Operating Instructions

Electronic preset counter
NE216

General Information

In the following you will find the explanations of the symbols used in this operating manual.

Explanation of symbols ➜ This symbol indicates activities to be carried out.

● This symbol indicates supplementary technical information.

⚠️ This symbol is located before texts to which particular attention is to be paid to ensure proper use of the product.

This symbol is located before texts that provide important additional information

Italics To help you quickly locate information, important terms are printed in italics in the left text column.

1 Safety instructions

General information

The products has been developed and built in accordance with the recognized rules of technology. The units have left the manufacturing plant ready to operate and in safe condition.
To keep the units in this condition, it is necessary that the units be
- installed and operated
- properly,
- in a safety and hazard-conscious manner,
under observance of this operating manual and in particular of these safety precautions!

Make sure that the personnel has read and understood the operating manual, and in particular the „Safety Instructions" chapter.
In addition to the operating manual, the generally applicable legal and other binding regulations for accident prevention and environmental protection must be observed and ensured.
This manual is intended as a supplement to already existing documentation (catalogues, data sheets or assembly instructions).

Proper use

The application of the units consists of controlling and monitoring industrial processes in the metal, wood, plastics, paper, glass and textile industry etc.
The units may only be operated
- in the properly installed state and
- in accordance with the specifications of the technical data

Operation not covered by the specified descriptions/parameters is improper and can lead to
- fatal injuries,
- serious damage to health,
- property damage or
- damage to the units
in conjunction with the systems/machines/processes to be controlled/monitored!

The overvoltages to which the units are subjected at the connection terminals must be limited to the value of the overvoltage category II (see Technical data)!
The units may not be operated
- in hazardous areas,
- as medical units,
- in applications expressly named in EN 61010!

If the units are used to control/monitor machines or processes with which, as the result of a failure/malfunction or incorrect operation of the units
- a life-threatening danger,
- health risks or
- a danger of property or environmental damage
could result, then appropriate safety precautions must be taken!

Do not open the housing of the units or make any changes to it! Tampering with the units can have a negative affect on their operating safety, resulting in dangers!
Do not make repairs on the units! Return defective units to the manufacturer!

Installation/commissioning

In case of changes (including in the operating behavior) that impair safety, shut-down the units immediately. During installation work on the units, the power supply must always be disconnected. Installation work may only be carried out by appropriately trained experts.

Maintenance/repairs

Always disconnect the power supply of all units involved. Maintenance and repair work may only be carried out by appropriately trained experts.
If troubleshooting is unsuccessful, do not continue to use the units. Please contact the manufacturer in this case.
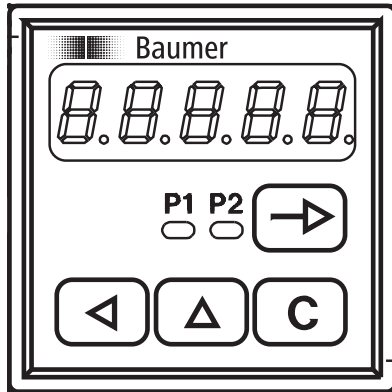
2 System description

2.1 Description

The device comprises
- a 5-digit preset counter with 2 settings
- an 8-digit totalizer

LED display

P1 Preset 1	
P2 Preset 2	
P1 blinks, preset P1 reached	
P2 blinks, preset P2 reached	

Control panel

|	
→)	Key for display of functions, confirmation key
C	Reset
△	Key to select HIGHER decades
◁	Key to select decades to the LEFT

