

## 1.0 GENERAL

- 1.1 The switch shall conform to the following specification.
- 1.2 The switch shall be a three-pole, group-operated loadbreak device with side-break blades, suitable for overhead distribution applications.
- 1.3 The switch shall be configured (select appropriate description):
  - (a) Upright
  - (b) Upright (with extra mounting-pole clearance)●
  - (c) Vertical
  - (d) Triangular●
  - (e) Tiered-outboard (phase-over-phase)
  - (f) Inverted
- 1.4 The switch, complete with an interphase drive, shall be factory-assembled and adjusted on a one-piece (select one of the following):
  - (a) Steel base
  - (b) Insulated base (not applicable to triangular configuration)
- 1.5 The interphase drive shall be driven by (select one of the following):
  - (a) A factory-adjusted hookstick operating mechanism (applicable to upright, upright with extra mounting-pole clearance, vertical, inverted, and tiered-outboard configurations)
  - (b) A rotating-type operating mechanism with a field-installed handle (applicable to upright, upright with extra mounting-pole clearance, inverted, and triangular configurations)
  - (c) A reciprocating-type operating mechanism with a field-installed handle (applicable to vertical, inverted, and tiered-outboard configurations)
  - (d) A rotating-type operating mechanism for power operation using an S&C 6801M Automatic Switch Operator (applicable to upright, upright with extra mounting-pole clearance, triangular, and inverted configurations)
  - (e) A reciprocating-type operating mechanism for power operation using an S&C 6801M Automatic Switch Operator (applicable to vertical, tiered-outboard, and inverted configurations)

● Not applicable to 34.5-kV switches.



## Omni-Rupter Switches

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- 1.6 The switch shall be furnished with (select one of the following):
- (a) Cycloaliphatic epoxy resin insulators
  - (b) Silicone insulators
  - (c) Porcelain station post insulators
- 1.7 The switch manufacturer shall have a minimum of 30 years of experience in the production of overhead distribution switches and have at least 30 000 units installed and in operation.
- 1.8 The switch manufacturer shall supply detailed erection drawings, including all standard mounting arrangements.

### 2.0 50/60-HERTZ RATINGS

- 2.1 The voltage ratings of the switch shall be as follows (select the appropriate row from the following table):

#### SELECTION OF VOLTAGE RATINGS

Nominal, kV	Maximum, kV	BIL, kV
14.4	17.0	110
25	29	150
34.5	38	200

- 2.2 The current ratings of the switch at 14.4 kV and 25 kV shall be as follows:
- (a) Load-Current Interrupting: 900 amperes
  - (b) Momentary: 65 000 amperes, peak
  - (c) Two-Time Duty-Cycle Fault-Closing Capability: 42 000 amperes, peak (ratings of 32 500 amperes peak for switches power-operated by an S&C 6801M Automatic Switch Operator)
  - (d) 10-Time Duty-Cycle Fault Closing Capability: 21 000 amperes, peak
- 2.3 The current ratings of the switch at 34.5 kV shall be as follows:
- (a) Load-Current Interrupting: 630 amperes
  - (b) Momentary: 65 000 amperes, peak
  - (c) Two-Time Duty-Cycle Fault-Closing Capability: 32 500 amperes, peak
  - (d) 10-Time Duty-Cycle Fault-Closing Capability: 21 000 amperes, peak
- 2.4 The switch shall be able to continuously carry and interrupt up to 900 amperes without wind assistance at 14.4 kV and 25 kV. It shall be able to continuously carry and interrupt up to 1 000 amperes at ambient temperatures up to 104°F (40°C) with a minimum wind velocity of 2 feet per second at 14.4 kV and 25 kV.
- 2.5 The switch shall be able to continuously carry and interrupt up to 630 amperes without wind assistance at 34.5 kV.

