



RISHABH

# Data Sheet

Single-Phase Direct Connected AC Energy Meter

RISH ED1101 2TS / ED1111 Mod



Measure



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### Overview :

RISH ED11X1 is a modern Single Phase Direct Connected AC Energy Meter designed for intended to use in residential, commercial and light industrial Electrical Energy Metering. The meter is engineered using advanced microcontroller technology and is suitable for electrical parameter measurement and monitoring in 1 Phase 2 Wire Networks. It supports maximum 45 A current measurement on direct connection. It supports Tariff Counters selectable via MODBUS Communication. It displays parameters on bright LCD and also has Pulse Output and Impulse LED for energy monitoring. It has inbuilt industry standard MODBUS RTU for remote monitoring. Meter housing is standard Din Rail Mount that allows ease of installation.

### Product Features :

#### Direct Connection Meter :

The meter can safely measure 45 A maximum current on direct connection, eliminating the use of expensive external CT for high current networks. Meter is also self-powered thus offer simplified connections.

#### Measured Electrical Parameters :

The meter is primarily for bidirectional Active, Reactive and Apparent Energy measurement but it also accurately measures important electrical parameters like Voltage, Current, Frequency, Active, Reactive and Apparent Power, and Power Factor in Single Phase Networks. The measured parameters can be viewed on display and MODBUS for remote viewing.

#### Demand :

The Demand parameter for Active Power (Import/Export), Reactive Power (Import/Export), Apparent Power and Current are calculated as per configurable Demand Integration time.

#### Pulse Outputs :

The meter has one opto-isolated potential free pulse output that can be configured for any one of the Active (Import/Export), Reactive (Import/Export) and Apparent Energy parameter. The pulse width and rate of pulse out is onsite programmable.

#### Impulse LED :

The meter has Impulse LED which flash at rate of 1000 impulse per 1 kWh indicating the Active Energy consumption.

#### LCD :

The LCD has bold seven segment digits with bright white backlit for display of measurement parameters.

Measurement screen can be set as automatic scrolling or manual scrolling.

#### Front Key :

One key is provided for easy navigation and accessibility of different parameters.

#### Remote Communication(Optional) :

The meter provides optional communication based on MODBUS protocol for remote data acquisition of measurement data and configuration. MODBUS parameters are Baud rate, device address and parity-stop bits are programmable.

#### Digital Input(Optional) :

The meter has one Digital Input (DI) dedicated for selection of active tariff T1 and T2. The opto-isolated DI is rated for a wide range of AC/DC voltage for operation.

#### Multi tariff :

The meter has Tariff Counters for energy accumulation which are selectable via Digital Input or via MODBUS Communication. Energy for tariff are Active Energy (Import/Export/Total), Reactive Energy (Import/Export/Total) and Apparent Energy.

#### Compliance to Standards :

National / International Standards are complied

Accuracy Standard :	EN50470-1, 3
	IEC62053-21, 23 (IEC)
IP for water & dust:	IEC 60529
Plastic Flammability Standard:	UL 94

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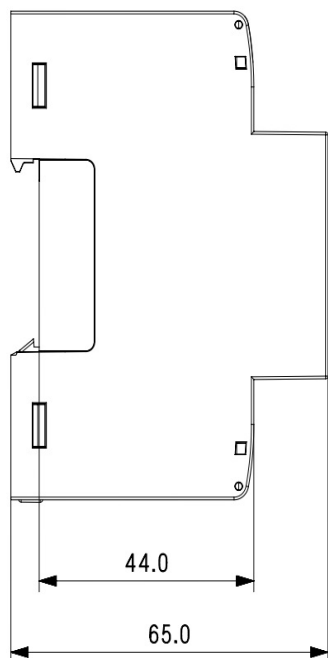
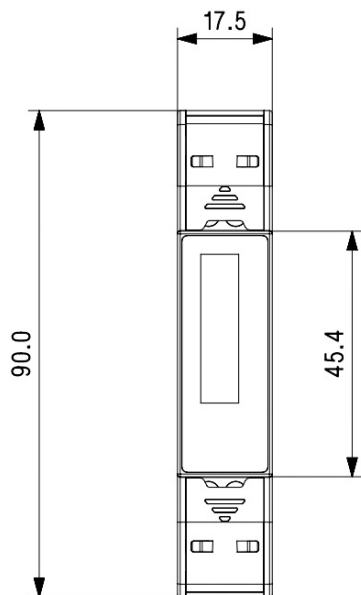


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### Dimensions Details:



### Technical Specifications:

#### Input :

Reference Voltage ( $U_n$ )	230 VLN
Operating Voltage Range	193 - 253 VLN
Power consumption in Voltage Circuit	< 2 W (10 VA)
Starting Current ( $I_{st} = 0.04 \cdot I_{tr}$ )	20 mA
Minimum Current ( $I_{min} = 0.5 \cdot I_{tr}$ )	250 mA
Transitional Current ( $I_{tr}$ )	0.5 A
Reference Current ( $I_{ref} = 10 \cdot I_{tr}$ )	5 A
Maximum Current ( $I_{max} > 50 \cdot I_{tr}$ )	45 A
Operating Current Range	0.25-5 A (45 A)
Short time Over-current	$30 \cdot I_{max}$ for half-cycle at 50 Hz
Power consumption in Current Circuit	<1 VA per phase
Frequency	45-65 Hz

#### Auxiliary Supply :

Type	Self Powered
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#### Reference Conditions for Accuracy :

Reference Temperature	23°C ± 2°C
Input Voltage	$U_n \pm 1\%$
Input Waveform	Sinusoidal (distortion factor <2%)
Input Frequency	50 Hz ± 0.3%

#### Accuracy :

Active Energy (Import/Export)	Class B as per EN50470-3 Class 1 as per IEC 62053-21
Reactive Energy (Import/Export)	Class 2 as per IEC62053-23
Apparent Energy	± 1.0 %
Voltage	± 0.5% of of range max
Current	± 0.5% of Nominal value
Frequency	± 0.2% of Mid frequency
Active Power	± 1% of range max
Reactive Power	± 1% of range max
Apparent Power	± 1% of range max
Power Factor	±1% of unity

#### Pulse Outputs :

So1	Passive Opto-isolated
Contact Range	5-27V DC, 27 mA DC (max)
Pulse Duration	60-200 millisecond
Pulse Rate	0.01-1000 pulse per kWh/kVARh/kVAh

#### Impulse LED :

Impulse Rate	1000 pulse per kWh
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#### Communication Interface :

##### MODBUS :

Protocol	RS485 MODBUS
Baudrate	2.4 /4.8 / 9.6 /19.2/38.4 kbit
Data Width	8
Parity- Stop Bits	None -1 / None -2/ Even -1 / Odd -1
Device Address	1- 247
Response Time	200 millisecond (1000 millisecond for 2.4/ 4.8 Kbit Baudrate)

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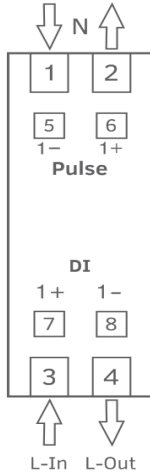
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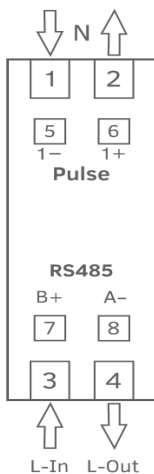
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### Connector Details:

A) Connection Diagram for ED1101 2TS Model



C) Connection Diagram for ED1111 Modbus Model



#### Display Ranges :

Active Energy	0.01-99999.99 kWh
Reactive Energy	0.01-99999.99 kVARh
Apparent Energy	0.01-99999.99 kVAh
Active Power	0-99999 W
Reactive Power	0-99999 VAR
Apparent Power	0-99999 VA

#### Installation :

Installation	Indoor
Enclosure	IP51(front side) & IP20(terminal side) (IEC 60529: 1989)
Housing	1 Module DIN 43880
Dimensions	17.5 mm X 90 mm X 65 mm
Weight	150 gm
Mounting	35 mm DIN Rail

#### Safety :

Safety Standard	According to EN50470-1
Installation Category	III
Protective Class	II (EN 50470-1) / IEC61010 (IEC)
High Voltage Test	4 kV AC, 50Hz for 1 minute between all electrical circuits
Impulse Voltage Withstand	6.0 kV (1.2 microsecond waveform)
Pollution Degree	2
Housing Flame Resistance	Flammability Class V-0 acc. to UL 94, Self Extinguishing, Non Dripping, free of Halogen

#### Environmental Conditions :

Mechanical Environment	M1
Electromagnetic Environment	E2
Operating Temperature	-25°C to +55°C
Storage/Transport Temperature	-40°C to +70°C
Relative Humidity	0... 95% (Non Condensing)
Shock	Half sine wave, peak acceleration 30g <sub>n</sub> (300 m/s <sup>2</sup> ), pulse duration 18msec
Vibration	10...150Hz, f<60 Hz 0.075mm constant amplitude, f>60Hz 1g <sub>n</sub> constant acceleration, 10 sweep cycles per axis
Altitude	< 2000 m max

