TABLE OF CONTENT

Chapter 1 Solar Inverter
1.1 Introduction
1.2 What is an inverter
1.3 Converters
1.4 Input voltage of an inverter
1.5 Output Voltage of an inverter
1.6 Nominal voltage of an inverter
1.7 Inverter rating
1.8 Units of conversion when discussing solar inverter
1.9 Inverter sizes and their nominal voltage
1.10 Factors that determine the size of a solar inverter
1.11 Power
1.12 Efficiency
1.13 Apparent power
1.14 Real power, True Power or Active power
1.15 Reactive power
1.16 Power factor
1.17 Unity power factor
1.18 Significance of a good power factor when sizing a solar inverter
1.19 What causes poor power factor
1.20 Effect of poor power factor when sizing solar inverter
1.21 Data sheet and Name plate
1.22 Tolerance
1.23 Factors that affect the design and sizing of a solar inverter
1.24 How to reduce cost of a solar system installation
1.25 Sizing the solar inverter
1.26 How to confirm the correctness of the size of your solar inverter choice
1.27 Sizing a solar inverter with different nominal voltages to power the same load size (Standalone design)
1.28 Advantages/disadvantages of designing a solar inverter with the above
1.29 Designing a solar inverter for inductive loads (Surge loads)
1.30 Advantages and disadvantages of downsizing a solar system
1.31 Advantages and disadvantages of Oversizing a solar system
1.32 Inverter features
1.33 Standard inverter features

1.34 Optional Inverter features
1.35 Standalone Inverter Features
1.36 Specifying standalone inverters
1.37 Features of grid-tied battery back-up inverters
1.38 Specifying a grid-tied battery back-up solar inverter
1.39 Features of battery-less grid-tied inverters
1.40 Specifying battery-less grid-tied inverters

Chapter 2 Solar Battery
2.1 A solar battery
2.2 Ratings of solar battery
2.3 Differences between residential solar battery and commercial solar battery
2.4 Why choose 12V/200Ah for residential solar battery and 2V/1000Ah for commercial solar battery
2.5 Charging
2.6 High voltage disconnect
2.7 Discharging
2.8 Low voltage disconnect
2.9 undercharging
2.10 A cycle
2.11 Cycle Life
2.12 Factors affecting life cycle of a solar battery
2.13 Battery specification
2.14 Days of autonomy
2.15 Battery capacity
2.16 Rate of discharge
2.17 Depth of discharge
2.18 Battery state of charge
2.19 Different ways of testing your solar battery state of charge
2.20 Life expectancy
2.21 Environmental conditions
2.22 Measurement of solar battery parameters
2.23 How to test for open circuit voltage
2.24 How to test for short circuit voltage
2.25 Knowing your solar battery condition
2.26 Factors affecting the size of a solar battery

2.27 Battery sizing
2.28 Sizing lead acid battery
2.29 Sizing lithium battery
2.30 Sizing solar battery for critical loads
2.31 Battery connection
2.32 Series connection
2.33 Parallel connection
2.34 Series/parallel connection

Chapter 3 Solar Panel
3.1 Introduction
3.2 Solar panel rating
3.3 Module characteristics
3.4 Cell material
3.5 Types of solar panel
3.6 Monocrystalline solar panels
3.7 Polycrystalline solar panels
3.8 Amorphous or thin film solar panel
3.9 Passivated Emitter and Rear Cell (PERC) panels
3.10 Concentrated PV cells (CVP)
3.11 How to choose your solar panel
3.12 Solar panel efficiency VS cost
3.13 Panel terminal
3.14 Solar panel efficiency
3.15 Factors affecting solar panel efficiency
3.16 Classification of solar panel by voltage
3.17 How to know a 12V solar panel
3.18 How to know a 24V solar panel
3.19 Distinguishing a 12V panel from a 24V solar panel
3.20 Half-cut or Half-cell solar panel
3.21 Advantages of half-cut solar panel
3.22 Module performance
3.23 I – Curve
3.24 Maximum power point
3.25 Open circuit Voltage
3.26 Short circuit Current
3.27 Solar panel name plate

3.28 Which solar panel type should you use
3.29 Types of connection
3.30 Series connection
3.31 Parallel connection
3.32 Series/Parallel Connection
3.33 Connecting solar panels of different ratings in series
3.34 Connecting solar panels of different ratings in parallel
3.35 Factors affecting solar panel performance
3.36 Factors affecting solar panel sizing
3.37 Solar panel sizing

Chapter 4 Solar Charge Controller
4.1 What are solar controllers
4.2 Rating of solar charge controller
4.3 Types of solar charge controller
4.4 Shunt charge controller
4.5 Single-Stage series charge controller
4.6 Diversion charge controllers
4.7 Pulse width modulation controllers
4.8 Maximum Power Point Tracking (MPPT) controllers
4.9 Solar Charge controllers features
4.10 Sizing solar Charge controllers