

## Technical Specification of 6.6KV VCB Switchgear

### A). 6.6 KV Switch Boards: - VCB – 800A, 250MVA. O/G = 1 No.

**Constructional Features:** The switchgear shall be indoor and level IP:55, metal clad, floor mounted and of Simple robust construction suitable for use in surface Sub-Station in mines area. As per latest IS (With latest amendment).

- i). Different panels of it shall consist of stationary type, self – supporting, sheet steel cubicles with Ventilating louvers within which draw out type circuit breaker shall be provided as per our single Line diagram.
- ii). The switchgear cubicle shall have structural steel frame work enclosed on all sides and top by sheet steel Of minimum SWG 16 /14 (2MM /1.8MM) thinness.
- iii). Each cubicle shall be provided with the front access door with handle and lock and removable back cover.
- iv). The compartments shall be so constructed that failure of one equipment does not affect the adjacent one. Each cubicle shall be separated from adjacent one by grounded sheet steel barrier.
- v). Each cubicle should be provided with thermostatically controlled space heater.
- vi). The switchgear shall have water/moisture proof and dust tight arrangement.
- vii). The main bus of the switchgear section shall be of high conductivity copper liberally sized with high Safety factor for specified current rating with maximum temp. Limited to 85deg. C i.e. 45deg.C of Ambient temperature. The bus and connections shall be well supported and braced as to be capable of Safety with – standing ckt corresponding to a fault level of 250 MVA (symmetrical at 6.6KV) and also to Take care of any thermal expansion.
- viii). Three - phase bus bar shall be adequately spaced and bus bars and connections shall be fully insulated For working voltage with adequate phase/ground clearance.
- ix). Insulating sleeves and cast resin shrouds shall be provided for bus bars and joints respectively
- x). All bus connections, Joints and tapes shall be silver – plated. Bimetallic connectors shall be furnished for The connection of dissimilar metal connections
- xi). Bus bar shall be color code coded for easy identification.
- xii). The bus bar chamber shall be provided with inter panel barrier with epoxy cast seal off bushing through Which the buses will pass through so as to prevent fire from one panel to other panel.
- xiii). The switchgear shall be so constructed that it can be disassembled in sections and transported easily as Well as it should be possible to lower it into our mines through our Decline. Accordingly the Switchgear shall be supplied in various sections and the provision of bus bar links shall be made. The Dimensions should suit to our requirements.

xiv). Control voltage isolation shall be provided for each cubicle by means of control fuses.

**B). 6.6KV – Circuit Breaker:**

The breaker shall be triple pole vacuum ckt breaker three – phase indoor metal clad draw out type with Horizontal isolation mounted on carriage.

**1). Breaker shall be provided with**

- a). An emergency mechanical On/trip.
- b). Mechanical on/off indication.
- c). Operation counter.
- d). Mechanical spring charge indication.

**2). Breaker shall have three positions**

- a). Service
- b). Test and
- c). Dis – connected.

- 3). The design of the beaker shall be such that it will be possible to close the front access door in each of the Three above positions.
- 4). Operating mechanism shall be electrical and shall comprise motor wound spring charge, trip free Mechanism with anti – pumping feature and shunt trip. The operating mechanism shall be suitable for 110V AC. In addition, facility for manually charging of spring and manual closing/tripping of the breaker Shall also be provided. Spring charging shall take place automatically after each breaker closing operation.
- 5). In addition to aux – contacts require for normal breaker close, required no. of aux – contacts with a Minimum no. of 4 – pairs N/O and 4 – pairs of N/C electrically separate auxiliary contacts shall be furnished for interlocking.
- 6). For safety of operation, maintenance and testing of the breaker mechanical interlock shall be provided to Prevent. 
  - a). A Close ckt breaker being isolated or inserted from, into the service position.
  - b). Closing and opening of the breaker in an intermediate position between service and test and Disconnected position.
- 7). Automatic safety shutter shall be provided to completely cover the primary disconnection when the Breaker is withdrawn.
- 8). For local operation of the breaker the front panel of each cubicle should be provided with 2 Nos. heavy Duty type push buttons for closing and tripping.
- 9). Breaker shall be provided with suitable encased roller meant for use on heavy – duty floor finish.

**C). Current Transformer:**

(O/G) Transformer feeders 1Nos. = 100A / 1A / 1A

Current transformer shall be cast resin type. Accuracy class shall be 5P20 for metering and protection.

D) Potential Transformer = Suitable range, 6600/110 V shall be cast resin type. Accuracy class shall be 5P20 for Metering and protection.

E) The panel shall be provided with 110V capacitor charge type power pack for closing and tripping of the VCB. The voltage shall be tapped from the main PT Voltage.

**Painting:**

All steel surfaces shall be thoroughly cleaned by sand blasting or chemical process. After cleaning Surfaces should be given a phosphate coating followed by two coats of high quality red oxide or yellow chromate primer. All the surfaces shall be finished with two coats of anti – corrosive and abrasion resisting epoxy paints in smoke gray shade.

