

CODIX 552

Kübler



Prozessanzeige

für Strom-/Spannungssignale,
mit Totalisator

Process display

for Current / Voltage signals,
with Totalizer

Contrôleur de process

pour signaux de courant/de tension
avec totalisateur.

Controlador de proceso

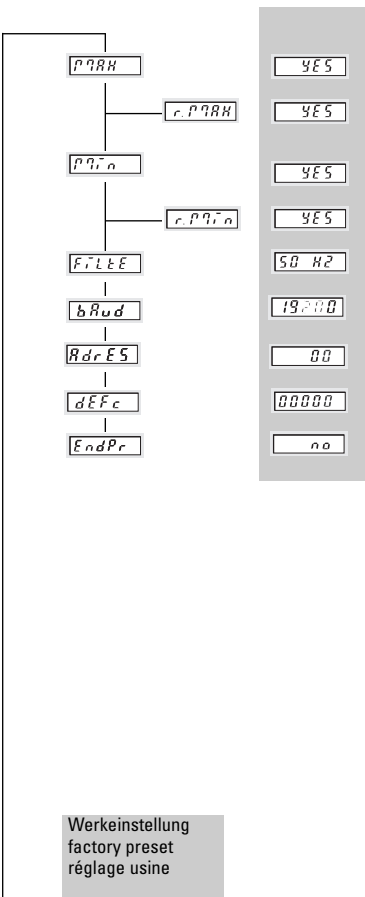
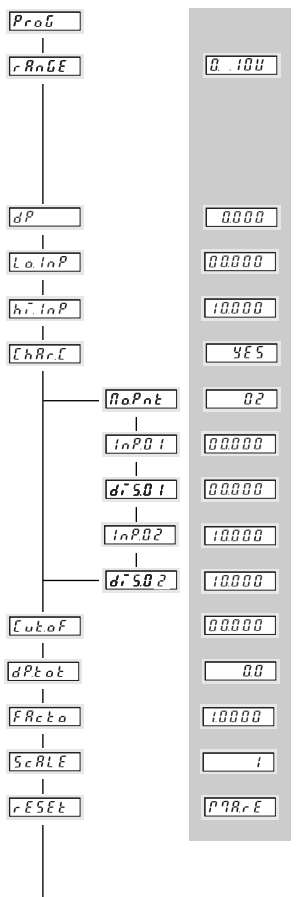
para señales de corriente y tensión,
con totalizador.

deutsch

english

français

español



Werkeinstellung
factory preset
réglage usine

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1 Safety instructions and warnings



Only use this display
– in a way according to its intended purpose
– if its technical condition is perfect
– adhering to the operating instructions and the general safety instructions.

1. Before carrying out any installation or maintenance work, make sure that the power supply of the digital display is switched off.
2. Only use this digital display in a way according to its intended purpose.
3. If its technical condition is perfect.
4. Adhering to the operating instructions and the general safety instructions.
5. Adhere to country or user specific regulations.
6. The digital display is not intended for use in areas with risks of explosion and in the branches excluded by the standard EN 61010 Part 1.
7. The digital display shall only operated if it has been correctly mounted in a panel, in accordance with the chapter "Main technical features".

1.1 Use according to the intended purpose

The digital display may be used only as a panel-mounted device. Applications of this product may be found in industrial processes and controls, in manufacturing lines for the metal, wood, plastics, paper, glass, textile and other processing industries.

Over-voltages at the terminals of the digital display must be kept within the limits in Category II

If the digital display is used to monitor machines or processes in which, in case of a failure of the device or an error made by the operator, there might be risks of damaging the machine or causing accidents to the operators, it is your responsibility to take appropriate safety measures.

