SERIE CRISTAL

CE

COUNTER
TOTALIZER
LCD

DELTA-D

INSTRUCTIONS MANUAL

Code: 30727176
Edition: March 2004

100% RECYCLED PAPER

DELTA-D
English

General information

Please find below the explanation to the symbols used in the following operating instructions.

This symbol induces actions.
- This symbol refers to aditional technical information.

⚠ This symbol is placed in front of text passages that have to be particularly observed to ensure the correct use of the DELTA-D.

☞ This symbol is placed in front of text passages that supply further important information.

italic   Important terms are written in italics on the left for quick reference purposes

```
┌─────────────────────────────────────────────────────────────────────────────┐
│                                                                               ╲
│  DIGITAL PANEL METER                          SERIE CRISTAL                     ╲
│                                                                                 │
│                          DELTA-D                                                │
│                                                                                 ╱
└─────────────────────────────────────────────────────────────────────────────┘
```

INDEX   Page.

1 SAFETY INDICATIONS

The electronic counter, controller and monitor has been designed to the latest state of the art.

Use the instrument only:
- In an absolutely correct technical state,
- For the intended purpose,
- Being conscious of relevant safety and danger, observe the operating instructions

Intended purpose

The instrument is to be used only indoors as built-in model for industrial processes and controls on production lines of the metal, wood plastic, paper, glass and textile industries and similar; overvoltage exerted on the terminals of the instrument must be limited to the voltages of category II.
Description of the overvoltage category under DIN VDE 0110, part2.
The instrument may only be operated in a correctly mounted state.
The instrument may only be operated as described under chapter "Technical data"

The instrument may not be used in hazardous areas, for medical apparatus, nor for applications expressely declared under EN 61010. If the instrument is to be used to control machines or processes, where the machine could be damaged or the operator could be injured due to a breakdown of the instrument or to a failure in operation, then relevant safety precautions will need to be taken

Organizational measures

Make sure that your personel has read and understood the operating instructions, especially the chapter "Safety indications".
In addition to the operating instructions, please make sure that generally applicable legal and other mandatory regulations relevant to accident prevention and enviroment protection are observed.

In the event of safety-relevant modifications (including those in the behaivor of the instrument during operation), immediately stop operation of the instrument

Instalation	The isntallation may only be effected as described under the chapter "Connection". During installation work, take care to cut off the power supply of the isntrument. Installations may only be effected by skilled expert Prior to initial operation of the instrument, please control voltage selection. Set the switch to the required AC voltage. During the installation make sure that supply voltage and connection of the output contacts are provided from the same MAINS phase. Max. voltage 250 V Terminal - Terminal, Earth – Terminal.
Initial operation	El instrumento está listo para uso después de que haya sido montado e instalado correctamente.
Maintenance / Servicing	Cut off power supply of all connected machinery.
Trouble shooting	These tasks may only be effected by a skilled expert. In case of unsucssesfull trouble shooting, you must absolutely interrupt use of instrument and contact your dealer.
Getting acquainted	After succesful initial operation, get acquainted with the handling of your instrument by studying the chapter "Get to kwo your DELTA-D".
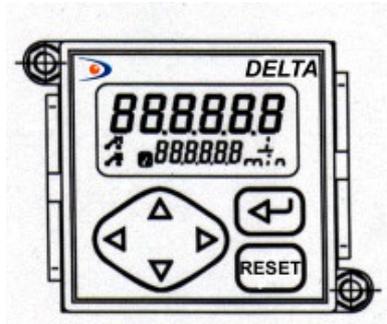
2.2 Block diagram of the DELTA-D

The block diagram swhos the components of the DELTA-D together with its contacts and connections
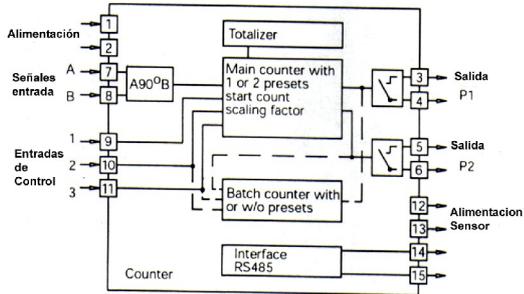
2 GET TO KNOW YOUR DELTA-D

2.1 DELTA-D components

-   A 6-digit preselection counter with 1 or 2 settings
-   A 6-digit batch counter with 1 or without preselection
-   An 8-digit totalizer

LCD-Display

Current count
P1 Preselection 1
P2 Preselection 2
Control state of preselection 1
Control state of preselection 2
tot   Totalizer
b   Batch counter
Measuring units mm, cm, dm, m, L

