

# Solar PV

## Practical course



### 2 Day PV course

This course covers installation principles and system design from a practical point of view.

See what to look out for when doing PV installations in order to reduce your risk as a contractor & increase your profit as an EPC.

**Content:** See the next page for a detailed outline of the course.

**When:** Courses are presented nationally on a regular basis. Contact us for the next available date in your region

**Where:** Midrand, PE, Cape Town, East London, Bloemfontein, Durban & Kimberley

**Time:** The workshops start at 09:00. In certain areas the times allocated to training may vary. Please confirm times as indicated on the program that will be circulated as

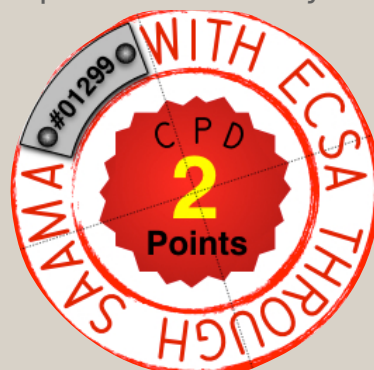
**Safety:** Indemnity forms might need to be completed in some classes, there may be physical testing of systems in which case safety gloves & or goggles will prevent accidental contact & reduce risks associated with physical activity.

For more information, enquiries, or; to register for the course: [Click here.....](#)

#### Cost Includes:

Lunch, training materials, equipment required to do the practical.

R3000 per person for the 2 day workshops.



# Solar PV Practical Course Outline

## Introduction

- What is happening locally with PV installations
- Local installation statistics

## The sun as a resource

- Insulation
- Efficiency Comparison - Solar Thermal vs PV
- Watts/m<sup>2</sup>

## PV Technology

- Performance of PV since the 1950's
- Manufacturing processes
- Thin Film, Mono & Poly Crystalline
- Series and parallel
- Fuse calculation
- Effect of temp on solar PV

## Cable Calculations

- Volt drop

## Earthing & SPD's

- Wiring options and alternatives
- Earthing tests

## Inverters

- Micro, Hybrid, String, AC & DC Optimisers
- Double vs single MPPT's

## Batteries

- Charging and discharging
- Fuses, circuit breakers and PSSC
- Insulating batteries

## Safety

- Working at heights
- Electrical safety

## Combiner boxes

- Using DC vs AC circuit breakers

## Mounting structures

- Structure design
- Different Brands available locally

## Standards

- NRS range of standards
- Development of new local standards
- International applicable standards
- Training and development

## Energy Efficiency & Demand Assessment

- Reducing consumption
- Efficiencies of SWH vs. PV
- Using PV powered elements
- Measuring & Calculating Loads

## Off-Grid

- Pure vs modified sine wave inverters
- Charge controllers

## Design of Grid Tied Systems

- Design
- Installation Guidelines &;
- Fault finding

## About the presenter & course content:

By the end of 2015 this training course had been presented to more than 1000 electricians, engineers and entrepreneurs since 2013.

As former Ombudsman for the Sustainable Energy Society of SA, Carel was responsible for identifying possible issues in solar installations and developing training materials for the solar sector. Currently Carel is also a consultant for the Copper Development Association Africa overseeing the water and electrical industry locally. As electrician he has done a number of PV installations, is involved with the development of local PV standards and currently only focusses on the local solar PV commercial, agricultural and residential sectors from a training and standards point of view. "I believe that knowledge of the sector and technology is key to the sustainable growth of the industry and thereby have been creating a hub of local information on solar PV installations, products and contractors from which candidates attending should benefit. Our training material only covers locally available products and explores the effect of local conditions on solar PV. This is a practical course for candidates that are ready to handle more information on PV. Learn about and use the various parameters to design and calculate panels, fuse sizes and batteries."



# PDF Registration form

## 2 Day Practical PV Course



### For invoicing purposes:

Company name:

VAT nr:

Company registration nr:   
(if required)

Company physical address:

Company Suburb, town or city:

Company region:   
(province)

Contact person at company:

Contact number at company:

E-mail address of contact:

### Candidate information:

Name:

Surname:

I.D. nr:   
(optional)

Cell or Mobile nr:

Candidate Province of residence:

E-mail address:

Occupation:

Please select province of interest:      Solar PV Practical 2 day course:      Gauteng

Cape Town       BFN       P.E       East London       Kimberley       Durban

This form is intended to serve as a registration form for one of the solar courses offered by [www.pqrs.co.za](http://www.pqrs.co.za). On completion; this form should be e-mailed to [carel.ballack@pqrs.co.za](mailto:carel.ballack@pqrs.co.za). Visit [www.pqrs.co.za](http://www.pqrs.co.za) or; alternatively contact at Carel at 082 322 2601 for more information.