### 3.0 MECHANICAL PERFORMANCE

3.1 The switch shall be capable of at least 3 000 mechanical open-close operations.

3.2 Select one of the following:

- (a) The switch shall be capable of being opened and closed under  $\frac{3}{4}$ -inch (19.05 mm) ice formation (applicable to 14.4 kV and 25 kV upright, upright with extra mounting-pole clearance, and triangular configurations operated with a manual operating handle or a hookstick operating mechanism).
- (b) The switch shall be capable of being opened under  $\frac{3}{4}$ -inch (19.05 mm) ice formation and closed under  $\frac{3}{8}$ -inch (9.525 mm) ice formation with the inclusion of optional ice shields (applicable to 14.4 kV and 25 kV vertical and tiered-outboard configurations operated with a manual operating handle, hookstick operating mechanism, or with an S&C 6801M Automatic Switch Operator).
- (c) The switch shall be capable of being opened under  $\frac{3}{4}$ -inch (19.05 mm) ice formation and closed under  $\frac{1}{2}$ -inch (12.7 mm) ice formation (applicable to 14.4 kV and 25 kV upright, upright with extra mounting-pole clearance, and triangular configurations operated with an S&C 6801M Automatic Switch Operator).
- (d) The switch shall be capable of being opened under  $\frac{3}{4}$ -inch (19.05 mm) ice formation and closed under  $\frac{3}{4}$ -inch (19.05 mm) ice formation with the inclusion of optional ice shields (applicable to 14.4 kV and 25 kV inverted configurations operated with a manual operating handle or with a hookstick operating mechanism).

3.3 The switch shall have integral dead-ending brackets capable of supporting (select one of the following):

For switches with steel bases:

- (a) Applicable to all 14.4-kV and 25-kV mounting configurations, except inverted and upright with extra mounting pole clearance: 2 000 pounds per conductor where pull-off forces are applied to only one side of the switch; 8 000 pounds per conductor where equal pull-off forces are applied to both sides of the switch. Optional extension link assemblies, pole-band, and J-bolts shall be required to attain full dead-end support capability.

or

Applicable to 14.4-kV and 25-kV upright extra mounting-pole clearance mounting, 14.4-kV inverted mounting configurations, and 34.5-kV upright and tiered-outboard mounting configurations: 1 500 pounds per conductor where pull-off forces are applied to only one side of the switch; 8 000 pounds per conductor where equal pull-off forces are applied to both sides of the switch. Optional extension link assemblies, pole-band, and J-bolts shall be required to attain full dead-end support capability.

or

Applicable to 25-kV inverted mounting configurations: 1 000 pounds per conductor where pull-off forces are applied to only one side of the switch, 8 000 pounds per conductor where equal pull-off forces are applied to both sides of the switch. Optional extension link assemblies, pole-band, and J-bolts shall be required to attain full dead-end support capability.

For switches with insulated bases:

- (b) Applicable to all 14.4-kV mounting configurations, except inverted: 750 pounds per conductor for 14.4-kV switches and 500 pounds per conductor for 25-kV switches where pull-off forces are applied to only one side of the switch; 8 000 pounds per conductor where equal pull-off forces are applied to both sides of the switch. Optional extension link assemblies, pole-band, and J-bolts shall be required to attain full dead-end support capability.

or

Applicable to 14.4-kV inverted mounting configurations and all 25-kV mounting configurations: 500 pounds per conductor for 14.4-kV switches and 1 000 pounds per conductor for 25-kV switches where pull-off forces are applied to only one side of the switch; 8 000 pounds per conductor where equal pull-off forces are applied to both sides of the switch. Optional extension link assemblies, pole-band, and J-bolts shall be required to attain full dead-end support capability.

or

Applicable to 34.5-kV upright, tiered-outboard, or inverted mounting configurations: 250 pounds per conductor where pull-off forces are applied to only one side of the switch; 8 000 pounds per conductor where equal pull-off forces are applied to both sides of the switch. Optional extension link assemblies, pole-band, and J-bolts shall be required to attain full dead-end support capability.