2. Technical Data

2.1 Miscellaneous Data

Display	5 digit red LED 14.2 mm high
Display range	-19999 ... 99999, with leading zeros suppression
Out of Range Indication	Under-range uuuuu / Over-range ooooo
Data storage	EEPROM, 1 Million storage cycles or 10 Years
Test voltages	EN 61010 Part 1 ; overvoltage category 2, level 2
EMC	Interference emissions EN 50081-2 / EN 55011 Class B Interference resistance EN 61000-6-2

2.2 Electrical Data

2.2.1 Power supply

AC power supply	90 ... 260 V AC/max. 6 VA external fuse 100 mA/T
DC power supply	10 ... 30 V DC, max. 2 W, galvanically isolated with inverse polarity protection external fuse 250 mA/T
Mains Hum Filter	digital filter 50 Hz or 60 Hz, programmable

2.2.2 Inputs

Measurement ranges

Current input (DC)	
Ranges	0 ... 20 mA, 4 ... 20 mA
Resolution	2 μ A
Voltage drop	max. 2 V bei 20 mA
Max. current	50 mA
Voltage input(DC)	
Ranges	0 ... 10 V, 2 ... 10 V, \pm 10 V
Resolution	1 mV
Input resistance	> 2 M Ω
Max. voltage	\pm 30 V

A/D converter	Dual-Slope
Measuring speed	approx. 2 measurements/s
Linearity	< 0,1% \pm 1 Digit for the whole measuring range at an ambient temperature of 20°C
Zero calibration	automatic
Temperature drift	100 ppm/K

Digital inputs

Input MPI*
1. Function Display-Hold
2. Function Reset

Function of the inputs depending on set up
to stop the instantaneous value
Reset the totalizer value

*MPI: Multi Purpose Input

Switching level	logical 0	0 ... 2 V DC
	logical 1	4 ... 30 V DC
	Min. pulse duration	> 5 ms

Input MPI and Input KEY are galvanically isolated

2.2.3 Outputs

Auxiliary power supply output for measuring transducer/sensor

AC models
voltage output 10 V DC $\pm 2\%$, 30 mA
and

voltage output 24 V DC $\pm 15\%$, 50 mA

DC models
only voltage output 10 V DC $\pm 2\%$, 30 mA

The auxiliary power supply is galvanically isolated from the inputs, outputs and the interface.

2.2.4 Interface

Available options	RS232, RS485, RS422
Baud rate	600, 1200, 2400, 4800, 9600, 19200 programmable
Address	00 ... 99 programmable
Data format	8 Data bit, no parity, 1 stop bit
Character format	advanced ASCII character format of IBM-PC without graphic characters

The interface is galvanically isolated from the inputs, outputs and auxiliary voltage.

2.3 Mechanical Data

Housing	Housing for control panel 96 x 48 mm according to DIN 43 700, RAL 7021
Dimensions (W x H x D)	96 x 48 x 90 mm
Panel cut-out (B x H)	92 ^{+0.8} x 45 ^{+0.6} mm
Mounting depth	approx. 83 mm
Weight	approx. 220 g
Protection	IP 65 (on the front side)

Connections

Power supply and output: 1 x screw terminal, 8-pole, RM 5.08

Measurement and control input: 1 x screw terminal, 11-pole, RM 3.81

Interfaces: (*) 1 x screw terminal, 5-pole, RM 3.81

Cleaning: The front of the unit is only to be cleaned with a soft wet (water !) cloth.

2.4 Environmental Conditions

Ambient temperature	-10°C ... +50°C
Storage temperature	-20°C ... +70°C
Climatic stability	relative humidity < 75%, without condensation

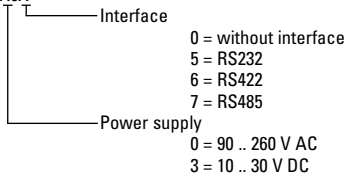
2.5 Delivery includes:

- Process display
- Screw terminal, 8-pole, RM 5.08
- Screw terminal, 11-pole, RM 3.81
- Screw terminal, 5-pole, RM 3.81(*)
- Clamping bracket
- Gasket
- Multilingual operating instructions
- 1 set of self-adhesive symbols

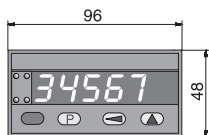
* only with the interface option

2.6 Order Code

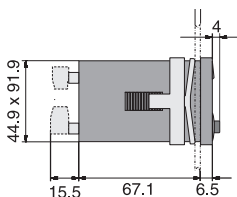
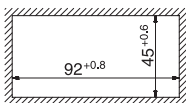
6.552.012.X0X



3. Mounting

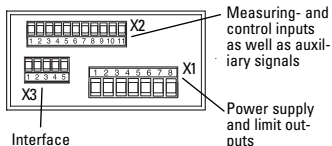


Panel cut out



4. Electrical connections

View of rear of unit



Warning: for 90 ... 260 V AC version. Please apply the power supply after the complete installation. Danger of Death! Please check

unit label before applying the power supply.

