

## **TENDER**

**for**

### ***Supply, Erection & Commissioning of “Induction Motor Testing Lab facilities”***

**Tender No. NTSC(C)/EC/LAB(M)-2/14-15**

Issued By

NSIC TECHNICAL SERVICES CENTRE,  
THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.,  
(A GOVT. OF INDIA ENTERPRISE)  
SECTOR B-24, GUINDY INDUSTRIAL ESTATE  
EKKADUTHANGAL, CHENNAI – 600 032.

Tel: 044-22252335/6/7  
Email: ntsche@nsic.co.in

Fax: 044-22254500  
Website: www.nsic.co.in

**NSIC TECHNICAL SERVICES CENTRE,  
THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.,  
(A GOVT. OF INDIA ENTERPRISE)**

**Sector B-24. Guindy Industrial Estate, Ekkaduthangal, Chennai – 600032.**

**Tel: 044-22252335/6/7 Fax: 044-22254500 Email: ntsche@nsic.co.in Website: www.nsic.co.in**

Ref. No: - NTSC(C)/EC/LAB(M)-2/14-15

Dated: - 08/08/2014

**INDEX**

<b>Sl. No.</b>	<b>Description</b>	<b>Page No.</b>
<b>1</b>	Cover Page	1
<b>2</b>	Index	2
<b>3</b>	Notice Inviting Tender	3
<b>4</b>	Instructions to the Tenderers	4
<b>5</b>	Form of Tender	5
<b>6</b>	Commercial and General Terms & Conditions	6 – 7
<b>7</b>	Annexure – A	8 – 11

**NSIC TECHNICAL SERVICES CENTRE,  
 THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.,  
 (A GOVT. OF INDIA ENTERPRISE)**

**Sector B-24. Guindy Industrial Estate, Ekkaduthangal, Chennai – 600032.**

Tel: 044-22252335/6/7 Fax: 044-22254500 Email: ntscche@nsic.co.in Website: www.nsic.co.in

Ref. No: - NTSC(C)/EC/LAB(M)-2/14-15

Dated: - 08/08/2014

**NOTICE INVITING TENDER**

Sealed tenders are hereby invited on behalf of the Chief General Manager, NSIC Technical Services Centre (Chennai), Sector B-24, Guindy Industrial Estate Ekkaduthangal, Chennai – 600 032 from the reputed manufacturers/ firms/ companies who are interested for **Supply, Erection & Commissioning of Induction motor testing lab facility** as per specifications at Annexure – A , so as to reach to Chief General Manager, NSIC-Technical Services Centre (Chennai), Sector B-24, Guindy Industrial Estate Ekkaduthangal, Chennai – 600 032 upto **11:00 AM. on 01/09/2014**. The details as summarized below:-

a)	Name of the Machines and equipments	As per Annexure-A
b)	Earnest Money Deposit	5% of the quoted price which should be <b>rounded off</b> to the <b>nearest Rs.500 on higher sides</b> . (Example: if calculated EMD is Rs.501 then Rs.1000/- is to be deposited as EMD).
c)	Cost of Tender Document	<b>Rs. 1000/- plus Sale Tax @ 5% (non-refundable)</b>
d)	System of Tender Document	Two bid system – technical bid and financial bid separately in two sealed covers superscribing “ <b>technical bid for supply, erection &amp; commissioning of induction motor testing lab facility</b> ” and “ <b>financial bid for supply, erection &amp; commissioning induction motor testing lab facility</b> ”. both envelopes should be kept in a third cover superscribing “ <b>tender for supply, erection &amp; commissioning of induction motor testing lab facility</b> ”.
e)	Supply of Machines and Equipments	Three months from the date of awarding the order
f)	Last date of submission of completed tender documents	<b>01/09/2014 upto 11:00 AM.</b>
g)	Date of issue of Tender	11/08/2014 (to be downloaded from NSIC web site)
h)	Estimated cost of Induction motor Test facilities	<b>106 Lakhs (inclusive of all taxes, freight etc.)</b>

The other Terms and Conditions applicable to this tender have been incorporated in the tender documents.

