



Data Sheet

Single-Phase CT Connected AC Energy Meter RISH EC21XX-X



Product images are representational purpose only.



Measure



Control



Record



Analyze



Optimize

Overview :

RISH EC21XX is a modern Single Phase CT 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 1A or 5A Nominal current measurement on external CT connection. It supports Tariff Counters selectable via MODBUS or MBUS Communication or Tariff input. 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 or MBUS for remote monitoring. Meter housing is standard Din Rail Mount that allows ease of installation.

Product Features :

CT Connected Meter :

The Meter can measure 1A or 5A current through external CT connection, which is on-site configurable enabling the meter to be used for different measuring range using same unit. 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 or MBUS 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.

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.

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

Tariff Input :

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

Dual tariff :

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

On-Site Programable CT Ratios :

It is possible to program Primary and secondary value of current transformer (CT) via front panel keys. The settable range for CT primary is 1A-9999A and 1A/5A for CT Secondary. This parameters are configured and programmed at the site only in first 15 minutes after entering into CT Primary or CT secondary edit mode and get locked as per MID standards

Compliance to Standards :

National / International Standards are complied

Accuracy Standard : EN50470-3:2022

IEC62053-21

IP for water & dust: IEC 60529

Plastic Flammability Standard: UL 94

Safety Standard 62052-31:2015



Measure



Control



Record

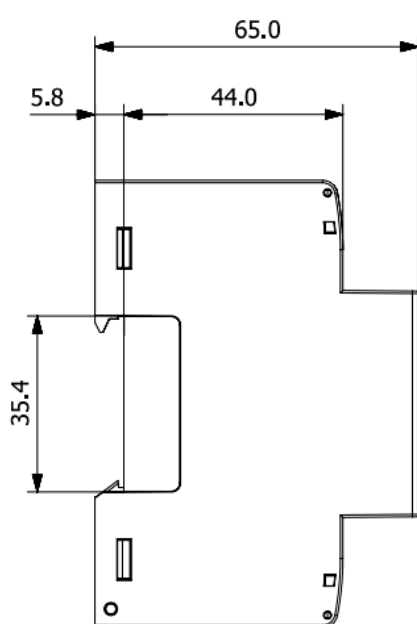
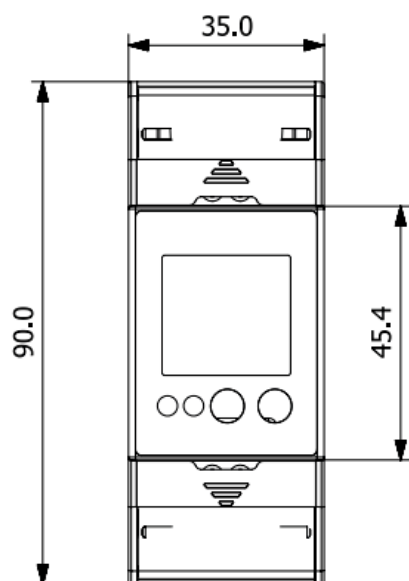


Analyze



Optimize

Dimensions Details:



Technical Specifications:

Input :

Nominal Voltage (U_n)	230 VLN
Operating Voltage Range	184 - 276 VLN
Power consumption in Voltage Circuit	< 2 W (7 VA)

Current Measurement Parameters	1 A	5 A
Starting Current ($I_{st} = 0.04 \cdot I_{tr}$)	2 mA	10 mA
Minimum Current ($I_{min} = 0.2 \cdot I_{tr}$)	10 mA	50 mA
Transitional Current (I_{tr})	50mA	250mA
Nominal Current ($I_n = 20 \cdot I_{tr}$)	1 A	5 A
Maximum Current for 1A ($I_{max} = 120 \cdot I_{tr}$) for 5A ($I_{max} = 24 \cdot I_{tr}$)	6A	6 A
Operating Current Range	10mA-1A (6A)	50mA-5 A (6A)
Short time Over-current	$20 \cdot I_{max}$ for 0.5 seconds	
Power consumption in Current Circuit	<0.03 VA	
Nominal Frequency	50 Hz	

