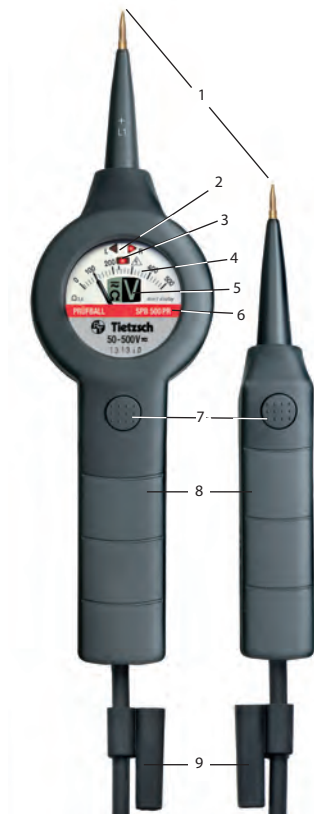



# User Instructions

Prüfball SPB 500B/PR/PRA  
SPB 1000B/PR








## Voltage Tester





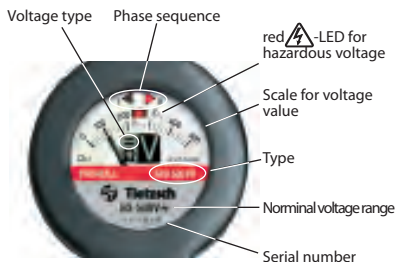
- 1 Test electrodes
- 2 Phase sequence indicator
- 3  -LED for hazardous voltages  $\geq 50$  V AC / 120 V DC and phase testing
- 4 Scale for measurement value
- 5 LCD indication for voltage, voltage type and continuity
- 6 Type plate
- 7 Push-buttons for load (types PR-/PRA)
- 8 Handgear
- 9 Connecting line with protective cap

### Symbols on the instrument

-  Attention! Observe user instructions!
-  Mark of approval from VDE test authority
-  Indicates EC conformity
- $TR_{on}$  On-time at highest nominal voltage
- $RT_{off}$  Recovery time after tests with highest nominal voltage
-  Device for live working
-  Push-button
-   $L_{2,5}$  moving-coil instrument, accuracy class
-  This device has to be disposed of according to the applicable regulations and laws (for Europe: WEEE 2012/19/EU). Please contact [info@ics-schneider.de](mailto:info@ics-schneider.de) in regard to the return of old devices.

## Labelling

Type of device, nominal voltage range and serial number are stated on the front and other markings on the back of the device.



## Overview types of device

Type	Phase / Phase sequence	Con- tinuity	Additional load	Vibra- tion	Acoustic signal
SPB 500B 50-500 V	✓	✓			
SPB 1000B 50-1000 V	✓	✓			
SPB 500PR 50-500 V	✓	✓	✓	✓	
SPB 1000PR 50-1000 V	✓	✓	✓	✓	
SPB 500PRA 50-500 V	✓	✓	✓		✓

### 1. Application

The Prüfball SPB is a two-pole voltage tester in accordance with EN/IEC 61243-3.

You can use the Prüfball SPB to measure d.c. and a.c. voltages within the nominal voltage range, specified on the type plate. Furthermore you can use the device to determine polarity, phase, phase sequence and continuity.

Thanks to its high degree of protection (IP 65) the Prüfball SPB may even be used in rain.

#### 1.1 Intended use

This device is intended for use in applications as described in the operating instructions only. Thus, it is imperative to observe the notes on safety and the technical data in conjunction with the ambient conditions.

Any other form of usage is not permitted and can lead to accidents or destruction of the unit.


Any misuse will result in the expiry of all guarantee and warranty claims.

## 2. Safety Precautions

The Prüfball SPB has been approved by VDE test authorities for application of the VDE GS-symbol. When used for its intended purpose, the safety of the operator, as well as that of the instrument, is assured.

