

# **PowrTec** **Three-Phase Energy Meter**

## **PowrTec Single-phase Networked Energy Meter**



### **Key Features:**

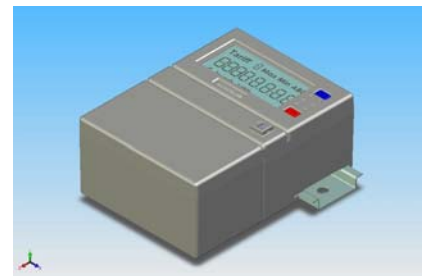
- Electronic Meter to IEC 61036 standards with Accuracy Better than 1%
- Integrated Ethernet Port for LAN connectivity and Automatic Meter Reading (AMR).
- Single-phase residential direct-reading meter
- 200-240VAC 50Hz
- 5(80) Amperes
- Eight-tariff
- Infrared (IR) port for configuration and meter reading
- RS485 Serial port for configuration and meter reading
- S0 Pulse output
- Data collection software and database with interface to utilities CRM software
- 80A breaker relay
- Meets DIN 43 857

## **PowrTec Single- phase Energy Meter**

**Product Brochure**

**Installation and  
Operations**

**Specifications**



**TABLE OF CONTENTS**

**OVERVIEW ..... 3**  
    **Product Perspective: ..... 3**  
    **Three-Phase Meters ..... 3**  
    **Mechanical Parameters: ..... 3**

**INSTALLATION ..... 4**  
    **Connections ..... 4**

**OPERATION ..... 6**  
    **LCD Display ..... 6**  
    **Setting the Date and Time ..... 6**  
    **The Infrared Interface ..... 6**  
    **ISM Band Radio Option ..... 6**  
    **GSM Option ..... 6**

**SPECIFICATIONS ..... 8**

**TABLE OF FIGURES**

Figure 1 Front View ..... 3  
Figure 2 Left Side View ..... 3  
Figure 3 Right Side View ..... 3  
Figure 4 View of Connector End ..... 4  
Figure 5 Base Connections ..... 4  
Figure 6 Screw Attachment Lugs for Power Leads  
    ..... 4  
Figure 7 LCD Display ..... 6

**TABLES**

Table 1 Base Connection ..... 4  
Table 2 Default Displayed Fields on LCD ..... 6

## Overview

### Product Perspective:

The PowrTec offers unparalleled features and accuracy at a value price. The meter offers many value features as a standard offering, these include; Class 1 power reading, Automatic Meter Reading using dual band GSM network, DIN 43 857 specification, IEC 61036 specifications and the IEC 61107 Optical Communications specifications. It's small foot print make it capable of fitting into all enclosures.

### Single-Phase Meters

The PowrTec single-phase product family direct connected meters with options for Ethernet, GSM, PLC and ISM band communication. The basic meter is available as 5 (80) Ampere Direct Reading Active Energy

