



SMART ENERGY ANALYZER

Model No: SMART-VEN 485

- The Smart Controller Multi-function Panel Meter
- Smart VEN485 is a state of the art intelligent panel meter, used not only in the electricity transmission and power distribution system



INTRODUCTION

This document provides operating, maintenance and instructions for the Smart Controller Smart VEN485. The unit measures and displays the characteristics of single phase two wires and three phase four wires supplies, including voltage, frequency, current, power and active and reactive energy, imported or exported. Energy is measured in terms of kWh, kVarh.

Maximum demand current can be measured over preset periods of up to 60 minutes. In order to measure energy, the unit requires voltage and current inputs in addition to the supply required to power the product. The requisite current input(s) are obtained via current transformers (CT). The Smart VEN485 can be configured to work with a wide range of CTs giving the unit a wide range of operation. Built-in interfaces provide pulse and RS485 Modbus RTU outputs. Configuration is password protected.

The unit can be configured to operate with CT ratio between primary and secondary current is 1 and 2000. Maximum CT primary current corresponds to a maximum input current to the unit of 1/5.



UNIT CHARACTERISTICS

The Smart VEN485 can measure and display:

- Line voltage and THD% (total harmonic distortion) of all phases.
- Line frequency.
- Currents, current demands and current THD% of all phases.
- Power, maximum power demand and power factor.
- Active energy imported and exported.
- Reactive energy imported and exported.
- Changing password.
- Supply system selection 1phase 2wire, 3phase 4wires.
- CT ratio and secondary current.
- PT ratio and secondary voltage.
- Demand interval time.
- Reset for demand measurements.
- Pulse output duration.

This unit provides 2 pulse outputs. One pulse output is configurable, which can be set from the SETUP menu to refer to active or reactive energy (total, import, export). While, another pulse output is fixed to total active energy, the constant is 3200imp/kWh.

MEASURED PARAMETERS

The Unit can monitor and display the following parameters of a Single Phase, 3 - Phase 3 - Wire or 3 Phase 4 - Wire supply.

POWER FACTOR AND FREQUENCY MAX

- Frequency in Hz
- Instantaneous Power
- Power 0 to 999MW
- Reactive Power 0 to 999MVA
- Volt-Amps 0 to 999 MVA
- Maximum demanded power since last demand reset power factor
- Maximum neutral demand current, since the last demand reset (three phase supplies only)



REFERENCE CONDITIONS OF INFLUENCE QUANTITIES

Influence quantities are variables that affect measurement errorsto a minor degree. Accuracy is verified under nominal value (within the specified tolerance) of these conditions.

ACCURACY

Voltage	0.5% of range maximum
Current	0.5% of nominal
Frequency	0.2% of mid-frequency
Power Factor	±1% of Unity (0.01)
Active Power (W)	±1% of range maximum
Reactive Power (VAR)	±2% of range maximum
Apparent Power (VA)	1% of range maximum
Active Energy (Wh)	Class 1 IEC 62053-21
Reactive Energy (VARh)	±2% of range maximum
Temperature Co-Efficient	Voltage and current = 0.013%/°C typical Active energy = 0.018%/°C, typical
Response Time to Step Input	1s, typical, to >99% of final reading, at 50 Hz.

REFERENCE CONDITIONS

Aambient Temperature	23°C ±1°C
Input Waveform	50 or 60Hz ±2%
Input Waveform	Sinusoidal (distortion factor < 0.005)
Auxiliary Supply Voltage	Nominal ±1%
Auxiliary Supply frequency	Nominal ±1%
Auxiliary Supply waveform (if AC)	Sinusoidal (distortion factor < 0.005)
Magnetic Field of external origin	Terrestrial flux

ENERGY MEASUREMENTS

Imported Active Energy	0 to 9999999.9 kWh
Exported Active Energy	0 to 9999999.9 kWh
Imported Reactive Energy	0 to 9999999.9 kVARh
Exported Reactive Energy	0 to 9999999.9 kVARh
Total Active Energy	0 to 9999999.9 kWh
Total Reactive Energy	0 to 9999999.9 kVARh

