



Data Sheet

RISH PQM

Power Quality Monitor



Measure



Control



Record



Analyze



Optimize

RISH PQM is a compact, multi-function panel mount power quality monitor, which measures, calculates and displays major electrical parameters of three phase power system like Voltage, Current, Active / Fundamental Reactive / Apparent Power and Energy, Individual Harmonics, Sags and Swells.

Application

- Energy billing
- Electrical load monitoring
- Sub-metering
- Test Benches and Laboratories

Product Features

Measures & Monitors more than 80 parameters

- All basic electrical parameters.
- Power quality parameters (Overcurrent, Sag & Swell).
- Individual harmonics contains of per phase voltage and current.

True RMS measurement:

The instrument measures distorted waveform upto 56th Harmonic for 50Hz and upto 46th Harmonic for 60Hz.

Power Quality Measurement

- Sags & Swells detection
- Measurable up to 56th (50Hz) harmonic on each phase. Maximum any 6 harmonics can be monitored simultaneously for each phase.
- Measurement of RMS value of fundamental and per phase voltage and current harmonics.
- (%) THD of per phase voltage and current
- Distortion factor of individual harmonics.
- Time stamping of sags & swells.

Graphical Analysis

- Per phase individual harmonic bar graph representation.
- Real time vector representation of all 3 Phases for complete system analysis.

Energy class 0.5S as per IEC 62053

- Independent Import and Export energy counter.
- Active energy (kWh), Fundamental Reactive energy (kVarh) & Apparent energy (kVAh) measurement.
- Accuracy as per IEC 62053-22, IEC62053-23
- Impulse for energy verification

On site programmable for user desired application

- Onsite programmable input voltage ($100V_{LL}$ to $500V_{LL}$), input current (1A or 5A) and system configuration (3 phase 4Wire (unbalanced) or 3phase 3Wire (unbalanced) network).
- Onsite programmable CT ratio & PT ratio.
- Wide auxiliary power supply range: 60-300VAC/DC.

EMC Compatibility

Compliance to International standard IEC 61326.

Time Of DAY (TOD / TOU)

- Easy programmable tariff schedule
- 4 seasons
- 4 tariffs
- 6 time zones per day
- 4 types of days
- 5 tariff energy registers
- Automatic daily profile storage for a one day, one month & one year
- Cost per kWh calculation

Custom color setting

User can assign individual colour for each phase as per the application requirement through display and MODBUS.

Real Time Clock (RTC)

Displays time and date.

Phase sequence detection

Incorrect phase sequence indication or phase failure indication on any of the input voltages.

Direct remote access via MODBUS

- Remote access of measured and configuration parameters.
- User Assignable Registers for MODBUS.
- Programmable baud rates up to 38.4kbps.

Limit (Alarm) & Pulse Relay Output

- Potential free, very fast acting relay contact
- Configurable as pulse output which can be used to drive an external counter for energy measurement.
- Configurable as limit (alarm) switch for voltage, current, power, total harmonic distortion(%) etc.

Ethernet Interface (Modbus TCP/IP Protocol)

- The optional Ethernet Interface output transmit all the measured parameters on Modbus TCP/IP.
- Also user can configure instrument via Ethernet Interface..

Compliance to International Safety standards

Compliance to International Safety standard IEC 61010-1- 2010



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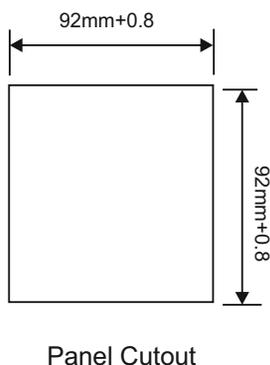
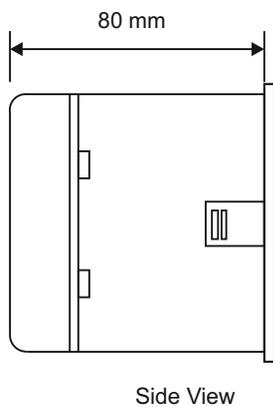
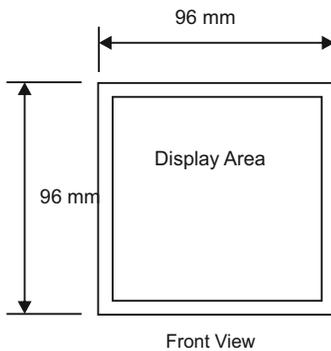


