



# Data Sheet

## Rish Delta Power

Digital Multifunction Instrument



Measure



Control



Record



Analyze

### Application:

**RISH Delta PØWER** measures important electrical parameters in 3 phase 4 Wire and 3 phase 3 Wire Network & replaces the multiple analog panel meters. It measures electrical parameters like AC Voltage, AC Current, Frequency, Active, Reactive, Apparent Power & many more.

### Salient Features:

- Fast & Easy Installation on panel with self clicking.
- True RMS measurement.
- Limit Switch (optional).
- 3 Line 4 Digits ultra bright LED Display (up to 9999).
- On site Programmable CT/PT Ratios.
- User selectable CT Secondary 1A/5A.
- User selectable PT Secondary from 100 VLL to 500 VLL.
- User selectable 3ph3wire / 3ph4wire / single phase Network.
- Two auxillary Power Supply available 40V – 300V AC DC or 12V-48V DC.
- Storage of MIN / MAX values.
- Measurement & Display of RPM, Run hours, On hours, No. of interruption.

### Products Features:

#### On site programmable PT/CT ratios:

It is possible to program primary of external potential Transformer (PT), primary of external Current Transformer (CT) on site via front panel keys by entering into Programming mode.

#### User selectable CT Secondary 5A/1A

The secondary of external Current Transformer (CT) can be programmed on site to either 5A or 1A using front panel keys.

#### User selectable PT Secondary

The secondary of external Potential Transformer (PT) can be programmed on site from 100VLL to 500VLL using front panel keys.

User can set the display in auto scrolling mode or fixed screen mode using front panel keys.

#### Onsite selection of Auto scroll/ Fixed Screen

User can set the display in auto scrolling mode or fixed screen mode using front panel keys.

#### Low back depth:

The instrument has very low back depth (behind the panel) of less than 55 mm (Without output option).



#### True RMS measurement

The instrument measures distorted waveform up to 15th Harmonic.

**RPM Measurement:** The instrument display Rotation per minutes for generator applications. Number of poles can be set on site depending upon application requirement.

#### Optional Limit switch (Relay):

The instrument will trip the relay if the programmed parameter exceeds the programmed Trip Limits.

#### 3 line 4 digits LED display:

Simultaneous display of 3 Parameters.

#### User selectable 3 phase 3Wire or 4Wire or Single phase Network

User can program on site the network connection as either 3 Phase 3 Wire or 4 Wire or single phase network using front panel keys.

In case of self powered Rish Delta only either 3 Phase 4 wire or single phase network are available.

#### Storage of parameters possible

The instrument stores minimum and maximum values for System Voltage, System Current, Run Hour, ON Hour & number of Interrupts. Every 60 sec stored values are updated.

#### Four function keys:

Using the four function key, it is possible to go desired parameter screen instantly.



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### Enclosure Protection for dust and water:

Conforms to IP 50 (for front face) & IP 20 (for back) as per IEC60529.

### EMC Compatibility

Compliance to International standard IEC 61326.

- Interference Emission : IEC 61326-1 : 2005, Class A
- Interference Immunity : IEC 61326-1 : 2005
- Electrostatic discharge : IEC 61000-4-2 -- 4kV/8kV contact/air. (ESD)
- EM Field : IEC 61000-4-3 -- 10 V/m (80 MHz to 1 GHz)
  - 3 V/m (1.4 Ghz to 2 GHz)
  - 1 V/m (2 GHz to 2.7 GHz)
- Burst : IEC 61000-4-4 -- 2 kV (5/50 ns, 5 kHz)
- Surge : IEC 61000-4-5 -- 1 kVLL / 2 kVLN.
- Conducted RF : IEC 61000-4-5 -- 3 V (150 kHz to 80 MHz)
- Rated Power Frequency magnetic Field : IEC 61000-4-8 -- 30 A/m
- Voltage dip : IEC 61000-4-11 -- 0% during 1 cycle.
  - 40% during 10/12 cycles.
  - 70% during 25/30 cycles.
- Short interruptions : IEC 61000-4-11 -- 0% during 25/30 cycles.
  - 25 cycles for 50 Hz test.
  - 30 cycles for 60 Hz test.

