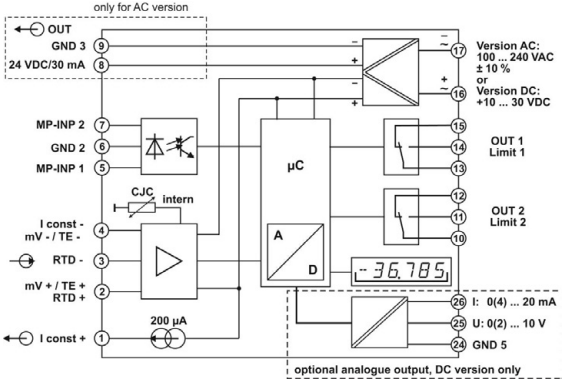
4 Display/Operating elements

(1) Display	
- 14 segment display, 6-digit, red	
- Height of figures 14 mm	
(2) Status display, 2 LED annunciators, red	
- Switching status of Alarm 1 and Alarm 2	
- Indication Function Group or Function	
(3) MP-Key and Programming Keys	
[ ]	- Multifunction key (MP-Key)
←	- Return from Function Group
	- Return from Function
−	- Select previous Function Group
	- Select previous Function
	- Decrement parameter value
+	- Select next Function Group
	- Select next Function
	- Increment parameter value
↵	- Enter a Function Group
	- Enter a Function
	- Accept the new setting
(4) Space for unit overlay	

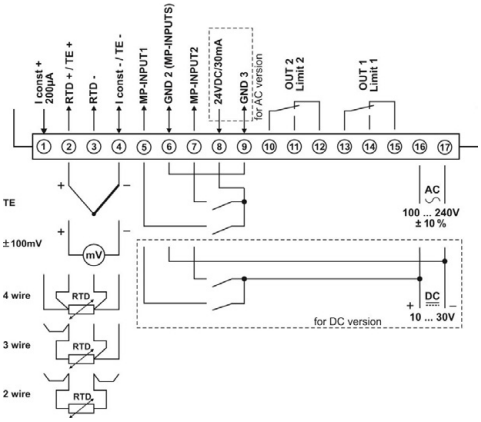


To enter the Programming Menu	− + + **> 3 sec**
To display Device Type and Software Version	← + − + ↵ **> 5 sec**
To restore factory default settings	← + ↵ **> 3 sec**

