

Demonstrate different charger specifications

Objective: At the end of this exercise you shall be able to
 • explain differnt charger specification electric vehicle.

Requirements			
Materials			
• A4 Sheet	- 1 No.	• Eraser	- 1 No.
• Pencil	- 1 No.	• Different chargers	- as reqd.

PROCEDURE

1 Table below showcases the mapping of different charger specification in India.

S.No.	Charging Station	Voltage (V)	Power (kW)	Type of Vehicle	Type of compatible charger
1	Level 1 (AC)	240	≤ 3.5 kW	4w, 3w, 2w	Type 1, BharatAC-001
2	Level 1 (DC)	≥ 48	≤ 15 kW	4w, 3w, 2w	Bharat DC-001
3	Level 2 (AC)	380-400	≤ 22 kW	4w, 3w, 2w	Type 1, Type 2, GB/T , BharatAC-001
4	Level 3 (AC)	200-1000	22 to 4.3 kW	4w	Type 2
5	Level 3 (DC)	200-1000	Up to 400 kW	4w	Type 2, CHAdeMO, CCS1, CCS2

The Ministry of power has issued the revised consolidated guidelines and standards for charging infrastructure for E-Vehicle on 14th January 2022. The objective is to enable a faster adoption of E-vehicle in India by ensuring safe, reliable accessible and affordable E-vehicle charging infrastructure and eco-system.

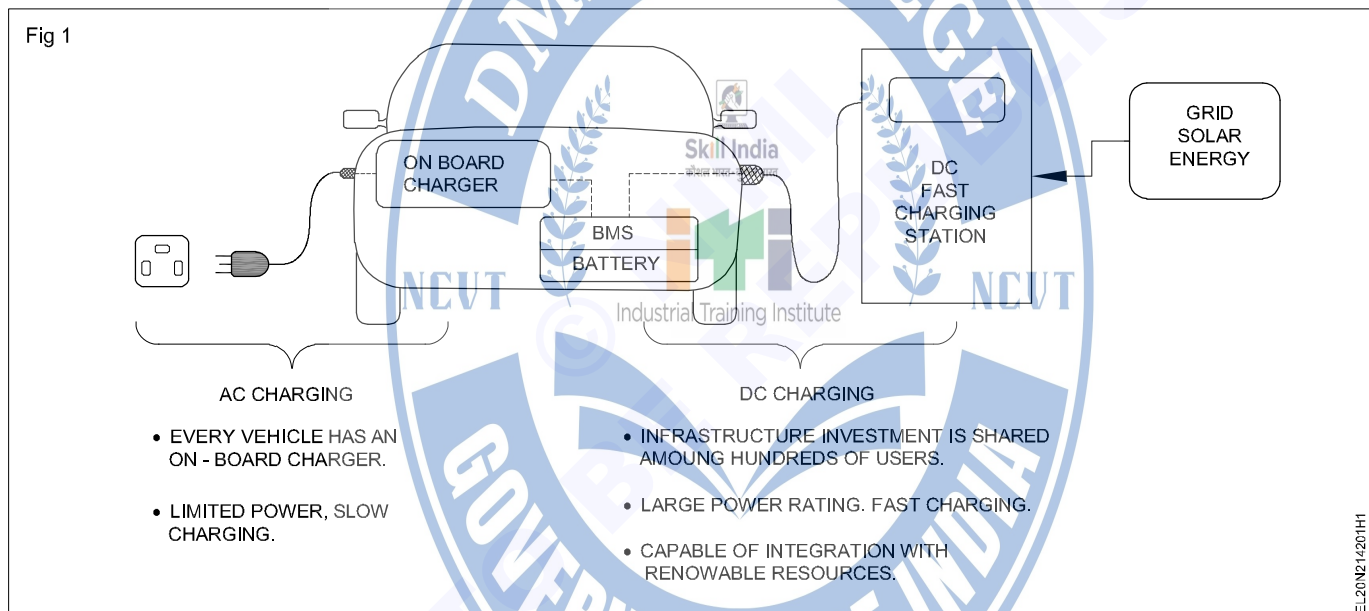
Perform installation of EV charging station for public place

Objective: At the end of this exercise you shall be able to
 • explain installation of EV charging station for public places.

Requirements			
Tools/Instruments		Materials	
• Electrician tool kit	- 1 No.	• Insulation tester	- 1 No.
• EV charging station unit for public	- 1 No.	• Charging probes	- as reqd.
		• 6 square mm PVC copper insulated cable	- as reqd.