2.2 Block diagram
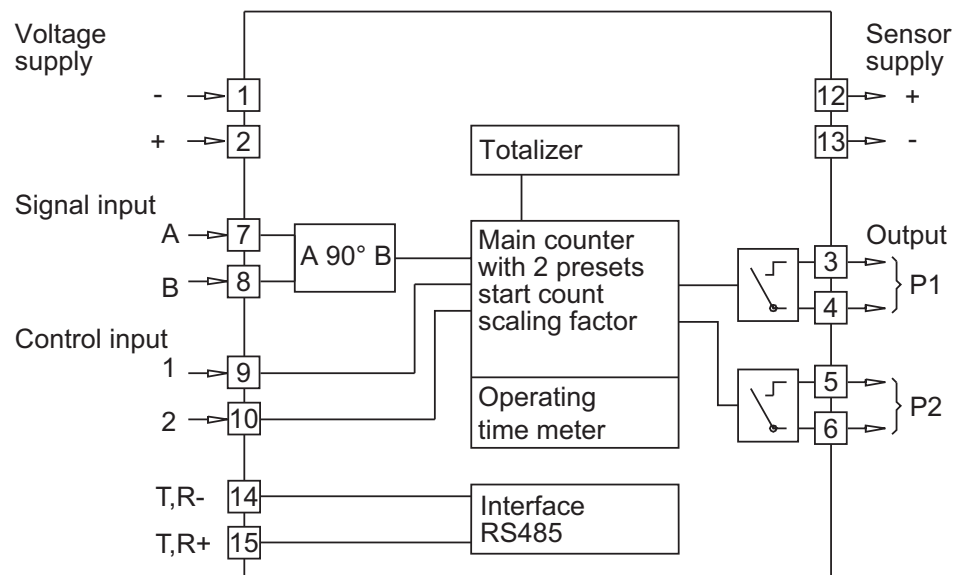
3 Connecting

This section describes the terminal assignments, accompanied by an example of a typical connection.
Sections 3.1 to 3.6 contain specific instructions and technical data relating to the individual terminals.
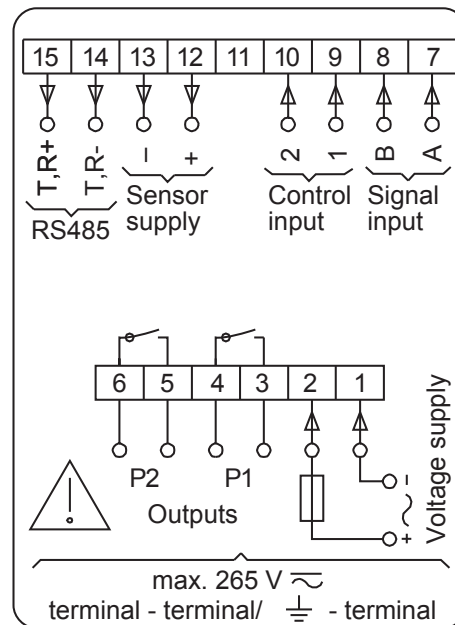
Assignment Relay outputs   Electronic outputs
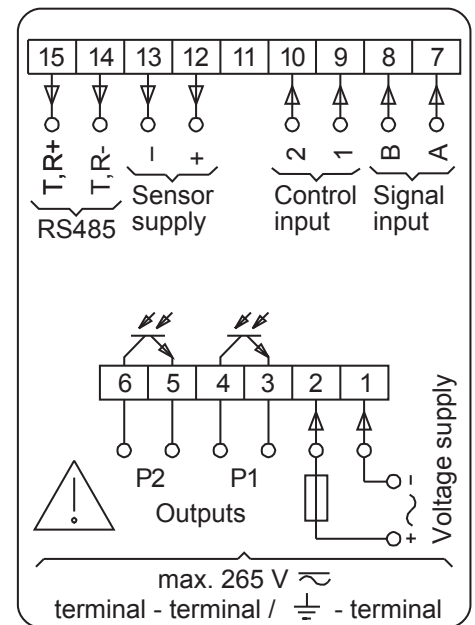
Connecting assignment
Relay outputs and electronic outputs

Terminal	Function
1	Voltage supply (-)
2	Voltage supply (+)
3	Relay output / Output P1
4	Relay output / Output P1
5	Relay output / Output P2
6	Relay output / Output P2
7	Signal input Track A
8	Signal input Track B
9	Control input 1 (main counter Reset)
10	Control input 2 (main counter Stop)
11	-
12	Sensor supply (+)
13	Sensor supply (-)
14	Option RS485 (T,R-)
15	Option RS485 (T,R+)

Litz contact only by means of connector sleeves with insulating enclosures 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 sensor 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 over long distances. The sensor leads should not be in the same phase winding as the mains supply and the output contact leads.

3.1 Connecting the voltage supply

Three voltage supply are available:
AC voltage: 24/48 VAC (50/60 Hz), set the required alternating voltage with the voltage selector switch.
AC voltage: 85...265 VAC (50/60 Hz), wide range supply
DC voltage: 12...30 VDC

Supply voltage	Recommended external protection
24 VAC ±10 %	M 400 mA
48 VAC ±10 %	M 400 mA
85...265 VAC	M 315 mA
12...30 VDC	M 400 mA
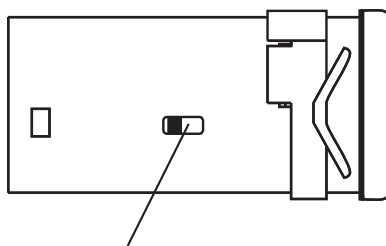
→ Model 24/48 VAC: set the required alternating voltage with the voltage selector switch.
→ Connect AC at the contacts 1 and 2 according to the terminal diagram.

DC-voltage 12...30 VDC:
Connect interference-free voltage supply. Therefore, do not use the voltage supply for parallel supply of drives, contactors, electromagnetic valves, etc.

voltage selector

Fire protection: Operate instrument on the MAINS with external fuse recommended on the type label. In case of disturbance, make sure that 8 A /150 VA (W) are never exceeded – as defined under EN 61010.