**In order to maintain flawless technical safety conditions, and to assure safe use, it is imperative that you read these operating instructions thoroughly and carefully before placing your instrument into service, and that you follow all instructions contained therein.**

**Observe the following safety precautions:**

- ▶ The voltages indicated on the Prüfball SPB are rated voltages. The voltage tester may only be used in systems working within these rated voltage ranges.
- ▶ Faultless indication of display values is only guaranteed between -15° and +45°C.
- ▶ Hold the instrument by the handgears only, to avoid covering the display and not touching the test electrodes.
- ▶ The maximum on-period is 120 s.
- ▶ Only qualified persons may carry out work with this device. The user needs to be familiar with the risks for measuring voltage and compliance with safety regulations and the proper use of the voltage detector.
- ▶ Workings may only be performed with appropriate personal protective equipment. Observe the minimum object distance to other plant components that are energized or earthed and use personal protective equipment as specified by national accident prevention regulations (in Germany: DGUV 3 or DIN EN 50110-1).
- ▶ The function of the voltage tester must be checked briefly before and whenever possible after the use. Carry out the function test. If the indication of one or several systems fails in the course of checking, the instrument must not be used again.
- ▶ The red -LED (LV-indication) only serves as an indication for hazardous voltage and not as measurement value.
- ▶ With non pushed buttons this voltage detector cannot reliably indicate the absence of operating voltage in case of interference voltage because of its relatively high internal impedance. When the display shows "voltage present" on a part that applies as separated from the installation, it is recommended to repeat the test while pressing the push buttons (additional load). When using devices without additional load connection repeat the test by other means.

- With determination of phase conductors and phase sequence the perceptibility of the display may be impaired, e.g. when using insulating protective gears, in unfavourable locations, for example on wooden ladders or insulating floor coverings, as well as with unfavourable lighting conditions and in an improperly earthed AC voltage system.
- The voltage tester may only be dismantled by authorised personnel.
- Before using the device check the housing and connecting line for visible damage. If damages are visible the voltage tester may not be placed into operation. In case of strong dirt contamination, the tester must be cleaned before use.
- The tester has to be stored in a clean and dry environment.

### 3. Putting into operation

The Prüfball is ready for operation when the protective caps have been removed.

After the device has been used, attach the protective caps to prevent injuries and discharge of the accu when connecting both electrodes.

#### Attention!

In accordance with EN 50110-1 voltage testers must be checked if they function correctly, briefly before and whenever possible after the use, for determining absence of voltage.

There are two possibilities:

#### 3.1 Testing correct function with the integrated self-test


Hold together both test electrodes.

Through this, the measurement and the connecting line are tested.

The resistance symbol  $\Omega$  must appear on the LCD indicator. In this case the self-test was successful.

If the  $\Omega$  sign doesn't appear, the Prüfball has to be checked at a known voltage source (see 3.2).

#### Note:


The red -LED is not included when performing this kind of self-test. Daily inspection is not necessary thanks to the highly reliable construction and the redundant moving-coil instrument.

Alternative:

#### 3.2 Testing correct function at an known voltage source

Check the function at a known voltage source (> 50 V AC and > 120 V DC).

Both systems must indicate:

- the red -LED has to light up
- the measured value has to be indicated on the scale

#### Attention!

If one of the displays fails during the self-test, even if only partial failure occurs, the voltage tester may not be placed into operation!

## 4. Testing


### 4.1 Testing voltage

Securely contact the test electrodes with the test points.

The measuring system directly indicates the effective value of a voltage within the nominal voltage range. At the same time, type of voltage and V-symbol are shown on the LCD.

When a hazardous voltage  $\geq 50 \text{ V AC} / 120 \text{ V DC}$  is impressed, the red -LED lights up.

#### **Attention!**

If one of the three display systems -LED, LCD indicator or measuring system fails at voltages  $\geq 50 \text{ V AC} / 120 \text{ V DC}$ , the voltage tester may not be placed into operation!

The maximum allowable on-time for voltage testing is 2 min.

#### **Note:**

All indication systems remain in working order, even with discharged accumulator.

#### **Direct and alternating voltage, polarity**

The type of voltage is indicated by the symbols “~” for AC and “-” for DC.

If minus of a direct voltage is connected to the test electrode (on the display part) designated with “+”, then the “-” leading sign appears on the LCD indicator. If plus is connected, then no leading sign appears.

