



Operating Instructions

Multifunctional Positioning Unit NA214

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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 counter.



This symbol is located before texts that provide important additional information.

Italics

Important terms in the left text column are printed in italics to help you find information more quickly.

1 Safety Instructions

1.1 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.

1.2 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!

1.3 Installation / commissioning

In case of changes (including in the operating behavior) that impair safety, shut-down the units immediately.

Installation may only be carried out in accordance with the procedure described in Chapter 3 "Connecting".

During installation work on the units, the power supply must always be disconnected. Installation work may only be carried out by appropriately trained experts.

Max. voltage 250 V terminal - terminal, ground - terminal.

Following proper assembly and installation, the units are ready for operation. Following commissioning, familiarize yourself with the use of the units in Chapter 4 "Operator Level".

1.4 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 Getting to know the counter

The counter is a programmable multifunction control unit. It consists of:

2.1 Main counter XP

- Display 6 digit with sign +/-
- XP = current position value of main counter
- P1 = preset value 1
- P2 = preset value 2
- Scaling factor (Multiplier) of the Main counter can be set from 0,000001...1,000000
- Set value (starting value not equal to zero), 6 places with sign +/-
- Decimal point programmable
- Start XP = start input, starting of the positioning cycle
- Stop XP = stop input, stopping of the positioning cycle

3 Center-zero relay outputs

P1, P2: programmable as maintained contact or from 0.01 to 99.99 s.

Direction signal: specifies the direction for reaching P1 or P2.

Analog outputs (0 - 10 V and -10 - +10 V, 12-bit resolution)

The analog outputs are assigned upper and lower analog limits. These limits are assigned variable values or the values of P1 and P2.

Using with an SSI absolute encoder

- Binary or Gray code
- Selection of resolution: programmable 1 - 25 bits
- Selection of reading speed: 1 MHz, 750 kHz, 500 kHz, 250 kHz, 100 kHz, 75 kHz
- Use of MSB as sign bit

Operating mode of the counter

Master: clock rate is generated by the counter.

Slave: clock rate is generated by another counter or controller.

2.2 Batch counter XB

- Display 6 digit
- XB = current value of batch counter
- B1 = preselection of batch counter
- Scaling factor of batch counter can be set from 0.01 - 99.99
- Resetting batch counter: manually with C key, by means of external input or automatically when B1 is reached
- Maximum counting frequency of batch counter 30 Hz
- Decimal point programmable
- Input XB: pulse input of the Batch counter
- Input reset XB: Reset input Batch counter
- 1 central-zero relay output
- The preselection B1 of the batch counter can be programmed as a maintained contact or as a passing contact from 0.01 to 99.99 s.



2.3 Totalizer Σ

The totalizer works parallel to the batch counter.

- Display 6 digit
- Σ = current total

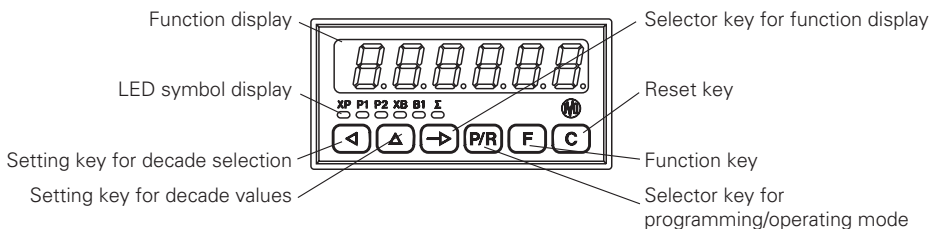
2.4 Components

Control panel

- Selector key for function display
- Setting key for decade selection
- Setting key for decade values
- Selector key for programming/operating mode
- Function key
- Reset key

