

CITY OF AUSTIN ELECTRIC UTILITY DEPARTMENT

PURCHASE SPECIFICATION

FOR

**METER,DISTRIBUTION,OH,1PH,20-380A,120-
277V,480V,ELECTRIC,SOLID STATE**

DATE	PREPARED BY	ISSUANCE/REVISION	APPROVAL PROCESS SUPV. / MATERIALS SUPV.
12/8/99	Herman Millican	ISSUANCE	Brian Davison / George Martinez
07/11/2001	Carlos Tello	Revision	Herman Millican / Anthony Hawkins

REASON FOR REVISION	AFFECTED PARAGRAPHS
Wording	3.1.4, 3.1.5

This specification, until rescinded, shall apply to each future purchase and contract for the commodity described herein. Retain for future reference.

**CITY OF AUSTIN ELECTRIC UTILITY DEPARTMENT
PURCHASE SPECIFICATION
FOR
SOLID-STATE ELECTRICITY METERS AND METERING DEVICES**

1.0 SCOPE AND CLASSIFICATION

1.1 Scope

The City of Austin, Electric Utility Department is hereinafter referred to as Austin Energy (AE). Austin Energy requires a qualified Vendor to supply solid-state meters, demand meters, demand registers, pulse devices, and auxiliary devices. All meters and metering devices shall be solid-state and constructed of good material in a workmanlike manner with the objective of attaining stability of performance, sustained accuracy, and safe operation over long periods of time and over wide ranges of operating conditions with minimum maintenance. **HYBRID (ELECTRO-MECHANICAL) METERS ARE NOT ACCEPTABLE.**

This specification establishes the minimum requirements for solid-state watthour meters and metering devices.

1.2 Classification

The solid-state meters and metering devices shall be user programmable using computer software and **YEAR 2000 COMPLIANT**. The solid-state meters shall be detachable socket (type "S") or bottom-connected ("A"-Base or type "S" with "A"-Base adapter) as stipulated by Austin Energy's purchase description. The meters shall be multi-form and multi-voltage ranging.

2.0 APPLICABLE SPECIFICATIONS

The latest revision of the following standards:

- 2.1 ANSI C12.1-1995 - Code for Electricity Metering
- 2.2 ANSI C12.10-1997 - American National Standard for Watthour Meters
- 2.3 ANSI C12.18-1996 – Protocol Specification for ANSI Type 2 Optical Port
- 2.4 AEP - American Electric Power Specification for Bar Coding of Meters and Programmable Registers

3.0 FUNCTIONAL REQUIREMENTS

3.1 Minimum requirements for a solid-state meter

- 3.1.1 Measure kWh energy
- 3.1.2 All programmable parameters shall be either internally programmable to the meter or programmable using an IBM/IBM compatible PC with Windows based software and RS 232 serial port (computer port). The meter shall be able to interface with the PC via ANSI type 2 optical port at a minimum rate of 9600-baud using ANSI C12.18 or other AE acceptable protocol.
- 3.1.3 The solid-state meter shall have a non-volatile memory, which shall be able to retain all accumulated data and programmed parameters, during a power outage.
- 3.1.4 It is preferred that the solid-state meter shall be able to run self-diagnostics, upon energizing, and, for poly-phase meters, determine the type of three-phase service (Y or Δ).

3.1.5 It is preferred that the three-phase solid-state meter shall be able to automatically adjust itself upon energizing to operate at the source voltage. The source voltages are as follows:

- 120/240 Volts
- 120/208 Volts
- 240/480 Volts
- 277/480 Volts

3.1.6 The Class of the solid-state meter shall be either 20, 200, or 320 amperes as stipulated by AE's purchase description.

3.1.7 The depth of the solid-state meter (socket, type "S" with or without "A-Base" adapter or bottom-connected, type "A") shall not exceed 9.5".

3.2 **Optional Meter Features/Devices**

As stipulated by AE's purchase description, optional solid-state meter features/devices may be required. These programmable solid-state metering devices shall be able to perform one or combinations of the following functions:

3.2.1 Demand Measurement

3.2.1.1 Measure block, sliding, thermal, or predicted, user programmable, demand (kW) over a specified interval of time.

3.2.1.2 Measure block, sliding, thermal, or predicted, user programmable, kVAR demand over a specified interval of time. When a kW peak is established, the coincidental reactive (kVAR) demand shall be stored in nonvolatile memory along with the peak kW.

3.2.2 Measure kVARh energy

3.2.3 Measure Qh

3.2.4 Pulse Initiators

3.2.4.1 Three wire, form C, KYZ pulse output(s) shall have programmable pulse weight(s) for a variety of energy and power values in the meter including, but not limited to, active, apparent, and/or reactive as stipulated by AE's purchase description.

3.2.4.2 Two wire, form A pulse output(s) shall be programmable for alarms or an end-of-interval indicator for demand.

3.2.5 Internal Recorder (Memory)

3.2.5.1 The number of channels, interval length, and number of days of storage required shall be stipulated by AE's purchase description.

3.2.5.2 The interval length shall be programmable.

3.2.6 Measure a variety of per phase values in the meter including, but not limited to, phase angle or power factor, current, or voltage as stipulated by AE's purchase description.

3.2.7 Communication Devices

3.2.7.1 Optical port ANSI Type 2

3.2.7.2 An internal telephone modem shall be furnished for communicating over a phone line to the meter. The meter shall interface with UTS MV-90 software. Off-Hook detection is required.

