



# Data Sheet

## RISH EM DC 6000

Multifunction DC Energy Meter



Measure



Control



Record



Analyze



Optimize

### Applications

- Solar Photovoltaic Systems
- Battery chargers and systems
- Wind Power Generation
- Electroplating Industries
- Power Distribution for Telecommunication
- Industrial DC control Systems

### Possible Applications of Relay Outputs

- Alarming via lamp or horn
- Load shedding
- Remote controlling

### Product Features

#### Bi-Directional Voltage & Current measurement

The meter has a unique feature of measuring both charging and discharging current

#### Isolated Voltage Channel

The Voltage channel is galvanically isolated from rest of the circuitry

#### Event Logging

Previous 5 Events of factory-default parameters can be logged with Date and Time stamp

#### Data Logging

- User Selectable parameters (1 to 30) can be logged at regular intervals (1 to 60 min) with Date & Time stamp in internal memory and can be accessed via Modbus
- Max Records can vary from 8532 to 91010 depending upon number of selected parameters

#### Load Profile Analysis

- Logging of Energy consumed and Peak Demand (Power & Current) in a day and in a month for efficient tracking of load behaviour
- Daily Data is available for last 1 year and Monthly Data is available for last 14 years

#### Direct Remote Access (optional)

- Remote configuration of the Instrument and access of measured parameters via MODBUS
- Programmable baud rates up to 57.6kbps

#### 1 - line 8 digit Ultra-bright LED Display

1 - line LED display provides easily readable data on meter front with a display range of 99999999

#### Reverse Locking

- Energy and Ampere Hour accumulation can be blocked for Reverse Power and Current resp
- Reverse condition can be set as Import or Export

#### Onsite Configuration

Configuration can be done via Front Keys, USB Serial Interface or RS485 (MODBUS)

#### Relay Functions

- Limit Switch - For protection against over-shoot or undershoot of any selected parameter
- Pulse Output - To drive an external counter for energy measurement
- Timer - Cyclic ON-OFF operation of relay for user-defined cycles with programmable ON-OFF Delays
- Remote Operation - Relays can be activated remotely via Modbus
- Reverse Locking Alarm
- RTC Relay - Relay can be activated & deactivated at predefined ON & OFF Time on any or all Days of Week.

#### Enclosure Protection for dust and water

Conforms to IP 54 (front face) as per IEC60529

#### Compliance to International Safety standards

Compliance to International Safety standard IEC 61010 - 1 - 2010

#### EMC Compatibility

Compliance to International standard IEC 61326 - 2012



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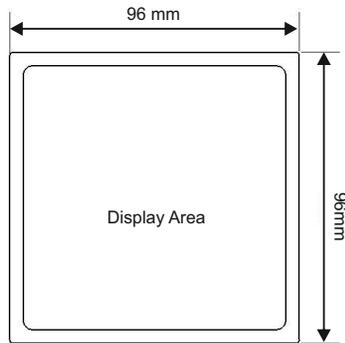


Analyze

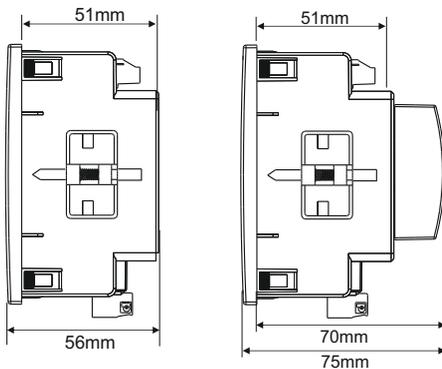


Optimize

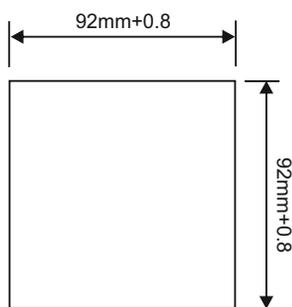
### Dimensions Details



Front View



Side View



Panel Cutout

### Technical Specifications:

#### Input Voltage:

Nominal Input Voltage Range

10 ~ 60 VDC,  
61 ~ 200 VDC,  
201 ~ 1000 VDC

Max continuous input voltage

125% of nominal value

Overload Withstand

2 x rated value for 1 second, repeated 10 times  
at 10 second intervals

#### Input Current

No of Channels

1

Current Sensor

External Shunt

Shunt Setting Range

50 ~ 150 mV

Full Scale Setting Range

1 A to 20 kA

Max continuous input current

125% of nominal value

Overload Withstand

20x rated value for 1 second, repeated 5 times  
at 5 min intervals

#### Operating Measuring Range

Voltage

±5 to ±125% of nominal value

Current

±0.2 to ±125% of nominal value

#### Auxiliary Supply

Higher Aux

60 V – 300 V AC-DC, 45 to 65 Hz range

Lower Aux

20 V – 60 V AC-DC

Nominal Value

230 V AC-DC, 50/60 Hz for Higher Aux  
24 V AC-DC for Lower Aux

#### VA Burden

Nominal input voltage burden

< 0.4 W approx.

Nominal input current burden

< 0.1 W approx.