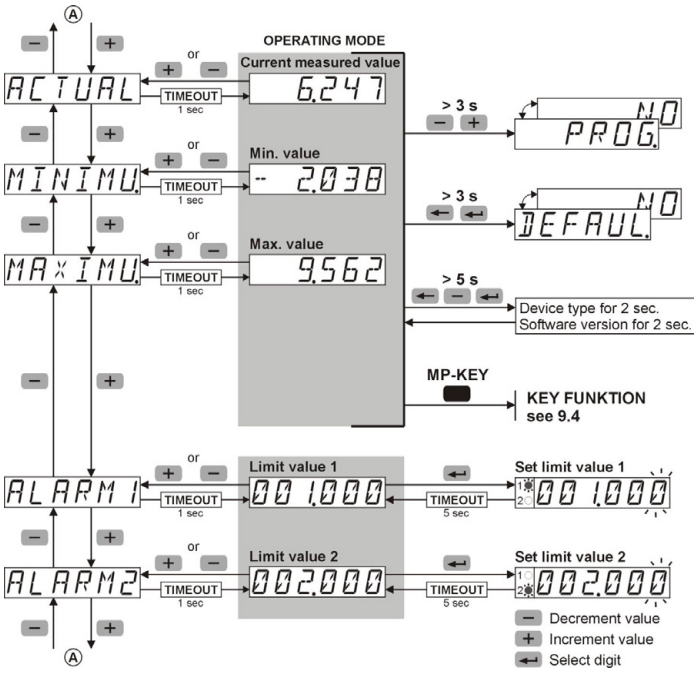
5 Block diagram



6 Connections



7 Operating concept (Operating mode)

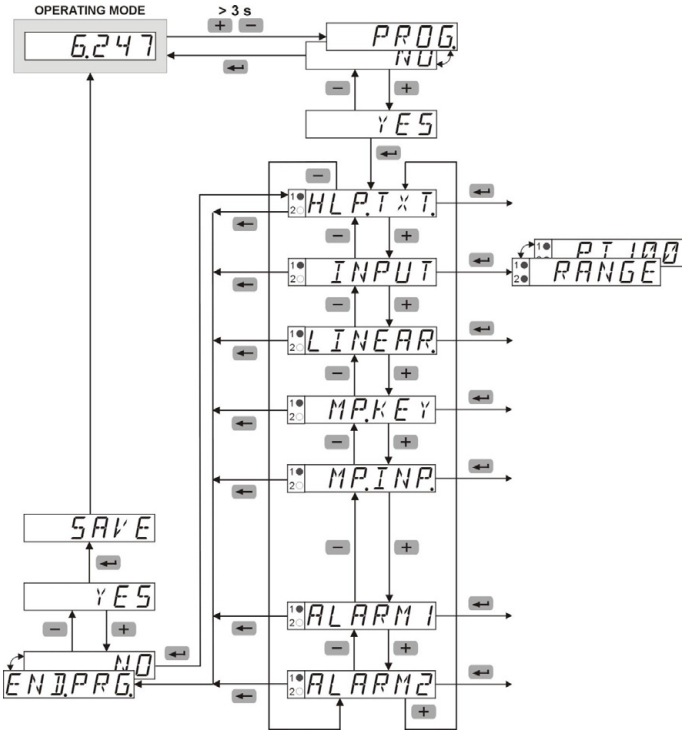


8 Programming

To enter the Programming Menu	− + + > 3 sec

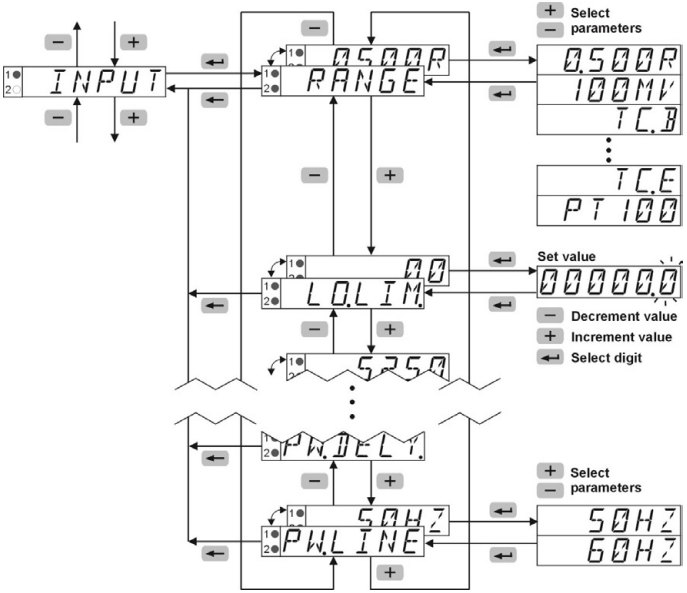
- During programming the relays are inactive (not energised).
- When quitting the programming menu via SAVE, the minimum and maximum vales are reset (cleared).

Entering the Programming Menu / Selecting Function Group / Quitting the Programming menu



Selecting Function / Setting Parameters / Accepting Parameters

Function Groups	Function	Parameters



9 Function Groups

Factory settings are highlighted grey.

9.1 Help Texts (running text)

HLP.TxT.	**Help Text menu**
HLP.TxT.	Select Help Text
ON	ON - a running text that has started can be aborted with any programming key
OFF	OFF
SL.LANG.	Select language for Help Text
EN	English
DE	Deutsch (German)

9.2 Signal inputs

INPUT	**Menu Input Signal**
RANGE	Select Temperature probe
PT 100	Resistance thermometer RTD Pt 100 [-200.0 … +850.0°C]
0.500R	Resistance 0 … 500 Ω
100MV	Millivolt -100 … +100 mV
TC.B	Thermocouple Pt30Rh-Pt6Rh
TC.J	Thermocouple Fe-CuNi
TC.K	Thermocouple NiCr-Ni
TC.N	Thermocouple NiCrSi-NiSi
TC.R	Thermocouple Pt13Rh-Pt
TC.S	Thermocouple Pt10Rh-Pt
TC.T	Thermocouple Cu-CuNi
TC.E	Thermocouple NiCr-CuNi
For PT100	
UNIT	Select temperature units
°C	Temperature in °C
°F	Temperature in °F
METH.	Select probe connection
2.WIRE	2-wire connection
3.WIRE	3-wire connection
4.WIRE	4-wire connection
Only for 2-WIRE	
R.WIRE	Select wire resistance of one connection wire
0.0	Input range 0.0 … 25.0 Ω
ADJUST	Select Correction Value (Offset)
0.0	Input range -99.9 … +99.9°C Input range -99,9 … +99,9°F
DP.	Select resolution
0.0	0 °C/°F 0.0 °C/°F
for 0.500R	
LO.LIM.	Select lower measuring range limit
0.0	Input range 0.0 … 525.0 Ω
HI.LIM.	Select upper measuring range limit
525.0	Input range 0.0 … 525.0 Ω
METH.	Select probe connection
2.WIRE	2-wire connection
3.WIRE	3-wire connection
4.WIRE	4-wire connection
Only for 2WIRE	
R.WIRE	Select wire resistance of one connection wire
0.0	Input range 0.0 … 25.0 Ω
DP.	Select decimal point (optical function only)
0.0	0 0.0 0.00 0.000 0.0000 0.00000
INP.LO.	Select input low value
0.0	Input range 0.0 … 525.0 Ω
DISP.LO.	Select display low value for INP.LO.
0.0	Input range -199999 … +999999 and DP
INP.HI.	Select input high value
500.0	Input range 0.0 … 525.0 Ω
DISP.HI.	Select display high value for INP.HI.
500.0	Input range -199999 … +999999 and DP

