



Technical Handbook 2023

What's this Document For?

This document provides an overview of the competition and specific information on the National Qualifying task for those who make it through to the live heat stages.

Take Part

To register for the competition visit www.skillelectric.org.uk/registration

Thank you to our sponsors and supporters

SkilleLECTRIC, organised by NET and run in partnership with WorldSkills UK, is the industry's premier annual skills competition, which is generously sponsored by Electric Center, the NICEIC and Scolmore Group.

The competition could not run without the valuable input from our SkilleLECTRIC judges and venues who host the competitions.



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The SkilleLECTRIC Competition

SkilleLECTRIC has been designed to reflect the role of an Electrical Technician and the standards that are expected within the electrical industry. Each year the best electrical students and apprentices from across the UK take part in SkilleLECTRIC National Qualifiers to win a place in the competition's grand UK Final.

SkilleLECTRIC is the only route to compete internationally at EuroSkills and WorldSkills level. To find out more see page 10 or visit the [SkilleLECTRIC website](#).

Those who are age eligible and meet the standard will be considered for a place in the next Squad UK following the 2023 UK final, to be in with a chance of competing as part of Team UK at the next WorldSkills event.

Electrician Alex Rendall recently competed in WorldSkills 2023 after his excellent performance in SkilleLECTRIC and Squad UK - [read more about his experience](#).

Time Commitment

The time needed for each stage varies – take a look below to give you an idea of what time your candidates will need to commit as the competition progresses:

	Duration
Pre-Competition Activity	1 hour
Entry Stage	1 hour
If candidate progresses to the National Qualifiers...	
National Qualifier	1 day
If candidate is selected for the UK final...	
Technical and Mindset training	1 day
UK Final	5 days

This does not include training and preparation time for each stage of the competition. You would also need to factor in potential travel and overnight stays if required for the National Qualifier and UK Final.

Special Requirements or Assistance

If your candidates have any particular personal requirements that they need to discuss with us, please encourage them to do so at the point of registration.

Where possible, on a case-by-case basis we will review and make reasonable adjustments to support their needs.

In the interest of personal safety, NET reserves the right to refuse or terminate a competitor's task should any medical issues present themselves on the day that have not been previously disclosed or discussed.

Core Competencies

The table below clearly lists the core competencies and the expected standards at each stage of the SkillELECTRIC competition journey, starting from the entry stage through to world class international standards.

		Entry Stage	National Qualifier	National Final	WorldSkills / Team UK
Competency	Health and Safety				
Level 3	Tidy work area	No	Yes	Yes	Yes
Level 3	Correct PPE being used	No	Yes	Yes	Yes
Level 3	Safe working practices being observed	No	Yes	Yes	Yes
Level 3	Safe isolation of electrical supply	Yes	Yes	Yes	Yes
Level 3	Theory knowledge	Yes	Yes	Yes	Yes
Competency	Positioning				
Level 3	Mark horizontal and vertical datum lines	No	Yes	Yes	Yes
Level 3	Correctly position electrical components in relation to the given drawings	No	Yes	Yes	Yes
Level 3	Ensure all equipment is fitted level	No	Yes	Yes	Yes
Competency	Wiring and Terminations				
Level 3	Correctly select the correct type and size of cable	No	Yes	Yes	Yes
Level 3	Correctly fit and secure cable glands	No	Yes	Yes	Yes
Level 3	Correctly and securely terminate conductors	No	Yes	Yes	Yes
Competency	Quality				
Level 3	Install cable containment to industry standards	No	Yes	Yes	Yes
Level 3	Correctly support cables with clips or cleats where required	No	Yes	Yes	Yes
Level 3	Correctly install cables within containment	No	Yes	Yes	Yes
Competency	Inspection and Testing				
Level 3	Correctly carry out the following tests:				
	1. Continuity	Yes	Yes	Yes	Yes
	2. Insulation resistance	Yes	Yes	Yes	Yes
	3. Earth fault loop impedance	No	No	Yes	Yes
	4. RCD operation	No	No	Yes	Yes
Competency	Function				
Level 3	Installation operates as specified	No	Yes	Yes	Yes

