

# OPERATING MANUAL

## *Rish Eine*



**Size: 48 x 96**



**Size: 96 x 96**

# Rish Eine

## PROGRAMMABLE DPM V/A

AC Volt Meter (3 $\Phi$ ) : Eine - 3V

AC Ammeter (3 $\Phi$ ) : Eine - 3A

AC Volt Meter (1 $\Phi$ ) : Eine - V

AC Ammeter (1 $\Phi$ ) : Eine - A

## Installation & Operating Instructions

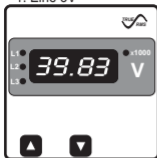
### Section

### Contents

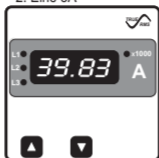
1. Introduction
2. Measurement Reading Screens
3. Programming
  - 3.1 Set Up Screens
4. Installation
  - 4.1 EMC Installation Requirements
  - 4.2 Case Dimensions and Panel Cut-out
  - 4.3 Wiring
  - 4.4 Auxiliary Supply
  - 4.5 Fusing
  - 4.6 Earth / Ground Connections
5. Connection Diagrams
  - 5.1 Connection Diagrams for EINE 3V
  - 5.2 Connection Diagrams for EINE 3A
  - 5.3 Connection Diagrams for EINE V
  - 5.4 Connection Diagrams for EINE A
6. Specifications

## Available Models :

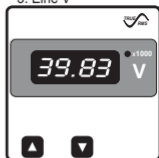
1. Eine 3V



2. Eine 3A



3. Eine V



4. Eine A



2



1

## 1. Introduction

The Eine Series is a panel mounted 96 x 96mm Digital Panel Meters for the measurement of AC Voltage and current in three phase or single phase systems.

The instrument integrates accurate measurement technology. The parameters are displayed with Ultra high brightness LED display with 14mm Digit height which enables to take readings from long distance. Programmable DPM can be configured and Programmed at site for the following :

PT Primary, CT Primary, PT Secondary, CT Secondary. The front panel has two push buttons for user interface to scroll through the available parameters the two keys has function as follow:

-  : Scrolls through parameter in upward sequence. Display sequence Eine 3V : L1 voltage, L2 voltage, L3 voltage, L1-L2 voltage, L2-L3 voltage, L3-L1 Voltage, System voltage and back to L1 voltage. Display sequence Eine 3A : L1 current, L2 current, L3 current, System current and back to L1 current.
-  : Scrolls the parameters in Reverse of above sequence.

**TABLE 1: Parameters Displayed with Eine 3V model**

Measured Parameters	Unit of measurement
L1 Voltage	volt
L2 Voltage	volt
L3 Voltage	volt
L1-L2 Voltage	volt
L2-L3 Voltage	volt
L3-L1 Voltage	volt
System Voltage	volt

**TABLE 2: Parameters Displayed with Eine 3A models**

Measured Parameters	Unit of measurement
L1 Current	Ampere
L2 Current	Ampere
L3 Current	Ampere
System Current	Ampere



**TABLE 3: Parameters Displayed with Eine V model**

Measured Parameters	Unit of measurement
L1 Voltage	volt

**TABLE 4: Parameters Displayed with Eine A models**

Measured Parameters	Unit of measurement
L1 Current	Ampere

## 2 . Measurement Reading Screen

In normal operation the user is presented with the measurement reading screens. These screens may be scrolled through one at a time in incremental order by pressing the  key and in decrementing order by pressing  key.

## A. Display Screens of Eine 3V Models :

Screen 1 : Voltage L1

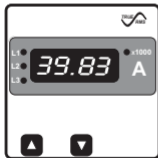


Screen 2 : System Voltage  
(value displayed after "Sys" flashing on Display)

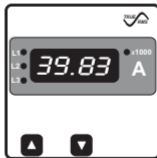


## B. Screens of EINE 3A Models :

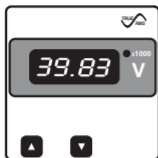
Screen 1 : L1 Current



Screen 2 : System Current  
(Value displayed after "Sys" flashing on Display)



## C. Display Screens of Eine V/A Models :



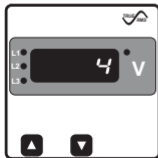
## 3. Programming

The following sections comprise step by step procedures for configuring the EINE 3A/ A and EINE 3V/V for individual user requirements. To access the set-up screens press and hold the “ $\uparrow$ ” and “ $\downarrow$ ” Keys Simultaneously.

