



Model Curriculum

QP Name: Field Technician - Air Conditioner

QP Code: ELE/Q3102

QP Version: 2.0

NSQF Level: 4

Model Curriculum Version: 2.0

Electronics Sector Skills Council of India || 155, 2nd Floor, ESC House, Okhla Industrial Area- Phase 3, New Delhi- 110020

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Training Parameters

| | |
|---|--|
| Sector | Electronics |
| Sub-Sector | Consumer Electronics & IT Hardware |
| Occupation | After Sales Service |
| Country | India |
| NSQF Level | 4 |
| Aligned to NCO/ISCO/ISIC Code | NCO-2015/7233.50 |
| Minimum Educational Qualification and Experience | 8th Class pass + ITI (2 years after 8th) with 2 years of relevant Experience OR 10th Class with 2 years of relevant Experience OR 2 year I.T.I (after 10th) OR 12th Class with 6 months of relevant experience OR Certificate of NSQF Level-3 in relevant field with 2 years of Experience |
| Pre-Requisite License or Training | NA |
| Minimum Job Entry Age | 18 Years |
| Last Reviewed On | 27/01/2022 |
| Next Review Date | 02/06/2025 |
| NSQC Approval Date | 27/01/2022 |
| QP Version | 2.0 |
| Model Curriculum Creation Date | 27/01/2022 |
| Model Curriculum Valid Up to Date | 02/06/2025 |
| Model Curriculum Version | 2.0 |
| Minimum Duration of the Course | 540 Hours |
| Maximum Duration of the Course | 540 Hours |

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills:

- Describe the process of engaging with customer with service.
- Demonstrate the process of performing installation and repair of air conditioner.
- Explain the importance of following inclusive practices for all genders and PwD at work.
- Demonstrate various practices to be followed to maintain health and safety at work.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

| NOS and Module Details | Theory Duration | Practical Duration | On-the-Job Training Duration (Recommended) | On-the-Job Training Duration (Mandatory) | Total Duration |
|---|-----------------|--------------------|--|--|----------------|
| Bridge Module | 04:00 | 00:00 | 00:00 | 04:00 | 08:00 |
| Module 1: Introduction and orientation to the role of a Field Technician- Air Conditioner | 04:00 | 00:00 | 00:00 | 04:00 | 08:00 |
| ELE/N3101 Engage with customer for service NOS Version- 2.0 NSQF Level- 4 | 50:00 | 75:00 | 00:00 | 55:00 | 180:00 |
| Module 2: Process of engaging with customer with service | 50:00 | 75:00 | 00:00 | 55:00 | 180:00 |
| ELE/N3108: Perform installation and repair of air conditioner NOS Version- 2.0 NSQF Level- 4 | 64:00 | 117:00 | 00:00 | 91:00 | 272:00 |
| Module 3: Process of performing installation and repair of air conditioner | 64:00 | 117:00 | 00:00 | 91:00 | 272:00 |

| | | | | | |
|--|---------------|---------------|--------------|---------------|---------------|
| ELE/N9905 Work effectively at the workplace NOS Version- 2.0 NSQF Level- 4 | 16:00 | 24:00 | 00:00 | 00:00 | 40:00 |
| Module 4: Soft Skills and Work Ethics | 16:00 | 24:00 | 00:00 | 00:00 | 40:00 |
| ELE/N1002 Apply health and safety practices at the workplace NOS Version- 3.0 NSQF Level- 4 | 16:00 | 24:00 | 00:00 | 00:00 | 40:00 |
| Module 5: Basic Health and Safety Practice | 16:00 | 24:00 | 00:00 | 00:00 | 40:00 |
| Total Duration | 150:00 | 240:00 | 00:00 | 150:00 | 540:00 |

Module Details

Module 1: Introduction and orientation to the role of a Field Technician – Air Conditioner

Bridge Module

Terminal Outcomes:

- Discuss the job role of a Field Technician-Air Conditioner.

| | |
|--|--|
| Duration: 04:00 | Duration: 00:00 |
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> • Describe the size and scope of the electronic industry and its sub-sectors. • Discuss the role and responsibilities of a Field Technician-Air Conditioner. • Describe various employment opportunities for a Field Technician-Air Conditioner. | |
| Classroom Aids | |
| Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop | |
| Tools, Equipment and Other Requirements | |
| NA | |