3.2 Assignment of signal outputs (relay contacts)

Contact P2   Contact P1

6   5 4   3
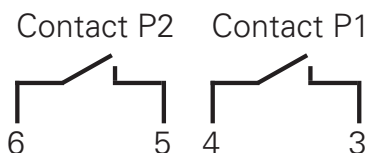
The signal outputs (contacts 3, 4 and 5, 6) are floating relay contacts. The signal outputs can be assigned as per the adjacent terminal diagram.
The type of outputs, as momentary or latched signal, can be chosen in the programming lines 41 / 42.
Their function, as normally open or closed, is selected in programming line 40.

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

3.3 Assignment of signal outputs (electronic)

Output P2   Output P1

6   5   4   3
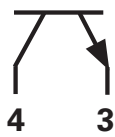
The electronic outputs (contacts 3, 4 and 5, 6) are optocoupler outputs. The signal outputs can be assigned as per the adjacent terminal diagram.
The type of output, as momentary or latched signal, can be chosen in the programming lines 41/42.
Their function, as normally open or closed, is selected in programming line 40.

Max. switching voltage	Max. switching current	Max. residual voltage
+40 VDC	25 mA	at 25 mA <1 V

The electronic outputs are not short-circuit-proof.

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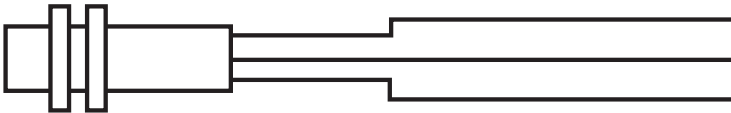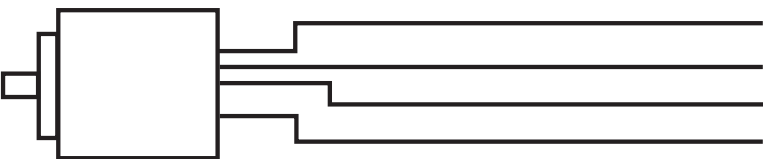The contacts 7 (Track A) and 8 (Track B) are counting inputs for a counting range between 3 Hz, 25 Hz or 10 kHz. The counting rate is determined in programming lines 31 and 32.
The contacts 9 and 10 are 2 control inputs for Reset, Stop, Hold, Print, Keylock etc. The function of these control inputs is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

Input resistance	Selectable operating threshold
approx. 3 kΩ	3 V and 6 V

3.5 Examples of connection

Sensor	**Contact assignment**	**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 protection

	7 Track A	Input logic:
	13 0 V	Line 33 to 1 = NPN

Incremental encoder

	7 Track A	Counting mode:
	8 Track B	A 90° 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

3.6 Connecting the sensor supply

Connect the sensor supply at terminals 12 and 13 – for example encoder supply, etc.

Do not use the sensor supply to supply non-earthed inductive or capacitive loads. The sensor supply is short-circuit proof (exception model 24/48 VAC).

Voltage supply	Sensor supply	Current load
24 VAC	10...26 VDC	60 mA
48 VAC	10...26 VDC	60 mA
85...265 VAC	24 VDC ±20 %	100 mA
12...30 VDC	9...28 VDC ±20 %	100 mA

3.7 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, 52, 53 and 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:1500 m

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

4 Operating mode

The following chapter will inform you on the operation.

● The counter 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 PC;
- to read and, if necessary, modify the presets 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, modify the scaling factor.

It is possible to disable all operator parameters on the programming mode (lines 11-17).
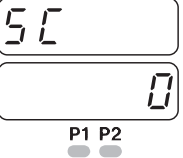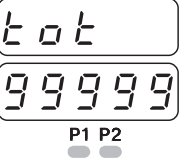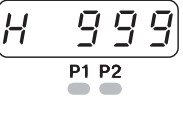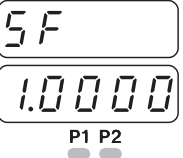
4.1 Key functions
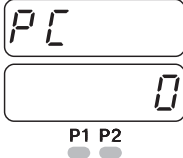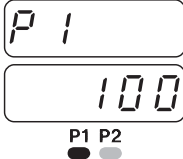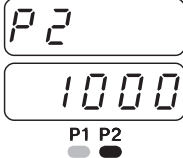
Parameter reading The key ⊕ allows to switch to the next operation parameter. For quick sweep, keep the key depressed.

Resetting of counts
1. Display count of respective parameter.
2. Press [C] key.

Setting of parameters
1. Display parameter.
2. Press [◁] key and select required decade; chosen decade position blinks.
3. Press [△] key 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.

`PC`
`0`
P1 P2
	Current count
	After the counter has been turned on or upon selection via ⊕ , „C"
	appears for one second on the display. The current count is then
	displayed for reading.
	➜ Read count PC.
	Clear ➜ Press Ⓒ key.

