



# Data Sheet

Single-Phase Direct Connected AC Energy Meter

RISH ED2101 2TS / ED2111 Mod



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### Overview :

RISH ED21X1 is a modern Single Phase Direct Connected Energy Meter designed for intended 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. The meter is available in 100 A maximum current measurement range on direct connection. It supports Tariff Counters selectable via Digital Input or MODBUS Communication. It displays parameters on bright intuitive LCD and also has Pulse Outputs 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 100A 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 two opto-isolated Pulse Outputs (SO) that can be configured for any one of the Active (Import/Export), Reactive (Import/Export/Inductive/Capacitive) 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 IMP/kWh indicating the Active Energy consumption.

#### Digital Input :

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.

#### Front Keys :

Two keys are provided for easy navigation and accessibility of different parameters and onsite programming of the meter.

#### Remote Communication ( Optional ) :

The Meter provides RS485 communication based on MODBUS protocol for remote data acquisition of measurement data and configuration. MODBUS parameters baud rate, device address and parity-stop bits are programmable.

#### LCD :

The LCD has bold seven segment digits with bright white backlit for display of measurement parameters. Special symbols, units and bar graph are provided for effective display and easy onsite configuration. Indications for communication status, active tariff, pulse outputs are available on screen. Measurement screen can be set as automatic scrolling or manual scrolling.

#### 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

IP for water & dust: IEC 60529

Plastic Flammability Standard: UL 94

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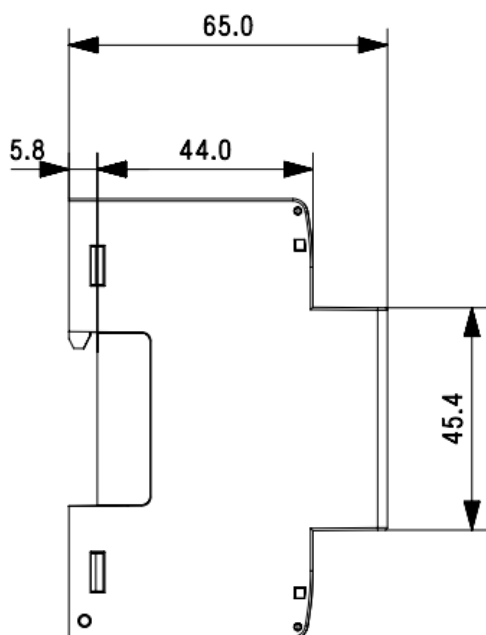
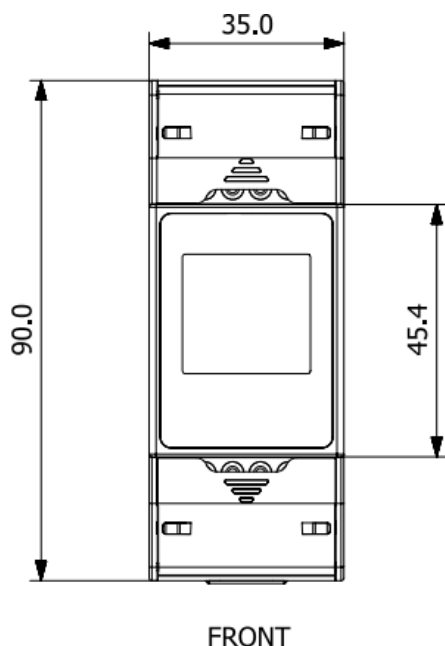


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## Dimensions Details:



## Technical Specifications:

### Input :

Reference Voltage ( $U_n$ )	230 VLN
Operating Voltage Range	184 - 276 VLN
Power consumption in Voltage Circuit	< 2 W (7 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 ( $I_{max} > 50 \cdot I_{tr}$ )	100 A
Operating Current Range	0.25-5 A (100 A)
Short time Over-current	$30 \cdot I_{max}$ for half-cycle at 50 Hz
Power consumption in Current Circuit	<1 VA
Frequency	50/60 Hz