 Shift key for display of functions confirmation key

 Reset

 Key to select HIGHER decades

 Key to select decades to the RIGHT

 Key to select decades to the LEFT
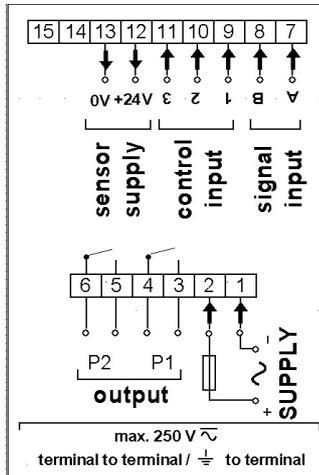
 Key to select LOWER decades

3   DELTA-D conection

This chapter will explain how the contacts are assigned and give you some examples of connection.
Under chapters 3.1 to 3.6, you will find actual tips and technical data for the various connections

Assignement

Model with relay outputs

Contact	Function
1	Supply voltage
2	Supply voltage
3	Relay output P1
4	Relay output P1
5	Relay output P2
6	Relay output P2
7	Signal input A
8	Signal input B
9	Control input 1 (Principal counter reset)
10	Control input 2 (Principal counter Stop)
11	Control input 3 (Reset Total)
12	Encoder supply + 10... 26 V
13	Encoder supply 0V
14	RS485 output (T,R-)
15	RS485 output (T,R+)

Assignement **Model with electronic outputs**
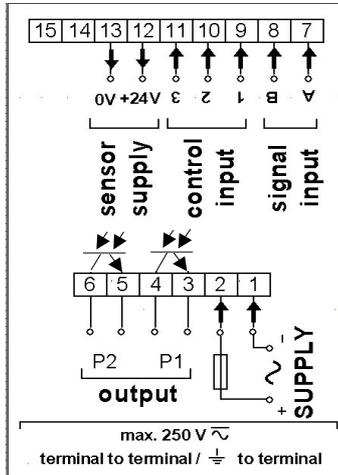
Contact	Function
1	Supply voltage
2	Supply voltage
3	Output P1
4	Output P1
5	Output P2
6	Output P2
7	Signal input A
8	Signal input B
9	Control input 1 (Reset contador principal)
10	Control input 2 (Stop contador principal)
11	Control input 3 (Reset Total)
12	Encoder supply + 10... 26 V
13	Encoder supply 0V
14	RS485 output(T,R-)
15	RS485 output (T,R+)

Litz contact only by means of connector sleeves with insulating enclosure for reasons of shock protection according to EN 61010. Do not otherwise assign contacts that have been left unassigned ex factory.

We recommend to screen all encoder terminal leads and to ground the shield on one side. Shields on both sides are recommended in case of RF interference or in case of equipotential bonding.

The encoder leads should not be in the same phase winding as the MAINS supply and the output contact leads.

3.1 Supply voltage connection

AC connection It is possible to choose two diferent AC voltages by using the selector on the side. The respectively higher voltage (48 V AC ó 230 V AC) is preset at the factory.

    Switch to the required AC voltage using the selector.

    Connect AC at the contacts 1 and 2 according to the DELTA-D terminal diagram

Supply voltage	Recommended external protection
24 VAC ±10 % 50/60 Hz	M 400 mA
48 VAC ±10 % 50/60 Hz	M 200 mA
115 VAC ± 10 % 50/60 Hz	M 100 mA
230 VAC ± 10 % 50/60 Hz	M 50 mA

DC connection Connect interference-free supply voltage. Therefore, do not use supply voltage for parallel supply drives, contactors, electromagnetic valves, etc.

    Connect DC according to the DELTA-D diagram.

Supply range 12 ... 30 V DC ± 10 %, max. 5 % residual ripple.
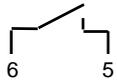Recommended external protection M 400 mA

⚠ Fire protection: Operate instrument on the MAINS with external fuse recommended on the rating plate. In case of disturbance, make sure that 8A / 150 VA (W) are never exceeded as defined under EN 61010.
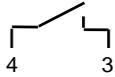
3.2 Assignement of signal outputs "Relay contacts"

Contact P2   Contact P1

6   5   4   3

The signal outputs (contacts 3, 4 and 5,6) are floating relay contacts. The signal outputs can be assigned as per the adjacent terminal diagram.

The type of outputs, as momentary or latched signal, can be chosen in the programming lines 41 / 42.

| max. rating	max. Voltage	max. Current
150 VA / 30 W	250 V	1 A

The user must take care that, in case of disturbance, the contact rating of 8 A / 150 VA (W) is not exceeded.

Internal spark suppresion by means of zinc-oxide varistor (275V). The output relays of the instrument (1 relay or several) may in total switch 5 x per minute at the most. Admisible clicks according to interference suppresion standard EN 55011, EN 50081-2 for the industrial sector. In case of higher switching rate, the operator will be responsible to take care of local interference suppresion in consideration of the contact rating.

