

smartcontroller

Electrical Excellence

PRODUCT CATALOGUE

PANEL MOUNTED METER





SMART SERIES, SINGLE PHASE VOLT METER

Model No: SMART-V200 V

- High Precision Measurement of Single Phase Voltage
- Programmable Voltage Ratio
- Auxiliary Power Supply
- Accuracy Class 0.5 or 1
- Size 96 x 96



INTRODUCTION

Smart Controller offers the smart series Single Phase Volt Meter which adopts alternating current sampling techniques. This enables it to measure single phase voltage in the grid with high accuracy, good sensitivity and excellent resistance to vibrations.

INSTALLATION AND HANDLING

The device is easy to maintain and handle, easy to wire and very simple to install for the ease of user and only qualified person should be involved in the wiring and installation job of this power meter. Certain part of the power meter does contain high voltage, improper handling therefore can cause serious injuries and device damage.

There are certain points that need to be taken into strict account as follow:

- Only use insulating tools.
- Do not connect when circuit is live.
- Place the device in only dry surroundings.
- Make sure that the wire used is suitable for the maximum current of this meter.

ELECTROMAGNETIC COMPATIBILITY

ESD (Electro-Static Discharge):

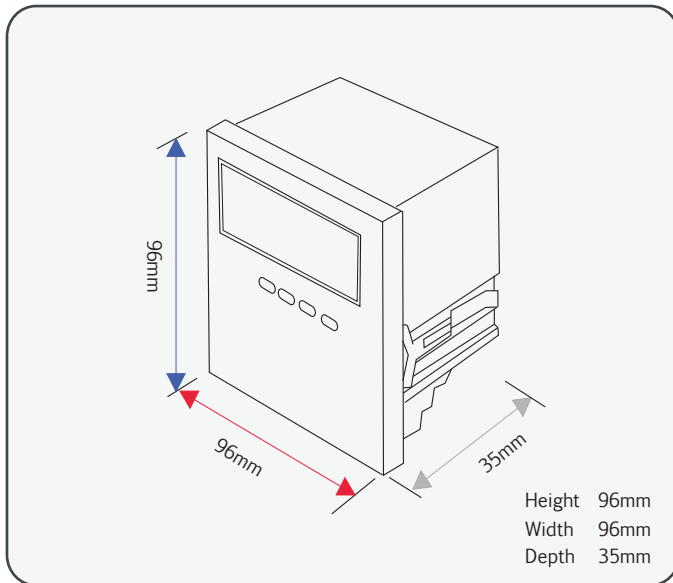
Level 4 Electrical fast transient burst: Level 4

MEASUREMENT

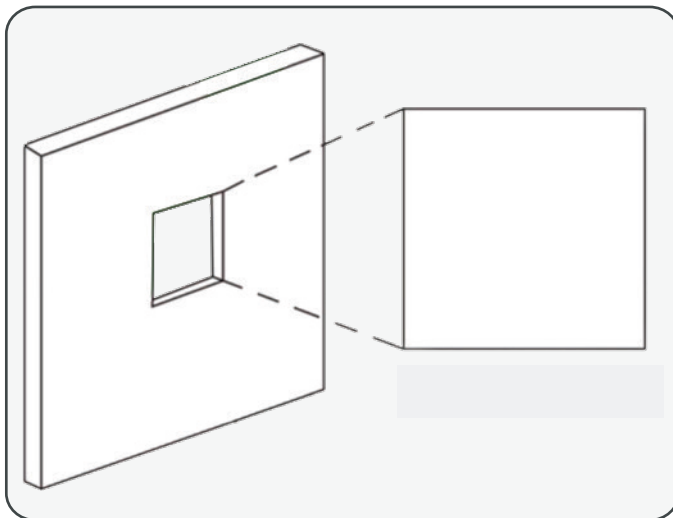
Accuracy Class	Class 0.5
Display Range	0.000 - 9999
Overload	Continuous 1.2 Times
Instantaneous	Current 10Times/5sec
Nominal Input	AC Current 100V~600V
Power Consumption	Less than 2VA
Dielectric Strength	2kV/1 Min
Frequency	45 - 65 Hz



DIMENSIONS



INSTALLATION



ADDITIONAL METER

Size 72x72

Model No. V272-V

CERTIFICATIONS

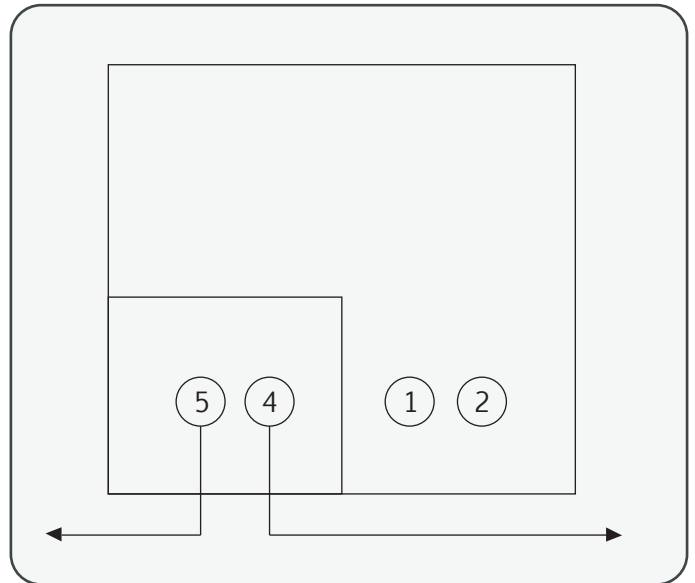
V - 200V complies with all the international standards which includes certification from standards such as EN-61326-1: 2013, EN 50470-1: 2006