for 100 mV	
LO.LIM	Select lower measuring range limit
-105.00	Input range -105.00 … +105.00 mV
HI.LIM	Select upper measuring range limit
105.00	Input range -105.00 … +105.00 mV
DP	Select decimal point (optical function only)
0.00	0 0.0 0.00 0.000 0.0000 0.00000
INP.LO	Select input low value
-100.00	Input range -105.00 … +105.00 mV
DISP.LO	Select display low value for INP.LO.
-100.00	Input range -199999 … +999999 and DP
INP.HI	Select input high value
100.00	Input range -105.00 … +105.00 mV
DISP.HI	Select display high value for INP.HI.
100.00	Input range -199999 … +999999 and DP
for TC.x	
UNIT	Select Temperature unit
°C	Temperature in °C
°F	Temperature in °F
REF.JUN	Select cold (reference) junction compensation
INTERN	Internal compensation
EXTERN	External compensation
JUN.TMP	Select external junction temperature
0.0	Input range -99.9 … +99.9°C or -147.8 … +212.0°F
ADJUST	Select Correction Value (Offset)
0.0	Input range -99.9 … +99.9°C Input range -99,9 … +99,9°F

DP	Select resolution
0.0	0 °C/°F 0.0 °C/°F (not with TC.B, R, S)
all	
FILTER	Select Input Filter The Filter function shows how many measurement cycles are used to determine the moving average.
1	Input range 1 … 99 [cycles] - with a value of 1 the filter function is switched off
PW.DELY	Select Start Delay after Power On (limit monitoring is processed only after the programmed time has expired)
0.0	Input range 0.0 ... 99.9 [sec]
PW.FREQ	Select local mains frequency
50Hz	Mains frequency 50 Hz
60Hz	Mains frequency 60 Hz

The functions LO.LIM and HI.LIM limit the editable range.

The value for HI.LIM must always be greater than the value for LO.LIM.

9.3 User Linearisation (±100 mV / 500 Ω)

	Menu User Linearisation
LINEAR.	Select User Linearisation
NO	Linearisation OFF
YES	Linearisation ON
NUM.PNT.	Select number of linearisation (control) points
3	Input range 3 … 12
INP.LO.	Select input low value
-100.00	Input range depends on measuring range [Ω / mV]
DISP.LO.	Select display low value for INP.LO.
-100.00	Input range -199999 … +999999 and DP
INP.01	Select input value 1
0.00	Input range depends on measuring range [Ω / mV]
DISP.01	Select display value for INP.01.
0.00	Input range -199999 … +999999 and DP

A maximum of 12 linearisation points is possible. An input value INP must be entered for each linearisation point (LP) - input of the sensor value from the analogue input in physical units - as well as the corresponding display value DISP for this sensor value. The linearisation points (LP) may be entered in any order. They are then sorted in the firmware in ascending order for the linearisation function. Linearisation based on a negative slope is possible.

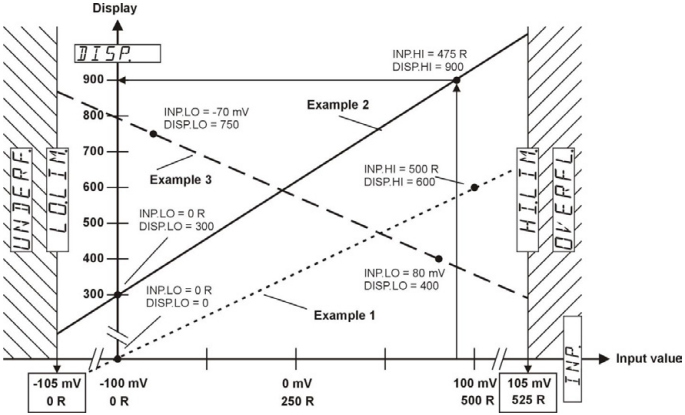
INP.10	Select input value 10
0.00	Input range depends on measuring range [Ω / mV]
DISP.10	Select display value for INP.10.
0.00	Input range -199999 … +999999 and DP
INP.HI.	Select input high value
100.00	Input range depends on measuring range [Ω / mV]
DISP.HI.	Select display high value for INP.HI.
100.00	Input range -199999 … +999999 and DP

The functions LO.LIM and HI.LIM limit the editable range.

