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Data Sheet

Single-Phase RJ12 Current Input AC Energy Meter

RISH ER21XX-X



RoHS CE UK CA

Product images are representational purpose only.

Measure | Control | Record | Analyze | Optimize

Overview :

RISH ER21XX is a modern Single Phase RJ12 CT Connected 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. The meter is available in 100 mA maximum current measurement range through 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 :

Plug and Play Current Transformer :
RJ-12 connector is available for external CT connection, which enables easy, fast and error free installation. 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 or MBUS parameters baud rate, device address and parity- stop bits are programmable.

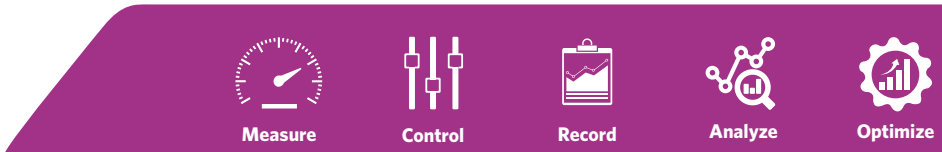
Tariff Input :
The meter has one Tariff Input dedicated for selection of active tariff T1 and T2. The opto-isolated Tariff Input is rated for a wide range of AC/DC voltage for operation.

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

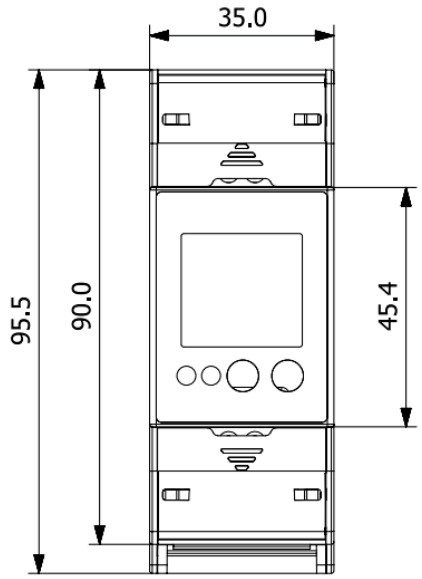
On-Site Programable CT Ratios :
It is possible to program Primary value of current transformer (CT) via front panel keys. The settable range for CT primary is 5A-9999A . This parameters are configured and programmed at the site only in first 15 minutes after entering into CT Primary or CT secondary edit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

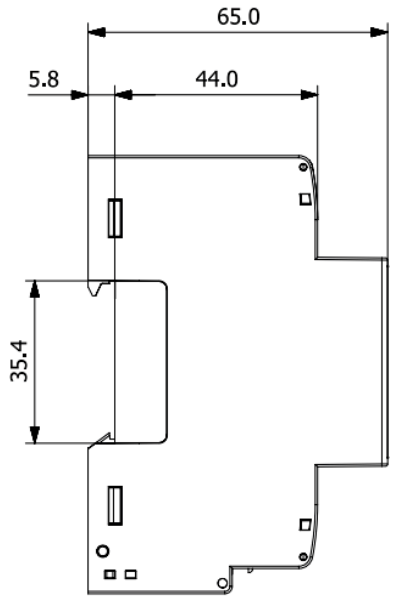
Compliance to Standards :
National / International Standards are complied

Accuracy Standard :	EN50470-3:2022
	IEC62053-21
IP for water & dust:	IEC 60529
Plastic Flammability Standard:	UL 94
Safety Standard	62052-31:2015



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	**RJ 12 MODEL**
Starting Current (I_{st} = 0.04*I_{tr})	0.2mA
Minimum Current (I_{min} = 0.2*I_{tr})	1mA
Transitional Current (I_{tr})	5mA
Nominal Current (I_n = 20*I_{tr})	100mA
Maximum Current (I_{max} = 24*I_{tr})	120mA
Operating Current Range	1mA-100mA (120mA)
Short time Over-current	20*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°C ± 2°C
Input Voltage	Un ± 1%
Input Waveform	Sinusoidal (Distortion Factor <2%)
Input Frequency	50 Hz ± 0.3%

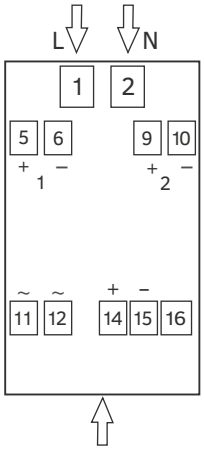
Accuracy :	
Active Energy (Import/Export)	Class B as per EN50470-3:2022 Class 1 as per IEC 62053-21
Reactive Energy (Import/Export)	± 2.0 %
Apparent Energy	± 1.0 %
Voltage	± 0.5% of of range max
Current	± 0.5% of Nominal value
Frequency	± 0.2% of Mid frequency
Active Power	± 1% of range max
Reactive Power	± 1% of range max
Apparent Power	± 1% of range max
Power Factor	±1%

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 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

Connector Details:



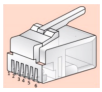
RJ12 Current Input

1 :L-IN
2 :Neutral -In
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)

Wiring Guidelines

Solid/Stranded with insulated Pin type lugs (sq. mm)		1 to 2.5
Torque value (Nm) 1.Aux and Voltage terminals 3.RS485,MBUS,Tariff Input,SO terminals		0.4 0.4 Nm
Length available for lug entry in terminal (mm)		6.5
Use Standard RJ12 Connector		
PIN NUMBER	1, 3, 5	2, 4, 6
CT SIDE	S1	S2

*Note:
1. Pin number 1, 3, 5 are shorted.
2. Pin number 2, 4, 6 are shorted.



It is recommended that the wires used for connections to the instrument should have insulated pin type lugs soldered at the end.

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 95.5 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, 50Hz for 1 minute between all electrical circuits
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)
Shock	Half sine wave, peak acceleration $30g_n$ (300 m/s^2), pulse duration 18msec.
Vibration	10...150Hz, f<60 Hz 0.075mm constant amplitude, f>60Hz 1g constant acceleration, 10 sweep cycles per axis
Altitude	<2000 m max

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	✓

Order Code:

Product Code : ER21 - M - 0 - 01 -01 - X - 0 -B - 0000

1Ph RJ12 CT Connected Energy Meter

Current Range:
01- 100 mA

Meter Interface:
A = 1 Tariff Input + 2 SO Output (ER2101 2TS)
B = RS485 with 2 SO Output +1 Tariff Input (ER2111 Mod)
C = MBUS with 2 SO Output + 1Tariff Input (ER2111 MB)

Certification:
00 = CE + UKCA Certified

Order Code Example:

ER21-M00101B0B0000
ER 2111 Mod 1 Phase RJ12 CT Connected Energy Meter with 184-276VLN 100mA RS485 + 2SO Output +1 Tariff Input with CE + UKCA Certification.

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Specifications may change without prior notice

Measure Control Record Analyze Optimize

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