POSTED UNDER POSTAL CERTIFICATE

BUREAU OF INDIAN STANDARDS

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BIS BANGALORE LABORATORY
Peenya Industrial Area
1st Stage, Tumkur Road
Bangalore – 560 058

Ref : BNBL / 13:2 / TFL

Date : 14 September 2006

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

Dear Sir(s),

Quotation(s) is / are invited for the supply of the equipment(s) / item(s) required for testing Tubular Fluorescent Lamp as per IS 2418(Part 1) : 1977.

1. The terms and conditions for submitting quotations and supply of the equipment are given in **Annexure – I** (Page 2 to 4).

2. The details of the equipment(s) / item(s) required along with specification(s) are given in **Annexure - II** (Page 5 to 31).

3. The quotation(s) should reach the undersigned latest by 1430 hours on **12 October 2006** at the above address.

4. The quotation(s) shall be opened at 1500 hours on **13October 2006** in the presence of such tenderers or their duly authorized representatives who may like to attend.

5. Unless stated otherwise, quotation(s) shall be deemed to be for delivery at BIS Bangalore Branch Office Laboratory.

6. The tender is also posted in BIS Website – www.bis.org.in

Thanking you,

Yours faithfully,

(B.R. Narayanappa)
Director & Head BNBOL

Encl. : 1) Annexure - I
2) Annexure - II

Annexure - I

TERMS & CONDITIONS

1. **The quotation(s) shall be submitted in two parts – Technical bid & Financial bid**. The technical bid and financial bid should be sealed by the bidder in separate covers duly superscribed and both these sealed covers are to be put in a bigger cover which should also be sealed and duly superscribed "Quotations for the supply of Test Equipment for Tubular Fluorescent Lamp as per IS 2418(Part 1) : 1977". The financial bid will be opened after technical evaluation of technical bids. The date of opening of price bids will be informed to the bidders found suitable in technical evaluation.

2. **The offer/quotation must be strictly as per required specifications and the tender terms and conditions.**

3. The technical bid shall contain the technical leaflets/literature and complete specification of the quoted model(s) of the item. It must be ensured that the offers must be strictly as per our specifications. Deviations, if any from the specifications shall be clearly brought out along with justification.

4. The financial bid should clearly give break-up of cost of each equipment as per specifications. The rates quoted should separately indicate Basic Cost, Excise Duty, Sales Tax, Packing and Forwarding Charges, Freight, Insurance, VAT, etc. In the 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.

5. The bids shall remain valid for a period of 90 days from the date of opening of quotation(s) specified.

6. Documents in support of experience, past performance, technical capability, manufacturing facilities, and financial position of the supplier as well as client-list should be furnished along with the technical bid.

7. The bids shall be accompanied with Earnest Money Deposit(EMD) for an amount of Rs 27,000/- (Rupees twenty seven thousand only) by demand draft in favour of "Bureau of Indian Standards", payable at Bangalore. The sealed envelope containing EMD shall be superscribed "EMD" and stapled separately with the envelope containing Technical Bid. This will be returned to the unsuccessful bidders within 30 days of the award of the contract.

8. **The bidders shall mention in the quotation, the rate/amount of annual maintenance charges**, if BIS opts for maintenance contract after expiry of the warranty period. This is mandatory to mention.

9. **It shall be clearly mentioned in the technical bid of arrangements for after sales service.** Suppliers having the required infrastructure in or around Bangalore for providing timely and efficient service of the equipment will be preferred.

10. **The Bureau gives first preference in its purchase to goods bearing ISI Certification Mark and second preference to those which conform to the relevant Indian Standard Specification as applicable.**

11. The delivery of stores is required within 60 days of receipt of order. If however, it is not possible for you to effect delivery during working hours by that date, you should specify the date by which you can guarantee delivery of stores. Quotation(s) qualified by such vague and indefinite expressions as " subject to immediate acceptance", "subject to prior sale", etc. and incomplete quotation(s) is/are liable to be summarily rejected.

12. The equipment should be installed/commissioned and demonstrated by the supplier at BIS Bangalore Laboratory immediately, but in any case within one month after receipt of the item in the lab, and the same will be put under operation to the satisfaction of BIS technical personnel who will test the performance of the equipment. **No separate charges for installation, etc. will be paid to the party beyond the quoted prices**.