ENVIRONMENT

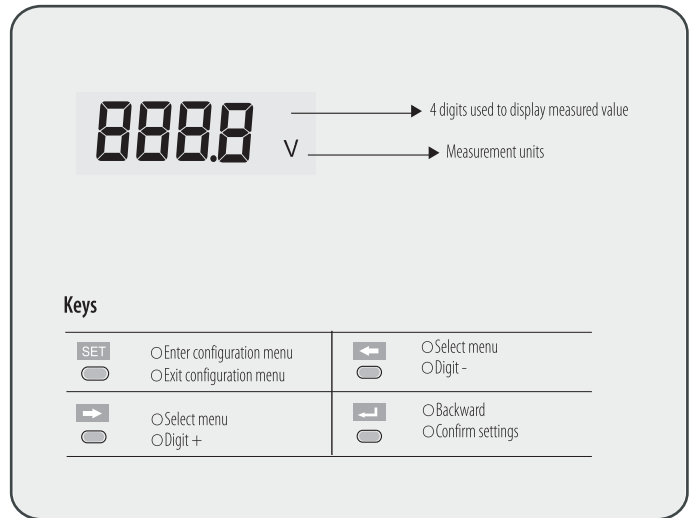
Working Temperature	10~55 Degree Celsius
Storage Temperature	-25~70 Degree Celsius
Relative Humidity	93% No Corrosive Gas
Elevation	Less Than 2500m



WIRING DIAGRAM



DESCRIPTION





SMART SERIES, SINGLE PHASE AMPERE METER

Model No: SMART-V200 A

- High Precision Measurement of Single Phase Ampere
- Programmable Voltage Ratio
- Auxiliary Power Supply
- Accuracy Class 0.5 or 1
- Size 96 x 96



INTRODUCTION

Smart Controller offers the smart series Single Phase Ampere Meter which adopts alternating current sampling techniques. This enables it to measure single phase voltage in the grid with high accuracy, good sensitivity and excellent resistance to vibrations.

INSTALLATION AND HANDLING

The device is easy to maintain and handle, easy to wire and very simple to install for the ease of user and only qualified person should be involved in the wiring and installation job of this power meter. Certain part of the power meter does contain high voltage, improper handling therefore can cause serious injuries and device damage.

There are certain points that need to be taken into strict account as follow:

- Only use insulating tools.
- Do not connect when circuit is live.
- Place the device in only dry surroundings.
- Make sure that the wire used is suitable for the maximum current of this meter.

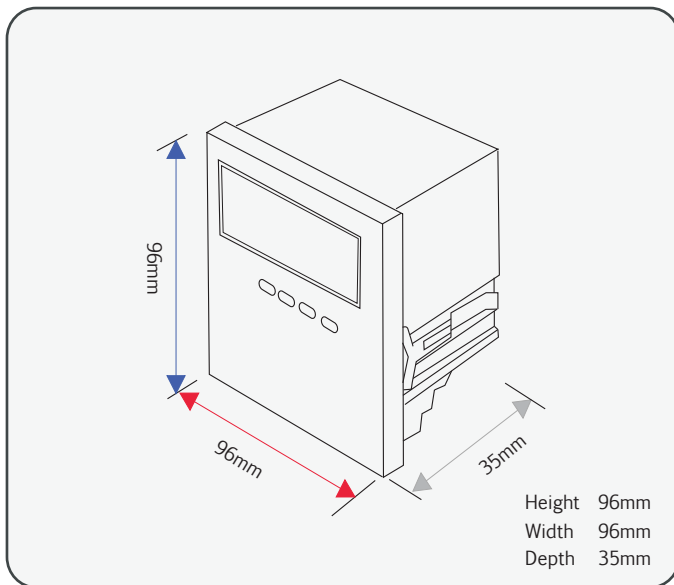
ELECTROMAGNETIC COMPATIBILITY

ESD (Electro-Static Discharge):