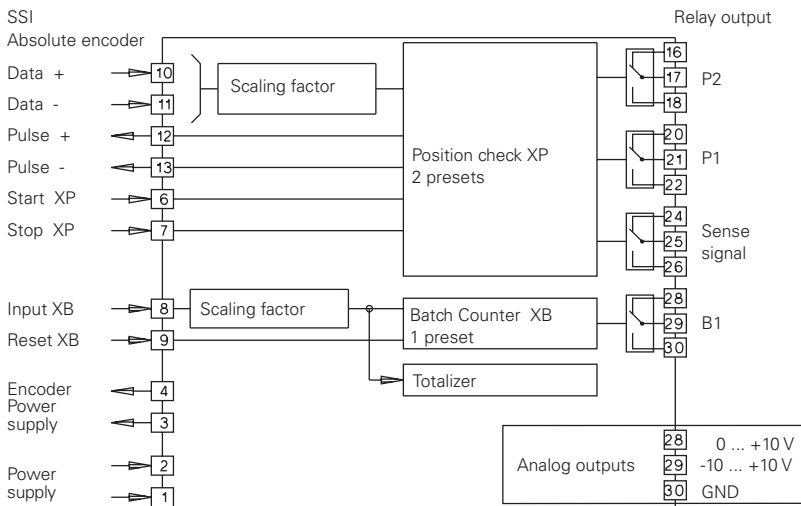
LED symbol display

- XP Current position value
- P1 Preset value 1
- P2 Preset value 2
- XB Current value batch counter
- B1 Batch counter preset value
- Σ Totalizing counter



2.5 Block diagram

The block diagram shows the components, terminals and connections of the counter.

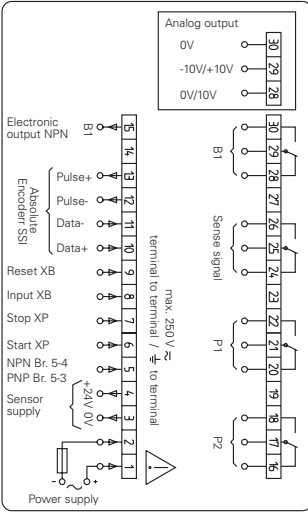




3 Connecting the counter

This section first describes the terminal assignments, followed by some typical connections. Sections 3.1 to 3.5 contain specific instructions and the specifications for the individual terminals. The two inputs and outputs are assigned to two plugin screw terminals.

Connection examples



Terminal	Function
1	Power supply
2	Power supply
3	Encoder power supply 0 Volt
4	Encoder power supply +24 VDC
5	NPN bridge 5-4 / PNP bridge 5-3
6	Start XP
7	Stop XP
8	Input XB
9	Reset XB
10	Data+
11	Data-
12	Pulse-
13	Pulse+
14	Not assigned
15	Electrical output NPN B1 (only in the version with analog output)
16-18	Relay output P2 (R2)
20-22	Relay output P1 (R1)
24-26	Relay output direction signal R3
28-30	Relay output or Analog output (R4)



For protection against shock hazards as specified in VDE 0411 part 100, stranded conductors may only be connected using wire end ferrules with insulating caps. Terminals which are not assigned in the factory must not be otherwise assigned by the user. We recommend shielding all encoder connecting leads and earthing the shield at one end. Earthing at both ends is recommend to avoid RF interference or if equipotential bonding conductors are installed over long distances. Encoder connecting leads should not be laid in the same trunking as the mains power supply cable and output contact leads.



3.1 Connecting the power supply

AC voltage connection Two AC voltages can be connected with the voltage selector switch accessible on the side (see adjacent table). The higher of the two alternating voltage ratings (48V or 230V) is preset by the factory.

- Set the required alternating voltage with the voltage selector switch.
- Connect the alternating voltage supply to terminals 2 and 3 in accordance with the counter wiring diagram.

Power supply AC voltage		Recommended external fusing
24 V ± 10 %	50/60 Hz	T 400 mA
48 V ± 10 %	50/60 Hz	T 400 mA
115 V ± 10 %	50/60 Hz	T 100 mA
230 V +6 %/ -10 %	50/60 Hz	T 100 mA

DC voltage connection Connect an interference-free power supply, i.e. do not use it for the parallel connection of drive systems, contactors, solenoid valves, etc.

- Connect the DC voltage in accordance with the counter wiring diagram.

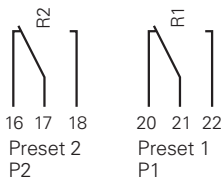
Power supply DC voltage	Recommended external fusing
24 V ± 10 % max. 5 % RW	T 400 mA



Fire protection: Operate the instrument using the recommended external fusing indicated in the terminal diagram. VDE 0411 specifies that 8 A / 150 VA (W) must never be exceeded in the event of a fault.

