



Operating Instructions

Electronic preselection counter NE 214

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General

Meanings of symbols used in these operating instructions:

Explanation of symbols:

- ➔ This symbol represents an activity to be carried out.
- This symbol represents supplementary technical information.



This symbol indicates instructions or information which is of particular importance to ensure the correct use of the N 214 and to exclude possible hazards.



This symbol indicates important additional information.

Italics

To permit you to find information quickly, key terms are indicated in italics in the left-hand column.

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,
- when conscious of relevant safety and danger, by observing the operating instructions.

Intended purpose

The instrument is to be used only indoors as built-in model. Its fields of application are industrial processes and controls on production lines of the metal, wood, plastic, paper, glass and textile industries; the overvoltage protection of the terminals must be limited to the voltages of category II.

Description of the overvoltage category under DIN VDE 0110, Part 2.

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 expressly 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 have to be taken.

Organizational measures

Make sure that all operators have 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 environment protection are observed.

Be conscious of operation

In the event of safety-relevant modifications (including changes in the behavior of the instrument during operation), immediately stop operation of instrument.

| | |
|--|--|
| <i>Installation</i> | The installation may only be effected as described under the chapter „Connection“. When installing the instrument, take care to cut off the power supply. The instrument may only be installed by a skilled expert. Prior to initial operation of the instrument, please control the voltage selection. Set the switch to the required a.c. voltage. During 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. |
| <i>Initial operation</i> | The instrument is ready for use after it has been correctly mounted and installed. |
| <i>Maintenance/Servicing/ Trouble shooting</i> | Cut off power supply of all connected instruments. This kind of work may only be effected by a skilled expert. In case of unsuccessful trouble shooting, interrupt use of instrument and contact your dealer. |
| <i>Getting acquainted</i> | After successful initial operation, make yourself familiar with the operation of your instrument by studying the chapter „Getting to know“. |

2 Getting to know the NE 214

2.1 The NE 214 consists of the following







Presetting counter with two preset values, start count value and scaling factor.

Totalizing counter or batch counter

Operating hours counter

The NE 214 consists of the following:

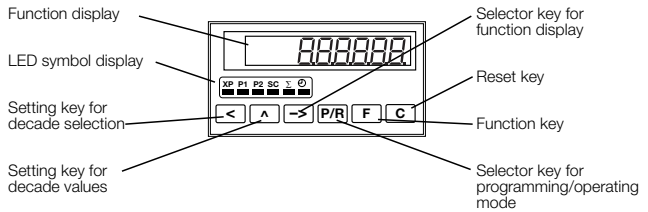
Control panel

-  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

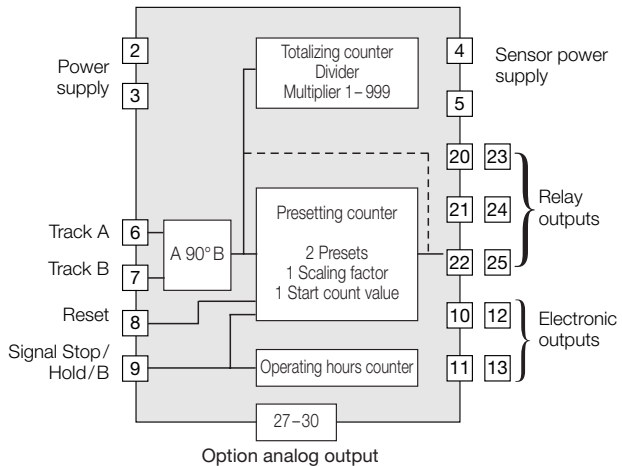
- XP Current counter status
- P1 Preset value 1
- P2 Preset value 2
- SC Start count value
- Σ Totalizing counter
- \odot Operating hours counter

Front view



2.1 NE 214 Block diagram

The block diagram shows the components, terminals and connecting points of the NE 214.



3 Connecting the NE 214

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 plug-in screw terminals. The two 15-pole screw-type terminals are coded to prevent reversed polarity.

Connection examples

Terminal assignments

| Terminal | Function |
|----------|--|
| 1 | Not assigned |
| 2 | Power supply |
| 3 | Power supply |
| 4 | Encoder power supply 0 volts |
| 5 | Encoder power supply +24 volts |
| 6 | Signal input, track A |
| 7 | Signal input, track B |
| 8 | Reset |
| 9 | Signal stop |
| 10 | Preset 1 (collector) |
| 11 | Preset 1 (emitter) |
| 12 | Preset 2 (collector) |
| 13 | Preset 2 (emitter) |
| 20-22 | Reserved for relay output, preset 1 (P1) |
| 23-25 | Reserved for relay output, preset 2 (P2) |
| 27-30 | Analog output (option) |



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

| 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 |

It is possible to switch between two different alternating voltage ratings by means of the voltage selector switch at the side of the unit. 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 NE 214 wiring diagram.