### Mechanical Parameters:

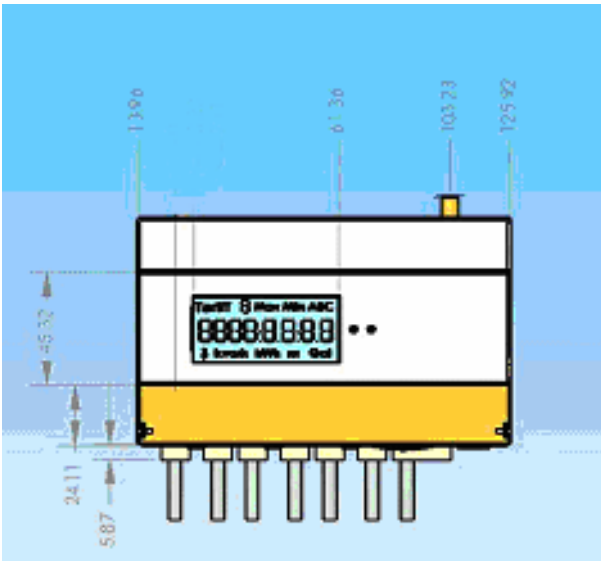


Figure 1 Front View

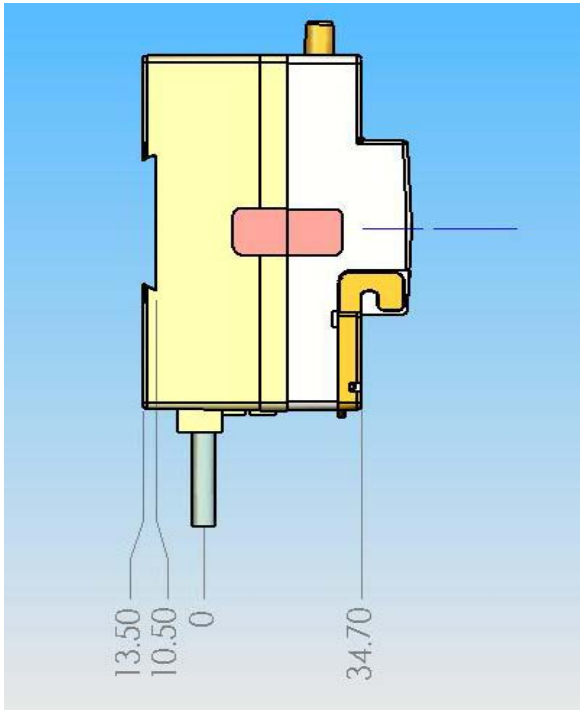


Figure 2 Left Side View

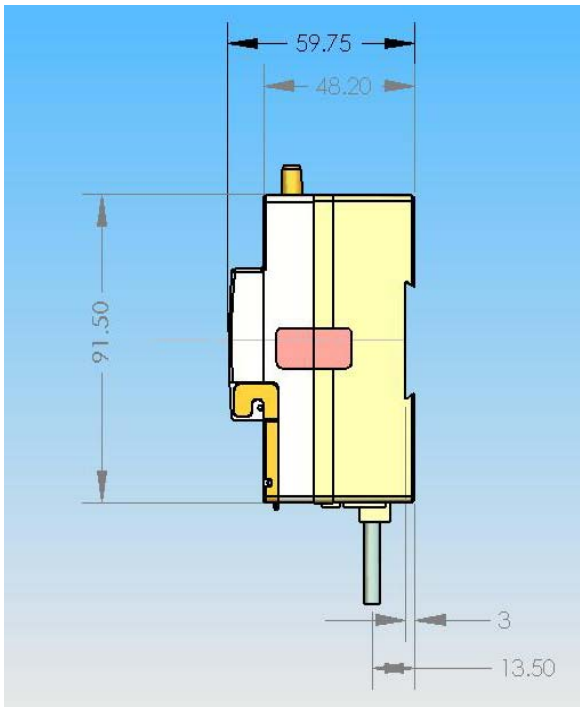
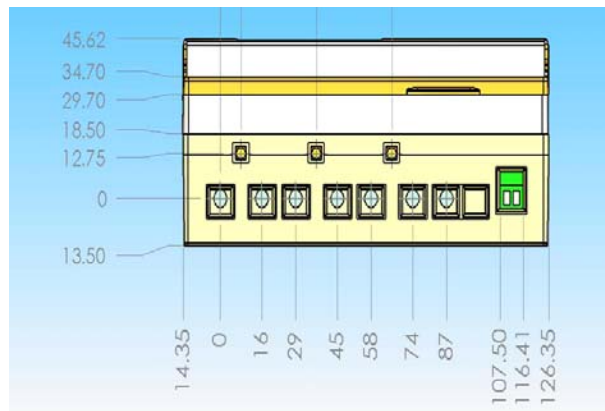


Figure 3 Right Side View



**Figure 4 View of Connector End**

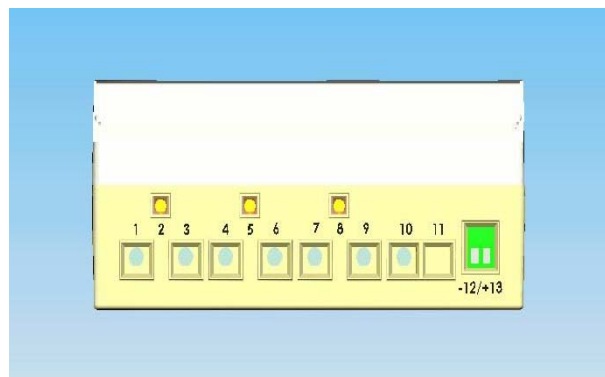
## Installation

This product is only to be installed by qualified electrical personnel. The Specifications given are only applicable if the product is installed in compliance with local Standards of Practice. If uncertain about such procedures or standards, qualified personnel must be consulted.

