

# Safety Regulations and Procedures for PowerLabDK, DTU Lyngby and Risø Campus (for High Voltage testing additional regulation apply)



## 1. SAFETY REGULATIONS

### 1.1 Purpose

- To prevent accidents
- Contribute to make the laboratories a safe work environment
- Incorporate safe working procedures

**Note:** Appendix 1 lists the definitions of personnel designations mentioned in these rules (marked with *italic*) and their associated tasks and responsibility.

### 1.2 Application area

These safety regulations and procedures apply for *all* laboratory work and *all* use of experimental facilities, including IT-system facilities, in the following laboratories (rooms) at DTU

Lab Lyngby	Location	Remarks
Electric Lab 1	LY329-001	incl. outdoor outlets
Electric Lab 2	LY329-002A	
SCADA	LY329-005	Not included in a safety zone
RTDS	LY329-006	
PMU-lab	LY329-007	
Power Student Lab	LY329-011	
Workshop	LY325-016	WSP not required
Converter Lab	LY329-030	
High Voltage Lab 2	LY329-034	Additional regulations
High Voltage Lab 1	LY329-036	Additional regulations
Electric Vehicle Lab	LY329A-001	incl. outdoor outlets
Drives Lab	LY329A-022	
Lab Risø	Location	Remarks
Switchboard station DR1	RI117	
Switchboardstation "Vindmøllehallen"	RI319	Including containers next to
Switchboard station	RI715	
Switchboard station	RI716	
PowerFlexhouse 1	RI772	

All the locations at Lyngby campus, except LY329-005 and LY329-016, are classified as electric operating rooms (DK: "Elektriske betjeningsrum") according to the Heavy Current Regulations, Part 6, Chapter 813.2.1.

All the locations at Risø campus, are classified as locked electric operating rooms (DK: "Aflåste elektriske betjeningsrum") according to the Heavy Current Regulations, Part 6, Chapter 813.2.2.

## In case of an accident involving a person

### Apply the four steps of first aid:

1. Stop the accident (activate the emergency stop or safety switch, to turn off the power)
2. Access any casualties and Call the emergency services on **1-1-2** (one one two) \*
3. Perform lifesaving first aid  
at Lyngby Campus, a defibrillator can be found in building 329, room 12  
At Risø, defibrillators can be found at the entrances of building 117, 319, 716, 776
4. Perform general first aid
5. Alert the *authorized person responsible for the laboratory* or a member of the *safety group*.
6. Notify the work environment coordinator and local *safety group* about the accident.

\* Electricity-related accidents: If a person is injured by voltages above 25 V<sub>AC</sub> or 60 V<sub>DC</sub>, make an emergency call to 1-1-2 and remember to say that the accident involves electricity.  
At Risø: inform the gatekeeper (tel. 46774444) about the arrival of an ambulance so they can open the gate and guide the rescue team.

Experimental setups with voltages above 1000 V<sub>AC</sub> or 1500 V<sub>DC</sub> are only allowed in the dedicated high voltage facilities under application of additional stricter regulations concerning high voltage testing. These additional regulations are described in the document “High Voltage Safety Regulations and Procedures for PowerLabDK, DTU Lyngby Campus”.

## 1.3 Legislation

For the laboratories the Heavy Current Regulations (DK: “Stærkstrømsbekendtgørelsen”) and the herein referred standards and norms applies and shall be followed. For test setups including moveable parts the Machines Directive: AT 612 (Arbejdstilsynets bekendtgørelse 612) must be followed as well. This also applies for students. All persons using the laboratories, including students, must follow the Danish Occupational Safety and Health Act (DK: “Arbejds miljøloven”).

## 1.4 Access

Access to the laboratories classified as electric operating rooms is only for *instructed persons* and *authorized experts*. Visitors and students are allowed in the laboratories by prior appointment and instruction, see appendix.

## 1.5 Use of the facilities

All laboratory work must be performed in accord with the safety procedures in this document.

Each test setup and any use of the experimental facilities requires a work space permit (WSP), which contains information about the purpose of the test, the equipment, safety regulations and who is responsible for what. The WSP has to be approved and signed by the *authorized person responsible for the laboratory*, an *administrative coordinator* and the *authorized expert*, as specified in the following chapter regarding safety procedures.