DC voltage connection

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

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 NE 214 wiring diagram.



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



3.2 Assigning the electronic outputs

The electronic outputs (terminals 10, 11 and 12, 13) are optocoupler outputs with separately assigned collector and emitter terminals. Preset values are assigned in lines 33 of the program.

| | | |
|---------------------------------|---------------------------------|--------------------------------|
| Max. switching voltage +40 V | Max. switching current 15 mA | Max. residual voltage < 1 V |
|---------------------------------|---------------------------------|--------------------------------|



The electronic outputs are not short-circuit proof.

→ Assign terminals 10, 11 and 12, 13 accordingly.

3.3 Assigning the signal outputs (relay contacts)

Terminals 20, 21, 22 and 23, 24, 25 are no-potential changeover contacts. The signal outputs can be assigned in accordance with the adjoining wiring diagram. Assignment of the relays as NO or NC contacts is effected in line 33 of the program.



| | | |
|--------------------------------------|---------------------------------|-------------------------------|
| Max. switching output 150 VA/30 W | Max. switching voltage 250 V | Max. switching current 1 A |
|--------------------------------------|---------------------------------|-------------------------------|



The user is responsible for ensuring that a switching load of 8A/150 VA (W) is not exceeded in the event of a fault. Internal spark suppression by means of two zinc oxide varistors (275 V). The output relays of the instrument (1 relay or several) may only be disengaged in total 5 x per minute at the most. Admissible clicks according to Interference Suppression Standard EN 55011 EN 50081-2 for the industrial sector.

In case of a higher switching rate, the operator must take care of interference suppression on the spot and under his own responsibility by observing the load to be switched.

→ Assign terminals 20, 21, 22 and 23, 24, 25 accordingly.

3.4 Assigning the signal inputs

Terminals 6 to 9 are signal inputs. Terminals 6 (track A) and 7 (track B) are signal inputs for the counter. The type of signal and signal logic are programmed in lines 25 and 28.

Terminal 8 is the external reset input for the main counter XP.

Terminal 9 (stop) is programmed for stop/hold/operating hours (line 31).

| | |
|------------------|----------|
| Input resistance | 3 kOhms |
| Max. input level | +/- 40 V |
| Max. frequency | 10 kHz |
| Min. attenuation | 3 Hz |

→ Assign terminals 6 to 9 accordingly.

3.5 Connecting the encoder supply



Connect the encoder supply at terminals 4 and 5. Do not use the encoder supply to supply non-earthed inductive or capacitive loads.



The encoder supply is not short-circuit proof.

| Terminal | Voltage | Maximum residual ripple | Maximum permissible current |
|----------|-----------------------|-------------------------|-----------------------------|
| 4 | 0V | – | – |
| 5 | +24 VDC +10% /-50% | depending on load | 100 mA |

3.6 Executing the test routine

The test routine is described below.

- To start test*
- Press the and keys simultaneously.
 - Switch on the NE 214 (hold down the above keys at the same time)
 - All the display segments will be displayed automatically in sequence and are thereby tested for functional capability.

- Test extension*
- Using the key, test the keyboard, the inputs, outputs and interface in sequence.



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

Keyboard test

Input test

- Inputs can be controlled simultaneously or individually. A display is only provided when a signal is applied.

Output test

- Press the and keys. The outputs are now activated. Reset the outputs using the key.

Analog output test (if applicable)

Typical display

Display: program number and version number

Display: program date

Test for various input levels (operating points), signal forms and the phase discriminator (test numbers 1-8).

- Terminate test*
- The test routine can only be terminated by switching off the instrument. A soon as the power supply has been switched on again, the NE 214 is in operating mode.

- Test program version*
- Press the key, switch on the NE 214 (holding the key down at the same time).

Display: Program number and version number

Display: Program date

4 Operating the NE 214

The operation and use of the NE 214 are described in this section.

- As soon as the power supply has been switched on, the NE 214 is automatically set to the operating mode.

Operating mode In the operating mode:

- the current counter status can be read and reset;
- the input preset values can be read and changed if required;
- the overall total can be read and reset;
- the start count value can be read and changed if required;
- the operating hours counter can be read and reset.

All the parameters can be disabled in the programming mode.

„Current counter status“

- To read → Read the display
To reset → Press the **C** key.



Preset value P1

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



- To change → Input preset P1 with **<** and **^**, prefix sign only possible when enabled in line 38.
→ Press the **→** key.
● Change completed.

Preset value P2

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



- To change → Input preset P2 with **<** and **^**, prefix sign only possible when enabled in line 38.
→ Press the **→** key.
● Change completed.

Start count value SC

- To read → Press the **→** key.
→ Read off the current limit value SC





- To change → Input required start count value SC using **<** and **^**, prefix sign only possible when enabled in line 38.
→ Press the **→** key.
● Change completed.

