**POSTED UNDER POSTAL CERTIFICATE**

**Our Ref : BNBOTC/13:2/TFL** **Date: 06 January 2014**

Subject: **Tender Notice for the supply of "Test Equipment for Tubular Fluorescent Lamp as per IS 2418 (Part 1) : 1977".**

Dear Sir,

Technical & Financial Bids are invited for the supply of **Test Equipment for Tubular Fluorescent Lamp as per IS 2418 (Part 1) : 1977**, in separate **SEALED** covers, which should reach the undersigned latest by **17.00** hrs. on **10th February 2014** at the following address:

Scientist-F & Head,
BUREAU OF INDIAN STANDARDS
Bengaluru Branch Laboratory
Peenya Industrial Area, 1st Stage, Tumkur Road,
**BENGALURU** – 560 058

2. The detailed technical specification(s) of the above mentioned equipment(s)/item(s) are given in **Annexure-IV**.

3. The terms and conditions of supply are given in **Annexure-I.**

4. The technical bids shall be opened in the **Committee Room** of the **Bengaluru Lab** at the address mentioned above at **10.30 hrs** on **11th February 2014** and in the presence of such tenderers or their duly authorized representatives, who may like to attend.

5. Please note that the envelopes containing Technical & Financial Bids are sealed properly, i.e. either wax sealed or with adhesive cello tape on both ends. Unsealed and stapled envelopes shall not be accepted.

6. The specification and terms and conditions can also be downloaded from BIS website – www.bis.org.in.

Thanking you,

Yours faithfully,

(Sc.F & Head BNBO TC)

Encl: As above

**Annexure – I**

## TERMS & CONDITIONS

1) The Tenderers are requested to give detailed tender in their own forms in two bids i.e.
**Part-A Technical Bid**
**Part-B Financial Bid**

2) The specifications of equipment have been specified against each item. However, bidder(s) may be required to arrange practical demonstration of equipment/model(s) quoted by them before finalization of order.

3) Tender document will be issued by BIS, Bengaluru Branch Laboratory or can also be downloaded from website. Bidders are requested to download the Tender Documents and enclose a non-refundable bid fee of Rs.500/- (Rupees Five Hundred only) for each item separately, in the form of Demand Draft drawn in favour of **BUREAU OF INDIAN STANDARDS** payable at **Bengaluru**. **The Bid fee should be enclosed with Technical bid only.**

4) In the technical bid, the following be clearly indicated:

   a. The equipment is required to be installed at locations indicated in the Tender Notice and subsequently training is to be provided to the concerned Scientists/testing personnel, where necessary.
   b. Packing, forwarding, freight & insurance and commissioning charges, if any extra may be quoted separately in Financial Bid.
   c. In case your quote is F.O.R/F.O.B basis, estimated insurance coverage charges may be indicated.
   d. CIF (Carriage inward & freight), Bengaluru value (both by Airfreight and Ocean freight), where applicable.

5) Tenders complete in all respects for each item should be submitted separately for **Technical** as well as **Financial bids** as follows:

   a. One sealed envelope superscribed **"Technical Bid"** will contain only the technical specifications of the indented equipment as per details in Clause 6 of this tender terms and conditions.
   b. A second sealed envelope superscribed "**Financial Bid"** will contain only the financial bid in which price, maintenance, Annual Maintenance contract Charges (AMC) etc. and any other information, which has financial implications, will only be given. **The Demand Draft of the EMD (see Para 42) be placed inside a separate sealed envelope clearly marked 'EMD' on the right hand side corner of the envelope and be stapled along with this sealed envelope containing the Financial Bid**. However, the EMD of the successful Bidder may be adjusted against Performance Bank Guarantee.

   c. Both the above sealed envelopes are to be kept in a main envelope, superscribed as **Tender No. BNBL/13:2/TFL dated 6th January 2014 for Test Equipment for TFL due on 10th February 2014** and duly sealed.

6) The **Technical Bid (Part-A)** should accompany complete Technical specification, manufacturer's name, address and the following details:

   a. Expected life span of equipment and accessories.
   b. List of infrastructural facilities and consumables to be arranged by the Bureau for commissioning of equipment,

c. List of the Users in India with their complete postal address to whom the similar equipment has been supplied,
d. Near locations in India from where after sales services shall be provided along with the name of Servicing Agent,
e. The optional and any other essential items/accessories required for the maintenance of the equipment for the next three years.
f. Technical Literature of the equipment along with necessary photograph/drawings, if any
g. Deviation Statement Form **(See Annexure - II)**

7) Cost of the items should be mentioned clearly in the **Financial Bid (Part-B)** only.

The following details need to be included:
a. Price break-up of main equipment and accessories and consumables to be supplied by the party,
b. Rebate on the quoted price, if additional equipment is procured for any other BIS Lab, and
c. The Annual Maintenance Contract charges for next three years after the expiry of warranty period
d. The rates quoted shall be valid for a minimum period of 120 days from the date of opening of the tender. However, the current value of the foreign currency would be applicable at the time of placing the order.

8) In case of foreign quote, the Principal supplier should clearly indicate the address of the Indian Agent and percentage (%) of Agency Commission payable if any, to be paid to the Indian Agent in Indian Currency.

9) Indicate the names and addresses of the Indian reputed Organizations where you have supplied similar equipment and may attach the satisfactory performance report of the equipment from user Organization.

10) (A) If you have supplied identical or similar equipment to Govt. Labs. / Institutes, the details of such supplies for the preceding three years should be given together with the prices eventually or finally paid.

(B) Based on the above information BIS will have its option to obtain details of the equipment, their performance, after sales services etc., for evaluation of the tender, directly from the concerned Labs/Scientists etc.

11) Fax/E-mail tenders shall not be considered

12) All the Bank Charges inside and outside India, including opening of LC, Communication confirmation, amendments etc., will have to be borne by supplier only.

13) Details of after-sales services offered by you are to be made clear in the tender.

14) **Delivery Period:** As time is the essence of the contract, Delivery period mentioned in Purchase Order should be strictly adhered to. Otherwise the tenderer will forfeit EMD, after maximum 10 days of the last date of delivery.

15) The supplier will have to give along with the equipment complete drawings, circuit diagrams, service/maintenance manual & operating manual of the equipment.

16) With regards to terms of payment including period of warranty, we prefer to release Payment on BILL Basis (excluding Indian Agency Commission) after receipt of

consignment in good condition and satisfactory installation, and commissioning thereof. Alternatively, depending upon the value and foreign exchange regulations the payment can also be considered through Draft/Letter of Credit through the Canara Bank for the order value, excluding the Indian Agency Commission. However, the detailed payment for Draft/Letter of Credit is mentioned at clause No.23 of this tender terms and conditions.

17) Supply means "Supply, Installation, Commissioning and satisfactory demonstration of the whole systems and training." If there are any charges extra for Installation, Commissioning and training, the same should be specified in the financial bid.

