

PURCHASE ENQUIRY

| | | |
|-----------|---|-------------------|
| To M/s | Our E-mail : smb@bhelswr.co.in | |
| | ENQUIRY No : | BHE/PW/PUR/X047 E |
| | ENQ.DATE | 17.02.11 |
| | DUE DATE | 10.03.11 |

Dear Sir,

Kindly submit your sealed quotation by Speed Post / Registered Post / Courier / Air Mail in **two bids viz. (1) Technical cum Commercial Bid & (2) Price Bid** for the material indicated below confirming acceptance to the terms and conditions enclosed, so as to reach our office on or before 2.00 PM on the due date. Quotation may be sent by Fax only if asked so by BHEL / with prior permission of BHEL.

| S.No. | Description of Material | Unit | Qty | Delivery Schedule | Material Required at (Destination) |
|-------|--|------|-----|------------------------------|---|
| 01 | SUPPLY OF SECONDARY INJECTION KIT AS PER ANNEXURE-I | Nos. | 01 | WITHIN 6 WEEKS FROM PO. DATE | REGIONAL SERVICE CENTRE 568/1, PARPIA COMPOUND, R.C. DUTT ROAD, VADODARA-390 007 (GUJARAT) |
| 02 | SUPPLY OF INDUCTIVE WINDING RESISTANCE METER AS PER ANNEXURE-II | Nos. | 01 | | |
| 03 | SUPPLY OF CIRCUIT BREAKER TIMING KIT AS PER ANNEXURE-III | Nos. | 01 | | |

A) GENERAL TERMS AND CONDITIONS OF CONTRACT

| Cl. No. | DESCRIPTION |
|---------|---|
| 01 | Each tender should be sent in a double cover, inner cover should be sealed with tenderer's distinctive seal. The outer cover should bear the address of this office and superscribed with correct Enquiry No. and Due Date. Bidders should indicate the item Sl. No. for which they have quoted on outer cover. Tender should be free from CORRECTION AND ERASURES. Corrections, if any must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between amount in figures and words, amount quoted in words shall prevail. |
| 02 | Technical cum Commercial bid will be opened at 3.00 PM on Due Date. The Technical cum Commercial bid should accompany copy of documents like authorized dealership certificate, earlier supply order details of similar equipment and their performance feedback from customers, company profile and present status, product catalogue of the models offered, technical specifications of the product, commercial Terms & Conditions and other relevant documents etc. |
| 03 | Price bid of technically accepted bidders only will be opened. No revision of prices will be entertained after Tenders are opened, unless mentioned in our enquiry / asked so by BHEL. |
| 04 | Manufacturer's name, Trade Mark or Patent No. if any, shall be specified in the Technical cum Commercial Bid |
| 05 | Please mention the relevant national / international standard code of the product quoted for in the Technical cum Commercial bid. |
| 06 | The purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any tender in part or full without assigning any reason whatsoever. |
| 07 | Late tenders (received after Due Date) will be rejected. |
| 08 | Price quoted shall be valid for 90 days from the date of opening |
| 09 | Price shall be quoted as per enclosed 'Price Format' only. Quotations not accompanying filled in 'Price Format' are likely to be rejected. Please fill in all the columns of all formats |