**NSIC TECHNICAL SERVICES CENTRE,  
THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.,  
(A GOVT. OF INDIA ENTERPRISE)**

**Sector B-24. Guindy Industrial Estate, Ekkaduthangal, Chennai – 600032.**

**Tel: 044-22252335/6/7 Fax: 044-22254500 Email: ntscche@nsic.co.in Website: www.nsic.co.in**

---

Ref. No: - NTSC(C)/EC/LAB(M)-2/14-15

Dated:- 08/08/2014

**INSTRUCTIONS TO THE TENDERERS**

The Tender shall be submitted in accordance with these instructions and any tender not conforming thereto is liable to be rejected. These instructions shall form the part of the tender and contract.

1. The tender should be submitted in two bid system – Technical Bid and Financial Bid separately as explained in “Notice Inviting Tender” in previous page. The technical bids will be opened at the first instance and evaluated by competent committee or Authority. At the second stage Financial Bids of the technically qualified Bidders only will be opened for further evaluation and ranking before awarding the contract.
2. Tender Document has to be downloaded from web site [www.nsic.co.in](http://www.nsic.co.in) and the cost of Tender Document should be enclosed with the Tender in the cover of technical Bid by way of Demand Draft/Pay Order in favour of “ NSIC Ltd. A/c NTSC.” payable at **Chennai**.
3. The tender shall be completed in all respects (**should be signed and dated by the Authorized Signatory in all pages**). **The tender received without tender fee and Earnest Money shall be rejected outright.**
4. Earnest Money deposit: – **5% of the quoted price** as explained in “Notice Inviting Tender” in previous page. EMD should be **rounded off** to the **nearest Rs.500 on higher sides**. (Example: if calculated **EMD is Rs.501** than **Rs.1000/- is to be deposited as EMD**).
5. **Tenderer submitting registration certificate issued by NSIC to claim exemption in EMD and Tender document cost will be applicable for those items in which the tenderer are registered. Tenderer has to submit EMD, as explained above, in case the item supplied by him is not mentioned in the registration certificate.**
6. All participant from manufacturers/ firms/ companies are instructed to enclose attested copies of the following documents in Technical Bid cover, failing which their bids will be summarily/ out- rightly rejected:
  - a. Copy of CST/VAT/TIN Registration Certificates
  - b. Copy of Income Tax Return.
  - c. Any other copies of Certificate (BEE/ISI/NABL/DGS&D/NSIC etc.)

## FORM OF TENDER

To,  
The Chief General Manager  
NSIC- Technical Services Centre  
Sector B-24, Guindy Industrial Estate  
Ekkaduthangal, Chennai – 600 032

Dear Sir,

Subject: Offer for Supply, Erection & Commissioning of Induction Motor Testing Lab facility.

**Tender No: NTSC(C)/EC/LAB(M)-2/14-15**

HAVING EXAMINED AND PERUSED THE FOLLOWING DOCUMENTS

1. Notice Inviting Tender
2. Instruction To The Tenderers
3. Form Of Tender
4. Terms & Conditions For Supply

I/We hereby submit our quoted rates in the enclosed format as Annexure - A. The validity of the offer is 60 days from the last date of submission of tenders. Should our tender be accepted I/We agree:-

1. A Sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) Only as Earnest Money Deposit shall be retained by NSIC-Technical Services Centre on account of security deposit.
2. The tender document along with your delivery instructions shall constitute and bind contract between us and NSIC Technical services Centre, Chennai.
3. In the event of failure to deliver the machines/equipments within stipulated time of four months period in full, liquidated damages at the rate of 1.00 percent per week of delay with a maximum of 10 Percent will be levied for delayed supply.
4. Earnest money will be refunded to us **without any interest thereof, if our tender is not accepted.**

**Enclosed Annexure –A**

Authorized Signature  
Name of Signatory & Seal of Firm

**NSIC TECHNICAL SERVICES CENTRE,  
THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.,  
(A GOVT. OF INDIA ENTERPRISE)**

