

Model Curriculum

Field Technician – Air Conditioner

SECTOR: Electronics
SUB-SECTOR: Consumer Electronics
OCCUPATION: After Sales Service
REF ID: ELE/Q3102 Version1.0
NSQF LEVEL: 4


Skill India
कौशल भारत - कुशल भारत


Skilling India in Electronics


N · S · D · C
National
Skill Development
Corporation
Transforming the skill landscape

Certificate

**CURRICULUM COMPLIANCE TO
QUALIFICATION PACK - NATIONAL
OCCUPATIONAL STANDARDS**
is hereby issued by the
ELECTRONIC SECTOR SKILL COUNCIL OF INDIA
for the
MODEL CURRICULUM
Complying to National Occupational Standards of
Job Role/ Qualification Pack: '**Field Technician - Air Conditioner Version1.0**'
QP No. '**ELE/Q3102 NSQF Level 4**'

Date of Issuance : Nov 15th, 2018
Valid up to* : Nov 15th, 2021
*Valid up to the next review date of the Qualification Pack


Authorised Signatory
(Electronic Sector Skill Council of India)

TABLE OF CONTENTS

1. Curriculum	01
2. Trainer Prerequisites	06
3. Annexure: Assessment Criteria	07

Field Technician – Air Conditioner

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Field Technician – Air Conditioner”, in the “Electronics” Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	Field Technician – Air Conditioner		
Qualification Pack Name & Reference ID	ELE/Q3102 VERSION 1.0		
Version No.	1.0	Version Update Date	15/11/2018
Prerequisites to Training	8th Standard passed / ITI / Diploma (Electrical/Mechanical/RAC) Minimum two years for as helper for 8 th /9 th passed		
Training Outcomes	<p>After completing this programme, the participants will be able to:</p> <ul style="list-style-type: none"> Identify the requirement of the customer by interacting with him Conduct installation and demonstrate the product to the customer's satisfaction Conduct successful repair of the product to customer's satisfaction and get his signatures on job sheet and collect payment, if any, as per company's policy Comply with standard operating procedures for different types of air conditioners Illustrate the soft skills that are required to carry out work efficiently Comply with the standard safety procedures to maintain a safe work area 		

This course encompasses 04 out of 04 National Occupational Standards (NOS) of “Field Technician – Air Conditioner” Qualification Pack issued by “Electronics Sector Skills Council of India”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1.	<p>Role of a Field Technician</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 15:00</p> <p>Corresponding NOS Code Bridge Module</p>	<ul style="list-style-type: none"> List the role of a field technician for Washing Machine Develop an electric circuit and explain its types Identify the basic parameters of electricity Illustrate Ohm’s Law Use a wiring layout while making connections List different components including active, passive and electromechanical used in a circuit Demonstrate how to read values of electronic components with reference to colour coding, polarity, orientation and tolerance Identify the use of different tools such as tester, spanner, wrench, measuring tape, drill machine, pliers, hammer, hacksaw, pipe-cutter, screw driver and test equipment multi-meter, volt -ohmmeter and so on required for installation and repair 	<p>Wiring layout, Basic Tool set, Digital Multi Meter, Digital Clamp Meter, Bulb, Wires, Battery, Loads, Electric circuit components such as diode, transistor, IC, LED, transformer, resistor, capacitor, thermistor, inductor, timer, motor, starter, connector, switch, PCB, relay and circuit breaker</p>
2.	<p>Customer Interaction</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code ELE/N3101</p>	<ul style="list-style-type: none"> Identify the customer requirements Identify the possible problems by interacting with customer on phone. Organize the tools and parts to be taken to customer location Identify the problem based on customer’s information such as symptoms and history of problems, age of appliance and status of upkeep and so on 	

		<ul style="list-style-type: none"> • Check if the customer is aware of the product and its working and inform him about product details (warranty, models, replacement cost and so on) • Estimate the cost and inform the customers about possible solutions and related cost • Develop optimum route complete maximum target visits 	
3.	<p>Installation of Air Conditioners</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 40:00</p> <p>Corresponding NOS Code ELE/N3108</p>	<ul style="list-style-type: none"> • Identify the different types of air conditioners • List different features and functionalities of various AC models • Execute the steps of pre-installation of an air conditioner such as arranging installation-site requirements, check the components after removing the packaging, placing the machine appropriately and make the required installations and connections • Apply installation of Window AC and split ACs following installation manual • Implement a test run after installation and demonstrate the features to the customers • Comply with safety precautions for installation • Organize the post-installation documents and records and inform about job completion • Report to the supervisor about customer issues and work status • Implement packaging waste disposal procedures 	<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>
4.	<p>Repairing an Air Conditioner</p> <p>Theory</p>	<ul style="list-style-type: none"> • Identify the fault as per customer interaction and initial inspection • Check the various electronic components of the air 	<p>Different types of air conditioners such as window and split AC, Testing equipment, Wiring accessories, Tube cutter Tube bender, Flaring tool</p>

