RISHABH

# RISH DELTA ENERGY NX_RJ12

## With Touch Key


Measure | Control | Record | Analyze | Optimize

# RISH DELTA ENERGY NX_RJ12

RISH Delta Energy NX measures important electrical parameters in 3phase 4wire, 3phase 3wire, 1phase 2wire and 1phase 3wire network. It displays many parameters at a glance. It measures electrical parameters like Active / Reactive / Apparent energy, power and all basic parameter. The instrument has one optional built in Relay output which can be configured as pulse output for energy measurement, as well as limit output. Optional MODBUS RTU over RS-485 is built in for remote monitoring and configuration.

## Product Features:

**Energy as per IEC 62053-21:**

- RISH Delta Energy NX is available in Accuracy Class 1
- Active Energy accuracy Class 1 as per 62053-21
- Independent Import and Export Energy counter. Active energy (kWh), Reactive energy (kVArh), Apparent energy (kVAh) measurement.

**THD Measurement:**

- The instrument measures per phase and system THD up to 31st harmonics for voltage and current.

**True RMS Measurement**

- The instrument measures distorted waveform up to 31st harmonic.

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

- It is possible to program primary, secondary of external potential transformer (PT) & primary of external current transformer (CT) via front panel keys and MODBUS.

**Limit (Alarm) or Pulse Output (Optional)**

- Available in Potential Free output
- Configurable as pulse output which can be used to drive an external counter for energy measurement.
- Configurable as limit (alarm) switch.

**MODBUS (RS485) Output: (Optional)**

- RS485 output enables the instrument to transmit all the Measured parameters over standard MODBUS protocol
- The instrument can be configured locally via front panel keys as well as MODBUS communication.

**Storage of parameters possible**

- The instrument stores minimum and maximum values of System Voltage, System Current. Also Run Hour, ON Hour and number of AUX interrupts are stored.

**Energy Count Storage**

- In case of power failure, the instrument memorizes the last energy count. The instrument updates the energy counter in the non-volatile memory.

**Impulse LED**

- Impulse LED on the front of the instrument is useful for checking the accuracy of energy measured by the instrument.


**Display:**

- 3 Line, 4 Digit bright Red LED display and indication LEDs
- Display can be configured for automatic scrolling of parameters or manual scrolling through 4 keys as per requirement and application of user.

**Demand**

- RISH Delta Energy NX integrates demand value for Active Power (kW), Apparent Power (kVA) and Current (A).
- The demand integration time can be configured from 1min to 60min

**Compliance to International Safety standards**

- Compliance to International Safety standard IEC 61010-1- 2018

**EMC Compatibility**

- Compliance to International standard IEC 61326

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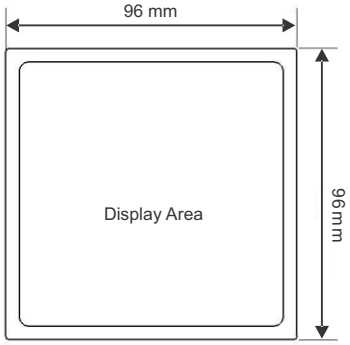
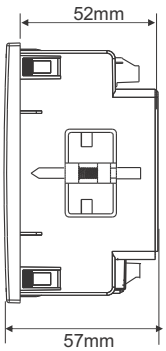
# RISH DELTA ENERGY NX_RJ12

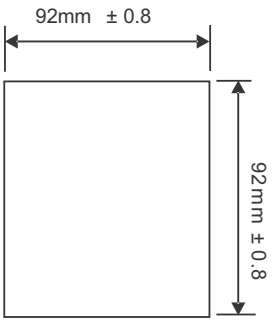
## Dimensions Details:



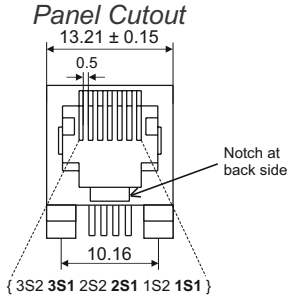

*Front View*




*Side View*




*Panel Cutout*




Meter Side RJ 12 Connection

## Technical Specifications:

| | |
|---|---|
| **Input Voltage:** | |
| Nominal input voltage (AC RMS) programmable on site. | 100VLL to 500VLL (57.5VLN to 288.67VLN) |
| System PT primary values | 100VLL to 1200kVLL programmable on site. (1000MVA maximum power per phase) (1200kVLL when CT primary ≤ 1002A) |
| Max continuous input voltage | 120% of nominal value |
| Overload Indication | "-ol-" >121% of Nominal value |
| Nominal input voltage burden | < 0.3VA approx. per phase (at nominal 240V) |
| Overload Withstand: | 2 x rated value for 1 second, repeated 10 times at 10 second intervals |
| **Input Current:** | |
| Nominal input current | 100mA Fixed (Factory Set ) |
| System CT primary values | From 1A to 9999A (1000 MVA maximum power per phase) (9999A when PT primary ≤ 120kVLL) |
| Max continuous input current | 120% of nominal value |
| Overload Indication | "-ol-" >121% of Nominal value |
| Nominal input current burden | < 0.3VA approx. per phase |
| Overload Withstand: | 20 x rated value for 1 second, repeated 5 times at 5 minute intervals |
| **Auxiliary Supply:** | |
| Higher Auxiliary supply range | 60-300V AC/DC (230V AC/DC nominal) |
| Lower Auxiliary supply range | 20-60V AC/DC (24V AC / 48V DC nominal) |
| Aux Supply frequency | 45 to 65 Hz range |
| Auxiliary Supply burden | < 6VA approx. |
| **Operating Measuring Ranges:** | |
| Current (Energy Measurement) | 1 to 120% of nominal value |
| I(Starting) & I(Minimum) | As per Standard IEC 62053-21 & IEC 62053-23 |
| Voltage | 19VLL to 600VLL (11VLN to 346VLN) |
| Power Factor | 0.5 Lag ... 1 ... 0.5 Lead |
| Frequency | 40Hz to 70Hz |
| **Reference Conditions for Accuracy** | |
| Reference temperature | 23°C +/- 2°C |
| Influence of temperature | 0.015%/°C for Voltage & 0.025%/°C for Current |
| Input Waveform | Sinusoidal (distortion factor 0.005) |
| Input frequency | 50/60 Hz ± 2% |
| Auxiliary supply frequency | 50/60 Hz ± 1% |
| Voltage Range | 20 … 120% of nominal value |
| Current Range | 10 … 120% of nominal value |
| Total Harmonic distortion | 40% (up to 31st Harmonics) |
| Voltage range for THD | 50% … 100% of nominal value |
| Current range for THD | 20% … 100% of nominal value |
| **Accuracy (Energy)** | |
| Active Energy | Class 1 as per IEC 62053 – 21 |
| Apparent Energy | Class 1 |
| Reactive Energy | Class 2 as per IEC 62053 – 23 |

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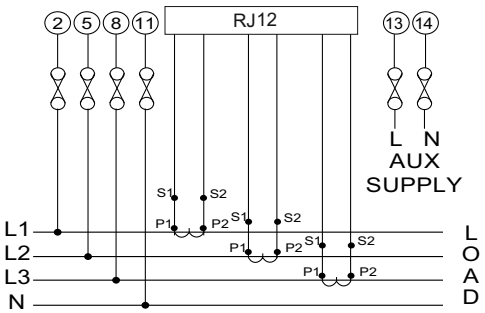
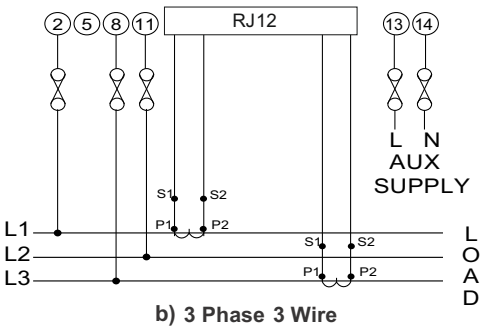
## Electrical Connection:

**Network Types :**

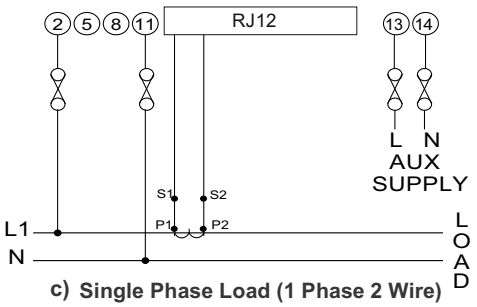



a) 3 Phase 4 Wire

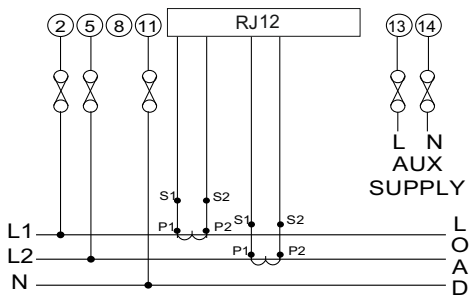



b) 3 Phase 3 Wire

**Note**: **L2** phase needs to be connected in terminal **11** instead of terminal **5** only for **3 Phase 3 Wire** connections.




c) Single Phase Load (1 Phase 2 Wire)




d) Split Phase Load (1 Phase 3 Wire)

It is recommended that the wires used for connections to the instrument should have lugs crimped at the end. That is, the connections should be made with Lugged wires for secure connections.

## Technical Specifications:

**Accuracy**

| | |
|---|---|
| Voltage | ± 0.5% of Nominal value |
| Current | ± 0.5% of Nominal value |
| Frequency | ± 0.1% of mid frequency |
| Active Power | ± 1% of Nominal value |
| Re-Active Power | ± 1% of Nominal value |
| Apparent Power | ± 1% of Nominal value |
| Power Factor/ angle | ±2° |
| THD (Voltage / Current) | ±3% |

| | |
|---|---|
| **Display update rate:** | |
| Response time to step input | 1 sec approx. |
| **Applicable Standards:** | |
| EMC | IEC 61326 – 1 :Table 2 |
| Safety | IEC 61010-1-2018 use |
| IP for water & dust | IEC 60529 |
| **Isolation:** | |
| Pollution degree: | 2 |
| Installation category: | III |
| High voltage test | |
| Input + AUX Vs Surface | 4kV RMS, 50Hz, 1min |
| Input + AUX Vs Remaining Circuit | 3.3kV RMS, 50Hz, 1min |
| MODBUS Vs Relay | 2kV RMS, 50Hz, 1min |
| **Environmental** | |
| Operating temperature | -20 to +70°C |
| Storage temperature | -25 to +75°C (Tested as per IEC 60688) |
| Relative humidity | 0... 95% RH (non condensing) |
| Warm up time | Minimum 3 minute |
| Shock (As per IEC60068-2-27) | Half sine wave, Peak acceleration 30gn (300 m/s^2),duration 18ms. |
| Vibration | 10 ... 150 ...10 Hz, 0.15mm amplitude |
| Number of Sweep cycles | 10 per axis |
| Enclosure | IP20 (Terminal side) and IP54 (Front side) |
| Altitude | 2000 |
| **Installation:** | |
| Mechanical Housing | Lexan 940 (polycarbonate), Flammability Class V-0 acc. to UL 94, self extinguishing, non dripping, free of halogen |
| Mounting Position | Panel Mounted (96X96) |
| Connection Element | Conventional screw type terminal with indirect wire terminals (Screw Torque: 0.5N.m) |
| Connection Terminal | 4mm$^2$ solid or 2.5mm$^2$ stranded cable |
| Weight | 250 Gram Approx. |
| **Interfaces** | |
| Impulse Led | For Energy testing |
| Relay (Optional) | 250 VAC, 5A AC<br>30VDC, 5A DC |
| MODBUS (Optional) | RS485, max.1200m.<br>Baud rate: 2.4k, 4.8k, 9.6k, 19.2k, 38.4k, 57.6k bps (Response time < 200ms) |