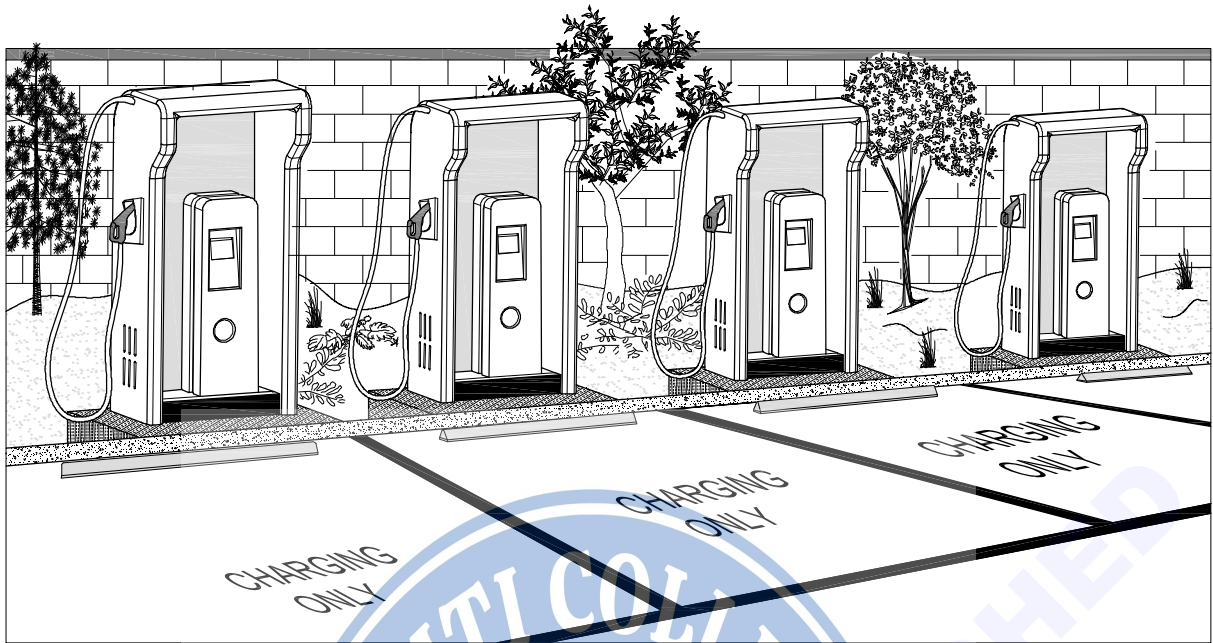
PROCEDURE

- Instructor may take the trainees to a nearest EV charging station.
- Before entering EV charging station the trainer may explain all components of EV station. (Fig 1)



- Components of EV station,
 - Three pin plug socket
 - On board charger
 - Battery Management System (BMS)
 - DC fast charging station
- Trace the various components of EV charging station by its specification.
- Note down the block diagram of EV charging unit.
- Get approval from the component authority then connect any E-vehicle (2-Wheeler or 4-Wheeler) to the charging unit and note down the voltage and current readings. (Fig 2)

Fig 2



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Perform installation of home EV charging stations

Objectives: At the end of this exercise you shall be able to
 • explain installation o home EV charging station.

Requirements			
Tools/Instruments		Materials	
• Electrician tool kit	- 1 No.	• Insulation tester	- 1 No.
• EV charging unit for home	- 1 No.	• Charging probes	- as reqd.
• Multimeter	- 1 No.	• 4 square mm copper insulation cable	- as reqd.

PROCEDURE

- 1 Collect EV charging unit from the store.
- 2 Identify the suitable space for EV charging unit.
- 3 Fix charging unit on the wall.
- 4 Select suitable PVC cable (4 mm²).
- 5 Connect 230V supply to he EV charging unit.
- 6 Before giving supply to the charging unit measure supply voltage using multimeter.
- 7 Connect EV charging unit to the four wheeler as shown in Fig 1.
- 8 Get approval from your instructor.
- 9 Avoid loose connections.
- 10 Show the control panel working to your instructor and get it approved.

Note: Remove the wiring as you did in the Ex.No.2.8.167(i) and preserve the remaining devices fitted for the next exercise 2.8.167(iv)

Fig 1



Project work

Objectives: The Trainees/Participants shall be able to

- select a project work of their choice
 - prepare the list of materials required and collect them
 - list out the tools required
 - prepare a brief note on the project
 - complete the project and submit the project report with all the details.
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Note: Instructor has to explain in detail regarding the project works to be carried out in the section. The trainees may be divided in groups according to the strength available in section and give all details how to prepare and finish the work with complete workmanship and accuracy.

Note: Instructor has to evaluate the project work with all records and reports. Marks to be awarded for the project working, accuracy, workmanship, safety features and its work performance related to the viva questions.

- Step to start and follow the project work
- Motivate the group by emphasising the technical work involved and its future influences.
- Divide the work equally and make sure in yoke participating with full interest.
- Start the project work, test it stage by stage and complete it.
- Test the completed project job for its functionality and its utility.
- Prepare a project report containing its technical parameters, specification, material requirement and its cost, operational procedure, maintenance, utility and marketing etc.
- Indicate the scope of future expansion, easy conversion to other project for advanced version in the report.
- Get it checked with your instructor.

The project should be completed with all operational with instructions necessary procedure.

Safety devices are to be placed according to the project and its functions.

Maintenance and repair instructions should be indicated clearly.

Project works

- 1 Battery charger/Emergency light
- 2 Control of motor pump with tank level
- 3 DC voltage converter using SCRs
- 4 Logic control circuits using relays
- 5 Alarm/indicator circuits using sensors

Note :

- 1 Some of the sample project works (indicative only) are given against each semester.
- 2 Instructor may design their own project and also inputs from local industry may be taken for designing such new project.
- 3 The project should proudly cover maximum skills in the particular trade and must involve some problem solving skill. Emphasis should be on Teamwork: Knowing the power of synergy/collaboration, work to be assigned in a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit Project report.
- 4 If the instructor feels that for execution of specific project more time is required than he may plan accordingly to produce components /sub-assemblies in appropriate time i.e., may be in the previous semester or during execution of normal trade practical.