BHARAT HEAVY ELECTRICALS LIMITED
PS-WR:HQ:NAGPUR

PUR-F31/01
Page 2 OF 15

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

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| 10 | The price quoted should be as applicable to DGS & D (Govt. of India) and other Govt. Organizations. In case DGS & D rate / Running Contract is not existing, but a contract is in vogue with any BHEL Unit, reference of the same shall be furnished and same may be applicable to this contract. |
| 11 | SECURITY DEPOSIT: The supplier shall have to furnish Security Deposit (Cash/DD/Bank Guarantee from a Scheduled Bank) if so specified in the tender under Special Terms & Conditions. |
| 12 | PACKING AND MARKING: The supplier shall arrange for secure protective packing of the goods suitable for tropical conditions to avoid loss, damage, atmospheric action during handling and transit. The packing standards will comply with relevant national standard/carrier's conditions of packing or established practice. If any damage is sustained and the carrier or underwriter attributes it to improper packing, the seller shall be liable to replace the material or reimburse the value of the loss notwithstanding any transit insurance arranged by him or not. The following marking shall be made on each package in black bold letters. NAME & ADDRESS OF CONSIGNEE, DIMENSION OF PACKAGE, WEIGHT DETAILS: GROSS, TARE & NETT These markings should be stenciled or written in bold letters on the package. Should the package be small, suitable cards/metal tags giving these details may be tagged or nailed |
| 13 | INSPECTION: Final inspection will be carried out the destination/site/Purchaser's works by the authorized inspecting Officer, if so specified in the tender under Special Terms & Conditions. Whenever preliminary or stage inspection is to be carried out at supplier's works the same is subject to final acceptance after receipt of the material at the destination/Purchaser's works and the decision of the purchaser shall be final. The propriety of goods shall not pass until final acceptance by the purchaser |
| 14 | REJECTION: The seller shall intimate the purchaser in writing within 15 days (after being intimated about rejection of goods) regarding disposal action of the rejected material. If no advice is received within this time the purchaser shall be at liberty to return the material at the cost and risk of the seller after receiving the cost if any paid by the Purchaser including inward freight and other incidental charges. The Purchaser will not be responsible for the rejected material thereafter and no claim will rest on him. |
| 15 | Delivery: Purchaser shall not be liable to receive and pay for any supply made after delivery date stipulated in the order unless the delivery date is formally extended by the purchaser. Wherever the terms of delivery of the order is other than F.O.R. destination, delivery date will be reckoned as the date of dispatch or the date of readiness after inspection of the material where the Purchaser has agreed for inspection or collection. |
| 16 | Test certificate: The seller shall carry out such tests as prescribed by the purchaser / as required in accordance to the relevant national or international standards, in his works and/or and other places as stipulated in the order. Necessary test certificate shall be submitted with delivery of materials. The seller shall also provide at no extra cost the required number of catalogues, drawing and other manuals related to materials under this order. |
| 17 | TERMS OF PAYMENT: Payment will normally be made within a month of receipt of material in good condition at destination. Any other payment terms have to be mutually agreed. The seller shall send dispatch documents, invoice etc. in such quantum and a manner as provided in the order. (I) It is expressly understood that in the event of rejection of the materials for which payment has been made against document's through bank the Purchaser reserves the right to claim from the seller the amount paid and the incidental charged incurred in the same manner i.e. negotiating return dispatch documents, through Bank and the Seller shall honour such claim and retire the documents from the Bank. (ii) Bank charges for any payment claimed through Bank shall be borne by the seller and the seller shall also agree to bear any demurrage or other charges arising out of any delay in retirements or documents from Bank due to delayed, insufficient incorrect information furnished. (iii) The seller shall also ensure that the Carriers do not delay dispatch of the consignment once the carrier's receipt is obtained. |
| 18 | GUARANTEE WARRANTY: The materials shall be warranted for design material and workmanship and also for performance warranty as specially stipulated by the purchaser in the order in its annexure. |
| 19 | INSURANCE: Wherever specifically agreed to and directed, the supplier will insure the goods for all transit risks upto delivery of the goods at the final destination. In all other cases supplier must furnish particulars of dispatch for each consignment immediately after the dispatch of goods. Failure to do this will make the supplier responsible for making good any loss, which otherwise might have been recovered from underwriters. |

