

Low Voltage SH type Power Factor Correction Capacitors

1. SCOPE

This specification covers indoor type, self healing, and metalized polypropylene design, cylindrical LT fixed shunt capacitor units filled with poly Urethane resin.

2. STANDARDS

The capacitor units shall comply with IEC60831 Part 1 & Part 2 for self healing type power capacitors

3. CLIMATIC CONDITIONS

The equipment to be supplied against this specification shall be installed on one of the pole of distribution transformer structure and shall also be suitable for satisfactory continuous operation at site under the following climatic conditions:-

- a) Maximum Ambient temperature : 55°C
- b) Height above main sea level : up to 2000 Meters.

4. GENERAL TECHNICAL REQUIREMENT

The capacitor element used in unit shall have metalized polypropylene film (MPP) having low dielectric loss and impregnated with such impregnate, which shall have high dielectric constant, low viscosity and high chemical stability. The impregnate should be polyurethane base resin. The elements made of metalized polypropylene material (PP- dielectric) need to be treated with **inert gas** during impregnation to ensure all the moisture and air gaps are removed to ensure better winding stability and hence better life. Manufacturer should adopt the stacked design of wound elements for better heat dissipation and longer life. Stacked design ensures 3 phases separated in 3 elements and delta connected. The contract area must be carefully prepared so as to achieve high inrush current and long life.

5. Safety Requirements

The capacitor unit shall have **pressure sensitive disconnect mechanism in all three phases**. Pressure sensitive disconnect has to be independent from internal assembly for safe disconnection. For easy identification of failed units with naked eye all the three phases should be simultaneously disconnected to ensure complete electrical isolation and enough lid deflection.

Discharge Device: Every capacitor shall be provided with a tamper proof , non accessible in build discharge device to ensure the capacitor discharge within 1

minute. Discharge resistance shall reduce the residual voltage to less than 50 volts within one minute as required by IEC60831.

6. CONSTRUCTION

The capacitors assembly should have 3 elements arranged in stack design and internally delta connected. This capacitor assembly housed in cylindrical aluminum container and seamed to ensure leak proof. Capacitors shall be filled with the suitable impregnant material to ensure insulation and faster cooling so that the windings are kept cool. At the base of capacitors unit suitable arrangement for earthing preferably in form of M-12 size stud bolt having 16mm outer(projected) length with toothed washer hexagonal nut .

There should be an in built protection devices(s) /pressure sensitive in the event of any fault/ abnormal condition inside the capacitor unit. Occurrence of such condition must be indicated by any mechanism/symbol in the capacitor unit

The resin filled capacitor units must be inert and absolutely harmless to environment. The operation and disposal of capacitor units must be environmental friendly. The constructional features necessary to prevent leakage and to ensure safety during operation must be adopted.

All the materials used to construct the capacitor need to be environment friendly i.e RoHS & REACH compliance.

7. Technical Specifications

PERMISSIBLE OVER LOADS

Voltage:- The permissible over loads shall not exceed limits set by IEC 60831 for self healing type capacitors. Capacitors shall be suitable for prolonged operation at RMS voltage between terminals not exceeding 1.1 times the rated voltage.

Current: - Capacitors units shall be suitable for continues operation at r.m.s. line current 1.5 times the current occurs at rated sinusoidal voltage and rated frequency excluding transients

Inrush Current: - Should be 200 times rated current.

CAPACITOR LOSS

The dielectric loss shall not be more than 0.20 W/kvar. The total capacitor loss after stabilization **including discharge resistor** should not be more than 0.5 watt/kvar for self-healing type capacitors using metalized polypropylene.