Modification or intervention of the fixed installations (e.g. LabCellBoards) may only be done by an *authorized expert* after agreement with the *authorized person responsible for the laboratory*. Operation of the main switchboards may only be done by an *authorized expert*.

Any defects and errors found must immediately be reported to the *authorized person responsible for the laboratory* or a *laboratory technician*. In case of a study project or exercises, students should notify their *supervisor*, who notifies the *authorized person responsible for the laboratory* or a *laboratory technician*.

## 1.6 Special safety installations

### 1.6.1 Special safety installations at Lyngby Campus facilities

The laboratories at Lyngby Campus are provided with a safety system consisting of a red warning lamp, safety switches and emergency stops:

#### Red warning Lamp

At the top of each LabCellBoard (LCB) a red warning lamp is turned on as soon any of the CEE supply outlets to the right side of the LCB are energized.



#### Safety switch

Each LCB contains a safety switch, which turns off the outlets on the right side of the LCB (CEE-outlets), i.e. all the outlets for equipment during tests. Measurement equipment, and the like, powered by the front outlets of the LCB are not turned off by the safety switch.

If the LCB is not in use the safety switch must be set in off position.

- When the LCB is operated locally, the safety switch must be turned on before switching on any CEE outlet.
- When the LCB is operated locally, a local operator can turn on the switch in a safety dialog with the remote operator securing that no unsafe equipment is connected and turned on.

For test setups connected to independent CEE outlets, a safety switch must be installed.

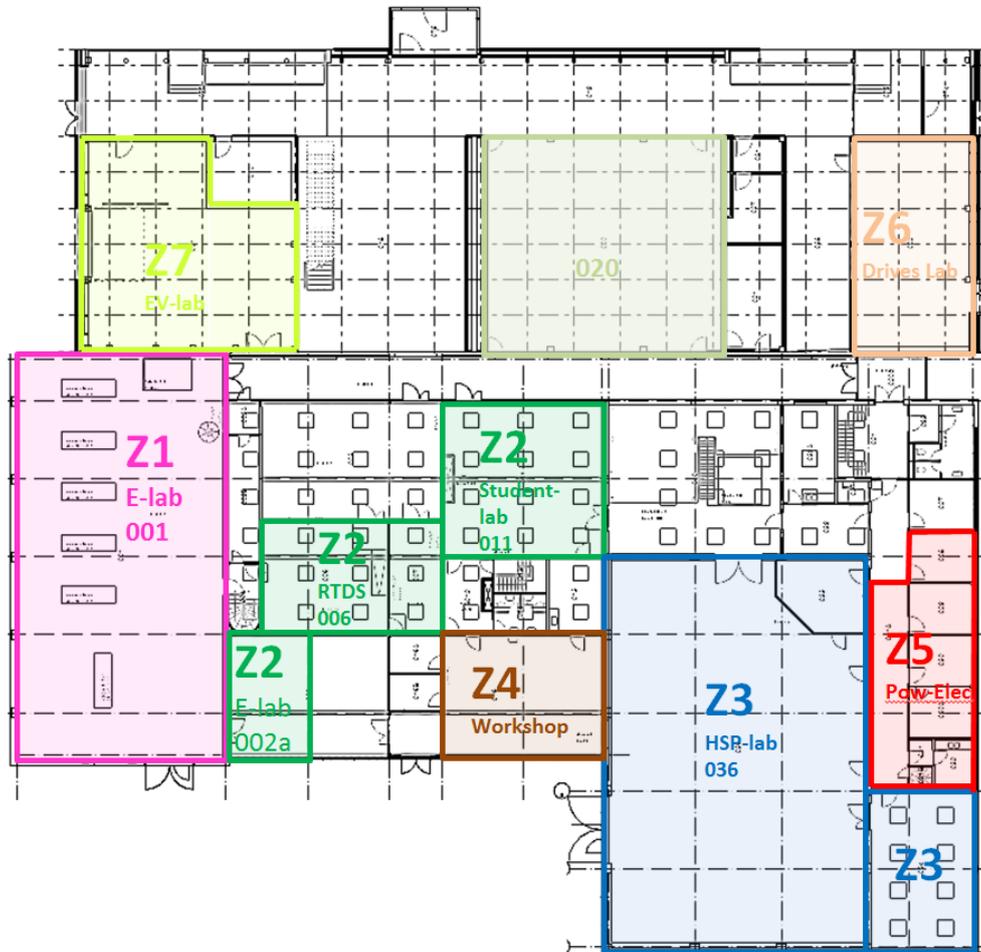


#### Emergency stop

An emergency stop, which can be used in case of an emergency, is situated by the entrance to the laboratory. By activating the emergency stop, all CEE-outlets, and outlets to office equipment and measurement equipment installed on the LCB's front, will be turned off.

