



Technical Data Sheet

AD43-3P100-x

*THREE-PHASE AC ENERGY METER -DIRECT CONNECTION,
DIN RAIL MOUNTING*



AD43-3P100-x is a modern Three 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 3 Phase 4 Wire, 3 Phase 3 Wire and 1 Phase 2 Wire Networks. It supports maximum 100 A current measurement on direct connection. It supports Tariff Counters selectable via Modbus or MBUS communication or Tariff Input. It displays parameters on bright intuitive LCD and also has Pulse Outputs and Impulse LED for energy monitoring. It has industry standard MODBUS RTU or MBUS for remote monitoring. Meter housing is standard Din Rail Mount that allows ease of installation.

Application

- Residential & Commercial
- Light Industrial
- Energy Management & Monitoring
- Renewable Energy Systems
- Billing & Revenue Metering
- Data Centers

Product Features

- **Direct Connection Meter**
 - AD43-3P100-x 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**
 - AD43-3P100-x 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 Three Phase and Single Phase Networks. The measured parameters can be viewed on display and MODBUS or MBUS 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 Output**
 - The AD43-3P100-x has two opto-isolated SO Outputs that can be configured for any one of the Active (Total/Import/Export), Reactive (Total/Import/Export) Energy parameter. The pulse width and rate of pulse output is onsite programmable
- **Impulse LED**
 - The meter has Impulse LED which flash at rate of 1000 IMP/kWh indicating the Active Energy consumption.
- **LCD & Backlit**
 - 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, Tariff inputs and pulse outputs status are continuously available on screen. Measurement screen can be set as automatic scrolling or manual scrolling.
- **Front Keys**
 - Three keys are provided for easy navigation and accessibility of different parameters and onsite programming of the meter.
- **Remote Communication (Optional)**
 - AD43-3P100-x communication based on MODBUS or MBUS protocol for remote data acquisition of measurement data and configuration. MODBUS or MBUS parameters Baud rate, Device address and parity- stop bits are programmable. It provides more than 100 measurement parameters and 20 additional user assignable registers for programmable mapping sequence.
- **Tariff Input**
 - The meter has two Tariff Inputs dedicated for selection of four tariff T1, T2, T3 and T4 selection. The opto-isolated Tariff Input is rated for a wide range of AC/DC voltage for operation.
- **Multi Tariff and Partial Energy Counters**
 - The meter has Tariff Counters for energy accumulation which are selectable via Tariff Input. Energy for Tariff and Partial counters are Total/Import/Export Active Energy, Total/Import/Export Reactive Energy, Total Apparent Energy.
- **Compliance to Standards**
 - Accuracy Standard : EN50470- 3 :2022
IEC62053-21, 23
 - IP for water & dust: IEC 60529
 - Plastic Flammability Standard: UL 94
62052-31:2015

Technical Specifications

Input Voltage

Nominal Voltage (U_n)	230 VLN (400 VLL)
Operating Voltage Range	100 - 289 VLN (173 - 500 VLL)
Power consumption in Voltage Circuit	< 2 W (10 VA) per phase
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
Nominal Current ($I_{ref} = 10 \cdot I_{tr}$)	5A
Maximum Current ($I_{max} = 200 \cdot I_{tr}$)	100A
Operating Current range	0.25-5 A (100 A)
Short time Over-current	$30 \cdot I_{max}$ for one half-cycle at 50 Hz
Power consumption in Current Circuit	<1 VA Per phase
Nominal Frequency	50 / 60 Hz
Operating Frequency Range	45 to 66 Hz

Auxiliary Supply

Type	Self Powered
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Reference Conditions for 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 : 2022, 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 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	$\pm 1.0\%$
VTHD and ITHD	$\pm 4\%$ (THD $\geq 15\%$)

