



## Truvo

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GERMANY

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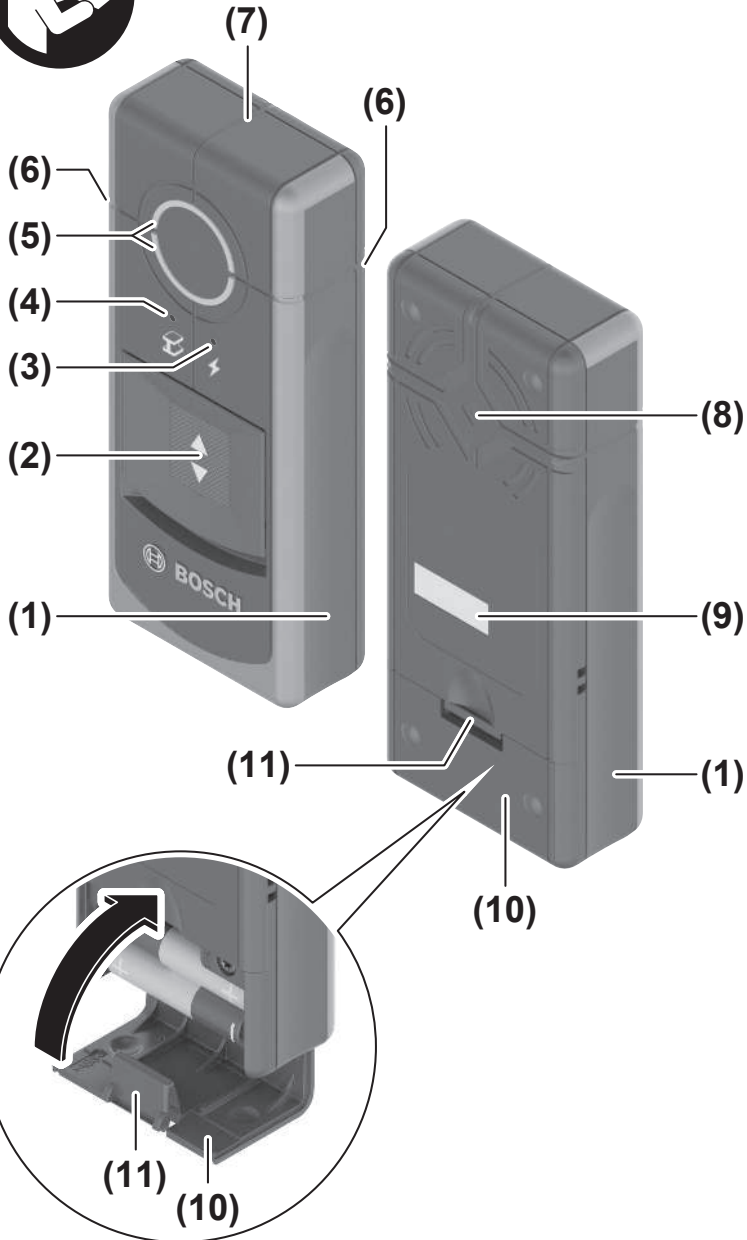
1 609 92A 8B5



en Original instructions







# English

## Safety Instructions



All instructions must be read and observed. The safeguards integrated into the measuring tool may be compromised if the measuring tool is not used in accordance with these instructions. **STORE THESE INSTRUCTIONS IN A SAFE PLACE.**

- ▶ **Have the measuring tool repaired only by a qualified specialist using only original replacement parts.** This will ensure that the safety of the measuring tool is maintained.
- ▶ **Do not use the measuring tool in explosive atmospheres which contain flammable liquids, gases or dust.** Sparks may be produced inside the measuring tool, which can ignite dust or fumes.
- ▶ **The measuring tool may not be 100 % accurate for technological reasons. To eliminate hazards, familiarise yourself with further sources of information, such as building plans and photographs taken during construction, etc. before carrying out any drilling, sawing or routing work on walls, ceilings or floors.** Environmental influences, such as humidity, or proximity to devices that generate strong electric, magnetic or electromagnetic fields, moisture, metallic building materials, foil-laminated insulation materials or conductive wallpaper or tiles may impair the accuracy of the measuring tool. The number, type, size and position of the objects may distort the measuring results.
- ▶ **If there are gas pipes in the building, check to ensure that none of them have been damaged after completing any work on walls, ceilings or floors.**

## Product Description and Specifications

Please observe the illustrations at the beginning of this operating manual.

### Intended Use

The measuring tool is intended for the detection of metal (ferrous and non-ferrous metals, e.g. reinforcing steel) and live wires in walls, ceilings and floors.

The measuring tool is suitable for indoor use.

### Product features

The numbering of the product features shown refers to the illustration of the measuring tool on the graphic page.