18) All goods shall be inspected by BIS preferably in the presence of supplier or his authorized representative, when the packages are opened in Labs prior to installation. The decision of BIS shall be binding. Rejected items/goods/stores shall be removed by the supplier at his own cost and risk, within 30 days of receipt of notice for the removal of such goods, and no liability, whatsoever, on the Bureau shall be attached for the rejected/disapproved goods/items/stores.

19) The Tenderer is required to furnish the Permanent Account Number (PAN) allotted by the Income Tax Department.

20) In case of foreign quote, the address of Principal's /Manufacturer's and their Banker's
details should be furnished.

21) The item should be supplied with manuals and the manuals including technical drawings should be compete in all respects to operate the system without any problem. If the manuals are on chargeable basis, the same should be specified in the offer.

22) The supplier is required to insure having a import licence for the equipment quoted where applicable as per GOI guidelines.

23) In case of Indigenous Items, the offer should contain the Basic Price and percentage of Excise Duty should be shown separately, <u>BIS shall pay custom duty as applicable.</u>

24) Price shall specifically indicate sales tax, excise duty or any other charges. In absence of any such stipulation, it will be presumed that the prices include all such charges and no claim for the same shall be entertained. The Bureau pays full CST and neither Form C nor Form D is provided.

25) (A) The successful bidder shall furnish within 15 days of placement of the order an unconditional Performance Bank Guarantee valid till 60 days after the warranty period from a Nationalized Bank for 10% of the order value within 15 days of placement of the order. On acceptance of this condition and submission of Bank Guarantee, the Letter of Credit will be opened for 100% order value. If the firm fails to submit the same, the Contract shall be deemed as terminated and the firm will forfeit the EMD, in case of foreign suppliers & indigenous suppliers. The performance Bank Guarantee is to be given in format enclosed at **Annexure - III,** enclosed with this document.

(B) **For foreign suppliers**: PAYMENT 90% payment shall be made by Site Draft/ an Irrevocable Letter of Credit established in favor of the supplier through the Canara Bank, Peenya, Bangalore for the order value, excluding the Agency Commission due to the Indian Agents, against the presentation of original Shipping documents. Balance 10% will be released after completion of satisfactory installation,

commissioning and demonstration of the whole system and on completion of training. However letter of Credit/Site Draft arrangement will be made for 100% order value. The Agency Commission to the Indian Agent, if any and payable by BIS will be paid only after successful installation, commissioning and satisfactory demonstration and acceptance of the items ordered for.

**(C) For Indigenous items:** 90% payment shall be made against delivery, installation, Commissioning, training and on acceptance as per Purchase Order at site and balance 10% shall be made after receipt of performance Bank Guarantee for 10% of the total order value, to be valid for One Year from the date of installation and acceptance.

26) The bidder has to state in detail the Electrical Power/UPS requirement, floor Space, head room, foundation needed and also to state whether Air-conditioned Environment is needed to house the system and to run the tests i.e. pre-installation facilities required for installation may please be intimated in the technical bid.

27) Installation: Bidder shall be responsible for installation/demonstration wherever applicable and for after sales service during the warranty and thereafter.

28) In case of Foreign Quote, the mode of dispatch should be by Air Post Parcel/Ocean Freight/Air Freight (By Air India Freight) and on Freight to-pay basis only. The approximate dimension of the packages and weight of consignment are to be indicated.

29) The make/brand name and address of the manufacturer, Country of Origin, Country of Shipment and currency in which rates are quoted are to be mentioned.

30) The payment of local currency portion shall be payable in equivalent Indian Rupees, within 30 days after the receipt of the equipment in good condition and after satisfactory installation and commissioning, demonstration and training.

31) The tender/quotation/offer submitted by you should be valid for a minimum period of 120 days from the date of opening of the tender.

32) The quotation should be only in Indian Rupees for indigenous items. In case of foreign quote, the vendors may quote their rates in Indian Rupees as well as in foreign Currency.

33) The Bidder who submits the tender on behalf of their principals should produce documentary evidence in support of their authority to quote or submit proforma invoice of their principals.

34) BIS will not provide any accommodation/transportation for the Engineers/ Representatives for attending Installation, Commissioning and Demonstration Work. It is the absolute responsibility of the Principal Supplier/Indian Agent to make their own arrangements.

35) **WARRANTY:** The equipment is to be guaranteed for trouble free **performance** for a minimum period of two years after installation. The defects, if any, during warranty period are to be rectified free of charge by arranging free replacement wherever necessary.

36) Indicate the name of firm, address, contact person, phone no. and fax no. etc. of onsite warranty agency who shall maintain during warranty and undertake Annual Maintenance Contract/Comprehensive Service Maintenance Contract beyond

warranty shall be given in the technical bid. In case of foreign quote, the Indian Agent who shall maintain during warranty and AMC beyond warranty shall be given in the Technical Offer.

37) The supply of spare parts is to be guaranteed at least for a period of 10 years after the supply of the equipment.

38) After successful installation what will be the minimum down time of equipment/instrument in case of breakdown. If the identified firm or person fails to put the system into working condition what is the further alternative course of action suggested by you to adhere to minimum down time.

39) Please mention the charges for comprehensive annual maintenance contract separately for 3 years in financial bid (for post warranty period).

40) No sub-contracting will be allowed for installation or maintaining system/ equipment/instrument during or after warranty period.

41) Discount offered should be mentioned clearly in the financial bid only.

42) **The Earnest Money Deposit (@ 5% of Quoted Price or as specified in the Tender Document must be sent along with your financial bid in the form of a Demand Draft, Banker cheque or Bank Guarantee (from a Nationalized Bank only) drawn in favour of BUREAU OF INDIAN STANDARDS payable at Bengaluru**, otherwise your technical & financial bids will not be considered at all. The Earnest Money of successful bidder will be returned only after installation, commissioning, satisfactory demonstration and acceptance of the equipment by the user Scientist/HOD as per the terms of our purchase order. The Earnest Money of the unsuccessful bidder whose technical bid has not been found suitable will be returned.

43) (A) Tenders not accompanied with Demand Draft/ Bank Guarantee towards "Earnest Money Deposit" will summarily be rejected.

(B) Tenders which are submitted without following the Two-Bid offer System, will summarily be rejected.

(C) Unsigned Tenders will also be rejected.

44) Conditional Offers will not be considered.

45) If the supplier fails to supply, install and commission the system as per specifications mentioned in the order within the due date, the supplier is liable to pay liquidated damages of one percent value of the Purchase Order awarded, per every week delay subject to a maximum of 10% of the total value of the order and such money will be deducted from any money due or which may become due to the supplier.

46) Goods should not be dispatched until the vendor receives a firm order.

47) Firms which have already supplied similar equipment to BIS and have not completed required installation/commissioning/after sales service/warranty replacements etc., such firm's offers will not be considered for further evaluation and no enquiries thereafter will be entertained.

48) Tenders addressed to the Sc.F & Head, Bengaluru Branch Laboratory, Bureau of Indian Standards, Bengaluru – 560 058 are to be submitted for each item separately as detailed in Clause 5 of this tender terms and conditions.

49) The tenders must be clearly written or typed without any cancellations/corrections or overwriting.