„Overall total“

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



- „Operating hours
 To read → Press the  key.
 → Read off „Operating hours“.
 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 NE 214

This section describes the procedure for programming the NE 214.

Programming mode Operating parameters are set in the programming mode, which is structured in three programming segments.

Programming segment 1 In the first programming segment, all the operating parameters can be accessed and changed. The operating parameters which are disabled in the operating mode are also displayed here. The first programming segment consists of 6 lines.

Programming segment 2 In the second programming segment, the individual operating parameters for access to the operating mode can be disabled and enabled (status). In the first programming segment, access is possible to these disabled operating parameters.

Programming segment 3 In the third programming segment, all the machine-related functions and values can be programmed, together with the analog output.

Key assignments 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. For a fast run-through, hold the key down.

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

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 39

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

Key 

Function in the operating mode When this key is pressed, the respective decade position advances by one value.

Function in the operating and programming modes 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 three programming segments in the order in which they are used.

To access programming

- Press the **[P/R]** key.
 - The system transfers from the operating to the programming mode.
 - Press the **[F]** key.
 - **[Code]** is displayed.
- The code applies to programming segments 1 - 3.
- 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 **[P/R]** key.
 - Press the **[F]** key.
 - Input the correct code.

Correct code unknown

- If the correct code is not known:
- Return the NE 214 to the factory.

Correct code

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

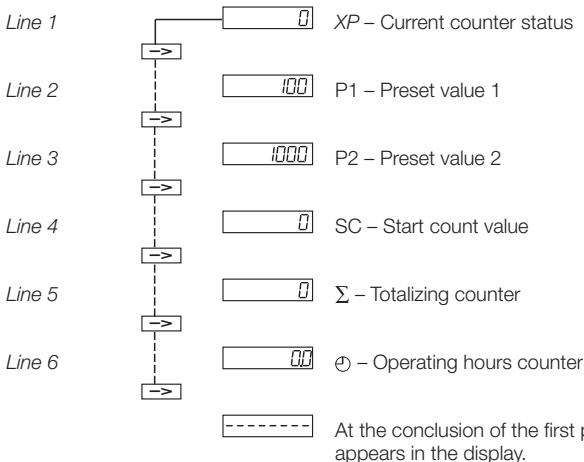
Programming segment 1

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 changing operating parameters

- Input the new value with the **[<]** and **[^]** keys.



Programming segment 2


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

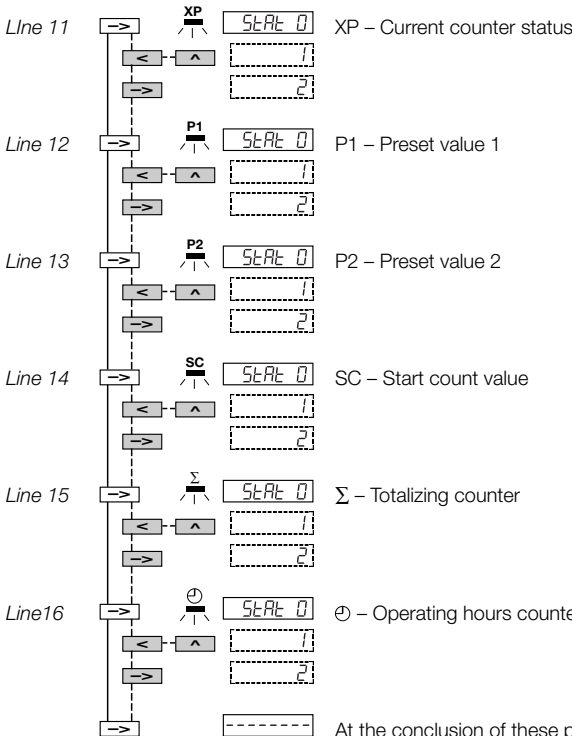
- **[STAT]** appears in the display. The LED for the corresponding operating parameter flashes.

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.



The default operating parameter status is zero.

Programming segment 3

Programming segment 3 begins with programming line 22. Programming lines are displayed in sequence in all these segments.



