City of Austin, Electric Utility Department
Purchase Specification
For
METER,DISTRIBUTION,OH,3PH,120-277V,480V,SOLID-STATE,MULTI-TARIFF

Date	Prepared by	Issuance/Revision	Department Approval Division Manager/Standards Manager
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6/15/98	Peter G. Soosay, P.E.	Revision	

This specification until revised or rescinded, shall apply to each future purchase and contract for the commodity described herein.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 Multi-Tariff Meters

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 multi-tariff meters. The solid-state multi-tariff meters shall be constructed of good material in a workmanlike manner with the objective of attaining stability of performance, sustained accuracy and operation over wide ranges of operating conditions with minimum maintenance. **HYBRID (ELECTRO-MECHANICAL) METERS ARE NOT ACCEPTABLE.**

1.2 Classification

The solid-state multi-tariff meters shall be, detachable socket, type "S" with polyphase adapter or bottom-connected, type "A", as will be stated in the bid by Austin Energy. The solid-state multi-tariff meters shall be programmable for various rate structures including "time-of-use". The meters shall be multi-form and multi-voltage ranging. **THE SOLID-STATE MULTI-TARIFF METER SHALL BE YEAR 2000 COMPATIBLE.**

2.0 APPLICABLE SPECIFICATIONS

The latest revision of the following standards:

2.1	ANSI C12.1	-	Code for Electricity Metering
2.2	ANSI C12.16	-	Solid-State Electricity Meters
2.3	IEEE C37.90.1	-	Surge Withstand Capability (SWC) tests for Protective Relays and Relay Systems
2.4	UL 50	-	Enclosures For Electrical Equipment

3.0 FUNCTIONAL REQUIREMENTS

3.1 The programmable solid-state multi-tariff meter shall be able to perform, including but not limited to, the following functions:

3.1.1 Measure demand (kW) over a specified interval of time.

3.1.2 Measure energy (kWh).

3.1.3 Time of Use, for a minimum of two (2) rate structures.

3.1.4 Measure current and voltage per phase.

3.1.5 Set time and date.

3.2 Other programmable parameters for the solid-state multi-tariff meter, shall include the following:

3.2.1 Daylight savings time

3.2.2 Leap year

3.3 The programmable parameters (§ 3.1 and § 3.2) 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 an optical port.

3.4 The solid-state multi-tariff meter shall have a non-volatile memory, which shall be able to retain all accumulated data and programmed parameters, during a power outage.

3.5 Operational Temperature Range

The solid-state multi-tariff meter shall be able to operate efficiently in the temperature range of -40°C and + 85°C.

3.6 The solid-state multi-tariff meters, shall be of the Forms and Elements as indicated in Table 1 (Attachment 1).

3.7 The solid-state multi-tariff meter shall be able to run self-diagnostics, upon energization, to determine the type of service (Y or Δ), voltage and current per phase. The solid-state multi-tariff meter shall be able to automatically adjust itself upon energization to operate at the source voltage. The source voltages are as follows:

a) 120/240 Volts

b) 120/208 Volts

c) 240/480 Volts

d) 277/480 Volts

3.8 The depth of the solid-state multi-tariff meter shall not exceed 9.0".

4.0 PERFORMANCE REQUIREMENTS

4.1 Register Display

The register display shall be as per ANSI C12.16 and shall include the following:

4.1.1 The solid-state multi-tariff 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 Size of Digits

The digits for visual reading of billing quantities shall not be less than 0.195" high.

4.1.4 Number of Digits

A minimum of four (4) digits shall be provided to display energy billing quantities and a minimum of three (3) digits for demand.

4.1.5 Identification Code

A code shall be used to identify each billing quantity displayed. The code characters shall be in addition to the number of digits (§ 4.1.4). Annunciators with appropriate legend are acceptable.

4.1.6 Scroll Time

The minimum scroll time for each billing quantity shall be four seconds (4s).

4.1.7 Non-continuous Display

If the display is not on continuously, it shall have the capability to be activated, upon request.

4.2 A segment test display (§ 4.1) shall provide an integrity check of the display, that is, all segments of the register including the annunciators and decimal point.

4.3 The register (§ 4.1) shall have a user selectable normal display mode and an alternate display mode that are independently programmable for display quantities (§ 3.1).

4.4 The solid-state multi-tariff meter shall have a test mode, which will enable testing of the meter without altering any billing data in the normal mode.

4.5 Nameplate

The nameplate of the solid-state multi-tariff meter shall include the following information:

a) Form designation

b) Manufacturer's name or trademark

c) Manufacturer's serial number

d) Manufacturer's type designation

e) Class designation

f) Voltage

g) Wire

h) Frequency (Hz)

i) Test Amperes

j) Bar Code

k) Meter Constant (K_h)

4.6 Nameplate Bar Code

The nameplate bar code (§ 4.5j) shall be as per ANSI C12.16. The bar code data (left to right) shall be in the following format:

American Electric Code	2 characters
Manufacturer Code	1 character
ALP	3 characters ("ALP" refers to Austin Light & Power)
Meter Number	6 characters (This information will be provided by the EUD, after bid award.)
Meter Shop Code	3 characters
Year of Manufacture	2 characters

4.7 Meter Finish

4.7.1 The solid-state multi-tariff meter shall be made of an UV-stabilized polycarbonate cover, 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 data and LCD display.

4.7.2 The solid-state multi-tariff meter finish shall be, at a minimum, Class I (General Purpose Finish) as per ANSI C12.16, for in-door and outdoor installations.