`P1`
`100`
P1 P2
	Preset P1
	Read ➜ Press ⊕ key.
	„P1" appears for one second on the display. The preset P1 is
	then displayed for reading.
	Modify ➜ Enter preset P1 via ◁ and △ .
	Press ⊕ key.

`P2`
`1000`
P1 P2
	Preset P2
	Read ➜ Press ⊕ key.
	„P2" appears for one second on the display. The preset P2 is
	then displayed for reading.
	Modify ➜ Enter preset P2 via ◁ and △ .
	Press ⊕ key.

`SC`
`0`
P1 P2
	Start count SC
	Read ➜ Press ⊕ key.
	„SC" appears for one second on the display. The display then
	jumps to the current start count SC.
	Modify ➜ Enter SC via ◁ and △ .
	Press ⊕ key.

`tot`
`99999`
P1 P2
	Totalizer tot
	Read ➜ Press ⊕ key.
	„tot" appears for one second on the display. The display then
	jumps to the current total.

`H 999` P1 P2	If the value 99999 is exceeded, its display will be shown in two steps. First step: Display of the first 5 digits. Second step: marked by „H", Display of 6th, 7th and 8th digits. Display of each value for approx. 3 seconds
	Clear ➜ Press Ⓒ key.

`SF`
`1.0000`
P1 P2
	Scaling factor SF
	The scaling factor allows the display of fractions or multiples of the
	counting pulses.
	Setting range: 0.0001 to 999.99
	Setting ex factory: 1.0000.

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

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

Read ➜ Press ⟶ key.
„SF" appears for one second on the display. The display then jumps to the current scaling factor SF.

Modify ➜ Enter scaling factor SF via ◁ and △ .
The setting range from 0.0001 to 999.99 is attained by shifting the decimal point. Select decimal point via ◁ and shift via △ .
➜ Press ⟶ key.

By pushing ⟶ again, the current count is re-displayed.

5 Programming mode

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

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.

Programming field 2

The individual operation parameters for operator access are disabled or enabled here.

Programming field 3

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

Switch on programming

➜ Press △ and ⟶ key simultaneously.
„**Code**" appears on the 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.

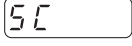|	
Enter code	Enter code via ◁ and △ keys. Press ➔ key to confirm. The instrument switches from the operator to the programming level.
Wrong code	If a wrong code has been entered, **„Error"** is displayed as long as ➔ remains pushed. After 15 s the instrument switches automatically back to the operator level.
Correct code unknown	If the correct code is not known, please return the counter to the supplier or effect reset to factory setting.
Select programming lines	Select the required programming line via ➔ . Its corresponding line number will be displayed. For quick sweep, keep ➔ depressed.
Jump back to programming line	By keeping △ depressed and by operating ➔ it is possible to jump back within the programming lines.
Modify operation parameters	Select the decade to be changed via ◁ . The selected decade blinks. Enter the value by pushing △ . Press ➔ key to confirm.
Leave programming	It is possible to shut down the programming at any time by pushing △ and ➔ simultaneously (keep depressed for 2 seconds).
Reset to factory setting	Turn on instrument and press ◁ and △ simultaneously. All values already programmed are set back to the factory setting. „ClrPr" appears on the display.
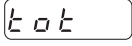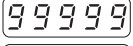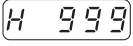
Programming field 1
Here it is possible to select and modify all operation parameters.
The operation parameters that are disabled for the operator are also displayed.

Line 1	PC 0 P1 P2	**PC - Main counter (current count)**
Line 2	P1 100 P1 P2	**P1 - Preset 1**
Line 3	P2 1000 P1 P2	**P2 - Preset 2**
Line 4	SC 0 P1 P2	**SC - Start count**
Line 5	tot 99999 P1 P2 H 999	**tot - Totalizer**
Line 7	SF 1.0000 P1 P2	**SF - Scaling factor**
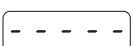
- - - - -   The dash line indicates the end of the first programming field.
Switch to programming field 2 by pushing ➔.

Programming field 2
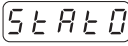
The individual operation parameters for operator access are disabled or enabled here.
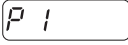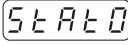
● **„Stat"** appears on the display. The denominations of the chosen line „PC", „P1", „P2", „tot", „SC" and „SF" are displayed for one second. Then the display jumps to StAt with the current status value.
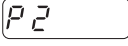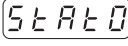
Meaning of the status numbers
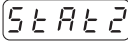
0	It is possible to select, read and modify the operation parameter on the operator level. (free access)
1	It is possible to select and read the operation parameter on the operator level. (display only)
2	It is impossible to select the operation parameter on the operator level. It is corresponding function is however sustained. (disabled)
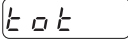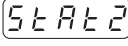
Modify status Enter corresponding status number via ◁ and △ .
Modified status number is automatically memorized when the next programming line is selected via →↓ .
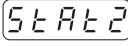
Line 11 $\boxed{PC}$ $\boxed{StAt\,0}$ **PC - Main counter**