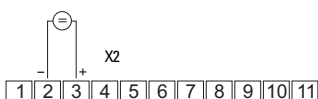
4.1 Measuring Inputs

Current input



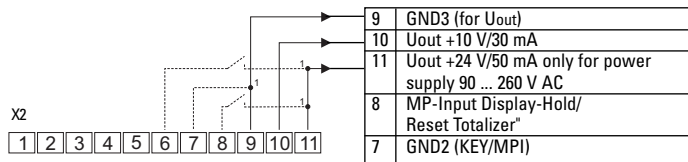
1	Current input (I) 0 ... 20 mA / 4 ... 20 mA
2	GND1 (Analogue)

Voltage input



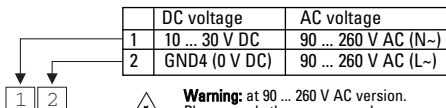
2	GND1 (Analogue)
3	Voltage input (U) 0 ... 10 V, 2 ... 10 V, -10 ... +10 V

4.2 Control inputs and auxiliary power supply (U_{out})



1 Alternatively connect directly to DC supply (galvanic separation of control and measurement inputs)

4.3 Power supply



Warning: at 90 ... 260 V AC version. Please apply the power supply after the complete installation. Danger of Death! Please check unit label before applying the power supply.

4.4 Interfaces

X3

1	2	3	4	5
---	---	---	---	---

	RS232	RS485	RS422
1	GND	–	–
2	RxD	DO+/RI+	RI+
3	TxD	DO-/RI-	RI-
4	–	–	DO+
5	–	–	DO-

5 Parameter setup

The parameters have to be set up before putting the unit into operation.

– Input parameter




The parameters of the scaling slope must be set up depending on the sensor used.

– Scaling scope

The correspondence between the input signal and the displayed value is given by the scaling slope. The scaling slope is set up by entering pairs of values.

5.1 Parameter Mode

To put the unit into set-up mode


- keep the + key pressed
- connect the unit with the power supply
- When the display shows  release the key.

Getting acquainted with the displays and keys

The selection or the settings can be run through as often as required thanks to the step-through programming method

Menu item:

The display alternates every 2 seconds between

Menu	<->	Selection
 R n G E		0 . 1 0 0

– Totalizer


The decimal point, the factor of the measuring unit, and the scaling of displaying the total value calculated by the unit must be set up.

– Mains Hum Filter


To reduce operational interference caused by the 50/60 Hz mains supply you can choose the local mains frequency.

Entering into the menu:



Either a selection has to be made or a value has to be set up.

Press the red  key . The display stops alternating.

– Making a selection:

Pressing the  key displays all the possible settings one after the other.


– Enter the selection:

Press the + key. The selected parameter will be stored. The next menu item appears


– Entering a value:





The flashing digit indicates that it is enabled for entry.

Press the  key, the number will be incremented.

Where negative values are permitted, the highest digit will switch from "9" to "-" and only then to "0".

Press the  key to switch to the next digit.









Enter value: Press the  +  key, the value will be stored. The next menu item appears.



5.2 Input Parameters for Instantaneous value

All set-ups related to the input signal and the corresponding displayed value are carried out here. The displayed value






is displayed from the input signal via the scaling slope.