### Auxiliary Supply :

Type	Self Powered
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### Reference Conditions for Accuracy :

Reference Temperature	$23^\circ\text{C} \pm 2^\circ\text{C}$
Input Voltage	$U_n \pm 1\%$
Input Waveform	Sinusoidal (Distortion Factor <2%)
Input Frequency	$50 \text{ Hz} \pm 0.3\%$

### 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	$\pm 1.0\%$
Voltage	$\pm 0.5\%$ of of range max
Current	$\pm 0.5\%$ of Nominal value
Frequency	$\pm 0.2\%$ of Mid frequency
Active Power	$\pm 1\%$ of range max
Reactive Power	$\pm 1\%$ of range max
Apparent Power	$\pm 1\%$ of range max
Power Factor	$\pm 1\%$ of unity

### Pulse Outputs :

SO1 and SO2	Passive Opto-isolated
Contact Ranges	5-27V DC, 27 mA DC (max)
Pulse Duration	60, 100 and 200 millisecond
Pulse Rate	1, 10, 100, 1000

### Impulse LED :

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

Protocol	RS485 MODBUS
Baudrate	2.4 / 4.8 / 9.6 / 19.2 / 38.4 kbps
Data Width	8
Parity - Stop Bits	None -1 / None -2/ Even -1 / Odd -1
Response Time	< 300 millisecond (1000 millisecond for 2.4 & 4.8 kbps)

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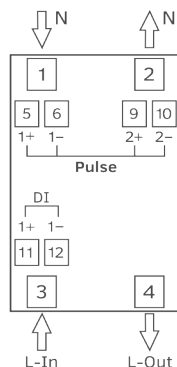
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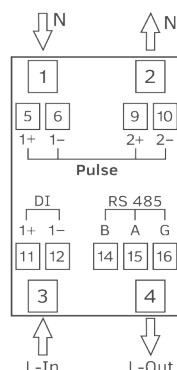
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### Connector Details:

A) Connection Diagram For ED2101 2TS Model



B) Connection Diagram For ED2111 ModBus Model



#### Display Ranges :

Active Energy	0.01-99999.99 kWh ( Autoranging)
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

#### Digital Input :

0 V	Low (T1 Tariff)
20... 300 VAC / 10... 60 VDC	High (T2 Tariff)

#### Installation :

Installation	Indoor
Enclosure	IP51 (IEC 60529: 1989)
Housing	2 Module DIN 43880
Dimensions	35 mm X 90 mm X 65 mm
Weight	250 gm
Mounting	35 mm DIN Rail

#### Safety :

Safety Standard	According to EN50470-1
Installation Category	III
Protective Class	II (EN 50470-1) / IEC61010 (IEC)
Pollution Degree	2
High Voltage Test	4 kV AC for 1 minute
Impulse Voltage Withstand	6.0 kV (1.2 microsecond waveform)
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... 90% (Non Condensing)
Altitude	<2000 m max

#### Wiring Guidelines:

Current Input Wire Size	50 mm <sup>2</sup>
Current/Voltage Tightening Torque	3 Nm
RS485 / SO / DI Wire Size	0.1 to 2.5 mm <sup>2</sup> (Solid/Stranded with pin type lug)
RS485 / SO / DI 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.	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 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 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 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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**Order Code:**

Ordering Information:

Product Code :	<b>ED21-M-00-1-02-A-0-B-0000</b>
<b>1 Ph Direct Connected Energy Meter</b>	
<b>Current Range:</b> 02 - 184-276VLN 0.25-5 A (100 A)	
<b>Meter Interface</b> A = 1 DI + 2 SO Output (ED2101 2TS) B = RS485 with 2 SO Output and 1 Digital Input (ED2111 Mod)	

**Order Code Example:**

**ED21-M00102A0B0000**

ED 2101 1 Phase Direct Connected Energy Meter with 184-276VLN 100A 2SO Output +1 Digital Input

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