



THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED
(A Govt. of West Bengal Enterprise)
Bakreswar Thermal Power Project
P.O.Bk.T.P.P , Dist -Birbhum,Pin -731104

NIT No.: WBPDC/Tend-Adv/CC/15-16/18/BkTPP

Date:22.04.2015

SUB: Tender document for Procurement of 01 No. Dual Source 3 Phase Secondary Voltage & Current Injection Kit for Testing of Relays, Transducers & Calibration of Meters at Bakreswar Thermal Power Project.

- SALE OF TENDER PAPER : **27/04/2015 to 15/05/2015 from 10:00 Hrs. to 14:00 Hrs.** on all working days except Sundays and holidays and Saturday from 10:00 Hrs. to 12:00 Hrs. against deposition of Cost of Tender Document at Cash Section of Bk.TPP.
- PRE-BID DISCUSSION ON : **On 20/05/2015 at 11:00 Hrs.**
- LAST DATE & TIME OF SUBMISSION OF TENDER PAPER : **03/06/2015 upto 14:30 Hrs.**
- DATE & TIME OF OPENING (PART-A FOR TECHNICAL BID ALONGWITH COMMERCIAL TERMS & CONDITIONS) : **03/06/2015 at 15:00 Hrs.**
- COST OF TENDER PAPER : Rs. 1,000/- (Rupees one thousand only)

DEPOSITED VIDE D.C.R.NO. _____

DATED _____

ISSUED TO M/s. _____

SR. MANAGER (Materials)
BAKRESWAR THERMAL POWER PROJECT
W. B. P. D. C. L.



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Sealed tender in two parts, Part A (for technical specification bid alongwith commercial Terms & Conditions) and Part B (for price bid) in duplicate are invited by the General Manager, Bakreswar Thermal Power Project (BkTPP) under The West Bengal Power Development Corporation Limited from interested, resourceful and experienced agencies.

The agencies should submit the following documents in their quotation while submitting the offer:

1. Valid I.T. & S.T., Service Tax Registration, Professional Tax Clearance Certificates, Provident Fund A/c. No. etc.
2. Credential of similar work done directly under a Government/Quasi Government Organization/Private Company during period of any three year within last seven years reckoning **from 31.12.2014**
 - “Similar Works” means ‘Supply of Dual Source 3 Phase Secondary Voltage & Current Injection Kit’ with the specifications detailed elsewhere in the Tender Document.
 - The value of work for similar type of job as mentioned above, completed by agency should be as follows:
 - a) In single order of value not less than Rs. 30 lakhs.
or
 - b) In two orders each of value not less than Rs. 18 lakhs.
or
 - c) In three orders each of value not less than Rs. 15 lakhs.
3. Average Annual Financial Turnover in last 3 financial years, (viz. 2011-12, 2012-13 & 2013-14) should be at least Rs. 12 lakhs.
4. Average net worth in last three financial years:- should be positive.
5. Audited balance sheet for last three financial years.

Job Description:

Procurement of 01 No. Dual Source 3 Phase Secondary Voltage & Current Injection Kit for Testing of Relays, Transducers & Calibration of Meters at Bakreswar Thermal Power Project:

Completion time

Material Delivery Schedule: - Twenty (20) weeks from the date of the order. Delivery is to be effected at BkTPP Store. Unloading will be done by WBPDC.

Earnest Money Deposit/Bank Guarantee

Rs. 80 thousand (Rupees eighty thousand only) in the form of Demand Draft or Bank Guarantee in favour of “THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED” drawn on /issued by any Nationalised /Scheduled Bank, Suri or United Bank of India, BkTPP Branch. The requisite earnest money should be deposited along with tender papers in a separate sealed envelope. No tender will be entertained without Earnest Money. NSIC holders are exempted from deposition of EMD. Necessary enlistment certificate should be submitted by the respective bidder.

Cost of Tender Paper

Rs. 1,000/- (Rupees one thousand) in cash only (non refundable)

Sale of Tender Paper

27/04/2015 to 15/05/2015 from 10:00 Hrs. to 14:00 Hrs. on all working days except Sundays and holidays and Saturday from 10:00 Hrs. to 12:00 Hrs. against deposition of Cost of Tender Document at Cash Section of BkTPP.

Pre-bid Discussion

On 20/05/2015 at 11:00 Hrs. at the Administrative Building of BkTPP. Bidders are requested to submit their queries before the Pre-bid discussion.