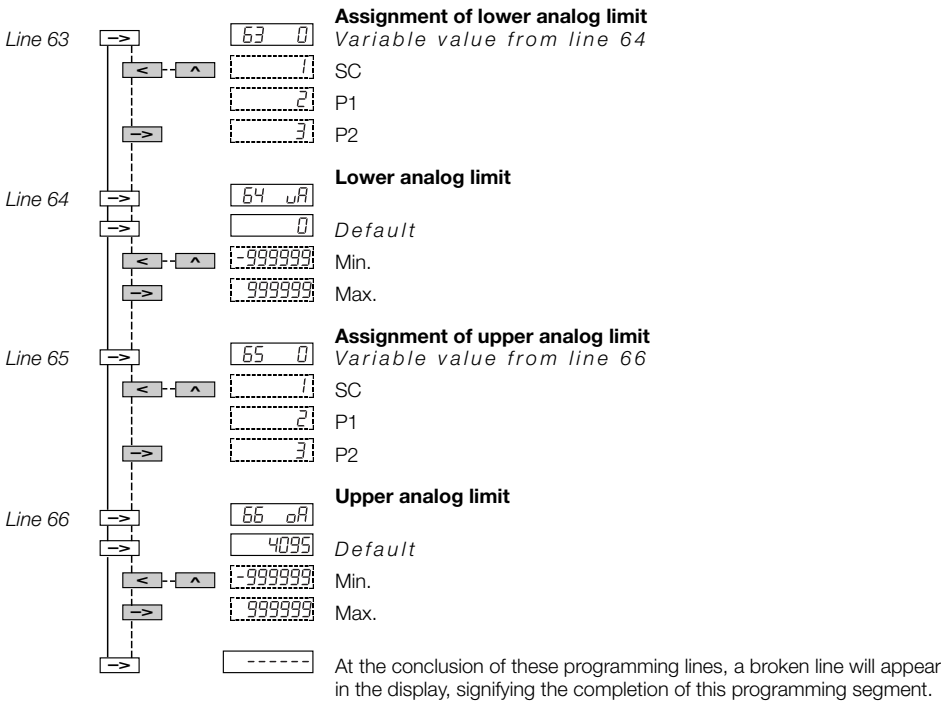
Default settings are always printed with double spacing.

- Programming lines are displayed in succession. The input is stored when the next line is called up.

| | | | |
|---------|--|--|---|
| Line 22 | | <div style="border: 1px solid black; padding: 2px; display: inline-block;">22 0</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">1</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">2</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">3</div> | <p>Operating modes <i>Step preset</i> Main preset Parallel comparison P1 Self-adjusting preset</p> |
| Line 23 | | <div style="border: 1px solid black; padding: 2px; display: inline-block;">23 5F</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">1000</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">0.000</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">999999</div> | <p>Scaling factor main counter 1,0000 0,0001 – 9999,99</p> |
| Line 24 | | <div style="border: 1px solid black; padding: 2px; display: inline-block;">24 0</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">1</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">2</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">3</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">4</div> | <p>Decimal point (applies to XP, P1, P2, SC, Σ) <i>No decimal point</i> 00000.0 0000.00 000.000 00.0000</p> |
| Line 25 | | <div style="border: 1px solid black; padding: 2px; display: inline-block;">25 0</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">1</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">2</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">3</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">4</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">5</div> | <p>Counting mode <i>Track A and UP/DOWN signal on track B</i> Differential counting, track A adding, track B subtracting (A-B) Totalizing, tracks A and B adding (A+B) Track A 90° track B, single evaluation Track A 90° track B, twofold evaluation Track A 90° track B, fourfold evaluation</p> |
| Line 26 | | <div style="border: 1px solid black; padding: 2px; display: inline-block;">26 0</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">1</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">2</div> | <p>Main counter frequency, track A 10 kHz 25 Hz 3 Hz</p> |
| Line 27 | | <div style="border: 1px solid black; padding: 2px; display: inline-block;">27 0</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">1</div> <div style="border: 1px dashed black; padding: 2px; display: inline-block;">2</div> | <p>Main counter frequency, track B 10 kHz 25 Hz 3 Hz</p> |

| | | | |
|---------|--|---|---|
| Line 28 | | <input type="text" value="28 0"/> | Input logic <i>PNP operating point 11V</i> |
| | | <input type="text" value="1"/> | NPN – operating point 11 V |
| | | <input type="text" value="2"/> | PNP – operating point 5 V |
| | | <input type="text" value="3"/> | NPN – operating point 5 V |
| | | <input type="text" value="4"/> | PNP – operating point 2,5 V |
| | | <input type="text" value="5"/> | NPN – operating point 2,5 V |
| Line 29 | | <input type="text" value="29 0"/> | Reset main counter <i>Automatic reset, externally static</i> |
| | | <input type="text" value="1"/> | Automatic reset, externally differentiated |
| | | <input type="text" value="2"/> | Externally static |
| | | <input type="text" value="3"/> | Externally differentiated |
| Line 31 | | <input type="text" value="31 0"/> | Function, signal input 9 (stop/hold) <i>Stop</i> |
| | | <input type="text" value="1"/> | Hold |
| | | <input type="text" value="2"/> | Keylock |
| | | <input type="text" value="3"/> | Operating hours counter on/off |
| | | <input type="text" value="4"/> | Print (for version with interface only) |
| Line 33 | | <input type="text" value="33 0"/> | Output logic for digital outputs <i>Both outputs as NO contacts</i> |
| | | <input type="text" value="1"/> | P1 NC, P2 NO |
| | | <input type="text" value="2"/> | P1 NO, P2 NC |
| | | <input type="text" value="3"/> | Both outputs as NC |
| Line 35 | | <input type="text" value="35 61"/> | Output time P1 <i>Data in seconds (tol. -0,01 s, range 00,02 – 99,99 s)</i> |
| | | <input type="text" value="0025"/> | 0,25 s |
| | | <input type="text" value="9999"/> | Maximum pulse time 99.99 s |
| | | <input checked="" type="checkbox" value="Latch"/> | Latch = continuous signal (<input type="checkbox"/> key or external reset to delete) |
| Line 36 | | <input type="text" value="36 62"/> | Output time P2 <i>Data in seconds (tol. -0,01 s, range 00,02 – 99,99 s)</i> |
| | | <input type="text" value="0025"/> | 0,25 s |
| | | <input type="text" value="9999"/> | Maximum pulse time 99.99 s |
| | | <input checked="" type="checkbox" value="Latch"/> | Latch = continuous signal (<input type="checkbox"/> key or external reset to delete) |
| Line 37 | | <input type="text" value="37 0"/> | Acceptance of presets P1, P2, SC <i>Effective immediately</i> |
| | | <input type="text" value="1"/> | On reset |
| Line 38 | | <input type="text" value="38 0"/> | P1, P2 and SC active <i>Only in plus counting range</i> |
| | | <input type="text" value="1"/> | In plus and minus counting range |