## Technical Specifications:

Nominal input voltage (AC RMS)  
 Max continuous input voltage  
 Nominal input voltage burden  
 System PT secondary values  
 System PT primary values

### Input Voltage:

Phase –Neutral 290V L-N , Line-Line 500V L-L  
 120% of rated value  
 < 0.3 VA approx. per phase (For external auxiliary meter)  
 100VLL to 500VLL programmable on site.  
 100VLL to 692kVLL programmable on site.

### Input Current:

Nominal input current  
 System CT secondary values  
 System CT primary values  
 Max continuous input current  
 Nominal input current burden

5A / 1A AC RMS  
 1A & 5A programmable on site.  
 From 1A up to 9999A (for 1 or 5 Amp )  
 120% of rated value  
 < 0.2 VA approx. per phase

### Auxiliary Supply:

AC DC External Aux  
 DC Auxiliary Supply  
 Self powered

40 V – 300V AC-DC (± 5 % )  
 12V- 48V DC  
 input voltage range from 80% to 100% of Rated value.  
 (Self powered meter is available only in 3Phase 4 Wire and Single Phase network.)  
 Auxiliary input is derived from Phase 1 (R phase)

Frequency range  
 VA burden  
 DC burden

45 to 65 Hz  
 3 VA Approx.  
 3W

### Overload Withstand:

Voltage  
 Current

2 x rated value for 1 second, repeated 10 times at 10 second intervals  
 20x rated value for 1 second, repeated 5 times at 5 min intervals



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### Technical Specifications:

#### Operating Measuring Ranges:

|                                 |                            |
|---------------------------------|----------------------------|
| Voltage Range With External Aux | 10... 120% of rated value  |
| Voltage Range With Self Power   | 80... 120% of rated value  |
| Current Range                   | 10 ... 120% of rated value |
| Frequency                       | 45...65 Hz                 |
| Power Factor                    | 0.5 Lead ... 1 ... 0.5 Lag |

#### Reference conditions for Accuracy:

|                            |  |
|----------------------------|--|
| Reference temperature      | 23°C +/- 2°C   |
| Input waveform             | Sinusoidal (distortion factor 0.005)   |
| Input frequency            | 50 or 60 Hz ±2%  |
| Auxiliary supply voltage   | Rated Value ±1%  |
| Auxiliary supply frequency | Rated Value ±1%  |
| Voltage Range              | 20... 100% of Nominal Value.   |
| Current Range              | 10... 100% of Nominal Value.   |
| Power                      | Cos phi / sin phi = 1 for Active / Reactive Power respectively.<br>10... 100% of Nominal Current &<br>20... 100% of Nominal Voltage. |
| Power Factor / Phase Angle | 40... 100% of Nominal Current &<br>20... 100% of Nominal Voltage.  |

#### Accuracy:

|                 |                        |
|-----------------|------------------------|
| Voltage         | ±1.0% of Nominal value |
| Current         | ±1.0% of Nominal value |
| Frequency       | 0.5% of mid frequency  |
| Active Power    | ±1% of Nominal value   |
| Re-Active Power | ±1% of Nominal value   |
| Apparent Power  | ±1% of Nominal value   |
| Power Factor    | 2 % of Unity           |
| Phase angle     | 2 % of range           |

Measurement error is normally much less than error specified above.  
Variation due to influence quantity is less than twice the error allowed for reference condition.

#### Limit Switch (Relay):

|                                       |                        |
|---------------------------------------|------------------------|
| Switching Voltage & Current for Relay | 240 VDC ,5 A (1NO+1NC) |
|---------------------------------------|------------------------|

#### Influence of Variations:

|  |                       |
|--|-----------------------|
| Temperature coefficient :<br>(for rated value range of use (0...50°C)) | 0.025%/°C for Voltage |
|  | 0.05%/°C for Current  |

#### Display update rate:

|                             |               |
|-----------------------------|---------------|
| Response time to step input | 1 sec approx. |
|-----------------------------|---------------|

#### Applicable Standards:

|                     |  |
|---------------------|--|
| EMC                 | IEC 61326-1: 2005                            |
| Safety              | IEC 61010-1-2001 , Permanently connected use |
| IP for water & dust | IEC60529                                     |



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### Technical Specifications:

#### Safety:

|                                  |   |
|----------------------------------|---|
| Pollution degree:                | 2   |
| Installation category:           | III   |
| High Voltage Test (for 1 minute) | 3510V AC r.m.s<br>Enclosure Vs Power supply + All measuring input<br>2210V AC r.m.s,<br>Power supply Vs All measuring input<br>Input Voltage Vs Input Current<br>Input Current Vs Input Current |