BHARAT HEAVY ELECTRICALS LIMITED
PS-WR:HQ:NAGPUR

PUR-F31/01
Page 3 OF 15

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

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|----|---|
| 20 | <p>DELIVERY FAILURE, TERMINATION & LIQUIDATED DAMAGE: The parties hereto agree that the timely dispatch/delivery and completion of the other schedules as stipulated in order/contract shall be the essence of the Order/Contract. If the seller/contractor fails to complete the dispatch/ delivery and other schedules within the time period stipulated in the order/contract, or within any extension of time granted by the purchaser, it shall be lawful for the purchaser to recover damages for the breach of order/contract without prejudice to any other rights and/or remedies provided for, in order/contract and hereunder.</p> <p>The purchaser reserves the right to recover from the Seller/Contractor, as agreed liquidated damages and not by way of penalty, a sum equivalent to half percent {½% of the total contract price per week part thereof, subject to a maximum of ten percent @ 10%} of the total contract price excluding elements of taxes, duties and freight, if seller/contractor has failed to deliver any part of the goods within the period stipulated in the Order/Contract.</p> <p>The purchaser reserves the right to purchase from elsewhere on account of and at the risk and cost of the seller /contractor without notice to the seller /contractor of goods not so delivered or their equivalent , without canceling the order/contract in respect of the goods not yet due for delivery.</p> <p>The purchaser reserves the right to cancel the order/contract or a portion thereof for the goods not so delivered at the risk and cost of the seller/contractor and the seller/contractor shall be liable to the purchaser for any excess costs thereof.</p> |
| 21 | <p>RISK PURCHASE : In the event the supplier has failed to deliver or dispatch whole of the goods or any part within the time stipulated or if the same were not available in his stock, the best and the nearest available substitute thereof may be purchased/arranged by purchaser from elsewhere at the risk and the cost of the seller. The purchaser at his option will be entitled to terminate the contract and seller shall be liable for any loss which the purchaser may sustain by reason of such risk purchases in addition to penalty at the rate mentioned in clause 20 above.</p> |
| 22 | <p>PREFERENTIAL DELIVERY : It should be noted that if an Order is placed on a higher tenderer as a result of this invitation to tender, in preference to the lowest acceptable offer in consideration of the earlier delivery, the seller will be liable to pay the purchaser the difference between the contract rate and that of the lowest acceptable tender on the basis of final price F.O.R. destination including all elements of freight, sales tax, duties and other incidentals in case of failure to complete supplies in terms of such contract within the date of delivery specified in the tender and contract.</p> |
| 23 | <p>Purchaser reserves its right to the Public Enterprises price preference facilities as admissible under the Govt. of India policy from time to time.</p> |
| 24 | <p>This order or any part thereof shall not be sub-contracted without the purchaser's consent.</p> |
| 25 | <p>METRIC SYSTEM: Supplier is requested to indicate metric system measurements in all documents.</p> |
| 26 | <p>INDEMNITY: The Seller shall indemnify the Purchaser against any claim due to any breach of patent, negligence, defective material or injury to seller or his agent.</p> |
| 27 | <p>In the event of any reduction in the price, due to change of Govt. duties after award to the work and before delivery commencement, purchaser is entitled to such reduction and may negotiate fresh price at its discretion.</p> |
| 28 | <p>GENERAL: The purchaser reserves the right to split up the tender and place orders for individual item on different suppliers and also increase or decrease the quantity.</p> |
| 29 | <p>DISPUTES & ARBITRATION: All cases of disputes will be resolved according to the Indian Arbitration Act 1940</p> |
| 30 | <p>FORCE MAJEUR: Acts of God, Acts of Government, War, Sabotage, Riots, Civil commotion, Police action, Revolution, Natural Calamities, Epidemic and other similar causes over which the supplier has no control, will amount to Force Majeur. Delay attributable to Force Majeur will be condoned; however the onus of establishing the reason of delay lies with the Supplier.</p> |
| 31 | <p>In case of any contradictions between General and special terms and conditions, the provisions in Special Terms & Conditions will prevail.</p> |

BHARAT HEAVY ELECTRICALS LIMITED
PS-WR:HQ:NAGPUR

PUR-F31/01

Page 4 OF 15

DUE DATE: 10.03.11

ENQUIRY NO. X047 E

DT.17.02.11

B) SPECIAL TERMS AND CONDITIONS OF CONTRACT

| Sl No. | Description |
|--------|--|
| 1 | Tender should be submitted in two parts (1) Technical bid comprising product catalogue, copy of relevant Indian Standards and Commercial Terms and conditions as enclosed. And (2) Price bid in prescribed price format in a separate sealed envelope. (Split up of Basic rate, Excise Duty/CVD, Sales tax / VAT must be furnished in the price bid) Tenders received as single bid indicating the price will be rejected. |
| 2 | Evaluation of Total Price: Evaluation shall be carried out by considering the input credit of ED/CVD offered by the vendor. (i.e. total landed cost including taxes, duties and freight <u>minus</u> ED/CVD paid for the same). |
| 3 | Bidder must confirm whether Excise/CVD Invoice shall be given or not. In case bidder confirms that excise/CVD invoice shall be given, then the evaluation of bid shall be on the basis landed cost to BHEL excluding Excise Duty/CVD. |
| 4 | Item wise evaluation of the offer will be carried out. |
| 5 | Payment Terms: 90% BASIC+100% TAXES AND DUTIES WITHIN 60 DAYS AGAINST SUBMISSION OF DISPATCH DOCUMENTS AT PSWR, NAGPUR OFFICE. BALANCE 10% AGAINST SUBMISSION OF PERFORMANCE BG EQUAL TO THE WARRANTY PERIOD AND AMOUNT. |
| 6 | Following details are to be furnished by you pertaining to your Bank Accounts where proceeds will be transferred through our Banker: Name of the Company Name of Bank Name of Bank Branch & Branch Code City Account Number Account type IFSC code of the Bank Branch MICR Code of the Bank Branch NOTE:- ABOVE DETAILS SHOULD BE DULY SIGNED AND CERTIFIED BY YOUR BANKER |
| 7 | OCTROI AT DESTINATION WILL BE PAID BY BHEL. |

Thanking you,

Yours faithfully,
For BHARAT HEAVY ELECTRICALS LTD.

