Operating Instructions

Position display

NA218

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General information

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

Explanation of symbols

➔ This symbol induces action.

● This symbol refers to additional technical information.

This symbol is placed in front of text passages that have to be particularly observed to ensure correct use of the NA 218.

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

Italics Important terms are written in *italics* on the left for quick reference purposes.

1 Safety indications

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

Use the instrument only

- in an absolutely correct technical state,
- for the intended purpose,
- being conscious of relevant safety and danger and observe the operating instructions.

Intended purpose The instrument is to be used only indoors as build-in model for industrial processes and controls on production lines of the metal, wood, plastic, paper, glass and textile industries and similar; the overvoltage exerted on the terminals of the instrument must be limited to the voltages of category II.
Description of the overvoltage category under DIN VDE 0110, 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 61 010.
If the instrument is to be used to control machines or processes, where the machine could be damaged or the operator could be injured due to a breakdown of the instrument or to a failure in operation, then relevant safety precautions will need to be taken.

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

Be conscious of safety	In the event of safety-relevant modifications (including those in the behavior of the instrument during operation), immediately stop operation of instrument..
Installation	The installation may only be effected as described under the chapter "Connection". During installation work, take care to cut off the power supply of the instrument. Installations may only be effected by a skilled expert.
Initial operation	The instrument is ready for use after it has been correctly mounted and installed.
Maintenance / Servicing / Trouble shooting	Make sure to cut off power supply of all connected machinery. These tasks may only be effected by a skilled expert. In case of unsuccessful trouble shooting, you must absolutely interrupt use of instrument and contact your dealer.
Getting acquainted	After successful initial operation, get acquainted with the handling of your instrument by studying the chapter "Get to know your NA 218".

2 Get to know your NA 218

2.1 NA 218 components

It comprises

– a positioning display
– a scaling factor to be programmed
– a start count value to be programmed.

Control panel - LED symbols

Shift key for display of functions

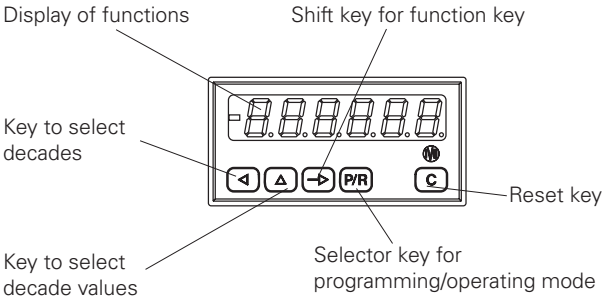
Key to select decades

Key to select decade values

P/R Selector key for programming/operating mode

C Reset

Front view



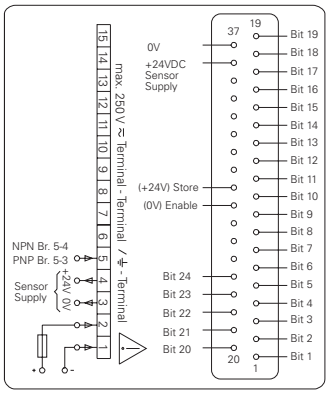
3 NA 218 connection

This chapter will first explain how the contacts are assigned and give you some examples of connection.

Under chapters 3.1 to 3.4, you will find actual tips and technical data for the particular connections.

The 15-pole screw terminal is coded to prevent reversed polarity.

Examples of connection



15-pole screw terminal assignment

Contact	Function
1	Supply voltage
2	Supply voltage
3	Encoder supply 0 V
4	Encoder supply +24 V
5	NPN bridge 5 - 4 / PNP bridge 5 - 3
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

37-pole SUB D plug assignment

Contact	Function	Contact	Function
1	Bit 1	20	Pin 20
2	Bit 2	21	Pin 21
3	Bit 3	22	Pin 22
4	Bit 4	23	Pin 23
5	Bit 5	24	Pin 24
6	Bit 6	25	
7	Bit 7	26	
8	Bit 8	27	
9	Bit 9	28	Enable
10	Bit 10	29	Store
11	Bit 11	30	
12	Bit 12	31	
13	Bit 13	32	
14	Bit 14	33	
15	Bit 15	34	
16	Bit 16	35	
17	Bit 17	36	Encoder supply + 24 Volt
18	Bit 18	37	Encoder supply 0 Volt
19	Bit 19		

Litz contact only by means of connector sleeves with insulating enclosures for reasons of shock protection according to VDE 0411, Section 100. Do not otherwise assign contacts that have been left unassigned ex factory. We recommend to screen all encoder terminal leads and to ground the shield on one side. Shields on both sides are recommended in case of RF interference or in case of equipotential bonding. The encoder leads should not be in the same phase winding as the MAINS supply and the output contact leads.