| | | | |
|---------|--|--|---|
| Line 39 | | <input type="text" value="39"/> <input type="text" value="0"/> | Function key assignment <i>No function</i> |
| | | <input type="text" value="1"/> | XP |
| | | <input type="text" value="2"/> | P1 |
| | | <input type="text" value="3"/> | P2 |
| | | <input type="text" value="4"/> | SC |
| | | <input type="text" value="5"/> | Σ |
| | | <input type="text" value="6"/> | \emptyset |
| Line 40 | | <input type="text" value="40"/> <input type="text" value="Cod"/> | Code setting |
| | | <input type="text" value="0"/> | 0 No code |
| | | <input type="text" value="9999"/> | 1 – 9999 |
| Line 41 | | <input type="text" value="41"/> <input type="text" value="0"/> | Secondary counter functions <i>As totalizing counter, divider 1</i> |
| | | <input type="text" value="1"/> | As totalizing counter, divider 10 |
| | | <input type="text" value="2"/> | As totalizing counter, divider 100 |
| | | <input type="text" value="3"/> | Counting on reaching P2 |
| Line 42 | | <input type="text" value="42"/> <input type="text" value="0"/> | Secondary counter as multiplier – only when line 41 = 3 Default |
| | | <input type="text" value="0"/> | Min. |
| | | <input type="text" value="999"/> | Max. |
| Line 51 | | <input type="text" value="51"/> <input type="text" value="0"/> | Baud rate <i>4800 Baud</i> |
| | | <input type="text" value="1"/> | 2400 baud |
| | | <input type="text" value="2"/> | 1200 baud |
| | | <input type="text" value="3"/> | 600 baud |
| Line 52 | | <input type="text" value="52"/> <input type="text" value="0"/> | Parity <i>Even parity</i> |
| | | <input type="text" value="1"/> | Odd parity |
| | | <input type="text" value="2"/> | No parity |
| Line 53 | | <input type="text" value="53"/> <input type="text" value="0"/> | Stop bits <i>1 Stop bit</i> |
| | | <input type="text" value="1"/> | 2 Stop bits |
| Line 54 | | <input type="text" value="54"/> <input type="text" value="0"/> | Address <i>Default</i> |
| | | <input type="text" value="0"/> | Min. |
| | | <input type="text" value="99"/> | Max. |
| Line 61 | | <input type="text" value="61"/> <input type="text" value="0"/> | Analog output assignment <i>Main counter</i> |
| | | <input type="text" value="1"/> | Secondary counter |
| Line 62 | | <input type="text" value="62"/> <input type="text" value="0"/> | Analog output offset <i>No offset</i> |
| | | <input type="text" value="1"/> | Offset 2 V/4mA |



To leave the programming mode.

- ➔ Press the **[P/R]** key.
- The NE 214 now reverts to the operating mode.

Reprogramming the NE 214 to the default settings

- ➔ Switch on the instrument and press the **[<]** and **[>]** simultaneously
- All the programmed values will now revert to their default settings. The message **[LrPr0]** appears briefly in the display.

5.1 Operating modes (line 22)

The operating modes are described below.

Step reset

On reaching a preset value, the NE 214 continues to count to the next preset value. Preset values are always processed in the sequence: preset value 1, preset value 2. Any values can be chosen. Automatic resetting to the start count value can be obtained with the second preset value. External or manual resetting can be carried out at any time.

Main preset

On reaching the individual preset values, the NE 214 is reset to the start count value. Preset values are always processed in the sequence: preset value 1, preset value 2. Automatic resetting to the start count value can be obtained with P2. External or manual resetting can be carried out at any time.

