

# USER'S MANUAL

## ENTITY **Energy Meter**

This document contains the latest technical information about ENTITY which is a micro-controller based Energy Meter. The unit is tested against latest "MTE" Standard Model PRS400.3 having basic accuracy of 0.02%, traceable upto International Standards derived using appropriate ratio techniques.

The product, Entity is sophisticated electronic equipment, and the user is advised to read this User's Manual carefully before attempting to install or operate the equipment.

Published on: (mention the date of publishing)  
Document Version: 1.0

## **Warranty statement**

Trinity warrants to the original retail purchaser of the Trinity product enclosed with this limited warranty statement that the product, if purchased new and used in the India conforms to the manufacturer's specifications and will be free from defects in workmanship and materials for a period of one year from the date of original purchase, unless expressly stated otherwise by Trinity, in a written format.

Should your Trinity product prove defective during the warranty period, please bring the product securely packaged in its original container or an equivalent, along with proof of the date of original purchase, to our Trinity Dealer or Factory. You are responsible for all costs (shipping, insurance, travel time) in getting the product to the service location. Trinity will, at its option, repair or replace on an exchange basis the defective unit, without charge for parts or labor. When warranty service involves the exchange of the product or of a part, the item replaced becomes Trinity property. The replacement unit may be new or refurbished to the Trinity standard of quality, and at Trinity's option, the replacement may be another model of like kind and quality. Trinity's liability for replacement of the covered product will not exceed the original retail selling price of the covered product. Exchange or replacement products or parts assume the remaining warranty period of the product covered by this limited warranty.

### **What This Warranty Does Not Cover:**

This warranty does not apply to refurbished or reconditioned products. This warranty covers only normal use in India. This warranty does not cover damage to the Trinity product caused by parts or supplies not manufactured, distributed or certified by Trinity. This warranty is not transferable. This warranty does not cover third party parts, components or peripheral devices added to the Trinity product after its shipment from Trinity. Trinity is not responsible for warranty service should the Trinity label or logo or the rating label or serial number be removed or should the product fail to be properly maintained or fail to function properly as a result of misuse, abuse, improper installation, neglect, improper shipping, damage caused by disasters such as fire, flood, and lightning, improper electrical current, interaction with non-Trinity products, or service other than by an Trinity Authorized Service.

*The warranty and remedy provided above are exclusive and in lieu of all other express or implied warranties including, but not limited to, the implied warranties of merchantability or fitness for a particular purpose. In the event, the remedies above fail, Trinity's entire liability shall be limited to a refund of the price paid for the Trinity product covered by this limited warranty. Except as provided in this written warranty, neither Trinity Energy Systems Pvt. Ltd. nor its affiliates shall be liable for any loss, inconvenience, or damage, including direct, special, incidental, or consequential damages, resulting from the use or inability to use the Trinity product, whether resulting from breach of warranty or any other legal theory.*

## Contents

<b>Introduction .....</b>	<b>4</b>
The Main Features Available in This Model.....	4
Technical Specifications .....	5
<b>Installation and Commissioning.....</b>	<b>6</b>
Connection Scheme.....	7
<b>Operational Details.....</b>	<b>8</b>
Programming Mode .....	8
Setting CT-Primary.....	8
Run Mode.....	9
Resetting Energies.....	9

## Introduction

Entity is based on proven microcontroller technology with front end ASICs, resulting in compact and accurate energy metering. The accuracy of the meters is maintained even under severely distorted waveform conditions which occur due to harmonics in the system.

Entity is a low cost **effective**, easy user interface and can measure accurate KWh energy that displays on 16XLCD. The unit supports only for three phase four wire in an electrical installation.

### The Main Features Available in This Model

- Class 1.0S accuracy as per IS13779
- Class 0.5S accuracy also available
- Compact 96 x 96 x 55 mm enclosure
- Microcontroller based with true RMS measurement
- 16X1 LC display
- Measurement of KWh energy.



