

# OCCUPATIONAL QUALIFICATION STANDARD

## Electrician, EstQF Level 4

An occupational qualification standard is a document which describes the set of skills, knowledge and attitudes, i.e. competence requirements, needed to successfully accomplish duties. Occupational qualification standards are used for compiling curricula and awarding qualifications.

Occupational title	Level of Estonian Qualifications Framework (EstQF)
Electrician, EstQF Level 4	4

### Part A DESCRIPTION OF WORK

<b>A.1 Description of work</b> <p>The goal of Electrician, Level 4 is to ensure the maintenance and safety of electrical installations. Electrician, Level 4 installs, checks and maintains electric installations and devices in various buildings, facilities and external networks where devices with AC voltage supply must not exceed a capacity of 1000 V and devices with DC voltage supply (hereafter referred to as low-voltage) must not exceed a capacity of 1500 V. External networks must not exceed a capacity of 1000 V (starting from the connection point). Electrician, Level 4 works both independently and as part of a work team, fulfilling tasks in changing circumstances. The occupation requires a wide array of occupational skills, since electric work is often performed on simplified devices (including automatics devices) with up to 50 V of AC voltage and up to 120 V of DC voltage (hereafter referred to as extra-low voltage).</p> <p>Similar professions            Electrician, Level 5            Distribution System Electrician, Level 4            Distribution System Electrician, Level 5            Automation Engineer, Level 4            Automation Engineer, Level 5            Security Systems Technician, Level 4            Security Systems Technician, Level 5</p>
<b>A.2 Tasks</b> <p>A.2.1 Planning of work in accordance with tasks</p> <ol style="list-style-type: none"> <li>1. Finding the necessary information from technical documentation</li> <li>2. Operational planning</li> <li>3. Choosing materials and equipment</li> </ol> <p>A.2.2 Ensuring working environment safety</p> <ol style="list-style-type: none"> <li>1. Fulfilling electricity safety and fire safety requirements</li> <li>2. Fulfilling task safety requirements</li> <li>3. Organising a safe workplace</li> <li>4. Responding in the event of an occupational accident</li> </ol> <p>A.2.3 Cabling</p> <ol style="list-style-type: none"> <li>1. Installing electrical power supply cables</li> <li>2. Installing information transmission, safety and security system cables</li> <li>3. Installing cables for the operation of technological systems</li> <li>4. Replacing existing cables</li> </ol> <p>A.2.4 Working in electricity distribution centres</p>

1. Installing and replacing electricity distribution centres and their components
2. Preparation of energy distribution centres

#### A.2.5 Installing low-voltage and extra-low voltage devices

1. Installation and replacement of electric accessories
2. Installation of earthing devices
3. Installation of lightning protection devices within the limits of their competence as set out in legal acts

#### A.2.6 Installing and connecting automation equipment

1. Finding the necessary information from an automation project
2. Installing automation devices
3. Connecting automation devices

#### A.2.7 Verifying and documenting performance

1. Verifying their own work through electricity measurements
2. Formalising documentation

#### A.2.8 Conducting operational procedures on electrical installations

1. Checking electric installations and accessories
2. Maintenance of electric installations and accessories
3. Documenting checks and maintenance of electric installations

### A.3 Work environment and specific nature of work

Work is mainly conducted indoors. Contact with noise, dust and live devices is possible. Tasks are varied and may lead to physical complaints due to working in forced positions.

Following occupational and electricity safety standards, regulations and advice from foremen is required in order to avoid trauma. Wearing special protective clothing and protection gear may be required.

In emergency situations, work may take place on weekends and public holidays and at night. The work is mobile in nature and may require a driver's licence.

### A.4 Tools

Manual and specialty tools, mechanisms (e.g. forklifts) and measuring devices (testers, ammeters, etc.), IT hardware and specialist software.

### A.5 Personal qualities required for work: abilities and characteristics

The occupation requires physical endurance, dexterity and readiness to work at heights. Important qualities for the occupation are persistence, emotional stability, the ability to concentrate, adapt and analyse and cooperation skills. Working with marked cables and wires assumes the ability to differentiate colours.

### A.6 Professional preparation

Electrician, Level 4 acquires their occupational skills at a vocational education institution or by learning at their place of work (including completing training courses).

### A.7 Most common occupational titles

Electrician

### A.8 Regulations governing profession

Working as an electrician requires a certificate of completion of a test of electrical danger awareness. Basis: Equipment Safety Act. Regulation of the Minister of Economic Affairs and Infrastructure 'Requirements for Operating Electrical Installations and for Electrical Work'.