50) Please indicate Page Nos. on your quotation. E.g. If the quotation is containing 25 pages,
Please indicate as 1/25, 2/25, 3/25--------25/25.

51) **Last Date and Time for receipt of Tenders:** The tenders will be received in the Bengaluru Laboratory, Bureau of Indian Standards, Peenya Industrial Area, 1st Stage, Tumkur Road, Bengaluru -560058 **up to 1700 hrs. on 10th February 2014**.

52) BIS will not be responsible:

a. For delayed/late quotations submitted/sent by Post/Courier etc.

b. For submission/ delivery of quotations at wrong places other than the Office of the Sc.F & Head Laboratory, Bureau of Indian Standards, Peenya Industrial Area, 1st Stage, Tumkur Road, Bengaluru – 560058.

53) Date **and Time of opening of Tenders:** The Tender's Part- A (Technical Bid only) will be opened **at 1030 hrs. on 11th February 2014** in the presence of Tenderers who wish to be present. .

54) The Date and Time of opening for Part B (Financial Bid) will be intimated only to pre-qualified and technically acceptable tenderers for the item at a later date.

55) All questions, disputes, differences arising under, out of or in connection with this Bid documents shall be subject to the exclusive jurisdiction of Bengaluru Court.

56) The Bureau reserves the right to accept any tender in full or in part or to reject the lowest or any or all tenders without assigning any reason.

**Annexure - II**

## DEVIATION STATEMENT FORM

1) The following are the particulars of deviations from the requirements of the tender document and specifications:

| CLAUSE | DEVIATION | REMARKS (Including justification) |
|---|---|---|
| | | |

**Place :**

**Date :**

**Signature & Seal of the Manufacturer / Bidder**

**NOTE:**

1. Where there is no deviation, the statement should be returned duly signed with an endorsement indicating “No Deviations”.

**Annexure - III**

## PERFORMANCE SECURITY FORM

To_____(Name of Purchaser)

**WHEREAS**_____(Name of supplier)
Hereinafter called "the Supplier" has undertaken, in pursuance of Contract No._____ dated_____ to supply _____ (Description of Goods and Services) hereinafter called "the Contract".

**AND WHEREAS** it has been stipulated by you in the said Contract that the Supplier shall furnish you with a Bank Guarantee by a Nationalized Bank for the sum specified therein as security for compliance with the Supplier's performance obligation**s** in accordance with the Contract.

**AND WHEREAS** we have agreed to give the Supplier a Guarantee:

**THEREFORE WE** hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of Rs._____ (Rupees _____ only) being the amount of the Guarantee and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract and without cavil or argument, any sum or sums within limit of Rs. _____ (Amount of Guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand **or** the sum specified therein.

The guarantee is valid until the _____ day of _____20__.

Signature and Seal of Guarantors
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Date----------

Address----------
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**Annexure – IV**

# LIST OF EQUIPMENT REQUIRED FOR TESTING TUBULAR FLUORESCENT LAMP AS PER IS 2418(Part 1) : 1977

| SL. NO. | EQUIPMENT / ITEM | EQUIPMENT SPECIFICATION CODE | QUANTITY |
|---|---|---|---|
| 1. | Life Test Rack for TFL 18/20/36/40W | CBE 04 | 01 no. |
| 2. | Ageing Rack for TFL 18/20/36/40W | CBE 10 | 01 no. |
| 3. | Starting Characteristics Test Unit for TFL | CBE 13 | 01 no. |
| 4. | Voltage stabilization and frequency converter | BBE 03 | 01 no. |
| 5. | Angular displacement test unit | DBE 01 | 01 no. |
| 6. | Torsion test equipment | DBE 03 | 01 no. |
| 7. | Length checking unit for 36/40W | DBE 05 | 01 no. |
| 8. | Length checking unit for 18/20W | DBE 06 | 01 no. |
| 9. | 'GO' and 'NO-GO' gauges for G13 cap | DBE 02 | 01 no. |

# BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE T&C)

# EQUIPMENT SPECIFICATION

| | | |
|---|---|---|
| EQUIPMENT SPFN. CODE | : | **CBE 04** |
| NAME OF THE EQUIPMENT | : | **Life Test Rack for TFL 18/20/36/40W** |
| PROPOSED FOR BIS LABS | : | **BNBO T&C** |
| TOTAL QUANTITY REQUIRED | : | **01(one)** |

**1.0 Scope**

Covers the basic guiding requirements for the design of life test rack for tubular fluorescent lamps required for carrying out the following test:

- Test for life as per Cl.6.9 of IS 2418(Part 1) : 1977.

**2.0 Test conditions**

Lamps shall be operated for 2000 hours. Life test quantity normally consists of 10 lamps.

**3.0 Construction**

3.1 The rack shall be designed and constructed to carry out life test on tubular fluorescent lamps of the following ratings:

18W / 600 × 26mm / G-13 / with starter
20W / 600 × 38mm / G-13 / with starter
36W / 1200 × 26mm / G-13 / with starter
40W / 1200 × 38mm / G-13 / with starter

The equipment shall be designed and constructed based on the following considerations:

- Personnel safety against electric shock
- Safety against the effects of excessive temperature and fire
- Reliable operation

3.2 Provision shall be made to operate 90 nos. of TFLs (up to 40W rating). The details of holders to be provided on the rack are as follows:

18W/20W/G-13 cap lamp holders : 30nos.
36W/40W/G-13 cap lamp holders : 60nos.

The holders shall be wired parallel to be supported by a three phase system. Typical details for fabrication of the life test rack are shown in the drawing attached.

3.3 The mechanical structure of the rack shall be fabricated out of MS square sections of suitable size and thickness so that it is sturdy and having adequate mechanical stability and shall be powder coated so as to ensure that during the long and extended use of the equipment, it shall be durable and free from rusting.

3.4 The holders shall be mounted on suitable MS sections and shall be powder coated with adequate spacing between one another for easy operation and shall be wired through heat resistant fiber glass insulated copper conductors of adequate current rating. The current rating of the conductors shall be so chosen as to keep the voltage drop between the point of measurement and the holder contacts within 0.1% of the test voltage. All other wiring may also be done using fiber glass insulated copper cable. All wiring terminations shall be made using suitable

copper lugs of appropriate size. Terminal blocks, used if any, shall be of adequate current rating. The screws, bolts, nuts, washers, etc., used if any, shall be non-rusting and shall not get damaged in a few operations.

3.5 A hinged panel of MS sheet metal of adequate thickness and powder coated shall be provided on the front side of the rack for housing switchgear, control gear and measuring instruments.

3.6 For each set of 10 lamp holders, there shall be an MCB of reputed make mounted on the front panel.

3.7 An isolator ON/OFF rotary switch of adequate current rating and reputed make shall be provided on the front panel for each set of 30 lamps for connecting/disconnecting the mains supply.

3.8 Indicator lamps shall be provided on the front panel for each set of 30 lamps for indicating the mains supply ON/OFF.

3.9 Three numbers of 3.5 digits, digital voltmeter (DPM) of reputed make, at least 0.5% accuracy, 0 – 300VAC shall be provided on the front panel for measuring the input voltage to each set of 30 lamps.