	<p>Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 50:00</p> <p>Corresponding NOS Code ELE/N3109</p>	<p>conditioner like compressor, capacitor</p> <ul style="list-style-type: none"> Identify the problem and cause of the problem and perform troubleshooting Check the air conditioner for faults Carry out repairing of different components such as fan, thermostat, brazing in case of gas leak and so on Check the functionality and take customer feedback Comply with the safety procedures Analyze and perform post-repair activities such as documentation, payments and so on 	<p>Brazing tool, Vacuum pump, Weigh scale Gas cylinder, Temperature meter, Pressure gauges</p>
5.	<p>Interaction with Colleagues and Supervisors</p> <p>Theory Duration (hh:mm) 25:00</p> <p>Practical Duration (hh:mm) 25:00</p> <p>Corresponding NOS Code ELE/N9901</p>	<ul style="list-style-type: none"> Illustrate proper interaction with supervisor and escalate problems or hazards Use proper interpersonal skills and etiquettes while interacting with colleagues Resolve personal conflicts Identify the importance of effective communication Demonstrate team building skills to work effectively in a team Implement workplace etiquettes and assist colleagues Assess feedbacks received from the colleagues and customers 	<p>Projector</p>
6.	<p>Safety Standards</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration</p>	<ul style="list-style-type: none"> Identify different hazards related to installation and repair Use safety guidelines while working Comply with the safety policies and general guidelines Comply with the electrical safety guidelines by using proper PPE 	<p>First aid, PPE</p>

	<p>(hh:mm) 30:00</p> <p>Corresponding NOS Code ELE/N3108 ELE/N3109</p>	<ul style="list-style-type: none"> • Use the safety and protection equipment such as Fire extinguisher, Safety instruments and clothing • Apply first-aid whenever required and provide basic first-aid to the needy • Identify and report any accident, injury or a hazard 	
	<p>Total Duration 300:00</p> <p>Theory Duration 120:00</p> <p>Practical Duration 180:00</p>	<p>Unique Equipment Required:</p> <p>Service Manual/ User Manuals (each)</p> <p>AC Power Source, Different type of Air conditioner</p> <p>Multi meter, Pressure Gauge, Electrical Drill, Clamp Meter, Tube Cutter, Tube Bender, Vacuum Pump, Weighing Scale, Gas Cylinder</p> <p>Temperature meter, Spanner, Screw Driver set, Connecting Wires</p> <p>Safety Helmet, Safety Shoes</p>	

Grand Total Course Duration: **300 Hours 0 Minutes**

(This syllabus/ curriculum has been approved by [Electronics Sector Skill Council of India](#))

Trainer Prerequisites for Job role: “Field Technician – Air Conditioner” mapped to Qualification Pack: “ELE/ Q3102” Version 1.0

Sr. No.	Area	Details
1	Job Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ELE/Q3102 version 1.0”
2	Personal Attributes	A Trainer should be free from socio-economic preferences and prejudice. He/ she should be safety conscious and proficient in handling and use security/ safety equipment. Besides being knowledgeable, he/ she should be energetic, motivating, innovative and good at communication. The trainer should be able to establish rapport with the trainees and employ innovative methods to impart instructions.
3	Minimum Educational Qualifications	ITI/Diploma (Electrical/Mechanical/RAC)
4a	Domain Certification	Certified for Job Role: “Field Technician – Air Conditioner” mapped to QP: “ELE/ Q3102 version1.0”. Minimum accepted score is 80%
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102”. Minimum accepted score is 80%
5	Experience	2 years experience to repair AC in any Service Centre

Assessment Criteria for “Field Technician – Air Conditioner”

Job Role	Field Technician – Air Conditioner
Qualification Pack	ELE/Q3102, Version1.0
Sector Skill Council	Electronics Sector Skills Council of India