3.2 Assignment signal outputs „relay contact“

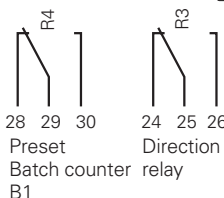
Terminals 16, 17, 18 / 20, 21, 22 and 24, 25, 26 / 28, 29, 30 are nonpotential changeover contacts. The signal outputs can be assigned in accordance with the adjoining wiring diagrams.



Max. switching power	Max. switching voltage	Max. switching current
150 VA/30 W	250 V	1A



The user is responsible for ensuring that a switching load of 8 A / 150 VA (W) is not exceeded in the event of a fault. Internal spark suppression by means of two zinc oxide varistors (275 V).



- Assign terminals 16, 17, 18 / 20, 21, 22 / 24, 25, 26 and 28, 29, 30 accordingly.



3.3 Functions of signal inputs and outputs

Terminals 10 (data +) and 11 (data -) are the signal inputs for the data leads from the absolute value encoder.

The resolution and code used by the rotary encoder are adjusted in programming lines 25 and 27

Input resistance	1,5 kOhms
Starting current	> 7 mA, < 15 mA
Breaking current	< 0,5 mA

→ Assign terminals 10 and 11 accordingly.

Terminals 12 (pulse -) and 13 (pulse +) deliver the requisite RS422 clock pulses for the rotary encoder, enabling it to transfer data words via the data lead.

Specify input logic

The connections 6, 7, 8 and 9 are AC optocoupler inputs. The logic of the inputs can be specified with a bridge,

PNP = 5 and 3

NPN = 5 and 4

Terminal 6 (Start XP) is the external starting input which activates relay outputs R1, R2 or R3 by applying a pulse (depending on operating mode).

Terminal 7 (Stop) is the external stopping input which deactivates relay outputs R1, R2 or R3 by applying a pulse (depending on operating mode).

Terminal 8 is the incremental counter input for the batch counter XB. The maximum counting frequency of the batch counter is 30 Hz.

Terminal 9 is the external reset input of the batch counter XB. Resetting is carried out by connecting a pulse.

Input resistance	1,5 kOhms
Max. input level	+/- 24 V
Max. frequency	30 Hz

→ Assign terminals 6, 7, 8 and 9 accordingly.



Depending on the coding, PNP or NPN, the terminals 6, 7, 8 and 9 must be actuated with a high or a low pulse.

Electronic output

The electronic output (Terminal 15) can be assigned accordingly to programming line 56. The function then corresponds to either P1, P2, direction signal or XB.

Output logic	Max. switching voltage	Max. switching current
NPN	+35 V	50 mA



The assignment for the analog outputs can be carried out in the programming lines 51 to 55. The analog outputs are linear between a lower and an upper value, which is set in lines 52 and 54. In programming line 55 the direction of the analog output can be turned.

0...10 V	:	Resolution 12 bits
-10...+10 V	:	Resolution 12 bits

NORMAL	lower level < higher level	lower level > higher level
Output 0...10V		
Output -10...10V		

INVERS	lower level < higher level	lower level > higher level
Output 0...10V		
Output -10...10V		

3.4 Connecting the encoder supply



Connect the encoder supply at terminals 3 and 4. Do not use the encoder supply to supply nonearthed inductive or capacitive loads.



The encoder supply is not shortcircuit proof.

Terminal	Voltage	Max. residual ripple	Max. permissible current
19	0V	–	–
20	+24 VDC +10 %/-50 %	Depending on load	100 mA



3.5 Executing the test routine

The test routine is described below.

- To start test → Press the and keys simultaneously.
- Switch the counter on (hold down the above keys at the same time).
- Press the key to advance from one test stage to the next.



No machine functions may be connected when the outputs are tested.

Message indicating start of test

Test of displays

The individual segments, decimal points of the LED displays and the LEDs themselves each light up when the key is pressed.

Keyboard test

Operation of the various keys on the keyboard causes the number of the key to appear in the right-hand part of the display.

Input Test

Activation of one of the electrical inputs causes the number of the activated input to appear in the righthand part of the display.

Output test

Whenever the key is pressed, one of the relay outputs is activated. They can be deactivated again with the key.