3.10 Three user programmable electronic timer(0 – 9999 hours) along with power tripping device shall be provided on the front panel for each set of 30 lamps for setting the life test period of the lamps, so that after completion of the set time, the power supply to the lamps shall be cut off automatically.

3.11 Three user programmable electronic cyclic timer(0 – 999min. ON time & 0 – 99min. OFF time) shall be provided on the front panel for switching on and switching off the lamps as per Cl.6.9.1 of IS 2418(Part 1) : 1977 for each set of 30 lamps.

3.12 Three electro mechanical time totalizers (0 – 99999.99 hours) of reputed make shall be provided on the front panel for each set of 30 lamps for recording the life test period of the lamps.

3.13 One digital temperature indicator (0 - 100°C) shall be provided on the front panel for recording the ambient temperature in which the lamps are operated.

3.14 90 numbers of ballasts shall be provided for the operation of the lamps. The ballasts used shall be of the type conforming to the relevant requirements specified in Appendix E of IS 2418(Part 1) : 1977.

3.15 90 numbers of starters shall be provided for the operation of the lamps. The starters used shall be with BIS Certification mark.

3.16 Suitable provision shall be made for keeping the Auto transformers (40A, 0-270V, oil cooled) supplying adjustable power to the lamps at the bottom of the rack (inside).

**4.0 Auto transformer**

Three numbers of continuously variable voltage auto transformers, oil cooled, shall be provided for supplying adjustable power to each set of 30lamps. The specifications of the auto transformers shall be as follows:

| | |
|---|---|
| Rated output current | : 40Amperes |
| Rated input voltage | : 240V |
| Rated output voltage range | : 0 – 270V |
| Rated frequency | : 50Hz |
| Number of phases | : Single phase |
| Type of cooling | : Natural oil cooled |

The auto transformers shall be supplied with first filling of ISI marked transformer oil.

**5.0 Calibration :**

Calibration certificates on voltmeters, timers, time totalizers, etc., from NABL

accredited calibration agency shall be furnished along with the equipment. The calibration certificates on timers may be for a shorter length of time since it may not be practical to carry out the calibration check for the full range.

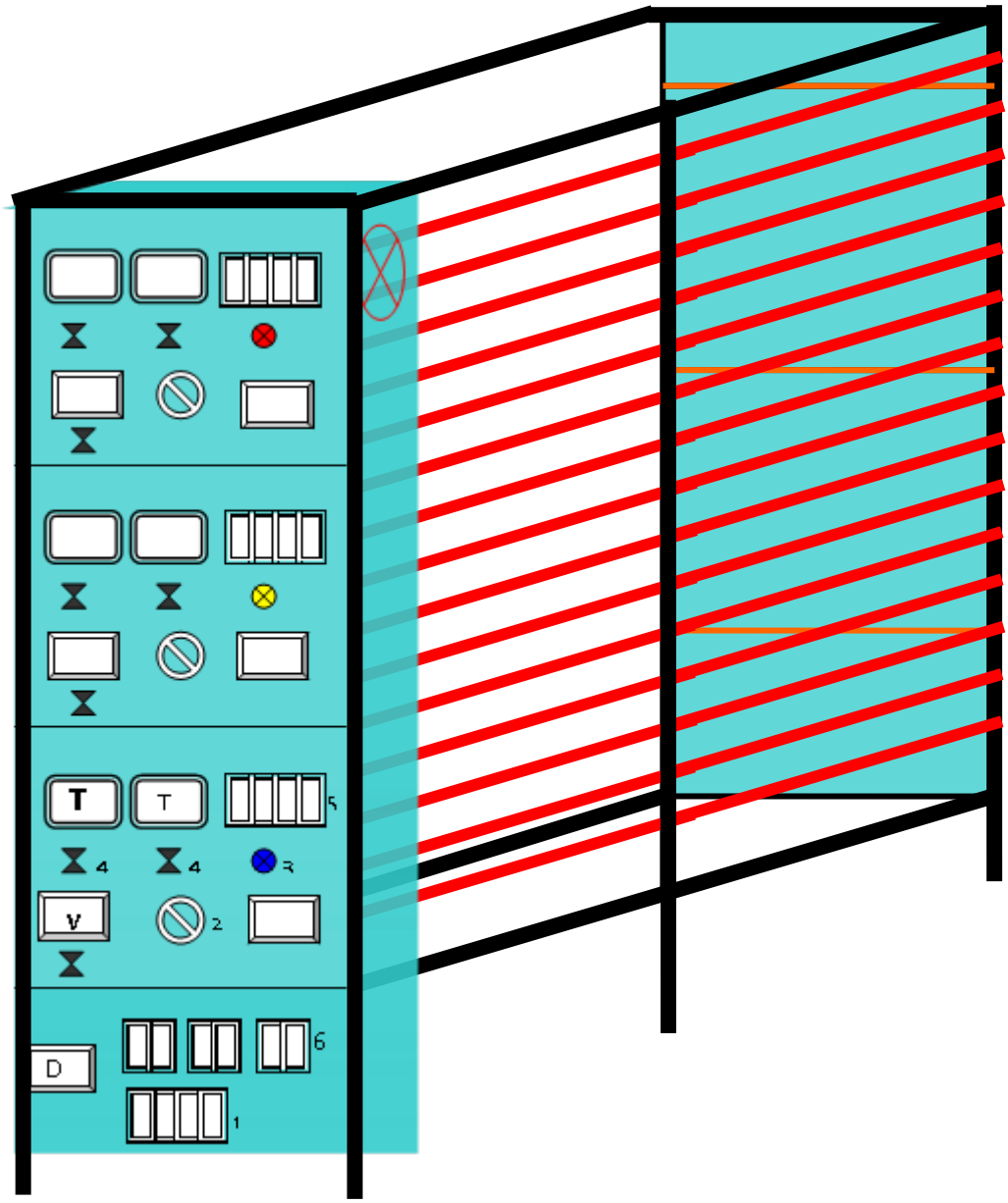
**6.0 Documentation**

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

**7.0 Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

# LIFE TEST RACK FOR TFL




**1 – 4 POLE MCB, TYPE D**
**6 – DOUBLE POLE MCB, TYPE D**
**2 – ISOLATOR ROTARY SWITCH**
**3 – INDICATOR LAMP**
**4 – ON-OFF SWITCH FOR METER/TIMER**
**5 – SINGLE POLE MCB, TYPE B**
**V – VOLTMETER(DPM)**
**T – PROGRAMMABLE TIMER**
**D – DIGITAL TEMPERATURE INDICATOR**
**- COOLING FAN**

# BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE T&C)

# EQUIPMENT SPECIFICATION

| | | |
|---|---|---|
| EQUIPMENT SPFN. CODE | : | **CBE 10** |
| NAME OF THE EQUIPMENT | : | **Ageing Rack for TFL 18/20/36/40W** |
| PROPOSED FOR BIS LABS | : | **BNBO T&C** |
| TOTAL QUANTITY REQUIRED | : | **01(one)** |

**1.0 Scope**

Covers the basic guiding requirements for the design of ageing rack for tubular fluorescent lamps required for carrying out the following test:

- Test for electrical, luminous and color characteristics as per Cl.6.8 of IS 2418(Part 1) : 1977.

