# Engineering Specifications

# Veris E51C3

# Bi-Directional Compact Power and Energy Meter

# With Modbus Communication and Data Logging Capability

1. The power meter shall be fully electronic with multi-line backlit LCD display showing measured parameters as well as alarm functions and pulse output.
2. The power meter shall perform the following measurements:
3. Total Real Energy (kWh) (a signed net sum of all energy imported and exported)
4. Real Energy (kWh), imported (from the grid), exported (to the grid) for each phase and totals for all phases
5. Reactive Energy (kVARh), both imported (from the grid) and exported (to the grid), by Quadrant, as defined by IEEE 1459-2000
6. Apparent Energy (kVAh), imported (from the grid), exported (to the grid), and signed net total
7. Net Present Demand for Real (kW), Reactive (kVAR) and Apparent (kVA) Power over a user-specified interval (block or sliding window)
8. Maximum (Peak) Real (kW), Reactive (kVAR) and Apparent (kVA) Demand Intervals, both imported (from the grid) and exported (to the grid)
9. Instantaneous Real (kW), Reactive (kVAR) and Apparent Power (kVA), by phase and in total
10. Current (amps) for each phase and average of all phases
11. Phase-to-phase voltage for each phase and average of all phase pairs
12. Phase-to-neutral voltage for each phase pair and average of all phases
13. Power factor for each phase and average of all phases
14. AC frequency
15. The power meter shall communicate all these measurements using the Modbus RTU protocol at speeds from 1200 to 38400 baud; odd, even, or no parity.
16. The power meter shall also provide a separate pulse output (of total Real energy).
17. The meter shall be UL/CUL listed to the latest applicable safety standards.
18. Power meter models must be available to directly accept voltage input over the range of 90 to 600 VAC (50 or 60Hz).
19. The power meter shall accept either 0 to 0.333VAC or 0 to 1VAC input from up to three current transducers to 32000 amps.
20. The measured energy consumption shall be retained in non-volatile ferromagnetic memory for the life of the product warranty.
21. The power meter shall have demand measurement programmable for up to 6 sub-intervals of 10 seconds to 546 minutes duration.
22. Meter shall be optionally available in an outdoor NEMA 4X enclosure.
23. The power meter shall operate from -30C to +70C.
24. The power meter shall have dimensions not exceeding 4.2” x 3.6” x 2.3”.
25. The power meter shall be Veris E51C3 or equivalent.
26. The power meter shall meet both ANSI C12.20 .5% and IEC 62053-22 Class .5S real power and energy accuracy specifications.
27. The power meter shall meet IEC 62053-22 Class 2 reactive power and energy accuracy specifications.
28. The power meter shall be configurable for operation on Single Phase (AN or AB), Split Phase (ABN), Delta (ABC), and Wye (ABCN) systems.
29. The power meter shall have separate control power inputs such that is may be powered from a different service than it measures.
30. The power meter shall have Phase Loss Alarm contacts with a user configurable phase loss threshold.
31. The power meter shall be configurable for use with Potential Transformers to 32000 volts.
32. The power meter shall have a configurable pulse weight in units of 10, 100, 1000, 10000 Wh.
33. The power meter shall calculate a maximum theoretical system power using the configuration parameters set by the user and use this value to set the slowest pulse duration that will keep up with this power level. If the selected pulse weight doesn’t allow the meter to find a pulse duration that can keep up, the meter shall warn the user.
34. The power meter shall support warnings for low power factor, phase voltage miss-wired, current over range, voltage over range, and frequency out of range, pulse output overrun and pulse output configuration.
35. The power meter shall log and retain in non-volatile memory up to 5760 (up to 60 days at 15 minute intervals) measurement records at time intervals determined by the Demand Interval duration setting. These records shall contain any 10 16-bit data values that the user selects from the base Modbus point map. These logged data records shall be readable over Modbus via additional registers.
36. The product shall have a 5-year warranty.