Sr. Engineer (PURCHASE)

BHARAT HEAVY ELECTRICALS LIMITED
PSWR: HQ: NAGPUR

TECHNO-COMMERCIAL TERMS & CONDITIONS: (PART OF TECHNICAL CUM COMMERCIAL BID)

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

| SN | DESCRIPTION OF T & C | TERMS & CONDITIONS AS QUOTED IN THIS TENDER |
|----|---|---|
| 01 | DELIVERY TERMS | F.O.R. DESTINATION ONLY |
| 02 | PLACE OF DELIVERY | REGIONAL SERVICE CENTRE, 568/1, PARPIA COMPOUND, R.C. DUTT ROAD, VADODARA (GUJARAT) |
| 03 | DELIVERY PERIOD FROM THE DATE OF ORDER | Within 06 WEEKS from the P.O. date. |
| 04 | CURRENCY OF PAYMENT | INR |
| 05 | PACKING & FORWARDING CHARGES | Included @ _____ % (or) Extra@ _____ % (or) NA |
| 06 | EXCISE DUTY/CVD (% RATE) | Included @ _____ % (or) Extra@ _____ % (or) NA |
| 07 | EXCISE /CVD INVOICES | WILL BE PROVIDED/ NOT PROVIDED |
| 08 | CST/ VAT WITHOUT CONCESSIONAL FORMS "C" / "D" (% RATE) | Included @ _____ % (or) Extra@ _____ % NO "C" OR "D" FORM WILL BE ISSUED BY BHEL |
| 09 | OCTROI / ENTRY TAX AT DESTINATION | Extra, if applicable shall be paid by BHEL on submission of original receipt. |
| 10 | FREIGHT CHARGES UP TO DESTINATION | Included @ _____ % (or) Extra@ _____ % (or) NA |
| 11 | INSTALLATION CHARGES | Included @ _____ % (or) Extra@ _____ % (or) NA |
| 12 | SERVICE TAX FOR INSTALLATION | Included @ _____ % (or) Extra@ _____ % (or) NA |
| 13 | TRANSIT INSURANCE CHARGES | BY BHEL. SUPPLIER HAS TO INTIMATE THE DISPATCH DETAILS TO BHEL'S UNDERWRITERS AS SOON AS THE MATERIAL DISPATCHED. |
| 14 | ANY OTHER CHARGES (please specify here the nature of charge) | (AMOUNT TO BE SPECIFIED IN THE PRICE FORMAT) |
| 15 | PAYMENT TERMS (Specify scope of Banker's Charges at both ends / Demand Draft Charges) | 90% BASIC+100% TAXES AND DUTIES AGAINST SUBMISSION OF DISPATCH DOCUMENTS DIRECTLY TO BHEL NAGPUR WITHIN 60 DAYS. BALANCE 10% AGAINST SUBMISSION OF PERFORMANCE BG EQUAL TO THE WARRANTY PERIOD AND AMOUNT. PAYMENT WILL BE RELEASED THROUGH RTGS/EFT (ELECTRONIC FUND TRANSFER) MODE ONLY (PL REF SPECIAL TERMS AND CONDITIONS). NO DD/CHEQUE PAYMENT. |
| 16 | MODE OF DISPATCH | BY ROAD / RAIL / SHIP / AIR / CARGO COURIER / SPECIAL MESSENGER / HAND DELIVERY |
| 17 | NAME OF THE GOODS MANUFACTURER / PRINCIPALS | |
| 18 | TRADE NAME / MODEL NUMBER OF GOODS | |
| 19 | AUTHORIZED DEALERSHIP CERTIFICATE | CERTIFICATE OF MANUFACTURER/PRINCIPALS: ENCLOSED/ NOT ENCLOSED |
| 20 | WARRANTY / GUARANTEE CONDITIONS | |
| 21 | PRODUCT CATALOGUE / WRITE UP | ENCLOSED / NOT ENCLOSED |
| 22 | CONTACT PERSON'S NAME, E-MAIL ID, PHONE NO | |

SIGNATURE & SEAL OF TENDERER

Dully filled and signed this sheet should be sent as a part of technical bid. Otherwise the offer will not be considered for further processing

