

# Ziegler

Redefine Innovative Metering

## Technical Datasheet

ZAM DC10

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DC ENERGY METER

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### ZAM DC10

**ZAM DC10** A versatile DC energy meter is specially designed to measure, display and communicate DC Voltage, Current, Power and Energy to monitor and control an external system

#### Product Features

- **Bi-Directional Voltage & Current measurement** : The meter has a unique feature of measuring both charging and discharging current
- **Isolated Voltage Channel** : The Voltage channel is galvanically isolated from rest of the circuitry
- **Multi-Load Support** : Single meter measures energy consumption of four independent loads connected to one Voltage source
- **Import & Export measurement** : Energy and Ampere Hour accumulation can be blocked for Reverse Power and Current resp. Reverse condition can be set as Import or Export
- **Onsite Configuration** : Configuration can be done via Front Keys, USB-based Serial Interface or through RS485 (MODBUS)
- **Event Logging** : Previous 5 Events of factory-default parameters can be logged with Date and Time stamp
- **Data Logging** : User Selectable parameters (1 to 30) can be logged at regular intervals (1 to 60 min) with Date & Time stamp in internal memory and can be accessed via. Modbus Max Records can vary from 8532 to 91010 depending upon number of selected parameters
- **Direct Remote Access (optional)** : Remote configuration of the Instrument and access of measured parameters via MODBUS. Programmable baud rates up to 57.6kbps
- **Relay Functions:**
  - ✓ **Limit Switch** - Limit switch can be assigned for individual thresholds for protection against over-shoot or under-shoot of any selected parameter
  - ✓ **Pulse Output** - To drive an external counter for energy measurement
  - ✓ **Timer** - Cyclic ON-OFF operation of relay for user-defined cycles with programmable ON-OFF Delays
  - ✓ **Remote Operation** - Relays can be activated remotely via Modbus
  - ✓ **Reverse Locking Alarm**
  - ✓ **RTC Relay** - Relay can be activated & deactivated at predefined ON & OFF Time on any or all Days of Week
- **Enclosure Protection for dust and water** : Conforms to IP 54 (front face) as per IEC60529
- **Compliance to International Safety standards** : Compliance to International Safety standard IEC 61010 - 1 - 2010
- **EMC Compatibility** : Compliance to International standard IEC 61326 - 2012



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### Fact Sheet

Interface	
RS485 Communication (Optional)	Modbus RTU Protocol, Baud Rate : 4800, 9600, 19200, 38400, 57600 bps, Distance : 1200m
Relay (Optional)	Maximum Load Voltage : 250 VAC / 30 VDC
	Maximum Load Current : 5A
Conforms Standards	
EMC	IEC 61326-2012
Immunity	IEC 61000-4-3 10V/m min – Level 3 industrial Low level
Safety	IEC 61010-1-2010 , Permanently connected use
IP for water & dust	IEC 60529 (IP54)
Installation category:	1000V CATII, 600V CATIII (Measuring Inputs), 300V CATIII (Power Supply)
High Voltage Test (DC, 1 minute)	6.22 kV DC, Enclosure versus all electrical circuits
	5.23 kV DC, Auxiliary Supply versus all other electrical circuits
	3.11 kV DC, Measuring Terminals versus all other electrical circuits
	3.11 kV DC, Relay versus Relay
	3.11 kV DC, USB & RS485 versus all other electrical circuits
(Optional)	3.11 kV DC, Voltage versus Current
Pollution Degree	2

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### Technical Specifications

Model	
Number of parameters measured	71
System	DC system : 1 Voltage, 4 Current Channel
Input Details	
Input Voltage	
Nominal Input Voltage range	10 - 60 VDC 61 - 200 VDC 201 - 1000 VDC
Maximum continuous input voltage	125% of nominal value
Input Current	
No of Channels	4
Current Input using	External Shunt
Shunt Setting Range	50 - 150 mV
Full Scale Setting Range	1 A to 20 kA
Max continuous input current	125% of nominal value
Operating Measuring Range	
Voltage	±2 to ±125% of nominal value
Current	±0.2 to ±125% of nominal value
Auxiliary Supply	
Higher Aux	60 V - 300 V AC/DC, 45 - 65 Hz range
Lower Aux	12 V - 70 V DC
Nominal Value	230 V AC-DC 50/60 Hz for Higher Aux 24 V DC for Lower Aux
VA Burden (approx.)	
Nominal input voltage burden	< 0.4 W approx
Nominal input current burden	< 0.1 W approx. per channel
Auxiliary Supply burden	< 6 VA approx
Overload Withstand	
Voltage	2 x rated value for 1 second, repeated 10 times at 10 second intervals
Current	20x rated value for 1 second, repeated 5 times at 5 minutes intervals
Accuracy	
Reference Conditions	23°C +/- 2°C
Voltage	±0.5% of Nominal value (±5 to ±120%)
Current	±0.5% of Nominal value (±5 to ±120%)
Power	±0.5% of Nominal value (±5 to ±120%)
Energy	Class 1
Temperature Drift	0.1%/°C
Environmental	
Operating temperature	-10 to +55°C
Storage temperature	-20 to +70°C
Relative humidity	0... 90% non condensing
Warm up time	Minimum 3 minute
Shock	15g in 3 planes
Vibration	10... 55...10 Hz, 0.15mm amplitude
Number of sweep cycles	10 per axis
Real Time Clock (RTC)	
Uncertainty	±2 minutes / month (23°C +/- 2°C)

