MANUAL
COUNTER ZD327401

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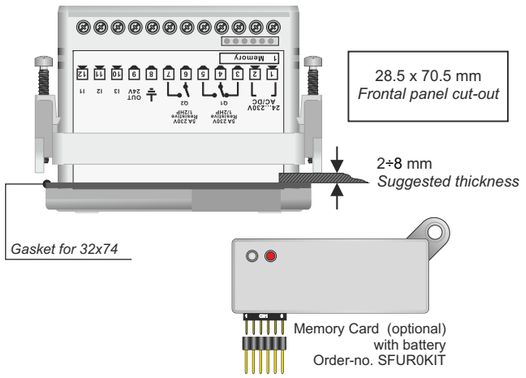
Version 2.2

SIZE AND INSTALLATION



TECHNICAL DATA

Operating conditions	*Operating temperature 0-40°C, humidity 35..95uR%*
Sealing	*Front panel IP65 (with optional gasket) , Box IP30, Terminal blocks IP20*
Material	*PC ABS UL94V0 self-extinguishing*
Digital Inputs	*3PNP/NPN configurable as analogue for potentiometers. (max 28 Vdc in PNP mode)*
Outputs	*2 relays 5A resistive charge*
OUT 24V	*30mA(at 24 VAC supply),40 mA(at 24 VDC supply), 60 mA (at 110 to 230 VAC)*
Back-UP	*Rechargeable battery, approx. 7days autonomy*
Power Supply	*24...230Vac/Vdc +/-15% 50/60Hz / 2W*

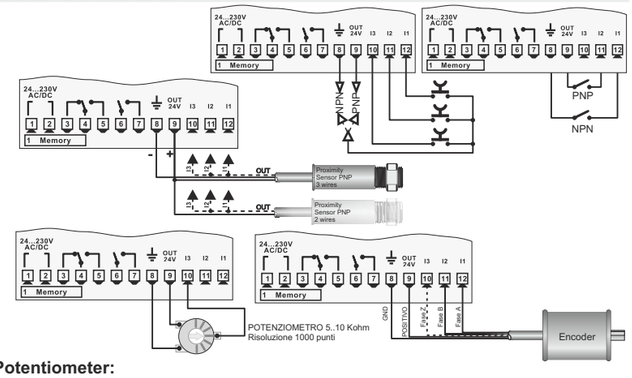
INTRODUCTION

Thanks for choosing a Wachendorff Prozesstechnik device.The ZD327401 can be set in 2 different modes: Single or Double counter, all with independent settings. 3 universal digital inputs are available (NPN/PNP/Potential free contact) and can be used for bidirectional encoders reading, UP/DOWN counter function, LOCK/HOLD to lock or hold current visualization.One input is also analogue in order to allow setpoint modification by an external potentiometer.

Read carefully the safety guidelines and programming instructions contained in this manual before using/connecting the device.Disconnect power supply before proceeding to hardware settings or electrical wirings.Only qualified personnel should be allowed to use the device and/or service it and in accordance to technical data and environmental conditions listed in this manual.Do not dispose electric tools together with household waste materials in observance of European Directive 2002/96/CE

LED	MEANING
	Report the activation of Q1
	Report the activation of Q2
	Report serial transmission by the ZD327401

WIRING DIAGRAM



Potentiometer:

To modify Set1 or Set2 by external potentiometer follow the steps below:

1-use potentiometers 0 to 5/10kohm

2-connect cursor to pin I3; a wrong connection may damage the potentiometer and lead to lock of the device.

3-accuracy on input is max 1000 points, therefore set the parameters "Upper limit" and "Lower limit" with a max difference of 1000 units.

(Ex.: LoS1 to 50,0 and uPS1 to 150,0 to modify preset value related to Set1 between 50 and 150 pulsess with steps of one tenth). Greater differences would make unstable the less significant digit.

4-To calibrate the scale of potentiometer enter the configuration mode and select:

Hin.3 as Pot **Fin.3** as **Set1** or **Set2** **P.tAr** as Enable

Exit configuration mode and place potentiometer at minimum level and press key, then place potentiometer at max level and press premere key: the device automatically exit the calibration procedure.

N.B.: A switch-off of the device would interrupt the calibration.

MEMORY CARD (optional)

Parameters and setpoint values can be copied from one device to another using the Memory card. Attention: Pls. perform first an update of the memory card.