13. BIS shall pay 90% of the cost after satisfactory installation and commissioning and training, and the balance of 10% as **contract performance security** would be paid after expiry of warranty period. However other terms of payment for contract performance security can also be considered, if so stated clearly.

14. The warranty period of the equipment shall be clearly stated in the Technical Bid. The warranty period of an item/equipment shall commence from the date of receipt of the item/equipment in good working condition and satisfactory installation / commissioning / demonstration at BIS Bangalore Laboratory. The warranty period and validity of contract performance security shall be extended for the period of delay in satisfactory installation.

15. Successful tenderer shall be required to provide comprehensive maintenance guarantee for the equipment, including replacement of spares if any.

16. Successful tenderer shall be required to provide training to BIS personnel at BIS Bangalore Laboratory in the use of the equipment at the supplier's cost.

17. All goods shall be received subject to approval on inspection. The decision of our inspecting officer 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.

18. This Bureau reserves the right of accepting the whole or any part of the quotation(s) or portion of the quantity offered and the successful tenderer shall supply the same at the rate quoted.

19. The institution reserves the right to accept or reject summarily any or all quotation(s) in whole or in part without assigning any reason whatsoever.

20. The institution takes no responsibility for delay, loss or non-receipt of quotation(s) after dispatch.

21. In case of non-compliance with the terms and conditions of the contract, the Bureau reserves its right to :
    a) cancel/rescind/revoke the order if supply is not made in time and is not conforming to the required specifications.
    b) impose penalty up to 1% of the total value of the order for a delay of every seven days after the scheduled date subject to the ceiling of a maximum of 10% of the total value of the order.

22. All questions, disputes or differences arising under, out of or in connection with this tender enquiry shall be subject to the exclusive jurisdiction of Bangalore Courts.

23. **Bidders must furnish a compliance statement of each and every clause of the terms and conditions of the tender along with the quotation. The deviations, if any, from the terms and conditions shall be clearly brought out in the statement. One copy of the terms & conditions along with equipment specifications may be duly signed and returned with the technical bid as an acknowledgement of having read and accepted the same.**

Annexure – II

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 36/40W	CBE 04	01 no.
2.	Life Test Rack for TFL 18/20W	CBE 05	01 no.
3.	Ageing Rack for TFL 36/40W	CBE 10	01 no.
4.	Ageing Rack for TFL 18/20W	CBE 10.1	01 no.
5.	Starting Characteristics Test Unit for TFL	CBE 13	01 no.
6.	Voltage stabilization and frequency converter	BBE 03	01 no.
7.	Angular displacement test unit	DBE 01	01 no.
8.	Torsion test equipment	DBE 03	01 no.
9.	Length checking unit for 36/40W	DBE 05	01 no.
10.	Length checking unit for 18/20W	DBE 06	01 no.
11.	'GO' and 'NO-GO' gauges for G13 cap	DBE 02	01 no.

BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**CBE 04**
NAME OF THE EQUIPMENT	:	**Life Test Rack for TFL 36/40W**
PROPOSED FOR BIS LABS	:	**BNBOL**
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:
36W / 1200 × 26mm / G-13 / with starter
40W / 1200 × 38mm / G-13 / with starter

3.2 The holders shall be wired parallel supported by a single phase system. The total number of holders to be provided on the rack is as follows:
36W/40W/G-13 cap lamp holders : 60nos.
Typical details for fabrication of the life test rack is 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.

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 Two 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 A 3.5 digit, digital voltmeter(DPM) of reputed make, 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 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 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 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.