3.1 Supply voltage connection

DC connection

Supply voltage	Rec. external protection
24 V ±10% max. 5% RW	T 400 mA

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

➔ Connect DC according to the NA 218 terminal diagram.

Fire protection: Operate instrument on the MAINS with external fuse recommended on the rating plate. In case of disturbance, make sure that 8 A /150 VA (W) are never exceeded - as defined under VDE 0411.

3.2 Functions of signal inputs

The contacts 1 - 24 of the 37-pole SUB D plug are the signal inputs for the data lines of the absolute valuator. The resolution as well as the code of the encoder used is set in programming lines 25 and 27.

Input resistance	1.5 kOhm
Starting current	> 7 mA < 15 mA
Breaking current	< 0.5 mA

3.3 Encoder supply connection

Connect encoder supply to the contacts 3 and 4. However, do not use encoder supply for unearthed inductors or capacitive loads.

The encoder supply is not short-circuit-proof.

Contact	Voltage	Max. residual ripple	Max. admissible current
3	0 V	–	–
4	+24 VDC	depending on load	100 mA

3.4 Test routine

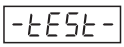
Please find below a description of the test routine.

Test start

Push key ◁ and P/R simultaneously.

➔ Turn on NA 218 (keep upper keys pressed until start)

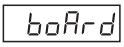
➔ Push the ⇨ key to hop from one test phase to the next.



Indication of test start

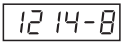
Display test

The individual segments, the decimal signs of the LED displays and the LEDs shine after every actuation of the ⇨ key.

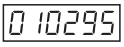


Testing the control panel

By pushing the different keys of the control panel, the number of the key appears in the right part of the display.



Number of the program version



Date of program version

4 NA 218 operation and programming

The following chapter will inform you on the operation and the use of your NA 218.

- The NA 218 is automatically on the operating level after the supply voltage has been turned on.

Operating level On the operating level it is possible
- to read the actual position value.

Programming level Operation parameters are set on the programming level.
The programming level consists of 3 programming fields.
The end of each programming field is indicated on the display by dash lines [------] .

1st programming field Here it is only possible to display the current position value of the absolute encoder. The first programming field consists of one line (line 01).

2nd programming field Here it is possible to program all features of the absolute encoder used. The second programming field consists of 7 programming lines (line 20 - 27).

3rd programming field Here it is possible to program the manufacturer's code. The third programming field consists of one programming line (line 81).

Key assignment The same key assignments apply to the individual programming fields. Key operation may vary on the operating and programming levels. Therefore, all functions are fully described in the following.

Key (→)

Function on operating and programming level Switch to the next operation parameter on the operating and programming level.

Key (P/R)

Function on operating and programming level Switch from operating to programming level and vice versa.

Key (◁)

Function on operating and programming level Select first or next decade desired. The chosen decade flashes.

Key (C)

Function on programming level Display is cleared. Reset to zero. Reset of possible programmed operation parameter.

Key (△)

Function on programming level When pushing the key, the respective decade position will switch to the next higher value until the maximum set value is reached.

Program set-up and the 3 programming fields will now be described in the sequence of their use.

Turn on programming

➔ Push the key P/R

- Co-.-- appears on the display.

➔ If no code has been programmed, push the key ⊕, otherwise enter code via ◁ and △ .

➔ Push the ⊕ key.

No code number has yet been set at the factory.

Wrong code

Enter wrong code.

- Error 1 is displayed as long as ⊕ remains pressed.
- After 15 s the instrument switches automatically back to the operating level.

➔ Push the key P/R .

➔ Enter correct code.

Correct code unknown

If the correct code is not known, please

➔ return NA 218 to the supplier.

Correct code

➔ In case of correct code, push the key ⊕ .

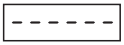
- The operating fields are now called up one after the other.

