

User manual

## Bargraph indicator

### BA9624 / 7224 / 4824N2

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Size (W x H)  
48 x 24 mm



Size (W x H)  
72 x 24 mm



Size (W x H)  
96 x 24 mm

**Direct voltage/Direct current**

0 – 10 VDC, 0/4 – 20 mA

**Switchable display colour:** standard: red/green,  
optional: green/orange or blue/red

## User manual

# Bargraph indicator

## BA9624 / 7224 / 4824N2

### Technical features

- Bargraph colour red or green, adjustable via code switch
- minimal installation depth due to a pluggable screw terminal
- parameterisation via HEX-switch and pushbutton
- pre-adjusted input (ex factory) for standard signal 0 to 10 V and 0/4 to 20 mA
- free adjusting on the input signal
- 8 different types of notation, adjustable as bars, dot or curtain
- free selection of direction and notation of the middle (e.g. bars starting from the middle)
- gradually brightness control
- protection class IP65 at the front
- pluggable screw terminal
- optional: colours green/orange, blue/red

# 1. Assembly

Please read the Safety advices on page 25 before installation and keep this user manual for future reference.

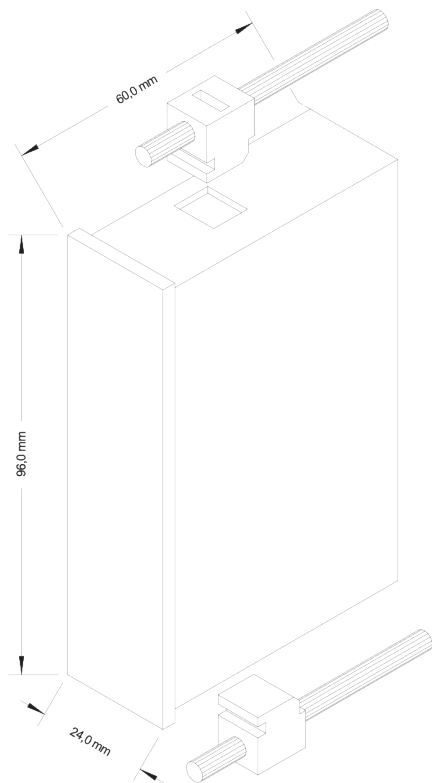
1. After removing the fixing elements, insert the device.
2. Check the seal to make sure it fits securely.
3. Click the fixing elements back into place and tighten the clamping screws by hand. Then use a screwdriver to tighten them another half a turn.



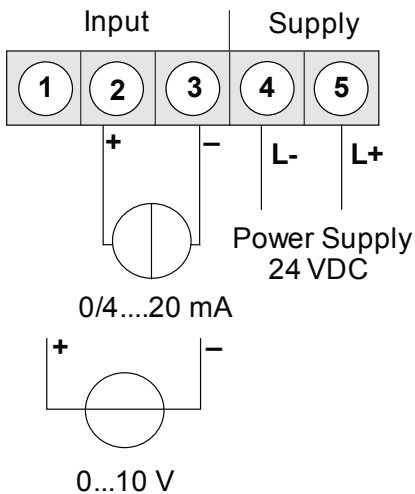
**CAUTION!** The torque should not exceed 0.1 Nm!

The dimension symbols can be exchanged before installation via a channel on the side!

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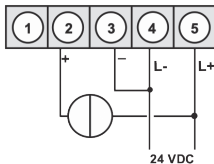
## 2. Electrical connection



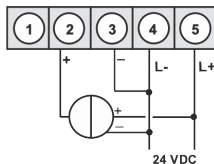


## Connection examples

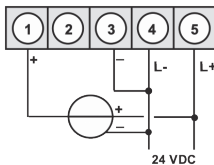
Below you find some connection examples, which demonstrate some practical applications:



BAxx24N2 in combination with a 2-wire-sensor and 4-20 mA



BAxx24N2 in combination with a 3-wire-sensor and 0/4-20 mA



BAxx24N2 in combination with a 3-wire-sensor 0-10 V

## 3. Description of functions and operation

### Operation

Programming happens via 2 operating elements. A code switch with 9 positions and a pushbutton on the rear side of the device.



### Code switch

Access to the 9 levels of the bargraph display happens via the code switch.

### Pushbutton

The parameters stored in the menu item can be parameterized here. Functions that can be adjusted or changed are always indicated with a flashing of the segments. Adjustments made at the parameterization level should always be confirmed by pressing the pushbutton to save them.

## Description of the operating elements

OPERATING ELEMENTS	
Menu level Code switch	
Parameterisation level Pushbutton	

### Operating mode



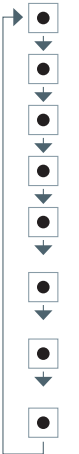
To enter the operating mode, the code switch needs always to be on position 0!

