Auxiliary Supply burden

< 6 VA approx

#### Accuracy

Reference Conditions

23°C +/- 2°C

Voltage

±0.5% of Nominal value (±20 to ±120%)

Current

±0.5% of Nominal value (±5 to ±120%)

Power

±0.5% of Nominal value (±5 to ±120%)

Energy

Class 0.5

Temperature Drift

0.05%/°C

#### Display

Type

1 line 8-digit LED Display

Display Height

9 mm

Overload Indication

-oL- (Above 126% of nominal value)

#### Display Range

Voltage

0 to ±9999

Current

0 to ±9999

Power

0 to ±9999

Energy (Import & Export)

0 to 99999999



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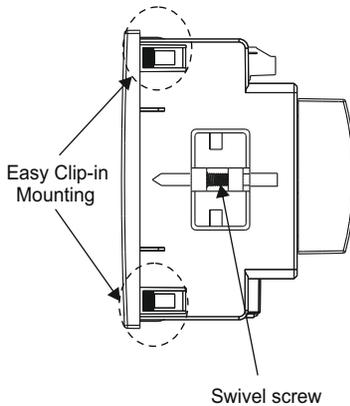
Analyze



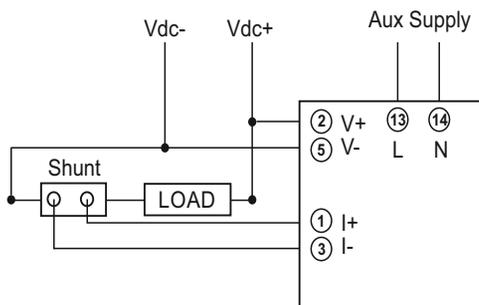
Optimize

### Electrical Connections:

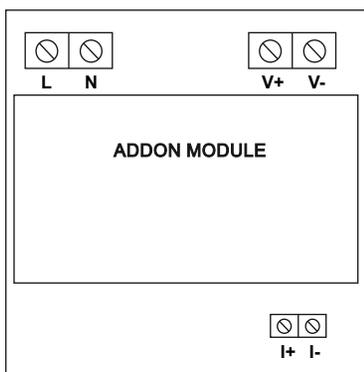
#### Installation



#### Electrical Connection



#### Meter Rear View



### Technical Specifications:

#### Real Time Clock (RTC)

Uncertainty  $\pm 2$  minutes / month (23°C +/- 2°C)  
 NOTE: Variation due to influence Quantity is 100% of class index

#### Interfaces

Impulse LED For Energy Testing  
 Relay Output (Optional) 250 VAC / 30 VDC, 5 A  
 Modbus (Optional) RS485, max. 1200 m  
 Baud rate: 4800, 9600, 19200, 38400, 57600 bps  
 USB (Optional) Baud rate: 57600 bps

#### Applicable Standards

EMC IEC 61326-2012  
 Immunity IEC 61000-4-3, 10V/m min – Level 3 industrial  
 Low level  
 Safety IEC 61010-1-2010, Permanently connected use  
 IP for water & dust IEC 60529  
 Pollution degree 2  
 Installation category 1000V CATII, 600V CATIII (Measuring Inputs)  
 300V CATIII (Power Supply)

#### Protective Class

High Voltage Test (DC, 1 minute) 2  
 • 6.22 kV DC, Enclosure versus all electrical circuits  
 • 5.23 kV DC, Auxiliary Supply versus all other electrical circuits  
 • 6.22 kV DC, Measuring Terminals versus all other electrical circuits  
 • 3.11 kV DC, Relay versus Relay  
 • 5.23 kV DC, USB & RS485 versus all other electrical circuits

#### Environmental

Operating temperature -10 to +55°C  
 Storage temperature -20 to +70°C  
 Relative humidity 0... 90% non condensing  
 Warm up time Minimum 3 minute  
 Shock 15g in 3 planes  
 Vibration 10... 55...10 Hz, 0.15mm amplitude  
 Number of Sweep Cycles 10 per axis  
 Enclosure IP 54 (Front Side) and IP 20 (Terminal Side)

#### Dimensions & Weights

Bezel Size 96 mm x 96 mm DIN 43718  
 Panel Cut-out 92 + 0.8 mm x 92 + 0.8 mm  
 Overall Depth 75 mm , with addon card,  
 57 mm, without addon card  
 Weight 320 gm. approx.

It is recommended that the wires used for connections to the instrument should have lugs soldered at the end. That is, the connections should be made with Lugged wires for secure connections.



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### Measured Parameter :

Sr. No.	Displayed Parameters	Sr. No.	Displayed Parameters
1	Voltage	12	Max Import and Export Power Demand
2	Current	13	Max Import and Export Current Demand
3	Power	14	Number of Interruptions
4	Import and Export Energy	15	Old Import and Export Energy
5	Import and Export Ampere Hour	16	Old Import and Export Ampere Hour
6	Import and Export Power Demand	17	Old Max Import and Export Power Demand
7	Import and Export Current Demand	18	Old Max Import and Export Current Demand
8	On Hour	19	Old On Hour
9	Run Hour	20	Old Run Hour
10	Max and Min Voltage	21	Old Number of Interruptions
11	Max and Min Current		

### Ordering Information :

Ordering Information	EM94-	Z	XX	X	X	00000000
Product Type	RISH EM DC 6000 - Single Channel DC Energy Meter					
Input voltage range	10 - 60 V		V1			
	61 - 200 V		V2			
	201 - 1000 V		V3			
Auxiliary Supply	60 - 300V AC / DC			H		
	20 - 60V AC / DC			M		
Output Option	NONE				Z	
	RS485+2 RELAY				R	
	RS485+2 RELAY+USB+Datalogging				D	

### Order Code Example : EM94-ZV3HD00000000

RISH EMDC 6000 - Single Channel DC Energy Meter : Input 201-1000V DC, Aux 60-300V AC/DC, With RS485 + 2 RELAY + USB + Datalogging



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Specifications may change without prior notice



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