Parallel comparison

On reaching the preset values, the outputs switch to continuous signals if the respective preset value in either counting direction is exceeded. Any preset values can be chosen; they are processed independently of each other. Pulse signals cannot be given in the parallel comparison mode.

P1 Self-adjusting preset

Preset value P1 serves as a preliminary signal and functions as a self-adjusting preset. The preliminary signal always switches to the input value before the final signal is given. Any second preset value can be chosen.

5.2 Programming lines

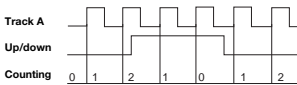
| Line | Default setting | Customer's program | Short description |
|------|--------------------------------------|------------------------------------|---|
| 01 | <input type="text" value="0"/> | <input type="text"/> | XP – Current counter status |
| 02 | <input type="text" value="100"/> | <input type="text"/> | P1 – Preset value 1 |
| 03 | <input type="text" value="1000"/> | <input type="text"/> | P2 – Preset value 2 |
| 04 | <input type="text" value="0"/> | | SC – Start count value |
| 05 | <input type="text" value="0"/> | | Σ – Totalizing counter |
| 06 | <input type="text" value="0"/> | | – Operating hours counter |
| 10 | <input type="text" value="-----"/> | | Separating line |
| 11 | <input type="text" value="START 0"/> | <input type="text" value="START"/> | XP – Current counter status |
| 12 | <input type="text" value="START 0"/> | <input type="text" value="START"/> | P1 – Preset value 1 |
| 13 | <input type="text" value="START 0"/> | <input type="text" value="START"/> | P2 – Preset value 2 |
| 14 | <input type="text" value="START 0"/> | <input type="text" value="START"/> | SC – Start count value |
| 15 | <input type="text" value="START 0"/> | <input type="text" value="START"/> | Σ – Totalizing counter |
| 16 | <input type="text" value="START 0"/> | <input type="text" value="START"/> | – Operating hours counter |
| 20 | <input type="text" value="-----"/> | | Separating line |
| 22 | <input type="text" value="22 0"/> | <input type="text" value="22"/> | Operating modes |
| | <input type="text" value="0"/> | <input type="text"/> | |
| 23 | <input type="text" value="23 SF"/> | <input type="text" value="23 SF"/> | Scaling factor main counter |
| | <input type="text" value="1000"/> | <input type="text"/> | |
| 24 | <input type="text" value="24 0"/> | <input type="text" value="24"/> | Decimal point |
| 25 | <input type="text" value="25 0"/> | <input type="text" value="25"/> | Counting mode |
| 26 | <input type="text" value="26 0"/> | <input type="text" value="26"/> | Frequency main counter track A |
| 27 | <input type="text" value="27 0"/> | <input type="text" value="27"/> | Frequency main counter track B |
| 28 | <input type="text" value="28 0"/> | <input type="text" value="28"/> | Input logic |
| 29 | <input type="text" value="29 0"/> | <input type="text" value="29"/> | Reset main counter |
| 31 | <input type="text" value="31 0"/> | <input type="text" value="31"/> | Function signal input 9 (stop/hold/print) |
| 33 | <input type="text" value="33 0"/> | <input type="text" value="33"/> | Output logic for digital outputs |
| 35 | <input type="text" value="35 t1"/> | <input type="text" value="35 t1"/> | Output time P1 |
| | <input type="text" value="0.25"/> | <input type="text"/> | |
| 36 | <input type="text" value="36 t2"/> | <input type="text" value="36 t2"/> | Output time P2 |
| | <input type="text" value="0.25"/> | <input type="text"/> | |
| 37 | <input type="text" value="37 0"/> | <input type="text" value="37"/> | Acceptance of presets P1, P2, SC |
| 38 | <input type="text" value="38 0"/> | <input type="text" value="38"/> | P1, P2 and SC active |
| 39 | <input type="text" value="39 0"/> | <input type="text" value="39"/> | Function key assignment |

| | | | | |
|----|--|--|----------------------------------|--|
| 40 | | | Code setting | |
| | | | Secondary counter functions | |
| 41 | | | | |
| 42 | | | Secondary counter as multiplier | |
| | | | Baud rate | } Only with version implementing RS-interface or analog output |
| 51 | | | Parity | |
| 52 | | | Stop bits | |
| 53 | | | Address | |
| 54 | | | | |
| | | | Analog output assignment | |
| 61 | | | Analog output offset | |
| 62 | | | Assignment of lower analog limit | |
| 63 | | | Lower analog limit | |
| 64 | | | | |
| | | | Assignment of upper analog limit | |
| 65 | | | Upper analog limit | |
| 66 | | | | |
| | | | | |
| 67 | | | Separating line | |

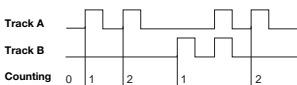
5.3 Counting modes for the main and totalizing counter (input modes)

This counter is able to count in either direction. The counting direction is independent of the adding or subtracting operating mode.