Program version number.

Date of program version.

Ver = 00: Positioning device with relay
 Ver = 01: Positioning device with relay and analog output
 Ver = 10: Display device
 Ver = 11: Does not exist



4 Operating mode

The operation and use of the counter are described in this section.

- As soon as the power supply has been switched on, the counter is automatically set to the operating mode.

In operating mode

- the current position value can be read and reset;
- the input preset values can be read and changed if required;
- the current batch counter status can be read and reset;
- the totalizing counter status can be read.

All the parameters can be disabled in the programming mode.

Current position value

To read → Read the position value.



Present value P1

To read → Press the key.
→ Read off preset value P1.



To change → Press the key.
● LED P1 flashes
→ Input preset P1 with and keys, prefix sign only possible when enabled in line 26.
→ Press the key.
● Change completed.

Preset value P2

To read → Press the key.
→ Read off the preset value P2.



To change → Press the key.
● LED P2 flashes
→ Input preset P2 with and keys, prefix sign only possible when enabled in line 26.
→ Press the key.
● Change completed.

Current counter status XB

To read → Press the key.
→ Read of the current counter status.



To reset → Press the key.



Preset value B1

- To read* → Press the key.
 → Read off current counter status (read off preset value B1)

- To change* → Press the key.
 ● LED B1 flashes
 → Input preset B1 with and keys.
 → Press the key.
 ● Change is completed.

Totalizer

- To read* → Press the key.
 → Read off overall total.
To reset → Press the key.



If a key is not operated within 15 seconds, the previous value will automatically be re-displayed.

5 Programming the counter

This section describes the procedure for programming the counter.

Operating parameters are set in the programming mode, which is structured in 6 programming segments. The end of each programming segment is identified by the following message in the display:

- Programming segment 1* In the **first programming segment**, all the operating parameters can be selected. The operating parameters which are disabled in the operating mode are also displayed here (see programming lines 11-16). The first programming segment consists of 6 lines (lines 1-6).
- Programming segment 2* In the **second programming segment**, the individual operating parameters for access to the operating mode can be disabled and enabled. In the first programming segment, access is possible to these disabled operating parameters. The second programming segment consists of six programming lines (lines 11-16).
- Programming segment 3* In the **third programming segment**, all the machine-related functions and values can be programmed, together with the characteristics of the absolute encoder used. The third programming segment consists of 11 programming lines (lines 20-36).
- Programming segment 4* The **fourth programming segment** relates exclusively to the programming of the operating parameters of the batch counter XB. The fourth programming segment consists of six programming lines (lines 41-47) or (line 41-56) version with analog output.
- Programming segment 5* In the **fifth programming segment**, a functional assignment can be programmed for the key, together with a manufacturer's code. The fifth programming segment consists of two programming lines (lines 61-81).



Key assignments

Start the programming The same key assignments apply to the individual programming segments. Since key functions may vary in the operating and programming modes, however, all the functions are described in full below.

Key

Function in the operating and programming modes Transfer to the next operating parameter in the operating and programming modes.

Key

Function in the operating and programming modes Transfer from programming to operating mode and vice versa.

Key



Function in the operating and programming modes Select the first or next required decade.
The selected decade position flashes.


Key

Function in the operating mode Deletes the display (XB + Σ only)
Function in the programming mode Deletes the display. Value reset to zero. Reset of possible programmed operating parameters.

Key

Function in the operating mode Transfer from any display to a parameter corresponding the selection in line 61.

Function in the operating mode  key is also used to select the next lowest line.
For example: Operator is in Line 24; he/she can automatically jump to Line 23 by pressing the  key.

Function in the programming mode In conjunction with the  key, transfer to programming mode.

Key

Function in the programming mode When the key is pressed, the respective decade position advances by one value until the maximum set value is reached.
The method of accessing the programming mode is described below, together with the five programming segments in the order in which they are used.



To access programming

- Press the **PR** key.
- The system transfers from the operating to the programming mode.
- Press the **F** key.
- **[0----** is displayed.
- If no code has been programmed, press the **→** key, otherwise input code **◀** and **▲**.
- Press the **→** key.



No code is entered before delivery.