## 4. Setting up the device

### 4.1. Switching on

Once the installation is complete, start the device by applying the supply voltage. Check beforehand once again that all the electrical connections are correct.

### 4.2. Parametrierung

MENU-LEVEL		PARAMETERIZATION LEVEL	
Code switch		Pushbutton	
	Operating mode	Without function	
	Selection operating type		<p>Bar function from top to bottom</p> <p>Bar function from bottom to top</p> <p>Dot function from bottom to top</p> <p>Dot function from top to bottom</p> <p>Bar function from the middle with alignment: +Signal top/left -Signal bottom/right</p> <p>Bar function from the middle with alignment: +Signal bottom/right -Signal top/left</p> <p>Bar function „curtain“: from the middle, indicating in both directions</p> <p>Bar function „curtain“: top (left) and bottom (right) indicating in both directions</p>

MENU-LEVEL Code switch		PARAMETERIZATION LEVEL Pushbutton	
	<b>Sensor calibration:</b> Application of the signal input/final value e.g. 10 V.		The display flashes until the value has been taken over by keystroke.
	<b>Sensor calibration:</b> Application of the signal input/final value 0 V.		The display flashes until the value has been taken over by keystroke.
	<b>Factory calibration:</b> Allocation measuring input 0 – 10 V, without application of the sensor signal.		The display flashes until the input has been allocated by keystroke.
	<b>Factory calibration:</b> Allocation measuring input 0 – 20 mA, without application of the sensor signal.		The display flashes until the input has been allocated by keystroke.
	<b>Factory calibration:</b> Allocation measuring input 4 – 20 mA, without application of the sensor signal.		The display flashes until the input has been allocated by keystroke.
	<b>Display position</b> <b>Final value</b>		By keystroke you can limit the final value at any position of the display e.g. on 50 instead of 100 on the scale.
	<b>Display position</b> <b>Initial value</b>		By keystroke you can limit the initial value at any position of the display e.g. on 50 instead of 0 on the scale.
	<b>Brightness adjustment /</b> <b>Choice of colour</b>		The colour (red/green) and the brightness can be changed in 9 steps by keystroke.

## 4.3. Bargraph display during parameterisation

### BA9624N2

OPERATION MODE		ILLUSTRATION OF OPERATI						
CODE SWITCH		1	2	3	4	5	6	7
1	Bar function from top/left to bottom/right							
1	Bar function from bottom/right to top/left	■	■	■	■		■	■
1	Dot operation from top/left to bottom/right							
1	Dot operation from the bottom up	■		■		■		■
1	Bar function from the middle with +signal to bottom/right							■
1	Bar function from the middle with +signal to top/left							
1	Bar function "curtain" from the middle in both directions							■
1	Bar function "curtain" top/left and bottom/right in both directions	■	■	■	■		■	■
2	Sensor calibration final value	■	■	■	■			
3	Sensor calibration Offset	■						
4	Factory calibration 0-10 V	■	■	■		■		■
5	Factory calibration 0-20 mA	■	■	■		■		■
6	Factory calibration 4-20 mA	■	■	■		■		■
7	Display position final value							
8	Display position Offset	■						
9	Brightness regulation, bargraph colour	■	■	■	■	■	■	■



### 4.3. Bargraph display during parameterisation

#### BA7224N2

OPERATION MODE		ILLUSTRATION OF OPERATION				
CODE SWITCH		1	2	3	4	5
1	Bar function from top/left to bottom/right					
1	Bar function from bottom/right to top/left	■	■	■	■	■
1	Dot operation from top/left to bottom/right					
1	Dot operation from the bottom up	■		■		■
1	Bar function from the middle with +signal to bottom/right					■
1	Bar function from the middle with +signal to top/left					
1	Bar function "curtain" from the middle in both directions					
1	Bar function "curtain" top/left and bottom/right in both directions	■	■	■		■
2	Sensor calibration final value	■	■	■		
3	Sensor calibration Offset	■				
4	Factory calibration 0-10 V	■	■	■		■
5	Factory calibration 0-20 mA	■	■	■		■
6	Factory calibration 4-20 mA	■	■	■		■
7	Display position final value					
8	Display position Offset	■				
9	Brightness regulation, bargraph colour	■	■	■	■	■







## 5. Factory settings

CODE SWITCH	
Position 1	Bar operation from the bottom up
Position 2	–
Position 3	–
Position 4	Measuring input 0 – 10 V
Position 5	–
Position 6	–
Position 7	100 %
Position 8	0 %
Position 9	Brightness, bargraph colour red, level 10

