

# Ziegler

Redefine Innovative Metering

## Technical Datasheet

Single-Phase Direct Connected Energy Meter  
ZAM DN2U

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# Energy Meter

## ZAM DN2U

### Overview :

**ZAM DN2U** is a modern Single Phase Direct 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 63 and 100 A maximum current measurement range on direct connection. It supports Tariff Counters selectable via Digital Input or MODBUS Communication. 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 for remote monitoring. Meter housing is standard Din Rail Mount that allows ease of installation.

### Product Features :

- **Direct Connection Meter:**

The Meter can safely measure 63A or 100A maximum current on direct connection, eliminating the use of expensive external CT for high current networks. 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 TRMS Voltage, TRMS Current, Frequency, Active, Reactive and Apparent Power, and Power Factor in Single Phase Networks. The measured parameters can be viewed on display and MODBUS 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(Optional) :**

The Meter has two opto-isolated potential free pulse outputs (SO) that can be configured for any one of the Active (Import/Export), Reactive (Import/Export/Inductive/Capacitive) and Apparent 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 impulse per 1 kWh indicating the Active Energy consumption.

- **Digital Input (Optional) :**

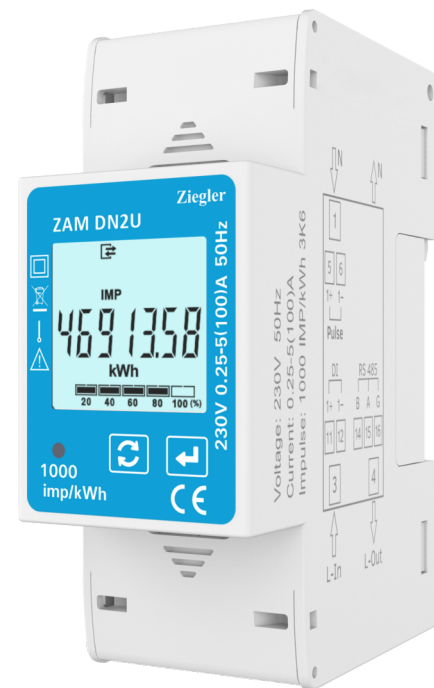
The meter has one Digital Input (DI) dedicated for selection of active tariff T1 and T2. The opto-isolated DI is rated for a wide range of AC/DC voltage for operation.

- **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 RS485 communication based on MODBUS protocol for remote data acquisition of measurement data and configuration. MODBUS parameters Baud rate, device address and parity- stop bits are programmable.



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- **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 status are continuously available on screen. Measurement screen can be set as automatic scrolling or manual scrolling.

- **Multi tariff :**

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

- **Compliance to Standards :**

National / International Standards are complied

Accuracy Standard : EN50470-1, 3

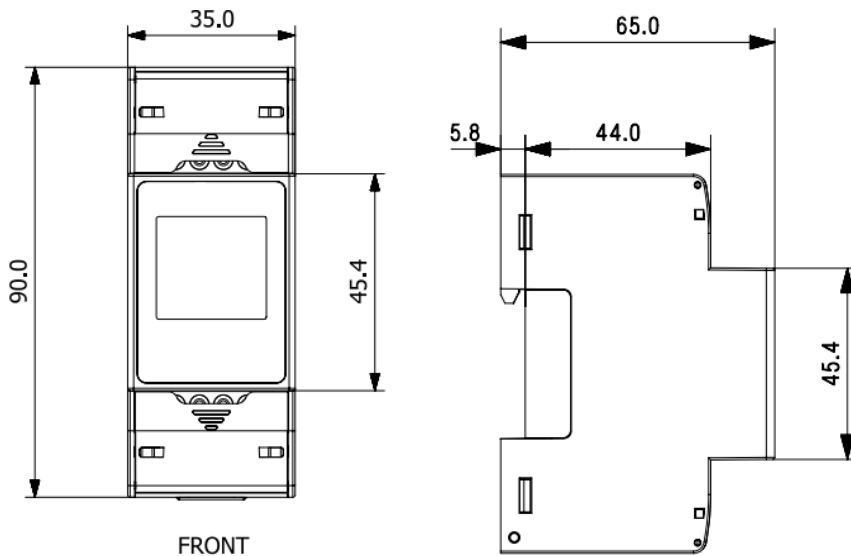
IEC62053-21, 23

IP for water & dust : IEC 60529

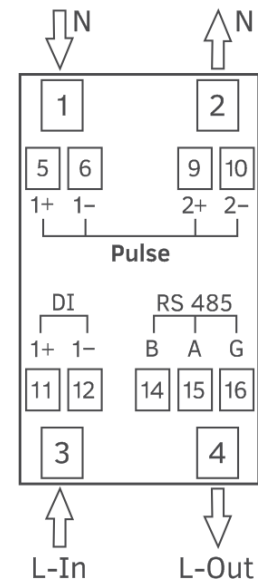
Plastic Flammability

Standard : UL 94

### Dimensions Details :



### Connector Details :



### Technical Specifications :

| Input :                              |               |
|--------------------------------------|---------------|
| Reference Voltage (U)                | 230 VLN n     |
| Operating Voltage Range              | 184 - 276 VLN |
| Power consumption in Voltage Circuit | < 2 W (10 VA) |