Line 12 $\boxed{P1}$ $\boxed{StAt\,0}$ **P1 - Preset 1**

Line 13 $\boxed{P2}$ $\boxed{StAt\,0}$ **P2 - Preset 2**

Line 14 $\boxed{SC}$ $\boxed{StAt\,2}$ **SC - Start count**

Line 15 $\boxed{tot}$ $\boxed{StAt\,2}$ **tot - Totalizer**

Line 17 $\boxed{SF}$ $\boxed{StAt\,2}$ **SF - Scaling factor**

$\boxed{- - - - -}$ The dash line indicates the end of the second programming field. Switch to programming field 3 by pushing →↓ .
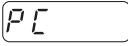
Programming field 3
All functions and values as well as interface parameters conditioned by the machinery are programmed here.

ⓘ Each factory setting is marked as such by *.

Line 21	`21    0`	**Operating modes main 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 reset (Line 23), it is effected at 0.

Line 22	`22    0`	**Preset mode**

0 * Step preset
1 P1 - Trailing preset

Line 23	`23    0`	**Reset modes**

0 * With automatic reset
1 Without automatic reset

Line 24	`24    0`	**Decimal point for PC, P1, P2, SC, tot**

0 * No decimal point
1 0000.0
2 000.00
3 00.000

Line 30	`30   0`	**Counting mode**

0 * Counting input track A, reversal track B
1 Subtraction track A adding and track B subtracting (A-B)
2 Totaling track A adding and track B adding (A+B)
3 Track A 90° B single evaluation
4 Track A 90° B double evaluation
5 Track A 90° B quadruple evaluation
● In case of the counting mode „Track A 90° B", the frequency of Track A and B, Line 31 and 32, has to be adjusted to 10 kHz.
6 Time meter with preset. Counting while track A active. Track B has no function.
7 Time meter with preset. Counting started via track A and stopped via track B. Track A and B edge-triggered.
● The time range is selected in line 43.

Line 31	`31    0`	**Frequency main counter track A**

0 * 10 kHz
1 25 Hz
1 3 Hz

Line 32	`32    0`	**Frequency main counter track B**

0 * 10 kHz
1 25 Hz
2 3 Hz

Line 33	`33    0`	**Input logic and operating threshold of signal inputs**

0 * PNP Operating threshold 6 V
1 NPN Operating threshold 6 V, or for Namur without Ex. protection
2 PNP Operating threshold 3 V
3 NPN Operating threshold 3 V

Line 34	$\boxed{3\ 4 \qquad 0}$	**Function control input 1 (Contact 9)**
		0 * PC - Main counter - Reset static
		1 PC - Main counter - Reset edge-triggered
		2 tot - Totalizer - Reset edge-triggered
		3 Stop (PC - Main counter and tot - Totalizer)
		4 Hold (PC - Main counter and tot - Totalizer)
		5 Programming disabled
		6 Keylock (preset change and programming disabled)
		7 Print
		8 Outputs ON
		9 Outputs ON and PC principal counter - Reset edge-triggered
Line 35	$\boxed{3\ 5 \qquad 0}$	**Minimum pulse duration for control input 1**
		0 * 30 ms
		1 100 µs
Line 36	$\boxed{3\ 6 \qquad 3}$	**Function control input 2 (Contact 10)**
		0 PC - Main counter - Reset static
		1 PC - Main counter - Reset edge-triggered
		2 tot - Totalizer - Reset edge-triggered
		3 * Stop (PC - Main counter and tot - Totalizer)
		4 Hold (PC - Main counter and tot - Totalizer)
		5 Programming disabled
		6 Keylock (Preset change and programming disabled)
		7 Print
		8 Outputs OFF
Line 38	$\boxed{3\ 8 \qquad 0}$	**Take-over of presets P1, P2, SC**
		0 * Effective immediately
		1 When resetting
Line 40	$\boxed{4\ 0 \qquad 0}$	**Output logic**
		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
Line 41	$\boxed{4\ 1 \quad t\ 1}$ $\boxed{0.25}$	**Output time P1**
		0,01 s Minimum signal duration
		* 0,25 s
		99,99 s Maximum signal duration
		LAtCH = Latched signal (by pressing the $\boxed{C}$ key)
Line 42	$\boxed{4\ 2 \quad t\ 2}$ $\boxed{0.25}$	**Output time P2**
		0,01 s Minimum signal duration
		* 0,25 s
		99,99 s Maximum signal duration
		LAtCH = Latched signal (by pressing the $\boxed{C}$ key)
Line 43	$\boxed{4\ 3 \qquad 0}$	**Time range hour counter**
		0 * 999 s 99/100 s
		1 99 min 59 s 9/10 s
		2 999 min 59 s
		3 999 h 59 min

