
# NMID33

## THREE-PHASE DIN RAIL AC ENERGY METER 100A

(MID CERTIFIED)

# NMID33

THREE-PHASE DIN RAIL ENERGY METER

LUMEL

## Overview:

NMID33 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 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 for remote monitoring. Meter housing is standard Din Rail Mount that allows ease of installation.

## FEATURES

**Direct Connection Meter:**
NMID33 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:**
NMID33 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 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 NMID33 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.

**Tariff Inputs:**
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.

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

**Remote Communication:**
NMID33 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. It provides more than 100 measurement parameters and 20 additional user assignable registers for programmable mapping sequence.

**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.

**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<br>IEC62053-21 |
| IP for water & dust: | IEC 60529 |
| Plastic Flammability Standard: | UL 94 |
| Safety Standard | 62052-3: 2015 |

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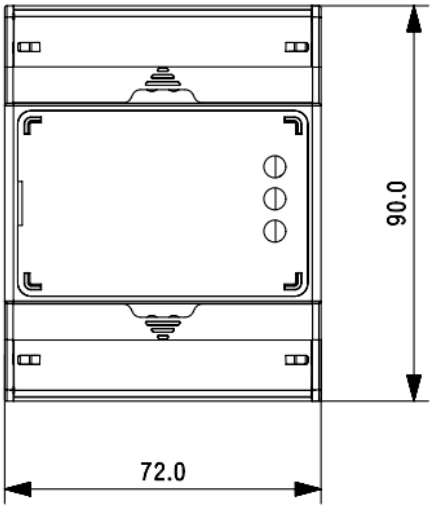
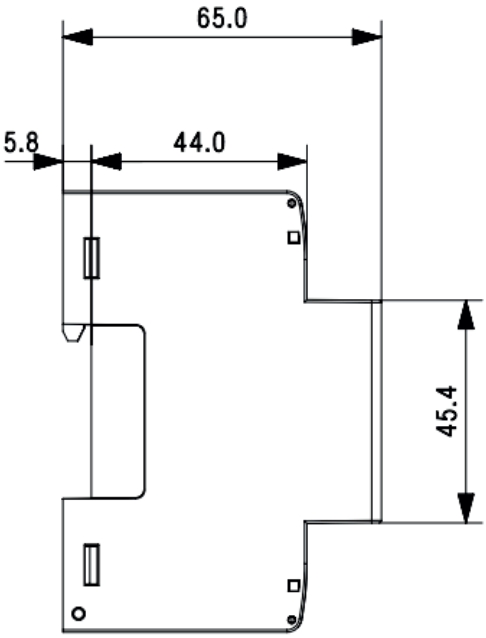
## Dimensions Details:




## TECHNICAL DATA

| Measurement Parameters: | |
|---|---|
| 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*$I_{tr}$) | 20 mA |
| Minimum Current ($I_{min}$ = 0.5*$I_{tr}$) | 250 mA |
| Transitional Current ($I_{tr}$) | 0.5 A |
| Nominal Current ($I_{ref}$ = 10*$I_{tr}$) | 5 A |
| Maximum Current (Imax= 200*Itr) | 100 A |
| Operating Current Range | 0.25-5 A (100 A) |
| Short time Over-current | 30*$I_{max}$ for half-cycle at 50 Hz |
| Power consumption in Current Circuit | <1VA per phase |
| Nominal Frequency | 50 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 EN50470-3:2022<br>Class 1 as per IEC 62053-21 |
| Reactive Energy (Import/Export) | ± 2.0 % |
| Apparent Energy | ± 1.0 % |
| Voltage | ± 0.5% 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% |
| VTHD and ITHD | ±4% (THD >=15%) |

| Pulse Outputs: | |
|---|---|
| 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 |

| 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 at 9.6 Kbps Baudrate |

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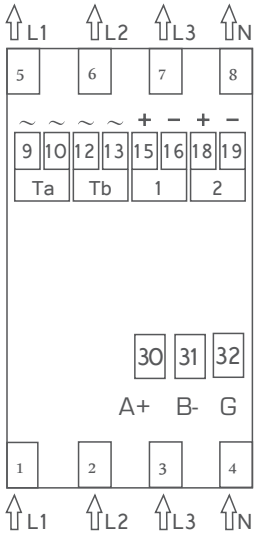
## Connector Details:




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 :RS-485 Terminal

## TECHNICAL DATA

| | |
|---|---|
| **Impulse LED:** | |
| Impulse Rate | 1000 pulse per kWh |
| **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 |
| **Tariff Input:** | |
| 0 V | Low |
| 230 V | High |
| **Installation:** | |
| Installation | Indoor |
| Enclosure | IP51 (Front) |
| 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 |
| Pollution Degree | 2 |
| AC Voltage Test | 4kV for 1 Minute |
| Impulse Voltage Withstand | 6 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 +55°C |
| Storage/Transport Temperature | -40°C to +70°C |
| Relative Humidity | 0... 95% (Non Condensing) |
| Altitude | < 2000 m |
| **Wiring Guidelines:** | |
| Current/Voltage Input Wire Size | 6-25 $mm^2$ (use with insulated pin type lug) |
| Current/Voltage Tightening Torque | 2.5 - 3.0 Nm |
| RS485 & Tariff input Wire Size | 0.1 to 2.5 $mm^2$ (Solid/Stranded with insulated pin type lug) |
| RS485 & Tariff Input Tightening Torque | 0.4 Nm |

## Measured Parameter System wise:

✓ : Available  × : Not Available

| Sr No | Parameters | 3 Phase 4Wire | 3Phase 3Wire | 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 | ✓ | ✓ | ✓ |
| 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 | ✓ | ✓ | ✓ |

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## Measured Parameter System wise contd.:

✓ : Available × : Not Available

| | | | | |
|---|---|---|---|---|
| 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 | ✓ | × | × |
| 77. | L12, L23, L31 Voltage | ✓ | ✓ | × |
| 78. | System Current | ✓ | ✓ | ✓ |
| 79. | L1, L2, L3 Current | ✓ | ✓ | × |
| 80. | Frequency | ✓ | ✓ | ✓ |
| 81. | System Active Power | ✓ | ✓ | ✓ |
| 82. | L1, L2, L3 Active Power | ✓ | × | × |
| 83. | System Reactive Power | ✓ | ✓ | ✓ |
| 84. | L1, L2, L3 Reactive Power | ✓ | × | × |
| 85. | System Apparent Power | ✓ | ✓ | ✓ |
| 86. | L1, L2, L3 Apparent Power | ✓ | × | × |
| 87. | System Power Factor | ✓ | ✓ | ✓ |
| 88. | L1, L2, L3 Power Factor | ✓ | × | × |
| 89. | System Phase Angle | ✓ | ✓ | ✓ |
| 90. | L1, L2, L3 Phase Angle | ✓ | × | × |
| 91. | System Voltage THD | ✓ | ✓ | ✓ |
| 92. | L1, L2, L3 Voltage THD | ✓ | × | × |
| 93. | System Current THD | ✓ | ✓ | ✓ |
| 94. | L1, L2, L3 Current THD | ✓ | × | × |

## Order Code:

**NMID33**
3 Phase Direct Connected Energy Meter with Input voltage 100-289VLN, 0.25-5 A (100A), Modbus with 2 SO Output and 2 Tariff Inputs with CE Certification.

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