5.2.1 Select range for the input signal

Menu	<->	Selection	Display range
			(-0,500 ... 10,500)
 ▲		 2 ... 10 V	(01,500 ... 10,500)
		 -10 ... +10 V	(-10,500 ... 10,500)
		 0 ... 20 mA	(-01,000 ... 21,000)
		 4 ... 20 mA	(03,000 ... 21,000)
		 0 ... 10 V	(-0,500 ... 10,500)

press the  +  key to accept the selection

5.2.2 Set the decimal point for the Instantaneous value

Menu	<->	Selection	Range
			-19999 ... 99999
 ▲		 0,0	-1999,9 ... 9999,9
		0,00	-199,99 ... 999,99
		0,000	-19,999 ... 9999,9
		 0,0000	-1,9999 ... 9,9999

press the  +  key to accept the selection

The position of the decimal point has no influence on the measuring accuracy. The maximum display value must be within the display range. After the decimal point is set up, the leading zeros in the display will be suppressed.

5.2.3 Changing the Range Limits

The given limits for the input range can be entered as is, or adjusted.

	Parameter $l_{\alpha} \text{ in } P$ Possible range of values	Parameter $h_{i}^{-} \text{ in } P$ Possible range of values
0 .. 10 V	-0.500 ... 10.500	-0.500 ... 10.500
2 .. 10 V	01.500 ... 10.500	01.500 ... 10.500
-10 .. +10 V	-10.500 ... 10.500	-10.500 ... 10.500
0 .. 20 mA	-1.000 ... 21.000	-1.000 ... 21.000
4 .. 20 mA	03.000 ... 21.000	03.000 ... 21.000

If the measured signal falls below or exceeds the programmed value, then the display alternates between l_{α} and the measured value or between h_{i}^{-} and the the measured value.

Setting values out of the range is not possible. It is only possible to continue with the set-up, using the $\ominus + \circ$ key, when the settings are correct.

Lower limit

Menu \leftrightarrow Selection

$l_{\alpha} \text{ in } P$ 10000 Example: -5.000
 $\ominus \leftarrow$ 40000 Select digit
 $\circ \uparrow$ -0000 Set digit
 $\ominus \leftarrow$ -0000 Select digit
 $\circ \uparrow$ -5000 Set digit

press the $\ominus + \circ$ key to accept the selection

When the signal drops below the value set here, then the signal alternates with the message l_{α}

Under-range: if the signal is less than -13,60 V than 00000 appears in the display.

Current values < 0.0 mA will not be measured.

Upper limit

Menu \leftrightarrow Selection

$h_{i}^{-} \text{ in } P$ 10000 Example: 9,000
 $\ominus \leftarrow$ 00000 Select digit
 $\circ \uparrow$ 09000 Set digit

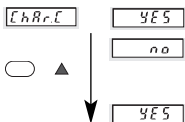
press the $\ominus + \circ$ key to accept the selection

When the signal exceeds the value set here, then the signal alternates with the message h_{i}^{-}

Over-range if the signal is higher than 11.00 V or 21.5 mA, then 00000 appears in the display..

5.2.4 Changing the Scaling Slope

Menu <-> Selection



Example: Yes

use the scaling slope curve, \Rightarrow Chapter 5.4, 14

Enter or alter scaling slope curve \Rightarrow Chapter 5.3, 12

press the key to accept the selection

5.3 Setting the Scaling Slope

At least two points (2 pairs of value) for the starting and the end points respectively of the characteristic curve are required.

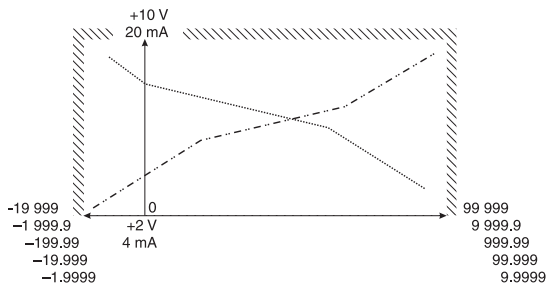
The curve can be ascending or descending.

At least two points (2 pairs of values) are required for the start point and end point of the scaling slope. This slope can be rising or falling. A maximum of 24 scaling points can be used.

However it should be noted that in all cases, whether the slope rises or falls, the values that are inputted (Inp.01 ... InP.24) must increase sequentially.

