**Typical Specification**

**Single-Phase Two-way Solid Dielectric Load Break Switch with Visible Break**

**Part 1-GENERAL**

* 1. **DESCRIPTION**

The switch shall consist of a solid dielectric insulated manually operated loadbreak switch. The switch shall include a blade type switch incorporated within the solid dielectric module to provide a visible break of the circuit.

* 1. **QUALITY ASSURANCE**
1. Manufacturer Qualifications: The chosen manufacturer shall have at least 10 years experience in manufacturing solid dielectric insulated medium voltage switchgear. The manufacturer shall be completely and solely responsible for the performance of the fault interrupter as rated.
2. The manufacturer shall furnish certification of ratings of the fault interrupter upon request.
3. The switch shall comply with requirements of the latest revision of applicable industry standards, including:

IEEE C37.74, ANSI/IEEE 386, IEC60529, IEEE 592

1. The switch shall be tested to IEC 60529 for submersibilty. The switch shall be rated IP68 for 20 days with a 20 foot head of water.
2. The switch manufacturer shall be ISO 9001 and 14001 certified.
3. The switch shall be RUS approved
	1. **DELIVERY, STORAGE, AND HANDLING**
4. The fault interrupter shall be shipped preassembled at the factory. No field assembly shall be required.
5. The contractor, if applicable, shall handle, transfer and move the switches in accordance with manufacturer’s recommendations.

**PART 2-PRODUCTS**

**2.1 SWITCH CONFIGURATION**

1. The switch shall be a two way device
2. The switch shall be designed for front access to cables and operators
	1. **SWITCH CONSTRUCTION**
3. The switch shall be a dead-front design. The operating mechanism housing shall be stainless steel with a viewing window for verification of vacuum interrupter contact position. The housing shall be painted ANSI 70 light gray using corrosion-resistant epoxy paint. Operating handles shall be padlockable and adaptable to keylock schemes. The operating shaft shall be stainless steel providing maximum corrosion resistance. A double "O" ring shaft seal shall be used for a leak resistant, long life seal.
4. The solid dielectric module must be coated with a semi-conductive layer of epoxy, providing a completely dead front device. The semi-conductive layer must be tested to IEEE 592 to ensure it can carry fault current to ground so as to ensure operator safety.
5. The switch shall be designed for long term operation in the harshest environments. The switch design must be tested to IEC60529 and achieve a protection rating of IP68, subjected to a 20’ head of water pressure for 20 days.
6. The switch shall be equipped with an integral blade type disconnect switch incorporated within the solid dielectric module to provide a true visible break. The Visible Break Switch shall be in series with the vacuum bottle and provide a clear visible break of the circuit. The visible break must be easily seen through a viewing window molded as an integral part of each solid dielectric module.

1. The switch shall interrupt all load currents within the vacuum bottle. The switch shall include two mechanical interlocks, one external and one internal, for safe operation.
2. The load break switch mechanism shall consist of a vacuum bottle assembly mechanically linked to a spring-assisted operating mechanism. Manual opening and closing of the load break switch shall be via an operating handle.

**2.3 DESIGN RATINGS**

A. The fault interrupter shall be rated:

|  |  |
| --- | --- |
| **SELECTION OF RATINGS** |  |
| Maximum Design Voltage, kV | 15.5 |
| Impulse Level (BIL) Voltage, kV | 95 |
| Continuous Current, Amperes | 630 |
| Load break Current, Amperes | 630 |
| One Minute Withstand (dry), AC kV | 35 |
| Production Test Rating | 34 |
| 15 Minute Withstand, DC kV | 53 |
| Momentary Current, kA, ASYM | 20 |
| Fault-Close Current, kA, ASYM | 20 |

**2.4 CABLE ENTRANCES**

Cable entrances shall be tested to IEEE 386 and be, as indicated on the switch drawing:

\_\_\_\_ 15.5KV 95KV BIL 600A Dead break Apparatus Bushings per IEEE 386 Figure 11

 \_\_\_\_ 15.5KV 95KV BIL 200A Bushing Wells per IEEE 386 Figure 3

**2.5 FACTORY PRODUCTION TESTS**

Each interrupter shall undergo the following production testing. Test reports must be available upon request

* A mechanical operation check
* AC hi-pot tested one minute phase-to-phase, phase-to-ground and across the open contacts
* Circuit resistance shall be checked.
* Each solid dielectric module shall undergo an X-ray inspection and a partial discharge test to ensure void-free construction.
* Leak test to insure the integrity of all seals and gaskets

**2.6 STANDARD COMPONENTS**

The following shall be included as standard:

* Welded stainless steel mechanism housing painted light gray with stainless steel and brass fasteners.
* Lifting provisions
* ½”-13 nuts to provide sufficient grounding provisions for interrupter and all cable entrances.
* Stainless steel one line diagram and corrosion-resistant nameplates.
* Switch operating handle with padlock provision.
* Removable parking stands
* Mounting bracket
* Operating handles for the loadbreak switch and for the visible break switch, secured with cotter pins, and suitable for operation via rope or hot stick

**2.7 OPTIONS**

(Choose as necessary for the application)

The following options shall be supplied:

* Mounting frame to bolt switch to the floor (specify galvanized or stainless steel construction. Specify height of lowest bushing)
* 4/0 brass ground lugs
* One (1) Form C contact for remote monitoring of the position of the vacuum bottle contact.
* Junction box for wiring Form C contact (specify NEMA 4X for dry applications or NEMA 6P for wet/damp applications)
* Motor operator package – includes motor operator, portable motor control, & 50 foot cable.

**2.8 LABELING**

A. Hazard Alerting Signs

The exterior of the pad mount enclosure (if furnished) shall be provided with “Warning--Keep Out--Hazardous Voltage Inside--Can Shock, Burn, or Cause Death” signs. Each unit of switchgear shall be provided with a “Danger--Hazardous Voltage--Failure to Follow These Instructions Will Likely Cause Shock, Burn, or Death” sign. The text shall further indicate that operating personnel must know and obey the employer’s work rules, know the hazards involved, and use proper protective equipment and tools to work on this equipment. Each unit of switchgear shall be provided with a “Danger--Keep Away--Hazardous Voltage--Will Shock, Burn, or Cause Death” sign.

B. Nameplates, Ratings Labels, and Connection Diagrams

Each unit of switchgear shall be provided with a nameplate indicating the manufacturer’s name, catalog number, model number, date of manufacture, and serial number. Each unit of switchgear shall be provided with a ratings label indicating the following: voltage rating; main bus continuous rating; short-circuit rating; fault interrupter ratings including interrupting and duty-cycle fault-closing; and load break switch ratings including duty-cycle fault-closing and short-time.