Last Date of Submission of Tender Papers:

Last date of submission of Tender Paper is 03/06/2015 upto 14:30 Hrs. and the same will be opened (Part-A) at 15:00 Hrs. on the same date in presence of the participating tenderers if any. Sealed tenders of the parties only who have deposited the requisite amount of Earnest Money will be opened for two part bid.

The Corporation reserves the right to accept / cancel any or all tenders or to split the work without assigning any reason whatsoever. The WBPDCCL does not bind itself to accept the lowest tender and qualification of tenderer will be adjudged as per sole discretion of WBPDCCL authority. The validity of tender will remain effective for 6 (six) months from the date of opening of Price Bid of tender. All other details are available in the tender document.

Enclo:
Information to Bidders
Annexure – I & II

(K. Sarkar)
Sr. Manager (Materials)
BkTPP/WBPDCCL



THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED
(A Govt. of West Bengal Enterprise)
Bakreswar Thermal Power Project.
P.O. Bk.T.P.P, Dist-Bibhum. Pin-731 104

NIT No.: WBPDC/Tend-Adv/CC/15-16/18/BkTPP

Date: 22.04.2015

INFORMATION TO BIDDERS

Sub :	Tender document for Procurement of 01 No. Dual Source 3 Phase Secondary Voltage & Current Injection Kit for Testing of Relays, Transducers & Calibration of Meters at Bakreswar Thermal Power Project:
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1.00.00. INTENT OF SPECIFICATION

This proposal is for the designing and procurement of 01 No. Dual Source 3 Phase Secondary Voltage & Current Injection Kit for Testing of Relays, Transducers & Calibration of Meters at Bk.TPP.

This specification is intended to cover the following activities in respect of above mentioned procurement with all components and accessories to be supplied to Central Store, BkTPP, WBPDC located in Birbhum district of West Bengal.

- a. Detailed design of the equipment and accessories.
- b. Providing Rating & Diagram Plate, Outline General Arrangement (OGA), Guaranteed Technical Particulars (GTP) & Quality Assurance (QA) Plan.
- c. Drawings, Data sheet, Format etc. for Owner's approval and records.
- d. Packing and transportation from the manufacturer's works to the site, including custom/port clearance, if required.
- e. Receipt, unloading, handling, storage and insurance of equipment.
- f. Reconciliation with customs authorities, if applicable.

2.00.00. GENERAL INSTRUCTION TO BIDDER

1. The bidder is advised to visit the plant/site, if required, and collect any information or data as may be required by them, before quoting against this specification. The bidder is also advised to give technical information of the material which is being quoted along with relevant literature covering all technical specifications and its features.
2. Bidder has to check receipt of complete documents referred to in the contents. In the event of order, the entire specification will form part of purchase order for compliance during execution.

3. Deviation, if any, shall be clearly brought out in the "Deviation Schedule". Otherwise, it will be interpreted that the bidder is fully complying with the specification.
4. In case of any dispute, Senior Manager (TECIT)'s decision will be final and binding.

3.00.00 BID PROPOSAL

1. Following documents shall be submitted along with the offer. The documents forming part of the offer shall be neat, legible and in English.
 - 1.1. Filled in data sheets of the product & its accessories offered. A list of such documents shall also be furnished.
 - 1.2. Outline General Arrangement drawing along with detailed descriptions.
 - 1.3. Guaranteed Technical Particulars
 - 1.4. Complete BOM of the offered material. The BOM submitted shall contain the make, model number, rating of the item etc. Vendor's name & addresses of brought out items are also to be mentioned along with warranty certificates. Warranty clauses would include name of the customer.
 - 1.5. Filled in "Deviation Schedule" with reason/justification for the deviation taken.
 - 1.6. **List and schedule of documents to be submitted by bidder for buyer's approval and information, after placement of order.**

4.00.00 SCOPE OF WORK (SOW):

The scope of this specification covers:-

- a) Design, Engineering, Manufacturing, testing before dispatch.
- b) Demonstration of the kit.
- c) Supply and delivery to site, installation and commissioning at site.
- d) Training of fully automatic three phase Dual source current injection relay test kit along with the accessories as per relevant standards.
- e) Set shall be supplied with 2 sets of technical / users manual.

5.00.00 BID QUALIFYING REQUIREMENT:

Required evidence for the following BQR conditions should be furnished along with the tender. Otherwise the offer will be summarily rejected.