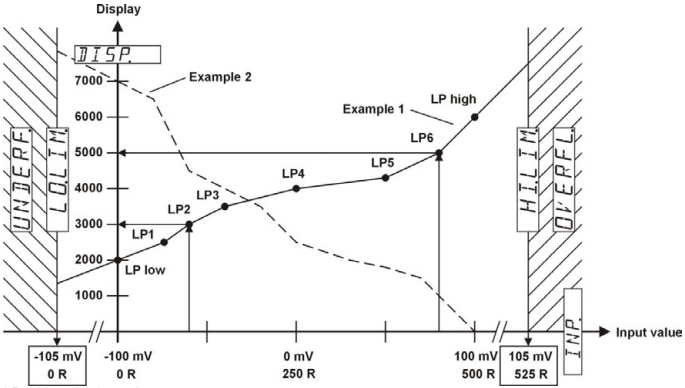
The value for HI.LIM must always be greater than the value for LO.LIM.

Example for linear scaling

Example 1: 0 … 500 Ω = 0 … 600
Example 2: 0 … 475 Ω = 300 … 900
Example 3: -70 … +80 mV = 750 … 400



Example for non-linear scaling



LP = Linearisation point

9.4 Function Multifunction Key (MP-Key) and Multifunction inputs (MP-INP)

Reset MIN value memory

- In the function group MP.KEY, programme the function RES.MIN to ON. In the operating mode select the minimum value memory (MINIMU) and briefly press the MP Key.
- In the function group MP.INP, programme the function MP.INP1 or MP.INP2 to RES.MIN or R.PEAKS. In the operating mode briefly activate the multifunction input 1 or multifunction input 2.

Reset MAX value memory

- In the function group MP.KEY, programme the function RES.MAX to ON. In the operating mode select the maximum value memory (MAXIMU) and briefly press the MP Key.
- In the function group MP.INP, programme the function MP.INP1 or MP.INP2 to RES.MAX or R.PEAKS. In the operating mode briefly activate the multifunction input 1 or multifunction input 2.

Reset of relay outputs in Latch mode

- In the function group MP.KEY, programme the function RES.REL to ON. In the operating mode briefly press the MP Key.
- In the function group MP.INP, programme the function MP.INP1 or MP.INP2 to RES.REL. In the operating mode briefly activate the multifunction input 1 or multifunction input 2.

Display Hold

- In the function group MP.INP, programme the function MP.INP1 or MP.INP2 to DISP.HD. In the operating mode, select either the current measured value (ACTUAL) or the totaliser (TOTAL) and activate multifunction input 1 or multifunction input 2.

Lock-out Limit Value (Alarm) setting

- In the function group MP.INP, programme the function MP.INP1 or MP.INP2 to LOC.ALR. In the operating mode, activate multifunction input 1 or multifunction input 2.

Lock-out Programming and Default setting

- In the function group MP.INP, programme the function MP.INP1 or MP.INP2 to LOC.PRG. In the operating mode, activate multifunction input 1 or multifunction input 2.

Lock-out Keypad

- In the function group MP.INP, programme the function MP.INP1 or MP.INP2 to LOC.KEY. In the operating mode, activate multifunction input 1 or multifunction input 2.

9.4.1 Multifunction Key

	Menu Function MP-Key
MP.KEY	
RES.MIN	Select function: Reset MIN value with MP-Key – only when MIN value appears in the display
OFF	OFF
ON	ON
RES.MAX	Select function: Reset MAX with MP-Key – only when MAX value appears in the display
OFF	OFF
ON	ON
RES.REL	Select function Output-Latch Reset with MP-Key - only if output is in memory mode (ALARMx = LATCH)
OFF	OFF
ON	ON - this setting is possible only if all other settings are set to OFF

9.4.2 Multifunction Inputs

	Menu Function MP-Inputs
MP.INP.	
MP.INP.1	Select function MP-Input 1
NO.FUNC.	No function
RES.MIN	Reset MIN value
RES.MAX	Reset MAX value
R.PEAKS	Reset MIN and MAX values
RES.REL.	Reset Output-Latch - only if output is in memory mode (ALARMx = LATCH)
DISP.HD.	Hold ('freeze') display
LOC.ALR.	Lock-out limit value setting
LOC.PRG.	Lock-out programming and default setting
LOC.KEY	Lock-out limit value setting, programming, default setting and MP-Key