This will take the User into the Sys Type Screen (in case of 3A/3V) Followed by “Sys” on Display (Section 3.1) or directly into the CT/PT Primary Screen (in case of A / V respectively) .

### 3.1 Set Up Screens

#### 3.1.1. System type(for Eine 3V/3A)

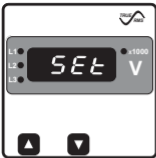


This screen is used to set the system type. System type “3” for 3 phase 3 wire & “4” for 3 phase 4 wire system.

Pressing the “ $\downarrow$ ” down” key accepts the present value and advances to the “PT primary (in case of 3V) or CT primary (in case of 3A) value Edit” menu (see section 3.1.2 for PT primary and 3.1.3. for CT primary). Pressing the “ $\uparrow$ up” key will enter to the system type selection menu and scroll the values through will enter values available. Pressing the “ $\downarrow$ down” key advances to the system type confirmation menu.

**Note: In Case 3P3W accuracy of I2 is 2% and Sys current is 1%.**

## System Type Confirmation

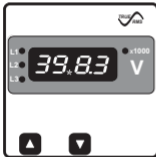


This screen will only appear following the edit of system type. If system type is to be edit again, Pressing the “ $\uparrow$ ” key will scroll between “3” for 3 phase 3 Wire and “4” for 3 Phase 4 Wire.

Pressing the “ $\downarrow$ ” down” key sets the displayed value and will advance to “Potential Transformer Primary Value Edit” menu. (See section 3.1.2 for 3V & V) and “Current transformer primary value (see section 3.1.3 for 3A & A)

### 3.1.2. Potential Transformer Primary Value (for 3V & V)

This screen displays “PtPr” message followed by previously set PT primary value on display. For Eine 3V (3 phase) user can set PT primary value from **100V<sub>LL</sub> to 999kV<sub>LL</sub>** & for Eine V (single phase), user can set PT primary from **57.5(V<sub>LN</sub>) to 999 (kV<sub>LN</sub>)**.



Pressing the “ $\downarrow$ ” key accepts the present value and advances to the “PT Secondary” selection menu(See Section 3.1.4) for Eine -3V and V.

Pressing the “ $\uparrow$ ” key will enter the “Potential transformer Primary Value Multiplier Selection.

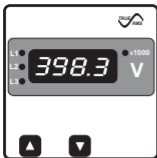
**Eine 3V:** Initially the “multiplier must be selected. Pressing the “ $\uparrow$ ” Key will move the decimal point position to the right side and show ###. , after which it will again Shift to ###. ###, ###. with Annunciation of “x1000”, which indicates the value in kV.

**Eine -V:** Initially the “multiplier must be selected. Pressing the “ $\uparrow$ ” Key will move the decimal point position to the right Side and show ##.##, #### after which it will again shift to ####, ####, #### With annunciation of “x1000”, which indicates the value in kV. Pressing the “ $\downarrow$ ” key accepts the present multiplier (Decimal Point position) and advances to the “PT Primary value Edit” menu with decimal flashing to indicate cursor position.

### PT Primary value Edit

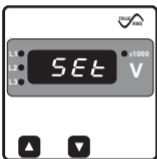
Pressing the “ $\uparrow$ ” key will scroll the value of the most significant digit.

Pressing the “ $\downarrow$ ” key accepts the present value at the cursor position and advances the cursor to the next Less significant digit. When the least significant digit has been set,



pressing the “ $\downarrow$ ” key will advance to the “Potential transformer Primary Value Confirmation” screen. For **Eine 3 V**: When PT primary is set < 100VLL then meter shows “Err” & again goes to PT primary edit stage with the minimum PT primary value i.e. 100VLL  
**Eine -V**: When PT primary is set less than 57.5 VLN then meter shows “Err” & again goes to PT primary edit stage with the minimum PT primary value i.e. 57.5VLN.

**Note** : the flashing decimal point indicates the cursor position, a steady decimal point will be present to identify the scaling of the number until the cursor position coincides with the steady decimal point position. At this stage the decimal point will be flashing.