Competition Cycle - Detail

1. PRE-COMPETITION

Use the Pre-Competition Guide to help you identify your most suitable candidate(s) to enter for SkilleLECTRIC. Within the guide you'll find:

- a. The **Talent Spotting Checklist** which defines the ideal personal attributes and other characteristic a competitor should have
- b. The **Core Competencies** that competitors are expected to meet at each stage of the SkilleLECTRIC competition journey, starting from the Entry Stage through to world-class international standards
- c. The **Pre-Competition Task** which can be used as an in-house competition from which you can identify your most suitable candidates to register for the SkilleLECTRIC competition.

2. ENTRY STAGE

The Entry Stage is an app-based, timed and interactive online task which will test the candidates' electrotechnical knowledge. It will take around an hour to complete. The app will be live from 10:00 on 27 March to 22:00 on 28 March; it must be completed during that time and it must be done independently.

After registering for SkilleLECTRIC and agreeing to the rules, candidates will be sent a one-time login and link to download the app on either Android or iOS, to a device which operates at least Android 10 or iOS 11.

Only the top scorers from across all of the UK at the Entry Stage will progress onto the National Qualifier heats, which will take place between April and June.

If a candidate is successful in the Entry Stage they will need to formally accept their place in the qualifying heats by **31 March 2023**. If formal acceptance is not submitted by this deadline, the candidate **will not be able to progress to the heat stage**.

At the time of registration the candidate will be asked to select their preferred first and second choice venue. NET will make every attempt to offer these venues; however the competition at each venue will only go ahead if there is sufficient demand. If a competition is unable to take place at your preferred venues, we will offer you another location.

3. NATIONAL QUALIFYING HEATS

A series of live competitions taking place across the UK. The top scoring competitors from the national qualifiers will progress to the UK final.

4. PRE-UK FINAL TRAINING

To help finalists prepare ahead of the UK Final, we will provide relevant technical training and share mindset development techniques, which will support them to remain focused on achieving success.

5. UK FINAL

WorldSkills UK quality assure the results and finalists will be notified by late summer to confirm their participation in the UK Final.

This is a 2.5 day competition where accommodation will be provided by NET.

Competition Rules and Code of Conduct (National Qualifiers and UK Final)

As the Competition Organising Partner, NET is responsible for you having a safe and enjoyable competition experience. For the duration of the competition, competitors will be observed against the expected standards, practices and behaviours as set out in the SkilleLECTRIC competition [rules](#), code of conduct and WorldSkills UK competition rules. We expect all competitors to use this as a guide for how to best behave during the competition at all times.

Please remember there may be a number of industry representatives attending your competition and it would be in your best interest to positively represent yourself and your organisation at all times. For competitors who choose to behave outside of the guidance provided, NET cannot be accountable for your actions and this may result in disqualification of your place in the competition.

NB: Competitors at Entry Stage will also have to adhere and agree to the following rules:

- I confirm I have read all the previous information and am happy to start the task
- I have not shared my personal log in details with anyone
- I will carry out the test myself and I will not receive help from any other person or source

Competition Task - National Qualifier

The SkilleLECTRIC National Qualifier competition is a one-day event [across a series of venues](#) where competitors will have a set time by which to complete the task. All materials to complete the competition piece will be provided by the sponsors.

On the day of the competition, a clear brief will be provided to you along with the technical drawing which will include the measurements. Past examples of technical drawings and task information can be found on the [SkilleLECTRIC website](#).

Tasks are designed to test a competitor's ability to:

- Work to the specification and dimensions as detailed on the wiring plan with a tolerance of +/- 2mm
- Install the competition piece safely to industry recognised standards
- Complete the competition piece with the materials provided
- Determine all necessary wiring methods for the correct installation and operation of equipment as described in the specification
- Comply with all health and safety legislation and requirements of the competition
- Wear eye protection when cutting and using a battery drill (this applies to using the drill for fixings)
- Wear eye protection and gloves when stripping SWA cable
- Carry out basic electrical tests to the standard as per the specification to demonstrate to the judges that the installation is safe to energise. Only judges or appointed persons are authorised to energise an installation and their decision is final.