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| Current Measurement Parameters                | 63 A Model                                 | 100 A Model      |
|---|--|------------------|
| Starting Current ( $I_{st} = 0.04 * I_{tr}$ ) | 20 mA                                      | 20 mA            |
| Minimum Current ( $I_{min} = 0.5 * I_{tr}$ )  | 250 mA                                     | 250 mA           |
| Transitional Current ( $I_{tr}$ )             | 0.5 A                                      | 0.5 A            |
| Reference Current ( $I_{ref} = 10 * I_{tr}$ ) | 5 A  | 5 A              |
| Maximum Current ( $I_{max} > 50 * I_{tr}$ )   | 63 A                                       | 100 A            |
| Operating Current Range                       | 0.25-5 A (63 A)                            | 0.25-5 A (100 A) |
| Short time Over-current                       | 30 * $I_{max}$ for half-cycle at 50 Hz max |                  |
| Power consumption in Current Circuit          | <1 VA                                      |                  |

Frequency 45-65 Hz

### Auxiliary Supply :

Type Self Powered

### Reference Conditions for Accuracy :

|                       |                         |
|-----------------------|-------------------------|
| Reference Temperature | 23°C ± 2°C              |
| Input Voltage         | Un ± 1%                 |
| Input Waveform        | (distortion factor <2%) |
| Input Frequency       | 50 Hz ± 0.3%            |

### Accuracy :

|                                 |                             |
|---------------------------------|-----------------------------|
| Active Energy (Import/Export)   | Class B as per EN50470-3    |
| Class 1 as per IEC 62053-21     | Class 1 as per IEC 62053-21 |
| Reactive Energy (Import/Export) | Class 2 as per IEC62053-23  |
| 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% of unity                |

### 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 |

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### Impulse LED :

Impulse Rate 1000 pulse per kWh

### Communication Interface :

|                    |                                     |
|--------------------|-------------------------------------|
| Protocol           | MODBUS                              |
| Baudrate           | 4.8 / 9.6 /19.2/38.4 kbit           |
| Data Width         | 8                                   |
| Parity - Stop Bits | None -1 / None -2/ Even -1 / Odd -1 |
| Device Address     | 1- 247                              |
| Response Time      | < 300 millisecond                   |

### Display Ranges :

|                 |                     |
|-----------------|---------------------|
| Active Energy   | 0.01-99999.99 kWh   |
| Reactive Energy | 0.01-99999.99 kVARh |
| Apparent Energy | 0.01-99999.99 kVAh  |
| Active Power    | 0-99999 W           |
| Reactive Power  | 0-99999 VAR         |
| Apparent Power  | 0-99999 VA          |

### Digital Input :

|                              |      |
|------------------------------|------|
| 0 V                          | Low  |
| 20... 300 VAC / 10... 60 VDC | High |

### Installation :

|              |                        |
|--------------|------------------------|
| Installation | Indoor                 |
| Enclosure    | IP51 (IEC 60529: 1989) |
| Housing      | 2 Module DIN 43880     |
| Dimensions   | 35 mm X 90 mm X 65 mm  |
| Weight       | 250 gm                 |
| Mounting     | 35 mm DIN Rail         |

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| Safety :                  |   |
|---------------------------|---|
| Installation Category     | III   |
| Protective Class          | II (EN 50470-1)   |
| High Voltage Test         | 4 kV AC, 50Hz for 1 minute between all electrical circuits                              |
| Impulse Voltage Withstand | 6.0 kV (1.2 microsecond waveform)   |
| Pollution Degree          | 2   |
| 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... 90% (Non Condensing)   |
| Shock                         | Half sine wave, peak acceleration<br>30g (300 m/s <sup>2</sup> ), pulse duration 18msec                           |
| Vibration                     | 10...150Hz, f<60 Hz 0.075mm constant<br>amplitude, f>60Hz 1g constant acceleration, n<br>10 sweep cycles per axis |
| Altitude                      | <2000 m max   |

| Wiring Guidelines :               |  |
|-----------------------------------|--|
| Current Input Wire Size           | 50 mm <sup>2</sup>   |
| Current/Voltage Tightening Torque | 3 Nm   |
| RS485 / SO / DI Wire Size         | 0.1 to 2.5 mm <sup>2</sup><br>(Solid/Stranded with pin type lug) |
| RS485 / SO / DI Tightening Torque | 0.3 to 0.4 Nm  |