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. Each NOS will have assessed both for theoretical knowledge and practical
3. The assessment will be based on knowledge bank of questions created by the SSC.
4. Individual assessment agencies will create unique question papers for theory and skill practical part for each candidate at each examination/training center
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Compulsory NOS			Marks Allocation		
Total Marks: 400					
Assessment Outcomes	Performance criteria	Total Marks	Out of	Theory	Skills Practical
ELE/N3101 Engage with customer for service	PC1. check customer complaint registered at customer care or installation schedule	100	3	1	2
	PC2. call customer to confirm problem and fix time for visit		3	1	2
	PC3. greet the customer and confirm the problem registered		4	2	2
	PC4. be polite and patient when interacting with customer		4	2	2
	PC5. check about warranty status of appliance and annual maintenance contract		4	2	2
	PC6. anticipate possible problems to carry tools and parts accordingly		4	2	2
	PC7. ascertain customer location in order to make the route plan for the day		3	1	2
	PC8. enquire about the symptoms and		5	2	3

	history of problems in the appliance				
	PC9. ask about the age of appliance and status of upkeep		5	2	3
	PC10. identify the problem based on customer's information		5	2	3
	PC11. communicate the problems identified and educate on possible reasons		5	2	3
	PC12. inform about costs involved		5	2	3
	PC13. discuss the problem(s) identified with customer		6	2	4
	PC14. suggest possible solutions and costs involved		6	2	4
	PC15. explain the time required and methodology for servicing necessary		6	2	4
	PC16. seek customer's approval on further action		6	2	4
	PC17. accurately assess the problem and solution(s) necessary		4	1	3
	PC18. offer most appropriate and cost-effective service as per customer's requirement		4	2	2
	PC19. communicate problem effectively in order to secure customer's confidence		4	2	2
	PC20. ensure customer satisfaction and positive feedback		4	2	2
	PC21. record minimum customer complaints post service		4	2	2
	PC22. avoid repeat problem post service		3	1	2
	PC23. prepare most optimum route plan to complete daily target visits		3	1	2
	Total		100	40	60
ELE/N3108 Install the air conditioner	PC1. visit the customer's premise before carrying out the installation	100	3	2	1
	PC2. interact with the customer to understand where the air conditioner is to be installed, i.e., window, split, high, low,		3	2	1
	PC3. check that the location meets structural requirements such as distance from power supply, distance from windows/doors being opened frequently		3	2	1
	PC4. make the customer aware of any pre-installations/masonry/electrical work to be carried out and educate the		3	2	1

customer about requirement of concealed drainage and electric conduits			
PC5. make necessary markings for placement of indoor and outdoor units	3	2	1
PC6. seek appointment for the next visit	3	2	1
PC7. remove the air conditioner packaging in which it was shipped to customer from point of sale/ warehouse	3	2	1
PC8. check that the product matches the customer order in terms of colour and make	3	2	1
PC9. check that all supporting accessories purchased have are there in the pack	3	2	1
PC10. check that tools and fitments required for the installation are available	3	2	1
PC11. clear up the packaging material waste and dispose as per company's norms	3	2	1
PC12. check if pre-installation requirements are met	3	2	1
PC13. maintain required distance from door/window	3	2	1
PC14. make measurements at the location identified and drill holes ensuring no internal wiring damage takes place	3	2	1
PC15. mount the indoor unit and ensure that the screws are fastened securely	3	2	1
PC16. place the outdoor unit at a suitable location and attach it firmly to wall/floor	3	2	1
PC17. connect the indoor and the outdoor units using the	3	2	1
field copper pipe of appropriate size and interconnecting cables	3	2	1
PC18. fill in additional gas if the distance between the indoor	3	2	1
and the outdoor units is more than what is recommended	3	2	1
PC19. make necessary power supply connections	3	2	1
PC20. align the air conditioner as per the instruction's manual	3	2	1
PC21. demonstrate the features and utility	3	2	1
PC22. explain the precautions to be taken while using the air conditioner	3	2	1
PC23. fill in customer acknowledgement form	2	1	1
PC24. seek customer's signature	2	1	1
PC25. complete other documentation for recording completion of installation	2	1	1

