



HSE guidelines

April 2017

ELECTRICAL SAFETY



Work safely or do not work at all

There are strict procedures when working on electrical installations and systems. After all, there is always a risk of danger from live electricity. You should therefore carefully read the permit to work and check if the described control measures have been taken. Then, take the precautionary measures needed for the work you are going to carry out.

Speaking the same clear language regarding Health, Safety and Environment, and harmonisation of regulations by focusing primarily on agreements between companies and contractors.

That is the goal the member parties of HSElife NL pursue.

*As well as the information that has already been harmonised, location and company-specific information also applies. **Ask for it!***

ELECTRICAL SAFETY

Incidents involving electricity can have disastrous consequences. To prevent them, the tasks and responsibilities of everyone involved in work on electrical systems must be absolutely clear. You also need to be aware of the risks posed by dangerous electrical situations.

IMPORTANT. You can only work on the electrical system if you are appointed in writing.

Except when taking measurements, we never work on live systems.

ELECTRICITY

- You can't see it
- You can't smell it
- You can't hear it
- If you feel it, it may already be too late



POTENTIAL RISKS

- Electrocution
- Serious burns
- Shock-induced falls
- Fire
- Explosion
- Damage to tools and materials

ELECTRICAL SAFETY

Work on live electrical systems and equipment is strictly prohibited.

When working on electrically driven equipment, this must be electrically locked and secured if necessary.

APPOINTED PERSONNEL

The following appointed persons have written authorisation to work on electrical systems.

Person Responsible for an electrical Installation (IV)

- Responsible for the system
- Must give prior written authorisation for electrical work

Nominated person in control of a work activity (WV)

- Responsible for the safe conduct of all work on an electrical system
- Either leads or delegates the work
- Informs all concerned of any specific dangers associated with the job

APPOINTED PERSONNEL

Skilled Person (VP)

- A qualified electrical technician having knowledge, understanding and experience to recognise and avoid dangers that may arise from electricity
 - Capable of and authorised to carry out electrical work without supervision
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Instructed Person (VOP)

- Trained sufficiently to work safely with electricity.
 - Permitted only to carry out simple, low-risk tasks.
 - Must have received specific job instructions.
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YOUR RESPONSIBILITY

Before starting any electrical job, you must satisfy yourself that all necessary safeguards are in place.

If you are in any doubt, or anything is unclear, ask for guidance!

PERMIT TO WORK

For all electrical work a work permit is required.

APPROVAL

The Permit to Work must both be completed and approved before the work begins.

Isolations may only be carried out by an authorised person.

If necessary, the authorised person may also issue written or verbal instructions.

BEFORE YOU START WORK

- Read, check and discuss the Permit to Work (both sides!)
- Attend the Toolbox Meeting
- Inspect your workplace
- Familiarise yourself with escape routes and assembly points
- Together with the authorised person, check that the equipment you are going to be working on has been made safe in the correct manner
- Take your own measurements to check that the equipment you are going to be working on is electrically dead
- Carry out a last-minute risk assessment (LMRA)

Any doubts about workplace safety? Convince yourself!

DURING THE JOB

- Check regularly that the workplace is still safe
- Report any changes in the situation to the site manager or supervisor
- If anything in the Permit to Work is unclear, or there are any deviations from it, stop work immediately
- Never improvise!
- Report any defects or damage immediately. This includes defective or loose earth connections
- Always use the correct equipment and tools (NB. zones, ATEX)
- Reassess the situation regularly. Remember that circumstances can change
- Weigh up any risks and dangers
- Respond appropriately
- If necessary, take additional precautions

ADDITIONAL PRECAUTIONS

- Do not wear rings or watches – they conduct electricity
- Personal protective equipment: insulated/arc-flash gloves, face shield, arc-flash clothes, etc.
- Rubber mats
- Insulated covers and hoods
- Insulated tools
- Insulated testing equipment (check the last inspection date!)
- Use double pole voltage detector
- Presence of a second person, as a rescuer



FIVE STEPS FOR A SAFE WORKPLACE

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1. Disconnect the system from the power supply;

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2. Secure it against re-connection: lock out and tag out. Compile an isolation sheet;

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3. Verify absence of operating voltage;

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4. If necessary, apply an earth and short-circuit;

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5. Provide protection against adjacent live parts.

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Only then can the work begin.

.....

Any doubts about workplace safety? Convince yourself that the system is electrically dead. Be sure – take measurements!

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EXPLOSION RISK ZONES

An explosive atmosphere is a hazardous mixture of oxygen with a flammable substance such as a gas, vapour or dust. If ignited, fire spreads quickly throughout the entire mixture. Potential sources of ignition include mechanical or electrical sparks, heat and static electricity.

EXPLOSIEGEVAARLIJKE ZONES

Drawings showing the different zones are available at all installations.

- Zone 0.** – An explosive gas mixture is present continuously or for long periods
- Zone 1.** – An explosive gas mixture is likely to occur occasionally in normal operation
- Zone 2.** – An explosive gas mixture is not likely to occur in normal operation and, if it does, will persist for a short period only



Only hand tools and measuring instruments that are suited for the potentially explosive zone may be used in these zones.