3.13 60 nos. starters shall be provided for the 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 (40A, 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 : 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 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

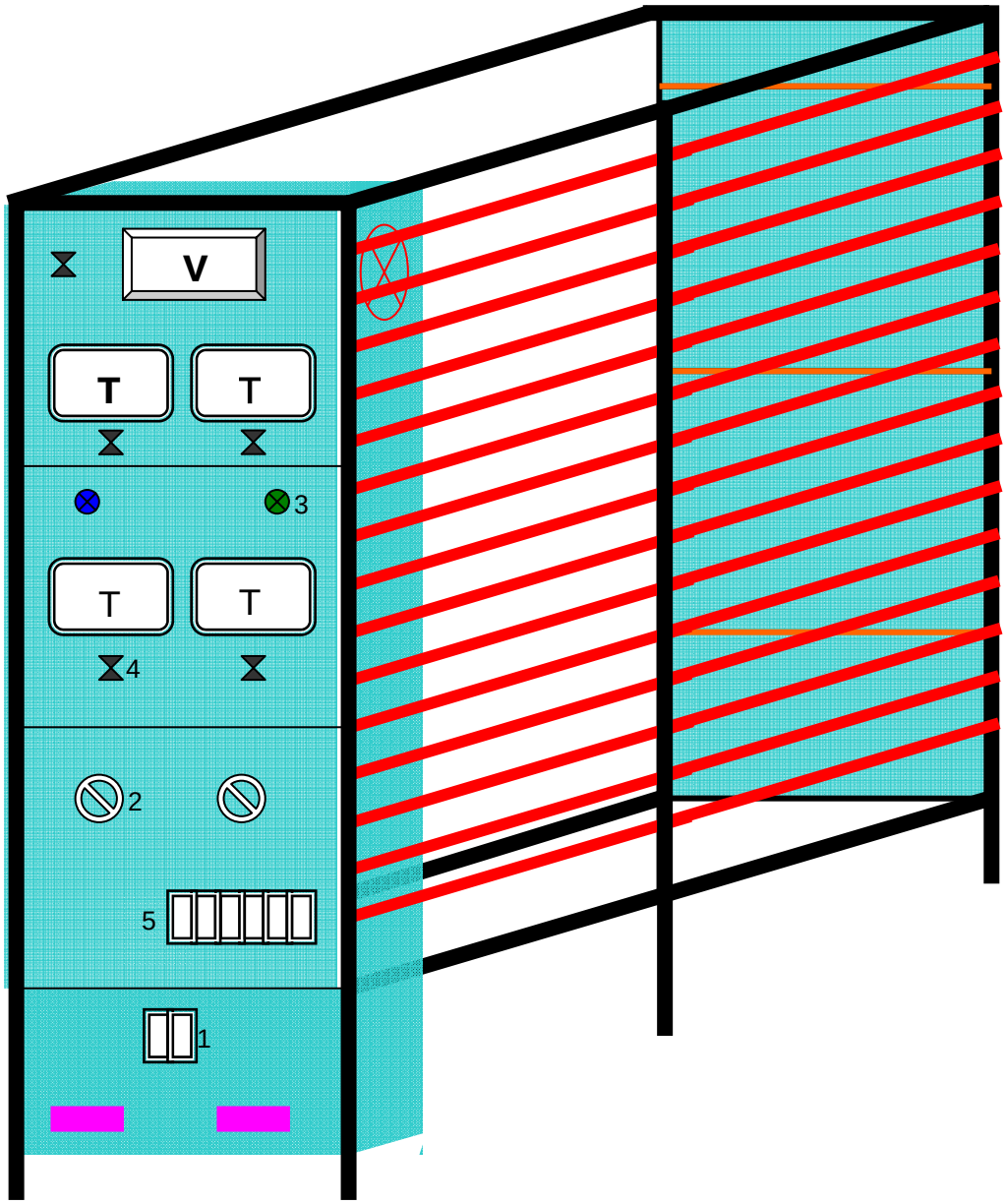
Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

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.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	M. RAJU PETER	S.K. SAHANA	
DESIGNATION	STA(LAB)	JD (Elect. Lab)	
DATE			

LIFE TEST RACK FOR TFL



1 – DOUBLE POLE MCB, TYPE D, 63A – 01no.
2 – ISOLATOR ROTARY SWITCH, 32A – 02 nos.
3 – INDICATOR LAMP
4 – ON-OFF SWITCH FOR METER/TIMER
5 – SINGLE POLE MCB, TYPE B, 16A – 06nos.
V – VOLTMETER(DPM), 0 – 300V, 3.5 digit, 0.5% accuracy
T – PROGRAMMABLE TIMER
⊗ - **COOLING FAN**

BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**CBE 05**
NAME OF THE EQUIPMENT	:	**Life Test Rack for TFL 18/20W**
PROPOSED FOR BIS LABS	:	**BNBOL**
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

3.2 The holders shall be wired parallel supported by a single phase system. The total number of holders to be provided on the rack is as follows:
18W/20W/G-13 cap lamp holders : 60nos.
Typical details for fabrication of the life test rack is 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.