There are two methods:

> With the device connected to the power supply
insert the memory card when the controller is off.

On activation display 1 shows and display 2 shows ----

(Only if the values stored on Memory Card are correct).

By pressing the key display 2 shows LoAd

Confirm using the key .

The device loads the new data and starts again.

> With the controller disconnected from the power supply:

The memory card is equipped with an internal battery with a life of about 1000 uses.

Insert the memory card and press the programming button.

When writing the parameters, the LED turns red and on completing the procedure it changes to green. It is possible to repeat the procedure.

⚠ **UPDATING MEMORY CARD.**

To *update* the memory card values, follow the procedure described in the first method, setting display 2 to ---- so as not to load the parameters on controller.

Enter configuration and change at least one parameter.
Exit configuration. Changes are saved automatically.

LOADING DEFAULT VALUES

This procedure restores the factory settings of the instrument.

SETPOINT MODIFICATION

	PRESS	DISPLAY
1	SET	Visualizes SETPOINT 1 / 2
2	or	Modify selected SET
2a	FNC	Selects chosen digit
3a	or	Modify blinking digit of selected SET

LOADING DEFAULT VALUES

This procedure restores the factory settings of the instrument.

LOADING DEFAULT VALUE

	PRESS	DISPLAY	DO
1	FNC for 3 seconds	Display 1 shows 0000 and 1st digit flashes. Display 2 shows PASS	
2	or	Modify flashing digit and pass to the next one pressing SET	Enter password 9999
3	SET to confirm	Device loads default settings	Switch-off and restart the device

MODIFY CONFIGURATION PARAMETERS

	PRESS	DISPLAY	DO
1	FNC for 3 seconds	Display 1 shows 0000 and 1st digit flashes. Display 2 shows PASS	
2	or	Modify flashing digit and pass to the next one pressing SET	Enter password 1234
3	SET to confirm	Display shows first parameter of configuration table Func	
4	or	Scroll parameters	
5	SET + or	Increase or decrease visualized value by pressing SET and an arrow key.	Enter the new data which will be stored releasing the keys
6	FNC	End configuration, controller exits from programming mode.	

PARAMETERS LIST

FUNCTION CONFIGURATION

Func.	**P-01 Counter Function**	***Counter Functions***	
SinG	Single (1 Counter)	*1 counter functioning*	Default
doub	Double (2 Counters)	*2 counters functioning*	

BACKUP MEMORY CONFIGURATION

PoME.	**P-02 Power-off Memory**	***Power-off memory***	
d.S	Disable	*No counter stored at power-off*	Default
cnt.1	Counter 1	*Counter 1 stored at power-off*	
cnt2	Counter 2	*Counter 2 stored at power-off*	
ALL	All Counters	*All counters stored at power-off*	

INPUT CONFIGURATION

H.in.1	**P-03 Hardware input 1**	***Input 1 Hardware configuration***	
H.in2	**P-04 Hardware input 2**	***Input 2 Hardware configuration***	
H.in3	**P-05 Hardware input 3**	***Input 3 Hardware configuration***	
nPn	NPN	*NPN (not available on Input 3)*	
PnP	PNP	*PNP*	Default
ttL	TTL	*TTL*	
Pot.	Potent.	*Potentiometer (available only for Input 3)*	
Fil.1	**P-06 Filter Delay Input 1**	***Input 1 digital filter configuration***	
Fil2	**P-07 Filter Delay Input 2**	***Input 2 digital filter configuration***	
Fil3	**P-08 Filter Delay Input 3**	***Input 3 digital filter configuration***	
00	No delay	*Input filter desabled*	Default
05	0,5 ms	*Filter of 0,5 ms*	
...	...	*...(Step 0,5 ms)*	
1000	100,0 ms	*Filter of 100,0 ms*	
A.in.1	**P-09 Active State Input 1**	***Active state Input 1***	
A.in2	**P-10 Active State Input 2**	***Active state Input 2***	
A.in3	**P-11 Active State Input 3**	***Active state Input 3***	
HLEv	High Level	*High level (available only for Input 2)*	
LLEv	Low Level	*Low level (available only for Input 2)*	
r.iS	Rising edge	*Rising edge*	Default
FALL	Falling edge	*Falling edge*	
F.in3	**P-12 Function Input 3**	***Function associated to Input 3***	
d.S	Disable	*Disabled*	
Enc2	Encoder Z	*Loading encoder Z*	
Ld.1	Load Counter 1	*Loading counter 1*	Default
Ld.2	Load Counter 2	*Loading counter 2*	
Ld.12	Load Counter 1&2	*Loading counters 1 and 2*	
SEt.1	Set1	*Set1 setting by potentiometer*	
SEt2	Set2	*Set2 setting by potentiometer*	
FtuP	**P-13 Function Key UP**	***Function associated to UP (up arrow key)***	
d.S	Disable	*Disabled*	Default
Ld.1	Load Counter 1	*Loading counter 1*	
Ld.2	Load Counter 2	*Loading counter 2*	
Ld.12	Load Counter 1&2	*Loading counters 1 and 2*	
PtAr.	**P-14 Potentiom. Tarature**	***Potentiometer calibration procedure***	
d.S	Disable	*Disabled*	Default
En	Enable	*Enabled*	