### 4.2 Load test (SPB 500PR /PRA/1000PR)

By pressing both push-buttons a low resistance is activated.

The additional load of the SPB 500PR and SPB 1000PR is indicated by vibration and the load of the SPB 500PRA by acoustic signal.

Load is depending on voltage and time. For safety reasons it reduces automatically. At 230 V and 20°C ambient temperature, load is 31 mA for 15 seconds. Afterwards, the additional load becomes highly resistive. After 30 s cool-down, the additional load is ready again.

#### **Note for vibration alarm:**

The types SPB 500PR and 1000PR indicate additional load at voltages of more than 200 V by vibration alarm in the handgear without display part. Voltage is supplied from the mains.

#### **Note for acoustic signal:**

The SPB 500PRA indicates additional load at voltages  $> 50 \text{ V}$  by a loud, intermittent acoustic signal. Voltage is supplied from the mains.

#### **Attention!**

Please note that sound reaches full volume only when the gap is clean between resonance plate and cover disk of the measuring system.

### RCD quick test

With the additional load RCDs (residual current-operated protective device) up to 30 mA at 230 V can be activated:

- Test the voltage between phase and protective conductor (ground). The tester shows 230 V.
- Press both push-buttons
- The RCD will be activated and 0 V is indicated on the scale.

### Check for interference voltage

With the connection of load, inductive and capacitive interference voltages can be suppressed:

- Test the line / neutral conductor that applies as disconnected. The tester indicates an interference voltage (e.g. 120 V)
- Press both push-buttons
- The tested voltage is supplied. In case of a coupled interference voltage, the tested voltage will break down to < 50 V. In case of an operating voltage the initial test value remains (e.g. 120 V).

### Attention!

Interference voltage must be grounded before further work.

### Capacitor discharge

With the connection of load, capacitors can be discharged:

- Test the capacitor voltage
- Press both push-buttons
- The capacitor will be discharged

### 4.3 Testing phase and phase sequence


These tests can be performed at a nominal voltage of at least 165 V (50 Hz) against earth using the integrated accu, see section 5.

### Attention!

When performing these tests, the device must be held closely at the handgear of the display part. Tests can be impaired by unfavourable locations, for example on wooden ladders or insulating floor coverings, as well as in improperly earthed AC voltage systems.

**Note:** You may wear insulating gloves when performing the tests.


Phase sequence indication during single-phase voltage tests (e.g. socket) has no relevance.

A short flash of the red -LED can be effected by static electricity and has no significance.



*Hold closely at the handgear of the display part!* 7

#### 4.3.1 Phase test

Determination of the phase conductor occurs by applying the test electrode "+L1" to the conductor. The conductor is live when the red -LED lights up.

#### Attention!

Single-pole tests are not suitable to determine absence of voltage.

#### 4.3.2 Testing phase sequence

**Note:** Phase sequence test can be performed with or without activating the push-buttons.

To determine the phase sequence between two phases in a earthed three-phase current system apply both test electrodes, clasp the handgear of the display part and proceed as follows (example 230/400 V):

- Search for the phase conductors using one pole (see section 4.3.1).
- Apply both test electrodes to the two phase conductors (display 400 V).
- When phase L1 is applied to the test electrode marked (+L1) and L2 to the other test electrode, the triangle **R** lights up when rotation is clockwise. If the triangle **L** lights up rotation is counter-clockwise.

The test result has to be checked by exchanging the two test electrodes. The opposite direction of rotation must be displayed.

If 230 V is displayed instead of 400 V, the neutral conductor may have been contacted with one of the test electrodes.

#### Attention!

In case both triangles are flashing or no triangle lights up, the test result is not reliable due to weak ground connection (Handgear held closely? Location insulated?).

#### 4.4 Continuity test


Securely contact both electrodes with the test points. When both test probes are connected to a zero-potential circuit up to 1 M $\Omega$ , then a  $\Omega$ -symbol appears on the LCD indicator.



## 5. Accu

The voltage tester works also with discharged accumulator.