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 Two 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 A 3.5 digit, digital voltmeter(DPM) of reputed make, 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 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 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 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.

3.13 60 nos. starters shall be provided for the 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 (40A, 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	: 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 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

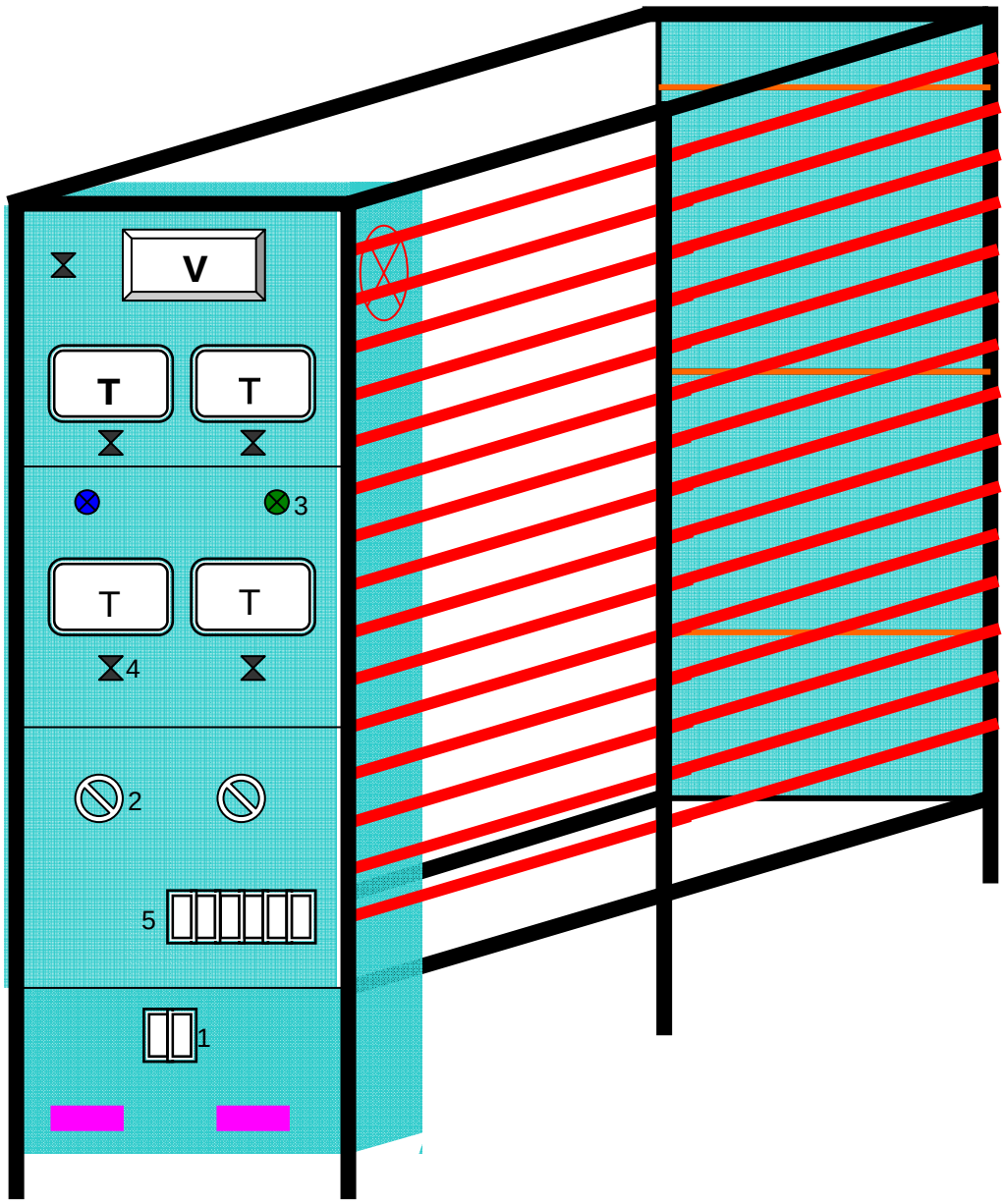
Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

