

# OPERATING MANUAL

## PROGRAMMABLE DPM



Size: 48 x 96



Size: 96 x 96



# Eine

## PROGRAMMABLE DPM

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
	3.1.1 System Type
	3.1.2 Potential Transformer Primary value
	3.1.3 Current Transformer Primary value
	3.1.4 Auto Scrolling
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 96 x 96 DPM
	5.2 Connection Diagrams for EINE 48 x 96 DPM
6.	Specifications

## Available Models :

1. Eine 3V



2. Eine 3A



3. Eine V





4. Eine A



## 1. Introduction

The Eine Series is a panel mounted 96 x 96mm & 48 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. Programmable DPM can be configured and Programmed at site for the following : PT Primary, CT Primary. The front panel has two push buttons for userinterface 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. These DPMs come with 14mm height 7 segment Display, which enables to take readings from long distance.



**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

## 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)



## 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 "↑" and "↓" Keys Simultaneously.

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

### 3.1 Set Up Screens

#### 3.1.1. System type(for EINE 3V & EINE 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 "↓" down" key accepts the present value and advances to the "PT primary (in case of Eine-3V) or CT primary (in case of Eine - 3A) value Edit" menu (see section 3.1.2 for PT primary and 3.1.3. for CT primary). Pressing the "↑"up" key the system type edit mode and scroll the values through will enter values available . Pressing the "↓" down" key advances to the system type confirmation menu.

## System Type Confirmation



This screen will only appear following the edit of system type. If system type is to be edit again, Pressing the “ $\uparrow$ up” 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 Eine 3V & Eine V) and current transformer primary value for Eine 3A (see section 3.1.3)

### 3.1.2. Potential Transformer Primary Value (for Eine 3V & Eine 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 **nominal input voltage(V<sub>LN</sub>) of meter to 999 kV<sub>LN</sub>**.

Pressing the “ $\downarrow$ ” key accepts the present value and advances to the “Auto scrolling or Fixed screen” selection menu. (See Section 3.1.4 for Eine-3V) for V advances to measurement screen

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

**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 “Potential Transformer value Edit” menu with decimal flashing to indicate cursor position.

### Potential Transformer 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 Nominal input voltage Value of meter, then meter shows "Err" & again goes to PT primary edit stage with the minimum PT primary value i.e. Nominal input voltage value of that meter.

**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 advances to the "Auto scrolling or fixed screen" Selection menu. (See section 3.1.4. for Eine-3V) for Eine-V it will advance to measurement screen.

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

This screen displays "CtPr" message followed by previously set CT primary value on display. This screen enables user to set CT primary from **Nominal input current of meter to 999kA**.



Pressing the " $\downarrow$ " key accepts the present value and advances to the "Auto Scrolling or Fixed Screen Selection" menu. (See Section 3.1.4 for Eine-3A) for Eine-A it will advance to measurement 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 "↑" 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 "Current transformer Primary Value confirmation" screen. When CT primary is set less than Nominal input current value of meter, then meter shows "Err" and again goes to

CT primary edit state with minimum CT primary value i.e Nominal input current value of meter.

**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

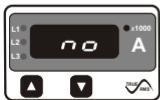
This screen will only appear following an edit of the Current Transformer Primary Value.



If the set value is to be corrected, pressing the "↑" key will return to the "Current Transformer Primary Value Edit" stage. Pressing the "↓" key sets the value and then advance to the "Auto Scrolling or Fixed screen" Selection menu for Eine-3A. (See section 3.1.4) for Eine-A it will exit from setup and goes to measurement reading screen.

### 3.1.4 Selection of Auto Scrolling or fixed Screen (only for Eine-3V/Eine-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.



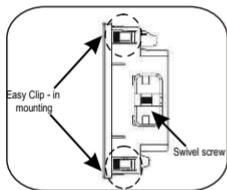
### Auto / Fixed Screen Confirmation

Pressing the “ $\downarrow$ ” key set the selected option and Exit set up with entering into measurement mode.