#### 4.0 DESIGN TESTS

The following design tests shall be applicable to the switch at 14.4 kV and 25 kV, and certified test reports shall be provided upon request:

Interrupting: IEEE 1247

Dielectric: IEEE 1247

Temperature Rise: IEEE 1247

Short-Time: IEEE 1247

Fault-Closing: IEEE 1247

Mechanical Endurance: IEEE 1247

Ice Breaking: IEEE 1247

The following design tests shall be applicable to the switch at 34.5 kV, and certified test reports shall be provided upon request:

Interrupting: IEEE C37.30.4

Dielectric: IEEE C37.30.1

Temperature Rise: IEEE C37.30.1

Short-Time: IEEE C37.30.1

Fault-Closing: IEEE C37.30.4

Mechanical Endurance: IEEE C37.30.1

Ice Breaking: IEEE C37.30.1

## 5.0 CONSTRUCTION

- 5.1 The switch shall be furnished with interrupters that break the circuit by means of a contact coordinating with an internal, spring-loaded circuit-breaking mechanism. No external arc shall be drawn during circuit breaking.
- 5.2 The interrupters shall be isolated from the circuit while the switch is closed.
- 5.3 The switch shall be furnished with spring-loaded silver-plated contacts and field-replaceable sacrificial guide fingers that protect the current-carrying contact during fault closing.
- 5.4 The switch blade shall be made of nickel-silver-plated copper and furnished with an integral copper-tungsten arcing tip.
- 5.5 The switch shall be furnished with stainless steel shafts and drive levers and bronze flange bearings that are corrosion-resistant.
- 5.6 The switch shall be furnished with a permanent retractable single-point lifting means to facilitate installation (applicable to upright and upright with extra mounting-pole clearance mounting configurations).
- 5.7 The switch shall be furnished with a positive toggle linkage with an indicator that ensures the switch is under positive pressure when closed (applicable to upright, upright with extra mounting-pole clearance, inverted, and triangular mounting configurations).
- 5.8 The switch shall be furnished with an articulating hinge-side terminal pad that will allow the terminal pad to rotate 13 degrees up or down and pivot 3 degrees to the side, thereby allowing increased flexibility when installing jumpers to the terminal pad connectors.

### 6.0 OPTIONAL FEATURES AND ACCESSORIES

The switch shall be furnished with the following optional features and accessories (select the following as applicable):

- (a) A 2 $\frac{5}{8}$ -inch diameter section of tubular fiberglass in the vertical operating shaft (applicable to switches in upright, inverted, and triangular mounting configurations operated with a manual operating handle)
- (b) A 1-inch diameter section of fiberglass rod in the vertical operating shaft (applicable to switches in vertical and tiered-outboard mounting configurations operated with a manual operating handle)
- (c) A cycloaliphatic epoxy resin insulator unit in the vertical operating shaft
- (d) A key interlock for a “locked open” application at the operating handle (applicable to switches in all mounting configurations operated with a manual operating handle)
- (e) Provisions only for key interlock (The lock mechanism shall be supplied by others. Applicable to switches in all mounting configurations operated with a manual operating handle)
- (f) Open-gap wildlife protection (applicable to switches in upright and upright with extra mounting-pole clearance configurations)
- (g) Phase-to-ground wildlife protection (applicable to switches in upright, upright with extra mounting-pole clearance, and inverted configurations furnished with cycloaliphatic epoxy resin insulators or porcelain station post insulators)
- (h) A hookstick-operated lockout-tagout mechanism (applicable to switches in upright, inverted, and tiered-outboard mounting configurations furnished with a hookstick operating mechanism)
- (i) Provisions for mounting six surge arresters, three on each side of the switch (applicable to switches in the upright, upright with extra mounting-pole clearance, inverted, tiered-outboard, and triangular mounting configurations)
- (j) Pole-band and J-bolts for mounting the switch on a wood pole (Pole-band and J-bolts are necessary to attain the dead-end loadings specified in Section 3.3.)
- (k) Extension link assemblies for dead-ending to the switch base (Extension link assemblies are necessary to attain the dead-end loadings specified in Section 3.3.)
- (l) Over-insulation for coastal applications using insulators of the next-higher voltage rating
- (m) Greaseless, graphite-impregnated contacts for coastal and contaminated-environment applications
- (n) Provisions for power operation using an S&C 6801M Automatic Switch Operator (applicable to switches with rotating-type operating mechanisms and switches with reciprocating-type operating mechanisms)