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.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	M. RAJU PETER	S.K. SAHANA	
DESIGNATION	STA(LAB)	JD (Elect. Lab)	
DATE			

LIFE TEST RACK FOR TFL



1 – DOUBLE POLE MCB, TYPE D, 63A – 01no.
2 – ISOLATOR ROTARY SWITCH, 32A – 02 nos.
3 – INDICATOR LAMP
4 – ON-OFF SWITCH FOR METER/TIMER
5 – SINGLE POLE MCB, TYPE B, 16A – 06nos.
V – VOLTMETER(DPM), 0 – 300V, 3.5 digit, 0.5% accuracy
T – PROGRAMMABLE TIMER
⊗ - COOLING FAN

EQUIPMENT SPFN. CODE	:	**CBE 10**
NAME OF THE EQUIPMENT	:	**Ageing Rack for TFL 36/40W**
PROPOSED FOR BIS LABS	:	**BNBOL**
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:
36W / 1200 × 26mm / G-13 / with starter
40W / 1200 × 38mm / G-13 / with starter

3.2 The holders shall be wired parallel supported by a single phase system. The total number of holders to be provided on the rack is as follows:
36W/40W/G-13 cap lamp holders : 60nos.
Typical details for fabrication of the ageing rack is 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.

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 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 A 3.5 digit, digital voltmeter(DPM) of reputed make, 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 (40A, 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 : 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 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

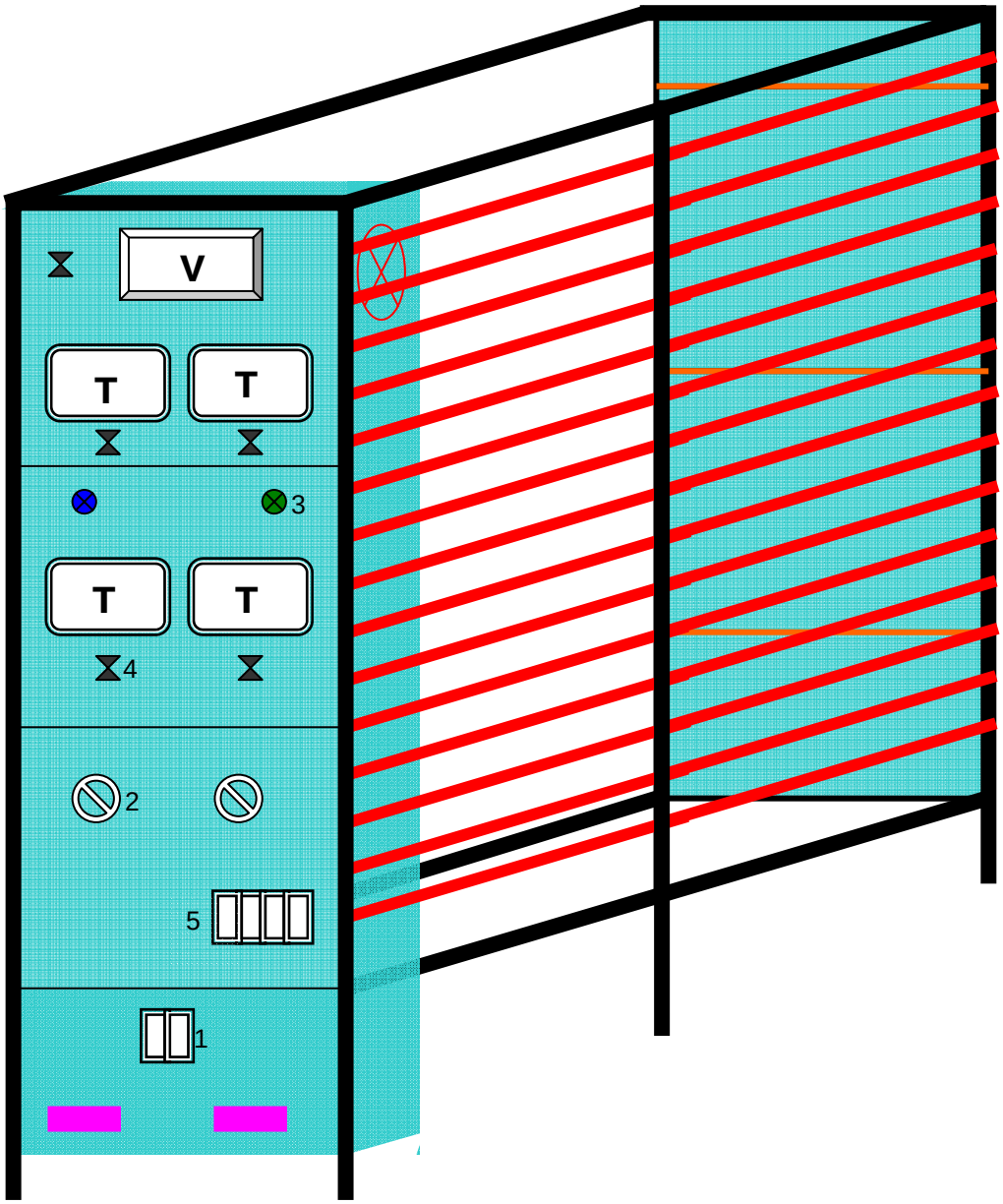
Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

