

**CITY OF AUSTIN ELECTRIC UTILITY DEPARTMENT**

**PURCHASE SPECIFICATION**

**FOR**

**SWITCH,NETWORK,URD,3PH,600A,15OR35KV,LOAD BREAK,2 WAY,3  
POSITION**

| <b>DATE</b> | <b>PREPARED BY</b> | <b>ISSUANCE/REVISION</b> | <b>APPROVAL<br/>PROCESS MANAGER/M&amp;ESS MANAGER</b> |
|-------------|--------------------|--------------------------|---|
| 05-17-99    | George Martinez    | Issuance                 | <hr/>   |

| <b><i>REASON FOR REVISION</i></b> | <b><i>AFFECTED PARAGRAPHS</i></b> |
|-----------------------------------|-----------------------------------|
| Issuance                          |                                   |

This specification, until rescinded, shall apply to each future purchase and contract for the commodity described herein.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  
SWITCH, 15 OR 38 KV, 600A**

**1.0 SCOPE**

- 1.1 The City of Austin (COA) requires a qualified Supplier to provide a 15 or 38 kV 600 Ampere, Load break, Two-way, Three-position switch for use in the Downtown Network System.
- 1.2 The switch furnished under this specification shall be assembled by a Supplier with a minimum of ten (10) years of experience in the manufacture of vacuum and SF6 switches at 15 kV to 38 kV.

**2.0 APPLICABLE SPECIFICATIONS**

Unless otherwise stated in this specification, switches furnished under this specification shall be designed, built, and tested per ANSI/IEEE C37.60 and C37.71 latest revision. Cable entrance apparatus bushings shall be tested per ANSI/IEEE 386.

- 2.1 ANSI/IEEE C37.71 - Standard for Three-Phase, Manually Operated Subsurface Load-Interrupting Switches for Alternating-Current Systems (R 1990).
- 2.2 ANSI/IEEE 386 - Standard for Separable Insulated Connector Systems for Power Distribution Systems Above 600 V (R 1991).

**3.0 DESIGN**

Rated voltage class: 15 and 38 kV, as specified on purchase order  
Rated continuous and load-break current: 600 Amps  
Impulse level (BIL): 110 kV BIL for 15 kV switch, 150 kV BIL for 38 kV switch  
Rated frequency: 60 Hz  
One minute AC withstand: 35 kV for 15 kV switch, 70 kV for 35 kV switch  
Short-time Current (Sym.) : 13.8 kA for 15 kV switch, 12.2 kA for 35 kV switch  
Short-time Current (Asym.): 22 kA for 15 kV switch, 19.5 for 35 kV switch

#### 4.0 FUNCTIONAL REQUIREMENTS

- 4.1 The switch shall be non self-reclosing with 600 Ampere apparatus bushings to accommodate one three-phase line in and one three-phase line out. The switch shall have a three position: closed, open, ground configuration. The switch shall be provided with an interlock so that the switch cannot be placed in the ground position while energized.
- 4.2 The control system shall provide dry contact points for remote close and trip operations. A remote control switch and 50 foot cable shall be provided so that the switch can be opened or closed from outside the transformer vault. Also, four "a" and four "b" auxiliary contacts for remote open and close supervisory alarms and remote annunciators.
- 4.3 The switch shall have a motor operator capable of closing or opening three phases simultaneously by remote electronic operation. The motor operator shall be easily disconnected to allow for manual operation. The motor operator shall be powered by an external 120 V source provided by the COA.
- 4.4 The completed unit must be capable of withstanding internal failure without tank rupture.
- 4.5 The switch and electronic controls shall function in a temperature range of -30°C to +54°C and be submersible.

#### 5.0 CONSTRUCTION

- 5.1 The switch tank shall consist of welded, 11 gauge, 304 stainless steel. The switch shall be totally sealed deadfront design. The apparatus bushings shall be gasketed and bolted or welded to the tank.
- 5.2 The switch operators shall be quick-make quick-break operation in either switching direction. The mechanism shall be capable of delivering sufficient torque and shall be provided with latches for each position to assure load interrupting, fault closing, and momentary ratings. All switch positions shall be clearly identified and pad lockable, including the ground position.
- 5.3 All current carrying components shall be 100% copper. Cable entrances shall be 600 Amp apparatus bushings with 100% copper current path. The apparatus bushings shall be sized for 600 Amp non-loadbreak elbows with 1/0 stranded, compact cable, either 15 kV or 35 kV, as specified on purchase order. All apparatus bushings shall be shipped with protective caps.

- 5.4 The switches shall be shipped, factory filled with SF6 laboratory grade gas at rated pressure. The switch shall have a DILLO fill valve, protected and sealed with a removable cap, for the field addition of SF6 and a gas pressure gauge with color coded indication of normal operating range, enclosed in a protective housing to prevent damage.
- 5.5 The switch tank shall be rectangular in shape with the overall maximum dimensions of: 35 inches high, 38 inches wide, and 32 inches deep (including operating handle). Both incoming and outgoing bushings shall be front mounted and offset to provide for ease in routing of elbows and cables.
- 5.6 Viewing windows shall be provided to allow operating personnel to view all three phases in the open and ground positions. The viewing window shall not be blocked by the elbows or cable coming from below the switch.
- 5.7 A 36 INCH HIGH, BOLTED, GALVANIZED, STEEL FRAME SHALL BE SUPPLIED TO SUPPORT THE SWITCH. THE SWITCH AND FRAME SHALL BE FREESTANDING WITH PROVISIONS FOR BOLTING TO A REAR WALL OR THE FLOOR. CABLES WILL APPROACH THE SWITCH FROM BELOW AND ATTACH TO THE FRONT OF THE SWITCH.
- 5.8 The exterior components of the tank shall be brass or stainless steel only. Two (2) welded lifting eyes shall be provided and be capable of supporting the weight of the switch. Three (3) 4/0 AWG clamp type ground lugs shall be provided, one for each set of bushings (2) and one for a tank ground.
- 5.9 A stainless steel nameplate shall be provided showing the ratings, circuit configuration, and date of manufacture. Separate stainless steel nameplates shall show phase identification.
- 5.10 The switch tank shall not be painted since it is stainless steel.

## 6.0 INSPECTION AND TESTING

### 6.1 Inspection

The City of Austin reserves the right to visit the manufacturing facility and observe the switch undergoing construction and testing. Advance notice of at least two (2) weeks shall be given to the City of Austin before the start of testing.

## 6.2 Testing

The switch shall be tested in accordance with applicable sections of ANSI/IEEE C37.60 and ANSI/IEEE C37.71. One-hundred percent production testing shall include a mass spectrometer leak test, SF6 moisture content test, and an AC high potential test. The switch shall be certified to be adequately sealed to prevent the operating pressure from dropping below the minimum operating pressure for 20 years. The apparatus bushings shall be tested in accordance with ANSI/IEEE 386. Three (3) copies of certified test reports shall be furnished before shipment.