#### Environmental:

|                       |                               |
|-----------------------|-------------------------------|
| Operating temperature | 0 to +50°C                    |
| Storage temperature   | -25°C to +70°C                |
| Relative humidity     | 0... 90% non condensing       |
| Warm up time          | Minimum 3 minute              |
| Shock                 | 15g in 3 planes               |
| Vibration             | 10... 55 Hz, 0.15mm amplitude |

#### Enclosure:

|       |        |
|-------|--------|
| Front | IP 50. |
| Back  | IP 20. |

#### Dimensions and Weights:

|                 |  |
|-----------------|--|
| Bezel size      | 96 mm x 96 mm DIN 43 718.                                  |
| Panel cut-out   | 92 +0.8 mm x 92 + 0.8 mm.                                  |
| Overall depth   | 55 mm.(without output option)                              |
| Panel Thickness | 1 - 3 mm for self clicking,<br>1 – 6 mm for swivel screws. |
| Weight          | 320 gm. Approx.(with output option)                        |

### Parameter measurement and Display:

| Sr No | Parameter   | 3 Phase 4 Wire | 3 Phase 3 Wire | 1 Phase 2 Wire |
|-------|---|----------------|----------------|----------------|
| 1     | System Volts  | ✓              | ✓              | ✓              |
| 2.    | System Current  | ✓              | ✓              | ✓              |
| 3.    | Volts R–N (Phase Voltage for Single phase)              | ✓              | ✗              | ✓              |
| 4.    | Volts Y–N   | ✓              | ✗              | ✗              |
| 5.    | Volts B–N   | ✓              | ✗              | ✗              |
| 6.    | Volts R–Y   | ✓              | ✓              | ✗              |
| 7.    | Volts Y–B   | ✓              | ✓              | ✗              |
| 8.    | Volts B–R   | ✓              | ✓              | ✗              |
| 9.    | Current R (Phase Current for Single phase)              | ✓              | ✓              | ✓              |
| 10.   | Current Y   | ✓              | ✓              | ✗              |
| 11.   | Current B   | ✓              | ✓              | ✗              |
| 12.   | Frequency   | ✓              | ✓              | ✓              |
| 13.   | System Active Power (kW)                                | ✓              | ✓              | ✓              |
| 14.   | Active Power R (Phase Power for Single phase) (kW)      | ✓              | ✗              | ✓              |
| 15.   | Active Power Y (kW)                                     | ✓              | ✗              | ✗              |
| 16.   | Active Power B (kW)                                     | ✓              | ✗              | ✗              |
| 17.   | System Re-active Power (kVAr)                           | ✓              | ✓              | ✓              |
| 18.   | Re-active Power R (Phase Power for Single phase) (kVAr) | ✓              | ✗              | ✓              |
| 19.   | Re-active Power Y (kVAr)                                | ✓              | ✗              | ✗              |
| 20.   | Re-active Power B (kVAr)                                | ✓              | ✗              | ✗              |
| 21.   | System Apparent Power (kVA)                             | ✓              | ✓              | ✓              |



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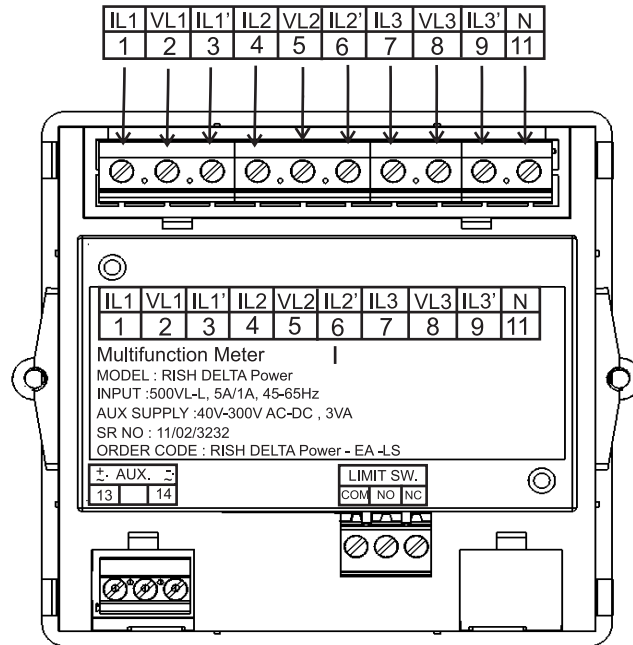