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

ANNEXURE-I

TECHNICAL SPECIFICATION FOR SECONDARY INJECTION KITS

| Sr. No. | Description | Bidder's Confirmation |
|----------------|--|------------------------------|
| 1 | Test objects to be tested | |
| | Distance relays (ground & phase distance) | |
| | Over current Relays (directional & Non-directional, definite time & inverse time – all characteristics as well as user defined) | |
| | Frequency relays (over-and-under-) | |
| | Voltage Relays (over-and-under-) | |
| | Power Relays (directional) | |
| | Differential Relays (incl. harmonic restraint & basic Characteristic) | |
| | Other associated protection relay functions: auto-reclose function, power swing, sync-check. Etc. | |
| | Multi-function relays & Transducers | |
| 2 | Hardware Specification | |
| 2.1. | General – Mechanics | |
| | Hardware units not to exceed: 16Kg | |
| | Unit Dimensions not to exceed: 460x155x410 mm | |
| | No moving elements or elements that are susceptible to damage, i.e. controls elements or displays on the front plate. | |
| 2.2 | Amplifiers | |
| | The amplifier stages are to be fully electronic. Range switching is not permissible. | |
| | All current amplifiers to be fully overload-, overburden-, over temperature- protected and proof. | |
| | All amplifiers to use linear amplification elements and to be dc-coupled. Able to generate dc and ac. | |
| | The amplifiers neutrals, the binary inputs and the main power supply to be galvanically isolated from each other. | |
| 2.2.1 | Internal Voltage Amplifiers (4 phases) | |
| | Setting Range : 4 x 0....300Vrms (Ph-N)/phase with V4 automatically calculated (i.e. V0) Or free programmable. | |
| | Output Power : 85 VA/Phase at 85...300Vrms with maximum 4x50VA | |
| 2.2.2 | Internal Current Amplifiers (6 phases) | |
| | Setting Range: 6 x 0....12, 5A/phase or 3 x 0...25A/phase or 1 x 0...75Amps | |
| | Output Power: 6 x 70 VA/phase at 7.5 Arms (1x280 VA at 7.5Arms) | |

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

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| 2.2.3 | Low-level signal Generators | |
| | 6 additional independent analog low-level signals to control external amplifiers or to test relays with low-level input. Together with 10 internally used signal generators the system to provide 16 signal channels in total. | |
| | Output range: 0....5Vrms | |
| | The quantities displayed in the software must be scalable. | |
| 2.3 | Signal generation | |
| | All outputs to be continuously & independently adjustable in amplitude, phase (0 to $\pm 360^\circ$) and frequency. | |
| | Maximum error to be less than 0.1% of scale and distortion (THD+N) not to exceed 0.05% for voltage and 0.1% for current outputs. | |
| | Able to generate continuous sine waves with a frequency between 10 and 1000 Hz and to generate transient files with a bandwidth from dc up to 3KHz. | |
| | Frequency error to be less than 1ppm. Phase resolution to be less than 4" (sec. of degree) | |
| | Specifications to be maximum & guaranteed figures over a temperature range of 23°C $\pm 5^\circ$ C. | |
| | Interface to the PC : See note at the end | |
| 2.4 | Timer/measuring inputs section (minimum 10, selectable binary/Analog input) | |
| | Binary inputs | |
| | Mode/Trigger criteria:- Pick –up and drop-out of potential-free contacts or dc Voltages of up to ± 600 Vdc. Trigger levels to be adjustable. | |
| | Max. error :- < 120 μ s | |
| | Max. Measuring time:-infinite | |
| | Counting function :- < 3kHz, at pulse width > 150 μ s | |
| | A) Analog AC-DC measuring inputs | |
| | Type:- AC+DC analog Voltage inputs | |
| | Nominal input ranges:- min. 100mV –max.600Vrms | |
| | Bandwidth:- DC...10kHz | |
| | Sampling frequency:- min. 9kHz | |
| | B) Dedicated counter inputs | |
| | Max. frequency:- 100kHz | |
| | Number :- minimum 2 | |

