Thank you for choosing a NIVELCO instrument.
We are convinced that you will be satisfied with our product!

NIMET

BC□-1□□-□

CAPACITIVE PROXIMITY SENSOR

User's manual

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1. INTRODUCTION

The **NIMET BC** capacitive proximity sensors are for industrial automation tasks for non-contact detection of metallic and non-metallic objects (water, plastic, stone, wood, etc.). The **NIMET BC** capacitive proximity sensors operate like an open capacitor. The dielectric of the capacitor is the air. If there is an object with a significantly different dielectric constant in the sensing area, the switch will change state. The material-dependent sensitivity can be set with the potentiometer. Devices with a DC power supply have short-circuit protected PNP or NPN transistor outputs. Devices with an AC power supply have a thyristor-driven output. Furthermore, there is a LED and a potentiometer on the backplate of the device. The LED shows the output state.

2. TECHNICAL DATA

GENERAL DATA

Type	BCV–		BCZ–		BCV–	BCZ–
	141	142	161	162	145	165
Sensing distance	8 mm		15 mm		8 mm	15 mm
Metal holder min. distance	10 mm				30 mm	
Hysteresis	Max 20 % of sensing distance					
Supply voltage (operational)	12–24 VDC (10–30 VDC)				100–240 VC (85–264 VAC)	
Sensitivity adjustment	With potentiometer					
Max. current consumption	15 mA				2.2 mA	
Residual voltage	1.5 V				20 V	
Max. response frequency	50 Hz				20 Hz	
Setting distance	0–5.6 mm		0–0.5 mm		0–5.6 mm	0–10.5 mm
Output	30 VDC transistor				230 VAC	
	NPN	PNP	NPN	PNP	thyristor	
Maximum output load	Resistive load: 200 mA, Inductive load: 100 mA					
Sensing distance temperature sensitivity	±10% max for sensing distance at +20°C, within the temperature range of −25°C…+70°C					
Housing ∅	18 mm		30 mm		18 mm	30 mm
Housing material	Plastic		Metal		Plastic	Metal
Connection, 2 m cable with plastic insulation	3 x 0.25 mm²				2 x 0.25 mm²	
Ambient temperature	−25°C…+70°C					
Electrical protection	Class III.				Class II.	
Ingress protection	IP66		IP65		IP66	IP65
Weight	~72 g		~212 g		~63 g	~220 g

2.1 Accessories

- User's manual
- Warranty card
- EU declaration of conformity
- Two hex nuts for mounting

2.2 ORDER CODE (NOT ALL COMBINATIONS ARE POSSIBLE!)

NIMET B C □ – 1 □ □ – □

TYPE [Ø mm]	CODE
18	**V**
30	**2**

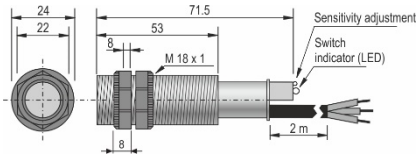
SENSING DISTANCE [mm]	CODE
8 (Ø18)	**0**
15 (Ø30)	**5**

OUTPUT	CODE
NPN / NO	**1**
PNP / NO	**2**
Thyristor / NO	**5**

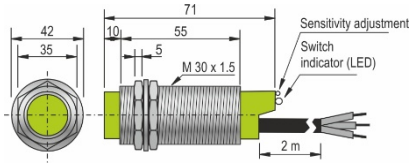
SUPPLY VOLTAGE	CODE
230 V AC	**1**
10–30 V DC	**4**

2.3 DIMENSIONS

BCV–14□–□



BCZ–16□–□



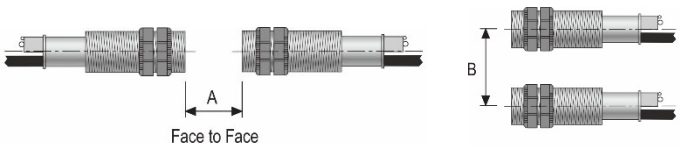
3. INSTALLATION

The device must be mounted with the two hex nuts provided with it so that the distance between the device and the object to be detected is less than 70% of the sensing (switching) distance of the given device.

- Materials of sensing targets: Sensing distance may be different due to the electrical characteristics of the target (conductivity, non-dielectric constant) and its physical properties, like water absorption, size etc.
- High-frequency electric fields may cause malfunction, e. g., fields generated by washing machines, etc.
- Surrounding environment: water or oil on the surface of the sensing part may cause a malfunction. If the sensing bottle is covered in oil etc., it may cause a malfunction. Especially in the case of the 15 mm version **(BCZ–16□–□)**, which is highly sensitive to certain objects and water droplets.
- Oil: Do not let the oil or other liquid flowed into the sensor or in the plastic case.