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Dimensions Details



Technical Specifications:

Accuracy

Active Energy	Class 0.5S as per IEC 62053 - 22
Apparent Energy	Class 0.5S as per IEC 62053 - 22
Fundamental Reactive Energy	Class 2 as per IEC 62053 - 23
Reference conditions	Ambient 23°C ± 1°C
(As per. IEC/EN 60688)	Sinusoidal (distortion factor 0.005), 50 / 60 Hz
Active Power	±0.2% of Nominal value
Fundamental Reactive Power	±0.2% of Nominal value
Apparent Power	±0.2% of Nominal value
Power Factor / Phase Angle	±2°
Voltage	±0.2% of Nominal value
Current	±0.2% of Nominal value
Frequency	±0.1% of mid frequency
Harmonics	±1.0%
THD Voltage / Current	±1.0%

Input Voltage

Nominal input voltage (AC RMS)	57.7 - 288.68 V _{LN} On site Programmable (Line-Line 100 - 500 V _{LL})
System PT primary values	100 V _{LL} to 692.8 kV _{LL} On site Programmable
Max continuous input voltage	347 V _{LN} , 600 V _{LL}
Voltage Measuring Range	5 V _{LN} 347 V _{LN} , 9 V _{LL} 600 V _{LL}
Overload Withstand	2x times of Nominal voltage for 1 second, repeated 10 times at 10 second intervals
Frequency Measuring Range	45Hz to 66Hz

Input Current

Nominal input current	1A / 5AAC RMS On site Programmable
System CT primary values	From 1A up to 9999A On site Programmable
Max continuous input current	120% of Nominal value
Current Measuring Range	5% to 120% of Nominal current.
Overload Withstand	20x times of Nominal current for 1 second, repeated 5 times at 5 min intervals
Starting Current for energy as per IEC 62053-22 class 0.5S	1 mA for 1A range 5 mA for 5A range

Auxiliary Supply

External Aux	60 V – 300V AC-DC (Without Ethernet) 70 V – 300V AC-DC (With Ethernet)
Aux supply frequency	50 / 60 Hz (± 10 %)

VA Burden

Nominal input voltage burden	< 0.2 VA approx. per phase
Nominal input current burden	< 0.2 VA approx. per phase
Auxiliary Supply burden	< 6.5 VA approx (Without Ethernet Option)
Auxiliary Supply burden	< 8.5 VA approx (With Ethernet Option)



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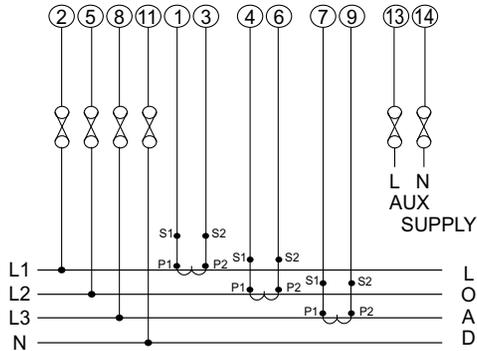
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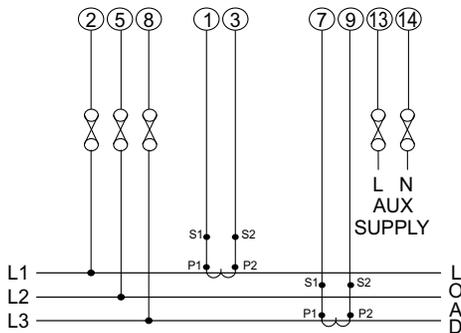
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Electrical Connections:

Network Types :



a) 3 Phase 4 Wire Unbalanced Load



b) 3 Phase 3 Wire Unbalanced Load

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. The Maximum diameter of the lug should be 7.0 mm and maximum thickness 3.5mm.