**2.0 Test conditions**

Before the lamps are subjected to rating test, they shall be aged for a period of 100 hours of normal operation. Rating test quantity normally consists of 15 lamps.

**3.0 Construction**

3.1 The rack shall be designed and constructed to carry out ageing on tubular fluorescent lamps of the following ratings:

18W / 600 × 26mm / G-13 / with starter
20W / 600 × 38mm / G-13 / with starter
36W / 1200 × 26mm / G-13 / with starter
40W / 1200 × 38mm / G-13 / with starter

The equipment shall be designed and constructed based on the following considerations:

- Personnel safety against electric shock
- Safety against the effects of excessive temperature and fire
- Reliable operation

3.2 Provision shall be made to operate 60 nos. of TFLs (up to 40W rating). The details of holders to be provided on the rack are as follows:

18W/20W/G-13 cap lamp holders : 30nos.
36W/40W/G-13 cap lamp holders : 30nos.

The holders shall be wired parallel to be supported by a single phase system. Typical details for fabrication of the life test rack are shown in the drawing attached.

3.3 The mechanical structure of the rack shall be fabricated out of MS square sections of suitable size and thickness so that it is sturdy and having adequate mechanical stability and shall be powder coated so as to ensure that during the long and extended use of the equipment, it shall be durable and free from rusting.

3.4 The holders shall be mounted on suitable MS sections and shall be powder coated with adequate spacing between one another for easy operation and shall be wired through heat resistant fiber glass insulated copper conductors of adequate current rating. The current rating of the conductors shall be so chosen as to keep the voltage drop between the point of measurement and the holder contacts within

0.1% of the test voltage. All other wiring may also be done using fiber glass insulated copper cable. All wiring terminations shall be made using suitable copper lugs of appropriate size. Terminal blocks, used if any, shall be of adequate current rating. The screws, bolts, nuts, washers, etc., used if any, shall be non-rusting and shall not get damaged in a few operations.

3.5 A hinged panel of MS sheet metal of adequate thickness and powder coated shall be provided on the front side of the rack for housing switchgear, control gear and measuring instruments.

3.6 For each set of 15 lamp holders, there shall be an MCB of reputed make mounted on the front panel.

3.7 Two isolator ON/OFF rotary switch of adequate current rating and reputed make shall be provided on the front panel for connecting/disconnecting the mains supply.

3.8 Indicator lamps shall be provided on the front panel for each set of 30 lamps for indicating the mains supply ON/OFF.

3.9 One number of 3.5 digit, digital voltmeter (DPM) of reputed make, at least 0.5% accuracy, 0 – 300VAC shall be provided on the front panel for measuring the input voltage to the lamps.

3.10 Two user programmable electronic timer(0 – 9999 hours) along with power tripping device shall be provided on the front panel for each set of 30 lamps for setting the ageing period of the lamps, so that after completion of the set ageing time, the power supply to the lamps shall be cut off automatically.

3.11 Two user programmable electronic cyclic timer(0 – 999min. ON time & 0 – 99min. OFF time) shall be provided on the front panel for switching on and switching off the lamps as per Cl.6.9.1 of IS 2418(Part 1) : 1977 for each set of 30 lamps

3.12 60 nos. ballasts shall be provided for operation of the lamps. The ballasts used shall be of the type conforming to the relevant requirements specified in Appendix E of IS 2418(Part 1) : 1977.

3.13 60 nos. starters shall be provided for operation of the lamps. The starters used shall be with BIS Certification mark.

3.14 Suitable provision shall be made for keeping the Auto transformer (60A, 0-270V, oil cooled) supplying adjustable power to the lamps at the bottom of the rack (inside).

**4.0 Auto transformer**

One number of continuously variable voltage auto transformer, oil cooled, shall be provided on the rack. The specifications of the auto transformers are as follows:

| | |
|---|---|
| Rated output current | : 60Amperes |
| Rated input voltage | : 240V |
| Rated output voltage range | : 0 – 270V |
| Rated frequency | : 50Hz |
| Number of phases | : Single phase |
| Type of cooling | : Natural oil cooled |

The auto transformers shall be supplied with first filling of ISI marked transformer oil.

**5.0 Calibration :**

Calibration certificate on voltmeter as well as the timers from NABL accredited calibration agency shall be furnished along with the equipment. The calibration certificate on timers may be for a shorter length of time since it may not be practical to carry out the calibration check for the full range.

