

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1            Section 26 05 00 - Common Work Results for Electrical.

**1.2                REFERENCES**

- .1            American National Standards Institute (ANSI).
  - .1            ANSI C39.1-1981, Requirements, Electrical Analog Indicating Instruments.
  - .2            CSA International.
    - .1            CAN3-C17-M84(R2008), Alternating - Current Electricity Metering.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1            Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2            Product Data:
  - .1            Submit manufacturer's instructions, printed product literature and data sheets for metering and switchboard instruments and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2            Include meter, instrument, outline dimensions, panel drilling dimensions and installation cutout template.

**1.4                DELIVERY, STORAGE, AND HANDLING**

- .1            Deliver, store, and handle materials in accordance with manufacturer's written instructions.
- .2            Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3            Storage and Handling Requirements:
  - .1            Store materials off ground, indoors, and in accordance with manufacturer's recommendations in clean, dry, and well-ventilated area.
  - .2            Store and protect metering and switchboard instruments from nicks, scratches, and blemishes.
  - .3            Replace defective or damaged materials with new.

**1.5                ACCEPTABLE PRODUCTS AND MATERIALS**

- .1            Where a particular brand name is stipulated, see Instructions to Bidders for procedure for requesting approval of substitute materials and products.

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**Part 2            Products**

**2.1                DIGITAL INDICATING INSTRUMENTS**

- .1    Digital indicating instruments: 1% accuracy, switchboard mounting, flush, rectangular case, operated from current transformer.
- .2    Digital measurement system indicating the following measures:
  - .1    Voltage and current for each phase;
  - .2    kVAs;
  - .3    kVARs;
  - .4    kW;
  - .5    Power factor;
  - .6    Hz;
  - .7    Cumulated kWh;
  - .8    Demand in A and in kW.
- .3    Communication port to transmit measurements to distance.
- .4    Acceptable products:
  - .1    PM800 of Powerlogic (Schneider Electric).
  - .2    Eaton.
  - .3    ABB.
  - .4    Replacement materials or products: approved by addendum according to Instructions to bidders.

**2.2                SHOP INSTALLATION**

- .1    Install meters and instrument transformers in separate compartment of switchboard.
- .2    Install instruments on switchboard.
- .3    Ensure adequate spacing between current transformers installed on each phase.
- .4    Verify correctness of connections, polarities of meters, instruments, potential and current transformers, transducers, signal sources, electrical supplies.

**Part 3            Execution**

**3.1                EXAMINATION**

- .1    Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for metering and switchboard instruments installation in accordance with manufacturer's written instructions.
  - .1    Visually inspect substrate.
  - .2    Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied.

### **3.2 METERING INSTALLATION**

- .1 Install instruments in location free from vibration and shock.
- .2 Make connections in accordance with diagrams.
- .3 If applicable, ensure power factor corrective equipment connected on load side of meter.
- .4 Connect meter and instrument transformer cabinets to ground.
- .5 Locate meters within 9 m of instrument transformers.
  - .1 Use 35 mm conduit for interconnections.
  - .2 Use separate conduit for each set of current transformer connections, exclusive for metering.

### **3.3 FIELD QUALITY CONTROL**

- .1 Conduct tests in accordance with Section 26 05 00 - Common Work Results for Electrical and in accordance with manufacturer's recommendations.
- .2 Perform simulated operation tests with metering, instruments disconnected from permanent signal and other electrical sources.
- .3 Verify correctness of connections, polarities of meters, instruments, potential and current transformers, transducers, signal sources and electrical supplies.
- .4 Perform tests to obtain correct calibration.
- .5 Do not dismantle meters and instruments.

### **3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.5 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metering and switchboard instrument installation.

**END OF SECTION**