Tool List

Competitors are asked to bring and use their own tools, equipment and consumable items as per the tool list below. Please be prepared and double check your tool box as the competition venue may not be able to provide any spare tools or consumable items.

There are restrictions which may not be included as follows; 'Stanley' type craft knives, an electrician's knife is recommended and no 230v/ 110v power tools. Battery operated screw drivers and chargers are allowed.

Please note that any live connection and test only carried out by the judging team only and no mains powered tools or Stanley knives will be allowed on site.

Permitted tools list	
Tool box	Drill bits various sizes
Full set of insulated screwdrivers flat and cross head	20mm hole cutter
Medium sized claw hammer	Continuity and insulation resistance tester
Bradawl	20mm heavy duty bending spring
Insulated pliers long and short	Battery drill and spare battery and charger
Side cutters	Large spirit level
Junior hacksaw, complete with spare blades	Protractor (large)/ adjustable angle
Large hacksaw, complete with spare blades	Mitre box/ saw
PVC conduit cutters	Pencils
Crimping tool	File medium cut
Cable strippers/ electrician knife	Tape measure or fixed rule
Cable cutters	Personal Protective Equipment (PPE)
Cable draw tape	Goggles/ safety glasses
Adjustable spanner x 2	Gloves
Bush spanner	Work-wear trousers or overalls
Face mask	Safety boots/ shoes

Safe Working

At all times we expect competitors:

- To work safely always and take appropriate precautions when working with any tools that have a potential safety hazard
- To wear appropriate Personal Protective Equipment (PPE)
- Not carry out any live working
- Not to use power tools except a battery-operated drill (preferably not impact)
- To comply with additional competition rules for safety
- There may be specific Covid guidance at each host venue, which we will provide in advance of you attending your competition

Marking

SkillELECTRIC is judged by industry professionals who will observe work practices throughout the duration of the competition. The judges are briefed on assessment procedures prior to the competition and the results are quality assured before results are announced.

The marking scheme objectively assesses a competitor's test piece, however, judges will also take into account soft skills such as, planning, working under pressure and time management.

The following table is an example criteria from which competitors work will be marked against. The range of marks will vary depending on the task that is set:

Aspect ID	Assessment criteria	Maximum marks available
A	Function	6
B	Wiring and terminations	25
C	Testing and inspecting	16
D	Installation quality	18
E	Measurements	30
F	Effective health and safety	5
	Total	100

The following standards will be used to assess the competition:

- All measurements must be within +/-2mm tolerance and taken from datum line
- All bends and sets to be formed evenly, uniformly and without distortion
- All conductors should be securely terminated with no bare conductor showing when viewed at 90 degrees, no insulation trapped in connection no reduction in the c.s.a of the conductor and insulation undamaged
- All circuits should function as design specification
- There should be no more than 1mm gap on any encasement
- All encasement, accessories and components should be vertical and horizontal and installed as per drawing provided which is not to scale.

Top Tips

From past competitions, we have observed that high scoring competitors carry out the following basic skills to help them with high standards of accuracy:

- Measuring and marking out to the specification.
- Correctly positioning the electrical components, focusing on angles of bends, sets and clearances, ensuring that all equipment fitted is level.
- Selecting the correct type and size cable for the task, securing cable glands and terminating conductors.
- Being observant of health and safety at all times.

Common areas of poorer performance include:

- Inaccurate results for testing and inspecting as key critical aspects of the process are overlooked e.g. testing at every point.
- The angles, bend, clearances and sets needed to be more accurate, as per the specification.
- Fault finding and the correction of faults.