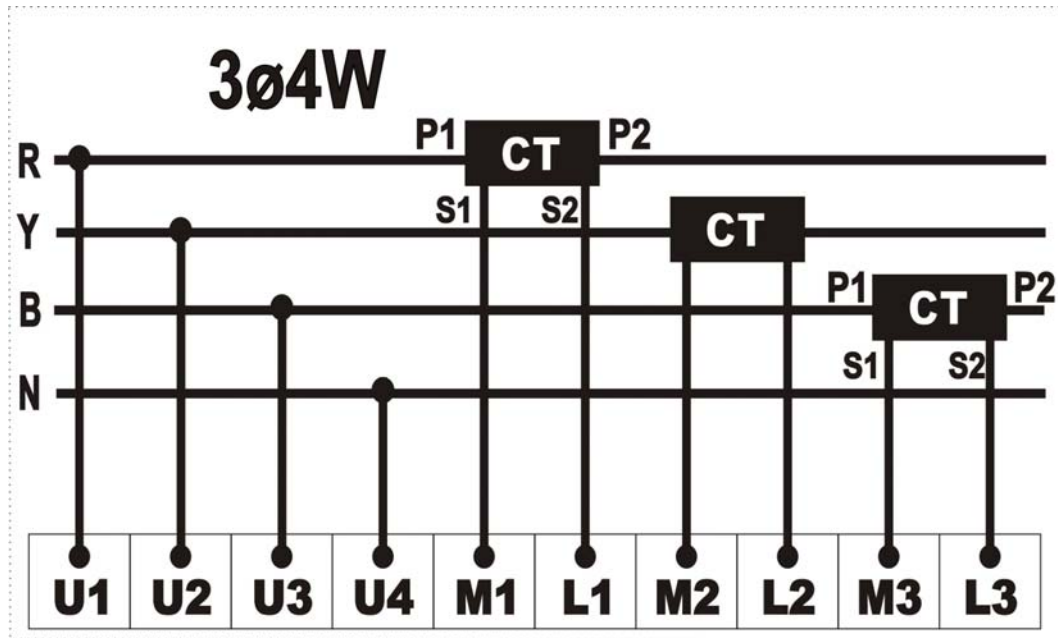
Technical Specifications

Parameter			
Type	Name	Statistics	
INPUT	Supply	Three Phases and Neutral of a 3P4W system	
	Voltage	Direct Voltage Input : Up to 300V L-N or 500V L-L Burden : 0.5VA	
	Current	Secondary Current Input : 5A or 1A (optional) CT Primary : Site Selectable Range of Reading : 5 – 5000A Burden : < 1.0VA Overload (Through CT) : 5A CT = 6A RMS Continuous 1A CT = 1.2A RMS Continuous (Whole Current) : 120% of I <sub>max</sub> continuous.	
	Power Supply	Wide operating Voltage SMPS : 80 VAC - 415 VAC, 50-60 Hz.	
MEASUREMENT	Energy	Total Active Energy (KWh) Range of Reading : 0 to 9999999.0 KWh Accuracy : 1.0S as per IS13779.	
MISCELLANEOUS	Dimensions	Bezel	96 X 96 mm
		Panel Cutout	92 X 92 mm
		Depth of installation	55 mm
		Display	16X1 LCD
		Operating temp	10°C to 50°C
		Min. Operating Current	0.4% of CT-Primary.