3.3 Assignement of signal outputs "electronic"

Output P2   Output P1

6   5   4   3
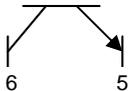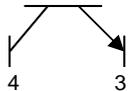
The electronic outputs (contacts 3,4 and 5,6) are optocoupler outputs. The signal outputs can be assigned as per the adjacent terminal diagram. The type of outputs, as momentary or latched signal, can be chosen in the programming lines 41/42.

Their function, as normally open or clodsed, is selected in programming line 40.

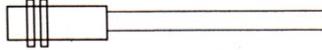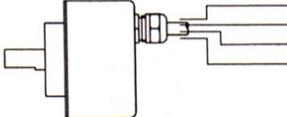| Max. Voltage	max. Current	max. Residual voltage
+ 40 V DC	25 mA	< 1 V @ 25 mA

The electronic outputs are not short-circuit-proof.

3.4 Assignement of signal inputs

Choice of PNP or NPN   The contacts 7 to 10 are comparator signal inputs. They can be triggered either by PNP or NPN encoders. The input logic as well as the operating threshold are correspondingly chosen in programming line 33. The contacts 7 (Track A) and 8 (Track B) are counting inputs for a counting range between 3 Hz, 25 Hz or 10 kHz. The counting rate is determined in programming lines 31 and 32. The contacts 9,10 and 11 are 3 control inputs for Reset, Stop, Hold, Print, Keylock, etc. The function of these control inputs is selected in the programming lines 34,36 and 37.
The minimum pulse duration of control input 1 can be switched in programming line 35 from 30 ms to 100 µs. For control inputs 2 and 3, 30 ms are generally valid.

3.4.1 Examples of connection

Encoder	DELTA-D Contact assignement		Programming
Contact	7	Track A	Counting rate:
	12	+ 24 V	Line 31 to 1=25 Hz
			Line 31 to 2=3 Hz
Proximity switch PNP or NPN	7	Track A	Input logic:
	12	+ 24 V	Line 33 to 0=PNP
	13	0 V	Line 33 to 1=NPN
NAMUR Without explosion prtotection	7	Track A	Input logic:
	13	0 V	Line 33 to 1=NPN
Incremental encoder	7	Track A	Counting mode:
	8	Track B	A 90º B (x1,x2,x4)
	12	+ 24 V	Line 30 to 3,4,5
	13	0 V	Counting rate:
			Line 31,32 to 0
			= 10 kHz

3.5 Encoder supply connection

Connect encoder supply for rotary encoder, proximity switch, etc. to the contacts 12 and 13. However, do not use encoder supply for unearthed inductors or capacitive loads.

The encoder supply is not short-circuit-proof.

Contact	Voltage	Máx. admissible current
12	10 ... 26 V DC	60 mA
13	0 V	

3.6 Interface connection

The serial interface can perform the following functions:
- Retrieve data
- Program parameters

Interface parameters are:
- Transmission speed (Baud rate),
- Parity bit,
- Number of stop bits,
- Address of controller for master.

The interface parameters can be set on the programming level (Lines 51 to 54).

RS485

Half-duplex transmission with the following features:
- Symmetrical
- 2 lines
- Multi-point connection – emitter and receiver (max. 32 units)
- Maximum distance of data transmission: 1500m

Assign contacts 14 (T,R-) and 15 (T,R+) accordingly.

4   DELTA-D OPERATION

The following chapter will inform you on the operation of your DELTA-D.

● The DELTA-D is automatically on the operator level after the supply voltage has been turned on.

On the operator level it is possible:

- To read and, if necessary, clear the current count;
- To read and, if necessary, modify the preselections P1 and P2;
- To read and, if necessary, modify the preset start count;
- To read and, if necessary, clear the totalizer;
- To read and, if necessary clear the batch counter;
- To read and, if necessary, modify the scaling factor.

● It is possible to disable all operator parameters on the programming level (Lines 11-17)

The keys and their function

Parameter reading   Select the enabled parameters via the key ↑ or ↓.
The key ↵ allows to switch to the mext operation parameter.
For quick sweep, keep this key depressed.

Resetting of counts   1. Display count of respective parameter.
2. Push Reset.

Setting of parameters   1. Display parameter.
2. Push ← or →; and select required decade; chosen decade position blinks.
3. Push ↑ or ↓ and enter required value.
To set further decades, repeat steps 2 and 3.
4. Confirm the parameter entered with ↵.
Should no confirmation be given within 15 s, the previous setting will remain valid.
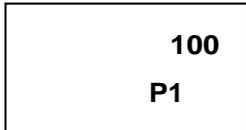
Current count

The upper display indicates the curent count.
The lower display indicates preselection P2 or a parameter of your choice in programming line 27.

```
            0
P2       1000
```
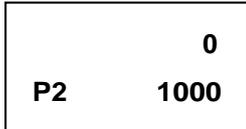
Read   Read count and,for example, preselection P2.