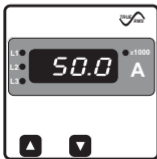
### Potential Transformer Primary Value Confirmation

This screen will only appear following an edit of the Potential Transformer Primary Value If the set value is to be corrected, pressing the “ $\uparrow$ ” key will return to the “Potential Transformer Primary Value Edit” stage. Pressing the “ $\downarrow$ ” key sets the value and then advance to the “PT secondary screen” Selection menu.

Note: For Eine V(600VLN ) it will exit from set up menu.

### 3.1.3 Current Transformer Primary Value (for 3A & A)

This screen displays “CtPr” message followed by previously set CT primary value on display. This screen enables user to set CT primary from **1A to 999kA**.

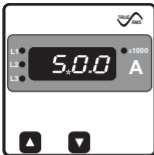


Pressing the “ $\downarrow$ ” key accepts the present value and advances to the “CT Secondary Selection screen”

Pressing the “ $\uparrow$ ” key will shift decimal point position to right side and show ###,###,###. , after which it will again shift to #.###,###,###. with Annunciation of “x1000”, It indicates the value in kA.

Pressing the “ $\downarrow$ ” key accepts the decimal point position and enters into Current Transformer Primary value edit.



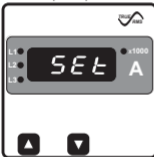


### Current Transformer Primary value Edit

Pressing the “ $\uparrow$ ” key will scroll the value of the most significant digit. Pressing the “ $\downarrow$ ” key accepts the present value at the cursor position and advances the cursor to the next Less significant digit. When the least significant digit has been set, pressing the “ $\downarrow$ ” key will advance to the “Current transformer Primary Value confirmation” screen. When CT primary is set less than 1A, then meter shows “Err” and CT primary is set to 1A.

minimum CT primary value that user can set is 1A.

**Note :** the flashing decimal point indicates the cursor position, a steady decimal point will be present to identify the scaling of the number until the cursor position coincides with the steady decimal point position. At this stage the decimal point will be flashing.



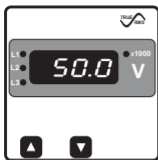
### Current Transformer Primary Value Confirmation

This screen will only appear following an edit of the Current Transformer Primary Value.

If the set value is to be corrected, pressing the “ $\uparrow$ ” key will return to the “Current Transformer Primary Value Edit” stage. Pressing the “ $\downarrow$ ” key sets the value and then advance to the “CT secondary” Selection menu.

### 3.1.4. Potential Transformer Secondary Value (for 3V & V)

This screen displays “Pt-S” message followed by previously set PT secondary value on display. For Eine 3V (3 phase) user can set PT secondary value from **100V<sub>LL</sub> to 500V<sub>LL</sub>** & for Eine V (single phase), user can set PT primary from **57.5(V<sub>LN</sub>) to 300V<sub>LN</sub>**.

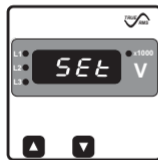


Pressing the "↓" key accepts the present value and advances to the "Auto scroll" selection menu (See Section 3.1.6) for 3V. In case of Eine V it will exit from set up menu.

Pressing the "↑" key will enter the "Potential transformer Secondary Value Most significant digit Selection."

Pressing the "↑" key will scroll the value of the most significant digit. Pressing the "↓" key accepts the present value at the cursor position and advances the cursor to the next Less significant digit.

When the least significant digit has been set, pressing the "↓" key will advance to the "Potential transformer secondary value confirmation" screen. For Eine 3V minimum PT secondary can set is 100V(L-L). For Eine V If Pt secondary is less than 57.5 V(L-N) then meter shows "Err" and PT secondary is set to 57.5 V(L-N).



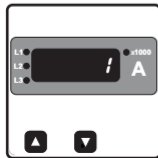
**Note:** For Eine V decimal point is fixed at third digit position.

#### **Potential Transformer Secondary Value Confirmation**

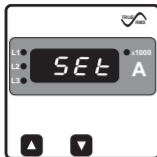
This screen will only appear following an edit of the Potential Transformer Secondary Value.