COUNTER CLOCK CONFIGURATION

CLC.1	**P-15 Clock Counter 1**	***Counter 1 count mode selection***	
CLC2	**P-33 Clock Counter 2**	***Counter 2 count mode selection***	
d.S	Disable	*Disabled*	Default C2
Enc	Encoder	*Bidirectional encoder (I1) phase A, (I2) phase B*	
uP.--	I1 Up, I2 Off	*UP mode (I1)*	Default C1
do--	I1 Down, I2 Off	*DOWN mode (I1)*	
--uP	I1 Off, I2 Up	*UP mode (I2)*	
--do	I1 Off, I2 Down	*DOWN mode (I2)*	
uPdo	I1 Up, I2 Down	*UP mode (I1) - DOWN mode (I2)*	
uP.d	I1 Up, I2 Incr./Decr.	*UP mode (I1) with reverse direction (I2)*	
uPEL	I1 Up, I2 En./Lock	*UP mode (I1) with count lock (I2)*	
uPEH	I1 Up, I2 En./Hold	*UP mode (I1) with keeping value on display (I2)*	
doEL	I1 Down, I2 En./Lock	*DOWN mode (I1) with count lock (I2)*	
doEH	I1 Down, I2 En./Hold	*DOWN mode (I1) with keeping value on display (I2)*	
oc2	Output Counter 2/1	*UP count on rising edge of counter 2/1 output*	

COUNTER DISPLAY CONFIGURATION

d.C.1	**P-16 Display Counter 1**	***Counter 1 visualization selection***	
d.C2	**P-34 Display Counter 2**	***Counter 2 visualization selection***	
d.S	Disable	*Counter value not visualized*	Default C2
U.Su	Visualized	*Counter value visualized*	Default C1
dPC.1	**P-17 Decimal Point Counter 1**	***Counter 1 visualization format***	
dPC2	**P-35 Decimal Point Counter 2**	***Counter 2 visualization format***	
0	0	*No decimal digit visualization*	**Default**
00	0.0	*1 decimal digit visualization*	
000	0.00	*2 decimal digits visualization*	
0000	0.000	*3 decimal digits visualization*	
inC.1	**P-18 Counter 1 input counts**	***Counter 1 input counts (1...9999)***	Default 1
inC2	**P-36 Counter 2 input counts**	***Counter 2 input counts (1...9999)***	Default 1
u.C.1	**P-19 Counter 1 Visualized Counts**	***Counter 1 visualized counts (1...9999)***	Default 1
u.C2	**P-37 Counter 2 Visualized Counts**	***Counter 2 visualized counts (1...9999)***	Default 1

SETPOINT CONFIGURATION

d.S.1	**P-20 Display Set 1**	***Counter 1 setpoint visualization selection***	
d.S2	**P-38 Display Set 2**	***Counter 2 setpoint visualization selection***	
d.S	Disable	*Setpoint value not visualized*	Default C2
U.Su	Visualized	*Setpoint value visualized*	
Mod.	Modifiable	*Setpoint value visualized and modifiable*	Default C1
LoS.1	**P-21 Lower Limit Set 1**	***Set 1 minimum value (0...9999)***	Default 0
LoS2	**P-39 Lower Limit Set 2**	***Set 2 minimum value (0...9999)***	Default 0
uPS.1	**P-22 Upper Limit Set 1**	***Set 1 maximum value (0...9999)***	Default 999
uPS2	**P-40 Upper Limit Set 2**	***Set 2 maximum value (0...9999)***	Default 999

