**SPECIFICATION FOR STATIC COMPENSATOR**
**(THYRISTOR SWITCHED CAPACITOR BANK)**

## 1.0 SCOPE

This specification describes the necessary requirements for the design, fabrication, and operation of thyristor switched capacitor banks.

**The thyristor switched capacitor bank is envisaged for providing VARs during startup and in operation to a standalone wind generator (Induction Generator).**

## 2.0 GENERAL CONSTRUCTION FEATURES

2.1 The capacitor cells, thyristors, controller, and related equipment shall be mounted in the same enclosure.

2.2 Current transformers and associated cabling necessary for VAR sensing are to be supplied and installed.

2.3 The standard enclosure shall be rated IP40 or higher. This enclosure is intended for indoor use primarily. The dimensions of the panel shall be restricted to the door dimensions of the control room 1750 mm Height, 1200 mm Width.

2.4 Provision shall be made for bottom conduit entry into the incoming cable compartment of the enclosure.

2.5 A solid state, multi step, adjustable power factor controller shall be provided as part of this equipment. This controller shall automatically switch 30KVAR capacitor banks in and out to provide power factor correction to a desired setpoint.

2.6 Current limiting MCB shall be provided on all three phases of each step.

2.7 Voltage transformer(s) of suitable rating shall be provided for control power and voltage sensing. Protection shall be provided with two current limiting fuses.



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## 3.0 Technical Details

| | |
|---|---|
| Rating of Thyristor switched Capacitor Bank | 300 KVAR @ 440 V AC RMS |
| Frequency | 50 Hz |
| No of Phases | 3 Phase |
| Protection | IP40 class or better |
| Application | Indoor |
| Cable Entry | Bottom |
| Bus bar Detail | Minimum 300 sq. mm Copper Busbar |
| Capacitors | Continuous voltage rating of capacitors: 525V RMS with maximum of 680V upto 1 minute |
| Filter Reactor | 14% detuned, 50 A rms, continuous current minimum |
| No of Steps | 10 Steps |
| Configuration | 10 x 30 KVAR |
| Switchgear Details | |
| Incomer | MCCB 630A rms |
| Steps Outgoing | MCB for each Thyristor switch |
| PIV of Thyristor | > 2200 V |
| Current Rating of Thyristor | 90 A , Minimum |
| Thyristor Switch | 30KVAr. Switching on should take place at zero voltage crossing. |
| APFC Relay | Microprocessor based control with 4 quadrant measurement for power factor correction required. Response Time < 100 msec. |
| Parameters Monitoring with digital display of V, I, KW, KVAR, KVA,PF, Hz | Required |
| Capacitor Bank On Indication | Required |
| Phase indicating Lamps (R, Y, B) | Required |
| Current Transformer for Measuring Current | Required |
| Forced Cooling Fans | Inbuilt in the panel |



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***4.0 Local / Remote Selection:*** *Provision for switching of the capacitor banks individually from a remote controller using ten digital outputs, one for each capacitor bank. Care should be taken regarding electrical isolation of the outputs of the remote controller from the outputs of the local controller provided in the panel, while switching between the remote controller and local controller. In remote operation, any protections provided for the capacitor banks should remain in force, i.e. no protection should get bypassed. Any protection provided by the local controller may be clearly specified so that the same can be incorporated in the remote controller. Local / Remote operation should be selectable from Remote Controller.*

## 5.0 Pre Delivery Inspection:

Pre-delivery inspection shall be carried out at the supplier's premises.

## 6.0 Erection and Commissioning:

The supplier has to deliver, install and commission the panel at site (At Tadipatri Wind Farm Farm Site, Ananthpur, AP). All accessories required for commissioning the panel is in the scope of the supplier.

## 7.0 Delivery:

The delivery at site shall be within two months from the date of PO. Offers will be rejected if delivery schedule is not met.

## 8.0 Warranty

The panel shall be warranted by the manufacturer to be free from defects for a period of 18 months from factory shipment or a period of one year after the unit is energized, whichever occurs first.

## 9.0 Documentation:

9.1 Along with offer, the manufacturer shall submit one set of outline drawings, one single line diagram and bill of materials. Catalogue of the PF controller shall be submitted along with the offer.

9.2 The equipment manufacturer shall furnish one set of operation and maintenance manuals.



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