If the set value is to be corrected, pressing the "↑" key will return to the "Potential Transformer Secondary Value Edit" stage. Pressing the "↓" key sets the value and then advance to the "Auto scroll" Selection menu in case of Eine -3V and in case of Eine -1V it will exit from set up menu.

### **3.1.5 Current Transformer Secondary Value (for 3A & A)**



This screen is used to set Current transformer secondary value. "1" for CT secondary 1A and "5" for CT secondary 5A. pressing "↓" down key accepts the present value and advances to the Auto Scroll option in case of Eine -3A and for Eine -A it will exit from setup and goes to measurement screen.

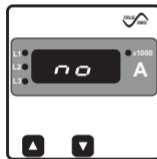


### Current transformer Secondary confirmation screen:

When "↓" down key is pressed , set message screen will appear, if again down key is pressed value is accepted. If CT secondary value is to be edit once again,pressing "↑" up key user can scroll between "5" for CT secondary 5A and "1" for CT secondary 1A.

Pressing "↓" key will accept displayed value and advance to auto scroll selection menu in case of Eine 3A and it will exit from set up in case of Eine A and goes to measurement screen.

### 3.1.6 Selection of Auto Scrolling or fixed Screen (only for 3V/3A)

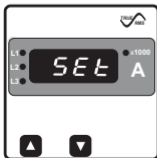


Pressing the "↓" key will accept the display value and exit from set up and enter into measurement mode.

Pressing the "↑" key will scroll between "Yes" and "No".

Select "Yes" for Auto scrolling of parameter display and Select "No" for fixed display screen.

Pressing the "↓" key will enter into Screen selection Confirmation screen.



### Auto / Fixed Screen Confirmation

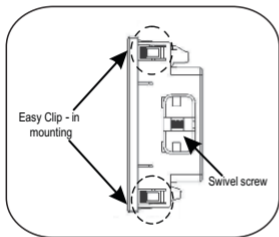
Pressing the "↓" key set the selected option and Exit set up with entering into measurement mode.

Pressing the "↑" key re-enter Screen selection menu.

## 4. Installation

Mounting of EINE is featured with easy "Clip-in" mounting. Push the meter in panel slot (size 92 x92 mm), it will click fit into panel with the four integral retention clips on two sides of meter.

If required Additional support is provided with swivel screws (optional) as shown in figure.



As the front of the enclosure conforms to IP 50, additional protection to the panel may be obtained by the use of an optional panel gasket. The terminals at the rear of the product should be protected from liquids.

The EINE V/A should be mounted in a reasonably stable ambient temperature and where the operating temperature is within the range 0 to 50 °C . Vibration should be kept to a minimum and the product should not be mounted where it will be subjected to excessive direct sunlight.

## Caution

1. In the interest of safety and functionality this product must be installed by a qualified engineer, abiding by any local regulations.
2. Voltages dangerous to human life are present at some of the terminal connections of this unit. Ensure that all supplies are de-energised before attempting any connection disconnection.
3. These products do not have internal fuses therefore external fuses must be used to ensure safety under fault conditions.

## 4.1 EMC Installation Requirements

This product has been designed to meet the certification of the EU directives when installed to a good code of practice for EMC in industrial environments, e.g.

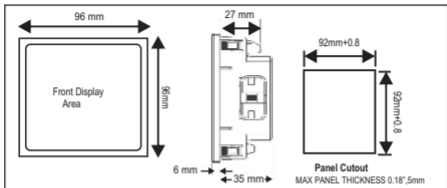
1. Screened output and low signal input leads or have provision for fitting RF suppression components, such as ferrite absorbers, line filters etc., in the event that RF fields cause problems.

**Note:** It is good practice to install sensitive electronic instruments that are performing critical functions, in EMC enclosures that protect against electrical interference which could cause a disturbance in function.

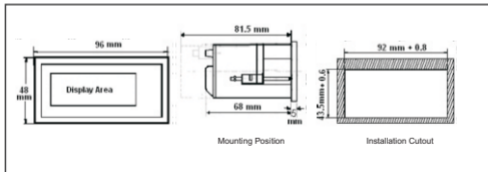
2. Avoid routing leads alongside cables and products that are, or could be, a source of interference.
3. To protect the product against permanent damage, surge transients must be limited to 2kV pk. It is good EMC practice to suppress differential surges to 2kV at the source. The unit has been designed to automatically recover in the event of a high level of transients. In extreme circumstances it may be necessary to temporarily disconnect the auxiliary supply for a period of greater than 5 seconds to restore correct operation.
4. ESD precautions must be taken at all times when handling this product.