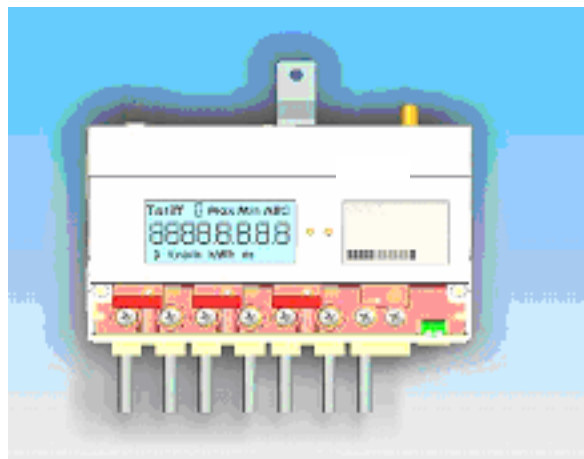
Lethal Voltages are present at the base terminals of an electric power meter.

## Connections

The base connections of the PowrTec Meter is presented below:



**Figure 5 Base Connections**



**Figure 6 Screw Attachment Lugs for Power Leads**

Figure 6 shows the connection points for each of the base-connected power leads. Properly sized and stripped power leads should be inserted into the base terminals (Screw Lugs) for each Phase current and potential connection. Insure that the Neutral connection(s) are made in compliance with local code.

**Table 1 Base Connection**

TERMINAL	FUNCTION	LEVEL
1	Phase A In	Direct Connection In
2	Phase A Potential	180 – 250 VAC
3	Phase A Out	Direct Connection Out
4	Neutral	280 – 250VAC
5	Neutral	180 – 250 VAC
RJ45-1 1		
RJ 45-1 2		
RJ45-1 3		
RJ45-1 4		
RJ45-1 5		
RJ45-1 6		
RJ45-1 7		
RJ45-1 8		
RJ45-2 1		
RJ 45-2 2		
RJ45-2 3		
RJ45-2 4		
RJ45-2 5		
RJ45-2 6		
RJ45-2 7		
RJ45-2 8		

When properly connected, the LCD will show a solid figure and the symbol “A” will be displayed. If any phase is

improperly connected or voltage is not present, the Phase indicator will flash.

### Installing GSM and Antenna

Looking at the meter from the front. Open terminal cover at the lower corners there are 2 screws holding the top and bottom portions of the meter. Remove both screws.

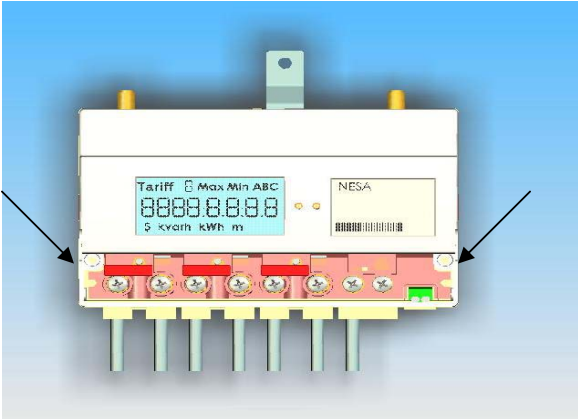


Figure Top Cover Mounting Screw Location

Now turn to the back of the meter. There are 2 screws at the top of the meter. Remove both screws.