AUTOMATIC LOAD CONFIGURATION

ALC.1	**P-23 Automatic Load Counter 1**	***Counter 1 automatic loading***	
ALC2	**P-41 Automatic Load Counter 2**	***Counter 2 automatic loading***	
d.S	Disable	*Automatic loading disabled*	Default
SEt.1	Counter = Set 1	*Loading if counter = Set1*	
SEt2	Counter = Set 2	*Loading if counter = Set2*	
Sod.1	Counter = Set 1+Output Duration 1	*Loading if counter = Set1 + "Output Duration 1"*	
Sod2	Counter = Set 2+Output Duration 2	*Loading if counter = Set2 + "Output Duration 2"*	
u.C.1	Counter = Visualized counts	*Loading if counter = "Visualized Counts"*	

COUNTER LOAD VALUE CONFIGURATION

CLd.1	**P-24 Counter Load Value 1**	***Counter 1 loading value***	Default 0
CLd2	**P-42 Counter Load Value 2**	***Counter 2 loading value***	Default 0

COUNTER OUTPUT MODE CONFIGURATION

CoM.1	**P-25 Counter 1 Output Mode**	***Counter 1 output mode***	
CoM2	**P-43 Counter 2 Output Mode**	***Counter 2 output mode***	
SEt.1	Counter =Set	*Output active if Counter =Set*	**Default**
t.nE	Counter =Set * Output Duration (time)	*Output active for "Output Duration" time if Counter =Set*	
Coun	Counter =Set * Output Duration (counts)	*Output active for "Output Duration" counts if Counter =Set*	
SE.12	Counter =Set1+Set2	*Output active if Counter =Set1+Set2*	

OUTPUT DURATION CONFIGURATION

odu.1	**P-26 Output 1 Duration**	***Counter 1 output duration***	Default 10
odu2	**P-44 Output 2 Duration**	***Counter 2 output duration***	Default 10
uSEr	Output Duration Input by User	*Value modifiable by user*	Default
LAtc	Latch output (clear only by load)	*Latch output, resettable by counter loading*	
1	Min output duration	*Output duration minimum value*	
999	Max output duration	*Output duration maximum value*	

COUNTER FREQUENCY DISPLAY CONFIGURATION

d.F.1	**P-27 Display Frequency Counter 1**	***Counter 1 frequency visualization***	
d.F2	**P-45 Display Frequency Counter 2**	***Counter 2 frequency visualization***	
d.S	Disable	*Counter frequency value not visualized*	Default
U.Su	Visualized	*Counter frequency value visualized*	
dPF.1	**P-28 Decimal Point Frequency Counter 1**	***Counter 1 frequency format***	
dPF2	**P-46 Decimal Point Frequency Counter 2**	***Counter 2 frequency format***	
0	0	*Visualization with no decimal digit*	**Default**
00	0.0	*Visualization with 1 decimal digit*	
000	0.00	*Visualization with 2 decimal digits*	
0000	0.000	*Visualization with 3 decimal digits*	
inF.1	**P-29 Counter 1 Input frequency**	***Counter 1 input frequency (1...9999Hz)***	Default 1
inF2	**P-47 Counter 2 Input frequency**	***Counter 2 input frequency (1...9999Hz)***	Default 1
u.F.1	**P-30 Counter 1 Visualized Frequency**	***Counter 1 visualized frequency***	Default 1
u.F2	**P-48 Counter 2 Visualized Frequency**	***Counter 2 visualized frequency***	Default 1
out.1	**P-31 Output Q1 Setup**	***Output Q1 setting***	
out2	**P-32 Output Q2 Setup**	***Output Q2 setting***	
d.S	Disable	*Disabled output*	Default C2
C.no	Out Counter 1 n.o.	*Counter 1 output on n.o. contact*	Default C1
C.nc	Out Counter 1 n.c.	*Counter 1 output on n.c. contact*	
C2no	Out Counter 2 n.o.	*Counter 2 output on n.o. contact*	
C2nc	Out Counter 2 n.c.	*Counter 2 output on n.c. contact*	

ZD327401 "COUNTER"

COUNTER FUNCTION

P-01 Counter Function

- Single (1 Counter)
- Double (2 Counters)