## 4.2 Case Dimensions and Panel Cut Out

### 4.2.1 for 96X96 models



### 4.2.2 for 48X96 models



### 4.3 Wiring

Input connections are made directly to screw-type terminals with indirect wire pressure. Numbering is clearly marked on the connector. Choice of cable should meet local regulations. Terminal for inputs will accept up to 4mm<sup>2</sup>(12 AWG) or 2.5mm<sup>2</sup> (12AWG)Standard

**Note :** 1) It is recommended to use wire with lug for connection with meter.

- 2) For disconnecting the device a switch or circuit-breaker shall be included at the site and shall be within easy reach of the operator. The specification are as below.  
For aux. = At least 1.5 times of applied Power supply.

For Measuring Input = At least 1.5 times of applied measuring inputs.

### 4.4 Auxiliary Supply

EINE should ideally be powered from a dedicated supply, however it may be powered from the signal source, provided the source remains within the limits of the chosen auxiliary voltage.

### 4.5 Fusing

It is recommended that all voltage lines are fitted with 1 amp HRC fuse.

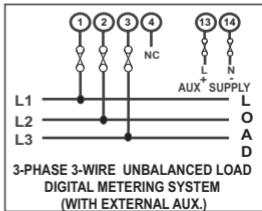
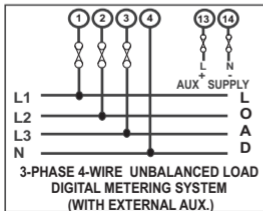
### 4.6 Earth/Ground Connections

For safety reasons, panels and accessories should be grounded in accordance

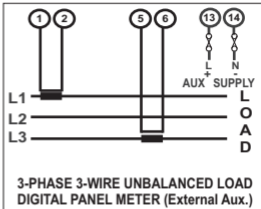
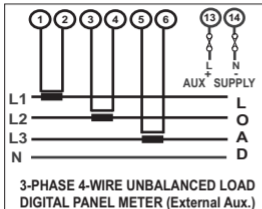
## 5. Connection Diagrams

### 5.1 For 96x96 DPM

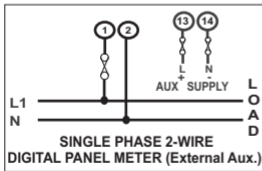
Connections for EINE 3V 96 x 96mm



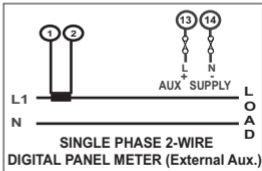
## Connections for EINE 3A 96X96



## Connections For EINE V 96X96



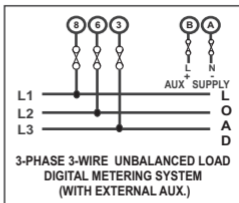
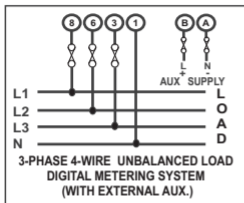
## Connections For EINE A 96X96



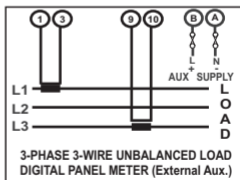
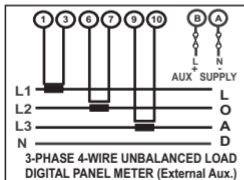


## 5.2 For 48x96 DPM

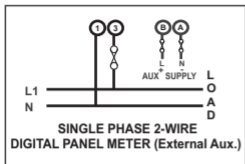
### Connections for EINE 3V 48 x 96mm



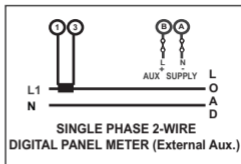
### Connections for EINE 3A 48 x 96mm



## Connections For EINE V 48 x 96mm



## Connections For EINE A 48 x 96mm



## 6. Specifications :

### Input voltage (3V / V) :

#### Nominal Input Voltage Ranges

#### Line - Neutral

57 V - 300 V L-N

600 V L-N (Applicable for single phase only)

#### Line - Line

100 V - 500V L-L

Max continuous input voltage

120% of rated value

Nominal input voltage burden

<0.3VA approx. per phase

<0.4 VA approx. per phase (for 600VLN)