Line 44	`44    0`	**Rapid preset recognition** 0 * Standard preset recognition 1 Rapid preset recognition P2, delay period min. 30 µs, max. 60 µs. Only in case of adding operation mode, Line 21 = 0, and counting mode 0, 3, 4, 5, under line 30.
Line 50	`50Cod`	**Code settings** 0 * Code not active Max. 9999
Line 51	`5 1   0`	**Baud rate** The programming lines 51-54 are 0 * 4800 Baud only displayed for models with 1 2400 Baud interface 2 1200 Baud 3 600 Baud
Line 52	`52   0`	**Parity** 0 * Even parity (7 data bits) 1 Odd parity (7 data bits) 2 No parity (8 data bits)
Line 53	`53   0`	**Stop bits** 0 * 1 Stop bit 1 2 Stop bits
Line 54	`5 4   0`	**Address** 0 * from 99 to
	`- - - - -`	The dash line indicates the end of the third programming field. As soon as ⟶ pushed again, the instrument will automatically return to the operator level. Programming can, however, be shut down on any line by simultaneously pushing △ and ⟶ (keeping the keys depressed for approx. 2 seconds).

5.1 Operating and preset modes

The following paragraphs describe the operating modes.

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

P1- trailing preset The entry of preset P1 corresponds to the interval between the previous signal and the final signal. This means that when changing the final signal, i.e. the preset P2, the previous signal will be auto-matically adjusted or „trailed". This mode is well suited for switching between rapid and creeping speed in the case of length measure-ment applications.

### 5.2 Counting modes for main counter and totalizer (input mode)

Counting input track A, Reversal track B (Up/Down)

The adding and/or subtracting 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.

Track A

Up/Down

Counting   0   1   2   1   0   1   2
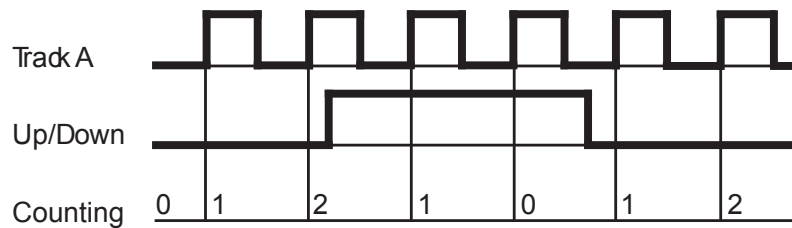
Differential counting, track A adding and track B subtracting (A-B)

Signal duration and particular time at choice. Programming line 30 to digit 1.

Track A

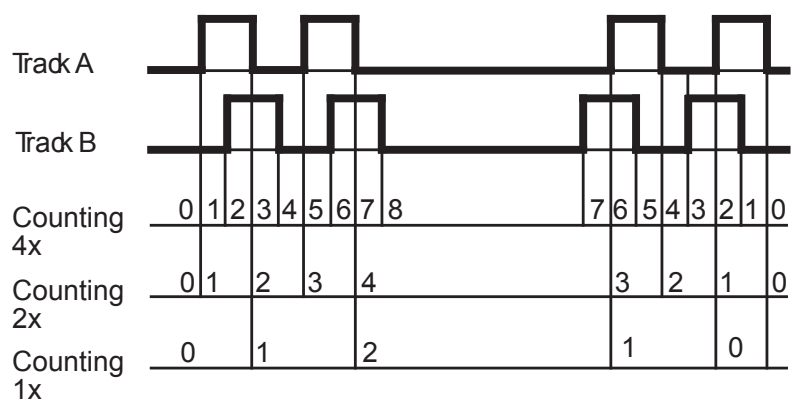Track B

Counting   0   1   2   1   2
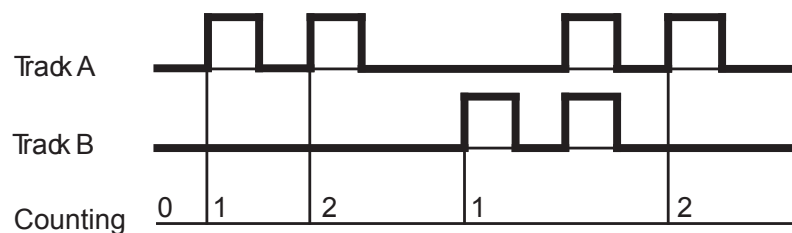
Totaling track A adding and track B adding (A+B)

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.