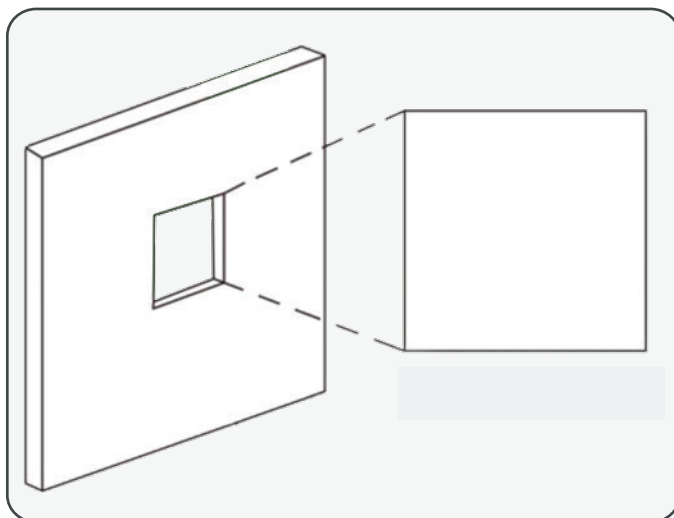
Level 4 Electrical fast transient burst: Level 4

MEASUREMENT	
Accuracy Class	Class 0.5
Display Range	0.000 - 9999
Overload	Continuous 1.2 Times
Instantaneous	Current 10Times/5sec
Nominal Input	AC Current 100V~600V
Power Consumption	Less than 2VA
Dielectric Strength	2kV/1 Min
Frequency	45 - 65 Hz

WIRING DIAGRAM



INSTALLATION



ADDITIONAL METER	
Size 72x72	Model No. V272-A

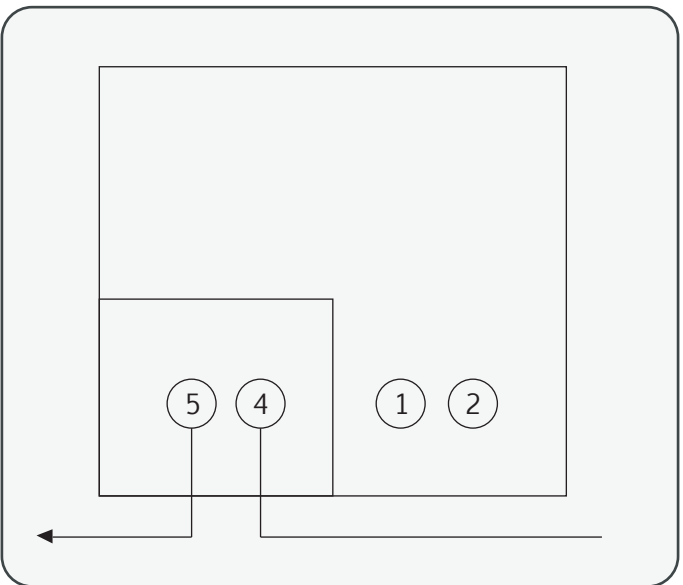
CERTIFICATIONS

V - 200A complies with all the international standards which includes certification from standards such as EN-61326-1: 2013, EN 50470-1: 2006

ENVIRONMENT

Working Temperature	10~55 Degree Celsius
Storage Temperature	-25~70 Degree Celsius
Relative Humidity	93% No Corrosive Gas
Elevation	Less Than 2500m

WIRING DIAGRAM



DESCRIPTION

4 digits used to display measured value
Measurement units

Keys

SET	Enter configuration menu	←	Select menu
○	Exit configuration menu	○	Digit -
→	Select menu	←	Backward
○	Digit +	○	Confirm settings



SMART SERIES, THREE PHASE VOLT METER

Model No: SMART-V396 V

- **The Smart Series Three Phase Volt Meter**
- **That Adopts Alternating Current Sampling Techniques.**
- **This enables it to measure three phase voltage current in the grid with high accuracy, good sensitivity and excellent resistance to vibrations.**



INTRODUCTION

The device is easy to maintain and handle, easy to wire and very simple to install for the ease of user and only qualified person should be involved in the wiring and installation job of this over meter. Certain parts of the power meter does contain high voltage, improper handling therefore can cause serious injuries and device damage.

There are certain points that need to be taken into strict account as follow:

- Only use insulating tools.
- Do not connect when circuit is live.
- Place the device in only dry surroundings.
- Make sure that the wire used is suitable for the maximum current of this meter.
- Make sure the AC wires are connected correctly before activating the current / voltage to the meter.
- Do not drop or allow physical impact to the meter as the internal components are of high precision material as it may experience in an electric shock and may result in breakage and malfunction of the device.

TECHNICAL DATA

Accuracy Class	Class 0.5
Display Range	0.000 – 9999
Overload	Continuous 1.2 times
Instantaneous	Current 10times/5seconds
Nominal Input	AC Current 100V~600V
Power Consumption	Less than 2VA
Dielectric Strength	2kV/1min
Frequency	45-65 Hz

ENVIRONMENT

Working Temperature	-10 ~ 55 Degree Celsius
Storage Temperature	-25 ~ 70 Degree Celsius
Relative Humidity	Less than 93%, (No corrosive gas)
Elevation	Less than 2500m
Height	96mm
Width	96mm
Depth	80mm

CERTIFICATIONS

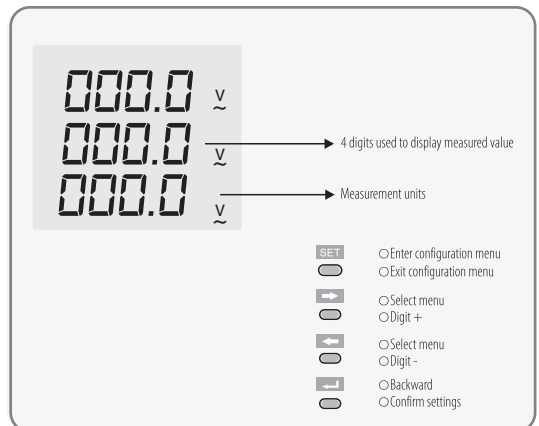
V396 – V complies with all the international standards which includes certification from standards such as EN-61326-1: 2013, EN 50470-1: 2006 and also confirm all the requirements of MI-003 of EC directive 2004/22/EC.