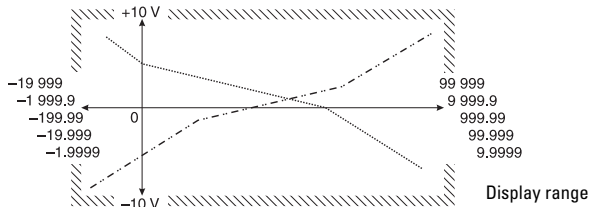
The scaling slope must lie within the limits of the input and display ranges. The first and last points can lie on the limits.

Input range 0 ... 10 V, 2 ... 10 V, 0 ... 20 mA, 4 ... 20 mA



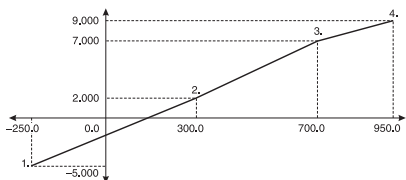
Display range

Input range -10 ... +10 V



Example with 4 scaling points

For the input range -10 ... +10 V



Scaling point	Input range	Display value
1	-5,000	-250,0
2	2,000	300,0
3	7,000	700,0
4	9,000	950,0

It is advisable to make a note of the desired pairs of values for the scaling points of the slope before starting the set-up.

5.3.1 Enter the number of scaling points

Menu <-> Selection

Input

02

Example: 2

0

▲



02

24

Pressing the key will increase the value by one. After reaching 24 the value jumps back to 2.

press the + key to accept the selection

5.3.2 Define first Scaling point

Firstly set the input value for the start of the slope using the respective unit (mA, V)

Then set the display value for the start of the slope

5.3.3 Define the second scaling point Set input value

Set **display value**

5.3.4 Define further scaling points

Additional scaling points will be requested only, when in section 5.3.1 more than 2

5.4 Totalizer

The totalizer accumulates the input display (instantaneous) values with a sampling rate of 1 per second.

If the measurement signal is out of range $[L.O. INP]$ or $[H.I. INP]$, this is indicated by the display alternating between $[LOERR]$ and $[LO]$ or $[HOERR]$ and $[HI]$.

Menu \leftrightarrow Selection

$[INP01]$ $[00000]$ Example: -5.000
 $[00000]$ Select digit
 $[-5000]$ Set digit

press the $\ominus + \omin�$ key to accept

Menu \leftrightarrow Selection

$[d-501]$ $[00000]$ Example: -250.0
 $[00000]$ Select digit
 $[-2500]$ Set digit

press the $\ominus + \omin�$ key to accept

Menu \leftrightarrow Selection

$[INP02]$ $[00000]$ Example: 2.000
 $[02000]$

press the $\ominus + \omin�$ key to accept

Menu \leftrightarrow Selection

$[d-502]$ $[00000]$ Example: 300.0
 $[03000]$

press the $\ominus + \omin�$ key to accept

scaling points are defined.

The totalizer continues adding the measurement results. If the measurement signal is out of range, over-range $[00000]$ or under range $[uuuuu]$, then $[LOERR]$ and $[00000]$ or $[HOERR]$ and $[uuuuu]$ appears in the display and the totalizer stops.

If the totalizer value exceeds the range 99999 the display blinks once per second.

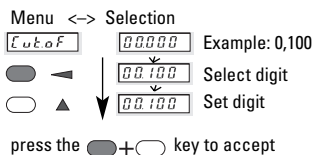
Note: In the event of a power failure the totalizer value is saved.

5.4.1 Set the input threshold for the totalizer

This value is always represented with three places after the decimal point. If set to 0.000 (no threshold) all input values are processed by the totalizer.

Note: With the ranges 4 ... 20 mA and 2 ... 10 V an interruption at the input signal may have the undesired effect that the value in the totalizer goes down;

this is because the input signal has fallen below the lowest input signal and this may be interpreted as a negative instantaneous value.



5.4.2 Totalizer Setup

The totalizer adds up the instantaneous values with a sampling rate of 1 per second. These values, when added together, give a very large resulting number which normally exceeds the display range. Hence, it is necessary to apply a conversion to bring the result within the display range. This is carried out with the help of factors and scaling.