The lights in the laboratories and the service outlets (by the doors), panel outlets and outlets on the floor studs will remain active when the emergency stop has been activated. Therefore they **are not allowed** for test setups.

The laboratories in the building are divided into 7 safety zones. An activation of the emergency stop in a given zone will only influence the CEE-outlets in that specific zone. Independent of the PowerLabDK safety Zone system a similar safety system is implemented in the lab class room 329A-020.



Safety zones Z1-Z7

### 1.6.2 Special safety installations at Risø Campus facilities

The laboratories at Risø Campus are provided with a safety system consisting of emergency stops at the main entrance doors..

Notice:

- The lab switchboards has multiple supplies
- The Neutral and SYSLAB ground cannot be isolated and must be considered live



#### Emergency stop

An emergency stop, which can be used in case of an emergency, is situated by the entrance to the laboratory. By activating the emergency stop, all SYSLAB Breakers and CEE-outlets in the actual room will be turned off.

The lights in the laboratories and the service outlets (by the doors), panel outlets and outlets on the floor studs will remain active when the emergency stop has been activated.

## 2. SAFETY PROCEDURES

## 2.1 Planning of test setups and assignment of laboratory space

Before a test setup can be established, the setup has to be planned and a Work Site Permit (WSP) must be filled out. The WSP must be approved and signed by the *authorized person responsible for the laboratory*.

In the WSP, the purpose and design of the test setup must be described. Based on the information in the WSP, the laboratory space is assigned by the *authorized person responsible for the laboratory* who confirms the plan by signing the WSP.

The *responsible person for the test setup* has the responsibility for filling out the WSP. For standard student exercises, it is the teacher responsible for the course, i.e. the *supervisor*, who is the *person responsible for the test setup* and therefore has the responsibility for writing the WSP.

The WSP form is compulsory. It can be found on [www.powerlab.dk](http://www.powerlab.dk). (Access and use) Filling out the form electronically is preferred.

If batteries or similar energy storage units are used in the test, the local safety regulations and procedures for working with batteries must be examined and used: "Energy Storage Systems Safety Regulations and Procedures for DTU Elektro"

If chemical substances are used in the test, the Safety Data Sheet (SDS) must be examined and the mandatory instructions for the chemical(s) must be followed. The SDS is available at [www.kemibrug.dk](http://www.kemibrug.dk). If there is no SDS for the chemical(s) being used, an SDS must be ordered from the website.

## 2.2 Design of the test setup

The design of the test setup should be neat and tidy.

Plan and organize the practical work so it can be performed safely and without risks to your health.

Examine the guides and instructions for the equipment thoroughly, before the test setup is made and the tests are performed.

Contemplate if personal safety equipment such as earmuffs, safety glasses, gloves, local exhaust ventilation etc. is necessary.

Equipment under test may only be connected to CEE outlets (but don't actually connect it before Approval and commissioning of the test setup, cf. section 2.3).



CEE-outlets, 3-fased (red) and 1-fased (blue).

### 2.2.1 Design of the test setup, special requirements Lyngby Campus

If a source (Photo Voltaic system, Wind Turbine, AC Power Supply, or similar) is connected to a LCB necessarily with a male CEE plug to the power plugs on the right side of the LCB, the CEE source connector MUST be signed with “Voltage from both sides”/“Spænding fra begge sider” and locked (if possible).

Only office equipment and measurement equipment may be connected to non CEE outlet, e.g. the outlets of the LCB front.

Office and measurement equipment with a protective ground (PE) may only be connected to an outlet through the Danish three legged plug. The Schuko plug is allowed if it is secured that the ground connector is connected through a suitable adapter.



Standard plug, Schuco plug, Adapter for Schuko plug

A switchboard with circuit breakers suitable for the equipment in use must be applied between the CEE-plug and the test equipment. An exception is if the CEE-outlet itself is protected adequately for the equipment.

