

BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
TRANSFORMER ENGINEERING DEPARTMENT

FORM NO: TRE-2003A

Sht I of 3 sheets

ANNEXURE TO INDENT-CUM-ENQUIRY - 240630077 DTD.: 27-11-13
DESCRIPTION OF EQUIPMENT : PORTABLE KARL FISHER TEST SET
WORK ORDER NO. : 60005-P-512-01
CUSTOMER : M/S HNPCL

SPECIFICATION FOR PORTABLE KARL FISHER TEST SET



1. GENERAL

The instrument shall be used for measurement of moisture content in transformer insulating oil (conforming to IEC: 60296) samples. The test kit makes use of automatic Karl Fischer Titrator method capable of measuring water in oil to 200 ppm. The measured moisture shall be displayed in microgram or ppm or percentage.

2. TECHNICAL REQUIREMENTS

The set should have the following features.

- 2.1 Sample Volume: 0.1, 0.2, 0.5, 1.0, 2.0, 5.0 & 10ml.
- 2.2 Specific gravity range: 0.6 to 1.4 in 0.01 steps.
- 2.3 Moisture range: 1 ppm - 5%.
- 2.4 Measuring range: 10 µg - 10mg water
- 2.5 End point detection method: ac polarization
- 2.6 End point indication: Visual display/printout/Acoustic beep
- 2.7 Maximum Titration speed: 2mg/minute
- 2.8 Maximum current: 400mA
- 2.9 Drift compensation: Automatically controlled
- 2.10 Starting delay: 10 Sec.
- 2.11 Stirrer speed: Microprocessor-controlled
- 2.12 Accuracy: ±3µg to ±0.5%
- 2.13 Calculation Mode: Volume/Density or Weight/Weight
- 2.14 Built in Printer: High speed thermal type or external printer to be provided

REV	DATE	ALT CKD	REV	DATE	ALT- CKD-	REV 00	NAME	SIGN	DATE
						PREP	A. Joshi		28.11.13
						CKD	R.K.Singh		28.11.13

DWI/TCB/TRE/010

BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
TRANSFORMER ENGINEERING DEPARTMENT

FORM NO: TRE-2003A

240630077

Shit 2 of 3 sheets

WORK ORDER NO. : 60005-P-512-01
CUSTOMER : M/S HNPCL

- 2.15 Should be compact & portable.
- 2.16 Display: 40 Character (min) alphanumeric with Backlit LCD
- 2.17 Should operate with Karl Fischer reagent of indigenous make.
- 2.18 Should have a magnetic stirrer, titration cell and electrodes.
- 2.19 Should have error indicator for indicating any defect in vessel charge or generator solutions and electrodes.
- 2.20 Should have facility for auto-display of ions in parts per million.
- 2.21 Should be free from effect of humidity, parasitic reactions and inherent drift of circulatory.
- 2.22 The operating instructions should be put on an anodized letter metal plate or of any such type of permanent nature on the set for convenience of operator.
- 2.23 Should be suitable for 90-265 V, 50 Hz, Single phase AC supply and 12VDC rechargeable Battery.
- 2.24 Should have lamp indications for Mains-ON, Instrument error, Stirrer-moving and Titrator-over.
- 2.25 The resolution should be 1 in ppm.
- 2.26 The speed of stirrer to be preferably controllable.
- 2.27 All accessories like adequate capacity set of syringes etc. and consumable chemicals required for installation and demonstrations of the instrument at site must be included in the scope of supply. Consumable chemicals which have limited shelf life can be supplied at the time of installation and demonstration at site.

3. TEST REQUIREMENT

The routine/acceptance test shall be conducted on order equipment on 100% basis.

4. TESTING AND DESPATCH

4.1 Three sets of inspection & routine test report, calibration certificates, descriptive leaflets, operation and maintenance manual shall be sent alongwith dispatch document. One set shall be supplied alongwith the equipment.

BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
TRANSFORMER ENGINEERING DEPARTMENT

FORM NO: TRE-2003A

240630077

Sht 3 of 3 sheets

WORK ORDER NO. : 60005-P-512-01
CUSTOMER : M/S HNPCL

4.2 The supplier shall furnish a list of all fittings and components in the dispatch details giving description and quantity of each item (Quantity of each item shall be mentioned). All items shall be properly packed in wooden boxes/gunny bags so as avoid scratches/damage in transit.

5. INSTALLATION, COMMISSIONING & TRAINING

Installation & commissioning of the system is also in the scope of supply. The supplier shall install & commission the system and provide training for operation and maintenance to our ultimate customer at site on intimation of BHEL and obtain certificate from the customer for the same. Supplier should quote the charges for the same, if any, in the offer separately.