

## Permitted live working according to DIN VDE 0105 - 100

### Scope of application

### Electrical test stations (workplaces)

#### 1. Scope of application

Initial and periodic inspection of electrical appliances

#### 2. Hazards to people and electrical installations



- Electric shock
- Electric arc short circuit
- Risk of fire

#### 3. Protective measures and rules of conduct



- These are based on DIN VDE 0701-0702.
- VDE 0104 (Erection and operation of electrical test equipment) must also be followed for inspection.
- The inspection may only be conducted by a competent person (see Ordinance on Industrial Safety and Health (Betriebssicherheitsverordnung, BetrSichV)).
- Examinations are prescribed at certain intervals (BetrSichV, TRBS 1201 and BGV A3 or GUV-V A3).
- Documentation shall be established by the ELEKTROmanager software or using the inspection protocol *PC\_GP\_04 VDE 0701-0702\_inspection protocol*.
- Before the inspection, measurement instruments including the test equipment must be checked for damage.
- Use an adapter with integrated PRCD-S. Only use measurement instruments with this adapter!

#### 4. Conduct in case of irregularities



- In the event of risks before or during work, the superior and/or the work supervisor must be informed.
- The work supervisor is entitled and required to stop or suspend works
- Upon suspension of works, the work site must be secured
- If defects are found during the inspection, these must be notified to the operator or the electrical engineering department. The appliance must be marked as defective, and the user must be informed thereof.

Issue/revised:	1	2					Page:	1 from 5
Date:	08.2011	01.2012					Valid from:	
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## 5. Conduct in the event of accidents

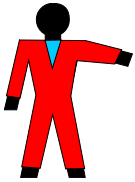


Employees must be trained in first aid (including heart-lung reanimation) and in the rules of conduct and measures in case of electrical accidents.  
Disconnect the installation and rescue the injured! Secure accident site, first aid



Emergency number: 110 security centre  
112 internal fire service  
113 company physician  
Emergency number from mobiles: 06131-66-1610

## 6. Inspections by the work supervisor



- Prior to commencing work, the workstation, the condition of the installation and the apparatus used must be inspected for proper condition.
- Damaged apparatus must be discarded, and measurement instruments must be inspected for suitability.
- If more than one person is working at a workstation, the work supervisor shall release the workstation following instruction.
- **The procedures in the diagram in Annex 1 must be followed!**

## 7. Workflow and safety measures

**Procedure for the initial and periodic inspection of electrical devices:**

### Inventory

- Apply an inventory number in the form of a barcode of transponder
- Record the device data in the "ELEKTROmanager" software
- Assign a risk assessment

### Visual inspection

- All visible parts, e.g. housing, covering, rating plate, including insulating parts, must be inspected for proper condition
- Inspect power connection lines
- The connection line with strain relief, kink protection and cable feedthroughs must be visually inspected for external defects, is the power connection line suitable?

### Establish the protective measures applied

- Establish the required inspection steps

### Inspect whether the appliance is suitable for the field of use

### Electrical testing

#### • **Protective conductor inspection**

The protective conductor distribution, the protective conductor connection and the protective conductor contacts must be inspected visually, by manual inspection (bending the conductor) and using measurement or test devices. It must also be verified whether there is an interruption in the protective conductor or if there are dangerous contact voltages. The resistance of the protective conductor may not exceed  $0.3 \Omega$  throughout its length for conductor lengths of up to 5 m (respect flow diagram for nominal currents  $> 16 \text{ A}$  and longer conductors). With a minimum current of 200 mA, measurements are then taken between conductive parts of the device housing and the protective contact of the mains plug.

Issue/revised:	1	2					Page:	2 from 5
Date:	08.2011	01.2012					Valid from:	
Prepared/modified:	MEBEDO RB	VEFK/Schenk						
Approved:								

## 7. Workflow and safety measures

- **Insulation resistance**

The insulation is inspected by measuring the insulation resistance using an insulation measurement device. The resistance between parts that are live during operation and the metallic housing is measured. The minimum insulation resistance for each protection class must be maintained.

