

Technical Datasheet

Single-Phase Direct Connected Energy Meter
ZAM DN1U - 2T / ZAM DN1U - MD

Energy Meter

ZAM DN1U

Overview :

ZAM DN1U 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. It supports maximum 45 A current measurement on direct connection. It supports Tariff Counters selectable via MODBUS Communication. It displays parameters on bright LCD and also has Pulse Output 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 :**

ZAM DN1U can safely measure 45 A 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 :**

ZAM DN1U 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 :**

ZAM DN1U has one opto-isolated potential free pulse output that can be configured for any one of the Active (Import/Export), Reactive (Import/Export) 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.

- **Front Key :**

One key is provided for easy navigation and accessibility of different parameters.

- **Remote Communication (ZAM DN1U - MD) :**

ZAM DN1U provides optional 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. Measurement screen can be set as automatic scrolling or manual scrolling.

- **Digital Input (ZAM DN1U - 2T)**

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.

- **Multi Tariff :**

The meter has 2 Tariff Counters selectable via Digital Input or via MODBUS Communication or energy accumulation. Energy for Tariff are Import Active Energy, Export Active Energy, Import Reactive Energy, Export Reactive Energy, Apparent Energy.

- **Compliance to Standards :**

National / International standards are complied

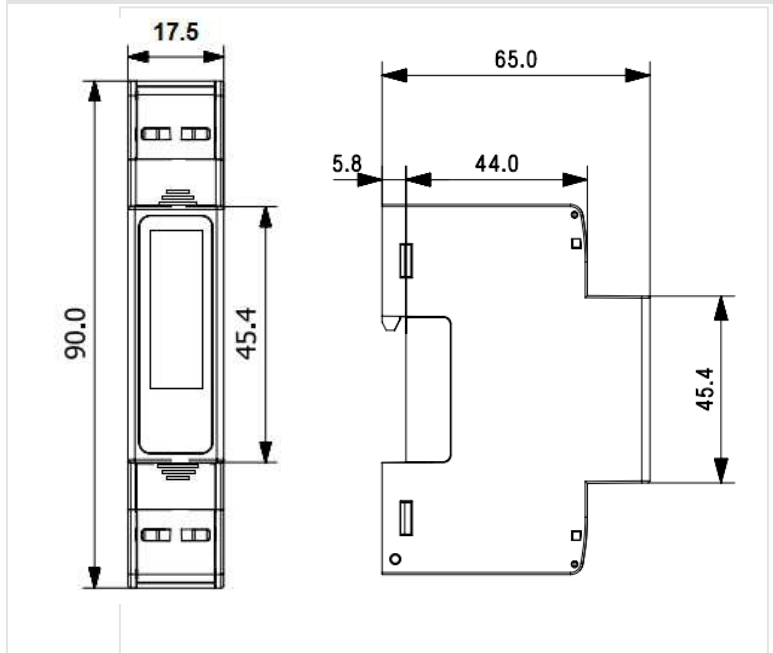
Accuracy Standard : EN50470-1, 3

IEC62053-21, 23

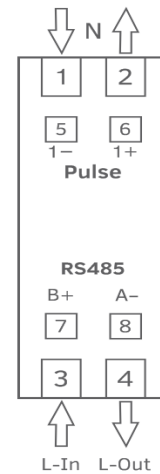
IP for water & dust : IEC 60529

Plastic Flammability Standard : UL 94

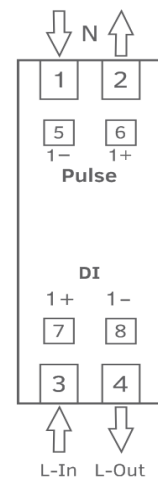
Dimensions Details:



Connector Details :



ZAM DN1U-MD



ZAM DN1U-2T

Technical Specifications :

Input :	
Reference Voltage (U_n)	230 VLN
Operating Voltage Range	193 - 253 VLN
Power consumption in Voltage Circuit	< 2 W (10 VA)

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Input :	
Starting Current ($I_{st} = 0.04 * I_{tr}$)	20 mA
Minimum Current ($I_{min} = 0.5 * I_{tr}$)	250 mA
Transitional Current (I_{tr})	0.5 A
Reference Current ($I_{ref} = 10 * I_{tr}$)	5 A
Maximum Current ($I_{max} > 50 * I_{tr}$)	45 A
Operating Current Range	0.25-5 A (45 A)
Short time Over-current	$30 * I_{max}$ for half-cycle at 50 Hz
Power consumption in Current Circuit	<1 VA per phase
Frequency	45-65 Hz