Preselection P1

Read   Push ↓ or ↵

```
          100

          P1
```

The preselection value P1 is displayed.
The lower display indicates "P1"

Modify   Enter preselection P1 via the keys ← → ↓ ↑
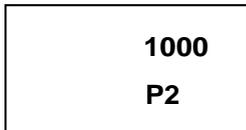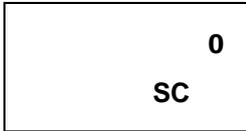Push ↵.

Preselection P2

Read   Push ↓ or ↵

```
        1000

          P2
```

The preselection value P2 is displayed.
The lower display indicates "P2"

Modify   Enter preselection P2 via the keys ← → ↓ ↑
Push ↵.

START COUNT SC

```
           0

      SC
```

Read Push ↓ or ↵
      The start count SC is displayed.
      The lower display indicates "SC".

Modify Enter the start count SC via the keys ← → ↓ ↑
        Push ↵.

Totalizer tot

Read Push ↓ or ↵
      The totalizer tot is displayed.
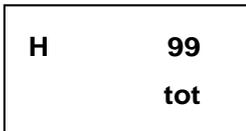   The lower display indicates "tot"

      If the value 999999 is exceeded, its display will be shown in two steps:
      First step: Display of the first 6 digits.
      Second step, market by an H: Display of the 7th and 8th digits.
      Display of each value for ca. 3 seconds.

Clear Push Reset

```
H        99

      tot
```

```
      999999

      tot
```

Batch counter b

Read   Push ↓ or ↵.

```
┌─────────────────┐
│                 │
│              0  │
│                 │
│  b              │
│                 │
└─────────────────┘
```

The batch counter b is displayed.
The lower display indicates "b"

Clear   Push Reset.

Scaling factor SF
The scaling factors allows the display of fractions or multiples of the principal
Counter and totalizer.
Setting range: 0.0001 to 9999.99. Setting ex factory to 1.0000.

```
┌─────────────────┐
│                 │
│   1.0000        │
│                 │
│   SF            │
│                 │
└─────────────────┘
```

Example   In the case of a length measurement by means of encoder and cyclometer,
when the circumference of the cyclometer measures 200 mm and the
encoder supplies 500 pulser per revolution, the measurement is to be displayed in mm.
The scaling factor is calculated as follows for this example:

$$\text{Scaling factor} = \frac{\text{Circumference}}{\text{Pulses}} = \frac{200}{500} = 0.4000$$

Read   Push ↓ or ↵.
The scaling factor SF is displayed.
The lower display indecates "SF".

Modify   Enter the scaling factor via the keys ← → ↓ ↑.

The setting range from 0.0001 to 999.99 is attained by shifting the decimal point.
Select the decimal point via ← and shift using ↑.
Push ↵.

By pushing ↓ or ↵ again, the current count is re-displayed.

5   PROGRAMMING DELTA-D

This chapter will inform you on how to program your DELTA-D.

Programming level   Operation parameters are set on the programming level.
The programming level consists of 3 programming fields.
Access is protected by a 4-digit code or via a control input.

1st programming field   Here it is possible to select and modify all operation parameters.
The operation parameters that are disabled for the operator are also displayed.

2nd programming field   The individual operation parameters for operator access are disabled or enabled here.

3rd programming field   All functions and values as well as interface parameters conditioned by the machinery
are programmed here.

THE KEYS AND THEIR FUNCTION

Turn on programming   Push ↑ y ↵ simultanously.
"**Code**" appears on the lower display.

No code number has yet been set at the factory, therefore it is possible to skip the
code query by pushing ↵.
The code is set on programming line 50.
**After a code has been set, it will only be possible to switch to the
programming level by entering the correct code.**

Enter code	Enter code via the keys ← → ↓ ↑. Push ↵ to confirm. The instrument switches from the operator level to the programming level.
Wrong code	If a wrong code has been entered, "Error" is displayed as long as ↵ remains pushed . After 15 s the instrument switches automatically back to the operator level.
Correct code unknown	If the correct code is not know, please return the counter to the supplier or Effect reset to factory setting.
Select programming lines	Select the programming line needed via the keys ↓ ↑. This function can also be reached by pushing ↵. The line number is displayed.
Modify operation parameters	Select the decade to be changed via the keys ← →. The selected decade blinks. Enter the value by pushing the keys ↓ ↑. Push ↵ .
Leaving programming	It is possible to shut down the programming at any time by pushing ↑ and ↵ simultaneously.
Reset to factory setting	Turn on instrument and press the keys ← and ↑ simultaneously. All values already programmed are set back to the factory setting. "**Clr Pro**" briefly appears on the display.

Programming field 1   Here it is possible to select and modify all operation parameters.
The operation parameters that are disabled for the operator are also displayed.