Measurement equipment should be powered by non-CEE outlets, which are not turned off by the safety switch. Signals to be measured must go to the measurement equipment through fully insulated wires. It may be necessary to further secure the voltage signals with circuit breakers (2A), for example. Current should be measured through a current transformer or a current transducer.

Voltages must never be applied to the casing of measurement equipment. The casing must also not be connected to the neutral pole of the outlet. If so, there will be a short circuit of the neutral and the protective ground (PE). Alternatively use an isolation transformer or a differential measuring technique (differential probe or two channels on the measurement equipment).

In test setups where DC components are present, e.g. in frequency converters, an AC/DC residual current device (type B) must be applied. If necessary, an upgrade of the LCB has to be made and an appropriate residual current device installed.

In test setups where batteries are part of the setup an *authorized expert* has to be consulted for special instructions regarding handling precaution before starting the work in the lab.

#### **a) Test setups protected against accidental contact**

Test setups, which solely contain equipment, which is completely isolated and protected from accidental contact with the electric parts, are defined as protected against accidental contact.

In this case a Dummy Safety plug is connected to the Safety I/O outlet of the LCB.

The LCB’s settings are set to default. See the guide on how to operate the LCB’s.

### b) Test setups with open terminals, rotating machine parts etc.

Test setups that contain uninsulated energized parts, for instance accessible energized terminals, are defined as test setups with open terminals. These kinds of test setups are only allowed in laboratories classified as electric operating rooms.

Test setups with open terminals and voltages above 25 V<sub>AC</sub> or 60 V<sub>DC</sub> must be protected from accidental contact. Likewise open test setups, with rotating machine parts etc., must be protected from accidental contact.

Protection from accidental contact must be obtained by a grounded safety screen, e.g. a cage with a safety door. There has to be at least 20 cm between the cage and the energized parts. The safety door must be connected to the LCB's Safety I/O outlet with the safety mechanism that automatically locks the test area.

The LCB's settings must be set in accord with the functionality of the test. In case of large electrical or mechanical time constants (capacitors, rotating machinery etc.), a trigger contact for the safety doors open time should be set to a minimum of 6 time constants.

### 2.2.2 Design of the test setup, special requirements Risø Campus

Non-conductive areas are used to protect against accidental contact with live parts (Heavy Current Regulations, Part 6, Chapter 413.3) in laboratories where distribution switchboards are located (all locked electric operating rooms mentioned in 1.2).

The protective ground (SYSLAB Grounding Zone) in the lab are and must be separated from protective ground and other conductive parts of the building.

Following rules must be used when using the lab:

- 2 meter protection zone must be established to separate SYSLAB ground from building protective ground or other conductive parts of the building. No conductive parts are allowed in this safety zone
- Chains or other types of separation must be used as special caution to protect against accidental contact with live parts
- Fuses (with lowest possible capacity), MCB's and RCB's must be used if possible.

Only office equipment and measurement equipment may be connected to non CEE outlet.

Office and measurement equipment with a protective ground (PE) may only be connected to an outlet through the Danish three legged plug. The Schuko plug is allowed if it is secured that the ground connector is connected through a suitable adapter.



Standard plug, Schuko plug, Adapter for Schuko plug

In test setups where DC components are present, e.g. in frequency converters, an AC/DC residual current device (type B) must be applied. If necessary, an upgrade of the LCB has to be made and an appropriate residual current device installed.

In test setups where batteries are part of the setup an *authorized expert* has to be consulted for special instructions regarding handling precaution before starting the work in the lab.

### 2.3 Approval and commissioning of the test setup

New test setups must not be connected to power outlets, energized or put into operation before the test setup has been analyzed and the WSP approved and signed by an *authorized expert*.

The approval should be based on the test setup description in the WSP (including sketches, charts and/or drawings and with an overview of safety issues), and a review of the test setup in the laboratory.

Though the *person responsible for the test setup* is an *authorized expert*, he is not allowed to approve and sign the WSP for his own test setup.

The WSP must be placed close to the test setup, in clear view and easy to access. The WSP must be placed in a holder e.g. mounted on a cage or an appropriate stand.

### 2.4 Use of test setup

The following rules apply when the test setup is not fully remote controlled.

Before a test is initiated a *person responsible for the test* and a *safety guard* must be appointed. The *person responsible for the test*, the *safety guard* and the *test participants* must sign in, in the logbook, which is placed behind the WSP. Pages for the logbook can be found on the website [www.powerlab.dk](http://www.powerlab.dk). The *person responsible for the test* doesn't have to be the *person responsible* for the test setup.