4.7.3 The tests on the finish of the solid-state multi-tariff meter shall include, weather simulation test and salt-spray test as per ANSI C12.16.

4.8 Raintightness

When the solid-state multi-tariff meter is mounted in its normal operating position in or on a meter mounting intended for outdoor installation, the meter shall pass the rain test as per UL 50.

4.9 Nominal Test Current

The nominal test current for the different meter class, shall be as shown in Table 2 (Attachment 2).

4.10 The performance tests for the solid-state multi-tariff meter, shall be as per ANSI C12.16 and shall include the following:

a) Accuracy Tests

b) No Load

c) Starting Load

d) Load Performance

e) Effect of Variation of Power Factor

f) Effect of Variation of Voltage

g) Effect of Variation of Frequency

h) Equality of Current Circuits

i) Internal Meter Losses

j) Temperature Rise

k) Stability of Performance

l) Effect of External Magnetic Field

m) Effect of Variation of Ambient Temperature

n) Effect of Temporary Overloads

o) Surge Withstand Capability (SWC) as per IEEE C37.90.1

p) Effect of Superimposed Signals

q) Effect of Radio Frequency Interference

r) Effect of Electrostatic Discharge (ESD) Immunity

4.11 Insulation

With the meter voltage and current circuits de-energized, the insulation between current carrying parts of separate circuits and between current carrying parts and other metallic parts, shall be capable of withstanding the application of a sinusoidal voltage of 2.5 kV rms, 60 Hz for 1 minute.

4.12 Effect of High Voltage Line Surges

The meter shall be subjected to a single pulse 6 kV peak (1.2/50 μs) voltage surge, both line to line and line to ground. The high voltage surge in the meter shall not change the display value more than ± 1 significant digit.

5.0 OTHER REQUIREMENTS

5.1 Software and Accessories

a) The Vendor shall provide in the bid all accessories, necessary for the operation and maintenance of the base line solid-state multi-tariff meter. The accessories shall include, software and hardware necessary to program the base line solid-state multi-tariff meter.

b) Software and hardware, including keys needed to upgrade the base-line solid-state multi-tariff meter shall be given as a line item in the bid. Note, this information will not be used in the bid evaluation.

5.2 Pulse Initiators

The solid-state multi-tariff meter shall have the option for use with pulse initiators (kWh). If KYZ output contacts are required, it will be indicated in the bid.

5.3 Optional Meter Features

5.3.1 Power Factor (pf) at peak kW

a) The "pf at peak kW" feature, will be specified in the bid package, only if this feature is required by Austin Energy, at the time of the bid. Otherwise, the solid-state multi-tariff meter shall be bid by the Vendor without this feature.

b) The solid-state multi-tariff meter with the "pf at peak kW" feature, does not require the start-up self-diagnostics feature (§ 3.7).

c) The solid-state multi-tariff meter with the "pf at peak kW" feature, shall have KYZ outputs with programmable pulse weight, for kWh and kVARh.

5.3.2 Reactive Metering

a) Reactive (kVAR) metering over a specified interval of time.

b) Measure kVARh

c) The reactive metering features (§ 5.3.2a & § 5.3.2b) will be specified in the bid package, only if these features are required by Austin Energy, at the time of the bid. Otherwise, the solid-state multi-tariff meter shall be bid by the Vendor without these feature.

5.4 The Vendor shall provide a one (1) year warranty (minimum), on all parts and labor for the solid-state multi-tariff meter. An extended warranty shall be provided as an option.

5.5 The Vendor shall provide, three (3) sets of instruction manuals, software manuals, schematics and wiring diagrams for the solid-state multi-tariff meter.

5.6 Certified Test Reports

5.6.1 No later than two (2) weeks prior to shipment, one (1) copy of certified test reports for the solid-state multi-tariff meter, shall be submitted to the Austin Energy Meter Electrician (§ 5.8). The certified test reports, shall show compliance to sections 4.7 through 4.12. This information shall be provided in EXCEL format, on 3 ½" diskette(s).

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

5.7 Meter Information

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

5.8 Austin Energy Meter Electrician

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

(512) 505-7073
(512) 505-7103 fax
carlos@electric.austin.tx.us

ATTACHMENT 1

TABLE 1

Solid-State Multi-Tariff Meter
(Elements - Form - Adapter)

ATTACHMENT 2

TABLE 2

Meter Class and Nominal Test Current

ATTACHMENT 3

Meter Information

908062	052	4	13660062	***Start***
908063	052	4	13660063	**Line 1, Column 15 = ALP #**
908064	052	4	13660064	
908065	052	4	13660065	**Line 1, Column 22 = Austin Meter Code**
908066	052	4	13660066	
908067	052	4	13660067	**Line 1, Column 32 =[1] (# Digits displayed)**
908068	052	4	13660068	
908069	052	4	13660069	**Line 1, Column 51 = MFG. Number**
908070	052	4	13660070	
908071	052	4	13660071	
908072	052	4	13660072	
908073	052	4	13660073	
908074	052	4	13660074	
908075	052	4	13660075	
908076	052	4	13660076	
908077	052	4	13660077	
908078	052	4	13660078	
908079	052	4	13660079	
908080	052	4	13660080	
908081	052	4	13660081	
908082	052	4	13660082	
908083	052	4	13660083	
908084	052	4	13660084	
908085	052	4	13660085	

This format may be used only for Solid State meters.

[1] Transformer Rated Meters = 4 digits displayed
Self-contained meters = 5 digits displayed