

1. Scope

This Specification covers the requirements for furnishing and delivering a Voltage and VAR sensing capacitor controller for 3-phase, switched shunt capacitors suitable for use on 12470 volt, 4-wire, grounded WYE primary distribution systems.

2. Material ID Number

This Specification applies to the following District Material ID number:

1001693 Controller, Switched Capacitor, Automatic

3. Reference Standards

Except as modified by this Specification, the Voltage and VAR sensing capacitor controller supplied under this Specification shall conform to the characteristics, definitions, terminology and requirements of the latest editions, amendments and specifications of the standards listed below:

ANSI/IEEE 18 IEEE Standard for Shunt Power Capacitors

ANSI/IEEE 1036 IEEE Guide for Application of Shunt Power Capacitors

ANSI/IEEE C62.41 IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits

IEC 801-2 Electromagnetic Compatibility for Industrial-Process Measurement and Control Equipment, Part 2: Emissions Electrostatic Discharge Req

4. Ratings

4.1 Electrical

Power Frequency	60 Hz
BIL	95 kV
Operating Voltage Range	120 var nominal +/- 20%

4.2 Environmental

Temperature Operating Range	-30° C to +70° C
Humidity Operating Range	3% to 95%

5. Control Functions and Operation

5.1 Primary control modes shall be:

- VAR
- Voltage
- Current
- Time
- No Operations

5.2 Override control modes shall be:

- Voltage
- Time

5.3 The controller shall have settings for two different seasons with the ability to change primary control modes in each.**5.4 The controller shall have the following protective functions:**

- Anti-Hunt
- Under-voltage Inhibit
- Daily Close Count Limit

5.5 The controller shall be able to record load data with the following:

- Date/Time Stamp
- Voltage
- Current
- kVAR
- kVA
- KW
- Power Factor
- Trip/Close Status

5.6 The controller shall be able to record a daily summary for the following:

- Date/Time Stamp
- Daily Max./Min. (Voltage, Current, kVAR)
- Daily Close Operations
- Close Operations Total

5.7 The controller shall be able to record operations for the following:

- Date/Time Stamp
- Primary Operations
- Override Operations
- Manual Operations
- Power Up/Down
- Reverse Power
- kVAR Before and After

5.8 Non-volatile, battery-backed RAM shall have a 10-year life in unpowered state.**5.9 The display shall have LCD with read/write capability.****6. Software**

An updated copy of the application software shall be provided with each controller.

7. Instruction Manual

An instruction manual covering installation, operation, and maintenance shall be provided with each controller.

8. Construction

8.1 Enclosure

8.1.1 Enclosure shall be constructed of UV-stable fiberglass polyester and shall meet NEMA 3R requirements.

8.1.2 Dimensions of enclosure shall not exceed 10" H x 7" W x 5" D.

8.2 Mounting

8.2.1 Mounting of the controller shall be 6-jaw meter base type.

8.2.2 Controller shall be configured to be compatible with the attached Drawing B-1054.

8.3 Communication

Controller shall have an EIA RS-232 DB9 female connector.

8.4 Fusing

8.4.1 Controller input shall have MDA-10 fuse.

8.4.2 A spare fuse shall be provided with the controller.

8.5 Measurement and Performance

8.5.1 Secondary voltage shall have a resolution of 0.3 Vac.

8.5.2 Secondary voltage accuracy shall have a range of +/- 0.5%.

8.5.3 Current resolution shall be 2 A.

8.5.4 Current accuracy shall be +/- 1% reading, +/- 0.6% range.

8.5.5 Current range shall be 4 to 800 A true RMS.

8.5.6 Reactive power resolution shall be 10 kVAR.

8.5.7 Reactive power range shall be -30,000 to +99,999 kVAR.

8.5.8 Time clock accuracy shall be +/- 10 minutes per year.

8.5.9 Time clock range shall be 24-hour clock.

8.5.10 Time clock settings shall be 1-minute increments.

8.5.11 Phase angle resolution shall be 1°.

8.5.12 Phase angle accuracy shall be +/- 1°.

8.5.13 Phase angle range shall be 0° - 359°.

8.5.14 Controller shall be able to receive line current from a Fisher Pierce 1301 line post sensor.

9. Warranty

9.1 The successful Bidder shall guarantee all parts of the controller against defects in material and workmanship for a minimum of 12 months from the date of energization or 18 months from the shipping date, whichever comes first.

9.2 Upon written notice from the District, the successful Bidder shall immediately repair or replace, at his own expense, all or any part of the controller that may prove to be defective during the period of this guarantee, whether installed initially or installed as repair or replacement under this guarantee. The Bidder shall pay for all shipping costs.

9.3 The successful Bidder further guarantees that the warranty for repaired or replaced material shall be of an equal duration as the original warranty period and shall start upon acceptance of such repaired or replaced material.

10. Evaluation of Bids

The following factors will be considered in the analysis and evaluation of bids and subsequent bid award:

10.1 Proposed delivery

10.2 Past performance of Bidder and product

10.3 Conditions of warranty

10.4 Completeness of Bidder's data

10.5 Initial cost

10.6 Construction details and interchangeability

10.7 Instruction manual

10.8 List of all exceptions to this Specification with adequate explanation for each, or a statement that there are no exceptions

11. Delivery

The successful Bidder shall deliver the controller by the date shown on the Special Provision Sheet. If at anytime the District has reasonable cause to believe that delivery will not be made at the time and place specified, the District shall have the right to terminate that Purchase Order, but shall not be obligated to do so.

12. Shipment

12.1 Shipment address:

PUD No. 1 of Snohomish County
Operations Center Receiving
1802 – 75th Street SW
Everett, WA 98203-6264

12.2 Equipment damaged in shipment will be refused on delivery and it will be the Bidder's responsibility to arrange the prompt repair or replacement to the standards of new equipment. The Bidder will not be relieved of the responsibility of delivering undamaged equipment, even if the damage is internal, or otherwise goes undetected and the nature of the damage remains unknown until the equipment is energized and tested.

12.3 Equipment shall be suitably packed to ensure against damage from weather or transportation in accordance with the requirements of common carriers.

13. Inspection

After delivery, inspection shall be in accordance with Section 2 of the District's Purchase Order Terms and Conditions, latest revision. If returning rejected equipment to the supplier, the shipping costs will be at the supplier's expense.

14. Correction of Deficiencies and Nonconformities

Any opportunity for the Supplier to correct deficiencies and nonconformities will be at the sole discretion of the District and at the sole expense of the Supplier. If the District elects to allow corrections, mutual arrangements shall be made for their completion. Any subsequent testing required due to deficiencies and nonconformities will be at the Supplier's expense. All shipping costs associated with correction of deficiencies and nonconformities will be at the Supplier's expense.

15. General Bidding Conditions

The attached General Bidding Conditions are made a part of this Specification.