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

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| 2.5 | Analog measuring inputs for transducers | |
| | <ul style="list-style-type: none"> • Number 2 • Direct current range 0...± 20mA • Direct voltage range 0...± 10V • Max. error < 0.05% | |
| 2.6 | Binary Outputs | |
| | Relays <ul style="list-style-type: none"> • Number 4 Transistors <ul style="list-style-type: none"> • Number 4 | |
| 2.6.1 | Auxiliary DC supply | |
| | <ul style="list-style-type: none"> • Voltage output 0...264Vdc • Power Maximum 50W | |
| 2.7 | Power Supply | |
| | <ul style="list-style-type: none"> • Nominal input voltage 110-240V ac, Single Phase • Range input Voltage 99-264 V ac • Frequency 50/60 Hz • Permissible range 47-63 Hz | |
| 2.8 | Temperature Range: | |
| | <ul style="list-style-type: none"> • Operating 0...50°C • Storage -25.... +70°C | |
| 2.9 | Humidity Range: 0...90% RH, non-condensing | |
| 2.10 | Certifications/Standards complied with: | |
| | EMC: Emission CE Conform, IEC 801-2/3/4, FCC Subpart B of Part 15 Class A | |
| | Immunity EN 55011/3, 1991/group 1/Class A | |
| | Safety: IEC 1010-1, UL 3111-1, EN 61010-1, EN 60950+A1: 1993-05 | |
| | | |
| 3 | Software Specification | |
| 3.1 | General features | |
| | No programming to be necessary to test any applications – entry of setting parameters to be all that is required to set up and perform a test with failed/passed evaluation. | |
| | User interfaces for all applications to be standard, similar to that of latest Microsoft Windows applications. | |
| | Futures expansions in functionality by means of software updates. Firmware updating to be handled by the software, i.e. exchange of EPROMs is not permissible. | |

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

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| | Mouse support and On-line help. | |
| | Automatic generation of test report. All graphics and text to be printable including relay parameters used during testing and assessment of the test results. Capability to export report to word processor program (i.e. MS Word) | |
| | All testing to be closed loop. | |
| | Test programs based on test modules to be easily generated (test Wizard) and serving simultaneously for test template & test report | |
| 3.2 | General purpose test module | |
| | For direct control of all the functions of the test set and connected amplifier. | |
| | Output values to be entered numerically or specified in vector diagram. | |
| | Continuous monitoring of upto 10 binary inputs. | |
| | Time counter from injection start of voltage and/or current quantities till binary input activated | |
| | Step variation capabilities in voltage, current, angle and frequency. | |
| 3.2.2 | Test module for multifunction relay | |
| | Generation of test sequences (>100) with for each test sequence, possibility to define up to 16 voltage and current signals in amplitude, angle and frequency and full state control of the binary inputs and outputs. | |
| | Assessment (passed-failed) of each function of the relay under test according to measurement and tolerance conditions | |
| | Overall display of test signals (current and voltage) and up to 10 binary inputs status versus time. | |
| | Prepared to be used with a GPS Signal. | |
| 3.2.3 | Test module for distance relay | |
| | <ul style="list-style-type: none"> • Manual and automatic test in impedance plane and Z/t grading diagram. • Test modules supported: constant current and constant voltage for all fault loops: single phase, two phase and three phase. • Ability to simulate dc offset. Control of angle of fault incidence. • RIO file format for the transfer of relay setting parameters to b supported. • Impedance characteristics (Theoretical with tolerance) to be displayed graphically (both quadrilateral & Mho and any combination). • Feedback signals: up to 10 binary inputs. Graphical display of contact responses vs. time. • Graphical display of waveforms injected to the relay. • Prepared to be used with a GPS Signal. | |

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

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| 3.2.4 | Test module for frequency, voltage, current and power relays, etc. <ul style="list-style-type: none"> • Automatic testing. • Generation of up to 5 amps for amplitudes, phase angles frequency of signal, with capability to amp up to two magnitudes simultaneously. • Pick-up and drop-out ratio calculation • Result assessment: Passed-failed. • Graphic display of relay pick-up and drop-out vs. Time and quantities. • Feedback signals: up to 10 binary inputs. | |
| 3.2.5 | Test module for differential relays <ul style="list-style-type: none"> • Manual and automatic testing. • Selection of 2nd up to 20th harmonics (50Hz) for harmonic restraint tests. • Results assessment: Passed failed • Graphic display of relay characteristics with tolerances. • Feedback signals: up to 10 binary inputs. | |
| 3.2.6 | Module for Transient playback <ul style="list-style-type: none"> • IEEE COMTRADE (C37.111-1991 and P37.111/D11) • Synchronization to GPS and other digital timing pulses. • Voltage and current traces as well as digital signals and relay responses to be displayed graphically. | |
| 3.2.7 | Module for harmonic signal generation <ul style="list-style-type: none"> • Easy generation in COMTRADE format of harmonics signals (current & voltage) by entering the amplitude and phase angle for the requested harmonics with respect to the fundamental. • Ability to generate signals containing up to the 50th harmonics (50Hz) | |
| 3.2.8 | Communication Ports & protocols <p>The Kit should have following two Ethernet interfaces (option separately Quoted):</p> <ul style="list-style-type: none"> • 10/100 Mbit/s (10/100 base-Tx, auto-sensing, auto-crossover, RJ45 connector for CAT5 twisted pair cables) • 10/100 Mbit/s (10/100 base-FX, MTR/ connector). Support for specific substation protocols such as the GOOSE/GSSE messaging according to IEC 61850-8-1 or UCA 2.0 | |
| | NOTE | |
| | 1. This attachment uses the slot for DVD R/W drive hence every time to read or write a CD/DVD the attachments have to be reshuffled. | |
| | 2. As the kit would be required to travel a lot the DVD drive may get damaged / unusable. Hence a laptop having an LPT and COM Port other than the IBM machine is required. This would further facilitate the usage of this same laptop for testing of Siemens and Micom relays. | |

