

Technical Datasheet

Single-Phase Direct Connected Energy Meter
ZAM DN2U-MD/ ZAM DN2U-2T

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 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 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 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 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 potential free 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 impulse per 1 kWh indicating the Active Energy consumption.

- **Digital Input :**

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 (ZAM DN2U-MD) :**

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.

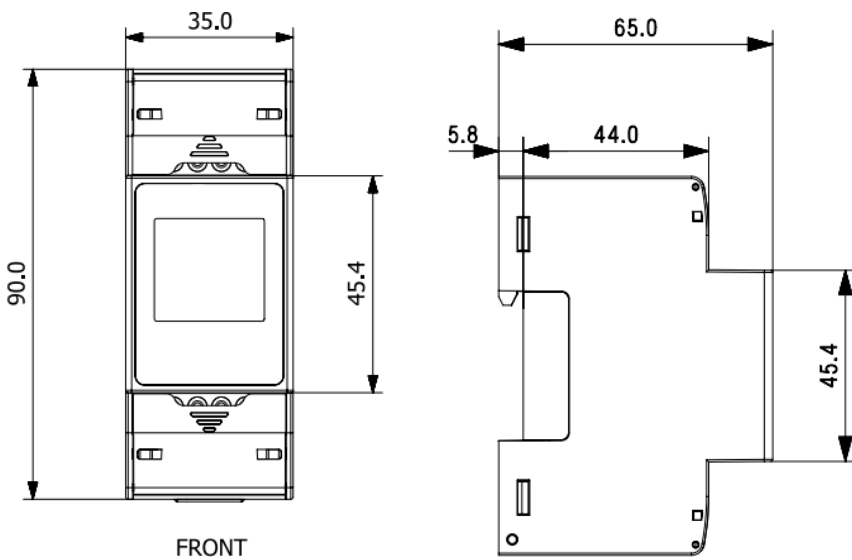


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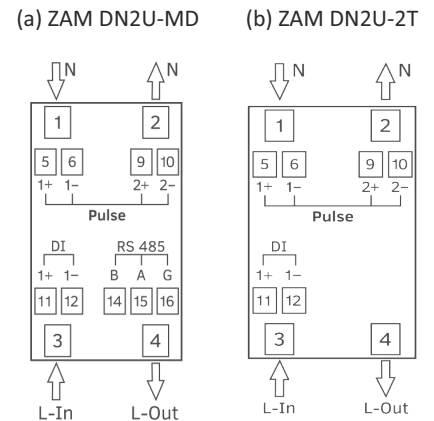
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- **LCD :**
The LCD has bold seven segment digits with bright white backlit for display of measurement parameters. Special symbols, units and bar graph are provided for effective display and easy onsite configuration. Indications for communication 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, Total Reactive 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 :



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Technical Specifications :

Input :	
Reference Voltage (U)	230 VLN
Operating Voltage Range	184 - 276 VLN
Power consumption in Voltage Circuit	< 2 W (7 VA)
Starting Current ($I_{st} = 0.04 \cdot I_{tr}$)	20 mA
Minimum Current ($I_{min} = 0.5 \cdot I_{tr}$)	250 mA
Transitional Current (I_{tr})	0.5 A
Reference Current ($I_{ref} = 10 \cdot I_{tr}$)	5 A
Maximum Current ($I_{max} > 50 \cdot I_{tr}$)	100 A
Operating Current Range	0.25-5 A(100 A)
Short time Over-current	$30 \cdot I_{max}$ for half-cycle at 50 Hz max
Power consumption in Current Circuit	<1 VA
Frequency	50/60 Hz

Auxiliary Supply :

Type	Self Powered
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Reference Conditions for Accuracy :

Reference Temperature	23°C ± 2°C
Input Voltage	$U_n \pm 1\%$
Input Waveform	Sinusoidal (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
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

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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

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 (Autoranging)
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 (T1)
20... 300 VAC / 10... 60 VDC	High (T2)

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 :	
Safety Standard	According to EN5047-1
Installation Category	III
Protective Class	II (EN 50470-1) / IEC61010
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)
Altitude	10 sweep cycles per axis <2000 m max

Wiring Guidelines :	
Current Input Wire Size	25 mm ²
Current/Voltage Tightening Torque	3.5 Nm
RS485 / SO / DI Wire Size	0.1 to 2.5 mm ² (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 Total Reactive Energy	✓
28.	Tariff 1 Apparent Energy	✓
29.	Tariff 2 Import Active Energy	✓
30.	Tariff 2 Export Active Energy	✓
31.	Tariff 2 Total Active Energy	✓
32.	Tariff 2 Import Reactive Energy	✓
33.	Tariff 2 Export Reactive Energy	✓
34.	Tariff 2 Total Reactive Energy	✓
35.	Tariff 2 Apparent Energy	✓

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Measured Parameter

✓ : Available X : Not Available

Sr No	Parameters	1Phase 2Wire
36.	Max Import kVA Demand	✓
37.	Max Current Demand	✓
38.	Max Export kVA Demand	✓
39.	Max Import kW Demand	✓
40.	Max Export kW Demand	✓
41.	Max Import kVAR Demand	✓
42.	Max Export kVAR Demand	✓
43.	Number of Interruptions	✓

Order Code :

Ordering Information :

Product Code :

ED21-M-00-1-02-A-0-B-00ZG

1 Ph Direct Connected Energy Meter

Current Range:

02 - 184-276VLN 0.25-5 A (100 A)

Meter Interface

A = 1 DI + 2 SO Output (ZAM DN2U-2T)

B = RS485 with 2 SO Output and 1 Digital Input (ZAM DN2U-MD)

Order Code Example : ED21-M00101A0B00ZG

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

Ziegler

Redefine Innovative Metering

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