

INSTALL SOLAR PV SYSTEMS

UNIT CODE: 0713 351 08A

TVET CDACC UNIT CODE: ENG/0S/SPV/CR/02/4/MA

UNIT DESCRIPTION

This unit covers the competences required in Install Solar PV Systems. Competences include; applying electrical concepts, constructing Solar PV support structures, installing Solar PV system components and maintaining solar PV system.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>(Bold and italicised terms are elaborated in the Range)</i>
1. Apply basic electrical concepts	1.1 <i>Electrical fundamental principles</i> are applied according to circuit network requirements 1.2 <i>Electrical passive components</i> are used according to AC circuit network requirements 1.3 <i>Electromagnetic induction machines</i> are used as per work requirement
2. Construct Solar PV support structures	2.1 Safety procedures are applied as per work requirements. 2.2 solar PV module structure is constructed as per design requirement. 2.3 Solar PV batteries structures is constructed as per design requirement.
3. Install Solar PV system components	3.1 <i>Solar PV module</i> is mounted as per layout 3.2 Charger controller is mounted as per layout 3.3 <i>Solar PV batteries</i> are installed as per layout 3.4 Inverter is installed as per layout 3.5 Cables are jointed as per system layout. 3.6 <i>Lightening arrestor</i> is installed as per design

	3.7 Housekeeping practice is performed as per work requirement.
4. Maintain Solar PV System	4.1 Materials are prepared as per work requirement. 4.2 Solar PV system test is performed as per IET regulations. 4.3 Maintenance is carried out as per IET regulations 4.4 Maintenance report is prepared as per work procedure.

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Electrical fundamental principles include but not limited to:	• Ohms law • DC and AC current principles
2. Solar PV module may include but is not limited to:	• Mono crystalline • Poly crystalline • Amorphous • Series connection up to 1000 wp • Parallel connection up to 1000 wp • Series-parallel connection up to 1000 wp
3. Solar PV batteries may include but is not limited to:	• Maintenance free • Flooded type • Series connection up to 24v • Parallel connection up to 24v • Series-parallel connection up to 24v
4. Lightening arrestor may include but is not limited to:	• Rod gap arrester • Earth Rod • Surge arrestor (SPD)

5. Housekeeping practice may include but is not limited to:	• Waste disposal • Recycle • Reuse • Reduce
6. Solar PV system test may include but is not limited to:	• Short circuit systems (Isc) • Open circuit voltage (Voc) • Battery voltage • Battery current
7. Maintenance may include but is not limited to:	• Cleaning the modules • Cleaning battery terminals • Applying jelly/grease on battery terminals • Checking states of electrolytes

REQUIRED KNOWLEDGE

The individual needs to demonstrate knowledge of:

- Technical drawing
- Workshop technology
- IEE regulations
- Electrical Technology
- Renewable energy
- Building codes

FOUNDATION SKILLS

- Environmental literacy
- Occupational safety and health practices
- Interpret electrical drawing
- Identification and proper use of electrical tools

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and understanding and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Applied electrical fundamental principles as per work requirement 1.2 Constructed Solar PV support structures 1.3 Mounted Solar PV module as per layout 1.4 Mounted Charger controller as per layout 1.5 Installed Solar PV batteries as per layout 1.6 Installed Inverter as per layout 1.7 Joined Cables as per system layout 1.8 Maintained Solar PV System
2. Resource Implications	The following resources must be provided: Resources same as that of workplace are advised to be applied including 2. 1 Measuring tools 2. 2 Cutting tools 2. 3 Fastening tools 2. 4 PPE 2. 5 Accessories and cables
3. Methods of Assessment	Competency may be assessed through: 1.1 Practical demonstration 1.2 Projects 1.3 Written tests 1.4 Oral test
4. Context of Assessment	Competency may be assessed in a work place or a simulated work place.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.