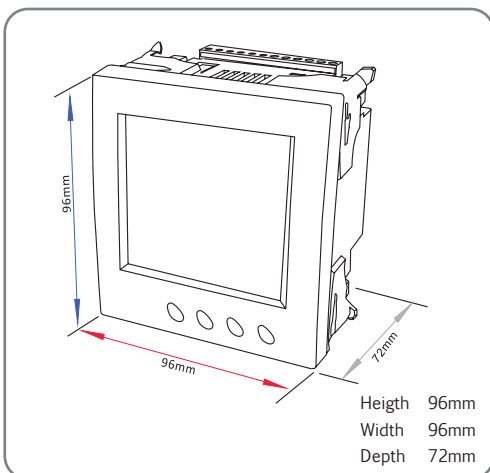
ENVIRONMENT

Operating Temperature	-25°C to +55°C*
Storage Temperature	-40°C to +70°C*
Relative Humidity	0 to 90%, non--condensing
Altitude	Upto 2000m
Warm up time	1 minute
Vibration	10Hz to 50Hz, IEC 60068-2-
Shock	30g in 3 planes

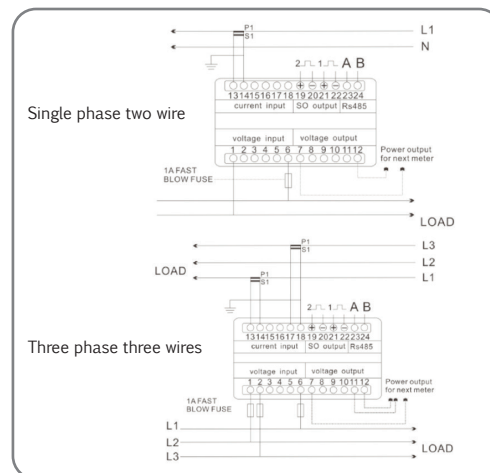
RS485 OUTPUT FOR MODBUS RTU

Baud Rate	2400,4800,9600,19200,38400
Parity	none/odd/even
Stop Bits	1 or 2
RS485 Network Address	nnn – 3-digit number, 1 to 247
Modbus™ Word Order	Hi/Lo byte order is set autom to normal or reverse. It canno configured from the set-up menu.

DIMENSIONS



WIRING DIAGRAM

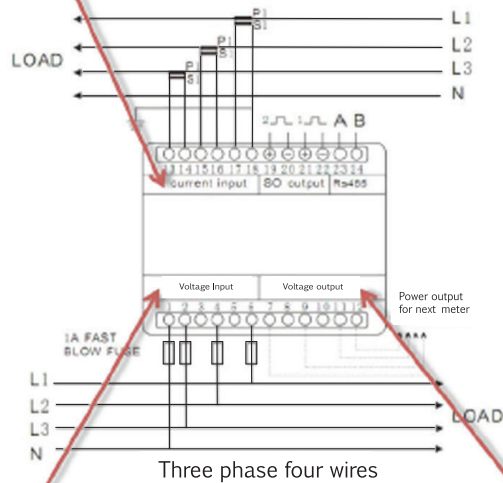
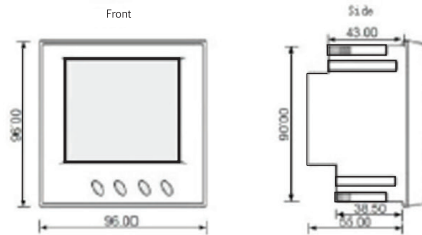


PLUG IN METERING SOLUTION:

DIMENSIONS:



1.Current Transformer Input



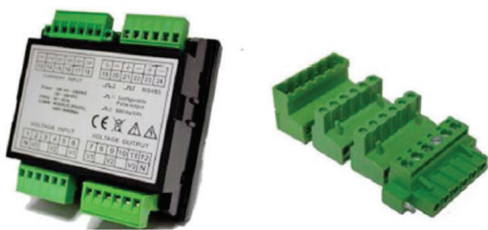
Three phase four wires



2.Fuse Voltage Input



3.Voltage Output to power the next meters (up to 16)



TERMINAL KIT OPTON

Optional terminal kit for customers who want to per-manufacture their own wiring looms. Also the terminal kit can be used for any standard Single Phase or split core current transformer with a 1A or 5A secondary. No requirement for additional convertors or hardware

PARAMETERS

- Phase to Phase Voltage
- Phase to Neutral Voltage
- Frequency
- Voltage total harmonic distortion (THD)
- Current
- Neutral current (Calculated modbus only)
- Current max demand (Modbus only)
- Current total harmonic distortion (THD)
- kW
- KVAr
- kW max demand
- Power factor
- Import kWh
- Export kWh
- Import kVarh