Incorrect code

If an incorrect code has been input:

- **[Error]** appears in the display when the **→** key is pressed.
- After 15 seconds, the system will automatically revert to the operating mode.
- Press the **PR** key.
- Press the **F** key.
- Input the correct code.

Correct code unknown

If the correct code is not known:

- Return the counter to the factory.

Correct code

- When the correct code has been input, press the **→** key.
- The programming segments are now called up in succession.

Programming segment 1

Information on the displays and changing individual values is also given in Section 4.

- Press the **→** key again.
- The operating parameters are now called up. The respective LED flashes.

To change operating parameters

- Input the new value with the **◀** and **▲** keys.

Line 1



XP - Current counter status

This value can only be displayed.

Line 2



P1 - Preset value 1

This value can be changed.

Press **PR** key and change with **◀** and **▲**.

Line 3



P2 - Preset value 2

This value can be changed.

Press **PR** key and change with **◀** and **▲**.

Line 4



XB - Current batch counter status

This value can be set to zero with the **C** key.



Line 5

B1 - Preset value B1 of the batch counter

This value can be changed.
Press key and change with and .

Line 6

Σ - Totalizing counter

This value can be reset to zero.

At the conclusion of these programming lines, a broken line will appear in the display, signifying the completion of the first programming segment.

Programming segment 2

In the second programming segment, the letters STAT appear in the display, signifying status selection.

- appears in the display. The LED for the corresponding operating parameter flashes

Significance of status numbers

- 0 The operating parameter can be selected, read and changed in the operating mode.
- 1 The operating parameter can be selected and read in the operating mode.
- 2 The operating parameter is completely disabled in the operating mode. If it is selected, it will not be displayed in the operating mode, but bypassed. The corresponding function remains unaffected.

To change status

- Input the appropriate status number.
- Press the key again.
- The status of each individual operating parameter is called up in sequence.

Line 11

XP - Current position value

Line 12

P1 - Preset value 1

Line 13

P2 - Preset value 2

Line 14

XB - Current batch counter status

Line 15

B1 - Preset batch counter value

Line 16

Σ - Totalizing counter



At the conclusion of these programming lines, a broken line will appear in the display, signifying the completion of the second programming segment.



The default status of all the operating parameters is zero.

Programming segment 3

Programming segment 3 begins with programming line 20. Programming lines are displayed in sequence in all these segments.



Default settings are always printed with * .

- Programming lines are displayed in succession. The input is stored when the next line is called up.
- Press **→** key repeatedly.
- The operating parameters are selected consecutively.
- Enter changed value with the keys **←** and **▲** .
- Reset the parameters with the **C** key.

Changing operating parameters

Line 20

20 SC

Default

* 000000
0-999999

Line 21

21 SF
10000

Scaling factor (max. 1,0000)

* 1,0000
0,000001-1,0000

When selected, only the numbers after the decimal point appear!

Line 22

22 0

Operating modes

- 0 * Step preset
- 1 Parallel comparison
- 2 P1-Self-adjusting preset
- 3 Sawtooth

Line 23

23 0

Decimal point

- 0 * 999999
- 1 99999,9
- 2 9999,99
- 3 999,999

Line 24

24 0

Reading speed (setting 4 and from 06/23/03)

- 0 * 250 kHz
- 1 500 kHz
- 2 750 kHz
- 3 1000 kHz
- 4 100 kHz
- 5 75 kHz



Line 25

Resolution (bits) of encoder

Two variants are available for programming.

Select variant → To switch over, press and hold key for 10 seconds.

Variant 1 (display of one 10s place)

- 0 * 25 bits Permanently set resolution with one
- 1 14 bits 10s place of 0 - 3.
- 2 13 bits
- 3 12 bits

Variant 2 (display of two 10s places) (from 10/01/03)

- 01 Direct entry of resolution with two
- : 10 s places between 01 - 25 bits.
- 25

Line 26

MSB Assignment

- 0 * Numerical bit
- 1 Prefix sign bit



If the highest value bit (MSB) of the rotary encoder is used as the prefix sign bit, presets P1, P2 and the start count value SC can be programmed with a prefix sign. The key permits confirmation of the prefix sign in the programming lines of parameter 3.