Module 2: Process of engaging with customer with service

Mapped to ELE/N3101 v2.0

Terminal Outcomes:

- Describe the process of interacting with customer.
- Explain how to Suggest possible solutions.

| Duration: 50:00 | Duration: 75:00 |
|--|--|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> • Explain the company’s policies on code of conduct, organisation's culture, customer care, reporting structure and documentation policy. • Explain the company’s products and recurring problems reported in consumer appliances. • State the precautions to be taken while handling field calls and dealing with customers. • Explain the importance of personal grooming with proper etiquettes at the customer's premises. • Explain the basic electrical, mechanical modules of various appliances and electronics involved in the type of appliance. • List models of different appliances, their common and distinguishing features, functionality of different features of appliances and new features. | <ul style="list-style-type: none"> • Demonstrate how to connect with the customer to confirm the problem telephonically and fix a time for the visit. • Show how to collect appropriate tools, parts, relevant reference sheets, manuals and documents. • Show how to check about warranty status of the appliance and annual maintenance contract. |
| Classroom Aids | |
| Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop | |
| Tools, Equipment and Other Requirements | |
| NA | |

Module 3: Process of performing installation and repair of air conditioner

Mapped to ELE/N3108 v2.0

Terminal Outcomes:

- Demonstrate the process of performing pre-installation checks.
- Demonstrate the process of installing the air conditioner.
- Describe the process of analysing symptoms, identifying and rectifying the faults.
- Describe the process of completing the documentation.

| Duration: 64:00 | Duration: 117:00 |
|---|---|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> • Explain the safety rules, policies, procedures and quality standards to be followed. • List the installation-site requirements such as structural requirements, ventilation, etc. • Explain the manual-based procedure of installing the air conditioner. • Explain how to fix various accessories and parts that have accompanied the unit. • Explain how to operate tools such as screw drivers, electric drill for installation. • Explain the packaging waste disposal procedures. • Explain how to operate the air conditioner and use the various features. • Explain the method of air conditioning, its use and functioning of sealed system. • Describe troubleshooting knowledge with respect to air conditioners. • List frequently occurring faults such as poor/no cooling, noisy unit, condensation water over flowing and basic electrical faults such as improper/no earthing, defective power cord, etc. • Explain basic electrical and mechanical modules of the air conditioner. | <ul style="list-style-type: none"> • Show how to check structural requirements such as distance from power supply, distance from windows/doors being opened frequently. • Demonstrate how to remove the air conditioner packaging without causing any damage. • Demonstrate the process of disposing the packaging material waste as per company's norms. • Demonstrate how to measure the location to drill holes ensuring that no internal wiring damage takes place. • Demonstrate the process of placing the outdoor unit at a suitable location and attaching it firmly to the wall/floor. • Show how to connect the indoor and the outdoor units using the field copper pipe of appropriate size and interconnecting cables. • Show how to fill in additional gas if the distance between the indoor and the outdoor units is more than what is recommended. • Demonstrate the process of carrying out basic tests such as power supply inspection, volt-ampere test, etc. • Show how to repair or replace the faulty part as per requirement at the customer location or send it to the service center on time in case immediate repair is not possible for |

| | |
|---|---|
| <ul style="list-style-type: none"> • Explain the usage of test equipment and tools such as multi-meter, oscilloscope, temperature meter, pressure gauges, etc. • Explain how to detect defects in the compressor, condenser and other problems such as improper alignment of unit, low refrigerant charge, etc along with their reasons. • Explain how to diagnose reasons for improper cooling by diagnosing causes such as dirty filter, blocked coil, bent fins, improper damper setting, low capacity of unit, etc. • Explain the fundamentals of electricity such as ohms law, difference between ac and dc, etc., basic electronic components such as diode, transformer, LED, photo transistor, etc., electrical and electronic symbols, multiples and SI units. • Explain the basics of types of refrigerants such as R12, R22, R134a, R290, R600a, R410, R32. • Explain the use of different brazing sticks, types of brazing torches, types of fluxes and their application. • Explain how to document completion note for customers. • Explain how to record completion information in the ERP system. | <p>specialized parts such as PCB.</p> <ul style="list-style-type: none"> • Demonstrate how to replace dysfunctional module/part after collecting it from the service center. • Demonstrate the process of carrying out brazing operation at the customer premise or pass the complaint on to a specialist in-charge of handling brazing. • Demonstrate how to reassemble the unit after rectifying an identified fault. • Show how to fill out the customer acknowledgement form. |
| <p>Classroom Aids</p> | |
| <p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p> | |
| <p>Tools, Equipment and Other Requirements</p> | |
| <p>Different types of air conditioners such as window and split AC, Testing equipment as multi-meter, clamp meter, vacuum pump, weigh scale, gas cylinder, temperature meter, pressure gauges, Wiring accessories, Tube cutter, Tube bender, Flaring tool, Brazing tool</p> | |