## 6. Technical data

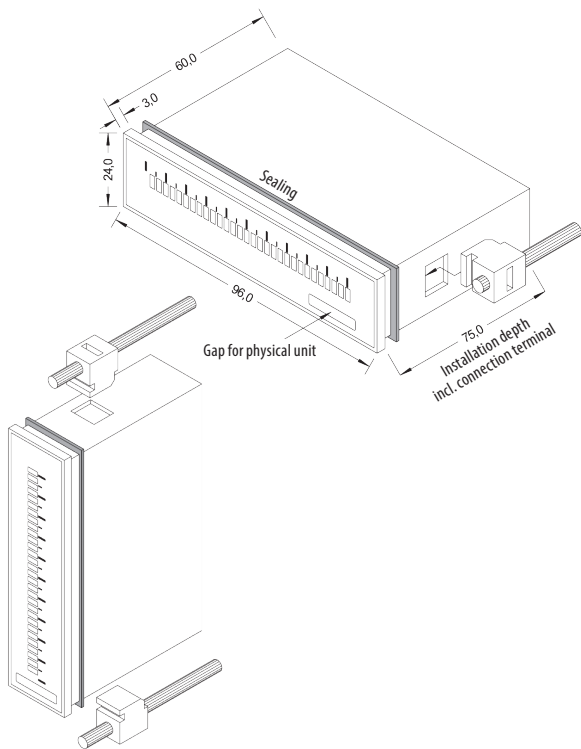
HOUSING	
Dimensions	
96 x 24	96 x 24 x 60 mm (W x H x D) 96 x 24 x 75 mm (W x H x D) including plug-in terminal
72 x 24	72 x 24 x 32 mm (W x H x D) 72 x 24 x 60 mm (W x H x D) including plug-in terminal
48 x 24	48 x 24 x 30 mm (W x H x D) 48 x 24 x 55 mm (W x H x D) including plug-in terminal
Panel cut-out	
96 x 24	92.0 <sup>+0.8</sup> x 22.2 <sup>+0.3</sup> mm
72 x 24	68.0 <sup>+0.7</sup> x 22.2 <sup>+0.3</sup> mm
48 x 24	45.0 <sup>+0.8</sup> x 22.2 <sup>+0.6</sup> mm
Wall thickness	up to 3 mm
Fixing	screw elements
Material	PC Polycarbonate, black
Sealing material	EPDM, 65 Shore, black
Protection class	standard IP65 (front), IP00 (rear side)
Weight	approx. 100 g
Connection	plug-in terminal; wire cross section up to 2.5 mm <sup>2</sup>
Display	
Bargraph segments	2x4 mm (WxB)
Segment colour	red/green selectable, optionally green/orange, blue/red
Display range	30/20/10 points bargraph display
Overflow	all segments are flashing, except the last 3

Display				
Underflow	flashing of the first 3 bargraph elements			
Display time	equals measuring time approx.100 ms			
Input	Meas. range	Ri	Measuring error	Digit
-22...24 mA	4 – 20 mA	~100 Ω	0.5 % of final value	±1
-12...24 VDC	0 - 10 VDC	~200 kΩ	0.5 % of final value	±1
Temperature drift	100 ppm / K			
Measuring time	approx. 100 ms			
Measuring principle	Voltage-/frequency conversion			
Resolution	14 Bit (at 0.1 sec measuring time)			
Power pack				
	24 VDC galv. isolated, ±10%, max. 2 VA			
Memory	EEPROM			
Data life	≥ 100 years			
Ambient conditions				
Working temperature	0...60°C			
Storing temperature	-20...80°C			
Weathering resistance	relative humidity 0-80% on years average without dew			
EMV	EN 61326, EN 55011			
CE-sign	Conformity according to directive 2014/30/EU			
Safety regulation	according to low voltage directive 2014/35/EU, EN 61010, EN 50554-1			