Line 27

Encoder code

- 0 * Binary code
- 1 Gray code

Line 28

Operating mode master/slave

- 0 * Master; pulse is generated by the counter
- 1 Slave; pulse is generated by another counter
- 2 Slave; pulse is generated by the SPC or similar

Line 35

Output time P1 (adjustable from 0,01-99,99)

- 0.25 * Standard pulse signal time 0,25s
- 0.00 No output signal
- 99.99 Signal duration 99,99 seconds
- LAt LAtch=continuous signal (press C-key)

Line 36

Output time P2 (adjustable from 0,01-99,99)

- 0.25 * Standard pulse signal time 0,25s
- 0.00 No output signal
- 99.99 Signal duration 99,99 seconds
- LAt LAtch=continuous signal (press C-key)



Note on programming lines 35 and 36: In the parallel comparison operating mode, relay outputs R1 and R2 act as continuous contacts, even if an ONtime has been programmed.

At the conclusion of these programming lines, a broken line will appear in the display, signifying the completion of the third programming segment.



Programming segments 4

Batch counter XB operating parameters

Line 41	41 1.00	<p>Scaling factor, batch counter (adjustable from 0,01 to 99,99) Scaling factor from 0,01 to 99,99 * 1,00 0,01 99,99</p>
Line 42	42 0	<p>Decimal point 0 * 999999 1 99999,9 2 9999,99 3 999,999</p>
Line 44	44 0	<p>Reset, batch counter 0 * Automatic reset at end of cycle 1 External reset only</p>
Line 45	45 0	<p>Activate change, preset B1 0 * At the next repositioning 1 Immediately on leaving programming mode via PR key</p>
Line 46	46 0	<p>Repositioning of batch counter XB and totalizing counter Σ 0 * Immediately on leaving programming mode via PR key 1 without repositioning</p>
Line 47	47 0.25	<p>Output time B1 (adjustable from 0,01 to 99,99) 0.25 * Standard pulse signal 0,25 s 0.00 No output signal 99.99 Signal duration 99,99 seconds LAt LAtch=continuous signal</p>

Only for version with analog output (Line 51-56)

Line 51	51 0	<p>Assignment lower analog limit value 0 * Variable value from line 52 1 P1 2 P2</p>
Line 52	52 6.95	<p>Lower analog limit value 0 * Default -999999 Min. 999999 Max.</p>
Line 53	53 0	<p>Assignment upper analog limit value 0 * Variable value from line 54 1 P1 2 P2</p>



Line 54

Upper analog limit value

0 * Default
 -999999 Min.
 999999 Max.

Line 55

55 0

Direction of analog output

Standard: level low=0 Volts and level high 10 Volts
 Inverted: level low=10 Volts and level high 0 Volts

Line 56

56 0

Assignment of the relay outputs and the electronic output NPN

P2=Relay	P1=Relay	Sens=Relay	Xb=Out.NPN
P2=Relay	P1=Relay	Sens=Out.NPN	Xb=Relay
P2=Relay	P1=Out.NPN	Sens=Relay	Xb=Relay
P2=Out.NPN	P1=Relay	Sens=Relay	Xb=Relay

At the conclusion of these programming lines, a broken line will appear in the display, signifying the completion of the fourth programming segment.

Programming field 5

Function assignment, key F; code adjustment

Line 61

61 0

Function assignment, key F

0 * Start XP
 1 XP
 2 P1
 3 P2
 4 XB
 5 B1
 6 Σ

1

2

3

4

5

6

Line 81

42 0

Code adjustment

0 No code
 9999 Code adjustable from 0000 to 9999

At the conclusion of these programming lines, a broken line will appear in the display, signifying the completion of the fifth programming segment.

To leave the programming mode

- Press the **PR** key.
- The counter now reverts to the operating mode.

Reprogramming the counter to the default settings

- Switch on the instrument and press the **PR** and **C** keys simultaneously.
- All the programmed values will now revert to their default settings.



5.1 Position display unit operating modes

The operating modes, which can be set in programming line 22, are described below.