Line 1	**0** **1** **PC**	**PC – Principal counter** (current count)
Line 2	**100** **2** **P1**	**P1 – Preselection 1**
Line 3	**1000** **3** **P2**	**P2 – Preselection 2**
Line 4	**0** **4** **SC**	**SC – Start count**
Line 5	**0** **5** **tot**	**tot – Totalizer**
Line 6	**0** **6** **b**	**b –Batch counter**
Line 7	**1.0000** **7** **SF**	**SF –Scaling factor**

- - - - - - -

The dash line indicates the end of the first programming field.
Switch to programming field 2 by pushing ↓ or ↵.

Programming field 2   The individual operation parameters for operator acces are disabled or enabled here.
StAt appears on the upper display. The lower display indicates the line number and the abbreviation for the operation parameter. The status number is entered on the upper display.

Meaning of the status numbers.

0   Free acces   It is possible to select, read and modify the operation parameter on the operator level.

1   Display only   It is possible to select and read the operation parameter on the operator level.

2   Disabled   It is possible to select the operation parameter on the operator level. Its corresponding function is however sustained.

☞

Each factory setting is marked as such by *.

Modify status   Enter corresponding status number via the keys ← → ↓ ↑.
Push ↵.

| Line 11 | StAt 0
11 PC | **PC – Principal counter**
0 * Free access
1 Display only
2 Disabled |
| | | |

PC – Principal counter

Line 11 — StAt 0 / 11 PC

0 * Free access
1 Display only
2 Disabled

P1 – Preselection 1

Line 12 — StAt 0 / 12 P1

0 * Free access
1 Display only
2 Disabled

P2 – Preselection 2

Line 13 — StAt 0 / 13 P2

0 * Free access
1 Display only
2 Disabled

SC – Start count

Line 14 — StAt 2 / 14 SC

0 Free access
1 Display only
2 * Disabled

tot – Totalizer

Line 15 — StAt 2 / 15 tot

0 Free access
1 Display only
2 * Disabled

b – Batch counter

Line 16 — StAt 2 / 16 b

0 Free access
1 Display only
2 * Disabled

SF – Scaling factor

Line 17 — StAt 2 / 17 SF

0 Free access
1 Display only
2 * Disabled

- - - - - -

The dash line indicates the end of the second programming field.
Switch to programming field 3 by pushing ↓ or ↵.

21

Programming field 3　　All functions and values as well as interface parameters conditioned by the machinery
Are programmed here

Each factory setting is marked as such by *.

Operating modes Principal counter

0　　*　　Adding, final signal at P2, reset to SC
1　　　　Subtracting, final signal at SC. If programming with automatic reset
　　　　　(line 23), it is effected at SC
2　　　　Subtracting, final signal at SC. If programming with automatic resert
　　　　　(line 23), it is effected at 0

Line 21

```
            0

  21
```

Preselection modes

0　　*　　Principal counter with 2 preselections (progressive preselections)
1　　　　Principal counter with 2 preselections (P1 then as trailing preselection)
2　　　　Principal counter with preselection P2, batch counter with preselection P1

Line 22

```
            0

  22
```

Reset modes

0　　*　　Principal counter and batch counter with automatic reset
1　　　　Principal counter without, batch counter with automnatic reset.
2　　　　Principal counter with, batch counter without automatic reset.
3　　　　Principal counter and batch counter without automatic reset.

Line 23

```
            0

  23
```
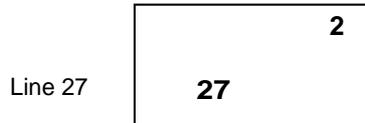
Decimal point for PC, P1, P2, SC, tot

Line 24

	0
24	
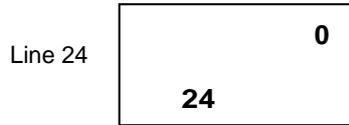
0	*	without decimal point
1		00000.0
2		0000.00
3		000.000

Indication of measuring unit on display

Line 26

	0
26	
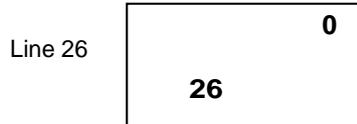
0	*	without measuring unit
1		m
2		dm
3		cm
4		mm
5		L

Assignement of lower display

Line 27

	2
27	

		The upper display always indicates the current value
0		without lower display
1		P1 - Preselection
2	*	P2 - Preselection
3		SC – Start count
4		tot - Totalizerr
5		b – Batch counter
6		SF – Scaling factor

Line 30

0	
30	
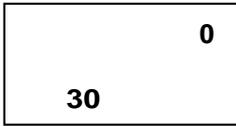
Counting mode Principal counter and totalizer