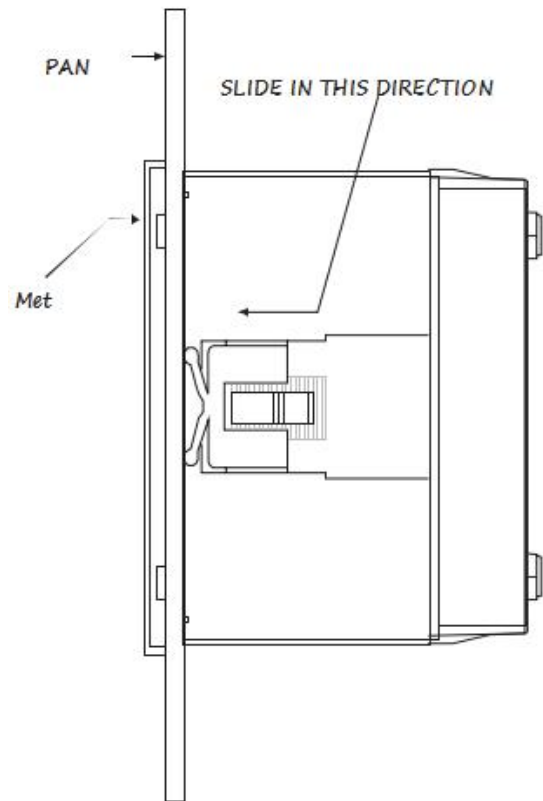
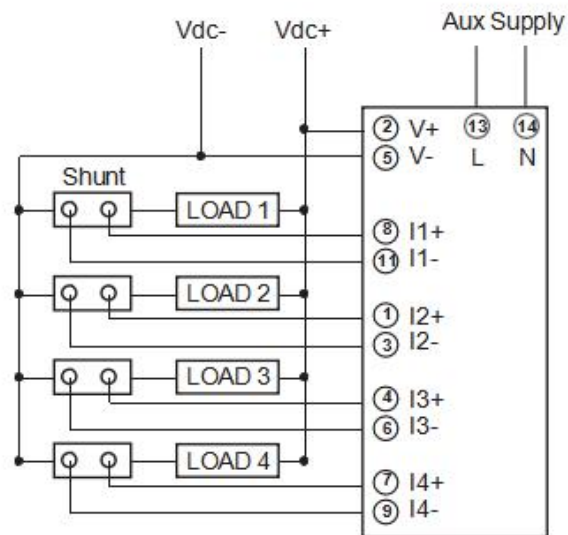
### Parameter Measurement

Sr No	Parameters	Sr No	Parameters
1	Voltage	37	Max Import and Export Power Demand channel 1
2	Current channel 1	38	Max Import and Export Power Demand channel 2
3	Current channel 2	39	Max Import and Export Power Demand channel 3
4	Current channel 3	40	Max Import and Export Power Demand channel 4
5	Current channel 4	41	Max Import and Export Current Demand channel 1
6	Total Import & Export Power	42	Max Import and Export Current Demand channel 2
7	Power channel 1	43	Max Import and Export Current Demand channel 3
8	Power channel 2	44	Max Import and Export Current Demand channel 4
9	Power channel 3	45	Number of Interruptions
10	Power channel 4	46	Old Import and Export Energy channel 1
11	Total Import & Export Energy	47	Old Import and Export Energy channel 2
12	Import and Export Energy channel 1	48	Old Import and Export Energy channel 3
13	Import and Export Energy channel 2	49	Old Import and Export Energy channel 4
14	Import and Export Energy channel 3	50	Old Import and Export Ampere Hour channel 1
15	Import and Export Energy channel 4	51	Old Import and Export Ampere Hour channel 2
16	Total Import & Export Ampere Hour	52	Old Import and Export Ampere Hour channel 3
17	Import and Export Ampere Hour channel 1	53	Old Import and Export Ampere Hour channel 4
18	Import and Export Ampere Hour channel 2	54	Old Max Import and Export Power Demand channel 1
19	Import and Export Ampere Hour channel 3	55	Old Max Import and Export Power Demand channel 2
20	Import and Export Ampere Hour channel 4	56	Old Max Import and Export Power Demand channel 3
21	Total Import & Export Power Demand	57	Old Max Import and Export Power Demand channel 4
22	Import and Export Power Demand channel 1	58	Old Max Import and Export Current Demand channel 1
23	Import and Export Power Demand channel 2	59	Old Max Import and Export Current Demand channel 2
24	Import and Export Power Demand channel 3	60	Old Max Import and Export Current Demand channel 3
25	Import and Export Power Demand channel 4	61	Old Max Import and Export Current Demand channel 4
26	Total Import & Export Current Demand	62	Old On Hour
27	Import and Export Current Demand channel 1	63	Old Run Hour channel 1
28	Import and Export Current Demand channel 2	64	Old Run Hour channel 2
29	Import and Export Current Demand channel 3	65	Old Run Hour channel 3
30	Import and Export Current Demand channel 4	66	Old Run Hour channel 4
31	On Hour	67	Old Number of Interruptions
32	Run Hour channel 1	68	Max and Min Voltage
33	Run Hour channel 2	69	Max and Min Current channel 1
34	Run Hour channel 3	70	Max and Min Current channel 2
35	Run Hour channel 4	71	Max and Min Current channel 3
36	Max and Min Current channel 4		

