



Technical Handbook 2022

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.

What's New for 2022?

Take a look at our competition journey on page 5 and visit our ['What's New'](#) page on the SkillELECTRIC website for more information on our new Passive stage.

Thank you to our sponsors/ supporters

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

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 the next WorldSkills International competition taking place in 2024 Lyon, France. Those who are age eligible and meet the standard will be considered for a place in Squad UK following the 2022 UK Final.

For more information on the competition please visit the [SkilleLECTRIC website](https://www.skillelectric.co.uk).

Core Competencies

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

| | | Passive | 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 |

Take Part

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

Competition Cycle

The competition cycle consists of 5 stages:

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 characteristics 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 Passive 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. PASSIVE - NEW

The new Passive 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 on April 25th from 10:00 to 26th April 22:00; 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 Passive Stage will progress onto the National Qualifier heats, which will take place between May and June.

3. NATIONAL QUALIFIER

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

4. PRE-UK FINAL TRAINING

To help finalists be prepared as they can ahead of the UK Final, we will provide relevant technical training. We may also introduce mindset development techniques which will support the finalists 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 National.

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 Passive 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
- Carry out a fault-finding test on a purpose-built rig and completing the report
- 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.
- 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

The next WorldSkills International competition is taking place in Lyon, France 2024. Those who are age eligible and meet the standard will be considered for a place in Squad UK following the 2022 UK Final.

After the UK Final 2022, competitors over the next eighteen months are trained to develop world class technical skills, high performance attributes and a winning mindset to prepare them for success in 2024 and represent the UK.

Further information can be found on the [WorldSkills website](https://www.worldskills.org/).

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 | TESP-England-Route-1-Apprenticeship.pdf (electricalcareers.co.uk) |
| Full-time education 14-19 | TESP-England-Route-2-Full-Time-Education-14-19.pdf (electricalcareers.co.uk) |
| Self-funded | TESP-England-Route-3-Self-Funded.pdf (electricalcareers.co.uk) |
| Experienced Worker Assessment | TESP-England-Route-4-Experienced-Worker-Assessment.pdf (electricalcareers.co.uk) |

| Wales | |
|-------------------------------|--|
| Route | Information |
| Apprenticeship | TESP-Wales-Route-1-Apprenticeship.pdf (electricalcareers.co.uk) |
| Full-time education 16-19 | TESP-Wales-Route-2-Full-Time-Education-16-19.pdf (electricalcareers.co.uk) |
| Self-funded | TESP-Wales-Route-3-Self-Funded.pdf (electricalcareers.co.uk) |
| Experienced Worker Assessment | TESP-Wales-Route-4-Experienced-Worker-Assessment.pdf (electricalcareers.co.uk) |

| Scotland | |
|---------------------------------------|---|
| Route | Information |
| Apprenticeship | TESP-Scotland-Route-1-Apprenticeship-Training.pdf (electricalcareers.co.uk) |
| Adult Training | TESP-Scotland-Route-2-Adult-Training.pdf (electricalcareers.co.uk) |
| Crediting Electrotechnical Competence | TESP-Scotland-Route-3-Crediting-Electrotechnical-Competence.pdf (electricalcareers.co.uk) |

| Northern Ireland | |
|-------------------------------|---|
| Route | Information |
| Apprenticeship | TESP-Northern-Ireland-Route-1-Apprenticeship.pdf (electricalcareers.co.uk) |
| Self-funded | TESP-Northern-Ireland-Route-2-Self-Funded.pdf (electricalcareers.co.uk) |
| Experienced Worker Assessment | TESP-Northern-Ireland-Route-3-Experienced-Worker-Assessment.pdf (electricalcareers.co.uk) |

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](#).