- 3.2.7.3 RS-232 COMM port with programmable baud rate. Acceptable protocols include Modbus, DNP 3.0, ION, mini-DLMS, SCS/SUSI, and GPS.
- 3.2.7.4 RS-485 with programmable baud rate. Acceptable protocols include Modbus, DNP 3.0, ION, mini-DLMS, SCS/SUSI, and GPS.
- 3.2.7.5 Internal radio frequency transmitter operating in the 900 MHz frequency range shall transmit meter's memory using standard ASCII file interface to AE's radio equipped fixed, handheld, or mobile meter reading systems.
- 3.2.7.6 Ethernet with programmable baud rate. Acceptable protocols include TCP/IP, ION, and Telnet.

3.2.8 Internal Totalizer

Meter shall receive inputs from other meters and provide summarized or totalized usage. These totalized quantities shall be the programmable sum or difference of the received inputs.

3.2.9 System Loss compensation

Meter shall be able to have line loss compensation and transformer (iron and copper) loss compensation programmed into the meter's registration by user. **Loss compensation achieved through factory modification of firmware is not desirable.**

3.2.10 Power Quality Monitoring

- 3.2.10.1 Detect any voltage swell, sag, or interruption outside user programmed thresholds and internally records the date, time, magnitude, duration, and description of the event in the meter's internal event recorder.
- 3.2.10.2 Detect any current swell, sag, or interruption outside user programmed thresholds and internally records the date, time, magnitude, duration, and description of the event in the meter's internal event recorder.
- 3.2.10.3 Detect and record Total Harmonic Distortion (THD) for per phase voltage and current variations outside user programmed threshold limits.
- 3.2.10.4 Detect and record other quantities as stipulated by AE's purchase description such as but not limited to, symmetrical components, K-Factor, and crest factor.

3.2.11 Power Factor

When a kW peak is established, the coincidental power factor shall be stored in nonvolatile memory along with the peak kW. The meter shall display the coincidental power factor.

- 3.2.12 All parameters, listed in 3.2, shall be programmable internally to the meter using an IBM/IBM compatible PC with Windows based software and RS 232 serial port (computer port) or via ANSI type 2 optical port.

4.0 PERFORMANCE REQUIREMENTS

4.1 Register Display

The register display shall be as per ANSI C12.10 and shall include the following:

- 4.1.1 The solid-state meter shall have a liquid crystal display (LCD).
- 4.1.2 All displays on the meter essential for billing purposes shall be readable from the front of the meter.
- 4.1.3 The scroll time for each billing quantity shall be programmable.
- 4.1.4 If the display is not on continuously, it shall have the capability to be activated, upon request.

- 4.2 A segment test display shall provide an integrity check of the display, that is, all segments of the register including the annunciators and decimal points.
- 4.3 The register shall have a user selectable normal display mode, an alternate display mode, and a test mode that are independently programmable for display quantities.
 - 4.3.1 The solid-state meter test mode shall enable testing of the meter without altering any billing data in the normal mode.

4.4 Nameplate

The nameplate of the solid-state meter shall be as per ANSI C12.10-1997, Section 3.7:

4.5 Nameplate Bar Code

The nameplate bar code shall be as per ANSI C12.10-1997, Section 3.7.5.3. The bar code data (left to right) shall be in the following format:

AEP Testcode	2 characters
AEP Manufacturer Code	1 character
“AE ”	3 characters (“Aespace” refers to Austin Energy)
AE’s Meter Number	6 characters (This information will be provided by AE Meter Shop Supervisor.)
AE’s Meter Shop Code	3 characters (This information will be provided by AE Meter Shop Supervisor.)
Year of Manufacture	2 characters

- 4.6 The solid-state meter cover shall be made of UV-stabilized polycarbonate, which shall provide solar shielding and resistance to damage from accidents. The meter face shall be made of a transparent polycarbonate, which gives a clear view of the meter’s nameplate and display data.
- 4.7 The performance tests for the solid-state meter and associated metering devices shall be as per ANSI C12.1.

5.0 OTHER REQUIREMENTS

5.1 Software and Accessories

The Vendor shall provide all accessories, necessary for the operation and maintenance of the solid-state meter and associated metering devices. The accessories shall include software and hardware necessary to program the solid-state meter and associated metering devices.

- 5.2 The Vendor shall provide a one (1) year warranty (minimum), on all parts and labor for the solid-state meter and metering devices. An extended warranty shall be provided as an option.
- 5.3 The Vendor shall provide three (3) sets of instruction manuals, software manuals, schematics and wiring diagrams for the solid-state meter and metering devices.

5.4 Certified Test Reports

5.4.1 No later than two (2) weeks prior to shipment, one (1) copy of certified test reports for the solid-state meter, shall be submitted to the Austin Energy Meter Shop Supervisor. This information shall be provided in EXCEL format, on 3 ½” diskette(s). The certified test report shall include, for each meter, the AE Company number, Manufacturer Serial number, Meter Nameplate information, and As Left Series Full Load, Light Load, and Power Factor test results.

5.4.2 One (1) copy of the certified test reports shall be sent with the shipment of meters.

5.5 Meter Information

The Vendor shall also provide meter information in ASCII format, on 3 ½” diskette(s), as an MS Word document. The Vendor shall follow the format as shown below, with information starting on Line 1, Column 15.

- Column 15 – AE Meter Number (N6)
- Column 22 – AE Meter Code (N3)
- Column 32 –Number of dials or display digits (N1)
- Column 51 –Manufacturer Serial Number (N8)

5.6 Austin Energy Meter Shop Supervisor

Carlos F. Tello
Austin Energy
Metering Operations
2526 Kramer Lane
Austin, TX 78758

(512) 505-7073
(512) 505-7103 fax

Carlos.Tello@AustinEnergy.com