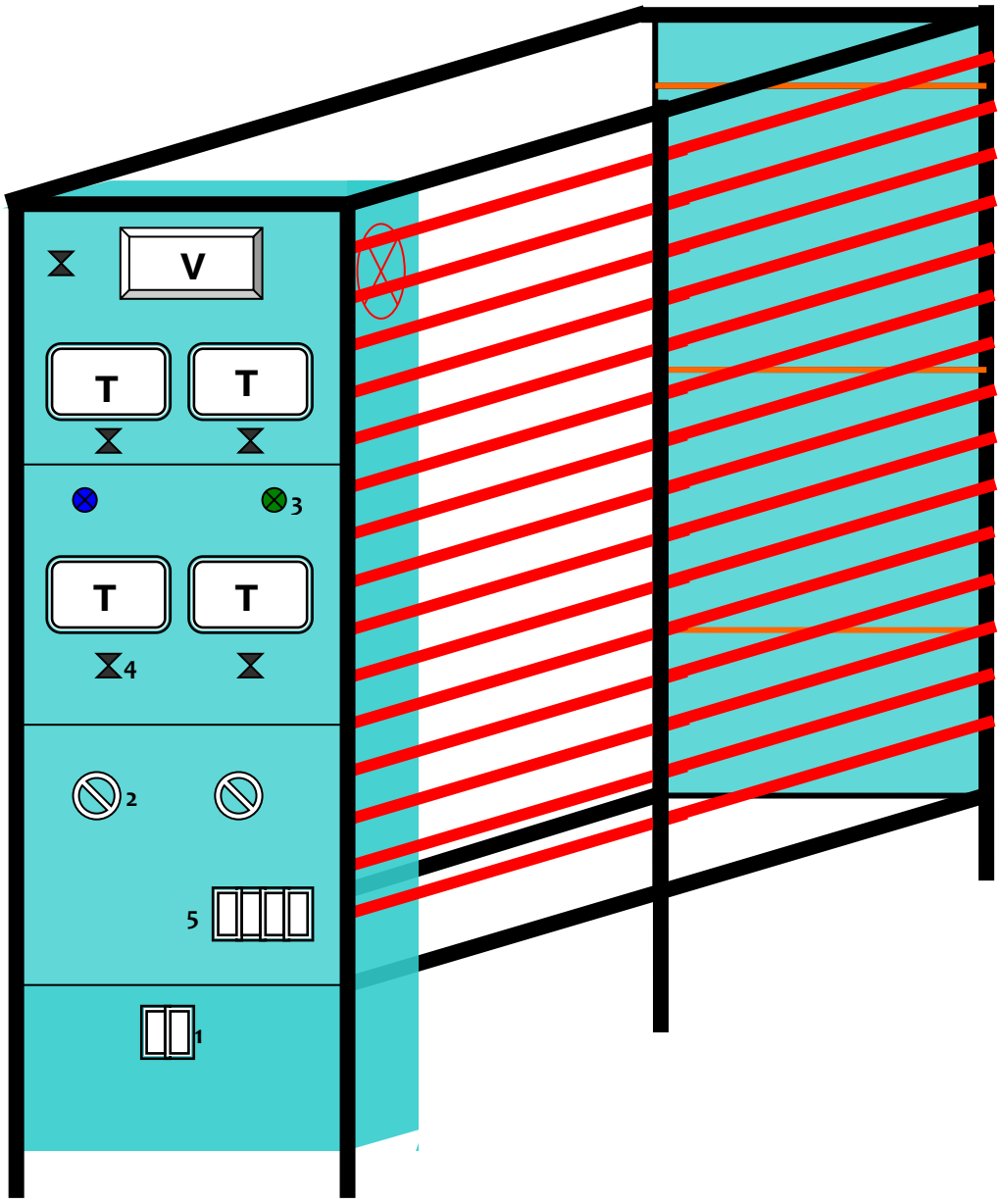
**6.0 Documentation**

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

**7.0 Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

# AGEING RACK FOR TFL




**1 – DOUBLE POLE MCB, TYPE D, – 01no.**
**2 – ISOLATOR ROTARY SWITCH, – 02 nos.**
**3 – INDICATOR LAMPS**
**4 – ON-OFF SWITCH FOR METER/TIMER**
**5 – SINGLE POLE MCB, TYPE B, – 04nos.**
**V – VOLTMETER(DPM), 0 – 300V, 3.5 digit, 0.5% accuracy**
**T – PROGRAMMABLE TIMERS**
⊗ **- COOLING FAN**

# BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE T&C)

# EQUIPMENT SPECIFICATION

| | | |
|---|---|---|
| EQUIPMENT SPFN. CODE | : | **CBE 13** |
| NAME OF THE EQUIPMENT | : | **Starting Characteristics Test Unit for TFL** |
| PROPOSED FOR BIS LABS | : | **BNBO T&C** |
| TOTAL QUANTITY REQUIRED | : | **01(one)** |

**1.0 Scope**

Covers the basic guiding requirements for the design of starting characteristics test unit required for carrying out the following test :

- Test for starting characteristics of tubular fluorescent lamps as per Cl. 4.2, 6.7 and Appendix D of IS 2418(Part 1) : 1977.

**2.0 Test conditions**

For starting characteristics test on tubular fluorescent lamps, the lamp and test equipment shall be set up in accordance with D-1 and D-2 of IS 2418(Part 1): 1977. The test shall be made in still air at an ambient temperature between 20-30ºC in a maximum relative humidity of 65%. Metallic parts and wires in the vicinity of the lamp shall be avoided. Prior to the test, the lamps shall be kept inoperative at the above ambient conditions at least for 24 hours.

**3.0 Construction**

3.1 The equipment shall be designed and constructed for carrying out starting characteristics test on tubular fluorescent lamps of the following ratings:

18W / 600 × 26mm / G-13 / with starter
20W / 600 × 38mm / G-13 / with starter
36W / 1200 × 26mm / G-13 / with starter
40W / 1200 × 38mm / G-13 / with starter

3.2 The lamp and test equipment shall be set up as per the drawing attached.

3.3 The lamp holders shall be mounted in a suitable non-metallic enclosure for avoiding any air movement. The position of the holders inside the enclosure shall be adjustable for fixing lamps of 600mm / 1200mm long.

3.4 An optical sensor interfaced to a time recording device shall be used for sensing the light-up of the lamp as well as recording the starting time. The time recording device shall have a range of 0 – 99.9 seconds with a resolution of 0.1 second.

3.5 Suitable terminals shall be provided for connecting the reference ballast externally.

3.6 Suitable provision shall be made for short-circuiting of the starter terminals for the purpose of measuring the preheating current.

3.7 Starters conforming to IS 2215 shall be provided for the various ratings of lamps mentioned at 3.1 above.

**4.0 Instruments and controls**

4.1 A control panel shall be provided for housing the various instruments, ballasts and control gears. The mechanical structure of the control panel shall be fabricated out of MS sheet metal of suitable thickness and shall be powder coated. It shall be suitable for desktop use.

4.2 A true rms digital voltmeter (DPM), 4.5 digit, 0 – 300V, at least 0.5% accuracy, shall be provided as shown in the drawing for measuring the supply voltage.

4.3 A true rms digital ammeter (DPM), 4.5 digit, 0 – 2A, at least 0.5% accuracy, shall be provided as shown in the drawing for measuring the preheating current.

4.4 A dimmerstat, air cooled, 2A, 0 – 270V shall be provided as shown in the drawing for adjusting the supply voltage.

4.5 A potentiometer of suitable rating shall be provided as shown in the drawing for adjusting the preheating current.

4.6 Ballasts for 18/20W & 36/40W lamps conforming to the relevant requirements of Appendix E of IS 2418(Part 1) : 1977 shall be supplied with the equipment.

**5.0 Calibration :**

Calibration certificates on the voltmeter, the ammeter and the time recording device from NABL accredited calibration agency shall be furnished along with the equipment.

