

SERC Training for Solar Water Pumping (PVP)

Course Content

1	ELECTRICAL ENERGY BASICS	9	PUMP MOTORS
1.1	Electrical Power	9.1	Brushless DC Motors
2	CIRCUIT MEASUREMENTS	9.2	AC Induction Motors
2.1	Short Circuit Current	9.3	Variable Frequency Drives
2.2	Open Circuit Voltage	9.4	International Motor Standards
3	PASSIVE COMPONENTS	9.5	Motor Protection
3.1	Serial Circuits	10	FLUIDDYNAMICS
3.2	Parallel Circuits	10.1	Atmospheric Pressure
3.3	Mixed Circuits	10.2	Pressure vs. Head
4	V/I CURVES OF PV PANELS	10.3	Calculating Pressure
4.1	Maximum Power Point Tracking	10.4	Static Heads
4.2	PV Panel Arrays	11	PUMP MECHANICS
4.3	Serial Connection of PV Panels	11.1	Pump Curves
4.4	Parallel Connection of PV Panels	11.2	System Curves
5	SHADING	11.3	Net Suction Head
5.1	Declination of the Sun	11.4	Regulating Pump Performance
5.2	Forms of Shading	12	PUMP MECHANICS
5.3	Cell Shading	12.1	Centrifugal Pump Types
5.4	Bypass Diodes	13	PUMP MOTORS
5.5	Panel Shading	13.1	Brushless DC Motors
6	ALTERNATING CURRENT	13.2	AC Induction Motors
6.1	Transformers	13.3	Variable Frequency Drives
7	ELECTRIC SHOCK PREVENTION	13.4	International Motor Standards
7.1	Basic Protection	13.5	Motor Protection
7.2	Fault Protection	14	HYDROLOGY
7.3	Additional Protection by RCD	14.1	Aquifers
7.4	Overload Protection	15.7	Mechanical Protection
7.5	Protection for PV Generators	14.2	Borehole Drilling
7.6	Arc Flashes	15	IRRIGATION
8	LIGHTNING PROTECTION	15.1	Soil
8.1	Risk Assessment	15.2	Irrigation Methods
8.2	PV without Lightning Protection	15.3	Surface Irrigation
8.3	Surge Protection	15.4	Sub Surface Irrigation
8.4	Buildings with Lightning Protection	15.5	Drip Irrigation
		15.6	Sprinkler Irrigation

Course Length: 5 Days

Participants will receive SERC training certificate after submitting their PVP project.

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