Standard regulating the organisation of electrical work EVS-EN50110-1 'Operation of Electrical Installations'.

Regulations concerning work involving an open flame as set by Minister of the Interior regulation 'Requirements for Work Involving an Open Flame'.

Work safety regulations and workers' rights and responsibilities in creating and maintaining a safe work environment are set out in the Occupational Health and Safety Act.

## Part B

### COMPETENCY REQUIREMENTS

#### B.1 Structure of occupation

Mandatory competences B.2.1-B.2.8 and recurring competence B.2.9 must be certified when applying for the qualification.

#### B.2 Competences

#### MANDATORY COMPETENCES

B.2.1 Planning of work in accordance with tasks	EstQF Level 4
<p>Performance indicators:</p> <ol style="list-style-type: none"> <li>1. identifies the necessary source data for task completion from technical documentation (e.g. the electrical project), using appropriate applications for reading digital electric blueprints;</li> <li>2. compiles a personal work plan based on source data, determines the order of work operations and the boundaries of the work place;</li> <li>3. chooses and assembles the materials necessary for the task.</li> </ol>	
<p>Knowledge:</p> <ol style="list-style-type: none"> <li>1) symbols used on electric blueprints;</li> <li>2) basic and derived electricity units of the SI system and simple derivation and comparison calculations;</li> <li>3) user manuals of tools (tools and mechanisms)</li> <li>4) characteristics and areas of use of electric materials.</li> </ol>	
B.2.2 Ensuring working environment safety	EstQF Level 4
<p>Performance indicators:</p> <ol style="list-style-type: none"> <li>1. adheres to electricity, fire and occupational safety requirements at every stage of work in order to avoid work accidents;</li> <li>2. complies with the user and safety requirements of lifting devices (e.g. pulleys and forklifts) and with the safety requirements of manual lifting work;</li> <li>3. complies with the use and safety manuals of devices used to lift people and follows safety regulations when working on ladders and scaffolding;</li> <li>4. prepares a safe workplace and checks its safety in the course of work, using proper protective equipment;</li> <li>5. keeps persons from non-electrical fields (subcontractors and construction workers) from accessing the work site;</li> <li>6. responds in the event of an occupational accident in their area if responsibility;</li> <li>7. calls for professional help and reports the accident in accordance with the procedure established by the company.</li> </ol>	
<p>Knowledge:</p> <ol style="list-style-type: none"> <li>1) basic knowledge of first aid.</li> </ol>	
B.2.3 Cabling	EstQF Level 4
<p>Performance indicators:</p> <ol style="list-style-type: none"> <li>1. installs extra-low and low-voltage power cables (e.g. in walls and ceilings and on cable shelves) in accordance with the task and the installation requirements;</li> <li>2. installs data communication cables, including fibre-optic cables, in accordance with the task and the installation requirements;</li> <li>3. installs cables for operating a building's technical systems in accordance with the task and the installation requirements;</li> <li>4. replaces a cable damaged due to a short circuit, interruption etc. based on the task and the location of the detected fault and using appropriate tools and techniques (e.g. switching the cable from device to device).</li> </ol>	
<p>Knowledge:</p> <ol style="list-style-type: none"> <li>1) requirements of work involving an open flame;</li> <li>2) requirements of electromagnetic compatibility.</li> </ol>	