The general advice we would give to anyone looking to enter include:

- Take the time to practise the test piece a few times before the live competition, preferably in an unfamiliar environment, so that you can overcome any potential curve balls or pressure this might cause. This will help you to remain calm at the actual competition and remain focused.
- Become familiar with the tools you are permitted to use at the competition so that time is not wasted at the live competition.
- Understand the duration and commitment that is required for the competition journey.
- Prepare for the competition by making sure you have all the tools and other equipment you may need such as pens and pencils. Make a checklist, discuss it with your training provider and work through it before you attend to make sure nothing is forgotten.
- Be grateful for the industry support we receive and thank key people who might be at the competition, including the sponsors and judges who have taken the time to attend your competition.
- Let your training provider and employer know that you are taking part and ask them for their support. Competitions can be tough but knowing that you have a network of support behind you can make a difference.
- Ask the competition organiser if they can share the contact details for a previous competitor with you, so that you can ask them about their experience to plan how you will approach the competition.

For more in-depth information on this please read the Training to Succeed Manual. The tips and advice in this include skill, body and mindset training and can make a difference to your performance and to prepare you for the competition.

International Competition

Following the 2023 UK Final, those who are age eligible and meet the standard will be considered for a place in Squad UK, with a chance to compete internationally at the next WorldSkills competition.

During the Squad UK process, competitors are trained to develop world class technical skills, high performance attributes and a winning mindset to prepare them for success if they are selected to represent their country and industry as part of Team UK.

Further information can be found on the [WorldSkills website](#).

About the Industry

Using the latest technology, lighting up festivals and stadiums, making machines and buildings come alive. With a career in electrical engineering, design or installation there's a whole world of opportunities right on your doorstep:

- Bring power to offices, retail parks and stadiums
- Programme and install smart buildings and controls
- Keep the country online with telecommunications systems
- Be at the forefront of energy monitoring and efficiency

Without electrical engineers, technicians, designers or electricians our lives would be a very different place – imagine no electricity, internet or mobile phone networks!

It all starts with an electrotechnical apprenticeship – once you've qualified, you can then develop your skills in whatever route you choose. And the sky's the limit in terms of career progression and where it could take you.

Electrical Training Routes

If you want to become a qualified electrician, an apprenticeship is the electrical training route preferred by the industry.

If you can't find an apprenticeship vacancy, there are other training routes you may be able to follow. However, it's just not possible to become a qualified electrician until you are working in the industry to gain on-site practical experience.

You also need to be wary of training courses that claim to qualify you as an electrician within a few weeks or months. If you're completely new to the industry this is simply not possible! Take look at the approved training routes where you can read the full details and download the training journey:

www.electricalcareers.co.uk/routes

England	
Route	Information
Apprenticeship	England Route 1 - Apprenticeships
Full-time education 14-19	England Route 2 - Full Time Education 14-19
Self-funded	England Route 3 - Self Funded
Experienced Worker Assessment	England Route 4 - Experienced Worker Assessment

Wales	
Route	Information
Apprenticeship	<u>Wales Route 1 - Apprenticeship</u>
Full-time education 16-19	<u>Wales Route - Full Time Education 16-19</u>
Self-funded	<u>Wales Route 3 - Self Funded</u>
Experienced Worker Assessment	<u>Wales Route 4 - Experienced Worker Assessment</u>

Scotland	
Route	Information
Apprenticeship	<u>Scotland Route 1 - Apprenticeship Training</u>
Adult Training	<u>Scotland Route 2 - Adult Training</u>
Crediting Electrotechnical Competence	<u>Scotland Route 3 - Crediting Electrotechnical Competence</u>

Northern Ireland	
Route	Information
Apprenticeship	<u>Northern Ireland Route 1 - Apprenticeship</u>
Self-funded	<u>Northern Ireland Route 2 - Self Funded</u>
Experienced Worker Assessment	<u>Northern Ireland Route 3 - Experienced Worker Assessment</u>

Progression Routes

Once you've completed an electrical apprenticeship there's a wide range of routes you can follow – you may wish to stay in a site-based role or look at something such as design or project management. The options are varied depending on your skills, strengths and what sort of career path you'd like to take.

With core electrotechnical skills under your belt, you can explore the different career and progression routes that are available to you on the [Electrical Careers website](#).