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.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	M. RAJU PETER	S.K. SAHANA	
DESIGNATION	STA(LAB)	JD (Elect. Lab)	
DATE			

AGEING RACK FOR TFL



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BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**CBE 10.1**
NAME OF THE EQUIPMENT	:	**Ageing Rack for TFL 18/20W**
PROPOSED FOR BIS LABS	:	**BNBOL**
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.

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3.2 The holders shall be wired parallel supported by a single phase system. The total number of holders to be provided on the rack is as follows:
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Typical details for fabrication of the ageing rack is shown in the drawing attached.

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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 (40A, 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	: 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 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.

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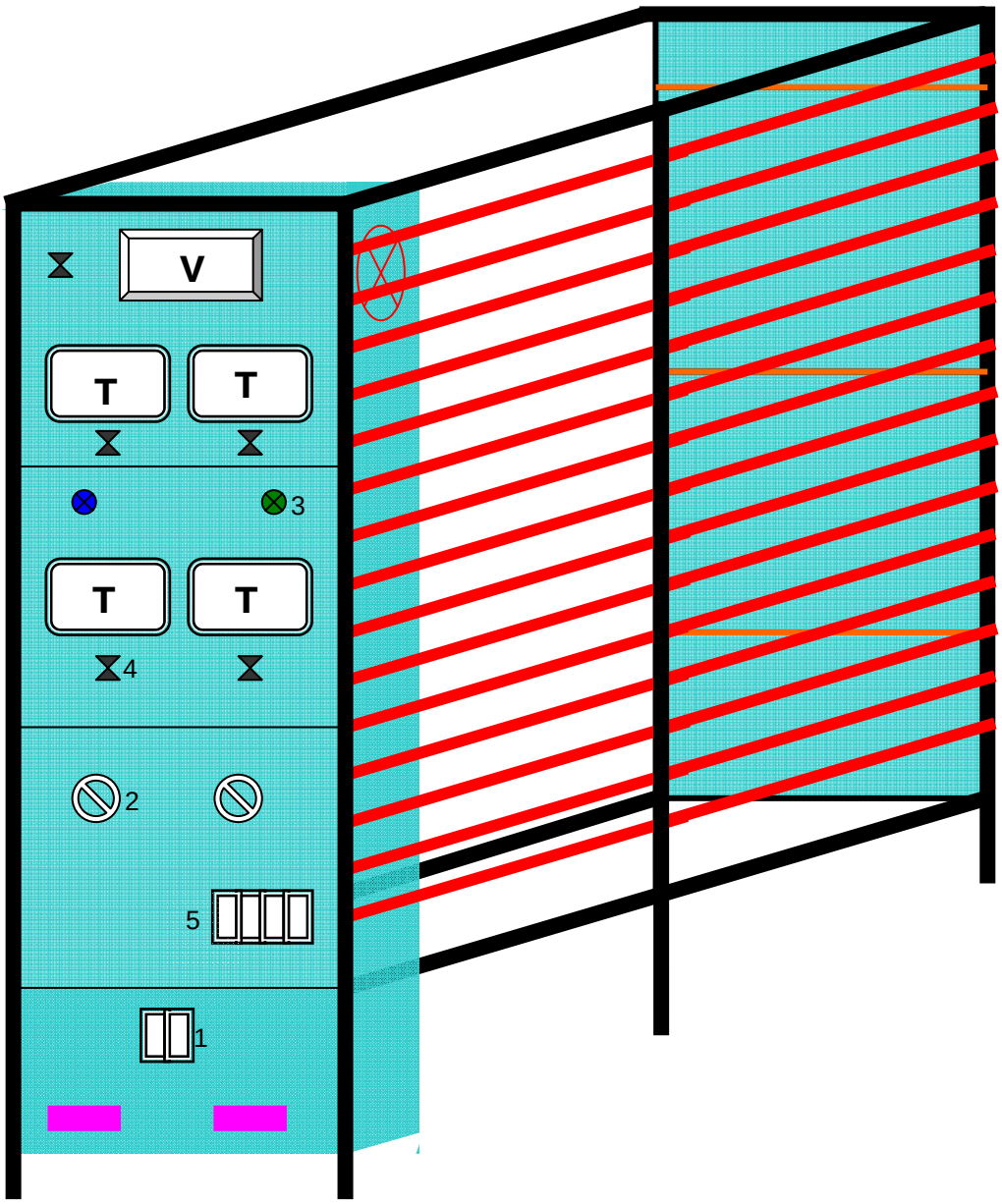
SIGNATURE			