Track A

Track B

Counting Add.   0   1   2   3   5   6   7
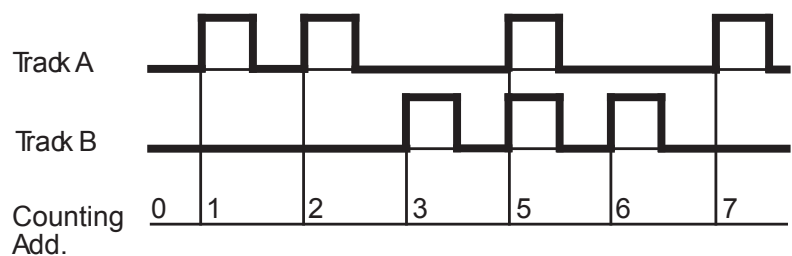
Up and down count with two counting signals by 90° out of phase

The counting direction is automatically recognized on the basis of the 90° 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.

Track A

Track B

Counting 4x   0 1 2 3 4 5 6 7 8   7 6 5 4 3 2 1 0

Counting 2x   0 1   2   3   4   3   2   1   0

Counting 1x   0   1   2   1   0

5.3 Output (output mode)

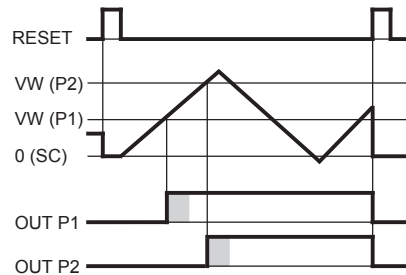The behaviour of the signal outputs is defined by the following settings under the programming field 3: Operating mode, preset mode, reset mode, take-over of presets, output logic and output time P1, P2 as momentary ▁▇▁ or latched signal ▁▁▔▔▁▁ .
The following diagrams illustrate some examples:

Programming

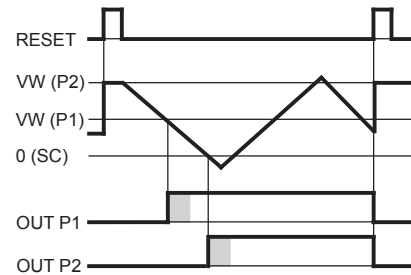| Operating mode Line 21 to 0 = adding | Operating mode Line 21 to 1 = subtracting |

Preset mode:
Line 22 to 0 = Step preset
Reset mode:
Line 23 to 1
without automatic reset
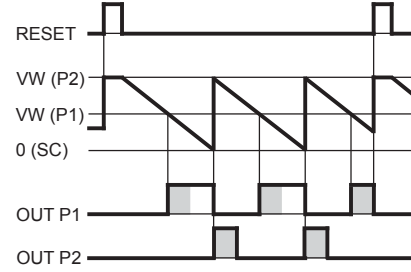Output time P1, P2:
Line 41, 42 to pulse or
duration

Preset mode:
Line 22 to 0 = Step preset
Reset mode: Line 23 to 0
with automatic reset
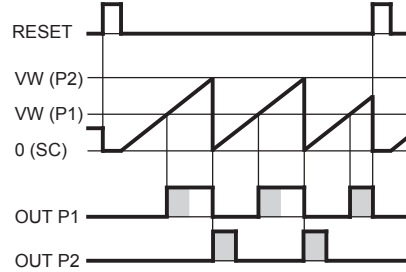
Preset mode:
Line 22 to 1 = Trailing preset
VW (P1) corresponds to the
interval between P1 and P2.
When P2 is changed, P1 is
trailed.

Operation mode:
Line 21 to 2 = OUT P2 at SC,
automatic reset at 0
Preset mode:
Line 22 to 0 = Step preset
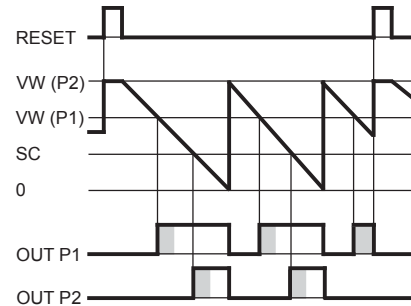
Preset mode:
Line 22 to 0 = Step preset
Reset mode: Line 23 to 1
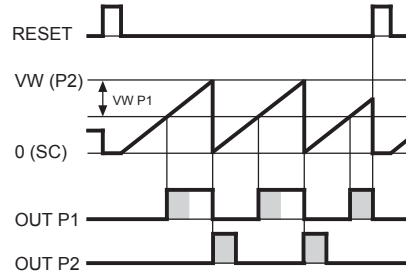without automatic reset
Function control input 1:
Line 34 to 9
OUT P1 and OUT P2 are
activated by a signal to
control input 1 (Ein St1) and
the count is reset.
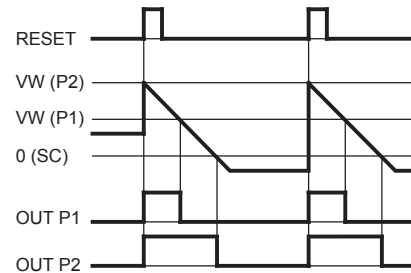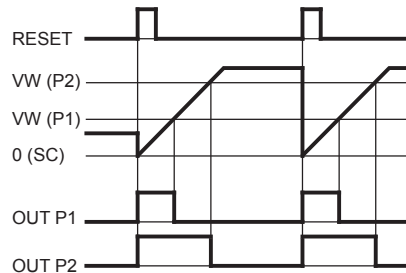
6 Technical data