ELECTROMAGNETIC COMPATIBILITY

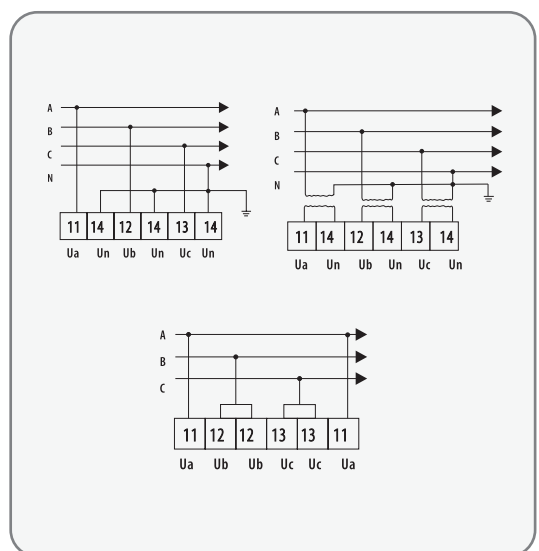
- ESD (Electro – Static Discharge): Level 4
- Electrical fast transient burst: Level 4



DIMENSIONS



WIRING DIAGRAM





SMART SERIES, THREE PHASE AMPERE METER

Model No: SMART-V396 A

- **The Smart Series Three Phase Ampere Meter**
- **That Adopts Alternating Current Sampling Techniques.**
- **This enables it to measure three phase ampere current in the grid with high accuracy, good sensitivity and excellent resistance to vibrations.**



INTRODUCTION

The device is easy to maintain and handle, easy to wire and very simple to install for the ease of user and only qualified person should be involved in the wiring and installation job of this over meter. Certain parts of the power meter does contain high voltage, improper handling therefore can cause serious injuries and device damage.

There are certain points that need to be taken into strict account as follow:

- Only use insulating tools.
- Do not connect when circuit is live.
- Place the device in only dry surroundings.
- Make sure that the wire used is suitable for the maximum current of this meter.
- Make sure the AC wires are connected correctly before activating the current / voltage to the meter.
- Do not drop or allow physical impact to the meter as the internal components are of high precision material as it may experience in an electric shock and may result in breakage and malfunction of the device.

TECHNICAL DATA

Accuracy Class	Class 0.5
Display Range	0.000 – 9999
Overload	Continuous 1.2 times
Instantaneous	Current 10times/5seconds
Nominal Input	AC Current 100V~600V
Power Consumption	Less than 2VA
Dielectric Strength	2kV/1min
Frequency	45-65 Hz

ENVIRONMENT

Working Temperature	-10 ~ 55 Degree Celsius
Storage Temperature	-25 ~ 70 Degree Celsius
Relative Humidity	Less than 93%, (No corrosive gas)
Elevation	Less than 2500m
Height	96mm
Width	96mm
Depth	80mm

CERTIFICATIONS

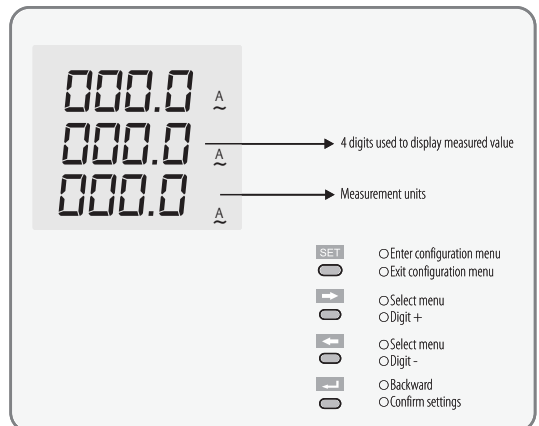
V396 – A complies with all the international standards which includes certification from standards such as EN-61326-1: 2013, EN 50470-1: 2006 and also confirm all the requirements of MI-003 of EC directive 2004/ 22/EC.