Pressing the “ $\uparrow$ ” key re-enter Screen selection menu.

## 4. Installation

Mounting of EINE is featured with easy “Clip-in” mounting (only for 96 x 96 model). Push the meter in panel slot (size 92 x 92 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.

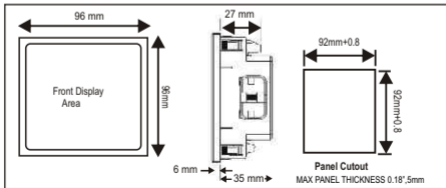
1. Screened output and low signal input leads or have provision for fitting RF suppression components, such as ferrite absorbers, line filters etc., in the event that RF fields cause problems.

**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.

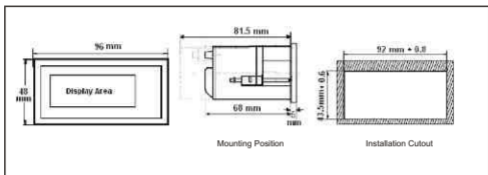
2. Avoid routing leads alongside cables and products that are, or could be, a source of interference.
3. To protect the product against permanent damage, surge transients must be limited to 2kV pk. It is good EMC practice to suppress differential surges to 2kV at the source. The unit has been designed 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 for 96 x 96mm DPM and Pluggable connector type for 48 x 96mm DPM. Numbering is clearly marked on the connector. Choice of cable should meet local regulations. Terminal for inputs will accept wire 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.

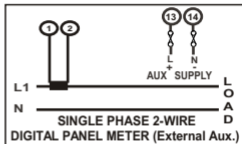
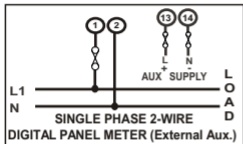
## 4.6 Earth/Ground Connections

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

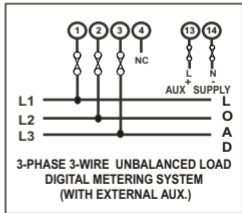
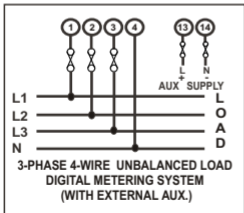
## 5. Connection Diagrams

### 5.1 For 96x96 DPM

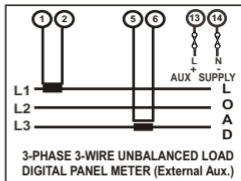
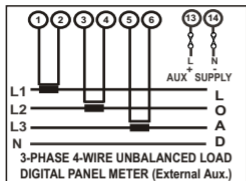
Connections For EINE V 96 x 96mm      Connections For EINE A 96 x 96mm



Connections for EINE 3V 96 x 96mm

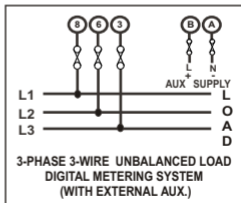
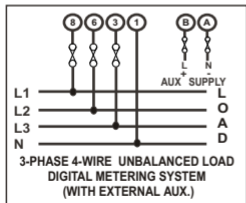


## Connections for EINE 3A 96 x 96mm

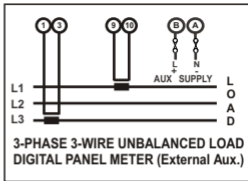
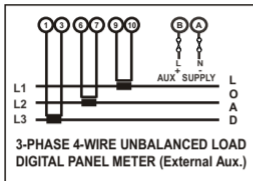