<b>B.2.4 Working in electricity distribution centres</b>	<b>EstQF Level 4</b>
Performance indicators: 1. installs and replaces electricity distribution centres and their components using appropriate tools and techniques; 2. assembles electricity distribution centres based on the given blueprints, using the appropriate tools and techniques and following standards of building electricity distribution centres.	
<b>B.2.5 Installing low-voltage and extra-low voltage devices</b>	<b>EstQF Level 4</b>
Performance indicators: 1. identifies the post-project locations of electrical accessories and installs them in accordance with the instructions provided by the manufacturer; 2. replaces electrical accessories because of a fault or a change in indicators; 3. installs grounding devices and electrodes as well as equipotential bonding bars and conductors in post-project locations, marking and mechanically protecting them; 4. confirms the accordance of grounding devices with established norms, in the case of any discrepancy informing the person in charge of electrical work and making suggestions to change the construction; 5. installs the necessary lightning protection devices to shield electric devices, in accordance with the project and following the provisions of legal acts.	
Knowledge: 1) types of motors and circuit diagrams.	
<b>B.2.6 Installing and connecting automation equipment</b>	<b>EstQF Level 4</b>
Performance indicators: 1. derives the necessary source data from the project, placement plan and arrangement diagram; 2. installs an electric motor's driving, ventilation, actuator and sensor devices and measuring tools (excluding specific systems) following the arrangement diagram and using appropriate tools and techniques; 3. connects control and power circuits based on the connection diagram and using appropriate tools and techniques.	
<b>B.2.7 Verifying and documenting performance</b>	<b>EstQF Level 4</b>
Performance indicators: 1. measures the electro-technical indicators of installations (resistance, electric circuit isolation resistance, phase sequence and conduction of electric circuit, load current and voltage) using appropriate measuring tools, making sure the indicators are in accordance with normative values; 2. compiles measurement protocols for installations that they performed and documents implemented changes according to the given forms.	
<b>B.2.8 Conducting operational procedures on electrical installations</b>	<b>EstQF Level 4</b>
Performance indicators: 1. plans methods for the elimination of faults or informs the responsible employee and acts in accordance with the given instructions; 2. checks, via electrical measuring, the technical indicators of electrical installations and accessories and makes sure they correspond to normative values, detecting any potential deviations, problems or faults. plans methods for the elimination of faults or informs the responsible employee and acts in accordance with the given instructions; 3. maintains energy installations and accessories periodically and in accordance with the operations plan. 4. repairs electric installations in accordance with previously planned fault elimination methods. 5. compiles measurement protocols and documents changes made during checks and maintenance procedures, following the plan of operations.	

## RECURRING COMPETENCES

<b>B.2.9 Recurring competences of Electrician, Level 4</b>	<b>EstQF Level 4</b>
Performance indicators: 1. is goal-oriented and responsible, adhering to the legal requirements of the occupation (standards of installation projects and construction, building regulations of electrical devices, etc.); 2. implements in their work the basics of electrical engineering (applications of the Ohm and Kirchhoff laws in direct and alternating current circuits, principles of electrical machines and equipment, etc.);	

3. uses resources for their intended purpose and efficiently;
4. follows environmental conservation guidelines, collects all waste material and waste created during their work process;
5. uses tools, accessories and safety equipment in accordance with rules and guidelines;
6. communicates politely and properly with colleagues and clients and relays information in a clear and intelligible way in their area of responsibility;
7. takes part in team work, where necessary supervising co-workers within the limits of their competence, and is able to react quickly in a changed situation;
8. makes use of opportunities for self-improvement and keeps informed of developments in technology;
9. uses professional ICT hardware and application software, following the data protection requirements and rules of the enterprise;
10. uses at least one foreign language at the B1 level for obtaining specialised information, see module 'Comprehension', Annex 1 'Language skills level descriptions';
11. Uses a computer in their work according to the base modules and standard modules 'IT security' and 'Cooperation online' as described on the ECDL certificate (see Annex 2 'Computer skills').

Assessment method(s):

Recurring competences are evaluated as part of the assessment of the other competences listed in the occupational qualification standard.

## Part C

### GENERAL INFORMATION AND ANNEXES

#### C.1 Information concerning compilation and certification of occupational qualification standard and reference to classification of occupations

1. ID of occupational qualification standard in register of occupational qualifications	07-16112017-2.1/3k
2. Occupational qualification standard compiled by:	Urmas Leitmäe, Elektritööde Ettevõtjate Liit Aulika Riisenberg, SA Innove Sergei Kuliš, Telia AS Ülo Kala, Walde AS Lembit Vali, Eesti Elektroenergeetika Selts Urmas Mahlapuu, TERA AS
3. Occupational qualification standard approved by:	Energy, Mining and Chemical Industry
4. No. of decision of Sectoral Council	8
5. Date of decision of Sectoral Council	16.11.2017
6. Occupational qualification standard valid until	07.11.2022
7. Occupational qualification standard version no.	3
8. Reference to International Standard Classification of Occupations (ISCO 08)	7412 Electrical Mechanics and Fitters
9. Reference to European Qualifications Framework (EQF)	4

#### C.2 Occupational title in foreign language

English:	Electrician, EstQF Level 4
Russian:	Электрик

#### C.3 Annexes

Lisa 1 [Language skills level descriptions](#)

Lisa 2 [Computer Skills](#)