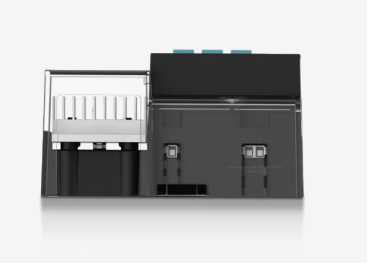
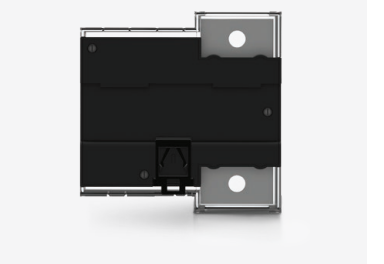
AcuDC-301 Series

EV Charging Meter Datasheet





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DESCRIPTION

The AcuDC-301 DC meter is specially designed for electric vehicle (EV) charging stations. Compliant with IEC 62053-41 Class 0.5 & EN50470-4 Class C standards and cable loss compensation capability, AcuDC-301 ensures revenue-grade accuracy for billing purposes. Featuring non-volatile memory for transaction log and Eich log with electronic metrology seal function, AcuDC-301 ensures data integrity and prevents unauthorized tampering.

FEATURES

+ Measures DC electrical parameters such as voltage, current, energy, power, and electrical charge.
+ Direct voltage measurement at 0.1% accuracy from 60V to 1000V.
+ Direct current measurement via shunt from 3.9A to 650A at 0.2% accuracy.
+ Signed data readouts in OCMF format.
+ Modbus-RTU over RS485 and Modbus-TCP/IP over Ethernet for data query and configuration.
+ Real-time data query and configuration via HMI display.
+ MID certified & UL Recognized for international markets.
+ German Eichrecht PTB-A 50.7, PTB-8.51-MB10-Krypto, REA 6A certified.

KEY FEATURES

High Accuracy Measurement for EV Charging

+ AcuDC-301 complies with the IEC 62053-41:2021 Class 0.5, EN50470-4 Class C, and MID 2014/32/EU standards, delivering precise measurements for revenue-grade applications. It offers current measurements via DC shunt with 0.2% from 3.9A to 650A, as well as directly connected voltage measurements with 0.1% accuracy from 60V to 1000V, covering the entire range of operation for most DC fast charging stations.

Compact and Flexible

+ The AcuDC-301 meter is 125mm in length, 69mm in width, and 125mm in height, making it a compact device that can easily fit inside an EV charging station. The meter is designed to be installed on a 35mm DIN rail mount for a simplified installation process.

OCMF Data Format

+ AcuDC-301 supports compliance with PTB-8.51-MB10-Krypto and REA 6A requirements for charging infrastructure. It reports data in OCMF (Open Charge Metering Format), an industry standard format used in EV charging applications which ensures accurate billing, monitoring, and reporting of energy usage.

Metrology Seal

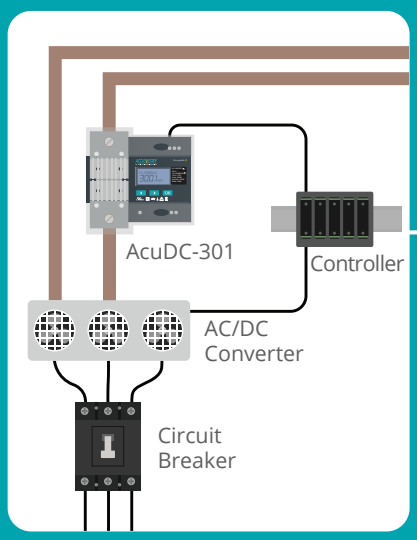
+ The AcuDC-301 is compliant with PTB-A 50.7 and features an electronic seal function that can be activated and deactivated by toggling the meter seal switch, kept hidden under a protective cover. When the electronic seal is activated, certain settings cannot be modified. A physical seal can also be installed to secure the cover, preventing unauthorized tampering and enhancing the DC meter's integrity.

Cable Loss Compensation

+ Resistance in the cable may lead to energy loss, making the energy received by the EV less than the energy delivered from the grid. The AcuDC-301 comes with a cable loss compensation feature, which ensures accurate billing data, so that the users will only be charged for the energy delivered to the vehicle, and not the energy lost in the cables.