#### Wiring Guidelines:

Current Input Wire Size	10 mm <sup>2</sup>
Current/Voltage Tightening Torque	0.5 Nm
Rs485 / SO Wire Size	1 to 2.5 mm <sup>2</sup> (Solid/Stranded with pin type lug)
Rs485 / SO Tightening Torque	0.3 to 0.4 Nm

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### Measured Parameter :

✓ : Available

\* : Not Available

Sr No	Parameters	1 Phase 2 Wire
1.	Import Active Energy	✓
2.	Export Active Energy	✓
3.	Total Active Energy	✓
4.	Import Reactive Energy	✓
5.	Export Reactive Energy	✓
6.	Total Reactive Energy	✓
7.	Total Apparent Energy	✓
8.	Tariff 1 Import Active Energy	✓
9.	Tariff 1 Export Active Energy	✓
10.	Tariff 1 Total Active Energy	✓
11.	Tariff 1 Import Reactive Energy	✓
12.	Tariff 1 Export Reactive Energy	✓
13.	Tariff 1 Total Reactive Energy	✓
14.	Tariff 1 Total Apparent Energy	✓
15.	Tariff 2 Import Active Energy	✓
16.	Tariff 2 Export Active Energy	✓
17.	Tariff 2 Total Active Energy	✓
18.	Tariff 2 Import Reactive Energy	✓
19.	Tariff 2 Export Reactive Energy	✓
20.	Tariff 2 Total Reactive Energy	✓
21.	Tariff 2 Total Apparent Energy	✓
22.	Partial Import Active Energy	✓
23.	Partial Export Active Energy	✓
24.	Partial Total Active Energy	✓
25.	Partial Import Reactive Energy	✓
26.	Partial Export Reactive Energy	✓
27.	Partial Total Reactive Energy	✓
28.	Partial Total Apparent Energy	✓
29.	Max Import kVA Demand	✓
30.	Max Current Demand	✓
31.	Max Export kVA Demand	✓
32.	Max Import kW Demand	✓
33.	Max Export kW Demand	✓
34.	Max Import kVAR Demand	✓
35.	Max Export kVAR Demand	✓
36.	Voltage	✓
37.	Current	✓
38.	Frequency	✓
39.	Active Power	✓
40.	Reactive Power	✓
41.	Apparent Power	✓
42.	Power Factor	✓
43.	Number of Interruptions	✓

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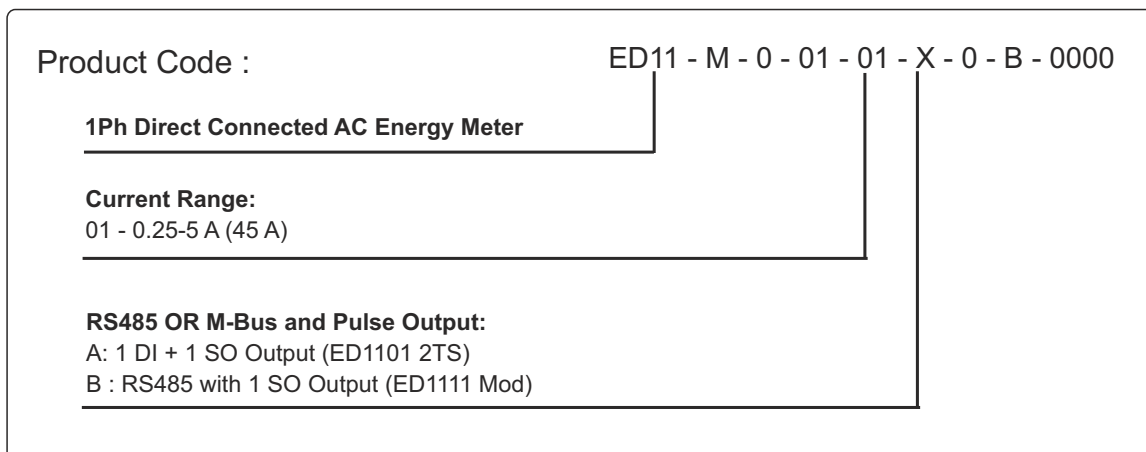
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**Order Code:**

Ordering Information:



**Order Code Example:**

**ED11-M00101B0B0000**

ED1111-Mod 1 Phase Direct Connected AC Energy Meter with Input voltage 193-253VLN, 0.25-5 A (45 A), RS485, 1 SO Output.

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