0	*	Counting input Track A, reversal Track B
1		Subtraction Track A adding and Track B subtracting (A-B)
2		Totaling Track A 90º Track B adding (A+B)
3		Track A 90º Track B single evaluation
4		Track A 90º Track B double evaluation
5		Track A 90º Track B quadruple evaluation

☞
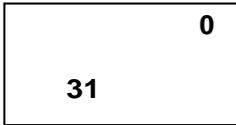
In case of the counting mode "Track A 90º Track B", the frequency of Track A and B (Line 31 and 32) must be adjusted to 10 kHz.
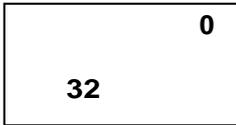
Line 31

0	
31	

Frequency Principal counter Track A

0	*	10 kHz
1		25 Hz
2		3 Hz

Line 32

0	
32	

Frequency Principal counter Track B

0	*	10 kHz
1		25 Hz
2		3 Hz

Line 33

0	
33	
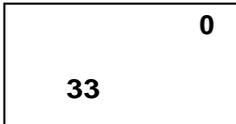
Input logic and Operating thresholds of signal inputs

| 0	*	PNP Operatin threshold 6 V
1		NPN Operatin threshold 6 V, or for NAMUR without explosion protection
2		PNP Operatin threshold 3 V
3		NPN Operatin threshold 3 V
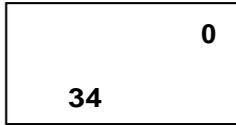
Function Control input 1 (contact9)

Line 34

	0
34	

0	*	PC Principal counter – Reset static
1		PC Principal counter – Reset edge-triggered
2		PC Principal counter – Stop
3		Hold
4		Programming disabled
5		Keylock
6		Print (30 ms minimum pulse duration)
7		Principal counter – Outputs ON
8		Principal counter – Outputs OFF
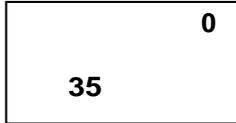
Minimum pulse duration for control input1

	0
35	

Line 35

0	*	30 ms
1		100 µs
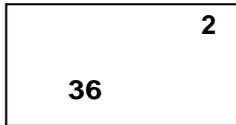
Function control input 2 (Contacto 10)

	2
36	

Line 36

0		PC Principal counter – Reset static
1		PC Principal counter – Reset edge-triggered
2	*	PC Principal counter – Stop
3		Hold
4		Programming disabled
5		Keylock
6		Print
7		Principal counter – Outputs ON
8		Principal counter – Outputs OFF
9		External counting input for batch counter

Function Control input 3 (Contact 11)

Line 37

| 37 | 0 |

0	*	tot − Totalizer − Reset estatic
1		tot − Totalizer − Reset edge-triggered
2		b − Batch counter − Reset estatic
3		b − Batch counter − Reset edge-triggered
4		Programming disabled
5		Keylock
6		Print
7		Principal counter − Outputs ON
8		Principal counter − Outputs OFF
9		External counting input for batch counter

Take-over of preselections P1, P2, SC

Line 38

| 38 | 0 |

| 0 | * | Effective immediately |
| 1 | | When reseting |

Output logic

Line 40

| 40 | 0 |

0	*	Both outputs as normally open
1		P1 normally closed, P2 normally open
2		P1 normally open, P2 normally closed
3		Both outputs as normally closed

Output time P1

Line 41

| 41 | 0.25 | * |

0.01 s   Minimum signal duration
0.25 s
99.99 s Maximum signal duration
Latch = Latched signal (By pressing the Reset key)

Output time P2

Line 42

	0.25
42	

*

0.01 s Minimum signal duration
0.25 s
99.99 s Maximum signal duration
Latch = Latched signal (by pressing the Reset key)

Code setting

Line 50

	0
50	

0   *   Code not active
              max. 9999

Baud rate

Line 51

	0
51	

0   *   4800 Baud
1   2400 Baud
2   1200 Baud
3   600 Baud

Parity

Line 52

	0
52	

*

0   *   Even parity
1   Odd parity
2   No parity

Line 53

```
            0
  53
```
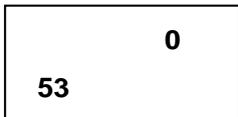
Stop bits

0   *   1 Stop bit
1   2 Stop bits

Line 54

```
            0
  54
```

Address

0   *   from
99   to

```
  - - - - - -
```
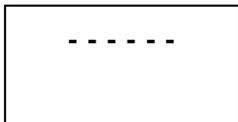
The dash line indicates the end of the third programming field
By pushing ↓ or ↵ , the instrument switches back to the beginning of the
First programming field. Programming can be shut down at any time by
Pushing the keys ↑ and ↵ simultaneously

5.1 Operating and preselection modes

The following paragraphs describe the operating modes.