Auxiliary Supply :	
Type	Self Powered

Reference Conditions or Accuracy :	
Reference Temperature	$23^{\circ}\text{C} \pm 2^{\circ}\text{C}$
Input Voltage	$U_n \pm 1\%$
Input Waveform	Sinusoidal (distortion factor <2%)
Input Frequency	$50 \text{ Hz} \pm 0.3\%$

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	$\pm 1.0 \%$
Voltage	$\pm 0.5\%$ of of range max
Current	$\pm 0.5\%$ of Nominal value
Frequency	$\pm 0.2\%$ of Mid frequency
Active Power	$\pm 1\%$ of range max
Reactive Power	$\pm 1\%$ of range max
Apparent Power	$\pm 1\%$ of range max
Power Factor	$\pm 1\%$ of unity

Pulse Outputs :	
So1	Passive Opto-isolated
Contact Ranges	5-27V DC, 27 mA DC (max)
Pulse Duration	60-200 millisecond
Pulse Rate	0.01-1000 pulse per kWh/kVARh/kVAh

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Impulse LED :

Impulse Rate 1000 pulse per kWh

Communication Interface :

Protocol	RS485 MODBUS
Baudrate	2.4 / 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	200 millisecond (1000 millisecond for 2.4/4.8 kbit Baud rate)

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

Installation :

Installation	Indoor
Enclosure	IP51(front side) & IP20(terminal side) (IEC 60529: 1989)
Housing	1 Module DIN 43880
Dimensions	17.5 mm X 90 mm X 65 mm
Weight	150 gm
Mounting	35 mm DIN Rail

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Safety :	
Safety Standard	According to EN50470-1
Installation Category	III
Protection Class	II (EN 50470-1) / IEC61010 (IEC)
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 30g _n (300 m/s ²), pulse duration 18msec
Vibration	10...150Hz, f<60 Hz 0.075mm constant amplitude, f>60Hz 1g _n constant acceleration, 10 weep cycles per axis
Altitude	<2000 m max

Wiring Guidelines :	
Current Input Wire Size	10 mm ²
Current/Voltage Tightening Torque	0.5 Nm
Rs485 / SO Wire Size	0.1 to 2.5 mm ² (Solid/Stranded with pin type lug)
Rs485 / SO Tightening Torque	0.3 to 0.4 Nm

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Measured Parameter

✓ : Available ✗ : 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.	Total Apparent Energy	✓
8.	Tariff 1 Import Active Energy	✓
9.	Tariff 1 Export Active Energy	✓
10.	Tariff 1 Total Active Energy	✓
11.	Tariff 1 Import Reactive Energy	✓
12.	Tariff 1 Export Reactive Energy	✓
13.	Tariff 1 Total Reactive Energy	✓
14.	Tariff 1 Apparent Energy	✓
15.	Tariff 2 Import Active Energy	✓
16.	Tariff 2 Export Active Energy	✓
17.	Tariff 2 Total Active Energy	✓
18.	Tariff 2 Import Reactive Energy	✓
19.	Tariff 2 Export Reactive Energy	✓
20.	Tariff 2 Total Reactive Energy	✓
21.	Tariff 2 Apparent Energy	✓
22.	Partial Import Active Energy	✓
23.	Partial Export Active Energy	✓
24.	Partial Total Active Energy	✓
25.	Partial Import Reactive Energy	✓
26.	Partial Export Reactive Energy	✓
27.	Partial Total Reactive Energy	✓
28.	Partial Apparent Energy	✓
29.	Max Import kVA Demand	✓
30.	Max Current Demand	✓
31.	Max Export kVA Demand	✓
32.	Max Import kW Demand	✓
33.	Max Export kW Demand	✓
34.	Max Import kVAR Demand	✓
35.	Max Export kVAR Demand	✓
36.	Voltage	✓
37.	Current	✓

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Measured Parameter

✓ : Available ✗ : Not Available

Sr No	Parameters	1Phase 2Wire
38.	Frequency	✓
39.	Active Power	✓
40.	Reactive Power	✓
41.	Apparent Power	✓
42.	Power Factor	✓
43.	Number of Interruptions	✓

Energy Meter

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Order Code :

Ordering Information :

Product Code :

ED11 - M - 0 - 01 - 01 - X - 0 - B - 00ZG

1Ph Direct Connected AC Energy Meter

Current Range:

01 - 0.25-5 A (45 A)

RS485 OR M-Bus and Pulse Output:

A: 1 DI + 1 SO Output (ZAM DN1U - 2T)

B : RS485 with 1 SO Output (ZAM DN1U - MD)

Order Code Example:

ED11-M00101B0B00ZG

ZAM DN1U - MD 1 Phase Direct Connected Energy Meter with Input voltage 193-253VLN, 0.25-5 A (45 A), RS485, 1 SO Output.

Ziegler

Redefine Innovate Metering

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