ELECTROMAGNETIC COMPATIBILITY

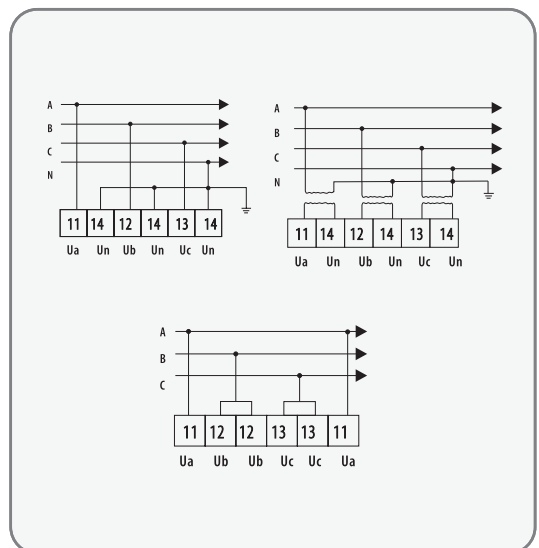
- ESD (Electro – Static Discharge): Level 4
- Electrical fast transient burst: Level 4



DIMENSIONS



WIRING DIAGRAM





SMART SERIES, SINGLE PHASE FREQUENCY METER

Model No: SMART-VEN 961 F

- **The Smart Series Single Phase Frequency Meter**
- **That Adopts Alternating Current Sampling Techniques.**
- **This enables it to measure frequency in the grid with high accuracy, good sensitivity and excellent resistance to vibrations.**



INTRODUCTION

The device is easy to maintain and handle, easy to wire and very simple to install for the ease of use and only qualified person should be involved in the wiring and installation job of this power meter. Certain part of the power meter does contain high voltage, improper handling therefore can cause serious injuries and device damage.

There are certain points that need to be taken into strict account as follow:

- Only use insulating tools.
- Do not connect when circuit is live.
- Place the device in only dry surroundings.
- Make sure that the wire used is suitable for the maximum current of this meter.
- Make sure the AC wires are connected correctly before activating the current / voltage to the meter.
- Do not drop or allow physical impact to the meter as the internal components are of high precision material as it may experience in an electric shock and may result in breakage and malfunction of the device.

TECHNICAL DATA

Accuracy Class	Class 0.5
Voltage Input	AC 220V
Overload	Continuous 1.2 times
Instantaneous	Voltage 2 time/1 seconds
Auxiliary Power Supply	AC 220V
Display Range	0.000-9999
Instantaneous	Current 10times/5seconds
Nominal Input	AC Current 1A, 5A
Power Consumption	Less than 2 VA
Isolation Voltage	Input/Output 2kV/1 min
CT Ratio	0001-9999
PT Ratio	0001-9999
Dielectric Strength	2kV/1 min
Frequency	45-65Hz

ENVIRONMENT

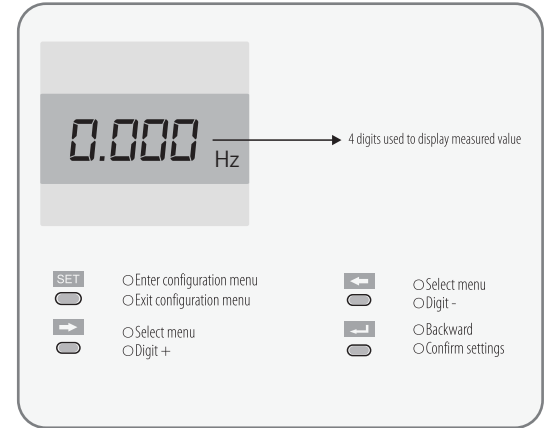
Working Temperature	-10 ~ 55 Degree Celsius
Storage Temperature	-25 ~ 70 Degree Celsius
Relative Humidity	Less than 93%, (No corrosive gas)
Elevation	Less than 2500m
Height	96mm
Width	96mm
Depth	80mm

ADDITIONAL METER

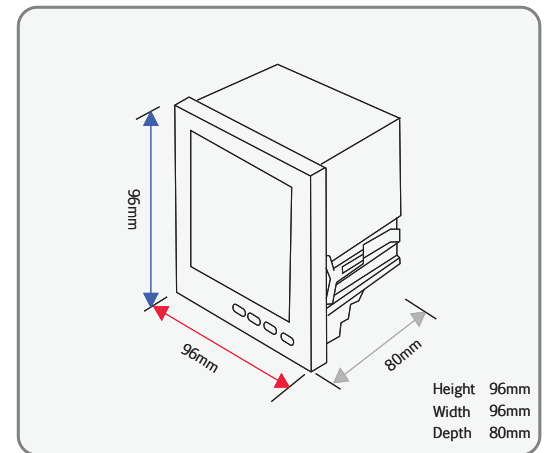
SIZE	TYPE	MODEL
Size 72X72	Single Phase	Model No. VEN721-F
Size 72x72	Three Phase	Model No. VEN723-F
Size 96x96	Three Phase	Model No. VEN936-F



DIMENSIONS



WIRING DIAGRAM





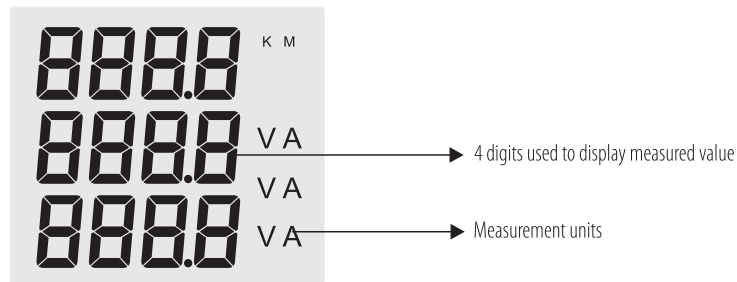
SMART SERIES, THREE PHASE VOLT/AMPERE METER

Model No: SMART-V350 V A

- High Precision Measurement of Single Phase Voltage.
- (AC or DC), or current AC or DC Frequency on Power.
- Programmable Voltage Ratio.
- Auxiliary Power Supply : AC/DC 85V~265V.
- Accuracy Class 0.5 or 1.