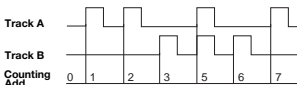
The exception to this is totalizing (A+B).



Up/down counting with one counting track A and an external up/down signal on track B

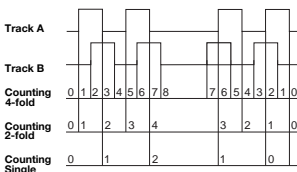


Differential counting, track A adding, track B subtracting (A-B)
Any signal duration and time.



Totalizing, tracks A and B adding (A+B)

The operating mode and consequent counting direction are selected in the programming mode



Up/down counting with two counting signals, phase-offset by 90 degrees

The counting direction is automatically identified from the leading/lagging 90° phase offset. The internal phase discriminator performs the necessary evaluation. Twofold or fourfold evaluation is possible.

5.4 Output response (output modes)

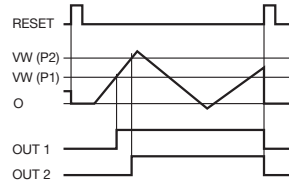
Signal output response is determined by the following:

- Programming of the preset value, start count value, output time, output logic and output function;
- External resetting;
- External counting direction control.

The diagrams below show the output signal response.

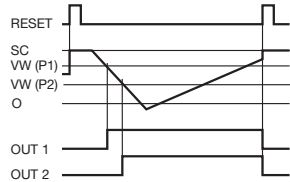
Adding operating mode

Stage preset with continuous signal, without automatic reset

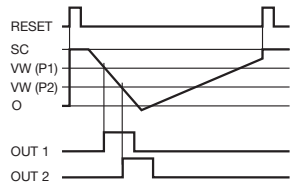
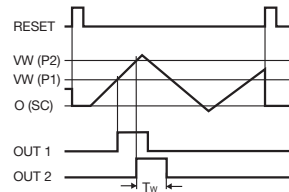


Subtracting operating mode

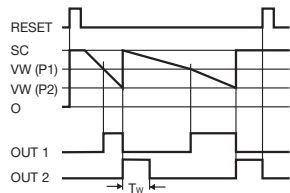
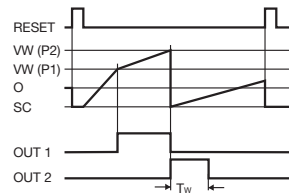
Stage preset with continuous signal, without automatic reset



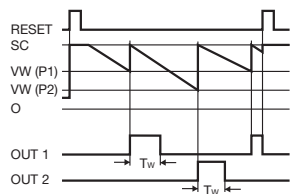
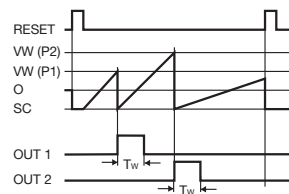
Stage preset with pulse signal, without automatic reset



Stage preset with pulse signal, but preliminary contacts as continuous signal, with automatic reset

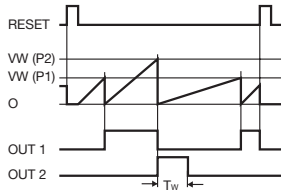


Main preset with pulse signal, with automatic reset

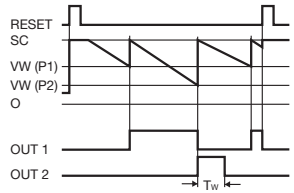


Adding operating mode

Main preset with pulse signal, but output signal P1 as continuous signal, with automatic reset

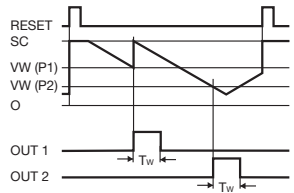
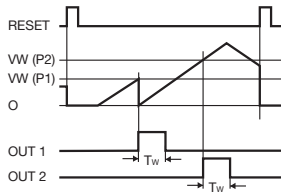


Subtracting operating mode

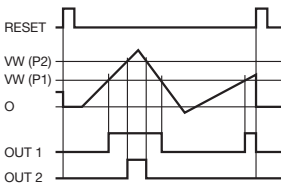


Main preset with pulse signal, without automatic reset

Start count value at zero

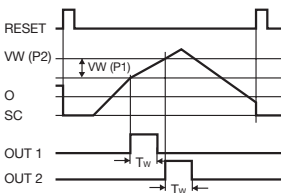


Parallel comparison



Operation in the subtracting mode is impractical.

Self-adjusting preset with pulse signal, without automatic reset



Input of the preset value P1 corresponds to the interval between the preliminary signal and the final signal. This means that, if the final signal (i.e. preset value P2) is changed, the preliminary signal is automatically readjusted.