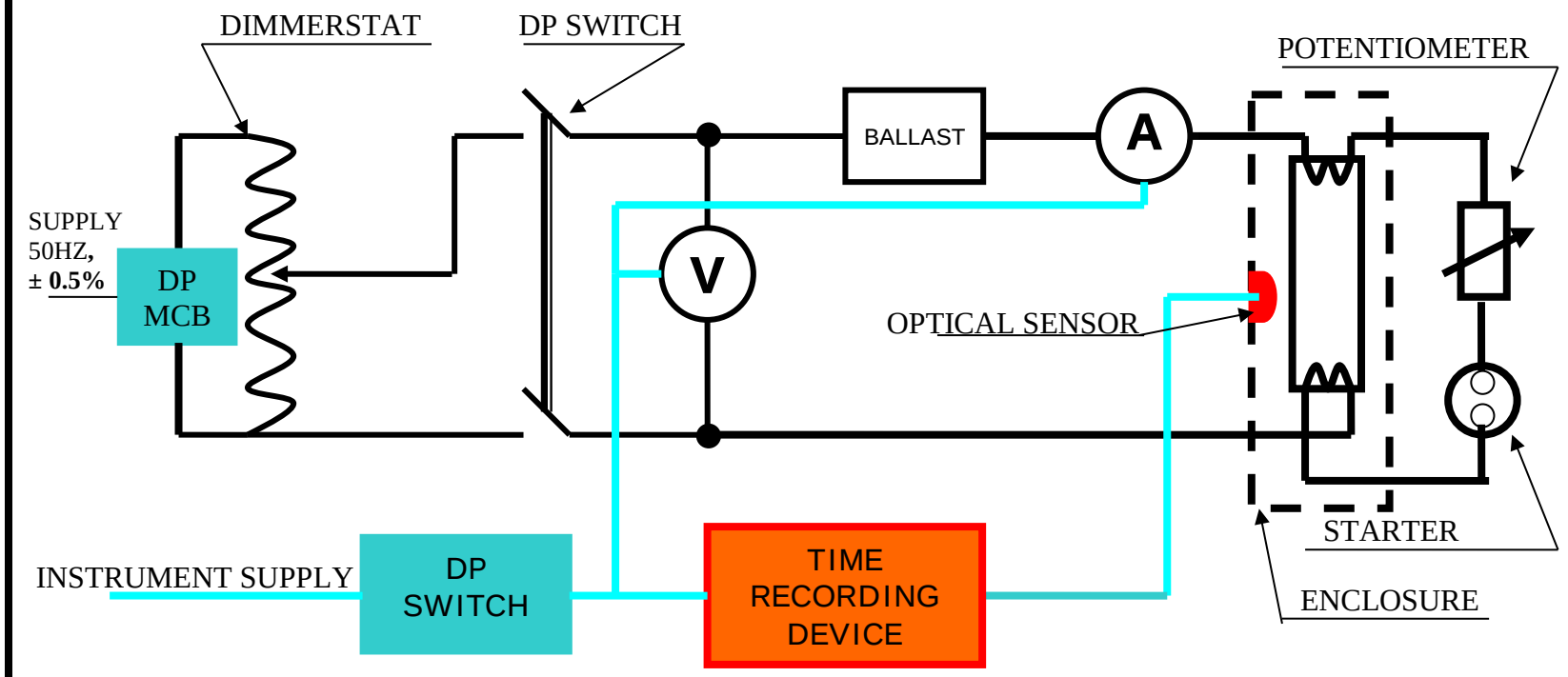
**6.0 Documentation**

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

**7.0 Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

# CIRCUIT DIAGRAM FOR STARTING TEST UNIT



# BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE T&C)

# EQUIPMENT SPECIFICATION

| | | |
|---|---|---|
| EQUIPMENT SPFN. CODE | : | **BBE 03** |
| NAME OF THE EQUIPMENT | : | **Voltage stabilization and frequency converter** |
| PROPOSED FOR BIS LABS | : | **BNBO T&C** |
| TOTAL QUANTITY REQUIRED | : | **01(one)** |

**1.0 Scope**

Covers the basic guiding requirements for the design of voltage stabilization and frequency converter required for carrying out the following test :

- Test for electrical, luminous and colour characteristics of tubular fluorescent lamps as per Appendix A of IS 2418(Part 1) : 1977.

**2.0 Test conditions**

For carrying out the test for electrical, luminous and colour characteristics on tubular fluorescent lamps, the frequency of the supply voltage shall be 50Hz with a tolerance of ± 0.5% and the supply voltage shall be stable within ± 0.5%. The total harmonic content of the supply voltage shall not exceed 3%.

**3.0 Technical specifications**

| | | |
|---|---|---|
| Capacity | : | 3 KVA |
| **Input** | | |
| Voltage | : | 230V ± 10% |
| Frequency | : | 50Hz ± 10% |
| Phase | : | Single phase |
| **Output** | | |
| Voltage | : | 230V |
| Voltage adjustment | : | ± 10% adjustable from nominal or better |
| Frequency | : | 50Hz |
| Frequency adjustment | : | ± 10% adjustable from nominal or better |
| Frequency stability | : | ± 0.1% or better |
| Voltage regulation : | | |
| Load regulation | : | ± 0.5% or better (No load to Full load) |
| Line regulation | : | ± 0.5% or better (for 10% line change) |
| Waveform | : | Sine wave |
| Harmonic distortion (THD) | : | Less than 3% |
| Load power factor | : | Unity to 0.5 lagging |

**4.0 Instruments and controls**

**Indications**

| | | |
|---|---|---|
| LCD / LED | : | Mains ON, Output ON, Mains under and over voltage, Output under and over voltage, Output overload |

**Metering**

| | | |
|---|---|---|
| Digital meters | : | Input AC Voltage, current & frequency ; Output AC Voltage, current & frequency |
| **Protections** | : | Input over/under voltage, Output over/under voltage, Output overload/short circuit |

**5.0 Test certificates :**

Test certificates on voltage regulation, frequency stability and harmonic distortion from NABL accredited testing laboratory shall be furnished along with the equipment.

**6.0 Documentation**

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

**7.0 Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

# BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE T&C)

# EQUIPMENT SPECIFICATION

| | | |
|---|---|---|
| EQUIPMENT SPFN. CODE | : | **DBE 01** |
| NAME OF THE EQUIPMENT | : | **Angular displacement test unit** |
| PROPOSED FOR BIS LABS | : | **BNBO T&C** |
| TOTAL QUANTITY REQUIRED | : | **01(one)** |

**1.0 Scope**

Covers the basic guiding requirements for the design of angular displacement test unit required for carrying out the following test :

- Test for maximum angular displacement of the plane of the cap pins on tubular fluorescent lamps as per Cl. 4.1.2.1 of IS 2418(Part 1) : 1977.

**2.0 Test conditions**

The maximum angular displacement of the plane of the cap pins at one end of the lamps with respect to the similar plane at the other end of the lamp shall not exceed 6º.

**3.0 Construction**

3.1 The apparatus shall be designed and constructed to carry out test for maximum angular displacement of the plane of the cap pins on tubular fluorescent lamps of the following ratings as per Cl. 4.1.2.1 of IS 2418(Part 1) : 1977:

18W / 600 × 26mm / G-13 / with starter
20W / 600 × 38mm / G-13 / with starter
36W / 1200 × 26mm / G-13 / with starter
40W / 1200 × 38mm / G-13 / with starter

3.2 The set-up, basically, consists of a mechanical structure supporting the two ends of the measuring device with provision to place the lamp horizontally. One end is fixed and the other end is adjustable along the length. A suitable measuring scale graduated in degrees is fixed to the movable end for measuring the angular displacement.

3.3 The mechanical structure shall be made of mild steel and shall be powder coated. The end fittings shall be hardened steel.

3.4 The least count and range of the measuring device shall be 2º(at least) and 0 - 10º on either side of the vertical axis.

3.5 The apparatus shall be of table-top model.

**4.0 Test certificates :**

Test certificates on the measuring scale from NABL accredited testing laboratory shall be furnished along with the equipment.

**5.0 Documentation**

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

**6.0 Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site.

The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

# BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE T&C)

# EQUIPMENT SPECIFICATION

| | | |
|---|---|---|
| EQUIPMENT SPFN. CODE | : | **DBE 03** |
| NAME OF THE EQUIPMENT | : | **Torsion test equipment** |
| PROPOSED FOR BIS LABS | : | **BNBOT&C** |
| TOTAL QUANTITY REQUIRED | : | **01(one)** |

**1.0 Scope**

Covers the basic guiding requirements for the design of torsion test equipment required for carrying out the following test :

- Torsion test on tubular fluorescent lamps as per Cl. 6.4 of IS 2418(Part 1) : 1977.