**Attention:** this inspection cannot be used for all electrical equipment  
(see **Annex 1** flow diagram)

- **Measurement of protective conductor current**

See **Annex 1** for the differential current procedure / thresholds

- **Measuring the contact current**

See **Annex 1** for the direct measurement procedure / threshold

- **Measuring the substitute leakage current**

Only to be used under certain conditions! / see **Annex 1**

- **Testing other protective devices**

e.g. RCD/FI etc. / see **Annex 1**

- **Testing any extra-low voltages etc.**

see **Annex 1**

### Documentation of inspection results

- Documentation of inspection results in the inspection protocol *PC\_GP\_04 VDE 0701-0702\_Inspection protocol* or using the "ELEKTROmanager" software.

**Attention:** If one of the above inspection steps cannot be conducted, this must be justified in the documentation!

### Restore to functional condition as found.

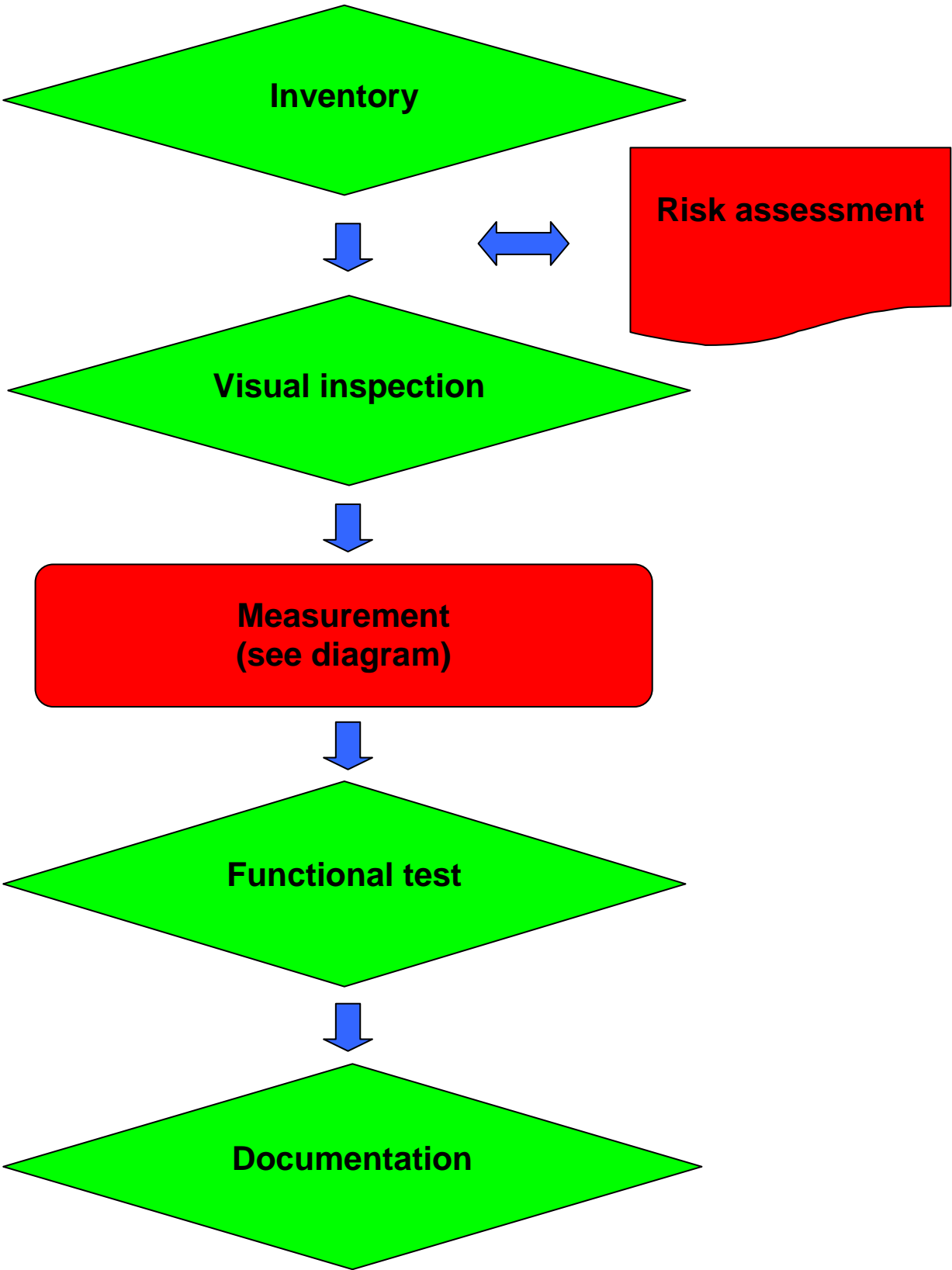
**Attention:** Defective devices must be withdrawn from use!