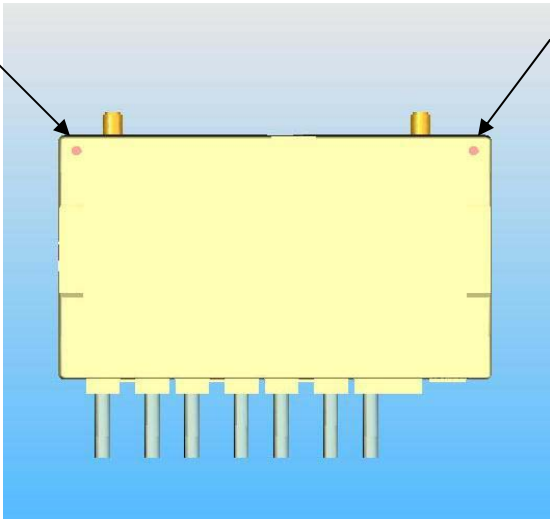
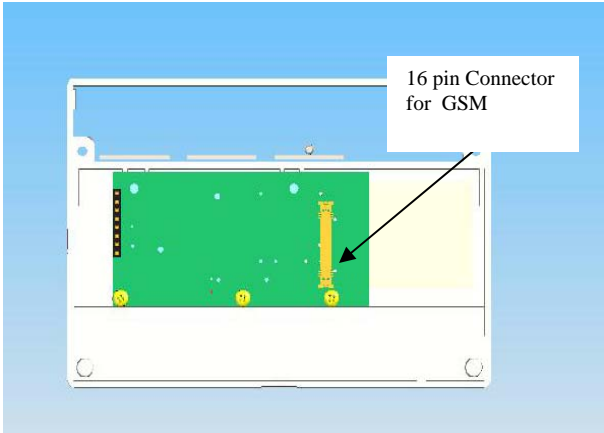


Figure 7 Back View and Top Screw Connection

Pull the top of the meter case off the bottom of the meter. Place the top portion of the meter case upside down. This will reveal a 16 pin connector on the top portion of the meter. Connect the GSM module to this 16 pin connector and press firmly together. Connect the 2 antennas to the top of the top case.



16-Pin Connector Location on Display Board

Next, take the top case in your right hand and place it over the bottom portion of the meter case. Align the 14-pin header through the bottom portion of the meter case and press firmly together. Now insert all 4 screws that were removed earlier.

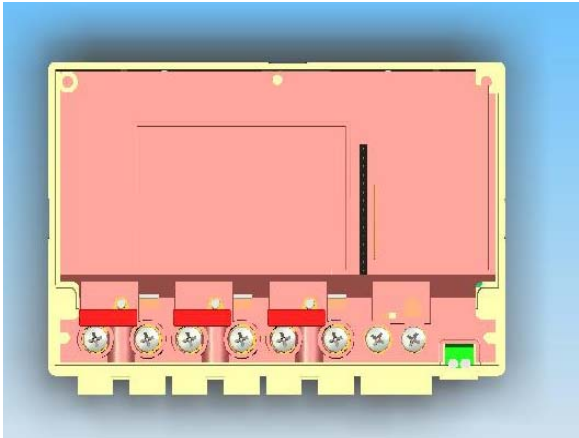
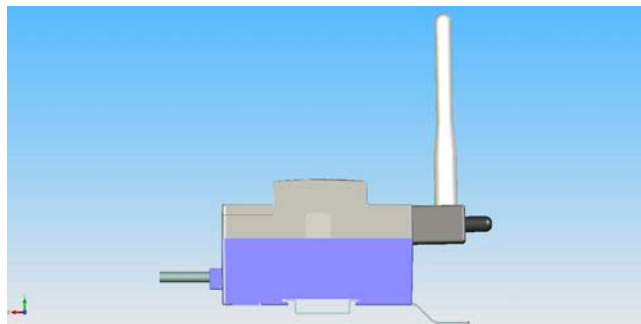


Figure 8 Insulated Inner Cover of Meter Bottom

Use only the Powrtec approved shielded antenna shown below



## Operation

### LCD Display

The two buttons on the meter cover are used to scroll the display among the available fields. These fields are programmed using the IEC 601107 Mode C interface and the supplied software. The default fields that are displayed are presented in the table below:



**Figure 9 LCD Display**

**Table 2 Default Displayed Fields on LCD**  
**(to be modified by customer specification)**

FIELD	READING	LEVEL
1	Total Energy	KiloWatt Hours
2	All Segment Check	-
3	Total Hourly	KiloWatts

	Demand	
4	Date	MM:DD:YY
5	Time	HH:MM:SS
6	Energy in Current Tariff	KiloWatt Hours
7	Calibration Constant	XXXXXX
8	Error Message	Text

### Setting the Date and Time

This process can be accomplished only by using the IEC 601107 interface and authorized passwords to prevent unauthorized change to the values.