	Select function MP-Input 2
MP.INP2	
NO.FUNC.	No function
RES.MIN	Reset MIN value
RES.MAX	Reset MAX value
R.PEAKS	Reset MIN and MAX values
RES.REL.	Reset Output-Latch - only if output is in memory mode (ALARMx = LATCH)
DISP.HD.	Hold ('freeze') display
LOC.ALR.	Lock-out limit value setting
LOC.PRG.	Lock-out programming and default setting
LOC.KEY	Lock-out limit value setting, programming, default setting and MP-Key

9.5 Limit Value (Alarm) Monitoring

ALARM 1	**Menu Alarm Output 1**
AL.OUT 1	Select operating mode
OFF	OFF
AUTO	Automatic operation
LATCH	Memory latch operation - not with band limitation
MD.OUT 1	Select Output triggering
INCR	With incrementing measuring signal
DECR	With decrementing measuring signal
BAND	Band limitation
FM.OUT 1	Select Alarm status
---r--	With alarm: output active
--7---	With alarm: output inactive
ON.HY 5.1	Select on-hysteresis
0.00	Input range 0 … +9999 and DP
OF.HY 5.1	Select off-hysteresis - only with auto operation
0.00	Input range 0 … +9999 and DP
ON.DL Y.1	Select on-delay
0.0	Input range 0.0 ... 99.9 [sec]
OF.DL Y.1	Select off-delay - only with auto operation
0.0	Input range 0.0 ... 99.9 [sec]

ALARM2	**Menu Alarm Output 2**
AL.OUT2	Select operating mode
OFF	OFF
AUTO	Automatic operation
LATCH	Memory latch operation
MD.OUT2	Select Output triggering
INCR	With incrementing measuring signal
DECR	With decrementing measuring signal
BAND	Band limitation
FM.OUT2	Select Alarm status
---r--	With alarm: output active
--7---	With alarm: output inactive

ON.HY 5.2	Select on-hysteresis
0.00	Input range 0 … +9999 and DP
OF.HY 5.2	Select off-hysteresis - only with auto operation
0.00	Input range 0 … +9999 and DP
ON.DL Y.2	Select on-delay
0.0	Input range 0.0 ... 99.9 [sec]
OF.DL Y.2	Select off-delay - only with auto operation
0.0	Input range 0.0 ... 99.9 [sec]

INCR
ON switching point = limit value + ON hysteresis
OFF switching point = limit value – OFF hysteresis

DECR
ON switching point = limit value – ON hysteresis
OFF switching point = limit value + OFF hysteresis

BAND
An alarm is triggered, if the measured value falls outside a defined range (Band).
Upper switching point = limit value + ON hysteresis
Lower switching point = limit value – OFF hysteresis

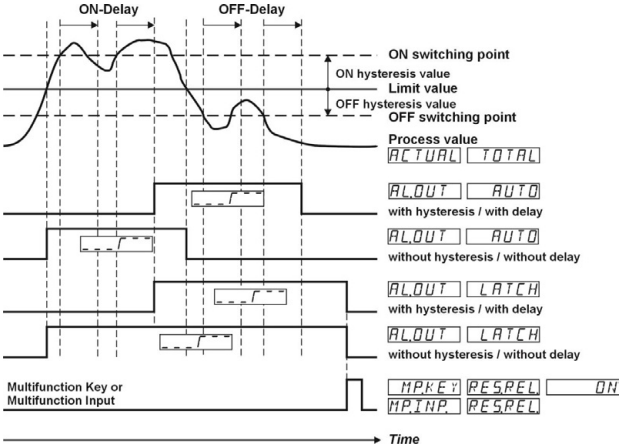
---r--
An alarm causes the output to become active (Relay energised, LED ON)

--7---
An alarm causes the output to become inactive (Relay not energised, LED OFF)

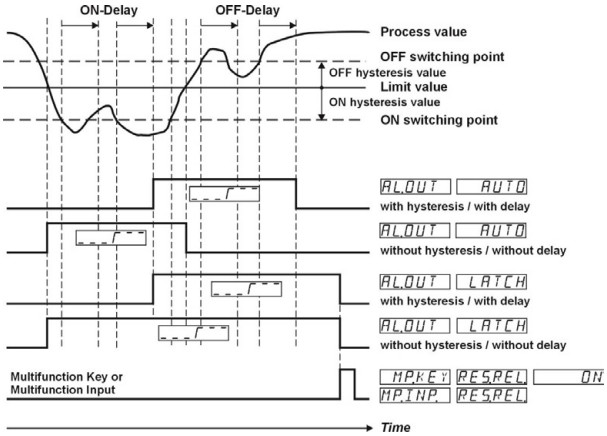
PW.DEL Y. LATCH
In memory latch operation the status of the outputs is stored in the event of a Power OFF condition and then immediately restored at the next Power ON.