Explanation: If the display shows a value of 12.345 and this is totalled over an hour, then 3.600 values of 12.345 each give a result of 44.442,000. This value can be displayed only if it has been divided by 1.000. Thus the display shows 44.442.

The displayed total value will be derived from the result in the totalizer, leaving the decimal point free to be set as required.

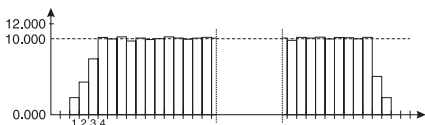
Note: To optimize the accuracy, it is recommended to make use of the full totalizer display range. This is also valid for the instantaneous value so far as it is possible to display the total scaling with a reasonable number of decimal digits (least possible rounding effects).

The totalizer value can be reset (set to 0) either via an electrical signal or manually using the red key.

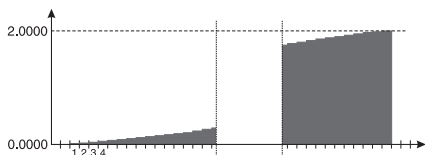
Example 1:

An empty container is filled at an average rate of 10 l/s until a volume of 2 m³ is reached. After this the container is

emptied and the total value set (reset) to 0.



Instantaneous value



Totalizer value

Instantaneous value display	Numerical value at the totalizer input		Number of values		Unscaled result in the totalizer
10000	10 000	X	200	→	2 000 000

Unscaled result in the totalizer		total scaling		Number at the output of totalizer	Totalizer display
2 000 000	X	1	→	2 000	2000

Possibilities for setting the overall scaling

Factor x Scaling
 0,1000 x 10
 1,0000 x 1
 etc.

Note:

In case it is required to output the totalizer value as weight, the weight per unit volume (specific gravity) can taken into consideration by setting the factor correspondingly.

Example 2:

If a tyre is tested for 1 hour at a speed of 180 km/h, the total distance travelled is 180 km.

Instantaneous value display	Numerical value at the totalizer input		Number of values		Unscaled result in the totalizer
1800	180,0	X	3 600	→	648 000,0

Hint:

Since one value is transferred each second, 3600 values are totalled in an hour. In order to make full use of the display range of the totalizer, the expected result will be displayed with two decimal digits. The 180.00 km corresponds to

a number of 18 000 at the output of the totalizer.

The total scaling of

$648\,000.0 : 18\,000 = 0.027777\dots$

is carried out by setting the factor = 2.7778 (rounded) and the scale = 0.01.

Unscaled result in the totalizer		total scaling		Number at the output of totalizer	Totalizer display
648 000,0	X	0,027778	→	18 000	18000

5.4.2.1 Setting the decimal point for the totalizer

Menu <-> Selection

d P t o t

0

0.000

max. 3 decimal places

press the + key to accept

The decimal point has only a visual effect in the display. It does not influence the result.

5.4.2.2 Overall scaling for the total value

Global scaling	=	Factor	x	scaling
Max. 999.99	=	9.9999	x	100
Min. 0,00001	=	0,0001	x	0,001

Factor and scale influence only the totalizer.

Setting the factor

Menu <-> Selection

F R c t o

0.0000

0.0000

Select digit

9.9999

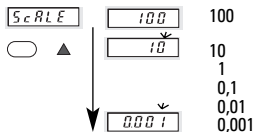
Set digit

press the + key to accept

Conversion into other measuring units can be carried out with the factor.