BACKUP MEMORY CONFIGURATION

POWER-ON RESET

P-02 Power-off Memory

- Disable
- Counter 1
- Counter 2
- All Counter

COUNTER CLOCK CONFIGURATION

P-15 Clock Counter 1

- Disable
- Encoder
- I1 Up, I2 Off
- I1 Down, I2 Off
- I1 Off, I2 Up
- I1 Off, I2 Down
- I1 Up, I2 Down
- I1 Up, I2 Incr./Decr.
- I1 Up, I2 En./Lock
- I1 Up, I2 En./Hold
- I1 Down, I2 En./Lock
- I1 Down, I2 En./Hold
- Output Counter 2

INPUT CONFIGURATION

I1

P-03 Hardware Input 1

- NPN
- PNP
- TTL

P-06 Filter Delay Input 1

- No delay
- 0,5 ms
- ...
- 100,0 ms

P-09 Active State Input 1

- Rising edge
- Falling edge

I2

P-04 Hardware Input 2

- NPN
- PNP
- TTL

P-07 Filter Delay Input 2

- No delay
- 0,5 ms
- ...
- 100,0 ms

P-10 Active State Input 2

- High Level
- Low Level
- Rising edge
- Falling edge

I3

P-05 Hardware Input 3

- PNP
- TTL
- Potent.

P-08 Filter Delay Input 3

- No delay
- 0,5 ms
- ...
- 100,0 ms

P-14 Potentiometer tarature

- Disable
- Enable

P-11 Active State Input 3

- Rising edge
- Falling edge

P-12 Function Input 3

- Disable
- Encoder Z
- Load Counter 1
- Load Counter 2
- Load Counter 1&2
- Set1
- Set2

P-13 Function Key UP

- Disable
- Load Counter 1
- Load Counter 2
- Load Counter 1&2

Key UP

AUTOMATIC LOAD CONFIGURATION

P-23 Automatic Load Counter 1

- Disable
- Counter 1 = Set 1
- Counter 1 = Set 2
- Counter 1 = Set 1 + Output Duration 1
- Counter 1 = Set 2 + Output Duration 2
- Counter 1 = Visualized counts 1

COUNTER LOAD VALUE CONFIGURATION

P-24 Counter 1 Load Value

- Min value
- Max value

INPUT TYPE / LOGIC LEVEL	NPN INPUT	PNP INPUT	TTL INPUT
H	< 4,7 v	>5,7 v (I1, I2) >12,4 v (I3)	>2,5 v
L	> 5,7 v	< 4,7 v (I1, I2) < 10,2 v (I3)	< 2,0 v

Enc — I1:Enc.A I2:Enc.B I3:Enc.N (opz.)

Inputs: I1, I2, I3, Load — Outputs: Counts, Load

uP-- — I1:count Up / --uP I2:count Up

Inputs: I1, I2, Load — Outputs: Counts, Load

do-- — I1:count Down / --do I2:count Down

Inputs: I1, I2, Load — Outputs: Counts, Load

uPdo — I1:count Up I2:count Down

Inputs: I1, I2, Load — Outputs: Counts, Load

uP.d — I1:count Up I2:Incr./Decr.

Inputs: I1, I2, Load — Outputs: Counts, Load

uPEL — I1:count Up I2:Enable/Lock

Inputs: I1, I2, Load — Outputs: Counts, Load

uPEH — I1:count Up I2:Enable/Hold

Inputs: I1, I2, Load — Outputs: Counts, Load

Display Value

doEL — I1:count Down I2:Enable/Lock

Inputs: I1, I2, Load — Outputs: Counts, Load

doEH — I1:count Down I2:Enable/Hold

Inputs: I1, I2, Load — Outputs: Counts, Load

Display Value

oc2 — Output Counter 2

Inputs: I1, I2, Load — Outputs: Counts, Load

Out Counter 2

COUNTER OUTPUT MODE CONFIGURATION

P-25 Counter 1 Output Mode

- Counter = Set
- Counter = Set * Output Duration (time)
- Counter = Set * Output Duration (counts)
- Counter = Set1+Set2

OUTPUT DURATION CONFIGURATION

P-26 Output 1 Duration

- Output Duration Input by User
- Latch output (clear only by load)
- Min output duration
- Max output duration