Programming field 1

Line 01

XP - Current position value

This value may be displayed only.



At the end of this programming line, a dash line appears on the display. This dash line indicates the end of the first programming field.

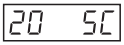
Programming field 2

The programming field 2 begins with the programming line 20. The programming lines are shown one after the other in this programming field.

Each factory setting is marked as such by *.

- The programming lines are selected one after the other. The entry is stored when calling the next programming line.

Line 20

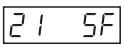


Start count

* Default

0 - 999999

Line 21



Scaling factor

* 1,0000

0,0001 - 1,000

Line 23

Decimal point

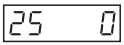
0 * 999999
1 99999,9
2 9999,99
3 999,99

Line 24

Output logic

0 * normal
1 invers

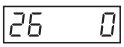
Line 25



Resolution of absolute encoder

0 * 24 bits
1 13 bits
2 12 bits
3 10 bits
4 9 bits

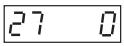
Line 26



MSB assignment

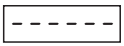
0 * Number bit
1 Range bit

Line 27



Encoder code

0 * Binary code
1 Gray-Code



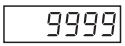
At the end of these programming lines, a dash line appears on the display. This dash line indicates the end of the second programming field.

Programming field 3

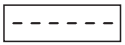
Line 81

Code setting

No code



Code can be set from 0000 to 9999



At the end of this programming line, a dash line appears on the display. This dash line indicates the end of the third programming field.

Turn off programming

➔ Push key

- NA 218 is now on the operating level.

Program NA 218 back to default setting

➔ Turn device on and push ◁ and △ simultaneously.

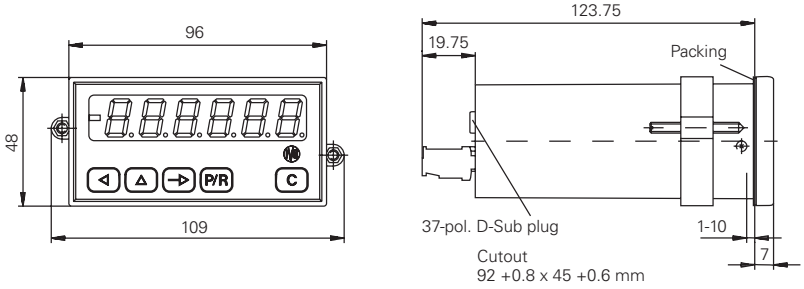
- All values already programmed will be programmed back to default setting.

5 Technical data

Display	7-segment LED-display 6-digit, red, with suppression of leading zero minus sign for negative values
Digit size	14 mm
Supply voltage	24 VDC ±10 %
Power consumption	7 VA, 5 W
Encoder supply	+ 24 VDC max. current 100 mA
Signal inputs to be progr.	PNP or NPN Input resistance 1.5 kΩ
Starting current of inputs	> 7 mA, < 15 mA
Breaking current of inputs	< 0.5 mA
Data storage	> 10 years (via EEPROM)
Fixing	Clamping frame
Dimensions	96 x 48 mm, Casing for front-plate mounting
Mounting depth	ca. 115 mm
Connections	Screw terminals + Sub-D plug
Core cross-section	Max. 1.5 mm^2
Casing material	Polycarbonate black, UL 94V - 0
Material of front membrane	Polyester
Weight	ca. 300 g
Protection category	Protection category II
Type of prot. to DIN 40050	From the front in mounted stated with packing IP 54
Operational requirements	According to contamination factor 2
Overvoltage prot. category	II
Interference immunity	Severity grade 3, ESD/Burst
Ambient temperature	0 ... + 50 °C
Storage temperature	-20 ... + 70 °C
Humidity	Max. relative humidity 80 %, non-condensing
General rating	to VDE 0411

5.1 Dimensions and cutout measures

Measures in mm



5.2 Default settings

The NA 218 is delivered with the following factory settings:

starting count prin. counter	000000
Preset value P1	001000
Preset value P2	002000
Scaling factor	1.0000
Preset value Batch counter	000010
Counting mode	Mode 1
Display	without decimals
Reading speed	250 kHz
Encoder resolution	25 bits
Type of code	Binary code
Impulse time	0.25 s

6 Order designation

NA 218.A03 AX 01