The adding mode is set if the chosen start count value SC is lower than preset values P1 and P2.
The subtracting mode is set if the chosen start count value SC is greater than preset values P1 and P2.

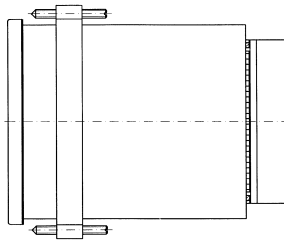
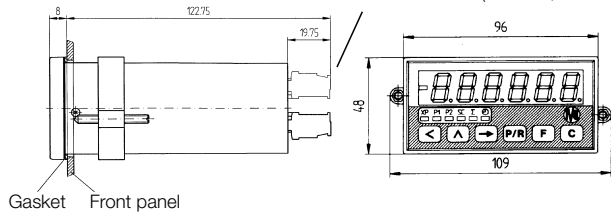
6 Technical data

| | |
|----------------------------------|---|
| Display | 7-segment LED display 6-digit, red with prefix zero suppression and minus sign |
| Digit height | 14 mm |
| Power supply | As per purchase order |
| Power consumption | 7 VA, 5W |
| Encoder power supply | +24 VDC, +20%/-50% max. 100 mA |
| Programmable signal inputs | PNP, NPN, NAMUR |
| Input resistance | approx. 3 kOhms |
| Max. input level | +/- 40 V |
| Max. input frequency | 10 kHz |
| Signal outputs | Optocouplers for presets 1, 2 |
| Max. switching voltage | 40 V |
| Max. switching current | 15 mA |
| Max. residual voltage | < 1 V |
| Data storage | > 10 years (via EEPROM) |
| Mounting | With clamping frame |
| Dimensions | 96 x 48 mm, housing for front panel mounting |
| Mounting depth | Approx. 115 mm |
| Terminals | Plug-in screw terminals |
| Max. core cross-section | Max. 1.5 mm ² |
| Housing material | Macrolon 6485 |
| Front membrane | Polyester |
| Weight | AC version: approx. 350 g DC version: approx. 250 g |
| Protection | According to EN 61010, category II |
| Type of protection per DIN 40050 | From the front, when mounted, with seal: IP 65 |
| Operational requirements | According to contamination factor 2 |
| Overvoltage protection | According to EN 61010, category II |
| Interference immunity | } factor 2 to 3 |
| Emitted interference | |
| Ambient temperature | 0 °C ... +50 °C |
| Storage temperature | -20 °C ... +70 °C |
| Relative humidity | Max. relative humidity 80%, non-condensing |
| General rating | According to EN 61010 |

6.1 Dimensional diagrams

Dimensions in mm

Supplementary plug for configuration with relay outputs, analog output and interface (RS 422, RS 232).



Installation aperture:
92+0.8 x 45+0.6

6.2 Default settings

The following parameters are programmed into the NE 214 by the factory, prior to delivery:

| | |
|-------------------------------------|---------------------------------|
| Preset value, main counter P1 | 100 |
| Preset value, main counter P2 | 1000 |
| Start count value | 0 |
| Scaling factor, main counter XP | 1.0000 |
| Display | No decimal point |
| Pulse signal time, main counter | 0.25 s |
| Counting mode | Operating mode 0 (stage preset) |
| Inputs, main and totalizing counter | Track A and UP/DOWN on track B |
| Change of preset | Effective immediately |
| Counting frequency | 10 kHz |

6.3 Error messages

NE 214 error messages Err 1 and Err 2: Fault must be rectified by the factory

Err 3: Excessively fast sequences, e.g. inadequate intervals between presets at high counting frequency; counting frequency for track A or B too high.

● Error message Err 3 can be cleared with the C key.

6.4 Analog output

Technical data

| | |
|---|--|
| Resolution | 12 bit (4096 steps) |
| Output ranges with current output | 0 – 20 mA 4 – 20 mA (programmable) |
| 1 bit value | 4884 μ A |
| Max. load (burden) with voltage output | 500 Ohms 0 – 10 V 2 – 10 V (programmable) |
| 1 bit value | 2442 mV |
| Min. load (burden) | 1000 Ohms |
| Accuracy | +/- 0.1% of final value |
| Non-linearity | +/-1 LSB |
| Output temp. coefficient | Typically +/- 50 ppm/ $^{\circ}$ C |
| Offset tolerance | Max. +/- 0.50 μ A Max. +/- 0.25 mV |
| Offset temp. coefficient | Max. +/- 20 ppm/ $^{\circ}$ C |
| Reference voltage | - 2.5 V |
| Insulation | 250 VRMS min. output to tachometer logic |
| Operating temperature | 0 – 50 $^{\circ}$ C |
| Other | All outputs are short-circuit proof. All other functions electrically isolated. Output range 4 – 20 mA/2 – 10 V programmable via keyboard. |

7 Order designation

