

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials, components, cabinets, instruments and installation for metering and switchboard Instruments.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 11 00 - General Requirements.
- .3 Section 26 05 00 - Common Work Results for Electrical.

1.3 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI C39.1 (current issue), Requirements, Electrical Analog Indicating Instruments.
- .2 Canadian Standards Association, (CSA International)
 - .1 CAN3-C17 (current issue), Alternating - Current Electricity Metering.

1.4 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate meter, outline dimensions, panel drilling dimensions and include cutout template, coordinate complete installation.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused wiring materials from landfill to metal recycling facility as approved as outlined in Waste Management Plan.
- .5 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 METER

- .1 Power Quality Meter
- .2 Mounted in a Separate Enclosure from Power Panel, C/W test block and CTs.
- .3 Ratings: 277/480 Vac, 3Ph, 4W

2.2 METER CABINET

- .1 Sheet steel CSA enclosure to Enmax standards with meter backplate, to accommodate meters, test terminal block and associated equipment, factory installed and wired.

2.3 TEST TERMINAL BLOCKS

- .1 Test terminal blocks: as required.

2.4 METER READOUT

- .1 Instantaneous Current: Voltage, Frequency, Current, Active (kW), reactive (kvar), and apparent (kVA) power factor and frequency, Voltage and current unbalance
- .2 Energy Values: Active, Reactive, Apparent
- .3 Harmonic readings: As a minimum up to the 31st harmonic
- .4 Transient Readings.

2.5 METER RATING

- .1 Power Quality Meter with Advanced Power Quality Measurement Accuracy.
- .2 Provide a high accuracy power meter meeting the requirements set forth in this specification. Note any exceptions taken with a detailed description.
- .3 Basic requirements of the Power Quality meter are as follows:
 - .1 Voltage inputs: The device shall be capable of interface with a 277 VAC (line-to-neutral) or 480 VAC (line-to-line) System.
- .4 Input-current
 - .1 Rated nominal current 1A, 2A, 5A, 10A
 - .2 Measurement range 0.005 - 20 A autoranging (standard range)
 - .3 Permissible overload 500 A rms for 1 s, non-recurring (5A)
- .5 Transient detection, data and waveform recording, IEC 61000-4-30 Class A & EN50160.
- .6 Harmonic Measurement, up to 31st harmonic for all voltage and current inputs
- .7 Accuracy:
 - .1 Current and voltage accuracy 0.25% + 0.05 % full scale

- .2 Power accuracy Real (kW) 0.5% reading
- .3 Apparent (kVA) 0.5% + 0.1%
- .4 Reactive (kvar) 1.5% reading
- .5 Energy accuracy
 - .1 Real (kWh) 0.5% reading
 - .2 Apparent (kVAh) 1.0% reading
 - .3 Reactive (kvarh) 1.5% reading

2.6 DATA RECORDING

- .1 Min/max of instantaneous values
- .2 Historical Logs: Up to 30 days, including harmonic readings.
- .3 Waveform Logs
- .4 Trending/Forecasting

2.7 INTERNAL MEMORY

Minimum 300kB Non-Volatile Internal Memory

2.8 COMMUNICATIONS

- .1 Minimum Two RS-485 ports
- .2 Minimum One 10Base-T Ethernet (RJ45) port
- .3 Minimum One 33.6k universal internal modem (RJ11) port

2.9 Display

- .1 An easy-to-read front panel with a back-lit LCD screen supports local data display and basic setup.

2.10 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 METERING INSTALLATION

- .1 Install meters 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. Use 32 mm conduit for interconnections. Use separate conduit for each set of current transformer connections, exclusive for metering.

3.2 FIELD QUALITY CONTROL

- .1 Conduct tests in accordance with Section 26 05 00 - Common Work Results - 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.

END OF SECTION