- (1) Gripping surface
- (2) On/off switch
- (3) Live wire indicator
- (4) Metal object indicator

- (5) Light-up ring
- (6) Left-hand and right-hand marking aids
- (7) Top marking aid
- (8) Sensor area
- (9) Serial number
- (10) Battery compartment cover )
- (11) Locking mechanism of the battery compartment cover )

## Technical data

Digital detector	Truvo
Article number	<b>3 603 F68 201</b>
Max. detection depth <sup>A)</sup>	
– Metal objects	70 mm
– Single-phase live cables (110–240 V, 50–60 Hz, with voltage applied) <sup>B)</sup>	50 mm
Calibration	Automatic
Operating temperature	0 °C to +40 °C
Storage temperature	–20 °C to +70 °C
Operating frequency range	50 ± 2 kHz
Max. magnetic field strength (at 10 m)	42 dBµA/m
Max. altitude	2000 m
Relative air humidity	30–80 %
Relative air humidity max. for "live" material identification	50 %
Pollution degree according to IEC 61010-1	2 <sup>C)</sup>
Batteries	3 × 1.5 V LR03 (AAA)
Operating time, approx.	> 3 h
Weight <sup>D)</sup>	0.12 kg
Dimensions (length × width × height)	144 × 60 × 28 mm

A) Depends on material and size of the objects, as well as material and condition of the substrate

B) Lower detection depth with non-live wires

C) Only non-conductive deposits occur, whereby occasional temporary conductivity caused by condensation is expected.

D) Weight without batteries

The serial number (9) on the type plate is used to clearly identify your measuring tool.

- ▶ **The accuracy and detection depth of the measuring result may be negatively affected if the condition of the substrate is unfavorable.**

## Assembly

### Inserting/changing the batteries

It is recommended that you use alkaline manganese batteries to operate the measuring tool.

To open the battery compartment cover (10), press the locking mechanism (11) and lift open the battery compartment cover. Insert the batteries.

When inserting the batteries, ensure that the polarity is correct according to the illustration on the inside of the battery compartment.

Always replace all the batteries at the same time. Only use batteries from the same manufacturer and which have the same capacity.

► **Take the batteries out of the measuring tool when you are not using it for a prolonged period of time.** The batteries can corrode during prolonged storage in the measuring tool.

## Operation

- **Protect the measuring tool from moisture and direct sunlight.**
- **Do not expose the measuring tool to any extreme temperatures or variations in temperature. In case of large variations in temperature, leave the measuring tool to adjust to the ambient temperature before switching it on.** The precision of the measuring tool may be compromised if exposed to extreme temperatures or fluctuations in temperature.
- **Avoid hard knocks to the measuring tool or dropping it.** After severe external influences and in the event of abnormalities in the functionality, you should have the measuring tool checked by an authorised **Bosch** after-sales service agent.
- **Hold the measuring tool by the intended gripping surface (1) only, so as not to influence the measurement.**
- **Do not attach any stickers or labels to the sensor area (8) on the rear of the measuring tool.** Metal labels in particular will affect measuring results.



**Do not wear gloves when taking measurements and make sure that you are properly earthed.** If you are not properly earthed, the identification of live wires may be impaired.



**When taking measurements, avoid getting close to devices that emit strong electric, magnetic or electromagnetic fields, such as mobile telephones, laptops or tablets.** If possible, deactivate all tools whose radiation could

interfere with the measurement and switch off the corresponding functions or tools.

## Starting Operation

### Switching on/off

- **Before switching on the measuring tool, ensure that the sensor area (8) is dry.** If necessary, use a cloth to dry the measuring tool.
- **If the measuring tool has been exposed to a significant change in temperature, leave it to adjust to the ambient temperature before switching it on.**



To **switch on** the measuring tool, push the on/off switch (2) down.

The measuring tool carries out a short self-check and calibrates itself automatically. Once the light-up ring (5) turns green, the measuring tool is ready to use.



To **switch off** the measuring tool, push the on/off switch (2) up.

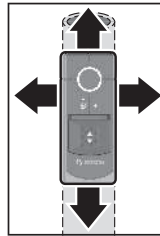
If no measurement takes place for approx. **10** minutes, the measuring tool automatically switches off to save the batteries.

**Note:** When the measuring tool has switched off automatically, the on/off switch (2) will still be in the "on" position. To switch the measuring tool on again, first switch it off and then switch it on again.

## How it Works

The measuring tool checks the substrate of the sensor area (8) up to the maximum detection depth.




Metal objects and live cables are automatically searched for during each measurement.



Always move the measuring tool in a straight line in a lateral direction over the substrate, applying light pressure, without lifting it off or changing the pressure. Hold the measuring tool by the gripping surface (1) with an even grip and do not touch the sensor area (8) while taking measurements. For the best possible results, make sure that the measuring tool maintains contact with the surface throughout

the measuring process.