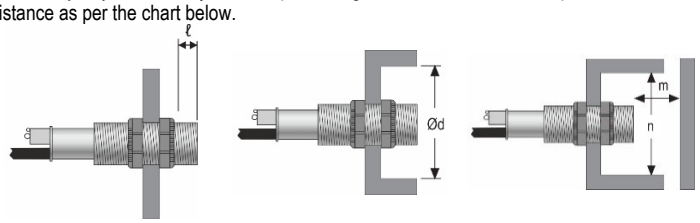
3.1 MUTUAL INTERFERENCE & EFFECTS OF SURROUNDING METALLIC OBJECTS

When several proximity sensors are mounted close to one another, the sensors may malfunction due to mutual interference. Therefore, be sure to provide a minimum distance between sensors as per the chart below.



Type	BCV–14□–□	BCZ–16□–□
A [mm]	48	90
B [mm]	54	90

When sensors are mounted on a metallic panel, the sensors must be prevented from being affected by any metallic objects except the target. Therefore, be sure to provide a minimum distance as per the chart below.



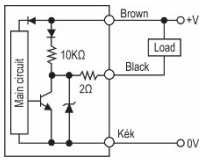
Type	BCV–14□–□	BCZ–16□–□
ℓ [mm]	20	10
∅d [mm]	54	90
m [mm]	24	45
n [mm]	54	90

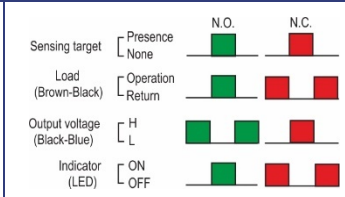
4. WIRING

4.1 CONTROL OUTPUT DIAGRAM

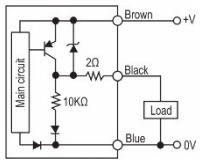
DC 3-wire type

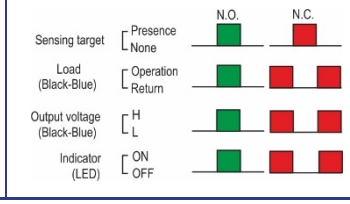
NPN output





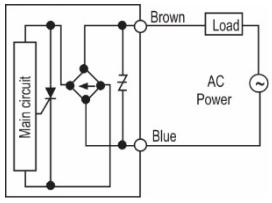
PNP output

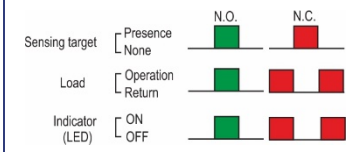




AC 2- wire type

Thyristor output

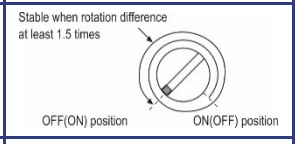
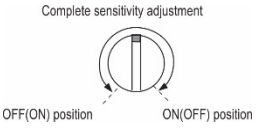




Attention:

Devices with an AC power supply must not be powered without a load connected in series to avoid damaging the devices. The load must be connected in series with the device. The phase must be connected to the load.

4.2 SENSITIVITY ADJUSTMENT

1. Without a sensing object, turn the potentiometer to the right (on the backplate of the device) until the output switches on.	
2. Place the target in front of the sensor and turn the potentiometer to the left until the output switches off.	
3. If the difference between positions **1** and **2** is more than one and a half turns, the setting is stable. Therefore, the potentiometer should be turned to the middle between the position **1** and **2** when finalizing the adjustment.	
4. If the target's distance from the surface of the sensor is variable, follow the procedure below: Set point **1** when the target is at the nearest position and set point **2** when the target is at the farthest position. Then set the potentiometer in the middle between the two positions.	

- If the distance between the sensor and the target fluctuates, move the sensor to the farthest position and adjust the potentiometer as described in **2.**
- Turning the potentiometer clockwise is increasing, while turning it counter-clockwise decreases the value. The potentiometer is adjustable within 15±3 turns. If it is turned past that, it will turn without the value changing.
- The notes in brackets ( ) apply to the closed-by-default variant.

5. MAINTENANCE AND REPAIR

The device does not require regular maintenance. However, if the settings deviate from the ideal position later, the adjustment procedure must be repeated. The warranty conditions can be found on the warranty card.

When sending a device back for repairs, the official repair form must be included in the package. In it, the sender must state that the device was properly decontaminated and the device was cleaned from all harmful or hazardous substances. Download the form here: Returned Equipment Handling Form.

6. STORAGE CONDITIONS

Storage temperature: −30°C...+80°C maximum humidity 95%.

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NIVELCO reserves the right to change technical data without notice!