The additional test functions phase, phase sequence and continuity are supplied by the integrated Li-accu. During each voltage test the accumulator recharges automatically, therefore it is not necessary to replace batteries.

The accumulator needs to be recharged in case the  $\Omega$ -symbol does not appear when holding the test electrodes together. Therefore plug the test electrodes of the Prüfball into a 230 V socket, so the red -LED lights up. Leave it for at least 10 hours, until the Li-accu is fully charged.

The on-period of 2 minutes is irrelevant here. Perform the function test before putting the device into operation (see section 3.1).

## 6. Maintenance

### 6.1 General information

The Prüfball SPB is completely maintenance-free. Nevertheless, observe the following information in order to maintain safe operation:

Always keep the voltage tester dry and clean. The housing can be cleaned with a cloth dampened with isopropyl (alcohol) or soapy water.

### 6.2 Repeated inspection

According to EN 61243-3 it is recommended to carry out repeated examinations.

It should not exceed the time-limit of 6 years.

Depending on operation conditions and frequency a previous inspection may be recommendable.

The serial number with the date of manufacturing (WWYYNN=Week Year Number) is imprinted on the type plate on the frontside of the device. Repeated inspections are offered by the manufacturer and indicated by the inspection plate.

## 7. Repair

Repair or battery replacement is only allowed by the manufacturer or explicitly authorized repair shops. In case of damages on the device or failure of the function test according to section 3 or for detailed inspection/calibration, please contact:

*info@ics-schneider.de* or send the device and a description of failure back to the manufacturer (address see page 1).

## 8. Limited warranty and limitation of liability


By continuous quality checks and production controls, state-of-the-art electronics and high quality materials we guarantee that the tester will be free from defects in material and workmanship for two years.

This warranty does not cover batteries, improper handling, improper use, opening the housing, improper storage or damages from accidents.

No other warranties such as fitness for a particular purpose will be given.

We are not liable for any indirect, incidental or consequential damage or loss, irrespective of the cause.

## 9. Technical data

Nominal voltage range:	SPB 500B/PR/PRA: 50...500 V AC/DC SPB 1000B/PR: 50...1000V AC/DC ± 2,5 %
Nominal frequency range:	DC/15... 500 Hz
Input resistance	
SPB 500B/PR/PRA:	
direct:	195 kΩ at 500 V
⊕ switched:	4 ... 7 kΩ
R <sub>IELV</sub> :	245 kΩ at 50V
R <sub>IELV</sub> ⊕:	12 kΩ at 50 V
SPB 1000B/PR:	
direct:	261 kΩ at 1000 V
⊕ switched:	4 ... 7 kΩ
R <sub>IELV</sub> :	335 kΩ at 50V
R <sub>IELV</sub> ⊕:	12 kΩ at 50 V
Current peak value I <sub>s</sub>	
direct:	< 4 mA
⊕ switched:	< 300 mA (35 mA at 230 V-RCD-resolution)
On-time:	at max nominal voltage TR <sub>on</sub> 120 s RT <sub>off</sub> max 240 s (recovery time)
Display	direct: red  -LED for voltage and phase tester, moving-coil instrument with large 90° scale and LCD indicator
⊕ switched:	additional vibration alarm (PR) additional acoustic signal (PRA) for connected load
Phase/ Phase sequence:	capacitive (Test with glove possible) LED for phase LED triangles for phase sequence
Polarity:	LCD voltage type - / ~
Continuity:	0 - 1000 kΩ
Power supply:	Voltage tests from the mains without accu Functions continuity, phase, phase sequence by integrated Li-accu
Overvoltage category:	SPB 500B/PR/PRA: CAT IV 500 V SPB 1000B/PR: CAT IV 1000 V
Surge voltage strength:	>12 kV (1,2/50 μs)
Insulation test voltage:	6 kV
Operating temperatures:	-15 ... + 45°C
Casing:	unbreakable silicone rubber, display cover made of impact resistant polycarbonate
Protection category:	IP 65, device can be used in moist environments
Connecting line:	PUR sheathed cable, 1000 V, 1 m
Standards:	IEC 61243-3:2014 + Cor.: 2015 EN 61243-3:2014 DIN-EN 61243-3:2015-08
EMV requirements:	DIN-EN 61326
Dimensions/Weight:	274 x 75 x 47 mm (display part) B: 380 g; PR: 390 g; PRA: 400 g

## 10. Accessories optional



### General information

The Prüfball SPB is provided with a thread on both test electrodes. You may only use original accessories from the manufacturer, e.g. test probes for overhead lines, insertion prods, pin prods, adapters etc.