Setting the scaling

Menu <-> Selection

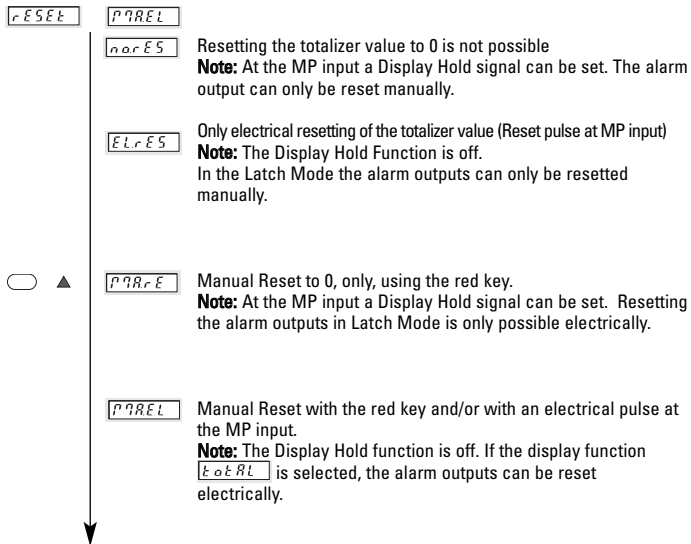


press the + key to accept

5.4.3 Resetting the total value

This setting affects the function of the MP input Chapter 4.2, 8, and Chapter 6.4, 24

Menu <-> Selection



Resetting the totalizer value to 0 is not possible

Note: At the MP input a Display Hold signal can be set. The alarm output can only be reset manually.

Only electrical resetting of the totalizer value (Reset pulse at MP input)

Note: The Display Hold Function is off.

In the Latch Mode the alarm outputs can only be reset manually.

Manual Reset to 0, only, using the red key.

Note: At the MP input a Display Hold signal can be set. Resetting the alarm outputs in Latch Mode is only possible electrically.

Manual Reset with the red key and/or with an electrical pulse at the MP input.

Note: The Display Hold function is off. If the display function is selected, the alarm outputs can be reset electrically.

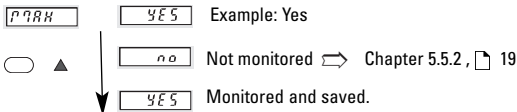
press the + key to accept

5.5 MIN/MAX value acquisition

The maximum value may be captured, saved and consulted during operation by pressing a key.

5.5.1 Capture of MIN/MAX Values

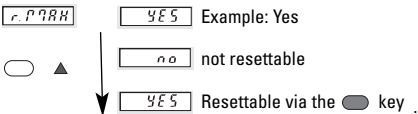
Menu <-> Selection



press the + key to accept

5.5.1.1 Reset Maximum value

Menu <-> Selection

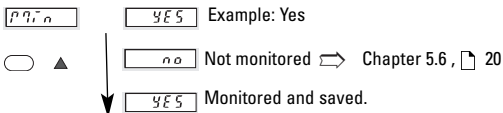


press the + key to accept

The MAX value can only be cleared by pressing the red key. In addition "MAX" must be selected as the display source. In parameter set-up "r.MAX" must be programmed as "YES"

5.5.2 MIN Value Monitor

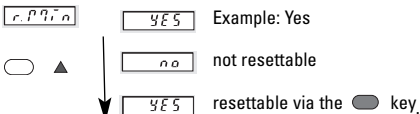
Menu <-> Selection



press the + key to accept

5.5.2.1 Reset Minimum value

Menu <-> Selection



press the + key to accept

The MIN value can only be cleared by pressing the red key. In addition "MIN" must be selected as the display source. In parameter set-up "r.MIN" must be programmed as "YES"

5.5.3 Effects resulting from exceeding the measuring range limits or of Overload/Underload on MIN/MAX.

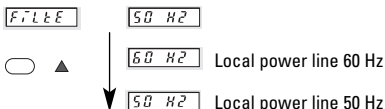
If the signal measured lies outside the measuring range limits $\boxed{L o I n P}$ or $\boxed{h i I n P}$ then the current measured value will be recorded either as a MIN value \boxed{uuuuu} or as a MAX value \boxed{ooooo} . If the signal is in an

overload or underload condition, then it will be saved either as a MIN value \boxed{uuuuu} or as a MAX value \boxed{ooooo} .

5.6 Mains Hum Filter

To reduce the interference from mains line and the environment (mains hum), the instrument must be set to the local mains frequency.