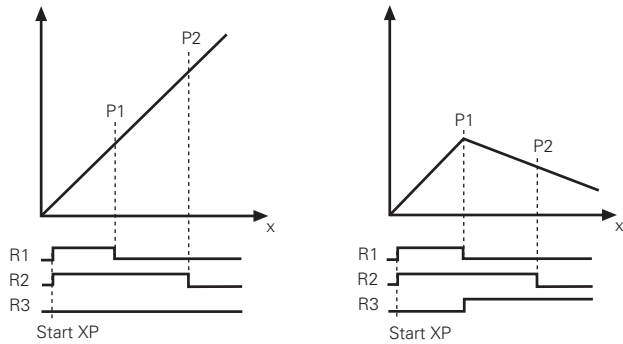
5.1.1 Step reset

On reaching a preset value, the counter continues to count to the next preset value. Preset values are always processed in the following sequence: preset value 1, preset value 2. At the start of positioning, relay outputs R1 and R2 must be activated with the **Start XP** command. On reaching preset value P1, relay output R1 is deactivated; on reaching preset value P2, relay output R2 is deactivated.



The directional relay is only activated when preset value P1 is less than preset value P2.

Relays R1 and R2 programmed as continuous signal

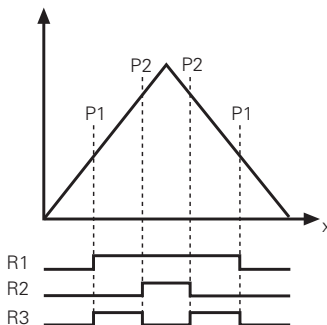




5.1.2 Parallel comparison

Relay output R1 is activated as soon as preset value P1 is reached. Relay output R2 is activated as soon as preset value P2 is reached. Relay output R3 is activated when the position value of the encoder is located between P1 and P2. The preset values P1 and P2 can be selected arbitrarily, since they operate independently of each other. Pulse signals cannot be given in the parallel comparison mode.

Preset $P1 < P2$



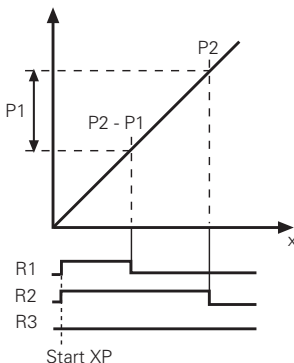
Pulse signals cannot be given in the parallel comparison mode.

5.1.3 P1 Selfadjusting preset

Preset value P1 serves as a preliminary signal for preset value P2. Preset P1 is the value of the preliminary contact which is used to position output R1 at „n“ units in advance of value P2. If value P2 is changed, preset P1 is automatically „coupled up“. At the start of positioning, relay outputs R1 and R2 must be activated with the **Start XP** command. On reaching preset value P1, relay output R1 is deactivated; on reaching preset value P2, relay output R2 is deactivated.



Preset value P1 must always be less than preset value P2.





5.1.4 Sawtooth

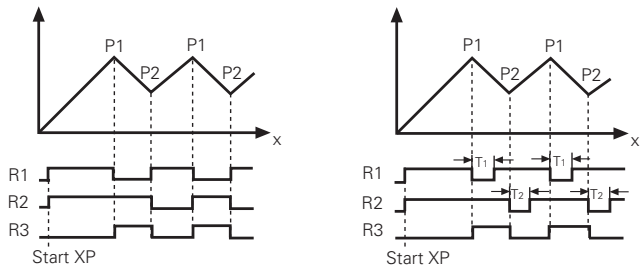
This operating mode corresponds essentially to the step preset mode. The only difference lies in the continuous verification of the programmed presets, i.e. outputs R1 and R2 are permanently activated or deactivated on reaching the corresponding presets P1 and P2 (activation/deactivation of the outputs in the step preset mode takes place only once per positioning cycle). Since the preset reverses with every counting direction, the function diagram resembles a „sawtooth“.

Condition: $P1 > P2$

The relay output R3 is activated when the position value of the encoder is between P1 and P2.