	PC26. call customer care and inform about job completed		2	1	1
	PC27. understand the work requirement from superior periodically		2	0	2
	PC28. report to superior on the work completed		2	1	1
	PC29. escalate the customer issues and problems that are unresolved in the field		2	1	1
	PC30. document the work completed on the company ERP software for tracking and future references		2	1	1
	PC31. remove packaging without damage to the air conditioner unit and accessories		2	1	1
	PC32. position air conditioner as per requirements specified in instructions manual		2	1	1
	PC33. educate customer on importance of proper placing		2	1	1
	PC34. inform about switching off the unit during voltage fluctuations and use of stabilizers, if necessary		2	1	1
	PC35. carry and use the correct tools and equipment for installation		2	1	1
	PC36. operate and check that they are in a safe and stable condition		2	1	1
	PC37. complete installation in time target given		2	1	1
	PC38. educate customer on proper operation and maintenance procedures		2	1	1
	PC39. complete daily field schedule as per instructions/format within the designated time		2	1	1
			100	40	60
ELE/N3109 Repair dysfunctional air conditioner	PC1. understand usage pattern of the air conditioner from the customer	100	3	2	1
	PC2. diagnose the fault based on customer interaction and initial inspection		3	2	1
	PC3. unplug the unit, carry out basic tests such as power supply inspection, volt ampere test and earthing test power supply, compressor, motors, PCB, condenser		3	2	1
	PC4. separate and inspect every module of the unit if the fault is not identified through basic tests		3	2	1
	PC5. send to factory for in depth diagnosis, if problem remains un-identified at site		3	2	1
	PC6. replace component at location, if the fault identified is because of damage of components such as relay or thermostat		4	2	2

PC7. remove and replace the faulty module with a functional one, either on a second visit or as pre-identified and collected from the service center, if the problem is at the PCB level or components that cannot be replaced at site	4	2	2
PC8. carry out brazing operation at the customer premise or pass the complaint on to a specialist in-charge of handling brazing, if the fault identified is a gas leak	4	2	2
PC9. reassemble the unit	4	2	2
PC10. switch on power supply and confirm that unit is functioning	4	2	2
PC11. check that all the modules of the unit work as per specifications	4	2	2
PC12. demonstrate and confirm functionality of the unit with customer	4	2	2
PC13. educate the customer about cleaning procedures and other best practices	4	2	2
PC14. collect necessary payments from the customer, if applicable	4	2	2
PC15. fill in customer acknowledgement form	3	2	1
PC16. complete other documentation procedures to record complaint closure	3	2	1
PC17. ensure damage free handling of the unit	3	2	1
PC18. diagnose the problem accurately and in assigned time	3	2	1
PC19. identify the problem modules accurately such as the power supply, compressor, fan motors, PCB	3	2	1
PC20. fix the dysfunctional air conditioner in designated time	3	2	1
PC21. rectify completely to avoid repeat fault in the air conditioner	3	2	1
PC22. record minimum customer complaints post service	3	2	
PC23. meet daily target on attending to number of complaints	3	2	1
PC24. select the right spares according to recorded complaints at the customer care	3	2	1
PC25. clearly communicate type of module required to the service centre, if a faulty module is to be replaced	3	2	1
PC26. secure repairs completion receipt from customer	3	2	1
PC27. educate customer on air conditioner maintenance and correct practices to follow in order to avoid further	3	2	1

	problems				
	PC28. ensure 100% customer satisfaction		3	2	1
	PC29. recover payments as per rate sheet/ communication from customer care		3	2	1
	PC30. sell related products such as new equipment or Annual Maintenance Contracts (AMC) as per company policy		3	2	1
			100	40	60
ELE/N9901 Interact with colleagues	PC1. understand work requirements, targets and incentives	100	5	2	3
	PC2. learn about new product models, their features and functions		5	2	3
	PC3. report problems identified in the field		5	2	3
	PC4. escalate customer concerns that cannot be handled on field		5	2	3
	PC5. resolve personnel issues		5	2	3
	PC6. receive feedback on work standards and customer satisfaction		5	2	3
	PC7. communicate any potential hazards at a particular location		5	2	3
	PC8. meet given targets		5	2	3
	PC9. deliver work of expected quality despite constraints		5	2	3
	PC10. Have feedback from a happy and satisfied customer		5	2	3
	PC11. resolve inter-personnel conflicts and achieve smooth workflow		8	3	5
	PC12. receive spares from tool room or stores		8	3	5
	PC13. deposit faulty modules and tools to stores		8	3	5
	PC14. pass on customer complaints to colleagues in a respective geographical area		9	4	5
	PC15. assist colleagues with resolving field problems		9	4	5
	PC16. clearly demarcate roles of each team member		8	3	5
	Total		100	40	60