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

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| | Calibration: The instrument should be calibrated at NABL accredited lab before delivery & calibration certificate should be sent with the instrument. | |
| | Guarantee/Warranty: Certificate required | |
| | Instruction Manual required. | |

NOTE: Bidders should submit the signed copy of this technical sheet as token of acceptance.

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

ANNEXURE-II

TECHNICAL SPECIFICATION FOR INDUCTIVE WINDING RESISTANCE METER

| Sr.no. | Description | | Bidder's Confirmation |
|--------|------------------------|--|-----------------------|
| 1 | Channels | Five: 3 for winding resistance | |
| | | 1 for test current measurement (internal) | |
| | | 1 for external temperature input | |
| 2 | Current Ranges | 25A, 10A, 5A, 1A, 100mA | |
| 3 | Resistance ranges | upto 2kΩ | |
| 4 | Max. open Ckt Volage | 50V | |
| 5 | Resolution | 4½ digits (1 count in 19999 counts) | |
| 6 | Accuracy | Value $\pm 0.5\% \pm 2$ digits | |
| 7 | Screen | 256 x 128 pixels, back lite graphic LCD | |
| 8 | Memory | Non-Volatile memory to store 5000 measurements | |
| 9 | Printer | In-built thermal printer, 55mm wide paper roll | |
| 10 | Serial port | IBM Compatible RS 232C | |
| 11 | External control | Possible via notebook PC through serial link & Ctrans software | |
| 12 | Temperature correction | Provided for Copper & Aluminium | |
| 13 | Temp. input channel | Compatible to accept RTD input | |
| 14 | User Interface | 17 key keybord and interactive menu | |
| 15 | Back-emf protection | During measurement, discharge and against accidental disconnection of leads. | |
| 16 | Discharge Indication | Audio-Visual alarm and messages on screen | |
| 17 | Tap changer Test | Detects discontinuity during tap changer test. | |
| 18 | Protection | Shut down of power source on Over Temperature | |
| 19 | Indications | Polarity reversal, Test connection continuity and discharge | |

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

| | | | |
|----|--|--|--|
| 20 | Diagnostics | Diagnostics of measurement condition at startup | |
| 21 | Test Leads | 20m Measuring Leads, AC supply and Earthing leads | |
| 22 | Environment | 0 to 50°C, 95%RH (non-condensing) Live EHHV Switchyard | |
| 23 | Power | 230V AC ±15%, 50Hz ±10%, 1500VA | |
| | | | |
| | <u>STANDARD ACCESSORIES</u> | | |
| | Test cables 20m Long, with Ck clamps, 75mm opening | 1 Set. | |
| | Shorting Lead, 10m long, with 75mm Ck clamps | 1 Set. | |
| | Master Earthing Cable, 7m Long | 1 Set. | |
| | Mains Cord, 3m long | 1 no. | |
| | RTD Sensor with 10m long lead & connectors | 1 no. | |
| | Spare fuses | 1 Set. | |
| | Carrying case for Test Lead Set | 1 no. | |
| | Instruction Manual | 1 no. | |
| | Calibration certificate having traceability to NPL should be provided | | |
| | | | |
| | <u>OPTIONAL ACCESSORIES</u> | | |
| | CTrans software for operation & downloading to PC | 1 Set. | |
| | A box of Paper rolls containing 10 rolls of Thermal Paper | 1 Set. | |
| | Test cable 20m long, with Ck clamps of 50-100mm | 1 Set. | |
| | Test cable 20m long, with Ck clamps of 100-150mm | 1 Set. | |
| | | | |
| | Supplier to arrange demonstration preferably at Baroda after delivery. | | |
| | Accessories | : Included & optional accessories as per P.O to be supplied. | |
| | Calibration | : The instrument should be calibrated at NABL acc. Lab before delivery and calibration certificate shall be sent with instruments. | |
| | Guarantee/ Warranty | : Certificate required | |
| | Manual | : Instruction manual required. | |

NOTE: Bidders should submit the signed copy of this technical sheet as token of acceptance.