PW.DEL Y. AUTO
In automatic (auto) operation the status of the outputs is not saved in the event of a Power OFF condition. At the next Power ON the limit values are not processed until after the expiration of the start delay (PW.DELY).

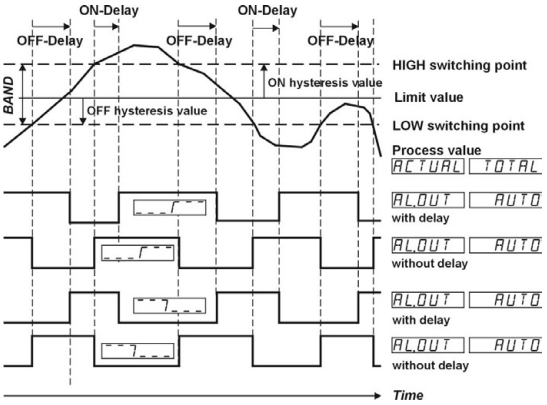
Control with incrementing measuring signal INCR



Control with decrementing measuring signal DECR



Control with Band Limitation BAND



10 Monitoring of Measuring Circuit

Meas. range	Lower Display Range limit DISPLO	Upper Display Range limit DISPHI	Lower Meas. Range limit LOLIM	Upper Meas. Range limit HILIM	Probe or wire short-circuit Probe or wire break
TC	–	–	■ 3)	■ 3)	■ 1)
PT100	–	–	■ 3)	■ 3)	■
±100 mV	■	■	■	■	■ 1)
500 Ω	■	■	■	■	■ 2)
Indication	-199999 **blinking**	999999 **blinking**	UNDERFL **blinking**	OVERFL **blinking**	SENSOR **blinking**

(■ = is detected)
1) only probe or wire break
2) no probe or wire short-circuit with 2-wire sensors
3) with thermocouples and Pt100 the measuring range limits are fixed in advance

11 Technical Data

11.1 General Data

Display:	6-digit, 14 segment LED
Digit height:	14 mm
Data retention:	> 10 years, EEPROM
Operation:	5 keys

11.2 Measuring signal inputs

Sampling rate: 10 readings/sec.
SELV circuits, reinforced / double insulation

Input Thermocouple

Sensor		Range	Accuracy @ 23°C
Fe-CuNi	J	-210.0 … +1200.0°C	typ. 0.2°C max. 0.5°C
NiCr-Ni	K	-200.0 … +499.9°C	typ. 0.6°C max. 1.0°C
		-500.0 … +1372.0°C	typ. 0.3°C max. 0.5°C
Cu-CuNi	T	-200.0 … +400.0°C	typ. 0.2°C max. 0.5°C
NiCr-CuNi	E	-200.0 … +1000.0°C	typ. 0.2°C max. 0.5°C
NiCrSi-NiSi	N	-200.0 … +1300.0°C	typ. 0.3°C max. 0.7°C
Pt10Rh-Pt	S	-50 … +1768°C	typ. 1.0°C max. 2.0°C
Pt13Rh-Pt	R	-50 … +1768°C	typ. 1.0°C max. 2.0°C
Pt30Rh-Pt6Rh	B	+250 … +1820°C	typ. 1.0°C max. 2.0°C

Resolution J, K, T, E, N:	1 or 0.1°C/°F
Resolution S, R, B:	1 °C/°F
Temperature drift:	< 100 ppm/K
Reference point: (cold junction)	internal or external constant
Reference point accuracy:	≤ ±1°C

Input mV

Measuring range:	± 105 mV
Resolution:	± 15 Bit
Measuring accuracy @ 23°C:	typ. 0.02 % of range max ≤0.05% of range
Temperature drift:	< 100 ppm/K
Input resistance:	> 2 MΩ

Input Pt100

Measuring range:	-200 … +850°C
Resolution:	1 or 0.1°C/°F
Measuring accuracy @ 23°C:	typ. 0.3°C max. ≤0.6°C
Temperature drift:	< 100 ppm/K
Measuring current:	200 µA
Connection:	2-, 3-, 4-wire
Lead wire resistance:	max. 25 Ω per wire

Input 500 Ω

Measuring range:	0 … 525 Ω
Resolution:	15 Bit
Measuring accuracy @ 23°C:	typ. 0.1 Ω max. ≤0.2 Ω
Temperature drift:	< 100 ppm/K
Measuring current:	200 µA
Connection:	2-, 3-, 4-wire
Lead wire resistance:	max. 25 Ω per wire

11.3 Control Inputs MPI 1 / MPI 2

SELV circuits, reinforced / double insulation

Quantity:	2, optocouplers
Function:	programmable
Switching levels:	Low: < 2 V High: > 4 V (max. 30 V)
Pulse length:	> 100 ms

11.4 Alarm outputs

Relays:	changeover contacts
Prescribed fuse:	5A
Switching voltage:	max. 250 V AC / 125 V DC min. 5 V AC / 5 V DC
Switching current:	max. 5 A AC / A DC min. 10 mA DC
Switching capacity:	max. 1250 VA / 150 W
Pull-in time:	approx. 10 ms

⚠	The maximum values shall in no case be exceeded!

