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PRECISION INSTRUMENTATION

KWH ENERGY METERS
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DATASHEET

Issue 1

NEW PRODUCT

- Multifunction Meters
- Transducers & Isolators
- Temperature Controllers
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DC21 DIN RAIL SINGLE CHANNEL DC ENERGY METER

SUBJECT TO CHANGE WITHOUT NOTICE
This datasheet superseded all previous versions – please keep for future reference

DC21 Din Rail DC Energy Meter

Product Features:

- Direct Connection Meter
- Measured Electrical Parameters
- Demand
- Pulse Outputs
- Impulse LED
- Front Keys
- Remote Communication
- LCD
- Compliance to Standards

DC21
Din Rail DC Energy Meter

NEW PRODUCT

Overview

The DC21 is a modern Single channel DC Energy meter with bidirectional energy measurement, designed for EV charging station, telecommunication base stations, solar photovoltaic, and other applications of DC Energy measurement. The meter is engineered using advanced micro controller technology and it is suitable for electrical parameter measurement and monitoring. 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 2000A maximum current through external shunt resister output 50-150mv.

Measured Electrical Parameters : The Meter is primarily for bidirectional Energy measurement but it also accurately measures important electrical parameters like Voltage, Current, Power, Energy, Amper hours. The measured parameters can be viewed on display and MODBUS for remote viewing. Note: Voltage channel is isolated(4kVDC).

Demand : The Demand parameter for Power (Import/Export)and Current are calculated as per configurable demand integration time.

Pulse Outputs : The Meter has one opto-isolated Pulse Outputs (SO) that can be configured for (Import/Export) 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 IMP/kWh indicating the Energy consumption.

Front Keys : Two keys are provided for easy navigation and accessibility of different parameters and onsite programming of the meter.

Remote Communication : 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..

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, pulse outputs are available on screen. Measurement screen can be set as automatic scrolling or manual scrolling.

Compliance to Standards : National / International Standards are complied

Accuracy Standard :	EN 50470-4:2023
	IEC 62053-41:2021
IP for water & dust:	IEC 60529
Plastic Flammability Standard:	UL 94
Electromagnetic Compatibility:	IEC 61326 - 1, Table 2

Dimensions Details

Technical Specifications:

Input :	
Input Voltage range	± 5-1000 VDC
Nominal Input Voltage range	100-1000 V
Operating Voltage range	± 5% to 110% of Nominal
Voltage Overload Withstand	2x rated value for 1sec, repeated 10 times at the 10sec intervals
Power consumption in Voltage Circuit	< 2 W
Current Sensor	External Shunt
Shunt Setting Range	50 - 150(375) mV (Note 1)
Nominal Input Current range	to 2000A (via External Shunt)(Note 1)
Operating Current range	± 0.4% to 100% * Imax (Note 1) of Nominal
Auxiliary Supply:	
Aux Higher	60-300V AC / DC (230V AC/DC nominal)
Aux Lower	20-60V AC / DC (24V AC/DC nominal)
Aux Supply Frequency	45 to 65 Hz range
Burden	< 3VA approx. (at nominal value)
Accuracy:	
Voltage	± 0.5% of nominal value
Current	± 0.5% of Nominal value
Power	± 1% of range max
Energy	± 1%
Energy(Import/Export)	Class 1 as per IEC 62053-41:2021 Class B as per EN 50470-4:2023
Pulse Output:	
So1	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.
Impulse LED :	
Impulse Rate	1000 pulse per kWh

Note 1:
IEC62053-41:2021 standard applicable to nominal input current range setting of 5A to 2000A and the shunt settings 50mV to 150mV.

Current measurement parameters	**5 to1000A**	**1001 to 2000A**
Nominal Current (I_n)	5 to1000A	1001 to 2000A
Maximum Current Imax	<=2*In	2000A

EN50470-4:2023 standard applicable to nominal input current settings 5A to 400A and the shunt settings 50mV to 75mV.

Current measurement parameters	**5A**	**400A**
Starting Current ($0.04*I_{tr}$)	0.02A	1.6A
Minimum Current ($0.5*I_{tr}$)	0.25A	20A
Transitional Current (I_{tr})	0.5A	40A
Nominal Current (I_n)	5A	400A
Maximum Current Imax ($50*I_{tr}$)	25A	2000A

Connector Details:

Connection Diagram For DC21

Shunt Connection :

Communication Interface :	
Protocol	RS485 MODBUS
Baudrate	2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 kbps
Data Width	8
Parity - Stop Bits	None -1 / None -2 / Even -1 / Odd -1
Response Time	< 200 millisecond
Display Ranges :	
Energy (Import / Export)	0 -99999.99 kWh & Autoranging further
Ampere Hour	0 - 99999.99 Ah & Autoranging further
Voltage	±0 - 9999 V
Current	±0 - 9999 A
Power	±0 - 9999 VA
Installation :	
Installation	Indoor
Enclosure	IP51 (Front side) & IP20 (Terminal side) (IEC 60529: 2001)
Housing	2 Module DIN 43880
Dimensions	35 mm X 90 mm X 65 mm
Weight	250 gm
Mounting	35 mm DIN Rail
Safety :	
Safety Standard	According to IEC 61010
Installation Category	II
Protective Class	I
Pollution Degree	2
High Voltage Test	6200V DC for 1 minute
Impulse Voltage Withstand	9.3 kV (1.2 microsecond waveform)
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 +70°C
Storage/Transport Temperature	-40°C to +70°C
Relative Humidity	0... 90% (Non Condensing)
Altitude	<2000 m max
Wiring Guidelines:	
Aux / Voltage Input Wire Size	1 to 2.5 mm2 (use insulated pin types lugs)
Aux / Voltage Tightening Torque	0.4 Nm
RS485 / SO / Tariff Wire Size	0.5 to 2.5 mm^2 (Solid/Stranded with pin type lug)
RS485 / SO / Current Tightening Torque	0.4 Nm

Measured Parameter :

Sr No	Parameters
1.	Total Energy
2.	Import Energy
3.	Export Energy
4.	Partial Total Energy
5.	Partial Import Energy
6.	Partial Export Energy
7.	Voltage
8.	Current
9.	Power
10.	Total Amper Hour
11.	Import Amper Hour
12.	Export Amper Hour
13.	Partial Total Amper Hour
14.	Partial Import Amper Hour
15.	Partial Export Amper Hour
16.	Import kW Demand
17.	Export kW Demand
18.	Max Import kW Demand
19.	Max Export kW Demand
20.	Max Import Current Demand
21.	Max Export Current Demand
22.	Import Current Demand
23.	Export Current Demand
24.	Max Current
25.	Min Current
26.	Max Voltage
27.	Min Voltage
28.	Max Power
29.	Min Power
30.	Run Hours
31.	On Hours
32.	Number of Interruptions

Order Information :

Ordering Information	DC21-	Z	0	XX	XX	X	X	X	0000
Input Voltage Range	5-1000VDC			01					
Current Range	5-2000A(50-150mV)				01				
Meter Interface	RS485 with 1 SO Output					A			
Auxiliary Supply	Lower Aux (20-60V AC/DC, 50Hz)						L		
	Higer Aux (60-300V AC/DC,50Hz)						H		
Accuracy	Class B							B	

Order Code Example:

DC21-Z00101ALB0000

DC 2111 Mod Single Channel DC Energy Meter, voltage range 5-1000V, lower aux 20-60V AC/DC, 50 Hz with RS485 Modbus and SO output.

Contact

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