**Sector B-24. Guindy Industrial Estate, Ekkaduthangal, Chennai – 600032.**

**Tel: 044-22252335/6/7 Fax: 044-22254500 Email: ntsche@nsic.co.in Website: www.nsic.co.in**

Ref. No: - NTSC(C)/EC/LAB(M)-2/14-15

Dated: - 08/08/2014

**COMMERCIAL AND GENERAL TERMS & CONDITIONS**

Subject: Offer for Supply, Erection & Commissioning of Induction Motor Testing Lab facility Tender No: NTSC(C)/EC/LAB(M)-2/14-15

Sealed Tenders are hereby invited for Supply, Erection & Commissioning of Induction Motor Test Lab as per following terms & conditions:

1. Tenderers shall submit their offers in two bid system, in sealed cover superscribed as **“Tender for Supply, Erection & Commissioning of Induction Motor Testing Lab facility”** as explained in the **INSTRUCTION TO THE TENDERERS** at NSIC Technical Service Centre, Chennai on or before **01.09.2014** up to **11:00 AM**.
2. Tenderers are strictly advised to quote their rates for the machines/ equipments as per the specifications furnished in **Annexure – A. Excise Duty, VAT, Insurance, Packing, Transportation charges etc.** whatever applicable should be mentioned clearly.
3. The Tender should be accompanied with the Earnest Money Deposit equivalent to 5% of the quoted price as explained in the **INSTRUCTION TO THE TENDERERS** and the EMD should be deposited in the form of Demand Draft /Pay Order in favour of **“NSIC Ltd. A/c NTSC”** payable at Chennai. **No Cheque or cash shall be accepted.** EMD should be annexed with the technical bid. **The offers without Earnest Money Deposit will be rejected.** Tenderers claiming for exemption of EMD should furnish the applicable documents.
4. The validity of the offer shall be of **60 days** from the last date of submission of the Tender.
5. The Chief General Manager, NSIC-TSC, Chennai reserves all the rights to accept or reject any or all the offers. The Centre is also not bound to accept the lowest offer.
6. The offer should be made in the Tender form and marked as **tender No. NTSC(C)/EC/LAB(M)-2/14-15; Dated: - 08/08/2014.**
7. The tenders will be opened at NTSC-Chennai **on 01.09.2014 at 11.30 AM.** The Tenderers or their authorized representatives (One person only) may be present at the time of opening of the tender.
8. The EMD deposited by the successful Tenderers shall be adjusted for the security deposit. The EMD deposited by the successful Tenderers will be refunded after issue of order to the successful Tenderer.

9. The successful Tenderers shall deliver the items to NTSC- Chennai within four months from the date of issue of order. In case the items are not supplied within the stipulated period, the **Security or Earnest Money Deposited shall be forfeited.**
10. All the machines/ equipments supplied alongwith the hardware and software should be guaranteed for one year from the date of commissioning.
11. The successful tenderer has to provide **pre dispatch inspection** with proper demonstration at their work place before supplying the same.
12. Detailed System Engineering of the equipments should be submitted, by the successful tenderer, comprising of General arrangement drawing, Foundation layout, Wiring diagram and operation cum maintenance manual with spare parts list.
13. Training regarding trouble shooting, system's working principle, use of equipment, general up-keeping etc. should be provided by the successful tenderer.
14. **Tenderers have to enclose, in the technical bid, detailed block diagram clearly explaining the system's operations.**
15. **Detailed information regarding after sales service should be provided.**
16. **Payment terms:** 75% of the order value against receipt of items at our Centre in good condition and the balance amount after installation, commissioning and satisfactory report of working. The Earnest money deposited will be refunded after completion of guarantee period of one year.  
Regarding EMD exempted suppliers, 75% of the order value against receipt of items at our Centre in good condition, 20% of the order value after installation, commissioning and satisfactory report of working and the balance 5% after completion of guarantee period of one year.
17. All the communication shall be addressed to:  
**The Chief General Manager,**  
NSIC TECHNICAL SERVICES CENTRE,  
THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.,  
(A GOVT. OF INDIA ENTERPRISE)  
SECTOR B-24, GUINDY INDUSTRIAL ESTATE  
EKKADUTHANGAL, CHENNAI – 600 032.  
TEL: 22252335/6/7, Fax: 22254500  
Email: [ntscche@nsic.co.in](mailto:ntscche@nsic.co.in)
18. The decision of the NSIC Technical Services Centre, Chennai will be final and binding on the Tenderers.
19. In the event of any dispute, the legal matter shall be subjected to the jurisdiction of Chennai / **Chennai court only.**