A). All protections should be provided as per our SLD. The protection shall comprise of over current and earth fault relays. Earth leakage relays with test and re-set facility should be provided with all outgoing feeders.

**Recommended makes of components:**

1). Relays: Schneider/ ABB / L&T

2). Meters: AE, IMP

3). Energy meter: Schneider/GEC / Simco / L& T. The feeder should provided with static type energy Meters.

4). VCB – Schneider/ABB/Siemens Make.

Earthing of all cubicles and breakers shall be through continuous earth bur bars of suitable size.

**F). Protection:**

**Out going (Transformer Feeder):-** 2x over current, 1x Earth fault relay, 1x instantaneous earth fault relay and earth leakage relay with CBCT. 3 Nos auxiliary relays, VAA type, two coils each for alarm and tripping of winding temperature, oil temperature, and buchholz/gas pressure, with latest amendment.

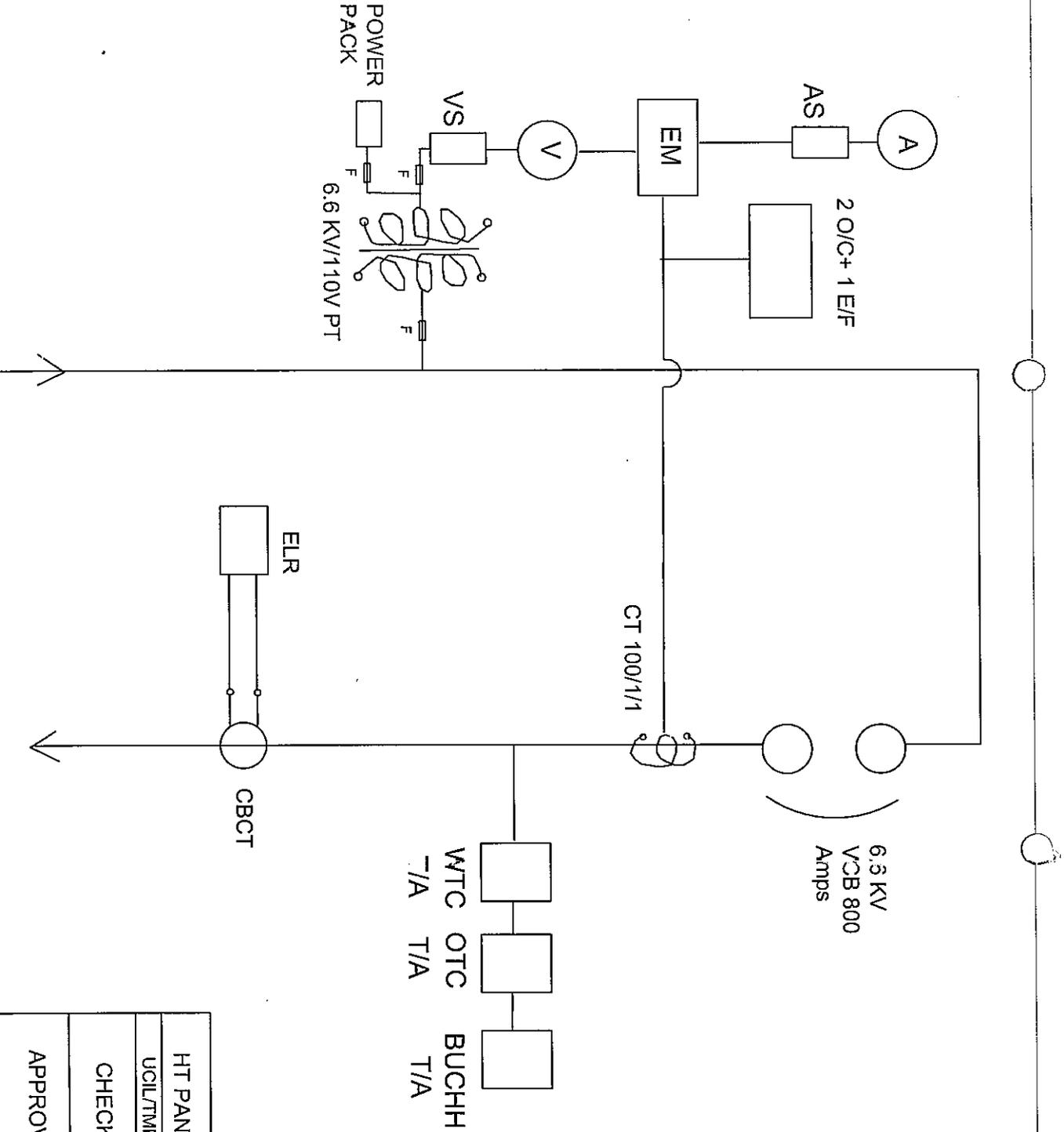
**Make:** Schneider Electrical Company.

**Dimensions :** Approximate dimensions of each panel should not be more than 2100mm Height X 1600mm Depth X 660mm Width.

Breaker panel should be supplied separately with all coupling materials like nut bolts and copper bus bars.

*Ca. 7/4/18.*





HT PANEL FOR POND S/S	
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