**2.0 Test conditions**

Lamps shall be inserted in a holder having the shape and dimensions given in Appendix C and fixed to a suitable torsion testing machine.

**3.0 Construction**

3.1 The equipment shall be designed and constructed to carry out torsion test on tubular fluorescent lamps of the following ratings as per Cl. 6.4 of IS 2418(Part 1) : 1977:
18W / 600 × 26mm / G-13 / with starter ; 20W / 600 × 38mm / G-13 / with starter
36W / 1200 × 26mm / G-13 / with starter ; 40W / 1200 × 38mm / G-13 / with starter

3.2 The set-up, basically, consists of a mechanical structure supporting the torsion test holders with provision to place the lamp horizontally. Required torsional moment is provided by means of a calibrated mass attached to a mechanism which can rotate around the horizontal axis. A suitable measuring scale graduated in Nm is fixed to one end for measuring the torsional moment.

3.3 The holders for torsion test shall conform to the requirements of Appendix C of IS 2418(Part 1) : 1977.

3.4 A locating device shall be fixed at a suitable distance from the holder to provide adequate support for the lamp while testing.

3.5 The mechanical structure shall be made of mild steel and shall be powder coated.

3.6 The range of the measuring device shall be at least 0 – 1.4 Nm.

3.7 The apparatus shall be of table-top model.

**4.0 Calibration :**

A calibration certificate on the torsion tester from NABL accredited calibration agency shall be furnished along with the equipment.

**5.0 Documentation**

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

**6.0 Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

# BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE T&C)

# EQUIPMENT SPECIFICATION

| | | |
|---|---|---|
| EQUIPMENT SPFN. CODE | : | **DBE 05** |
| NAME OF THE EQUIPMENT | : | **Length checking unit for TFL (36/40W)** |
| PROPOSED FOR BIS LABS | : | **BNBO T&C** |
| TOTAL QUANTITY REQUIRED | : | **01(one)** |

**1.0 Scope**

Covers the basic guiding requirements for the design of length checking unit required for carrying out the following test :

- Test for lamp dimensions on tubular fluorescent lamps as per Cl. 4.1.3 of IS 2418(Part 1) : 1977.

**2.0 Test conditions**

The lamp dimensions shall be as specified on the individual lamp data sheet in IS 2418(Part II) : 1977.

**3.0 Construction**

3.1 The equipment shall be designed and constructed to carry out test for lamp dimensions on tubular fluorescent lamps of the following ratings as per Cl. 4.1.3 of IS 2418(Part 1) : 1977:
36W / 1200 × 26mm / G-13 / with starter, and
40W / 1200 × 38mm / G-13 / with starter

3.2 The set-up, basically, consists of a mechanical structure supporting two flat blocks fixed at two ends with provision to place the lamp horizontally. The distance between the end blocks are calibrated and adjusted to the required value as specified in the Indian Standard.

3.3 The mechanical structure shall be made of mild steel and shall be powder coated. The end blocks shall be made of hardened steel.

3.4 The distance between the end blocks shall be calibrated and adjusted to the required value as specified in IS 2418(Part II) : 1977 .

3.5 The apparatus shall be of table-top model.

**4.0 Calibration :**

Calibration certificate on the length checking device from NABL accredited calibration agency shall be furnished along with the equipment.

**5.0 Documentation**

Technical documentation such as instruction manual shall be supplied along with the equipment.

**6.0 Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

# BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE T&C)

# EQUIPMENT SPECIFICATION

| | | |
|---|---|---|
| EQUIPMENT SPFN. CODE | : | **DBE 06** |
| NAME OF THE EQUIPMENT | : | **Length checking unit for TFL (18/20W)** |
| PROPOSED FOR BIS LABS | : | **BNBO T&C** |
| TOTAL QUANTITY REQUIRED | : | **01(one)** |

**1.0 Scope**

Covers the basic guiding requirements for the design of length checking unit required for carrying out the following test :

- Test for lamp dimensions on tubular fluorescent lamps as per Cl. 4.1.3 of IS 2418(Part 1) : 1977.

**2.0 Test conditions**

The lamp dimensions shall be as specified on the individual lamp data sheet in IS 2418(Part II) : 1977.

**3.0 Construction**

3.1 The equipment shall be designed and constructed to carry out test for lamp dimensions on tubular fluorescent lamps of the following ratings as per Cl. 4.1.3 of IS 2418(Part 1) : 1977:

18W / 600 × 26mm / G-13 / with starter

20W / 600 × 38mm / G-13 / with starter

3.2 The set-up, basically, consists of a mechanical structure supporting two flat blocks fixed at two ends with provision to place the lamp horizontally. The distance between the end blocks are calibrated and adjusted to the required value as specified in the Indian Standard.

3.3 The mechanical structure shall be made of mild steel and shall be powder coated. The end blocks shall be made of hardened steel.

3.4 The distance between the end blocks shall be calibrated and adjusted to the required value as specified in IS 2418(Part II) : 1977 .

3.5 The apparatus shall be of table-top model.

**4.0 Calibration :**

Calibration certificate on the length checking device from NABL accredited calibration agency shall be furnished along with the equipment.

**5.0 Documentation**

Technical documentation such as instruction manual shall be supplied along with the equipment.

**6.0 Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

# BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE T&C)

# EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE : **DBE 02**
NAME OF THE EQUIPMENT : **'GO' and 'NO-GO' gauges for G13 cap**
PROPOSED FOR BIS LABS : **BNBO T&C**
TOTAL QUANTITY REQUIRED : **01(one)**

**1.0 Scope**

Covers the basic guiding requirements for the design of 'GO' and 'NO-GO' gauges for G13 cap required for carrying out the following test :

- Test for cap dimensions on tubular fluorescent lamps as per Cl. 4.1.2 of IS 2418(Part 1) : 1977.

**2.0 Test conditions**

The dimensions of lamp caps shall be in accordance with IS 2418(Part III) : 1977.

**3.0 Construction**

3.1 The gauges shall be designed and constructed to carry out test for cap dimensions on tubular fluorescent lamps of the following ratings as per Cl. 4.1.2 of IS 2418 (Part 1) : 1977:
18W / 600 × 26mm / G-13 / with starter ; 20W / 600 × 38mm / G-13 / with starter
36W / 1200 × 26mm / G-13 / with starter ; 40W / 1200 × 38mm / G-13 / with starter

3.2 The dimensions and constructional details of the gauges shall be as given in Table 4 of IS 2418(Part IV) : 1977.

3.3 The gauges shall be made of hardened steel.

**4.0 Calibration :**

Calibration certificate on the gauges from NABL accredited calibration agency shall be furnished along with the equipment.

**5.0 Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

| | PREPARED BY | CHECKED BY | APPROVED BY |
|---|---|---|---|
| SIGNATURE | | | |
| NAME | RAJU PETER | N SHIVANANDAN | S P HIREMATH |
| DESIGNATION | LO(B) | Sc.E& OIC(E) | Sc.F&H BNBO TC |
| DATE | 06 January 2014 | | |