Changes to the test setup or a circuit may only be done while the power is off and when warranted by the *person responsible for the test setup*. If the test setup is altered significantly the WSP has to be updated and reapproved.

The primary safety is reached by unplugging the test setup from the supply. The test setup must always be unplugged when not in operation.

If needed, the test setup should be grounded after the safety doors have been unlocked. The last thing to be done before the safety doors are locked is to remove the ground pin from the test setup, if it is used.

Measurement equipment, components, wires and other equipment, which are not used in the test setup, must be returned to their right place.

Measurement equipment, components, wires and other equipment suspected of defects must be handed in to the *authorized responsible for the laboratory* or a *laboratory technician*. Defect devices must be marked clearly as such and may only be repaired by an *authorized expert* or in agreement with one. Private equipment may only be used by appointment with a *supervisor* or *authorized expert*.

Energized test setups may only be left when securely shielded and only when agreed with an *authorized expert*. Open test setups, which can be controlled remotely (from outside the room), must be secured as locked operation rooms before they are left. The test setup must be equipped with a warning sign, which states that the setup is remotely controlled. Likewise, there must be a similar warning in the WSP.

## 2.5 Clean up/removal of the test setup

When a test is completed, all the equipment must be cleaned and put back in its right place. Any defect equipment has to be marked clearly as such and handed to the *authorized responsible for the laboratory* or a *laboratory technician*. The *authorized person responsible for the laboratory* should be notified that the test is completed.

At the end of a test, the Statement of completion part in the WSP must be filled and signed by the *authorized responsible for the laboratory*.

## 3. Sanctions

A member of the AMU-group (Work and environmental group) or an authorized expert can stop a test immediately, if the test or setup is violating present regulations or referred legislation. In such a case a clear sign is mounted on the setup indicating that the setup has been dedicated un-approved and it must be corrected before further use.

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If you have suggestions that could improve the safety level in the laboratories and/or these rules please contact a member of the local safety group.

## APPENDIX 1 - DEFINITIONS

Designation	Definition	Requirements	Responsibilities and assignments
<i>Authorized expert</i> (DK: <i>sagkyndig</i> )	A person with a relevant education and experience to enable him to notice risks and avoid the possible dangers of electricity.	Authorized experts have to be evaluated and approved according to the rules in Appendix 4.	Is authorized to approve test setups. Is authorized to guide and supervise e.g. students in electrical installations. Authorized experts may work with energized test setups as stated in/following the L- <i>aus</i> -regulation: SB section 6 chapter 637.
<i>Instructed person</i> (DK: <i>Instrueret person</i> )	A person sufficiently instructed or supervised by an <i>authorized expert</i> , to be able to foresee risks and avoid the dangers with electricity (e.g. operation- and maintenance personnel).	A person who has been sufficiently instructed or supervised by an <i>authorized expert</i> - or in certain cases by an <i>instructed person</i> .  See Appendix 5 for specific requirements.	Is allowed to visit the laboratories or build test setup and work with test, dependent on the instruction.
<i>Person responsible for test setup</i>	The person who has the responsibility for the design and build of the test setup, with the aim to minimize risks.	An <i>authorized expert</i> or <i>instructed person</i> .	The person responsible for a test setup has the overall responsibility for the design and build of that test setup.
<i>Person responsible for the test</i>	The person who has the responsibility for performing the test.	An <i>authorized expert</i> or <i>instructed person</i> .  For every test a person responsible for the test is appointed. The <i>Person responsible for the test</i> must always have an agreement with a <i>safety guard</i> during the test.	The person is responsible for the execution of the test, e.g. when using a permanent test setup. When special test setups are operated at least two people have to be present.
<i>Test participant</i>	A person participating in a test.	An <i>authorized expert</i> or <i>instructed person</i> .	A person who is executing the test following instructions from the person responsible for the test.
<i>Safety guard</i>	A person who is sufficiently knowledgeable of the function of a test setup and who knows how to make an emergency stop of the test.	An <i>authorized expert</i> or <i>instructed person</i> .	A person is allowed to tend to assignments other than the test he is guarding. The safety guard can reside in adjacent rooms, but must follow the progress of the test.
<i>Supervisor</i>	Is a supervisor for laboratory exercises or project students	An <i>authorized expert</i>	Has the supervision responsibility as specified in the course description or project agreement.
<i>Authorized person responsible for the laboratory</i>	A person appointed to be responsible for the use of a laboratory and is named on a bulletin at the laboratories entrance.	An <i>authorized expert</i> .	Overall supervision and responsible for the use of the laboratory, including management of the laboratory space.