Progressive preselection
The DELTA-D counts to the next preselection after having reached a preselection. The preselections are always handled in the sequence P1, P2. You can select the preselection of your choice.
An automatic reset to 0 and/or to the start count SC is possible at P2 (at the second preselection). An external or manual reset is possible at any time.

P1 trailing preselection
The entry of preselection P1 corresponds to the interval between the previous signal and the final signal. This means that when changing th final signal, i.e. the preselection P2, the previous signal will be automatically adjusted or "trailed"
This mode is well suited for switching between rapid and creeping speed in the case of lenght measurement applications

5.2 Counting modes for principal counter and totalizer (input mode)
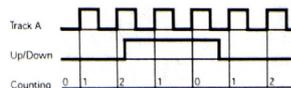
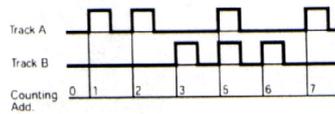**Counting input Track A, reversal Track B (Up/Down)**
The adding and/or substracting counting directions are automatically set when selecting the operating mode in programming line 21 (diagram for adding mode).
If necessary, it is possible to use the entry Track B for reversal of direction count. Programming line 30 to digit 0.
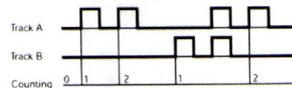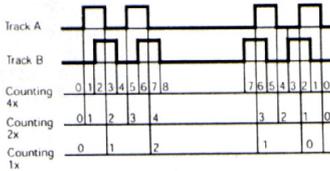

Differential counting Track A adding and Track B subtracting (A-B)
Signal duration and particular time at choice. Programming line 30 to digit 1

Totaling Track A adding and Track B adding (A+B)

The adding and/or subtracting count directions are automatically set when selecting the operating mode in programming line 21.
Programming line 30 to digit 2

Up and down count with two counting signals by 90⁰ out of phase

The counting direction is automatically recpgnized on the basis of the 90⁰ leading or trailing phase shift. The internal phase discriminator does the evaluation. Single, double or quadruple evaluation is possible. Programming line 30 to digits 3,4 or 5

5.3 Output (Output mode)

The behavior of the signal outputs is defined by the following settings under the programming field 3: Operating mode, preselection mode, reset mode, take-over of preselections, output logic and output time P1 and P2. The following diagrams illustrate some examples:

Programming

Preselection mode:
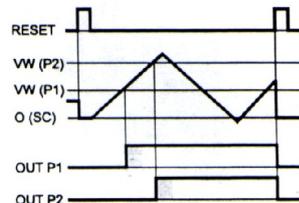Line 22 to 0 = Prograssive preset.
Reset mode:
Line 23 to 1 or 3
Without automatic reset
Output time P1,P2:
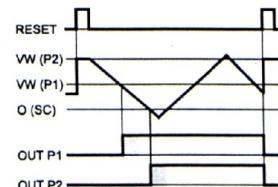Line 41, 42 to pulse or duration

Operating mode
Line 21 to 0 = adding

Operating mode
Line 21 to 1= subtracting

Programming

Preselection mode:
Line 22 to 0 = Progressive preset
Reset mode:
Line 23 to 0 = automatic

Operating mode
Line 21 to 0 = adding

Operating mode
Line 21 to 1 = subtracting

Preselection mode:
Line 22 to 1 = Trailing preselection
VW (P1) corresponds to the interval between P1 and P2. When P2 is changed, P1 is trailed.
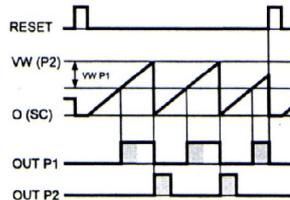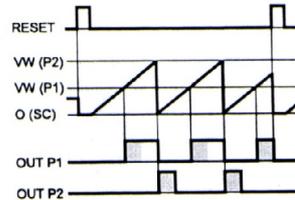

Operation mode:
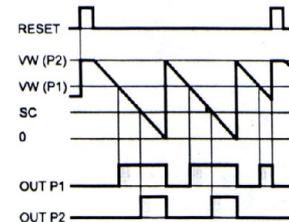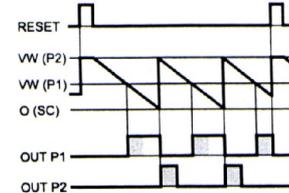Line 21 to 2 = OUT P2 at SC.
Automatic reset at 0
Preselection mode:
Line 22 to 0 = Progressive preset.