### Specification for Induction Motor Testing Lab Facility

<b>OBJECTIVE:</b>			
To set up of automatic test beds for testing of induction motors <b>by regenerative method</b> to minimize power consumption. <b>Power consumption should be 40% or less, taken from Grid at full load condition</b> , compared to traditional testing by using dynamometer method. <b>The capacity of testing setup should be provided from 0.5HP to 3.0 HP in single Phase and from 1.0 HP to 150HP in three phase</b> in three numbers of test bed.			
<b>SCOPE OF TESTING:</b>			
- Testing of single and three phase induction motors upto max. 150 HP capacity in different frequency range from 20 Hz. to 60 Hz.		- Testing of motors from 132S to 315L frame size	
- Testing of motor speed upto 3600 RPM		- Testing capacity of torque upto 2000 Nm. The facility should be provided to make constant torque at variable speed.	
- Motor resting table with hydraulic/pneumatic system upto 300 mm (minimum).			
<b>All the test to be performed as per IS 996, IS 325, IS 12615 by automatic mode. The instruments and transducers/sensors required to perform the following tests should be integrated with control panel assembly and test bench rig.</b>			
- I.R (Insulation resistance) test		- H.V test	
- Measurement of resistance of windings of stator and wound rotor		- No load test at rated and various voltage to determine input power, current and speed.	
Open circuit voltage ratio of wound rotor motors (slip ring motors)		- Reduce voltage running up test at no load (for squirrel cage motors upto 37 KW )	
- Locked rotor readings of voltage, current & power input at suitable reduced voltage		-Full load test to determine efficiency, power & slip	
- Full load test at various voltages with output keeping constant		- Temperature rise test	
- Locked rotor test to determine breakaway torque		- Momentary overload test	
- Pull-up & Pull-out torque test		- Over speed test	
- Surface temperature measurement of motor at various location		- Occasional excess current test (1.5 time of rated current upto min. 2 minutes))	
- Direction of rotation		- Load test at various load upto 150%	
<b>Measurement facility of following parameters:</b>			
-Single & three phase voltage. (Ph. to Nu & Ph. to Ph.)		-Single & three phase ampere. (Per Ph. & Total Average)	
-Single & three phase active, reactive and apparent power. (Per Ph. & Total average)		-Frequency (Hz) and power factor	
-RPM, %Slip		-Torque measurement	
- Resistance of winding		-Temperature	
<b>TEST PROCESS:</b>			
Induction motor test to be controlled by software with help of data acquisition system, as per scope of testing. Test data will be measured by control panel (includes power analyzer and other instruments) interfaced through USB/RS-485/RS-232 to computer, to provide data. Software installed in computer receives all data from instruments and generate reports and graphs accordingly.			
<b>OUT PUT FROM SOFTWARE:</b> Motor performance report			
Curve for load current Vs output	Torque Vs Speed at various load at rated voltage of motor	Efficiency Vs output	Power factor Vs output
% Slip Vs. output	Load current Vs Slip	NL voltage Vs NL current	I/p Power Vs Speed at constant torque