Permissible cross section of the connections wires:
 $\leq 4.0 \text{ mm}^2$ single wire or $2 \times 2.5 \text{ mm}^2$ fine wire

Technical Specifications:

Real Time Clock (RTC)

Uncertainty

± 2 minutes / month ($23^\circ\text{C} \pm 1^\circ\text{C}$)
 (trimmable through display or Modbus)

Display update rate

Response time to step input

1 sec approx.

Applicable Standards

EMC

IEC 61326

Immunity

IEC 61000-4-3. 10V/m min – Level 3 industrial
 Low level

Safety

IEC 61010-1-2010 , Permanently connected use
 (IP 54 for Front) IEC60529

IP for water & dust

Pollution degree

2

Installation category

III

High Voltage Test

5.23 kV DC for 1 minute between all Electrical
 circuits.

Environmental Conditions, Other information

Operating temperature

-10 to $+55^\circ\text{C}$

Storage temperature

-20 to $+65^\circ\text{C}$

Relative humidity

0... 95% non condensing

Warm up time

Minimum 3 minute

Shock

15g in 3 planes

Vibration

10... 150... 10 Hz, 0.075mm amplitude

Temperature Coefficient

0.05%/°C

Interfaces

Impulse LED

At the rear of the instrument with an
 Impulse constant of 4000 impulses/kWh.

Relay

Configured as Limit or Pulse output

Load Capacity

240 V AC ,5 A

Contact

Change over contact, bistable

MODBUS / RTU

RS485,max. 1200m

Ethernet option (TCP/IP)**

Baud rate: 4.8k, 9.6k, 19.2k, 38.4k bps
 Available

Power Quality Parameters

Sag Threshold*

Adjustable.. 10%.... 90% of Nominal Value

Swell Threshold*

Adjustable.. 110%.... 150% of Nominal Value

Over Current*

Adjustable.. 110%.... 150% of Nominal Value

*Detects sag / swell / Overcurrent if Voltage/Current waveform remains below or above threshold for at least 500msec with an interval of 500ms respectively.

** With Ethernet option Relay, Impulse unavailable



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Display Parameter

✓ : Available

* : Not Available

Sr No	Displayed Parameters	3 Phase 4Wire	3Phase 3Wire
1.	System Voltage	✓	✓
2.	System Current	✓	✓
3.	Volts L1 – N	✓	*
4.	Volts L2 – N	✓	*
5.	Volts L3 – N	✓	*
6.	Volts L1 – L2	✓	✓
7.	Volts L2 – L3	✓	✓
8.	Volts L3 – L1	✓	✓
9.	Current L1	✓	✓
10.	Current L2	✓	✓
11.	Current L3	✓	✓
12.	Neutral Current	✓	*
13.	Frequency	✓	✓
14.	System Active Power (kW)	✓	✓
15.	Active Power L1 (kW)	✓	*
16.	Active Power L2 (kW)	✓	*
17.	Active Power L3 (kW)	✓	*
18.	System Fundamental Reactive Power (kVAR)	✓	✓
19.	Fundamental Reactive Power L1 (kVAR)	✓	*
20.	Fundamental Reactive Power L2 (kVAR)	✓	*
21.	Fundamental Reactive Power L3 (kVAR)	✓	*
22.	System Apparent Power (kVA)	✓	✓
23.	Apparent Power L1 (kVA)	✓	*
24.	Apparent Power L2 (kVA)	✓	*
25.	Apparent Power L3 (kVA)	✓	*
26.	System Power Factor	✓	✓
27.	Power Factor L1	✓	*
28.	Power Factor L2	✓	*
29.	Power Factor L3	✓	*
30.	Phase Angle L1	✓	*
31.	Phase Angle L2	✓	*
32.	Phase Angle L3	✓	*
33.	Import kWh (Up to 14 digit resolution)	✓	✓
34.	Export kWh (Up to 14 digit resolution)	✓	✓
35.	Fundamental Import kVARh (Up to 14 digit resolution)	✓	✓
36.	Fundamental Export kVARh (Up to 14 digit resolution)	✓	✓
37.	kVAh (Up to 14 digit resolution)	✓	✓
38.	Current Demand	✓	✓
39.	kVA Demand	✓	✓
40.	kW Import Demand	✓	✓
41.	kW Export Demand	✓	✓
42.	Max Current Demand	✓	✓
43.	Max kVA Demand	✓	✓
44.	Max kW Import Demand	✓	✓
45.	Max kW Export Demand	✓	✓
46.	Run Hour	✓	✓
47.	On Hour	✓	✓
48.	Number of Interruption	✓	✓
49.	Phase Reversal Indication	✓	*
50.	Phasor Diagram	✓	*