### Attention!

The connection between test probe and voltage tester has to be controlled in each case! Check function at a known voltage source or by self-test.

Only a perfect mechanical connection ensures safe contact and thus an unambiguous voltage test.

### Safety instructions

- Only qualified personnel with appropriate protective equipment may do these workings. Observe the minimum object distance to other plant components that are energized or earthed and use personal protective equipment as specified by national accident prevention regulations (in Germany: DGUV 3 or EN 50110-1).
- Hold the instrument by its handles only to avoid covering the display or touching the extension probes.
- Voltage testers and test probes etc. must be kept dry and clean.
- Voltage testers and test probes etc. may not be used when they are damaged.

### Additional safety instructions

#### Insertion prod SPB-S20-A

- Insertion prods may only be plugged to uncovered cables into single wires otherwise there is risk to short circuit.
- Insertion tests damage the wire insulation. Tests may only be performed at test points that are sealable afterwards, e.g. at junction sleeves.

#### Pin tip SPB-S70

- Secure functioning can only be ensured with contact positioned in the front. Test points at the side must be visibly connected (not suitable for sockets).

## Available accessories

Art.no.	Type	Description
81020	SPB-S500	Extension 500 mm, insulated stainless steel tube, 1000 V
81022	SPB-S600	Extension 600 mm, insulated stainless steel tube, 1000 V
81028	SPB-S900	Extension 900 mm, GRP tube, 1000 V
81021	SPB-S20-A	Insertion prod for underground cables, 1000 V
81023	SPB-S70	Pin prod, flexible pin 3 x 63 mm, CAT IV 600 V / CAT III 1000 V
81029	SPB-S-ADA	Srewable adapter with 4 mm socket, CAT IV 600 V / CAT III 1000 V
84311	L-SETR	Test line 0.8 m with crocodile clip, CAT III 1000 V, red
81030	SP-LED	Leather bag, 30 x 12 x 6 cm
81032	SP-KLT	Artificial leather bag, 30 x 12 x 6 cm
81035	SP-KLT-S600	Artificial leather bag for SPB and test probes up to 600 mm, 65 x 17 cm
81031	S-HUELSE	Plastic casing for extension test probes up to 600 mm
81041	SP 200	Voltage source 50-690 V, test box for voltage tester





### EC-Declaration of Conformity

In accordance with the EEC low-voltage directive 2014/35/EU of 26 February 2014

Herewith we declare that these corresponds to below designated products in its conception and design as well as in production the execution the fundamental safety and health requirements of the Community directive low-voltage brought by us. In this case of a change of the product not coordinated with us the expiration date its validity. This statement does not include a warranty of properties.

**Manufacturers name:**  
 Rudolph Tietzsch GmbH & Co. KG  
 Willystraße Str. 16  
 D-58256 Ennepetal

**Description of the electrical equipment:**

- Typenreihe <b>Prüfball SPB 500B / 500PR / 500PRA</b> <b>SPB 750B / 750PR</b> <b>SPB 1000B / 1000PR</b>
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\* Funktion (two-pole low-voltage detector)  
 \* year of construction from 2010 on

**The agreement with further valid guidelines/regulations following for the product is explained:**

- EMC-Directive (2014/53/EU) of 26. February 2014
- RoHS-Directive (2011/65/EU) of 8. June 2011
- WEEE-Directive (2012/19/EU) of 4. July 2012

**Reference to the harmonized standards:**

- Low working - Voltage detectors
- Two-pole low-voltage type
- EN 61243-3:2014 (IEC 61243-3:2014 = Cox: 2015)

**Year of the CE characteristic assignment: 2016**

**Personal date of the signer:**  
 Michael Tietzsch (CEO)

Compliant to: 