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### Measured Parameter

✓ : Available X : Not Available

| Sr No | Parameters                      | 1Phase 2Wire |
|-------|---------------------------------|--------------|
| 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.    | Active Power                    | ✓            |
| 9.    | Reactive Power                  | ✓            |
| 10.   | Apparent Power                  | ✓            |
| 11.   | Power Factor                    | ✓            |
| 12.   | Voltage                         | ✓            |
| 13.   | Current                         | ✓            |
| 14.   | Frequency                       | ✓            |
| 15.   | Partial Import Active Energy    | ✓            |
| 16.   | Partial Export Active Energy    | ✓            |
| 17.   | Partial Total Active Energy     | ✓            |
| 18.   | Partial Import Reactive Energy  | ✓            |
| 19.   | Partial Export Reactive Energy  | ✓            |
| 20.   | Partial Total Reactive Energy   | ✓            |
| 21.   | Partial Apparent Energy         | ✓            |
| 22.   | Tariff 1 Import Active Energy   | ✓            |
| 23.   | Tariff 1 Export Active Energy   | ✓            |
| 24.   | Tariff 1 Total Active Energy    | ✓            |
| 25.   | Tariff 1 Import Reactive Energy | ✓            |
| 26.   | Tariff 1 Export Reactive Energy | ✓            |
| 27.   | Tariff 1 Apparent Energy        | ✓            |
| 28.   | Tariff 2 Import Active Energy   | ✓            |
| 29.   | Tariff 2 Export Active Energy   | ✓            |
| 30.   | Tariff 2 Total Active Energy    | ✓            |
| 31.   | Tariff 2 Import Reactive Energy | ✓            |
| 32.   | Tariff 2 Export Reactive Energy | ✓            |
| 33.   | Tariff 2 Apparent Energy        | ✓            |
| 34.   | Max Import kVA Demand           | ✓            |
| 35.   | Max Current Demand              | ✓            |
| 36.   | Max Export kVA Demand           | ✓            |
| 37.   | Max Import kW Demand            | ✓            |

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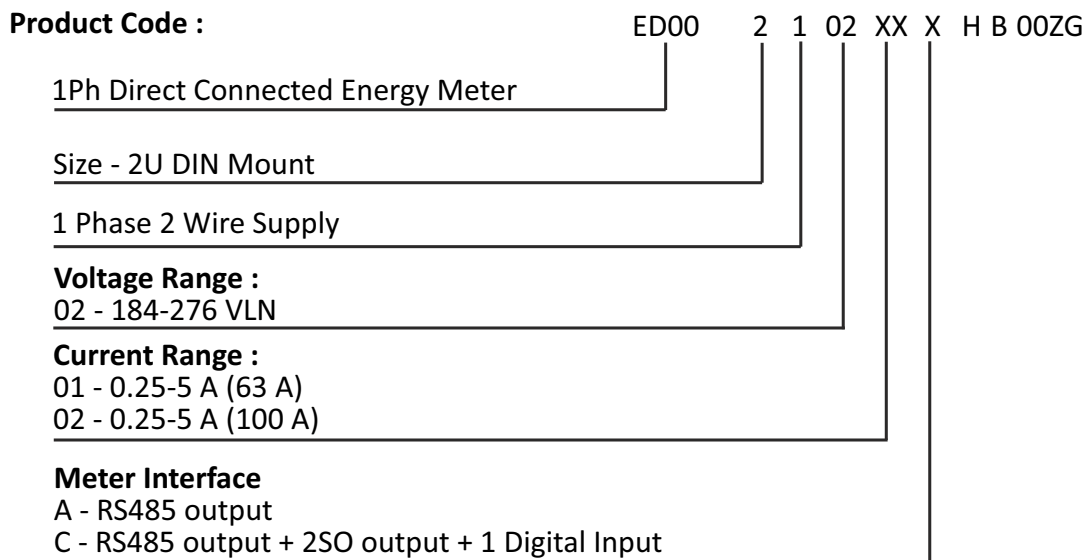
### Measured Parameter

✓ : Available X : Not Available

| Sr No | Parameters              | 1Phase 2Wire |
|-------|-------------------------|--------------|
| 38.   | Max Export kW Demand    | ✓            |
| 39.   | Max Import kVAR Demand  | ✓            |
| 40.   | Max Export kVAR Demand  | ✓            |
| 41.   | Number of Interruptions | ✓            |

### Order Code :

#### Ordering Information :



Order Code Example : ED00-210202CHB00ZG

**ZAM DN2U** With 100A RS485 output + 2SO output +1 Digital input



# Ziegler

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