NR12

SINGLE-PHASE DIN RAIL AC ENERGY METER 45A

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LUMEL

Overview :

NR12 is a modern Single Phase Din Rail Power Netowrk 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.

FEATURES

Direct Connection Meter :
NR12 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 :
NR12 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 :
The NR12 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.

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.

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

Remote Communication :
NR12 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.

Multi Tariff :
The meter has 2 Tariff Counters selectable via MODBUS Communication for energy accumulation. Energy for tariff are System Import Active Energy, System Export Active Energy, System Import Reactive Energy, System Export Reactive Energy, System Apparent Energy and System Total Active Energy.

Compliance to Standards :
National / International Standards are complied

Accuracy Standard :	EN50470-1, 3 IEC62053-21, 23 (IEC)
IP for water & dust:	IEC 60529
Plastic Flammability Standard:	UL 94

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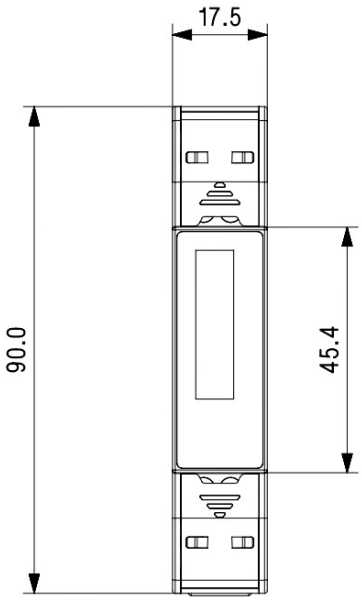
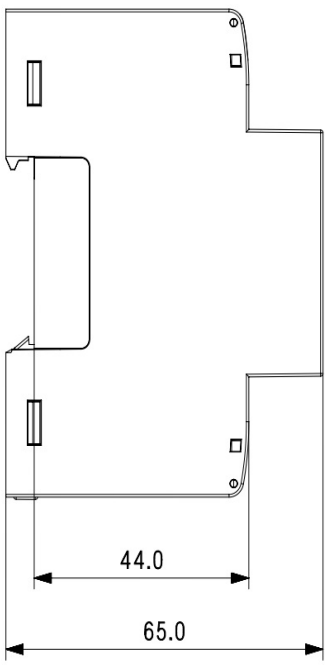
Dimensions Details:





TECHNICAL DATA

Input :	
Reference Voltage (U_n)	230 VLN
Operating Voltage Range	193 - 253 VLN
Power consumption in Voltage Circuit	< 2 W (10 VA)
Starting Current (I_{st} = 0.04*I_b)	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_b)	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	50/60 Hz
Auxiliary Supply :	
Type	Self Powered
Reference Conditions for Accuracy :	
Reference Temperature	23°C ± 2°C
Input Voltage	Un ± 1%
Input Waveform	Sinusoidal (distortion factor <2%)
Input Frequency	50 Hz ± 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	± 1.0 %
Voltage	± 0.5% of of range max
Current	± 0.5% of Nominal value
Frequency	± 0.2% of Mid frequency
Active Power	± 1% of range max
Reactive Power	± 1% of range max
Apparent Power	± 1% of range max
Power Factor	±1% of unity
Pulse Outputs :	
SO1	Passive Opto-isolated
Contact Range	5-27V DC, 27 mA DC (max)
Pulse Duration	60-200 millisecond
Pulse Rate	0.01-1000 pulse per kWh/kVARh/kVAh
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 Baudrate)

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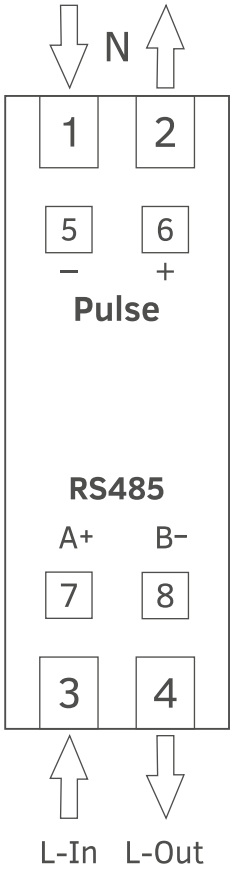
Connector Details:



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
Safety :	
Safety Standard	According to EN50470-1
Installation Category	III
Protective 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... 95% (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 sweep 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

Measured Parameters:

✓ : Available × : Not Available

Sr No	Parameters	1 Phase 2 Wire
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.	Tariff1 Total Active Energy	✓
11.	Tariff1 Import Reactive Energy	✓
12.	Tariff1 Export Reactive Energy	✓
13.	Tariff 1 Total Reactive Energy	✓
14.	Tariff 1 Total 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 Total 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 Total 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	✓
38.	Frequency	✓
39.	Active Power	✓
40.	Reactive Power	✓
41.	Apparent Power	✓

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