SETPOINT CONFIGURATION

P-20 Display Set 1

- Disable
- Visualized
- Modifiable

P-22 Upper limit Set 1

P-21 Lower limit Set 1

COUNTERS DISPLAY CONFIGURATION

P-16 Display Counter 1

- Disable
- Visualized

P-17 Decimal Point Counter 1

- 0
- 0.0
- 0.00
- 0.000

P-18 Counter 1 Input counts

P-19 Counter 1 Visualized counts

COUNTERS FREQUENCY DISPLAY CONFIGURATION

P-27 Display Frequency 1

- Disable
- Visualized

P-28 Decimal Point Frequency 1

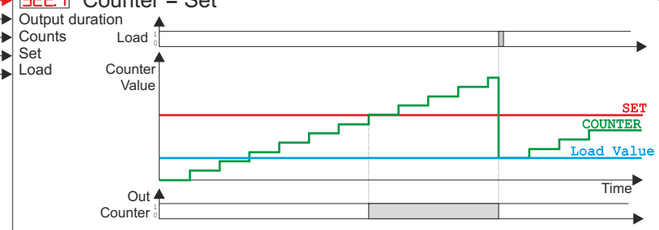
- 0
- 0.0
- 0.00
- 0.000

P-29 Counter 1 Input Frequency

P-30 Counter 1 Visualized Frequency

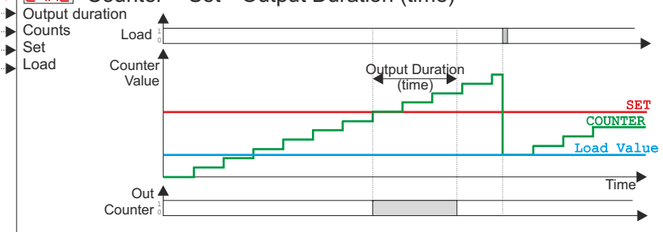
SEt.1 — Counter = Set

Inputs: Output duration, Counts, Set, Load — Output: Out Counter



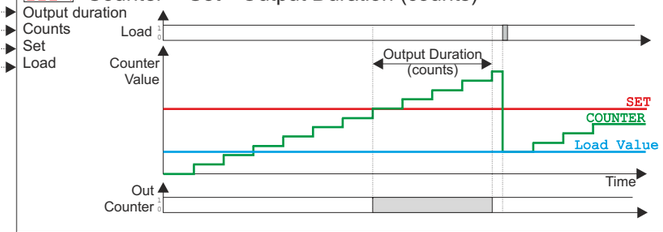
tiME — Counter = Set * Output Duration (time)

Inputs: Output duration, Counts, Set, Load — Output: Out Counter



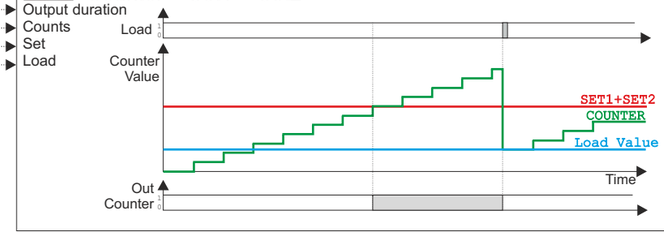
Coun — Counter = Set * Output Duration (counts)

Inputs: Output duration, Counts, Set, Load — Output: Out Counter



SE.12 — Counter = Set1 + Set2

Inputs: Output duration, Counts, Set, Load — Output: Out Counter



OUTPUT CONFIGURATION

P-31 Output Q1 Setup

- Disable
- Out Counter 1 n.o.
- Out Counter 1 n.c.
- Out Counter 2 n.o.
- Out Counter 2 n.c.

P-32 Output Q2 Setup

- Disable
- Out Counter 1 n.o.
- Out Counter 1 n.c.
- Out Counter 2 n.o.
- Out Counter 2 n.c.

Q1, Q2

TABLE OF ERROR MESSAGES

E-01	ERROR IN WRITING OF EEPROM
E-02	ERROR IN READING OF EEPROM
E-03	INCORRECT PARAMETERS (Note 1)
E-04	INCORRECT CALIBRATION DATA (Note 1)
E-05	INCORRECT STATUS DATA (Note 1)
E-06	INCORRECT BACKUP REGISTERS (Note 2)

Note 1:
Switch the device off and restart it, if error is still notified contact technical service.
Note 2: Discharged battery, keep the device connected to the power supply in order to recharge the battery.