NAME	M. RAJU PETER	S.K. SAHANA	
DESIGNATION	STA(LAB)	JD (Elect. Lab)	
DATE			

AGEING RACK FOR TFL



1 – DOUBLE POLE MCB, TYPE D, 63A – 01no.
2 – ISOLATOR ROTARY SWITCH, 32A – 02 nos.
3 – INDICATOR LAMP
4 – ON-OFF SWITCH FOR METER/TIMER
5 – SINGLE POLE MCB, TYPE B, 16A – 04nos.
V – VOLTMETER(DPM), 0 – 300V, 3.5 digit, 0.5% accuracy
T – PROGRAMMABLE TIMER
⊗ - COOLING FAN

BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**CBE 13**
NAME OF THE EQUIPMENT	:	**Starting Characteristics Test Unit for TFL**
PROPOSED FOR BIS LABS	:	**BNBOL**
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 and starting test on compact fluorescent lamps as per Cl. 8 of IS 15111(Part 2) : 2002.

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

The equipment shall also be suitable for carrying out starting test on compact fluorescent lamps as per Cl. 8 of IS 15111(Part 2) : 2002.

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.

3.8 Suitable provision shall be made for carrying out starting test on compact fluorescent lamps as per Cl. 8 of IS 15111(Part 2) : 2002..

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 20W& 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.