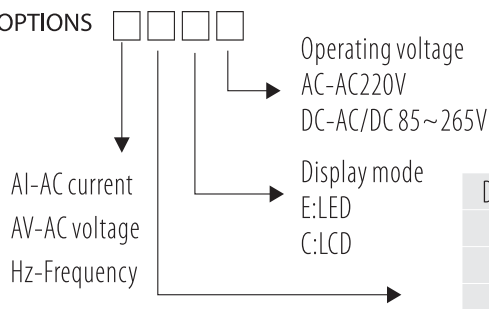
DIMENSIONS



Keys

	○ Enter configuration menu ○ Exit configuration menu		○ Select menu ○ Digit -
	○ Select menu ○ Digit +		○ Backward ○ Confirm settings

MODEL OPTIONS



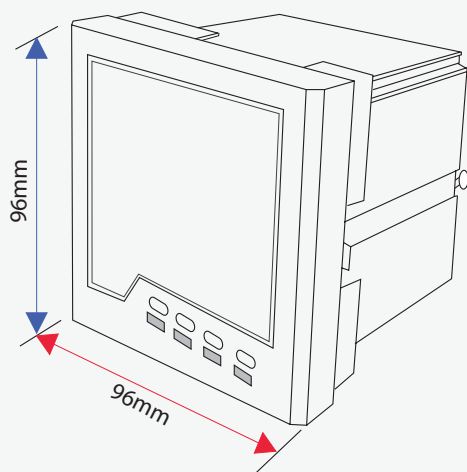
Dimension	Face frame	Hole size
1	48X96	45X91
2	72X72	67X67
3	96X96	91X91

SPECIFICATION

Ratio Value	AC100V, AC230V, AC400V
Overload	120%
Ferquency	45~65Hz or DC
Working Range	AC100V , AC230V, AC400V
Power Consumption	<4VA
Operational Environment	-25°C~+55°C
Relative Humidty	-40°C~+70°C
Height Above Sea Level	≤ 90%, in the place without corrosive gas
Insulation Resistance	≤ 2000m
AC Withstand Voltage	> 100Mohm
Electro-Static Discharge	AC 2KV
Electrical Fast	Class 4
Transient Pulse Train	Class 4
Electrical Surge	Class 4



DIMENSIONS

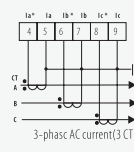
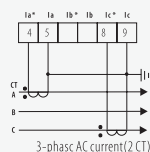


Height 96mm
Width 96mm

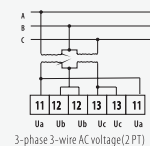
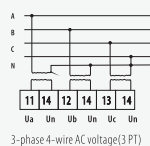
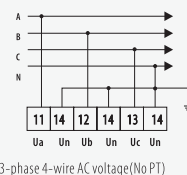


WIRING DIAGRAM

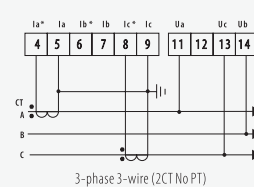
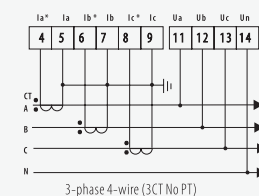
Amperemeter