Relays R1 and R2 programmed as continuous signal

Relays R1 and R2 programmed as passing signal



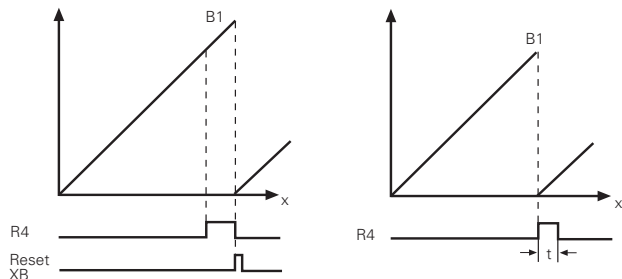
5.2 Batch counter XB operating mode

The batch counter XB operates in the sum mode, i.e. all pulses at input XB are added. If the set preselection value B1 is reached, then the relay output R4 is activated. The repositioning of the secondary counter XB can be set in programming line 44.

- External repositioning is effected by operating the **C** key or by a pulse at the reset input XB.
- Automatic repositioning takes place at the end of every cycle. The batch counter XB is set to zero as soon as the value of preset B1 is reached.



With automatic repositioning, a pulse signal duration of t_w must be programmed for relay output R4.

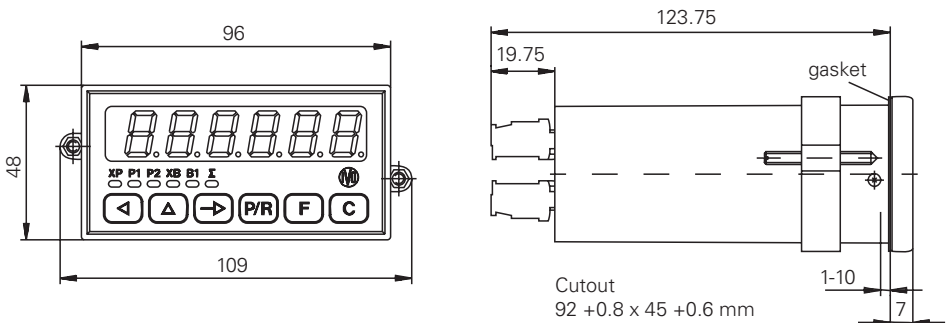




6 Technical Data

Display	7 segment LED display, 6 digit, red with prefix zero suppression and minus sign, with negative values
Digit height	14 mm
Power supply	As per purchase order
Power consumption	7 VA, 5W
Encoder power supply	+24 VDC, max. 100 mA
Programmable signal inputs	PNP or NPN
Input resistance	1.5 kOhms
Input starting current	> 7 mA, < 15 mA
Input breaking current	< 0.5 mA
Max. output switching voltage	250 VAC
Max. output switching current	1 A
Max. output switching capacity	150 VA/30 W
Max. input frequency, batch counter	30 Hz
Data storage	> 10 years (via EEPROM)
Mounting	With clamping frame
Dimensions	96 x 48 mm, housing for front panel mounting
Mounting depth	Approx. 103 mm
Terminals	Plug-in screw terminals
Core cross-section	Max. 1.5 mm ²
Housing material	Polycarbonate, black UL 94V-0
Front membrane	Polyester
Weight	Approx. 350 g
Ambient temperature	0...+50 °C
Storage temperature	-20...+70 °C
Humidity	Max. relative humidity 80%, no condensation
Type of protection	Frontseite IP 65 nach DIN 40050
Classification	EN 61010 Category II
Conditions of use	As per contamination factor 2
Interference immunity	EN 50082-2 Severity grade 3
Emitted interference	EN 50081-2
General rating	EN 61010
Overvoltage protection	II

6.1 Dimensions





6.2 Default settings

The following parameters are programmed into the Counter by the factory, prior to delivery:

Start count value, main counter	000000
Preset value P1	001000
Preset value P2	002000
Scaling factor	1,0000
Preset value, batch counter	000010
Counting mode	Operating mode 1
Display	No decimal point
Reading speed	250 kHz
Encoder resolution	25 Bit
Type of code	Binary
Pulse contact time	0,25 s

6.3 Error messages

Error 1

The programming level can be blocked with a code. If an incorrect code is entered, Error 1 appears in the display as long as the key is pressed.

Error 4

Batch counter XB error message. Process between the preselection and the automatic resetting with an excessively high counting frequency is too fast. Deletion of the error message with the key.

Error 5

Batch counter XB error message. The counting frequency is too high. Deletion of the error message with the key.

Error 8

EEPROM error message. During mains switch-on an incorrect parameter was discovered in the EEPROM. All data are reset to the factory setting. Deletion of the error message with the key.

7 Order designation