<i>Laboratory technician</i>	PLDK employees in building 329.	n/a	Technical support to the use of the laboratory.
<i>Safety group</i>		Member of the CEE's safety group	
<i>Administrative coordinator</i>	Employees appointed to handle administrative issues.	Instructed in handling of administrative issues related to PowerLabDK, DTU Lyngby and Risø Campus, incl. WSP signing and archiving.	Administrative support to the use of the laboratory.

## APPENDIX 2 – REFERENCES

The following materials are appropriate for use in the laboratory. They are, however, not an integrated part of the safety regulations and safety procedures:

1. Operations technical guide for LabCell Boards
2. List of contact persons
3. Building overview, building 329 and 329A
4. Energy Storage Systems, Safety Regulations and Procedures for DTU Elektro

The documents can be found on [www.powerlab.dk](http://www.powerlab.dk) and/or in the laboratories safety folder situated on the wall by the entrance to the laboratory.

### APPENDIX 3 – RULES OF ORDER

- Keep your experimental setup and the laboratory room tidy
- Keep experiments within the provided area
- Food and drinks are not allowed
- Use a trolley for your tools, materials and small equipment
- Clean up and pack your tools etc. after each working day
- Do not put equipment in laboratory room unless it is a part of the setup (use the storage rooms instead)
- The last person leaving in the room must ensure that all equipment is disconnected (except those marked with long term test or remotely controlled) and doors and windows closed and locked.

## APPENDIX 4 – APPROVAL AND APPOINTMENT OF AUTHORIZED EXPERTS

To be approved as an authorized expert the following rules must be followed:

- A authorized expert must document:
  - A sufficient professional education e.g. electrician, electrical engineer, electrical technician.
  - A practical experience in working in electrical laboratories
  - Capability to make a risk analysis for an electrical test setup and testing procedures.
  - L-AUS course including lifesaving first aid
  - An annual update of the L-AUS course

The Head of Department, DTU Elektro has the responsibility to evaluate and appoint authorized experts according to the requirements above. He can appoint a substitute(s) to make the evaluation of proposed persons.

The local safety group is responsible for keeping files over approved authorized experts and information on their fulfilling of requirements for still being capability to be approved as authorized expert.

## APPENDIX 5 – REQUIREMENTS FOR INSTRUCTED PERSONS

The instruction of *Instructed persons* varies according to the function they will perform.

The person giving the instruction has to ensure that the instruction is sufficient and that it is clear to which extend the instruction apply, e.g. in relation to application area.

The instruction normally has to be given by an *authorized expert*. Only if the instruction is for visitors under supervision (see below) the instruction can be given by an *instructed person*.

The following are rules for instructions for different functions:

Function	Needed instruction
Visitors under supervision of an <i>authorized expert</i> or <i>Instructed person</i>	Instruction about any necessary precautions must be given.
Visitors without supervision	Must fulfill the same requirements as “Persons involved in use of the laboratories”
Visitors in large groups	<p>A large group of visitors can access the laboratories if an <i>authorized expert</i> prior to the access ensures that laboratories don’t expose any risks to persons without sufficient professional education and the visitors sign a visitor form which briefly informs about safety and risks related to electricity.</p> <p>A typically instruction for guests prior to a visit in the labs will include:</p> <ul style="list-style-type: none"> <li>• Follow immediately any safety related command given by the visitors guide</li> <li>• Show the Emergency Stop button and explain its functionality</li> <li>• Don’t touch any setups, measuring or control equipment.</li> <li>• Respect any enclosures</li> <li>• In case of an accident call 1-1-2 (one one two)</li> </ul>
Persons involved in use of the laboratories (including <i>Persons responsible for the test, Test participants, Safety guards</i> etc.)	<p>The persons must:</p> <ul style="list-style-type: none"> <li>• Have a professional education e.g. electrician, electrical engineer, electrical technician.</li> <li>• People lacking sufficient professional education, e.g. students, must as a minimum have attended the course: Course element in course 31015, PowerLabDK safety-course, or equivalent. The courses must include the following elements: <ul style="list-style-type: none"> <li>○ Fuse characteristics</li> <li>○ Residual current relay (HPFI-relay)</li> <li>○ Insulation / Double insulation</li> <li>○ Selectivity</li> <li>○ Grounding methods</li> </ul> </li> </ul>