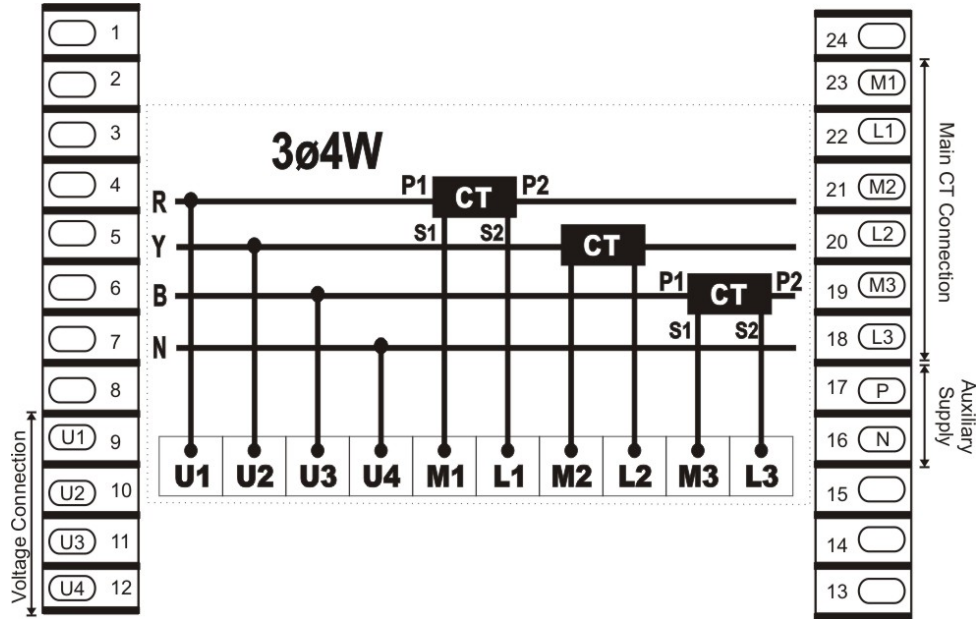
## Installation and Commissioning

To install the Unit, proceed the following instruction:

1. Push the unit into the panel and mount using the clamps provided.



2. Connect the Auxiliary supply (80-270 VAC) to the terminals marked P and N.
3. Connect the three phases with the phase sequence being R, Y, B to the terminals marked U1, U2, and U3 respectively and then, connect the neutral wire to the terminal marked, U4. Make sure the three phases coming to the unit come through control fuse of 1.0A rating. This will protect the electronic inside from damage due to sever overvoltage or phase fault in the system.
4. Connect the two wires from R-phase CT to the terminals marked M1 and L1 such that S1 goes to the terminal marked M1. Connect the two wires coming from the Y-phase CT to the terminals marked M2 and L2 such that S1 from the CT goes to terminal marked M2. Connect the two wires coming from B-phase CT to the terminals marked M3 and L3 such that S1 from the CT goes to the terminals marked M3.
5. Supply power to the three phases. The unit will display power receiving information such as ““---TRINITY---”,” then it comes into Run Mode.
6. First the CT-primary should be set, and then enters into Run Mode. Refer Operational Details in the next section.
7. Now the unit is ready for operation.



Connection Scheme

## Operational Details




The energy based Entity is a versatile meter with all the features needed to implement for a robust electrical system. It can be configured to suit for the measurement of energy. There are two types of operational Mode in this unit such as Programming Mode and Run Mode.

After supplying power (80 to 270 VAC), the unit will display with power receiving information such as “---TRINITY---”, and then enters into Run Mode by default with the following display.



KWh=541.3


### Programming Mode

The unit has only one field programmable parameter, **CT-Primary** and is also easy user interface by pressing three keys such as ,  and .

### Setting CT-Primary






The CT-Primary is freely programmable from 5 to 5000 A of which 5 to 200 can be set with the steps of 5 and 200 to 5000 with the steps of 25, and hence the CT setting falls onto the standard rating of user's desire. The CT setting thus gives the true current value for CT operated meter in your electrical installation system.

To set the CT-Primary, proceed the following instructions.

1. In Run Mode display, press  key for about 4 to 5 seconds continuously. The unit will enter into Programming Mode with the following display.



CT\_PRI=200



2. Press  key. Immediately, "P" starts blinking which shows that CT-Primary can now be set. Set the desired CT-Primary by pressing  and  keys and then press  to confirm the setting.
3. After the setting is completed, press  key again for about 4 to 5 seconds to return into Run Mode.

### Run Mode

In the Run Mode, KWh energy calculated by the unit is displayed on a 16X1 LC display such as shown below.



### Resetting Energies

The Active Energy (KWh), can be reset by pressing  key and  key simultaneously for about 10 seconds. Hence, the unit will restart and return into Run Mode displaying zero energy.

P.O No. : .....

Customer : .....

Sr. No. : .....

Routine and function tests conducted to relevant standards and our Specifications/Literature/O & M Manual.

Traceability: tested against latest "MTE" Standard Model PRS400.3 having basic accuracy of 0.02% traceable upto International Standards derived using appropriate ratio techniques.

Result of Test : .....

Remarks : .....

Test engineer : .....

Date : .....

---