Overview of indications:

	 (5)	 (4)	 (3)	Audio signal	Meaning
Green	–	–	–	–	No object is within the sensor range
Yellow	●	–	–	–	– Metal object near the sensor or – Small or deep-lying metal object is within the sensor range or – Sensor interference due to the unfavourable nature of the wall
Illuminated red	●	–	●	●	Metal object is within the sensor range
Illuminated red	–	●	●	●	Live cable is within the sensor range

Objects are only displayed roughly the first time you move over them. Move the measuring tool several times over the same surface in order to locate the object precisely.

The detection depth of the measurement depends on material and size of the objects, as well as material and condition of the substrate and may be less than the maximum detection depth.

### Searching for Metal Objects

Preparing to take measurements and features of the measuring process:

- Remove any metal objects, such as rings, watches and other jewellery from the vicinity of the measuring tool to prevent interference with the measurement results.
- The proximity of metal objects such as door frames and radiators can impede the search for other metal objects beneath the surface. This also applies to aluminium foil covering heating pipes or insulation, which is recognised as metal and indicated over large areas.

When approaching a metal object, the light-up ring (5) first lights up yellow and then changes to red. The metal object indicator (4) will light up and an acoustic signal is emitted.

- ▶ **Even when the light-up ring is yellow, there may be a metal object beneath the sensor area.** Small or deep-living metal objects are near the sensor, or the nature of the wall affects the measuring result.

### Searching for Live Cables

The measuring tool displays single-phase live cables (110–240 V, 50–60 Hz). Other cables (multi-phase electricity cables, DC, higher/lower frequency or voltage) as well as non-live cables cannot be reliably detected, but they may be displayed as metal objects.

Preparing to take measurements and features of the measuring process:

- **The cable must be live.** You should therefore connect electricity consumers (e.g. lights, appliances) to the electricity cable you are trying to find. Switch on the electricity consumers to ensure that the electricity cable is live.
- **The 50–60 Hz signal from the electricity cable must be able to reach the measuring tool.** If the cable is in damp walls (e.g. due to high humidity), behind metallic foils (e.g. from thermal insulation) or in an empty metal pipe, the signal will not reach the measuring tool and you will not be able to find the cable.
- If the light-up ring (5) lights up yellow or red over a larger area, then the material is electrically shielded and the search for live cables is not reliable.
- **The measuring tool must be sufficiently earthed.** To do this, hold it firmly (without gloves) by the gripping surface (1). Make sure that you are in good contact with the floor. Insulating shoes, ladders or platforms may compromise your contact with the floor. The floor must also be earthed in order for live cables to be detected.
- **The 50–60 Hz signal from the electricity cable must be stronger along the cable than in its immediate vicinity.** If the wall is very dry or poorly earthed, the signal will be the same strength throughout the wall. This will

result in the measuring tool indicating that it has found a signal over a large area, but it will not be able to detect the exact location of the cable.

In this instance, it may be helpful to place your free hand on the wall 20–30 cm from the measuring tool in order to conduct the signal away from the wall. However, you should not change the position of your free hand during the measuring process.

If a live cable is found, the light-up ring (5) lights up red, the live cable indicator (3) lights up white and an audio signal is emitted.

- ▶ **Switch off power consumers and make sure that live cables are de-energised before drilling, sawing or milling into walls, ceilings or floors. After performing any kind of work, check to ensure that objects placed on the substrate are not live.**

### Working Advice

#### Marking objects

If required, detected objects can be marked. Perform a measurement as usual.

Once you have found the boundaries or the centre of an object, mark the sought location at the top marking aid (7) and the side marking aid (6). Connect the points with a vertical and horizontal line. The boundary or the centre of the object is located where the lines intersect.

#### Recalibration

Manually recalibrate the measuring tool if the light-up ring (5) continues to light up yellow or red even though there is no metal near the measuring tool.

- Switch on the measuring tool using the on/off switch (2).
- Remove a battery from the measuring tool whilst it is switched on.
- Switch off the measuring tool using the on/off switch (2) after the battery has been removed.
- Reinsert the battery into the measuring tool. Ensure that the polarity is correct.
- Remove all objects near the measuring tool (including watches or metal rings) and hold the measuring tool in the air.
- Switch the measuring tool on and off again within 3 s using the on/off switch (2). The light-up ring (5) will flash red slowly for the 3 s to indicate readiness for calibration.
- Switch the measuring tool back on within 0.5 s. The calibration will start and take roughly 6 s. During calibration, the light-up ring (5) flashes green quickly. Once the light-up ring (5) lights up green continuously, the calibration is complete and the measuring tool is ready to use.