	<ul style="list-style-type: none"><li>○ The 5 rules of first aid</li><li>○ Safety regarding rotating machines</li><li>○ Machine directive</li><li>○ PLDK safety rules and procedures</li></ul> <ul style="list-style-type: none"><li>● Be instructed regarding laboratory specific aspects, especially introduction to the document “Safety Regulations and Procedures for PowerLabDK, DTU Lyngby Campus” (this document) and the WSP-procedures.</li></ul>
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## Appendix 6:

### List of authorized Experts (valid from 2018-November)

List of PowerLabDK authorized experts, valid from 10.04.2018

Name	L-AUS course date	PowerLabDK Authorized expert
Arne Hejde Nielsen	08-03-2018	X
Bjarni í Dali	08-03-2018	X
Chresten Træholt	08-03-2018	X
Daniel Arndtzen	27-02-2018	X
Esben Larsen	27-02-2018	X
Joachim Holbøll	27-02-2018	X
Nenad Mijatovic	08-03-2018	X
Per Munch Jakobsen	27-02-2018	X
Tonny Wederberg Rasmussen	08-03-2018	X

If a L-AUS course for an authorized expert is more than 2 years old the authorized expert is suspended until the L-AUS Course is up dated.

### Authorized person responsible for the laboratory, (valid 2018-November)

Lab	Location	Lab responsible	Lab responsible, deputy
Electric Lab 1	LY329-001		
Electric Lab 2	LY329-002A		
SCADA	LY329-005		
RTDS	LY329-006		
PMU-lab	LY329-007		
Power Student Lab	LY329-011		
Workshop	LY325-016		
Converter Lab	LY329-030		
High Voltage Lab 2	LY329-034		
High Voltage Lab 1	LY329-036		
Electric Vehicle Lab	LY329A-001		
Drives Lab	LY329A-022		
PowerLab Risø			

## Revision log

Changes to this document have been done:

Date	Date	Description of revision
Version 0.9	2012-05-07	Draft version.
Version 1.0	2012-05-13	First version.
Version 1.1	2012-06-18	Updated application area, references to national rules, access, definitions and other minor corrections.
Version 1.2	2012-12-03	<p>LY329-003 and LY329-005 no longer classified as electric operating rooms – corrections made accordingly. Rewriting of section 1.2.</p> <p>Added information about primary safety via disconnection in section 2.2-2.4.</p> <p>Definitions of Authorized expert and Instructed persons have been modified with reference to new appendices 4 and 5.</p> <p>Added procedure for revision of the document in Revision Log section.</p> <p>The machine Directive must also be followed when appropriate.</p> <p>Working Space Permit has been renamed to Work Site Permit</p>
Version 1.2.1	2018-08-17 (PMJA)	Section 2.1, requirement for use of local regulations when working with batteries
Version 1.2.2	2019-01-31 (ela) (PMJA)	<p>1.2 and 1.6: Safe Zones</p> <p>2.2 Sources connected to LCB</p> <p>2.2 Schuco plugs</p> <p>3. Sanctions</p> <p>App. 6 List of authorized experts and lab responsables.</p> <p>Minor changes</p> <p>2.2.2 Lab Risø is included</p>

### Procedure for revision of this document:

1. Revisions to this document must only be done by the local safety group in collaboration with the PowerLabDK management.

2. Revisions shall be approved by the DTU Elektro safety group before set into operation. The local safety group has the responsibility for this approval takes place. A confirmation from the chairman of the DTU Elektro safety group and minutes of meetings from a DTU Elektro safety group meeting is considered as sufficient documentation for approval.
3. When the document has been approved the local safety group has the obligation to immediately ensure that the old version of the document in the laboratories are removed and replaced with the newly approved version so a new updated version can be found in all laboratories. Furthermore the local safety group has the obligation to immediately ensure that the PowerLabDK webpage ([www.powerlab.dk](http://www.powerlab.dk)) is updated with the new version and that an E-mail is send to all relevant staff (ELEK CEE ALL) with information about the availability of the new version and a link to the relevant webpage.