

# **Karnataka Power Transmission Corporation Limited**

## **1. Technical Specifications of BDV kit (Automatic Electric Strength Apparatus)**

### **1. SCOPE**

This specification is regarding Automatic Electric Strength Apparatus used for testing of Electric Strength of Transformer oil as per IEC – 156 , IS 6792-1992 and other International Standards up to 100kV. The Instrument should carry out the sequence of tests without supervision.

The bidder shall provide:

- a) Operation and maintenance manual including drawings in English language.
- b) Software in a CD in English language.
- c) Training to KPTCL personnel on all aspects of operation, maintenance and calibration.
- d) Continued technical support during guarantee period (2 years) and also during extended warranty period (3 years).
- e) The bidder must have trained Engineers dedicated for trouble shooting and Technical support, permanently posted in India preferably in Bangalore.

### **2. APPLICABLE STANDARDS**

Unless otherwise specified separately in this specification, the equipment shall comply with the requirements of IEC 156, IS 6792-1992 and any other standards relevant IEC, BS, ASTM etc. Over and above to this, all special requirements specified in the specification shall be complied.

### **3. OPERATING CONDITIONS:**

- a) Voltage (Mains) : 90 to 264V AC (-10% to +10%)
- b) Frequency (Mains) : 50 Hz  $\pm$ 5%
- c) Environment : Laboratory use. Indoor
- d) Operating Temperature: 0 deg C to +50 deg C
- e) Storage Temperature: -20 deg C to +65 deg C
- f) Humidity 80% RH 40 deg C Operation.

### **4. INTERFACE and PRINTER**

- i) Inbuilt Printer
- ii) Unit should have internal memory to store results and should be transferable to a USB drive or PC.

### **5. ESSENTIAL FEATURES**

- a) **Type:** Fully Automatic Onboard Control Interface.  
Fully Automatic to set the following option
- a. Stand time
  - b. Stir Time
  - c. Rate of Rise of voltage 0.5kV to 5kV adjustable
  - d. No. of Tests carried out.

- b) **Out put Rating:** 0 – 100 kV @ 61.8 Hz with 0.1 kV resolution.

**c) Accuracy:** 0.1 kV  $\pm 1\% \pm 2$  digits.

**d) Transformer:** Voltage applied to the electrodes of the oil filled test-cell should be nearly sinusoidal and the peak factor should be within the limits of 1.34 and 1.48.

**e) Method:** The unit shall have automatic voltage increase as per the various testing standards. Provision should also be available for user settable tests. The unit shall be automatic and complete with test cell, stirrer and 'GO' and 'NO GO' gauge for adjusting the gap.

**f) Additional Features:** Facility of manual operation, recalling of Breakdown.

i) The equipment shall have provision for automatic oil temperature measurement.

ii) Instrument should be light weight, Portable and should not exceed 30 kgs.

iii) Instrument should be supplied with a suitable calibrator which allows the actual applied voltage to be quickly and easily checked against the displayed value giving immediate confidence in the calibration of the oil test set.

iv) The instrument shall trip the high voltage with direct measurement of Voltage and current.

**g) Breakdown Indication:** The test set should display individual and avg BDV with mean and standard deviation with date and time. The instrument should have an internal built in printer for printing the test results.

**h) Display :** 320 X 240 QVGA colour display with back light

**i) Protection:** Safety Interlock on Cover

Instrument should meet the safety requirements of IEC 61010-1

Instrument should meet the EMC requirements of IEC 61326-1

## **5.10. Test Vessel**

**5.10.a. Material:** Cell made of glass or rigid oil resistant plastic shall be transparent and covered  
Volume: 350ml to 500ml

### **5.10.b. Electrodes:-**

Type : all types including Spherical (As per IS.6792-1992).

Material: Brass, Copper, Bronze or Stainless Steel. The two electrodes should be mounted on a horizontal axis and should be 2.5 mm apart. The gap between them should be set to an accuracy of  $\pm 0.01$ mm by gauge. The axis of the electrodes should be immersed to a depth of approximately 40mm.

## **5.11. Interlocking System:-**

Safety Interlock on High Voltage test Chamber. Open ground & Interlock

indication & protection on front panel. Zero start interlocking.

**5.12.Circuit Protection:-**

The instrument shall have fast HV switch off time less than 10 micro seconds.

**6. GUARANTEE PERIOD**

The whole equipment along with accessories shall be guaranteed for a period of minimum 36 months from date of successful demonstration at site/Laboratory.

**7. INSTALLATIONS AND TRAINING**

The bidder shall install the equipment at the location specified by the KPTCL and provide training to at least 2 personnel about the operation, maintenance and calibration of the equipment.

Two sets of Instruction Manual with circuit diagrams shall be provided.

**8. TEST CERTIFICATES:**

The equipment shall be supplied along with the valid calibration certificate and Test certificate.

**9. Recommended Spares and Consumables:**

The bidder shall supply the following spares and consumables required for the satisfactory and trouble free operation of the equipment for 2 years.

Spares:	a) Test Vessel	-	2 Nos.
	b) Electrode set	-	2 Nos.
	c) Electrode gauge set	-	2 Nos.
	d) Magnetic Stirrer with retriever	-	3 Nos.
	e) Software CD		
	f) Mains supply Cable		

---