Voltmeter



VA meter/Power meter





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

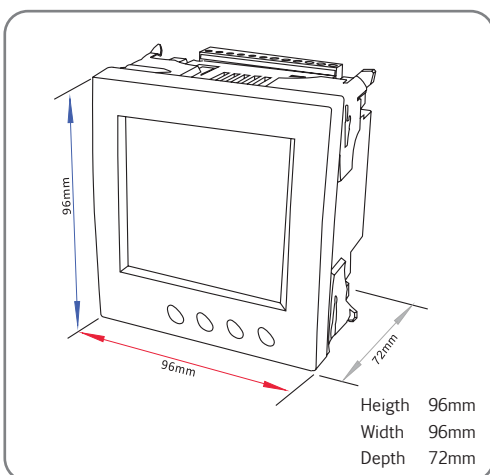
ENVIRONMENT

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

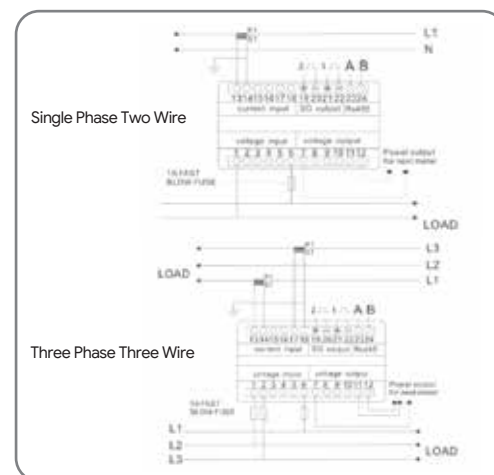
RS485 OUTPUT FOR MODBUS RTU

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

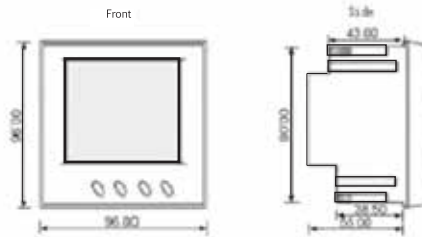


PLUG IN METERING SOLUTION:

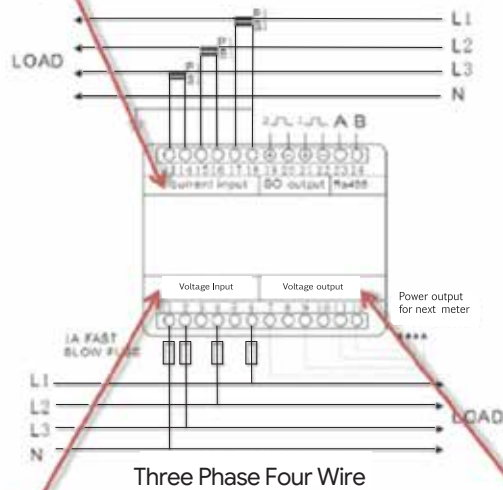
DIMENSIONS:



1.Current Transformer Input



Three Phase Four Wire



2.Fuse Voltage Input



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



TERMINAL KIT OPTION

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 hard ware

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



SMART ENERGY ANALYZER FOR SINGLE AND THREE PHASE SYSTEMS

Model No: SMART-VEN 585

- Measures Kwh, Kvarh, Kw, Kvar, Kva, P, F, Pf,
- Hz, Dmd, V, A, Etc.
- Bi-Directional Measurement Imp & Exp
- Energy Information of Each Phase
- Total Harmonic Distortion Of Voltage and Current
- 2nd~63rd Individual Harmonic Distortion
- Backlit LCD Display for Full Viewing Angles



INTRODUCTION

The Multi-Function Energy Analyzer Smart VEN585 series is a top new-generation intelligent panel meter, used not only in the electricity transmission and power distribution system, but also in the power consumption measurement and analysis in high voltage intelligent power grid.

This document provides operating, maintenance and installation instructions for the Smart Controller 585 series unit measures and displays the characteristics of single phase two wires, three phase three wires and three phase four wires supplies, including voltage, frequency, current, power and active and reactive energy, imported or exported, harmonic, power factor, max. demand etc. Energy is measured in terms of kWh, kVarh.

Maximum demand current can be measured over preset periods of up to 60minutes. 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 The Smart VEN 585 can be configured to work with a wide range of CTs, giving the unit a wide range of operation.



UNIT CHARACTERISTICS

The Unit can measure and display:

- Line voltage and THD% (total harmonic distortion) of all phases.
- 2~63rd voltage IHD% (Individual harmonic distortion) of all phases.
- Line Frequency.
- Currents, current demands and current THD% of all phases.
- 2~63rd current IHD% of all phases
- Active Power, reactive power, apparent power, maximum power demand and power factor.
- Active Energy imported and exported.
- Reactive Energy imported and exported.
- Energy of each phase.

The Unit has password-protected set-up screens for:

- Communication setting: Modbus address, baudrate, parity.
- CT setting: CT 1 (Primary), CT2 (Secondary), CT rate
- PT setting: PT1 (Primary), PT2 (Secondary) , PT rate
- Pulse setting: Pulse output 1, Pulse rate, Pulse time
- Demand setting: Demand interval time, demand method
- Time setting: Backlit time, display scroll time
- System configuration: System type, System connect.

CT and PT

CT1 (Primary Current): 5~9999A

CT2 (Secondary Current): 1A or 5A

PT1 (Primary Voltage): 100V ~ 500,000V

PT2 (Secondary Voltage): 100 to 480 V AC (L-L)

RS485 OUTPUT FOR MODBUS RTU

This unit uses a RS485 serial port with Modbus RTU protocol to provide a means of remote monitoring and controlling.

PULSE OUTPUT

Two pulse outputs indicate real-time energy measurement. Pulse output 1 is configurable, pulse output 2 is fixed to active energy, 3200imp/kWh.

VOLTAGE AND CURRENT

- Phase to neutral voltage 100 to 276 V a.c (Not for 3p3w supplies).
- Voltage between phases 174 to 480V a.c (3p supplies only).
- Installation category III (600V).
- Rated current: 1A or 5A.
- Current input range: 5%~120% Ib.
- Percentage total voltage harmony distortion (THD%) for each phase to percentage current harmonic distortion for each phase.
- Current on each phase.