<b>Test bed for testing of single phase and three phase induction motors from 0.5HP to 150HP</b>			
<b>Sl. No.</b>	<b>Description of Item No. A - Control Panel with Power Analyzer (branded/standard make/own make)</b>	<b>Qty</b>	<b>Rate</b>
<b>1.</b>	<p>Control Panel for testing of single and three phase motor :</p> <p>Two separate control panels should be provided to meet out the testing requirement of the motors:</p> <p>1<sup>st</sup> for 1 Ph and 3 Ph.(both), rating from 0.5 HP to 30 HP. 2<sup>nd</sup> for 3 ph.(exclusively), rating from 5 HP to 150 HP.</p> <p>Specification:</p> <ul style="list-style-type: none"> <li>- Powder coated panel box.</li> <li>- 1 ph. Starter. (Capacity: 35 Amp. minimum.)</li> <li>- Capacitor selector switches for start &amp; Run. Capacitors.</li> <li>3Ph. Star delta starter. (capacity: as per system rating requirement)</li> <li>- Voltage up-Down switches. (For dimmer)</li> <li>- Programmable control card &amp; relay card, data acquisition card.</li> <li>- Motor testing software with curve &amp; performance report.</li> </ul> <p><i>Note: Switchgear &amp; wires used in panel should be of appropriate/required current and standard make.</i></p>	02 set	
<b>2.</b>	<p><b>The following parameters of Single phase &amp; three phases should be measured by Power analyzer with basic accuracy 0.1% of reading for power, voltage, current, frequency, power factor and 0.5% of reading for torque, resistance, RPM, slip &amp; temperature measurement. The power analyzer should be computer interface. This analyzer should be capable for measurement of the following parameters of 0.5 HP to 150 HP at no load to full load condition.</b></p> <p><b>1<sup>st</sup> power analyzer should be capable for measurement from 0.5 HP to 30 HP with above mentioned accuracy range.</b></p> <p><b>2<sup>nd</sup> power analyzer should be capable for measuring from 15 HP to 150 HP with above mentioned accuracy range.</b></p> <ul style="list-style-type: none"> <li>- Single &amp; three phase voltage. (Ph to Nu &amp; Ph. to Ph.)</li> <li>- Single &amp; three phase ampere. (Per Ph. &amp; Average)</li> <li>- Single &amp; three phase active, reactive and apparent power. (Per Ph. &amp; Total)</li> <li>- Frequency (Hz), power factor, RPM, %Slip, CRPM.</li> <li>- Computer I/F through USB/RS-232.</li> </ul> <p><b>Note:</b></p> <ol style="list-style-type: none"> <li>a) Current capacity should be as per system rating requirement.</li> <li>b) Power analyzer should be either own make or branded make like Yokagawa, Fluk etc.</li> <li>c) Calibration certificate of the Power analyzer should be submitted from the NABL accredited Lab.</li> </ol>	02 set	

<b>3.</b>	<b>Fabricated motor resting table with hydraulic/pneumatic system (suitable for all types of motor frame size), Pneumatic break, Disc type coupling &amp; triple/double axis table with 0-300 mm stroke (minimum).</b>		
<b>3.1</b>	0.5 HP to 5 HP	01	
<b>3.2</b>	5 HP to 30 HP	01	
<b>3.3</b>	30 HP to 150 HP	01	
<b>4.</b>	Laser type speed sensor for each bed (Make: branded /standard.)	03	
<b>5.</b>	Regenerative / AC drive(minimum 02 or more as needed to meet out our requirement) Branded Make like Siemens/ABB/Mitsubishi...etc.	---	
<b>6.</b>	Loading motor (minimum 03 or more as needed to meet out our requirement) Branded Make like Siemens/ABB/CG...etc. Efficiency of each motor should be more than 88%.	---	
<b>7.</b>	A <b>separate bed</b> is required for Eddy current Dynamometer (Air Cooled) upto the capacity of 5.0 HP for loading of single phase submersible motor to find out efficiency. It should also be controlled by 1 <sup>st</sup> control panel. It should be operated in vertical and horizontal orientation. <b>The arrangement should be provided for testing of horizontal induction motor(mono block or regenerative) and vertical induction motor(submersible motor)</b>	01 set	

**NOTE:**

- All measuring and sensing instruments to be accompanied with **calibration certificate from NABL accredited lab** and should be submitted at the time of supply.
- **Item No. A** is considered as **one set** but, the quotation should be submitted separately as per serial number.
- The tenderer have to **submit an authorization letter** as a dealer from the principle manufacturer in case he is dealing in the equipment's made by the principle manufacturer.
- The tenderer will be responsible for providing after sale and services for entire system including all parts and equipment's.
- The operating system voltage for single phase is 220/230 Volt and for three phase 400/415 Volt. at 50 Hz.
- Control panel should be well equipped with all the necessary protection system namely:
  - a. Dynamic short circuit protection.
  - b. Under voltage monitoring.
  - c. DC bus over voltage protection.
  - d. Over current protection.
  - e. Over temperature protection.
  - f. Other if any.

## THREE BED SYSTEM