Auxiliary Supply :

Type	Self Powered
------	--------------

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 EN50470-3:2022 Class 1 as per IEC 62053-21
Reactive Energy (Import/Export)	$\pm 2\%$
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	$\pm 1\%$

Pulse Outputs :

SO	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 pulse per kWh/kVARh/kVAh

Impulse LED :

Impulse Rate	1000 pulse per kWh
--------------	--------------------

Communication Interface (MODBUS) :

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	200 millisecond at 9.6 kbps Baudrate



Measure



Control



Record

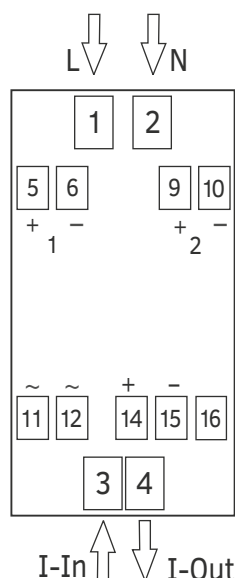


Analyze



Optimize

Connector Details:



- 1 :L
- 2 :Neutral
- 3 :I-In
- 4 :I-out
- 5,6,9,10 :Pulse Output 1 & Pulse Output 2 Terminal
- 11,12 :Tariff input Terminal
- 14,15,16 :RS485 Terminal (in Modbus model)
Mbus Terminal (in Mbus Model)

Communication Interface (MBUS) :

Protocol	EN13757-3 MBUS
Baudrate	0.3/ 0.6/ 1.2/ 2.4/ 4.8/ 9.6 kbps
Data Width	8
Parity - Stop Bits	Even -1
Address	1 250

Display Ranges :

Active Energy	0.01-99999.99 kWh & Autoranging further
Reactive Energy	0.01-99999.99 kVARh & Autoranging further
Apparent Energy	0.01-99999.99 kVAh & Autoranging further
Active Power	0-3000 KW
Reactive Power	0-3000 KVAR
Apparent Power	0-3000 KVA

Tariff Input:

0 V	Low
230 V	High

Installation :

Installation	Indoor
Enclosure	IP51(front side) & IP20 (terminal side) (IEC 60529: 2001)
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 62052-31 :2015
EMC standard	IEC61326 (IEC)
Installation Category	III
Protective Class	II
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... 95% (Non Condensing)
Altitude	<2000 m max

Wiring Guidelines:

Current/Voltage Input Wire Size	1 to 2.5 mm ² (Use with Insulated pin type lug)
Current/Voltage Tightening Torque	0.4 Nm
RS485,MBUS,SO,Tariff Input Wire Size	1 to 2.5 mm ² (Solid/Stranded with insulated pin type lug)
RS485,MBUS,SO,Tariff Input Tightening Torque	0.4 Nm



Measure



Control



Record



Analyze



Optimize

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	✓



Measure



Control



Record



Analyze



Optimize

Order Code:

Product Code :	EC21 - M - 0 - 01 -02 - X - 0 -B - 0000
1Ph CT Connected Energy Meter	
Current Range: 02- 1A/5A	
Meter Interface : A = 1 Tariff Input + 2 SO Output (EC2101 2TS) B = RS485 with 2 SO Output +1 Tariff Input(EC2111 Mod) C = MBUS with 2 SO Output + 1 Tariff Input(EC2111 MB)	
Certification: 00 = CE + UKCA Certified	

Order Code Example:

EC21-M00102B0B0000

EC 2111 MOD 1 Phase CT Connected Energy Meter with 184-276VLN 1A/5A RS485 + 2SO Output +1 Tariff Input with CE + UKCA Certification.



Measure



Control



Record



Analyze



Optimize



RISHABH

Specifications may change without prior notice



Measure



Control



Record



Analyze



Optimize

RISHABH INSTRUMENTS LIMITED

Domestic (India): +91 253 2202099 | marketing@rishabh.co.in
International: +91 253 2202004/06/08/99 | global@rishabh.co.in
www.rishabh.co.in