FIRST AID AFTER RECEIVING ELECTRIC SHOCK

- **Switch off the power**
- **Make sure that you are not exposed to electricity when approaching or touching the victim**
- **Make the victim safe**
- **Immediately alert the medic or a first-aider**

ELECTRICAL EQUIPMENT

- A written Permit to Work is mandatory, even for non-electrical work
- On the Permit to Work, state whether or not the equipment needs to be isolated

NB. Isolation may only be carried out by an authorised person

Make motors and pumps safe.

- On the control panel in the Motor Control Centre (MCC).

AND

- On the ground, using the local switch

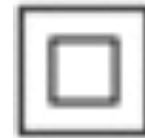
HAND-HELD POWER TOOLS (230V)

Before using any power tool, check:

- The inspection sticker, the expiration date has not passed?
- That the plug, power lead and housing are undamaged; and,
- That no temporary repairs or modifications have been made (look for wiring connector, insulating tape, replacement plugs, etc.)

If in doubt, check with the authorised person.

Use double insulated hand tools,
these can be recognised by the symbol.



PORTABLE ELECTRICAL EQUIPMENT

- Generators, concrete mixers, upright drills, etc.
- Must be fitted with an Class 1 earthed plug (yellow and green wire in power lead)

A class 1 plug can be
recognised by the symbol



FIXED ELECTRICAL EQUIPMENT

Many fixed equipment are connected to the plant earth due to safety requirements. Examples include:

- Electric motors
- Cable trays and ladders.

Temporary shall be connected to the plant earth as well. Examples include:

- Scaffolding
- Metal site offices
- Metal supports for construction power

EARTH CONNECTIONS

Only an authorised electrician is allowed to loosen a permanent earth connection to connect temporary equipment to earth. After the work the original situation shall be restored by an authorised electrician.

GENERATORS

The use of portable generators must be kept to an absolute minimum. Wherever possible, use a permanent or temporary mains power supply. If you have no other choice, then the generator must be inspected and approved by an authorised person (designation level responsible person for a work activity or higher) before use. The technician determines whether the generator needs to be earthed and checks that it is safe.



QUESTIONS? MORE INFORMATION?

You can always approach the site manager/supervisor

5 TO REMEMBER

- 1 Make sure electrical equipment is switched off and isolated**
(lock out and tag out)
- 2 Have an authorised person check that the equipment is isolated**
- 3 Follow the instructions** in the Permit to Work
- 4 Make sure temporary power sources are known** and have been checked by an expert
- 5 The power supply must be reconnected by an authorised person**

IMPORTANT! For more information about the duties of authorised persons, read the folder.

QUESTION

1. When are you allowed to work on an electrical installation?

.....

A) You are only allowed to work on an electrical installation if you are appointed in writing.

.....

B) You are only allowed to work on an electrical installation after you carried out a Last Minute Risk Analysis.

.....

C) You are only allowed to work on an electrical installation if you wear the correct personal protection equipment and if you have an Electrical Isolation Certificate.

.....

ANSWER

1. When are you allowed to work on an electrical installation?

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QUESTION

2. Are you allowed to carry out electrical work if there is no work permit?

.....

A) Yes, because the site manager makes sure that all necessary safeguards are in place.

.....

B) No, unless you've carried out a Last Minute Risk Analysis.

.....

C) No, because a work permit is required for all electrical work.

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ANSWER

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C) No, because a work permit is required for all electrical work.

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QUESTION

3. What first aid do you offer in case of electrocution?

.....

A) You switch off the power and you make the victim safe. You make sure that you are not exposed to electricity. Then you immediately alert the medic or first aider and you check the isolation measures.

.....

B) You switch off the power. You make sure that you are not exposed to electricity when approaching or touching the victim. Then you make the victim safe and you immediately alert the medic or first aider.

.....

C) First you alert the medic or first aider. Then you switch off the power and you make the victim safe. Subsequently you make sure that you are not exposed to electricity and you check the isolation measures.

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ANSWER

3. What first aid do you offer in case of electrocution?

A) You switch off the power and you make the victim safe. You make sure that you are not exposed to electricity. Then you immediately alert the medic or first aider and you check the isolation measures.

B) You switch off the power. You make sure that you are not exposed to electricity when approaching or touching the victim. Then you make the victim safe and you immediately alert the medic or first aider.

C) First you alert the medic or first aider. Then you switch off the power and you make the victim safe. Subsequently you make sure that you are not exposed to electricity and you check the isolation measures.

QUESTION

4. Who checks the safeguards and when?

.....

A) The Instructed Person checks the safeguards before the work starts.

.....

B) The Person Responsible for an electrical Installation should check the safeguards before everyone starts working.

.....

C) You must satisfy yourself that all necessary safeguards are in place before starting any electrical job.

.....

QUESTION

4. Who checks the safeguards and when?

A) The Instructed Person checks the safeguards before the work starts.

B) The Person Responsible for an electrical Installation should check the safeguards before everyone starts working.

C) You must satisfy yourself that all necessary safeguards are in place before starting any electrical job.

QUESTION

5. What extra precautionary measures do you take before you start working on an electrical installation?

.....

A) Use the correct personal protection equipment such as rubber gloves.
Wear a watch to note the time in the event that there is an incident.

.....

B) Use the correct personal protection equipment such as arc-flash clothes.
Use rubber mats, insulated covers and hoods and insulated tools.

.....

C) Use the correct personal protection equipment such as a safety helmet.
Restore earth connections that are temporarily disconnected.

.....

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