Pulse Output

SO1 and SO2	Passive Opto-isolated
Contact Ranges	5-27V DC, 27 mA DC (max)
Pulse Duration	60, 100 and 200 millisecond
Pulse Rate	0.01, 0.1, 1, 10, 100, 500 and 1000 pulse per kWh and kVARh
Parameters	Total/Import/Export kWh and kVARh

Impulse LED

Impulse Rate	1000 pulse per kWh
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Technical Specifications

Communication Interface (MODBUS)

Protocol	RS485 MODBUS
Baudrate	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

Communication Interface (MBUS)

Protocol	EN13757-3 MBUS
Baudrate	0.3/ 0.6/ 1.2/ 2.4/ 4.8/ 9.6 kbps
Data Width	8
Parity - Stop Bits	Even -1
Address	1 250

Display Ranges

Active Energy	0-999999.99 kWh
Reactive Energy	0-999999.99 kVARh
Apparent Energy	0-999999.99 kVAh
Active Power	0-99999 W
Reactive Power	0-99999 VAR
Apparent Power	0-99999 VA

Installation

Installation	Indoor
Enclosure	IP51 (Front side)
Housing	4 Module DIN 43880
Dimensions	72 mm X 90 mm X 65 mm
Weight	350 gm
Mounting	Snap-on 35 mm DIN Rail

Safety

Safety Standard	According to 62052-31:2015
Installation Category	III
Protective Class	II (EN 50470-3) / IEC61010
Pollution Degree	2
High Voltage Test	4 kV for 1 minute
Impulse Voltage Withstand	6.0 kV (1.2 microsecond waveform)
Housing Flame Resistance	Flammability Class V-0 acc. to UL 94, Self Extinguishing, Non Dripping, free of Halogen

Tariff Input

0 V	Low
230 V	High

Technical Specifications

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... 95% (Non Condensing)
Altitude	<2000 m max
Wiring Guidelines	
Current Input Wire Size	6.25 mm ² (use insulated pin type lug)
Current Voltage Tightening Torque	3.0 Nm
RS485/ MBUS/ SO, Tariff Input Wire Size	1 to 2.5 mm ² (Solid/Stranded with insulated pin type lug/pin type lug)
RS485 / MBUS/ SO, Tariff Tightening Torque	0.4 Nm

Technical Specifications

Sr No	Parameters	3Phase 3Wire	3 Phase 4Wire	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.	T1 Import Active Energy	✓	✓	✓
9.	T1 Export Active Energy	✓	✓	✓
10.	T1 Total Active Energy	✓	✓	✓
11.	T1 Import Reactive Energy	✓	✓	✓
12.	T1 Export Reactive Energy	✓	✓	✓
13.	T1 Total Reactive Energy	✓	✓	✓
14.	T1 Total Apparent Energy	✓	✓	✓
15.	T1 Partial Import Active Energy	✓	✓	✓
16.	T1 Partial Export Active Energy	✓	✓	✓
17.	T1 Partial Import Reactive Energy	✓	✓	✓
18.	T1 Partial Export Reactive Energy	✓	✓	✓
19.	T2 Import Active Energy	✓	✓	✓
20.	T2 Export Active Energy	✓	✓	✓
21.	T2 Total Active Energy	✓	✓	✓
22.	T2 Import Reactive Energy	✓	✓	✓
23.	T2 Export Reactive Energy	✓	✓	✓
24.	T2 Total Reactive Energy	✓	✓	✓
25.	T2 Total Apparent Energy	✓	✓	✓
26.	T2 Partial Import Active Energy	✓	✓	✓
27.	T2 Partial Export Active Energy	✓	✓	✓
28.	T2 Partial Import Reactive Energy	✓	✓	✓
29.	T2 Partial Export Reactive Energy	✓	✓	✓
30.	T3 Import Active Energy	✓	✓	✓