Record



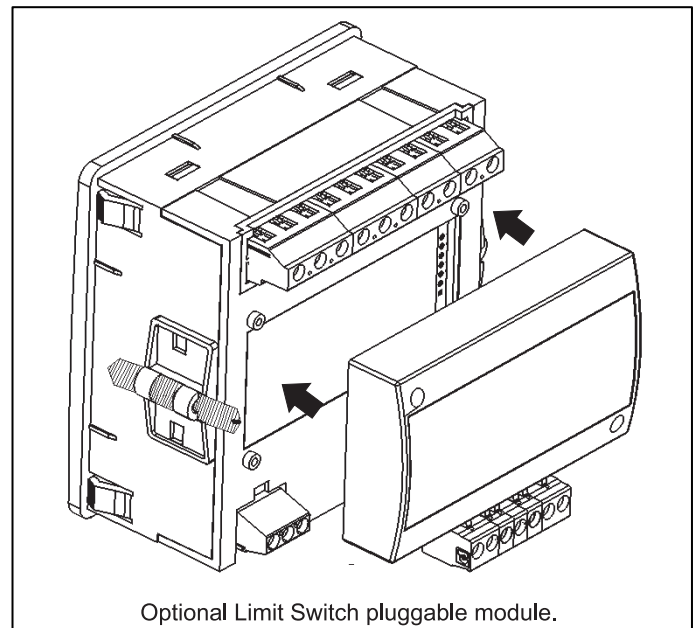
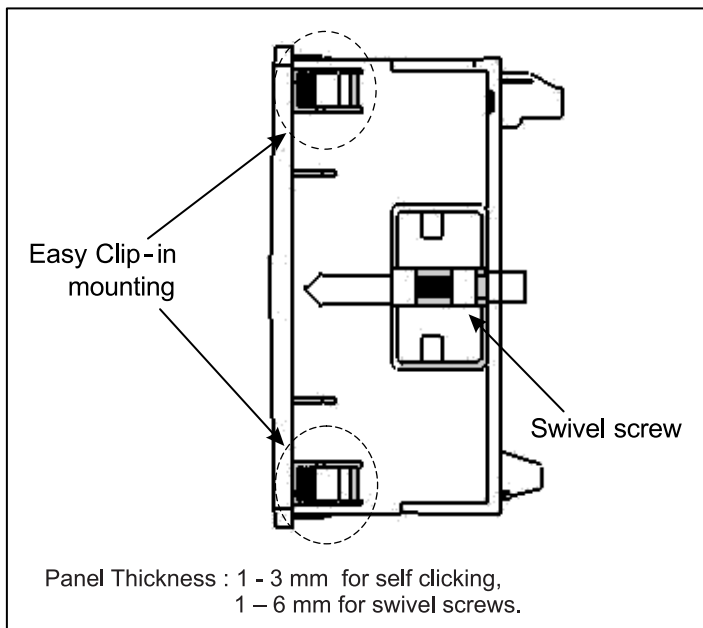
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### Rear Connection



### Installation:

Easy Clip in Installation on Panel.



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### Parameter measurement and Display:

| Sr No | Parameter   | 3 Phase 4 Wire | 3 Phase 3 Wire | 1 Phase 2 Wire |
|-------|---|----------------|----------------|----------------|
| 22.   | Apparent Power R (Phase Power for Single phase) (kVA) | ✓              | ✗              | ✓              |
| 23.   | Apparent Power Y (kVA)                                | ✓              | ✗              | ✗              |
| 24.   | Apparent Power B (kVA)                                | ✓              | ✗              | ✗              |
| 25.   | System Phase Angle                                    | ✓              | ✓              | ✓              |
| 26.   | System Power Factor                                   | ✓              | ✓              | ✓              |
| 27.   | Power Factor R  | ✓              | ✗              | ✓              |
| 28.   | Power Factor Y  | ✓              | ✗              | ✗              |
| 29.   | Power Factor B  | ✓              | ✗              | ✗              |
| 30.   | Phase Angle R   | ✓              | ✗              | ✓              |
| 31.   | Phase Angle Y   | ✓              | ✗              | ✗              |
| 32.   | Phase Angle B   | ✓              | ✗              | ✗              |
| 33.   | RPM   | ✓              | ✓              | ✓              |
| 34.   | Max (System Voltage / System Current)                 | ✓              | ✓              | ✓              |
| 35.   | Min (System Voltage / System Current)                 | ✓              | ✓              | ✓              |
| 36.   | Hour Run  | ✓              | ✓              | ✓              |
| 37.   | ON Hour   | ✓              | ✓              | ✓              |
| 38.   | Number of auxiliary interrupt                         | ✓              | ✓              | ✓              |