Module 4: Soft Skills and Work Ethics

Mapped to ELE/N9905 v2.0

Terminal Outcomes:

- Work effectively at the workplace.
- Implement the practices related to gender and PwD sensitization.

| Duration: 16:00 | Duration: 24:00 |
|---|--|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> • State the importance of work ethics and workplace etiquette • State the importance of effective communication and interpersonal skills. • Explain ways to maintain discipline at the workplace. • Discuss the common reasons for interpersonal conflict and ways of managing them effectively. • Discuss the importance of following organisational guidelines for dress code, time schedules, language usage and other behavioural aspects. • Explain the importance of working as per the workflow of the organisation to receive instructions and report problems. • Explain the importance of conveying information/instructions as per defined protocols to the authorised persons/team members. • Explain the common workplace guidelines and legal requirements on non-disclosure and confidentiality of business-sensitive information. • Describe the process of reporting grievances and unethical conduct such as data breaches, sexual harassment at the workplace, etc. • Explain the concept and importance of gender sensitivity and equality. • Discuss ways to create sensitivity for different genders and Persons with Disabilities (PwD). | <ul style="list-style-type: none"> • Develop a sample plan to achieve organisational goals and targets. • Create a sample feedback form to obtain feedback from customers, colleagues etc. • Roleplay to demonstrate the use of professional language and behaviour that is respectful of PwD and all genders. • Apply organisational protocol on data confidentiality and sharing only with the authorised personnel. |

| | |
|--|--|
| <ul style="list-style-type: none">• Discuss ways of dealing with heightened emotions of self and others. | |
| Classroom Aids | |
| Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop | |
| Tools, Equipment and Other Requirements | |
| Sample Of Escalation Matrix, Organization Structure. | |

Module 5: Basic Health and Safety Practice

Mapped to ELE/N1002 v2.0

Terminal Outcomes:

- Apply health and safety practices at the workplace.

| Duration: 16:00 | Duration: 24:00 |
|---|---|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> • Discuss job-site hazards, risks and accidents. • Explain the organizational safety procedures for maintaining electrical safety, handling tools and hazardous materials. • Elaborate on electronic waste disposal procedures. • Describe the process of disposal of hazardous waste • List the name and location of concerned people, documents and equipment for maintaining health and safety in the workplace. • Describe how to interpret warning signs while accessing sensitive work areas. • Explain the importance of good housekeeping. • Describe the importance of maintaining appropriate postures while lifting heavy objects. • List the types of fire and fire extinguishers. • Explain the importance of efficient utilisation of water, electricity and other resources. • List the common sources of pollution and ways to minimize it. • Describe the concept of waste management and methods of disposing hazardous waste. • Explain various warning and safety signs. • Describe different ways of preventing accidents at the workplace. | <ul style="list-style-type: none"> • Demonstrate the use of protective equipment suitable as per tasks and work conditions. • Prepare a report to inform the relevant authorities about any abnormal situation/behaviour of any equipment/system. • Administer first aid in case of a minor accident. • Demonstrate the steps to free a person from electrocution safely. • Administer Cardiopulmonary Resuscitation (CPR). • Demonstrate the application of defined emergency procedures such as raising alarm, safe/efficient, evacuation, moving injured people, etc. • Prepare a sample incident report. • Use a fire extinguisher in case of a fire incident. • Demonstrate the correct method of lifting and handling heavy objects. |

| Classroom Aids |
|--|
| Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop |
| Tools, Equipment and Other Requirements |
| Personal Protection Equipment: Safety Glasses, Head Protection, Rubber Gloves, Safety Footwear, Warning Signs and Tapes, Fire Extinguisher, First Aid Kit, Fire Extinguishers and Warning Signs. |