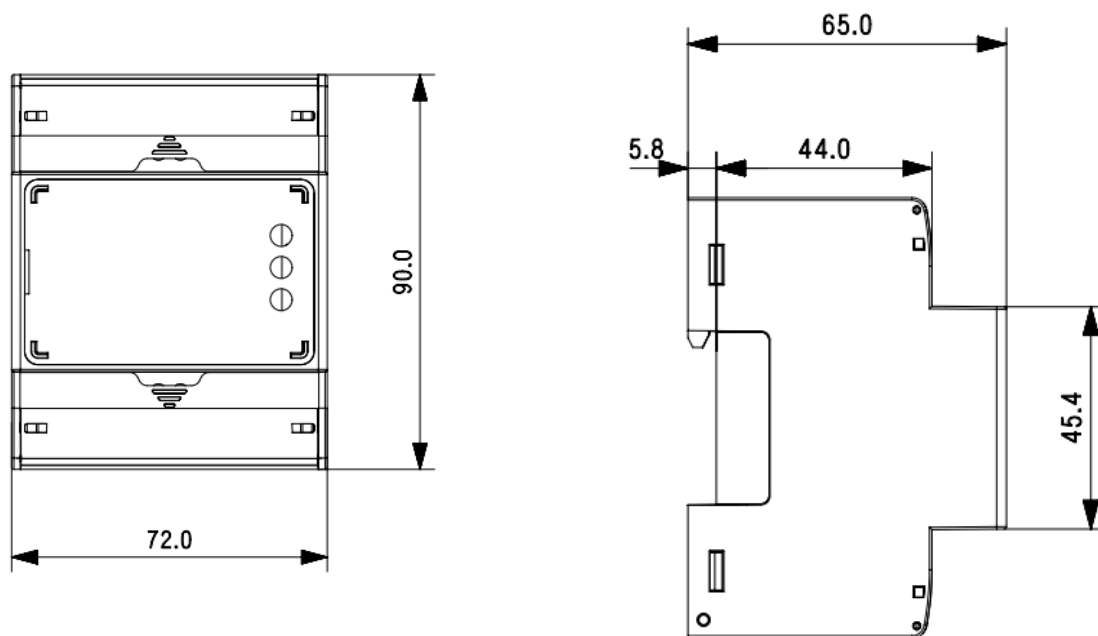
Technical Specifications

Sr No	Parameters	3Phase 3Wire	3 Phase 4Wire	1Phase 2Wire
31.	T3 Export Active Energy	✓	✓	✓
32.	T3 Total Active Energy	✓	✓	✓
33.	T3 Import Reactive Energy	✓	✓	✓
34.	T3 Export Reactive Energy	✓	✓	✓
35.	T3 Total Reactive Energy	✓	✓	✓
36.	T3 Total Apparent Energy	✓	✓	✓
37.	T3 Partial Import Active Energy	✓	✓	✓
38.	T3 Partial Export Active Energy	✓	✓	✓
39.	T3 Partial Import Reactive Energy	✓	✓	✓
40.	T3 Partial Export Reactive Energy	✓	✓	✓
41.	T4 Import Active Energy	✓	✓	✓
42.	T4 Export Active Energy	✓	✓	✓
43.	T4 Total Active Energy	✓	✓	✓
44.	T4 Import Reactive Energy	✓	✓	✓
45.	T4 Export Reactive Energy	✓	✓	✓
46.	T4 Total Reactive Energy	✓	✓	✓
47.	T4 Total Apparent Energy	✓	✓	✓
48.	T4 Partial Import Active Energy	✓	✓	✓
49.	T4 Partial Export Active Energy	✓	✓	✓
50.	T4 Partial Import Reactive Energy	✓	✓	✓
51.	T4 Partial Export Reactive Energy	✓	✓	✓
52.	L1, L2, L3 Import Active Energy	✓	×	×
53.	L1, L2, L3 Export Active Energy	✓	×	×
54.	L1, L2, L3 Total Active Energy	✓	×	×
55.	L1, L2, L3 Import Reactive Energy	✓	×	×
56.	L1, L2, L3 Export Reactive Energy	✓	×	×
57.	L1, L2, L3 Total Reactive Energy	✓	×	×
58.	L1, L2, L3 Total Apparent Energy	✓	×	×
59.	Partial Import Active Energy	✓	✓	✓
60.	Partial Export Active Energy	✓	✓	✓
61.	Partial Total Active Energy	✓	✓	✓
62.	Partial Import Reactive Energy	✓	✓	✓
63.	Partial Export Reactive Energy	✓	✓	✓
64.	Partial Total Reactive Energy	✓	✓	✓
65.	Partial Total Apparent Energy	✓	✓	✓
66.	Current Max Demand	✓	✓	✓
67.	kVA Max Demand	✓	✓	✓
68.	kW Max Demand	✓	✓	✓
69.	kVar Max Demand	✓	✓	✓
70.	Import kW Max Demand	✓	✓	✓
71.	Export kW Max Demand	✓	✓	✓
72.	Import kVar Max Demand	✓	✓	✓
73.	Export kVar Max Demand	✓	✓	✓
74.	L1, L2, L3 Current Max Demand	✓	✓	×
75.	System Voltage	✓	✓	✓
76.	L1, L2, L3 Voltage	✓	×	×