✓ - Available ✗ - Not available

### Electrical Connections:

|                                | Self Powered Aux | External Powered Aux |
|--------------------------------|------------------|----------------------|
| 3 Phase 4 Wire Unbalanced Load |                  |                      |
| 3 Phase 3 Wire Unbalanced Load | Not Applicable   |                      |
| 1 Phase 2 Wire                 |                  |                      |



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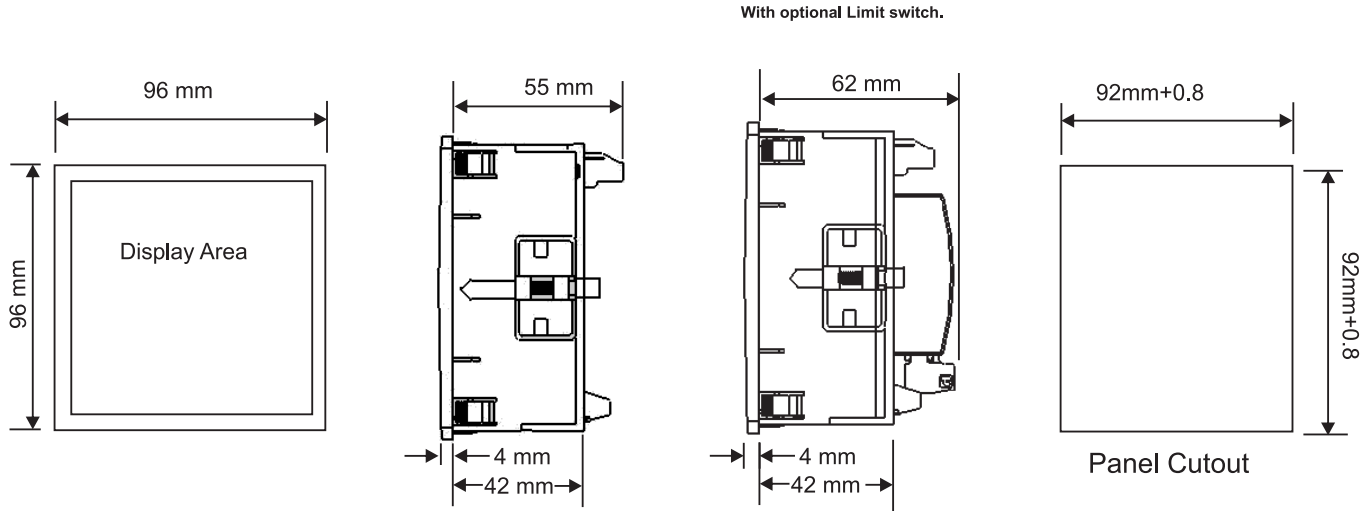


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### Dimension Details:



| Ordering information                   | Ordering Code    |
|--|------------------|
|  | RISH Delta POWER |
| <b>Auxiliary Supply</b>                |                  |
| Self Aux*                              | SA               |
| <b>External Aux</b>                    |                  |
| 40 V – 300V AC/DC                      | EA               |
| 12 V – 48V DC                          | DC               |
| <b>Limit switch (Relay) - Optional</b> |                  |
| With Limit switch                      | LS               |
| Without Limit switch                   | Z                |

### Order Code Example:

RISH Delta **POWER– EA - LS**

RISH Delta **POWER**, external aux (40V – 300V AC/DC), with limit switch.

**\*NOTE:** Self Auxiliary meter is available only in 3Phase 4 Wire and Single Phase network.

Auxiliary input is derived from Phase 1 (R phase).

In case of external auxiliary meter all three networks are available  
(3Phase 4Wire / 3Phase 3Wire / Single Phase)

Rishabh Instruments always tries for innovation and therefore product specifications are subject to change without notice



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