Mechanical service life (switching cycles)	$1x10^7$
N° of switching cycles at 5 A / 250 V AC	$5x10^4$
N° of switching cycles at 5 A / 30 V DC	$5x10^4$

11.5 Supply voltage

AC supply:	100 ... 240 V AC / max. 9 VA 50 / 60 Hz, Tolerance ± 10% ext. fuse protection: T 0.1 A
DC supply:	10 ... 30 V DC / max. 3.5 W with galvanic isolation and, reverse polarity protection SELV, CLASS II (Limited Power Source) ext. fuse protection: T 0.4 A
Mains hum suppression:	50 Hz or 60 Hz programmable

11.6 Sensor Supply Voltage

(Voltage output for external sensors)
SELV circuits, reinforced / double insulation

AC supply:	24 V DC ± 15 %, 30 mA

11.7 Climatic Conditions

Operating temperature:	-20°C ... +65°C
Storage temperature:	-25°C … +75°C
Relative humidity:	R.H. 93 % at +40°C, non-condensing
Altitude:	up to 2000 m

11.8 EMC

Noise immunity:	EN 61000-6-2 with shielded signal and control cables
Noise emission:	EN 55011 Class B

11.9 Device Safety

Design to:	EN 61010 Part 1
Protection Class:	Protection Class 2 (front side)

⚠ Only the front side is classified as accessible for the operator.

Application area:	Pollution level 2 over-voltage Category II
Insulation:	Front: double insulation, Rear side: basic insulation,

Signal inputs and und sensor power supply: SELV

11.10 Mechanical Data

Housing:	Panel mount housing to DIN 43 700, RAL 7021
Dimensions:	96 x 48 x 102 mm
Panel cut-out:	$92^{+0.8}$ x $45^{+0.6}$ mm
Installation depth:	approx. 92 mm incl. terminals
Weight:	approx. 180 g
Protection:	IP65 (front, device only)
Housing material:	Polycarbonate UL94 V-2
Vibration resistance:	10 - 55 Hz / 1 mm / XYZ
EN 60068-2-6	30 min in each direction
Shock resistance:	
EN 60068-2-27	100G / XYZ 3 times in each direction
EN 60068-2-29	10G / 6 ms / XYZ 2000 times in each direction

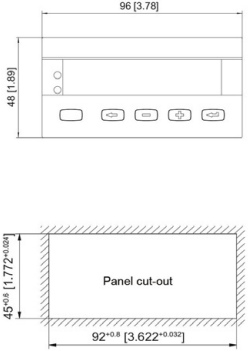
11.11 Connections

Supply voltage and outputs:
Plug-in screw terminal, 8-pin, RM5.00
Core cross-section, max. 2.5 mm²

Signal and control inputs:
Plug-in screw terminal, 9-pin, RM 3.50
Core cross section, max. 1.5 mm²

12 Dimensional Drawings

Dimensions in mm [inch]