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## Measured Parameter System wise:

√: Available  x : Not Available

| Sr. No. | Parameter | 3 Phase 4 Wire | 3 Phase 3 Wire | 1 Phase 2 Wire | 1 Phase 3 Wire |
|---|---|---|---|---|---|
| 1 | System Volts | √ | √ | √ | √ |
| 2 | System Current | √ | √ | √ | √ |
| 3 | Voltage L1 | √ | x | x | √ |
| 4 | Voltage L2 | √ | x | x | √ |
| 5 | Voltage L3 | √ | x | x | x |
| 6 | Voltage L12 | √ | √ | x | √ |
| 7 | Voltage L23 | √ | √ | x | x |
| 8 | Voltage L31 | √ | √ | x | x |
| 9 | Current L1 | √ | √ | x | √ |
| 10 | Current L2 | √ | √ | x | √ |
| 11 | Current L3 | √ | √ | x | x |
| 12 | Frequency | √ | √ | √ | √ |
| 13 | System Active Power | √ | √ | √ | √ |
| 14 | Active Power L1 | √ | x | x | √ |
| 15 | Active Power L2 | √ | x | x | √ |
| 16 | Active Power L3 | √ | x | x | x |
| 17 | System Re-active Power | √ | √ | √ | √ |
| 18 | Re-active Power L1 | √ | x | x | √ |
| 19 | Re-active Power L2 | √ | x | x | √ |
| 20 | Re-active Power L3 | √ | x | x | x |
| 21 | System Apparent Power | √ | √ | √ | √ |
| 22 | Apparent Power L1 | √ | x | x | √ |
| 23 | Apparent Power L2 | √ | x | x | √ |
| 24 | Apparent Power L3 | √ | x | x | x |
| 25 | System Phase Angle | √ | √ | √ | √ |
| 26 | System Power Factor | √ | √ | √ | √ |
| 27 | Power Factor L1 | √ | x | x | √ |
| 28 | Power Factor L2 | √ | x | x | √ |
| 29 | Power Factor L3 | √ | x | x | x |
| 30 | Phase Angle L1 | √ | x | x | √ |
| 31 | Phase Angle L2 | √ | x | x | √ |
| 32 | Phase Angle L3 | √ | x | x | x |
| 33 | Import Active Energy | √ | √ | √ | √ |
| 34 | Export Active Energy | √ | √ | √ | √ |
| 35 | Inductive Re-active Energy | √ | √ | √ | √ |

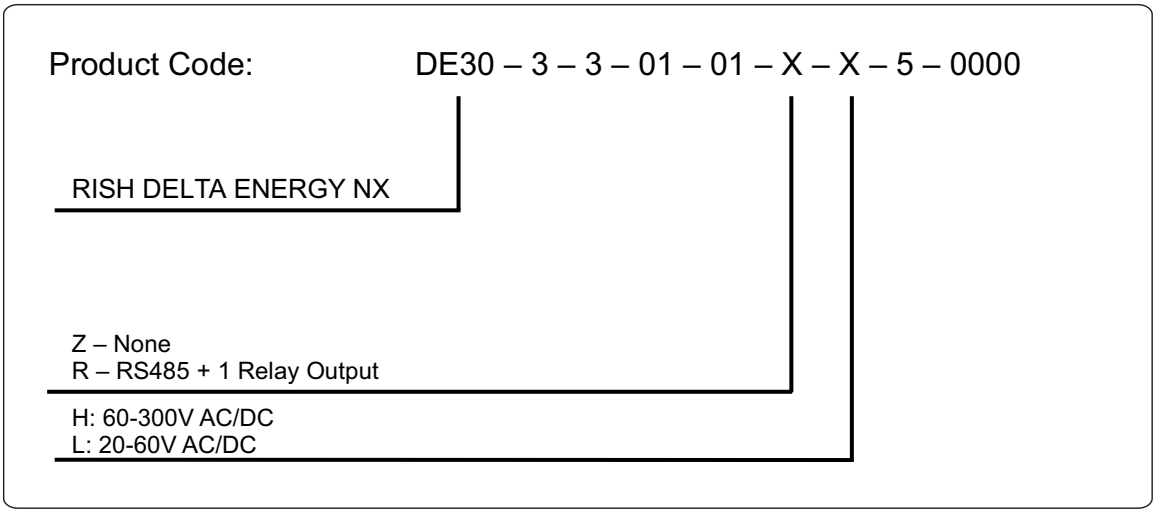
## Measured Parameter System wise:

√: Available  x : Not Available

| Sr. No. | Parameter | 3 Phase 4 Wire | 3 Phase 3 Wire | 1 Phase 2 Wire | 1 Phase 3 Wire |
|---|---|---|---|---|---|
| 36 | Capactivice Re-active Energy | √ | √ | √ | √ |
| 37 | Apparent Energy | √ | √ | √ | √ |
| 38 | RPM | √ | √ | √ | √ |
| 39 | Min and Max System Voltage | √ | √ | √ | √ |
| 40 | Min and Max System Current | √ | √ | √ | √ |
| 41 | Run Hour | √ | √ | √ | √ |
| 42 | On Hour | √ | √ | √ | √ |
| 43 | Number of Interruptions | √ | √ | √ | √ |
| 44 | Current Demand | √ | √ | √ | √ |
| 45 | kVA Demand | √ | √ | √ | √ |
| 46 | Import kW Demand | √ | √ | √ | √ |
| 47 | Export kW Demand | √ | √ | √ | √ |
| 48 | Max Current Demand | √ | √ | √ | √ |
| 49 | Max kVA Demand | √ | √ | √ | √ |
| 50 | Max Import kW Demand | √ | √ | √ | √ |
| 51 | Max Export kW Demand | √ | √ | √ | √ |
| 52 | Neutral Current | √ | x | x | √ |
| 53 | Max Neutral Current | √ | x | x | √ |
| 54 | %THD Voltage L1 | √ | √ | x | √ |
| 55 | %THD Voltage L2 | √ | x | x | √ |
| 56 | %THD Voltage L3 | √ | √ | x | x |
| 57 | %THD Current L1 | √ | √ | x | √ |
| 58 | %THD Current L2 | √ | x | x | √ |
| 59 | %THD Current L3 | √ | √ | x | x |
| 60 | System Voltage THD | √ | √ | √ | √ |
| 61 | System Current THD | √ | √ | √ | √ |
| 62 | Min and Max Import Active Power* | √ | √ | √ | √ |
| 63 | Min and Max Export Active Power* | √ | √ | √ | √ |
| 64 | Min and Max Inductive Re-active Power* | √ | √ | √ | √ |
| 65 | Min and Max Capacitive Re-active Power* | √ | √ | √ | √ |
| 66 | Min and Max Apparent Power* | √ | √ | √ | √ |
| 67 | Min and Max Line Voltage* | √ | √ | √ | √ |
| 68 | Min and Max Line Current* | √ | √ | √ | √ |

*Note - Line and System parameters Min Max values are shown on Modbus only.

## Ordering Information




Order Code Example: **DE30-330101RH10000**
RISH Delta Energy NX with Higher Auxiliary Supply, 100mA RJ 12 Current Input, RS485 and 1 Relay Output

## Rishabh Current Transformers with RJ12 Output

3 Phase RJ 12 CT


Quick Fix Module

Single Phase RJ12 CT

3 Phase Nano CT with RJ12

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