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Display Parameter

✓ : Available

✗ : Not Available

Sr No	Displayed Parameters	3 Phase 4Wire	3Phase 3Wire
51.	Voltage Waveform	✓	✓
52.	Current Waveform	✓	✓
53.	% THD Voltage L1-N	✓	✗
54.	% THD Voltage L2-N	✓	✗
55.	% THD Voltage L3-N	✓	✗
56.	% THD Voltage L1-L2	✗	✓
57.	% THD Voltage L2-L3	✗	✓
58.	% THD Voltage L3-L1	✗	✓
59.	% THD Current L1	✓	✓
60.	% THD Current L2	✓	✗
61.	% THD Current L3	✓	✓
62.	% THD Voltage Mean	✓	✓
63.	% THD Current Mean	✓	✓
64.	RMS voltage of Harmonics	✓	✓
65.	RMS Current of Harmonics	✓	✓
66.	Fundamental Active Power per phase	✓	✗
67.	Fundamental Reactive Power per phase	✓	✗
68.	Fundamental Apparent Power per phase	✓	✗
69.	Fundamental Power Factor per phase	✓	✗
70.	Individual Harmonic Active Power per phase	✓	✗
71.	Individual Harmonic Reactive Power per phase	✓	✗
72.	Individual Harmonic Apparent Power per phase	✓	✗
73.	Distortion Factor of all harmonics on phase voltage	✓	✓
74.	Distortion Factor of all harmonics on phase Current	✓	✓
75.	Power Factor of Individual Harmonic per phase	✓	✗
76.	Fundamental voltage RMS per phase	✓	✓
77.	Fundamental current RMS per phase	✓	✓
78.	Swell indication	✓	✓
79.	Over current indication	✓	✓
80.	Sag indication	✓	✓

Ordering Information :

Ordering Information	PA00-	3	8F	75	H	XX	I	0000
Product Type	RISH PQM - Power Quality Monitor							
System Type	3 Phase							
Input voltage	100-500VLL 50/60Hz							
Input Current	CT-1/5A							
Auxiliary Supply	60-300V AC/DC							
Communication Option	RS485					RZ		
	Ethernet					EZ		
	RS485 + 2 Relay					RD		
	NONE					ZZ		
Impulse LED	Impulse 4000 imp/kWh							

Order Code Example : PA00-38F75HRDI0000

RISH PQM - 3 Phase, Input 100-500L-L, 1A/5A, Aux 60-300V AC/DC, with RS485 + 2 Relay output, Accuracy Class 0.5S



Measure



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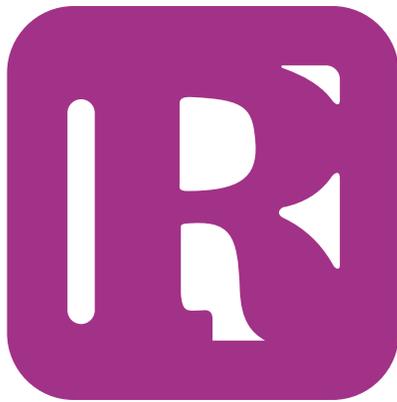
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Specifications may change without prior notice



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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