System PT Primary values

**3 V:** 100VL-L to 999kV L-L Programmable onsite

**V:** 57.5VL-N to 999kV L-N Programmable onsite

### **Input current (3A / A) :**

Nominal Input Current Ranges	1A and 5A AC RMS
System CT Primary values	1A to 999kA Programmable onsite
Max continuous input current	120% of rated value
Nominal input current burden	<0.2VA approx. per phase

### **Overload Indication :**

"-oL-"  
(If input is greater than 125% of secondary value.)

### **Auxiliary Supply :**

AC-DC Auxiliary Supply	40V to 300V AC/DC (+/- 5%) 20V to 40V AC /20V to 60V DC
Frequency Range for AC Aux. Supply	45 to 65 Hz
VA Burden	<3 VA at 240V ,50Hz .

### **Overload Withstand :**

Voltage	2 X Rated Value for 1 Second, repeated 10 times at 10 second interval.
Current	4 X Rated Value for 1 Second, repeated 5 times at 5 min interval.

### **Operating Measuring Ranges**

Voltage Range	10 ... 120 % of Rated Value
Current Range	10 ... 120 % of Rated Value
Frequency	45 ... 65 Hz

### **Reference conditions for Accuracy :**

Reference temperature	23 °C $\pm$ 2 °C
Input waveform	Sinusoidal (distortion factor 0.005)
Auxiliary supply voltage	Rated Value $\pm$ 1 %
Auxiliary supply frequency	Rated Value $\pm$ 1 %
Input Frequency	50 Hz / 60 Hz

## Reference conditions for Accuracy :

Voltage Range	20...100% of Nominal Value
Current Range	10...100% of Nominal Value

## Accuracy

Voltage (3V / V)	± 0.5% of Nominal value.
Current (3A / A)	± 0.5% of Nominal value.

Measurement error is normally much less than errors specified in the above. Variation due to influence quantity is less than twice the error allowed for reference condition.

## Temperature Coefficient

Voltage	0.025% / °C
Current	0.05% / °C

(For Rated value range of use 0... 50 °C )

## Display

LED	1 line 4 digits .
Digit height	14mm
Annunciator LEDs	For Displaying Units and Parameter

## Controls

User Interface	2 Keys
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## Applicable Standards

EMC	IEC 61326-1:2005 10V/m min-Level 3 industrial low level Electromagnetic radiation environment
Safety	IEC 61010-1: 2001,Permanently Connected use
IP for water & dust	IEC 60529

## Safety

Pollution Degree	2
Installation Category	III
High Voltage Test	2.2 kV AC, 50 Hz for 1 minute

## Environmental conditions

Operating temperature	0 to 50 °C
Storage temperature	-25 to 70 °C
Relative humidity	0 .. 90 % (Non condensing)
Warm up time	Minimum 3 minute
Shock	15g in 3 planes
Vibration	10 .. 55 Hz, 0.15mm amplitude

## Enclosure

Front	IP50
Front with seal(option)	IP65
Back	IP20
Material	Polycarbonate Housing ,
Terminals	Screw-type terminals

## Dimension and weight:

	96x96 models	48x96 models
Bezel Size (DIN 43718)	96mm X 96mm (DIN 43718 )	48mm X 96mm
Panel Cut-Out	92 + 0.8mm X 92 + 0.8mm	43.5 + 0.6mm X 92 + 0.8mm
Overall Depth	40mm	68mm
Weight	310g Approx.	250g Approx.

The Information contained in these installation instructions is for use only by installers trained to make electrical power installations and is intended to describe the correct method of installation for this product. However, Manufacturer has no control over the field condition which influence product installation.

It is the user's responsibility to determine the suitability of the installation method in the user's field conditions. Manufacturer only obligations are those in Manufacturer standard Conditions of Sale for this product and in no case will Manufacturer be liable for any other Incidental, indirect or consequential damages arising from the use or misuse of the products.