

SECTION 26 27 13

ELECTRICAL SUB-METERING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Electrical sub-meters.

1.2 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Division 01.
- B. Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

PART 2 - PRODUCTS

2.1 ELECTRICAL USE SUB-METERS

- A. Acceptable Manufacturers:
 - 1. *E-MON*, model E32-480100-REZ7KIT (277/480 Volt, 3 phase)
 - 2. Substitutions: None permitted
- B. Sub-meter shall be designed for Multifunction Electrical Measurement on 3 phase power systems.
 - 1. Sub-meter shall support 3 element wye, 2.5 element wye, 2 element delta, 4 wire delta systems.
 - 2. The sub-meter shall accept universal voltage input suitable for 120, 220, and 277 power systems.
 - 3. Surge withstand shall conform to IEEE C37.90.1
 - 4. The sub-meter shall be user programmable for voltage range to any PT ratio.
 - a. The sub-meter shall accept a voltage input range of up to 416 Volts Line to Neutral, and a range of up to 721 Volts Line to Line.
- C. The sub-meter shall have an accuracy of +/- 0.1% or better for volts and amps, and 0.2% for power and energy functions. The sub-meter shall meet the accuracy requirements of IEC687 (class 0.2%) and ANSI C12.201(Class 0.2%).
 - 1. The sub-meter shall provide true RMS measurements of voltage, phase to neutral and phase to phase, current, per phase and neutral.
 - 2. The sub-meter shall provide sampling at 400+ samples per cycle on all channel measured readings simultaneously.
- D. Sub-meter shall provide Harmonics %THD (% of total Harmonic Distortion).

- E. The sub-meter shall be fully electronic with 4-line 20-character backlit LCD display.
 - 1. Sub-meter display shall show kWh, kW demand (with peak date and time), power factor per phase, real-time load in kW, Amps per phase and Volts per phase.

- F. Sub-meter shall include virtual measurement upgrade packs, which shall allow user to upgrade in field without removing installed sub-meter.
 - 1. Two upgrade packs shall be:
 - a. Volts, Amps, kw, kVAR, PF, kVA, Freq., kWh, kVAh, kVARh.
 - b. Volts, Amps, kW, kVAR, PF, kVA, Freq., kWh, kVAh, kVARh, %THD Monitoring and Limit Exceeded Alarms.
 - 2. These virtual upgrade packs must be able to be updated without physically removing the installed sub-meter.
 - a. Sub-meter shall be a traceable revenue sub-meter, which shall contain a utility grade test pulse, allowing power providers to verify and confirm that the sub-meter is performing to its rated accuracy.

- G. Sub-meter shall be capable of daisy-chain or star connection using RS-485 communications in combinations of Class 3200s, 3400s, 5000s, IDR-8s, IDR-16s not to exceed 52 devices. Cabling shall be available terminal block (3-conductor), 18-22AWG, up to 4,000 cable feet total.

- H. The sub-meter shall store interval data for kWh and kVARh for up to 72 days in first-in first-out format.

- I. The sub-meter shall have a standard 4-year warranty.

- J. Sub-meter shall be able to be stored in (-40 to +85) degrees C.
 - 1. Operating temperature shall be (-30 to +70) degrees C.
 - a. NEMA 12 faceplate rating shall be available for the Sub-meter.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install sub-metering equipment in accordance with manufacturer's instructions.
- B. Install sub-meters in surface mounted enclosures directly above the panel being served.
- C. Provide a CAT6 communications cable between each electrical sub-meter and the closest local area network equipment rack.

END OF SECTION 26 27 13