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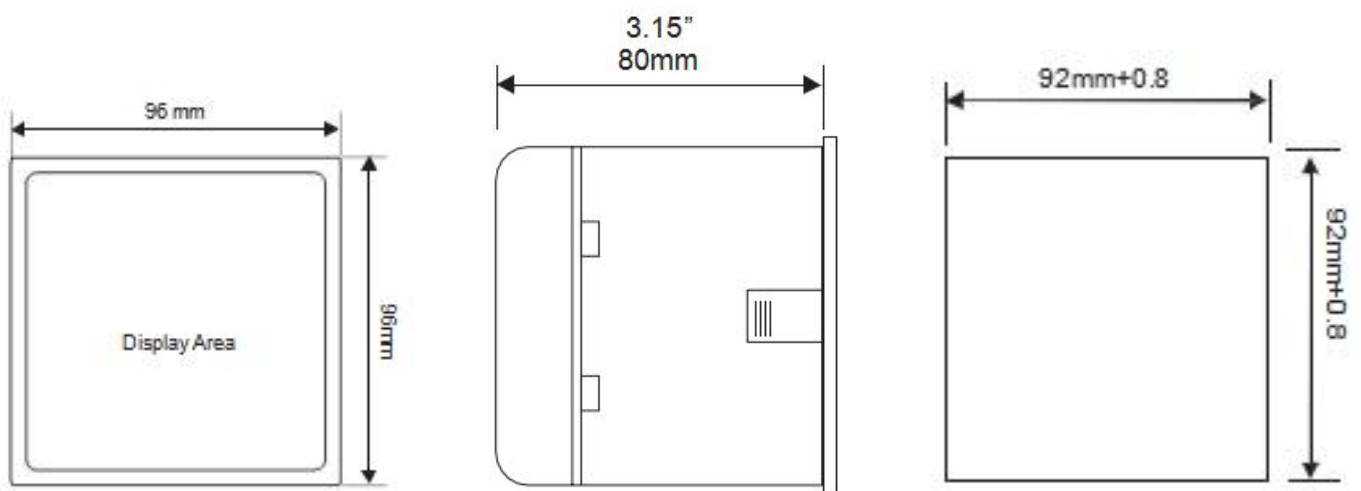
## DC ENERGY METER

### Connection Diagram and Installation



It is recommended that the wires used for connections to the instrument should have lugs soldered at the end. That is, the connections should be made with Lugged wires for secure connections. The Maximum diameter of the lug should be 7.0 mm and maximum thickness 3.5mm. Permissible cross section of the connections wires:  $\leq 4.0$  mm sq. single wire or 2x2.5mm sq. fine wire

### Dimensions



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## Ordering Information

Model (✓)	
Basic Model (without USB, RTC & Datalogging)	
Higher Model (with USB, RTC & Datalogging)	
Nominal Input Voltage range	
10 - 60 V	
61 - 200 V	
201 - 1000 V	
Voltage Isolation	
With Isolated Voltage Channel	
With Non-Isolated Voltage Channel	
Auxiliary Supply Voltage	
60 - 300 V AC DC	
12 - 70 V DC	
Communication	
MODBUS (RS485)	
MODBUS Option not used	
Output Options	
No Relay Output	
2 Relay Outputs	
4 Relay Outputs	

# Ziegler

Redefine Innovative Metering

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