Technical data - electrical ratings

Voltage supply	24/48 VAC ±10 % (50/60 Hz) 85...265 VAC (50/60 Hz) 12...30 VDC, 5 % RW
Power consumption	5 VA, 5 W
Sensor supply	24/48 VAC: 10...26 VDC / 60 mA 85...265 VAC: 24 VDC ±20 % / 100 mA 12...30 VDC: 9...28 VDC / 100 mA
Display	LED, 7-segment display
Number of digits	5-digits
Digit height	7.6 mm
Function	Preset counter Main counter with 2 presets Totalizer Hour counter
Scaling factor	0.0001...9999.99
Count modes	Adding or subtracting A-B (difference counting) A+B total (parallel counting) Up/Down A 90° B phase evaluation
Counting frequency	3 Hz, 25 Hz, 10 kHz programmable
Operating modes	Step preset, Trailing preset, Time meter and hour counter
Data memory	>10 years in EEPROM
Reset	Button, electric or automatic
Outputs electronic	Optocoupler
Outputs relay	Normally open or closed, programmable
Output holding time	0.01...99.99 s
Interface	RS485
Standard DIN EN 61010-1	Protection class II Overvoltage category II Pollution degree 2
Emitted interference	DIN EN 61000-6-4
Interference immunity	DIN EN 61000-6-2
Programmable parameters	Operating modes Sensor logic Scaling factor Count mode Control inputs
Approval	UL approval / E63076

Technical data - mechanical design

Ambient temperature	0...+50 °C
Storing temperature	-20...+70 °C
Relative humidity	80 % non-condensing
E-connection	Plug-in screw terminals
Core cross-section	1.5 mm²
Protection DIN EN 60529	IP 65 face with seal
Operation / keypad	Membrane with softkeys
Housing type	Built-in housing
Dimensions W x H x L	48 x 48 x 100 mm
Installation depth	100 mm
Mounting	Clip frame
Cutout dimensions	45 x 45 mm (+0.6)
Materials	Housing: Makrolon 6485 (PC) Keypad: Polyester
Weight approx.	150 g (12...30 VDC / 85...265 VAC) 260 g (24/48 VAC)

Technical data - trigger level

| **Comparator inputs**	**Input circuit**
Inputs	PNP- / NPN-logic
Input level	Programmable
Input level Low	0...2 VDC
Input level High	3...40 VDC
Input resistance	3 kΩ
Relay outputs	**Output circuit**
Switching voltage max.	250 VAC / 110 VDC
Switching current max.	1 A
Switching capacity max.	150 VA / 30 W
Relay responding time	5 ms
Electronical outputs	**Output circuit** Optocoupler short-circuit proof
Switching voltage max.	40 V
Switching current max.	25 mA
Residual voltage	<1 V

6.1 Dimensions
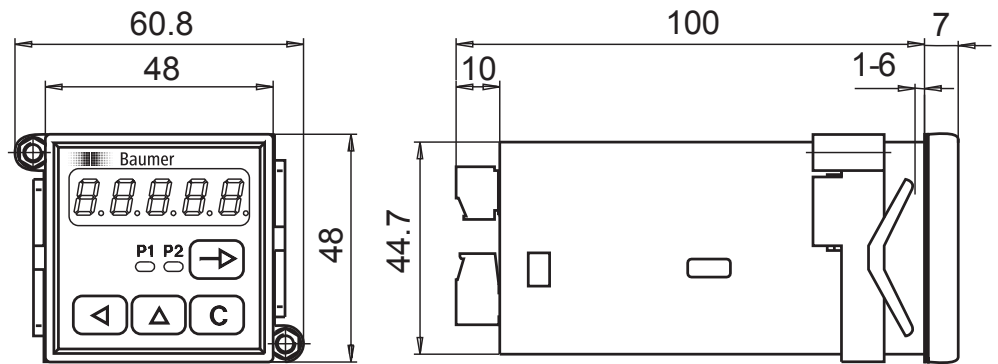
6.2 Error messages

| $Err\ 1$ $Err\ 2$ | Error must be fixed at the factory. |

Error must be fixed at the factory.

$Err\ 6$ Sequences are too quick, e.g. very short intervals between presets at high counting rate.

● Message $Err\ 6$ can be cleared by pushing c .

7   Part number

NE216. ☐ ☐ ☐ | **AX01**

Voltage supply
1   24/48 VAC
2   85...265 VAC
3   12...30 VDC

Outputs
1   Relay outputs
2   Electronic outputs

Interface
0   Without interface
1   RS485