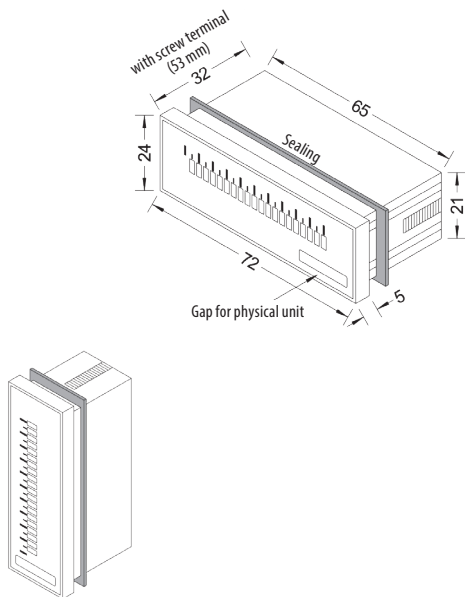
## Housing dimensions

### BA9624N2

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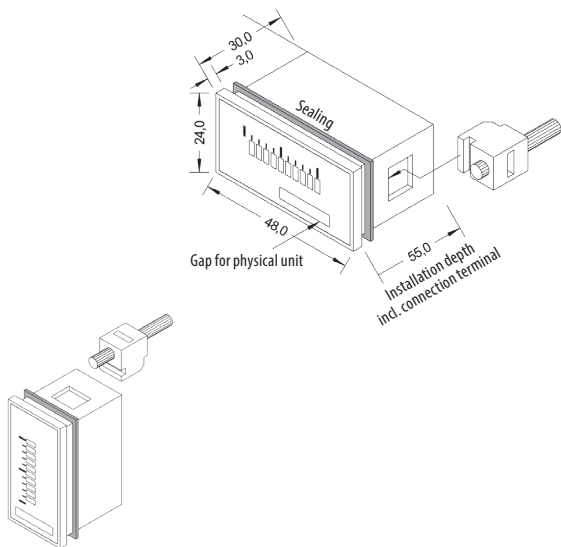


## BA7224N2



## BA4824N2

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## 7. Safety advices

Please read the following safety advices and the assembly chapter 1 before installation and keep it for future reference.

### Proper use

The BAxx24N2-device is designed for the evaluation and display of standard signals.



**Danger!** Careless use or improper operation can result in personal injury and/or cause damage to the equipment.

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### Control of the device

The panel meters are checked before dispatch and sent out in perfect condition. Should there be any visible damage, we recommend close examination of the packaging. Please inform the supplier immediately of any damage.

### Installation

The BAxx24N2-device must be installed by a suitably qualified specialist (e.g. with a qualification in industrial electronics).

## Notes on installation

- There must be no magnetic or electric fields in the vicinity of the device, e.g. due to transformers, mobile phones or electrostatic discharge.
- The fuse rating of the supply voltage should not exceed a value of 0.5 A N.B. fuse!
- Do not install inductive consumers (relays, solenoid valves etc.) near the device and suppress any interference with the aid of RC spark extinguishing combinations or free-wheeling diodes.
- Keep input, output and supply lines separate from one another and do not lay them parallel with each other. Position “go” and “return lines” next to one another. Where possible use twisted pair. So, you receive best measuring results.
- Screen off and twist sensor lines. Do not lay current-carrying lines in the vicinity. Connect the screening on one side on a suitable potential equaliser (normally signal ground).

- The device is not suitable for installation in areas where there is a risk of explosion.
- Any electrical connection deviating from the connection diagram can endanger human life and/or can destroy the equipment.
- The terminal area of the devices is part of the service. Here electrostatic discharge needs to be avoided. Attention! High voltages can cause dangerous body currents.
- Galvanically isolated potentials within one complex need to be placed on a appropriate point (normally earth or machines ground). So, a lower disturbance sensibility against impacted energy can be reached and dangerous potentials, that can occur on long lines or due to faulty wiring, can be avoided.

## 8. Error elimination

ERROR DESCRIPTION	MEASURES
<p>1. The unit permanently indicates overflow. The two bargraph segments at the top are flashing.</p>	<ul style="list-style-type: none"> <li>○ The input has a very high measurement, check the measuring circuit.</li> <li>○ With a selected input with a low sensor signal, it is only connected on one side or the input is open.</li> <li>○ Not all of the activated setpoints are parameterised. Check if the relevant parameter are adjusted correctly.</li> </ul>
<p>2. The unit permanently indicates underflow. The two bargraph segments at the bottom are flashing.</p>	<ul style="list-style-type: none"> <li>○ The input has a very low measurement, check the measuring circuit.</li> <li>○ With a selected input with a low sensor signal, it is only connected on one side or the input is open.</li> <li>○ Not all of the activated setpoints are parameterised. Check if the relevant parameter are adjusted correctly.</li> </ul>
<p>3. Bargraph stays on alternating design.</p>	<ul style="list-style-type: none"> <li>○ Please contact the manufacturer if errors of this kind occur.</li> </ul>

## 9. Identification

### Bargraph indicator BA9624 / 7224 / 4824N2

BA    1.    2.    3.    4.    5.    6.    7.  
 —  —  —  —  —  —  —

1. Model	
4824N2	10 segments
7224N2	20 segments
9624N2	30 segments

2. Mounting	
1	vertical
2	horizontal

3. Bargraph colour	
1	red/green, selectable

4. Power supply	
5	24 V DC with galv. isolation

5. Input signal	
0	0/4..20 mA, 0..10 VDC

6. Measuring range scale 0..100 %	
10	universal design

7. Protection class	
2	IP65





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