## 8. Completing works

- Restore proper and safe condition of the installation.
- Clear the work site.
- Inspect and clean equipment and tools.

Issue/revised:	1	2					Page:	3 from 5
Date:	08.2011	01.2012					Valid from:	
Prepared/modified:	MEBEDO RB	VEFK/Schenk						
Approved:								

Annex 1



Issue/revised:	1	2					Page:	4 from 5
Date:	08.2011	01.2012					Valid from:	
Prepared/modified:	MEBEDO RB	VEFK/Schenk						
Approved:								

# Diagram

1. The purpose is  
Visual inspection

## DIN VDE 0701-0702 General requirements

SK I

SK II

SK III

What protective  
measures are used?  
It is possible that no  
 $R_{SL}$  can be measured!

Protective conductor resistance  
 $\leq 0.3 \Omega$  \*1

①

Insulation measurement  
 $\geq 1 M\Omega$

②

Protective conductor  
current  
 $\leq 3.5 mA$  \*2

Substitute leakage current  
 $\leq 3.5 mA$

③

Contact current  
 $\leq 0.5 mA$  \*2

The effectiveness of other  
protective measures e.g.  
RCD/FI must be proven using  
measurement instruments  
and must be "documented"!

①

Insulation measurement  
 $\geq 2 M\Omega$

②

Contact current  
 $\leq 0.5 mA$  \*2

Substitute leakage current  
 $\leq 0.5 mA$

Insulation measurement  
 $\geq 0.25 M\Omega$

Documentation

For SELV/PELV circuits, note:  
External exposed extra-low  
voltages must be examined for  
compliance with thresholds!

**Important:** For SELV/PELV, it must be noted that exposed external connection points of extra-low voltages produced in the device must be examined for compliance with thresholds for the extra-low voltage protective measure.

\*1 for connection line up to max. 5m, plus  $0.1 \Omega$  for every additional 7.5 m but max.  $1 \Omega$ .

**New:** For devices with a nominal voltage  $> 16 A$ , the threshold must be calculated using the conductor length of the conductor cross-section and the conductor material!

\*2 the measurement can be made according to the direct or differential current method.

**Attention:** These measurements must be conducted in both plug positions.

① If not technically possible and not for IT devices or if the device could be damaged from the measurement, or if it cannot be ensured that all parts subjected to mains voltage are included in the insulation measurement (e.g. electrical start relay, mains switch with undervoltage release). **The omission of  $R_{ISO}$  must be justified in the documentation!**

② Only the substitute leakage current measurement method must be used. Specific conditions must be taken into consideration.

③ This measurement must only be conducted on exposed live parts not connected to the protective conductor.

**New:** The effectiveness of other protective devices, e.g. RCD/FI, must be proven using measurement instruments and must be "documented"!