### The Infrared Interface

The PowrTec Meter includes an IEC 601107 Mode C interface for use with industry-standard optical reading equipment. The meter is provided with software that may be operated from hand-held, laptop or desktop computers. The distribution disk for the provided software includes installation and operation directions for this software.

### ISM Band Radio Option

The PowrTec Meter includes an option for ISM band radio. This radio can be used to collect data from :

- Other energy meters
- Gas/heaters
- Water meter

### GSM Option

The PowrTec Meter includes a GSM Cellular data modem for SMS or GPRS data connection to available data systems. The GSM modem is connected internally by serial port to the meter display measurement and display electronics. A robust 2-Ampere power supply is provided for full-power operation of the cellular phone. Antenna connection is included at the top of the meter.

- Module Carrier Approvals in Asia, Europe and USA
- SMS Point to Point, Cell Broadcast, Text and PDU
- Multi Slot 115Kbps GPRS
- Optional battery operation
- Tri-Band GSM

Using the GSM modem operators can access the following data:

- Meter ID

- Hourly KWH readings
- Meter status
- Power Fail monitor
- Demand
- Up to 8 tariff readings

## Specifications

	<b>SINGLE TARIFF METER CONFIGURATION</b>	<b>MULTI-TARIFF METER CONFIGURATION</b>
Specifications:	IEC Class 1.0 Energy Meter with DIN attachment and Power Connections	IEC Class 1.0 Energy Meter with DIN attachment and Power Connections
Power:	3 X 65/80 A, 3 X 200 – 240 VAC 50 Hz, Single Phase, Two-Wire. DIN-standard base terminals. Active Power, Demand, Voltage and Current Readings.	3 X 65/80 A, 3 X 200 – 240 VAC 50 Hz, Single Phase, Two-Wire. DIN-standard base terminals. Active Power, Demand, Voltage and Current Readings.
Stand-Alone Capability	GSM functionality depends on at least one phase operating.	Meter controls and display operational without any external power. Network Interfaces operate without system power. GSM functionality depends on at least one phase operating.
Multi-Tariff	-	Eight Tariffs and computation of Demand
Time of Use	-	Interval Recording of Energy Usage Per Phase for up to 3 Months with intervals from 15 minutes to 24 hours
Pulse Output	SO pulse output with Kh of 1,000 or 3200 impulses per kWh	SO pulse output with Kh of 1,000 or 3200 impulses per kWh
Display	Wide Temperature range (-40 to +70 Degrees Celsius), 8 digits with programmable decimal, annunciator for function and phase status	Wide Temperature range, 8 digits with programmable decimal, annunciator for function and phase status
Power Fail Battery Operation	No	Optional
Environment	-25 to +55 Degrees Celsius operating; -40 to +70 Degrees Celsius Storage, Humidity 0 – 100 percent, non-condensing, Altitude to 4,000 meters. IP51 housing for indoors use.	-25 to +55 Degrees Celsius operating; -40 to +70 Degrees Celsius Storage, Humidity 0 – 100 percent, non-condensing, Altitude to 4,000 meters. IP54 housing for indoors or rain tight outdoor use.
Optical I/O	IEC 601103 Mode C at 300 - 9600 baud	IEC 601103 Mode C at 300 - 9600 baud
Serial I/O	Internal TTL Serial I/O	Optional RS-485 Isolated Serial Communications; 9.6 – 116 kBaud
Network	SMS GPRS GSM	Ethernet, Fiber Optic, GSM Interface Adaptors mounted within the meter enclosure
Pushbuttons	-	Dual Hermetic
Burden	Without GSM Power Supply less than 1.5 VA, less than 0.5 VA per phase	Without GSM Power Supply less than 1.5 VA, less than 0.5 VA per phase
Mechanical	140 x 91.5 x 59.75 mm with DIN Rail attachment. Wire and Pin attachment at 13.5 mm from wall.	140 x 60 x 25 mm IEC
Surge and Immunity to ESD	To IEC 601036, with extended specifications to common Scandinavian requirements available as NC Option	To IEC 601036, with extended specifications to common Scandinavian requirements available as NC Option



---

**For Further Information:**

***PowrTec Corporation***

***1500 Green Hills Rd  
Suite 107  
Scotts Valley, CA 95066, USA***

***Ph: 831 438 3000***

***Web: WWW.POWRTEC.COM***