## 5.2 For 48x96 DPM

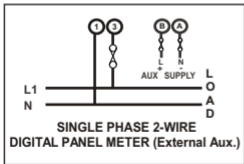
### Connections for EINE 3V 48 x 96mm



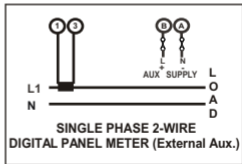
## Connections for EINE 3A 48 x 96mm



## Connections For EINE V 48 x 96mm



## Connections For EINE A 48 x 96mm



## 6. Specifications :

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

Nominal Input Voltage Ranges	Line - Neutral	Line - Line
	57 V - 70 V L-N	100 V - 120 V L-L
	71 V - 139 V L-N	121 V - 240 V L-L
	140 V - 277 V L-N	241 V - 480 V L-L
	600 V L-N (Applicable for single phase only)	
Max continuous input voltage	120% of rated value	
Nominal input voltage burden	<0.3VA approx. per phase	
System PT Primary values	<b>Eine-3 V:</b> 100VL-L to 999kV L-L Programmable onsite <b>Eine-V:</b> 60VL-N to 999kV L-N Programmable onsite	

### Input current (Eine-3A / Eine-A) :

Nominal Input Current Ranges	1A or 5A AC RMS
System CT Primary values	1A to 999kA(for 1A or 5A) Programmable onsite
Max continuous input current	120% of rated value (optional : 150% of rated value)
Nominal input current burden	<0.3VA approx. per phase

### Overload Indication :

For continuous input current 120%	"-oL-" (If input is greater than 125% of secondary value)
For continuous input current 150%	(If input is greater than 155% of secondary value)

### Auxiliary Supply :

AC-DC Auxiliary Supply	40V to 300V AC/DC (+/- 5%)
AC Auxiliary Supply	80V to 300V AC
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 (Optional: 10 ... 150 % of Rated Value)
Frequency	45 ... 65 Hz

## Reference conditions for Accuracy :

Reference temperature	23 °C ± 2 °C
Input waveform	Sinusoidal (distortion factor 0.005)
Auxiliary supply voltage	Rated Value ± 1 %
Auxiliary supply frequency	Rated Value ± 1 %
Input Frequency	50 Hz / 60 Hz
Voltage Range	20...100% of Nominal Value
Current Range	10...100% of Nominal Value

## Accuracy

Voltage (Eine-3V / Eine-V)	± 1.0% (0.5% on request) of Nominal value.
Current (Eine-3A / Eine-A)	± 1.0% (0.5% on request) 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

## Applicable Standards

EMC IEC 61326-1:2005

10V/m min-Level 3 industrial low level  
Electromagnetic radiation environment

Safety IEC 61010-1: 2001,Permantly 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
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.

## WARRANTY

Dear Customer,

You are now the privileged owner of **DPM**, a product that ranks the first of its kind in the world. **Company** provides 12 months warranty from the original date of Purchase against defective material and workmanship.

In the unlikely event of failure of the instrument / accessories within the warranty period.

**Company** will repair meter / accessories free of charge. Please hand over the meter / accessories to the dealer / stockist from whom you have purchased along with this card and relevant Cash Memo / Invoice. This warranty entitles you to bring the meter / accessories at your cost to the nearest stockist / dealer and collect it after repairs.

**NO TRANSPORTATION CHARGES WILL BE REIMBURSED.**

**The warranty is not valid in following cases:**

1. Warranty card duly signed and stamped and original Cash Memo / Invoice is not sent along with **DPM**.
2. Complete warranty card is not presented to authorised person at the time of repairs.
3. Meter / accessories is not used as per the instructions in the instruction manual.
4. Defect caused by misuse, negligence, accidents, tampering and Acts of God.
5. Improper repairing by any person not authorised by the company.
6. Any sort of Modification, Alteration of any sort is made in electrical circuitry.
7. Seal provided inside/outside is broken.

In case of dispute to the validity of the warranty, the decision of Company service center will be final.

If you bought this **DPM** directly from the company, and if you notice transit damage, then you must obtain the insurance surveyors report and forward it to **Company**.

Thank you.

(To be filled by authorized dealer)

Model No.: \_\_\_\_\_ Serial No. : \_\_\_\_\_

Date of Purchase : \_\_\_\_\_ Cash Memo / Invoice No. : \_\_\_\_\_

Dealer's Signature : \_\_\_\_\_ Dealer's Stamp : \_\_\_\_\_