Programming

Preselection mode:
Line 22 to 0 = Progressive preset.
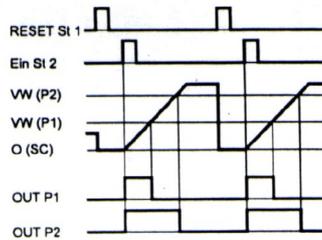Reset mode:
Line 23 to 1 or 3
Without automatic reset
Function conrol input 2:
Line 36 to 7 = OUT P1 and OUT P2
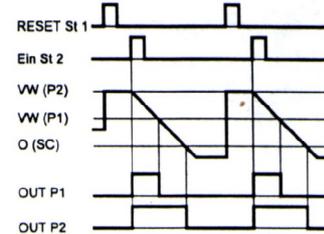Are activated by a signal to control input 2
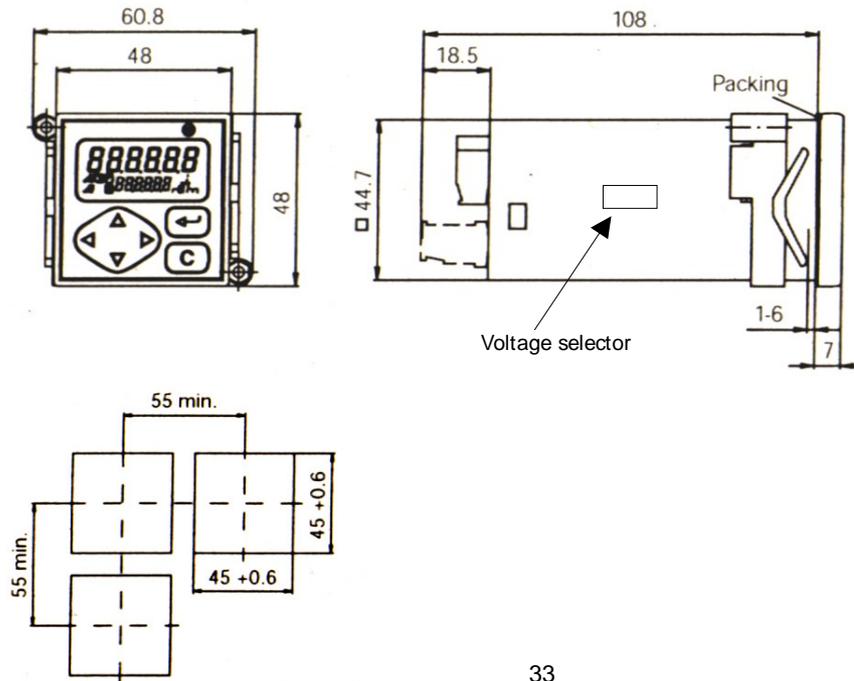
Operation mode
Line 21 to 0 = adding

Operation mode
Line 21 to 1 = subtracting

6 Technical data

6.1 Dimensions and mounting

Voltage selector

6.2 Technical data

Display .... 7 segments LCD-display background illumination
Digit size.. First line: 7 mm, second line 4 mm
Display of measuring units........................... " mm, cm, dm, m, L "
Display of switching outputs P1,P2 .... Illustration as normally open or normally closed

Supply voltage.. 115 / 230 VAC (50/60Hz)
                               24 / 48 VAC (50/60Hz)
                               12...30 VDC 5 % RW
Power consumption .... 5 VA, 4W
Encoder supply... 10 ... 26 VDC, 60 mA
Counting rate Principal .... 25 Hz or 40 kHz
Counting rate batch .... 3 Hz, 25 Hz or 10 kHz
Data storage .... > 10 years (via EEPROM)
Fixing .... Clampingg frame
Front measures .... 48 x 48 mm
Mounting depth .... 100 mm
Connections .... Two plug-in screw terminals
                               With 6 poles (grid 5.08 mm) and with 9 poles (grid 3.81 mm)
Core cross-section .... max. 1.5 mm^2

Casing material .... Makrolon 6485
Keypad .... 6 Short stroke keys and front membrane
Front membrane.. Polyester membrane

Weight.. Model AC: ca. 260 g
                               Model DC: ca. 140 g

Ambient temperature .... 0 ... +50 ºC
Storage temperature .... -20 ... + 70 ºC
Humidity .... 80 % max. Non-condensing
Protection .... Frontal IP 65 to DIN 40050
General rating .... EN 61010 Part 1
- Protection class II
- Overvoltage protection II
- Contamination factor 2

Interference immunity .... EN 61000-6-2
Emitted interference .... EN 50081-2

6.2 Error messages

Err 1 and **Err 2** : Error must be fixed at the factory
Err 6: Sequences are too quick, e.g. very short intervals between preselections at high counting rate.
Message Err 6 can be cleared by pushing Reset.

5. WARRANTY

All products are warranted against defective material and workmanship for a period of three years from date of delivery.

If a product appears to have a defect or fails during the normal use within the warranty period, please contact the distributor from whom you purchased the product.

This warranty does not apply to defects resulting from action of the buyer such as mishandling or improper interfacing.

The liability under this warranty shall extend only to the repair of the instrument ; no responsibility is assumed by the manufacturer for any damage which may result from its use.