Menu <-> Selection



press the + key to accept

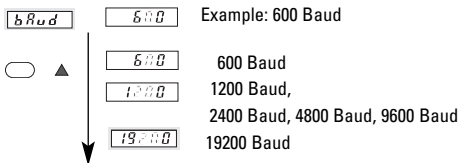
5.7 Interface

As an option the instrument can be supplied with a serial interface, either RS232, RS485 or RS422. Using a PC, then all the unit's parameters can be read or programmed via this interface.

A more detailed description of the commands can be found in the separate instruction manual "CODIX 55x Interfaces". This manual is supplied with units having an interface. When the unit is powered up, then the type of interface will appear in the display for approx. 2 sec.

5.7.1 Select Baud Rate

Menu <-> Selection



press the + key to accept

5.7.2 Select address

Menu ↔ Selection

`AdrES` `00` Example: device address 12

◀ `00` Select digit
 ▲ `12` Set digit

press the + key to accept

5.8 Setting Default Values

The user has the possibility to set all parameters back to their default values by using the parameter `defc`. This parameter `defc` must be programmed with the value `07899`. If you then proceed to the next parameter using the keys,

then all parameters are reset to their default values. It is not necessary to finish the programming; a new programming cycle can take place immediately.

Menu ↔ Selection

`defc` `00000`

◀ `00000` Select digit
 ▲ `07899` Set digit

press the + key to accept the selection

5.9 End of Setup Yes/No?

Menu ↔ Selection

`EndPr` `YES`

▲ `YES` Parameters will be stored -> Operation
 `no` Check/alter Parameters ↔ Chapter 5.10, 21

press the + key to accept the selection

5.10 Check/Alter Parameters

Menu ↔ Selection

`rRnGE` Checking the individual menu items

- after every 2 seconds the menu changes to Selection

- If the setting is as desired, then switch to the next menu with + key, otherwise, start the set-up again.

6 Operation

The unit is in the operating mode, when the power supply is switched on or at the end of the set-up.

One of the following will be displayed during operation.

326.81

326.81 The measuring signal has been applied and lies within the limits of the measuring range. The display will show either the current

measured value, the totalizer value, the MAX value or the MIN value.

L o

The input value is below the lower limit of the measuring range. This message alternates with the

current measured value or with the value of the totalizer.

h r

~ The input value is higher than the upper limit of the measuring range. This message alternates with the

current measured value or with the value of the totalizer.



u u u u u

The input value is less than -13.6 V. Current inputs below 0.0 mA are not measured.

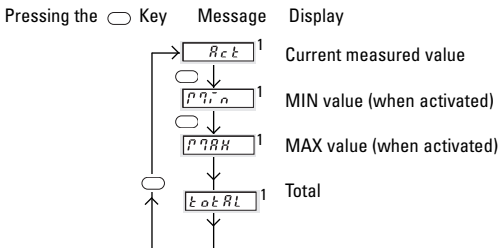
o o o o o

The input value is higher than 11.0 V or above 21.5 mA

6.1 Changing the Display during Operation

Pressing the  key once for 2 sec will identify the function currently selected. If within these 2 sec the  key is pressed again, then the display will proceed to

the next display function. The new identification will be displayed for 2 sec to confirm this. After 2 sec the corresponding value of the selected function will be displayed.



6.2 Resetting MIN/MAX value

Resetting is only possible if this has been enabled in the parameter mode.

Select Min/Max value display

- press the red key.
- the stored value is cleared

6.3 Resetting the Totalizer

Resetting is possible only if the MP input has been programmed for the Reset function.

Depending on the setting, the resetting is carried out either manually with the red key, and /or electrically with a high pulse (> 4V; > 5 ms) at the reset input.

Reset

- Ensure the totalizer value is shown in the display
- Press the red key and/or apply a high-level pulse at the MP input
- The value in the totalizer will be cleared

6.4 Display Hold

The Display Hold function is only available for use with the current measured value and for the totalizer value.

For as long as a high level signal (> 4 V DC) is present at the MP input,

then the display is "frozen".

The MIN/MAX capture, alarm monitoring and totalizer functions continue in the background.

The Display Hold function is only active with the following parameter settings:

	Parameter	Settings
Reset totalizer value	<code>rESEt</code>	<code>noRES</code> or <code>PRRF</code>