13 Help Texts

PROG.	NO	NO PROGRAMMING
PROG.	YES	START PROGRAMMING
HLP.TXT.		MAIN MENU SELECT HELPTEXT
HLP.TXT.	ON	HELPTEXTS ON
HLP.TXT	OFF	HELPTEXTS OFF
SL.LANG.	DE	SPRACHE DEUTSCH
SL.LANG.	EN	LANGUAGE ENGLISH
INPUT.		MAIN MENU SIGNAL INPUT
RANGE	TC.J	THERMOCOUPLE J
RANGE	TC.K	THERMOCOUPLE K
RANGE	TC.N	THERMOCOUPLE N
RANGE	TC.B	THERMOCOUPLE B
RANGE	TC.R	THERMOCOUPLE R
RANGE	TC.S	THERMOCOUPLE S
RANGE	TC.E	THERMOCOUPLE E
RANGE	TC.T	THERMOCOUPLE T
RANGE	PT100	RESISTANCE THERMOMETER PT100
RANGE	0.500R	RESISTANCE INPUT RANGE 0-500 OHM
RANGE	100MV	VOLTAGE INPUT RANGE -100MV/+100MV
LO.LIM.		LOWER INPUT RANGE LIMIT
HI.LIM.		UPPER INPUT RANGE LIMIT
UNIT	°C	TEMPERATURE IN °C
UNIT	°F	TEMPERATURE IN °F
METH	2.WIRE	2-WIRE CONNECTION
METH	3.WIRE	3-WIRE CONNECTION
METH	4.WIRE	4-WIRE CONNECTION
R.WIRE		LINE RESISTANCE IN OHM
REF.JUN	INTERN	COLD JUNCTION COMPENSATION INTERN
REF.JUN	EXTERN	COLD JUNCTION COMPENSATION EXTERN
JUN.TMP		EXTERNAL COLD JUNCTION TEMPERATURE
ADJUST		CORRECTION VALUE
DP.	0	NO DECIMAL POINT
DP.	0.0	DECIMAL POINT 0.0
DP.	0.00	DECIMAL POINT 0.00
DP.	0.000	DECIMAL POINT 0.000
DP.	0.0000	DECIMAL POINT 0.0000
DP.	0.00000	DECIMAL POINT 0.00000
INP.LO.		INPUT START VALUE
DISP.LO.		DISPLAY START VALUE
INP.HI.		INPUT END VALUE
DISP.HI.		DISPLAY END VALUE
FILTER		INPUT FILTER
PW.DELY.		POWER-ON DELAY FOR OUTPUTS [SEC]
PW.FREQ.	50HZ	POWER LINE FREQUENCY 50HZ
PW.FREQ.	60HZ	POWER LINE FREQUENCY 60HZ
LINEAR.		MAIN MENU LINEARIZATION
LINEAR.	NO	LINEARIZATION OFF
LINEAR.	YES	LINEARIZATION ON
NUM.PNT.		NUMBER OF LINEARIZATION POINTS

INP.01		INPUT VALUE NO.1
DISP.01		DISPLAY VALUE NO.1
to		
INP.10		INPUT VALUE NO.10
DISP.10		DISPLAY VALUE NO.10
MP.KEY		MAIN MENU MP-BUTTON
RES.MIN.	OFF	FUNCTION RESET MIN VALUE OFF
RES.MIN.	ON	FUNCTION RESET MAX VALUE ON
RES.MAX.	OFF	FUNCTION RESET MIN VALUE OFF
RES.MAX.	ON	FUNCTION RESET MAX VALUE ON
RES.REL.	OFF	FUNCTION RESET OUTPUT-LATCH OFF
RES.REL.	ON	FUNCTION RESET OUTPUT-LATCH ON
MP.INP.		MAIN MENU MP-INPUTS
MP.INP.1	NO.FUNC.	NO FUNCTION
MP.INP.1	RES.MIN.	FUNCTION RESET MIN VALUE
MP.INP.x	RES.MAX.	FUNCTION RESET MAX VALUE
MP.INP.x	R.PEAKS	FUNCTION RESET MIN/MAX VALUE
MP.INP.x	RES.REL.	FUNCTION RESET OUTPUT-LATCH
MP.INP.x	DISP.HD.	FUNCTION DISPLAY HOLD
MP.INP.x	LOC.ALR.	FUNCTION LOCK EDITING ALARM VALUE
MP.INP.x	LOC.PRG.	FUNCTION LOCK PROGRAMMING
MP.INP.x	LOC.KEY	FUNCTION LOCK KEYS
ALARMx		MAIN MENU ALARM x
AL.OUTx	OFF	ALARM x OFF
AL.OUTx	AUTO	AUTOMATIC MODE OF ALARM OUTPUT x
AL.OUTx	LATCH	LATCH MODE OF ALARM OUTPUT x
MD.OUTx	INCR	ALARM x ACTIVE AT INCREASING INPUT SIGNAL
MD.OUTx	DECR	ALARM x ACTIVE AT DECREASING INPUT SIGNAL
MD.OUTx	BAND	ALARM x BAND LIMITATION
FM.OUTx		OUTPUT ACTIVE AT ALARM
FM.OUTx		OUTPUT INACTIVE AT ALARM
ON.HYS.x		SWITCH ON HYSTERESIS ALARM x
OF.HYS.x		SWITCH OFF HYSTERESIS ALARM x
ON.DLY.x		ON DELAY ALARM x [SEC]
OF.DLY.x		OFF DELAY ALARM x [SEC]
END.PRG.	NO	REPEAT PROGRAMMING
END.PRG.	YES	EXIT PROGRAMMING AND STORE DATAS
-1.9.9.9.9.9		DISPLAY RANGE UNDERFLOW
9.9.9.9.9.9.		DISPLAY RANGE OVERFLOW
OVERFL.		OVERFLOW UPPER INPUT RANGE LIMIT
UNDERF.		UNDERFLOW LOWER INPUT RANGE LIMIT
SENSOR		SENSOR ERROR

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