APPLICATIONS

The AcuDC-301 EV Charging Meter is a high-accuracy DC meter purpose-built for EV fast charging stations. Designed for up to 1,000V applications, and supports OCMF format for revenue-grade billing.



+ EV Fast Charging Application
+ Renewable energy applications
+ Solar PV
+ Wind Turbine Power Generation
+ Transportation Systems
+ Telecommunications
+ Power Distribution Systems

SPECIFICATIONS

Metering

PARAMETERS	ACCURACY	RESOLUTION	UPDATE RATE	RANGE
Voltage	0.1%	0.001V	20 ms & 100 ms	60.000~1000.000V
Current	0.2%*	0.001A	20 ms & 100 ms	3.900 ~650.000A
Power	0.5%	0.001kW	20 ms & 100 ms	-650.000~650.000 kW
Energy	0.5%	0.0001kWh	100 ms	-999999999999.9999 ~999999999999.9999 kWh
Charge	0.5%	0.0001Ah	100 ms	-999999999999.9999 ~999999999999.9999 Ah
Ripple Factor	N/A	0.001%	100 ms	0.000~100.000%

Input

CURRENT INPUT	
Nominal Current	130A
Metering Range	±650A
Current Withstand Capacity	30 x Imax for 0.01 second
Pickup Current	0.52A
Accuracy	0.2% (3.9A~650A)

VOLTAGE INPUT	
Metering Range	0 ~ 1000V
Voltage Withstand Capacity	5kVRMS for 1 minute
Pickup Voltage	10V
Accuracy	0.1% (60V ~ 1000V)

ENERGY AND CHARGE ACCURACY	
Energy	Class 0.5 (According to IEC 62053-41), Class C (According to EN50470-4)
Charge	0.5%

Communications

Modbus-RTU	Modbus-RTU 2-Wire Shielded Twisted Pair Cable Connection 2400~115200 bps
Ethernet	Ethernet 10M/100M BaseT Modbus-TCP/IP

Control Power

Universal	DC

DC CONTROL POWER	
Operating Range	24VDC
Burden	<2.7W

Operating Environment

Operating Temperature	–35°C to 70°C (–31°F to 158°F)
Storage Temperature	–35°C to 70°C (–31°F to 158°F)
Relative Humidity Range for Operation	0 % to 95 %
Relative Humidity Range for Storage and Shipping	0 % to 95 %
Altitude	0~2000m
Pollution Degree	2

Standard Compliance & Certifications

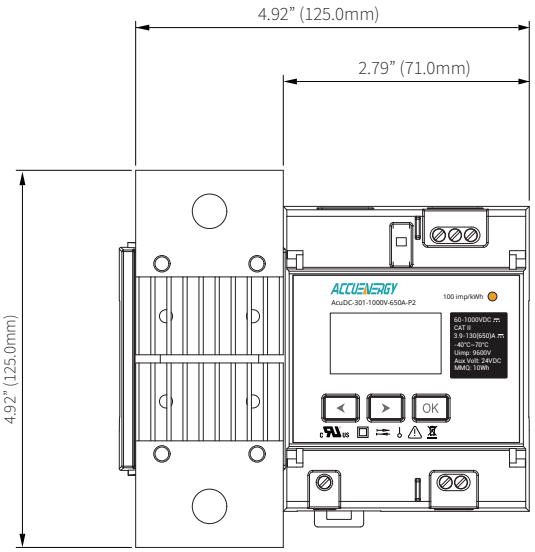
Measurement Standard	MID 2014/32/EU, IEC 62053-41:2021, EN50470-4, Eichrecht MessEV, PTB-A 50.7, PTB-8.51-MB10-Krypto, REA 6A
EMC Emission	EN55032 Class B FFC-15 Class B
Safety Standard	UL 61010-1, UL61010-2-30 Measurement Category II Overvoltage Category II
EMC Standard	IEC 61000-4-2/-3/-4/-5/-6/-8/-11/-18/-19/-29, IEC 61000-6-1/-2

* Acceptable percentage error limits:
For I_{min} = 6.5A < I < 0.1 I_n = 13A, current accuracy is 1%. For 0.1 I_n = 13A < I < I_{max} = 650A, current accuracy is 0.2%.