MEASURED INPUTS

Voltage inputs through 4-way fixed connector with 2.5mm² stranded wire capacity. Single phase two wire(1p2w), three phase three wire(3p3w) or four phase four wire (3p4w) unbalanced. Line frequency measured from L1 voltage or L3 voltage. Three current inputs (six physical terminals) with 2.5mm² stranded wire capacity for connection of external CTs. Nominal rated input current 5A or 1A/ A.C.

ACCURACY

Voltage VL-N	0.5%
Voltage VL-L	0.5%
Current	0.5 %
Frequency	0.1 %
Active Power	0.5 %
Apparent Power	0.5 %
Reactive Power	1 %
Power Factor	00.1
Active Energy	IEC62052-21 Cl.1 or IEC62053
Reactive Energy	IEC62053-23 Cl.2
THD	1 %

ENERGY MEASUREMENTS

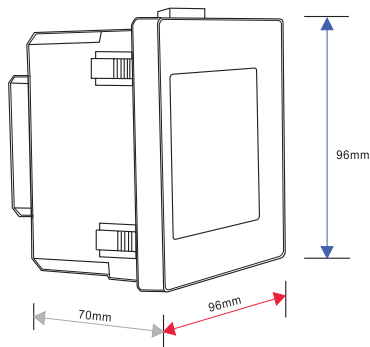
Imported/Exported Active Energy	0 to 9999999.9 kWh
Imported/Exported Reactive Energy	0 to 9999999.9 kVarh
Total Active Energy	0 to 9999999.9 kWh
Total Reactive Energy	0 to 9999999.9 kVarh

ENVIRONMENT

Operating Temperature	-25C To +55C
Storage Temperature	-40C To +70C
Relative Humidity	0 to 95%, non -condensing
Altitude	< 2000 meter
Vibration	10Hz to 50 Hz,
Pollution Degree	IEC 60062-2



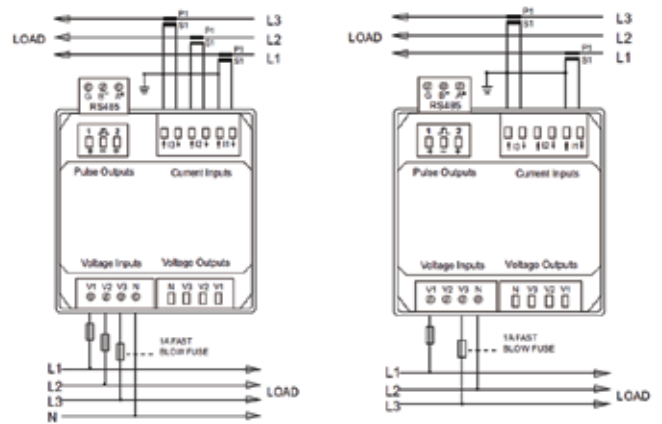
DIMENSIONS



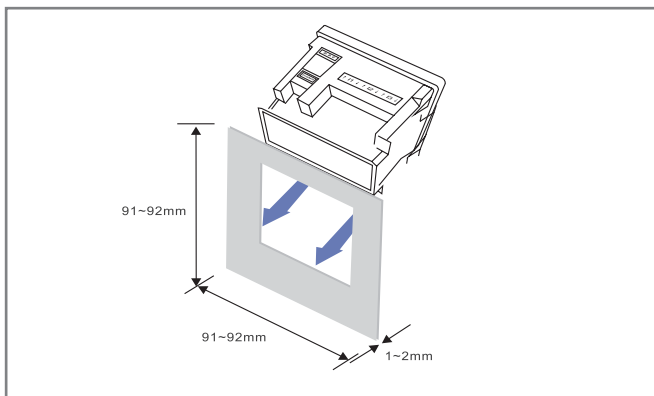
Height 96mm
Width 96mm
Depth 70mm



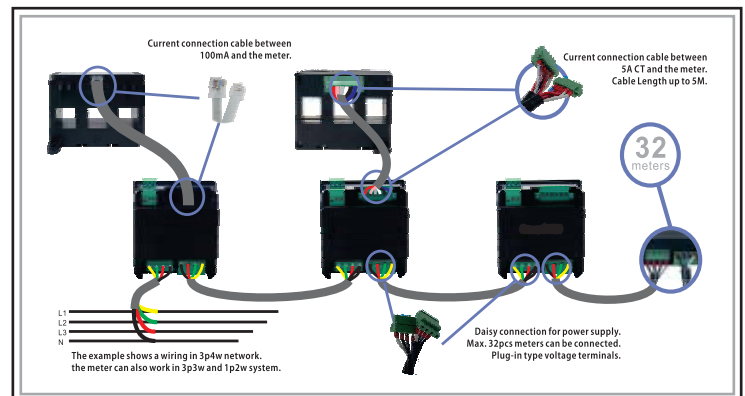
WIRING DIAGRAM



INSTALLTION



Plug-in Plug Solution





UNIT C7/4 Inchinnan Industrial Park
Glasgow, Renfrewshire PA49RJ,
UNITED KINGDOM



info@smart-controllers.com



www.smart-controllers.com