**Note:** If the sequence of switching off and switching on again is not observed, calibration will not take place. The light-up ring (5) continues to light up yellow or red even though there is no metal nearby. In this case, repeat the calibration in the exact same way.

## Errors – Causes and Corrective Measures

Cause	Corrective measures
<b>Measuring results inaccurate/improbable</b>	
Interfering objects are within the sensor range <b>(8)</b>	Remove all interfering objects (e.g. watches, bracelets, rings, etc.) from within range of the sensor <b>(8)</b> . Do not hold the measuring tool close to the sensor.
Auto-calibration not successful	Manually recalibrate the measuring tool.
<b>Light-up ring does not light up.</b>	
Measuring tool has switched off automatically.	Switch the measuring tool off and on again.
Batteries drained	Change the batteries.
<b>Light-up ring lights up green/yellow/red in an uncoordinated manner.</b>	
Interference from electric, magnetic or electromagnetic fields	If possible, deactivate all tools whose radiation could interfere with the measurement and switch off the corresponding functions or tools.
<b>Light-up ring flashes continuously, alternating green/yellow/red.</b>	
Measuring tool faulty	Send the measuring tool to an authorised <b>Bosch</b> after-sales service centre.
<b>Error when searching for and indicating metal</b>	
Cause	Corrective measures
<b>Light-up ring lights up yellow or red even though there is no metal nearby.</b>	
Ambient temperature too high/too low	Only use the measuring tool in the operating temperature range.
Strong temperature variation	Allow the measuring tool to reach the correct temperature.
Auto-calibration not successful	Manually recalibrate the measuring tool.
<b>Light-up ring lights up yellow or red over a large measuring range on the wall.</b>	
Many metal objects spaced closely together	Metal objects spaced too closely together cannot be detected separately.
Building materials containing metal or reinforcing steel in concrete	In the presence of metallic building materials (e.g. foil-laminated insulation materials, heat conduction plates), reliable detection is not possible.
Solid metal objects on the back of the wall	In the presence of solid metal objects (e.g. radiators), reliable detection is not possible.
Auto-calibration not successful	Manually recalibrate the measuring tool.

Cause	Corrective measures
<b>Metal object not found.</b>	
Metal object is too deep or too small.	The detection depth depends on the building material and on the object and may be less than the maximum detection depth.
<b>Error when searching for and indicating live cables</b>	
Cause	Corrective measures
<b>Light-up ring lights up red over a large measuring range on the wall.</b>	
Insufficient earthing of the wall	Touch the wall with your free hand at a distance of 20–30 cm from the measuring tool in order to earth the wall.
Wall is too damp.	Only use the measuring tool when the humidity has been low for a few days and the wall is not damp.
<b>Live cable not found.</b>	
No/unusual voltage in the cable	Apply voltage to the cable, e.g. by turning on the corresponding light switches. It is not possible to reliably detect multi-phase electricity cables and cables with voltages outside the 110–240 V and 50–60 Hz range.
Cable is too deep.	The detection depth depends on the building material and may be less than the maximum detection depth.
Cable runs in earthed metal pipe.	Be sure to look at the metal object display to find the metal pipe.
Measuring tool not earthed	Grip the measuring tool firmly without gloves. Do not stand on insulating ladders or scaffolds. Do not wear insulating footwear.
Shielding building material or humidity too low/too high	Detection will not be reliable in the presence of metallic building materials or building materials that are too dry or too damp (e.g. if the humidity is too low or too high).

## Maintenance and Service

### Maintenance and Cleaning

- **Check the measuring tool before each use.** If the measuring tool is visibly damaged or parts have become loose inside the measuring tool, safe function can no longer be ensured.

Always keep the measuring tool clean and dry to ensure optimum, safe operation.

Never immerse the measuring tool in water or other liquids.

Wipe off any dirt using a dry, soft cloth. Do not use any detergents or solvents.

## After-Sales Service and Application Service

### Great Britain

Tel. Service: (0344) 7360109

### GB Importer:

Robert Bosch Ltd.  
Broadwater Park  
North Orbital Road  
Uxbridge  
UB9 5HJ

### People's Republic of China

#### China Mainland

Tel.: 400 826 8484-3-2

In all correspondence and spare parts orders, please always include the 10-digit article number given on the nameplate of the product.

## Disposal

Measuring tools, accessories and packaging should be recycled in an environmentally friendly manner.



Do not dispose of measuring tools or batteries with household waste.

### Only for EU countries and United Kingdom:

Electrical and electronic equipment or used batteries that are no longer suitable for use must be collected separately and disposed of in an environmentally friendly manner. Use the designated collection systems. Incorrect disposal may cause harmful effects on the environment and human health, due to the potential presence of hazardous substances.

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