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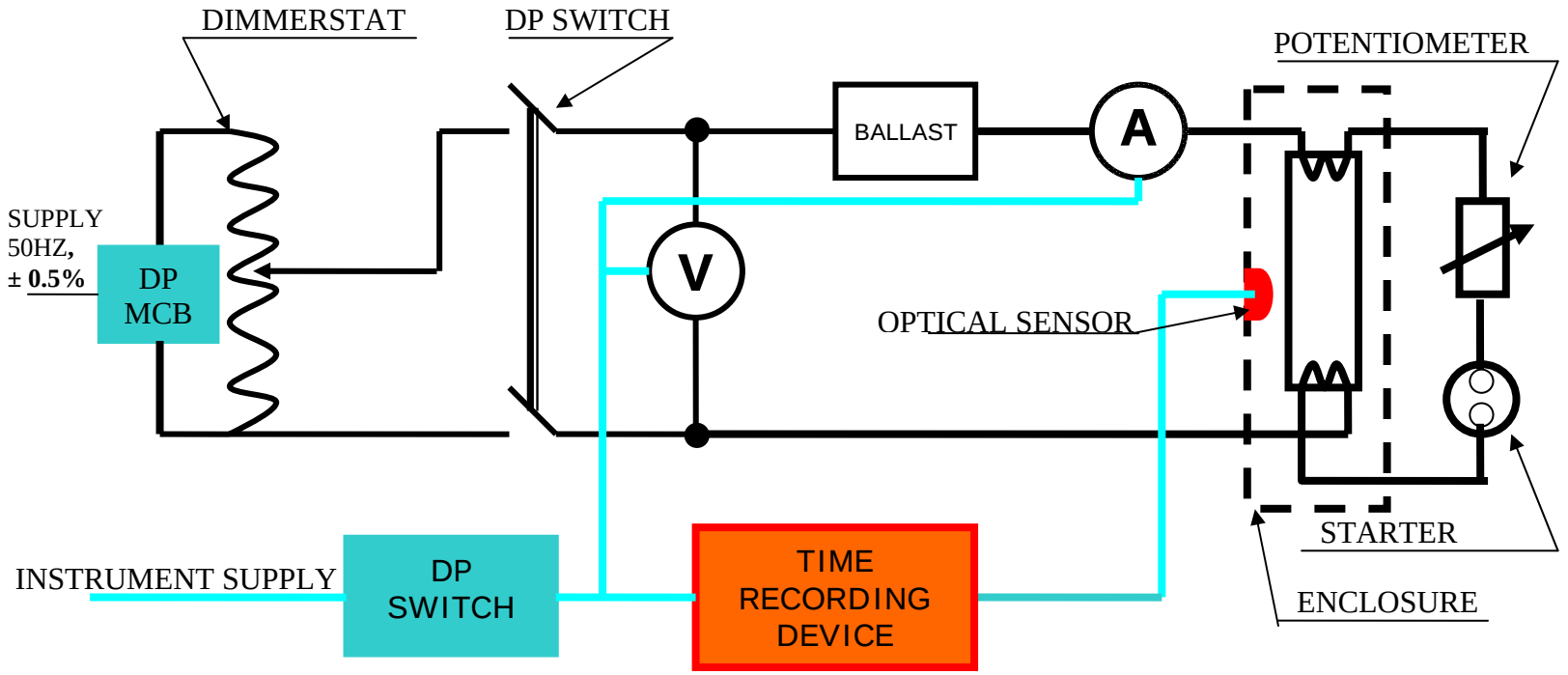
CIRCUIT DIAGRAM FOR STARTING TEST UNIT



BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**BBE 03**
NAME OF THE EQUIPMENT	:	**Voltage stabilization and frequency converter**
PROPOSED FOR BIS LABS	:	**BNBOL**
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.

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BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**DBE 01**
NAME OF THE EQUIPMENT	:	**Angular displacement test unit**
PROPOSED FOR BIS LABS	:	**BNBOL**
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 manual shall be supplied along with the equipment.

6.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year.

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BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**DBE 03**
NAME OF THE EQUIPMENT	:	**Torsion test equipment**
PROPOSED FOR BIS LABS	:	**BNBOL**
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 manual shall be supplied along with the equipment.

6.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year to cover any manufacturing defects.

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BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**DBE 05**
NAME OF THE EQUIPMENT	:	**Length checking unit for TFL (36/40W)**
PROPOSED FOR BIS LABS	:	**BNBOL**
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 to cover any manufacturing defects.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
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BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**DBE 06**
NAME OF THE EQUIPMENT	:	**Length checking unit for TFL (18/20W)**
PROPOSED FOR BIS LABS	:	**BNBOL**
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 to cover any manufacturing defects.

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BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**DBE 02**
NAME OF THE EQUIPMENT	:	**'GO' and 'NO-GO' gauges for G13 cap**
PROPOSED FOR BIS LABS	:	**BNBOL**
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 gauges shall be guaranteed for a minimum period of one year to cover any manufacturing defects.

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