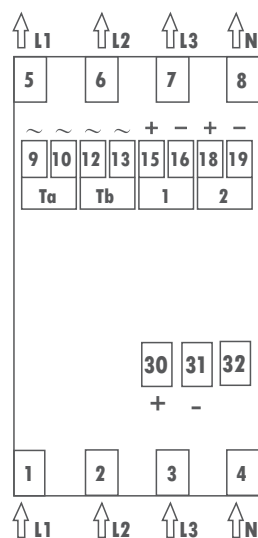
Technical Specifications

Sr No	Parameters	3Phase 3Wire	3 Phase 4Wire	1Phase 2Wire
77.	T3 Export Active Energy	✓	✓	×
78.	T3 Total Active Energy	✓	✓	✓
79.	T3 Import Reactive Energy	✓	✓	×
80.	T3 Export Reactive Energy	✓	✓	✓
81.	T3 Total Reactive Energy	✓	✓	✓
82.	T3 Total Apparent Energy	✓	×	×
83.	T3 Partial Import Active Energy	✓	✓	✓
84.	T3 Partial Export Active Energy	✓	×	×
85.	T3 Partial Import Reactive Energy	✓	✓	✓
86.	T3 Partial Export Reactive Energy	✓	×	×
87.	T4 Import Active Energy	✓	✓	✓
88.	T4 Export Active Energy	✓	×	×
89.	T4 Total Active Energy	✓	✓	✓
90.	T4 Import Reactive Energy	✓	×	×
91.	T4 Export Reactive Energy	✓	✓	✓
92.	T4 Total Reactive Energy	✓	×	×
93.	T4 Total Apparent Energy	✓	✓	✓
94.	T4 Partial Import Active Energy	✓	×	×

Dimensions



Electrical Connections



- 1,2,3 :I-In
 5,6,7 :I-Out
 4 :Neutral-In
 8 :Neutral-Out
 15,16,18,19 :Pulse Output 1 & Pulse Output 2
 Terminal
 9,10,12,13 :Tariff input a & Tariff input b
 Terminal
 30,31,32 :RS485 Terminal (in Modbus model)
 Mbus Terminal (in Mbus model)

Ordering information

Ordering Code	Model	Ordering Description
ED43-Z00102A0B00ST	AD43-3P100-TS	AD43-3P100-TS : 100-289VNL 100A 2TI+2SO
ED43-Z00102B0B00ST	AD43-3P100-RS	AD43-3P100-RS : 100-289VN 100A RS+2TI+2SO
ED43-Z00102C0B00ST	AD43-3P100-MBUS	AD43-3P100-MBUS : 100-289VN 100A M-BUS+2TI+2SO