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR

ENQUIRY NO. X047 E

DT.17.02.11

DUE DATE: 10.03.11

ANNEXURE-III

TECHNICAL SPECIFICATION OF CIRCUIT BREAKER TIMING KIT

| SI NO. | SPECIFICATION | | BIDDER'S CONFIRMATION |
|---------------|---|--|------------------------------|
| 1 | Channels | Three | |
| 2 | Control of Circuit Breaker | Through 300V / 30A SSRs to trip and close the connected circuit breaker. | |
| 3 | Output | 4 line 20 Character backlit LCD RS 232 C Port for downloading data to PC | |
| 4 | Range | 999 milliseconds maximum or better | |
| 5 | Resolution | 1 milliseconds | |
| 6 | Measuring Accuracy | Value $\pm 0.05\% \pm 1$ digits or better | |
| 7 | Test Leads | Set of 15m, wear resistant Test Cables | |
| 8 | Environment | 0 to 50 C, 95 % RH (Non- Condensing) Electrical noise normally found in live Switchyards of upto 420kV. | |
| 9 | Power | 230V AC $\pm 15\%$, 50Hz $\pm 10\%$, 25VA | |
| 10 | Supplier to Arrange Demonstration preferably at Baroda after delivery | | |
| 11 | Accessories | Included & Optional Accessories as per P.O. to be Supplied | |
| 12 | Calibration | The instruments should be calibrated at NABL acc. Lab before delivery and calibration certificate shall be send with instruments | |
| 13 | Guarantee/ Warranty | Certificate required | |
| 14 | Manual | Instruction manual required | |

NOTE: Bidders should submit the signed copy of this technical sheet as token of acceptance.

PRICE FORMAT

**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR: WESTERN REGION: NAGPUR**

NAME OF THE TENDERER: _____

SELLER'S REF. No. _____ DATE : _____

ENQUIRY No.: X047 E

DATED:17.02.11

DUE DATE: 10.03.11

| SL. | DESCRIPTION | PRODUCT-1 | PRODUCT-2 | PRODUCT-3 | PRODUCT-4 | PRODUCT-5 |
|-----|--|---|-----------|-----------|-----------|-----------|
| A. | ITEM DESCRIPTION AS PER ENQUIRY (PLEASE QUOTE THE BRAND NAME AND MODEL NUMBER) | | | | | |
| B. | QTY OFFERED | | | | | |
| C. | UNIT RATE | | | | | |
| D. | CURRENCY | | | | | |
| E. | DISCOUNT (%AGE & AMOUNT) | | | | | |
| F. | DISCOUNTED UNIT RATE | | | | | |
| G. | DISCOUNTED BASIC PRICE (G = B x F) | | | | | |
| H. | PACKING & FORWARDING CHARGES | | | | | |
| I. | INSTALLATION CHARGES | | | | | |
| J. | SERVICE TAX FOR INSTALLATION (PERCENTAGE AND AMOUNT) | | | | | |
| K. | EXCISE DUTY /CVD (PERCENTAGE AND AMOUNT) | | | | | |
| L. | IMPORT DUTY (PERCENTAGE & AMOUNT) | | | | | |
| M. | SALES TAX AS APPLI. WITHOUT C-FORM (PERCENTAGE & AMOUNT) | | | | | |
| N. | FREIGHT UPTO DESTINATION | | | | | |
| O. | TRANSIT INSURANCE | BY BHEL | | | | |
| P. | OCTROI CHARGES / ENTRY TAX AT DESTINATION | Extra, if applicable at actual on production of original receipt. | | | | |
| Q. | TOTAL PRICE AT DESTINATION (SUM of 'G' to 'P') | | | | | |

NOTES:

- PLEASE USE ADDITIONAL SHEETS IF NECESSARY
- FURNISH FURTHER BREAK UP OF PRICE IF NECESSARY

SIGNATURE OF THE TENDERER WITH SEAL