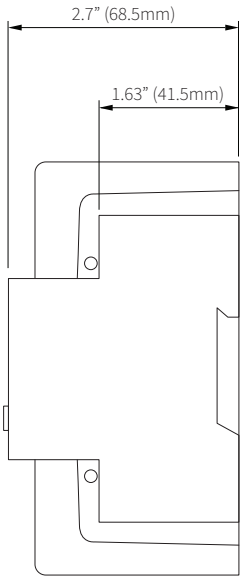
FUNCTION LIST

	Function	Parameters
Real-Time Measuring	Basic	Voltage Measured Voltage Compensated Voltage Current Power Ripple Factor U Ripple Factor I
Real-Time Energy	Energy	Import Energy Export Energy Net Energy Total Energy
	Charge	Import Charge Export Charge Net Charge Total Charge
Max/Min with Timestamps		Max Voltage, Min Voltage Max Current, Min Current Max Power, Min Power Max Ripple Factor U, Min Ripple Factor U Max Ripple Factor I, Min Ripple Factor I
Cable Loss Compensation		Voltage Drop Compensation through Configurable Resistor
Custom Read	Reading	User Configurable Data Output Selection
Transaction Log		Logs up to 61,440 records of charging session energy usage, output in OCMF v1.4.1 JSON format via Modbus RTU or Modbus TCP/IP.
Eich Log		Logs up to 6,000 records of metrological audit events, including seal status changes, parameter modifications, and time synchronization deviations.
Time	Device Run-Time	Hours
	Device Load-Time	Hours
	Device Clock	Year-Month-Date Hours:Minutes:Seconds, Weekdays

DIMENSIONS

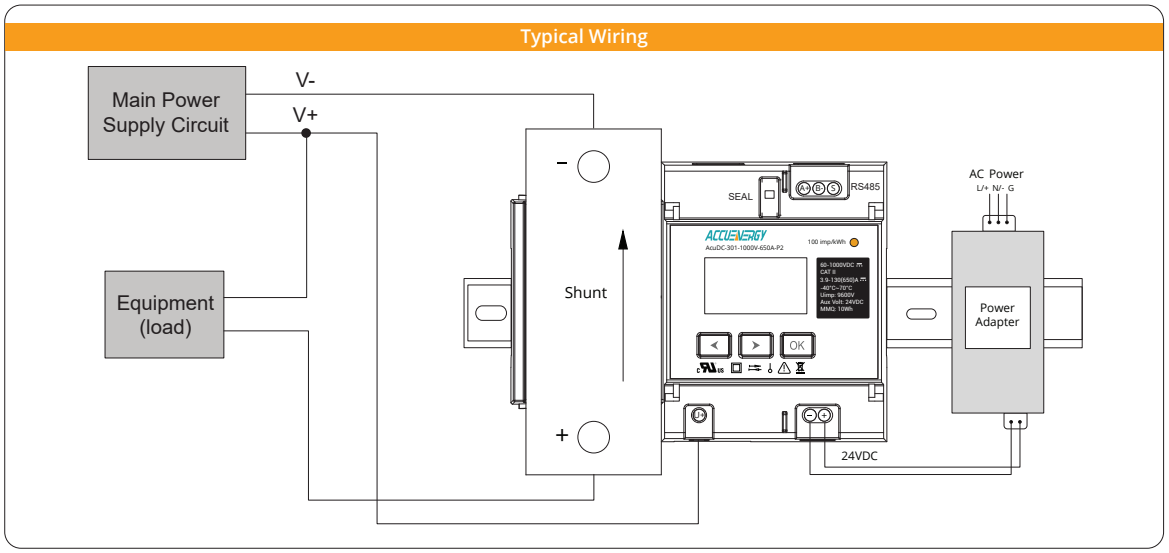


Front View



Side View

WIRING DIAGRAM



ORDERING INFORMATION

Meter Model	- Voltage Input	- Current Input	- Power Supply
AcuDC-301	**1000:** 1000V Direct Connect	**650:** 650A Direct Connect (Built-In Shunt)	**P2:** 24 VDC Input
Ordering Example:	**AcuDC-301-1000V-650A-P2-MID**		

NOTE: P2 power supply sold separately. Accuenergy recommends the AcuLink-RIK-PSU

Accessories *(Optional)*	
AcuLink-RIK-PSU	9-36VDC input with DIN-rail mount.

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Specs Subject To Change Without Notice.

ISO 9001, 14001 & 45001 Certified

ISO 27001 & 50001 Certified