Module 6: On-the-Job Training

Mapped to Field Technician- Air Conditioner

| | |
|--|------------------------------------|
| Mandatory Duration: 150:00 | Recommended Duration: 00:00 |
| Location: On Site | |
| Terminal Outcomes <ol style="list-style-type: none">1. Collecting the appropriate tools, parts, relevant reference sheets, manuals and documents.2. Explain the company's policies on code of conduct, organisation's culture, customer care, reporting structure and documentation policy.3. Removing the air conditioner packaging without causing any damage.4. Using the tools and fitments required for the installation.5. Mounting the indoor unit.6. Connecting the indoor and the outdoor units using the field copper pipe of appropriate size and interconnecting cables7. Communicating effectively at the workplace.8. Applying health and safety practices at the workplace. | |

Annexure

Trainer Requirements

| Trainer Prerequisites | | | | | | |
|-----------------------------------|--|------------------------------|--------------------|----------------------|----------------|---------|
| Minimum Educational Qualification | Specialization | Relevant Industry Experience | | Training Experience | | Remarks |
| | | Years | Specialization | Years | Specialization | |
| Diploma/ I.T.I | Electronics/ Mechanical / Electrical | 1 | Air Conditioner | 1 year preferably | Electronics | |

| Trainer Certification | |
|--|--|
| Domain Certification | Platform Certification |
| “Field Technician-Air Conditioner”, “ELE/Q3102, v2.0”, Minimum accepted score is 80% | “Trainer”, “MEP/Q2601” with a minimum score of 80% |

Assessor Requirements

| Assessor Prerequisites | | | | | | |
|-----------------------------------|--|------------------------------|--------------------|--------------------------------|----------------|---------|
| Minimum Educational Qualification | Specialization | Relevant Industry Experience | | Training/Assessment Experience | | Remarks |
| | | Years | Specialization | Years | Specialization | |
| Diploma/ I.T.I | Electronics/ Mechanical / Electrical | 2 | Air Conditioner | 1 year preferably | Electronics | |

| Assessor Certification | |
|--|---|
| Domain Certification | Platform Certification |
| “Field Technician-Air Conditioner”, “ELE/Q3102, v2.0”, Minimum accepted score is 80% | “Trainer”, “MEP/Q2601” with a minimum score of 80% |

Assessment Strategy

1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC
- The assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process & records

2. Testing Environment

To ensure a conducive environment for conducting a test, the trainer will:

- Confirm that the centre is available at the same address as mentioned on SDMS or SIP
- Check the duration of the training.
- Check the Assessment Start and End time to be 10 a.m. and 5 p.m. respectively
- Ensure there are 2 Assessors if the batch size is more than 30.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
- Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
- Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
- Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:

- Question papers created by the Subject Matter Experts (SME)
- Question papers created by the SME verified by the other subject Matter Experts
- Questions are mapped with NOS and PC
- Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
- The assessor must be ToA certified and the trainer must be ToT Certified
- The assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- Centre photographs with signboards and scheme-specific branding
- Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
- Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:

To verify the details submitted by the training centre, the assessor will undertake:

- A surprise visit to the assessment location
- A random audit of the batch
- A random audit of any candidate

6. Method for assessment documentation, archiving, and access

To protect the assessment papers and information, the assessor will ensure:

- Hard copies of the documents are stored

- Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
- Soft copies of the documents & photographs of the assessment are stored on the Hard drive

References

Glossary

| Term | Description |
|------------------------------|---|
| Declarative knowledge | Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem. |
| Key Learning | Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application). |
| OJT (M) | On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site |
| OJT (R) | On-the-job training (Recommended); trainees are recommended the specified hours of training on site |
| Procedural Knowledge | Procedural knowledge addresses how to do something, or how to perform a |
| Training Outcome | Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training. |
| Terminal Outcome | Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome. |

Acronyms and Abbreviations

| Term | Description |
|------|--|
| ISO | International Organization for Standardization |
| NCO | National Occupational Standards |
| NOS | National Skills Qualification Committee |
| NSQF | National Skills Qualification Framework |
| OJT | On-the-Job Training |
| OMR | Optical Mark Recognition |
| PC | Performance Criteria |
| PwD | Persons with Disabilities |
| QP | Qualification Pack |
| SDMS | Skill Development & Management System |
| SIP | Skill India Portal |
| SME | Small and Medium Enterprises |
| SOP | Standard Operating Procedure |
| SSC | Sector Skill Council |
| TC | Trainer Certificate |
| ToA | Training of Assessors |
| ToT | Training of Trainers |
| TP | Training Provider |