1. Manufacturer or authorized dealer/distributor of dual source current and voltage injection kit for testing of relays and meters should only participate in the tender. The attested copy of the evidences for the same should be enclosed along with the offer.

2. The Bidder shall have 24 Hours support facility in eastern region of India and details for the support should be enclosed. Any type of defectiveness of the kit to be rectified by the bidder in India.
3. The bidder should have annual turn over of not less than Rs.12 lac in any one of the last 3 consecutive financial years (2011-12, 2012-13 & 2013-14). Attested photo copies of Annual Audited statement/ balance sheet/ Income statement / Profit & Loss statement duly certified by the Chartered Accountant for the above three years should be enclosed.

The bidders may also enclose the following documents as a proof of turnover.

- i. Attested copy of the income tax return filed by the bidder.
- ii. Attested copy of sales tax clearance certificate
- iii. Attested copy of enlistment certificate issued by NSIC containing turnover details of the bidder for the respective period.
4. Performance certificate from Govt. Organisation like PGCIL, Central PSU, NTPC, state electricity boards, utilities etc where Kit has been working for last 5years.
5. The bidder should produce the related support documents specified in the technical specification. i.e. different certificates of EMC: 2004/108/EC (CE Conform), IEC 61326-1, IEC 61000-6-4, IEC 61000-3-2/3 etc
6. The bidder should confirm the support service or supplying spares of supplied relay testing kit for at least next 20 years
7. After Techno-commercial bid submission, Bidder should give a field demonstration whenever asked by WBPDCCL for technical scrutiny.

6.00.00 TERMS AND CONDITIONS

Sealed Tenders in two parts, Part A (for Technical Specification bid alongwith commercial terms and conditions) and Part B (for Price Bid) in duplicate (Non-transferable) with firm's own seal are invited as detailed in the attached sheet ANNEXURE-II under following terms and conditions:-

1. Tender Notice No. Brief description of the supply and due date of opening should be clearly mentioned on the top of the envelope.
2. Material Delivery Schedule: - Twenty (20) weeks from the date of the order. Delivery is to be effected at BkTPP Store. Unloading will be done by WBPDCCL.
3. LEAF LET ETC: - The descriptive literature of materials shall have to be enclosed along with the tender / quotation.
4. INSPECTION:-
 - a) The complete equipment has to be offered for inspection by WBPDCCL representative at bidder's works and the bidder shall give 30 days advance notice for arranging the inspection after the equipment is made fully ready. Inspection will also be carried out at BkTPP stores by the representatives of concerned dept after effecting delivery.
 - b) Decision of Sr. Manager (TECIT), BkTPP would be final & binding for inspection at vendor's works & vendor must offer for inspection by WBPDCCL at their works.
 - c) The equipments can be dispatched only after the clearance by

WBDCL.

d) Rejected Materials have to be lifted by party at their own cost. Loading at BkTPP for lifting the rejected materials will be arranged by party at their cost.

5. PRICE:-

a) Rates and total amount should be mentioned both in figure and words, if there be any difference the fewer amounts will be considered.

b) Excise duty, S.T. /VAT, Service Tax, other statutory Levies, Forwarding & Packing & freight etc must be clearly mentioned in the tender/quotation.

c) The rates inclusive of delivery at Bk.T.P.P. Stores must be quoted. Break up should also be submitted.

d) The D G S & D rate should be quoted, if there be any D G S & D rate contract that is to be furnished.

e) Bids or modification of bids received after opening of Tender will not be considered.

6. PAYMENT:

i) 90% payment will be made by Cheque against Store Received Voucher (SRV). The SRV will be issued only after acceptance of material by user department. Payment by Demand Draft with bank charges on vendor's account may be considered subject to mention in relevant quotation / offer.

ii) Balance 10% of payment will be released after 12 months from the date of successful commissioning of equipment and after observing the performance of equipment or 18 months after delivery of the materials, whichever is earlier.

PAYING AUTHORITY:

i) Bill in triplicate alongwith challans is to be submitted to the G.M (F&A)/ Dy.GM (F & A), WBDCL Corporate Office. STD Form for concessional rate of S.T can be provided to the supplier only after completion of supply with submission of final bill. Excise duty can not be without E. Duty Gate Pass (GP-I) E.D. Gate Pass is to be submitted in original along with the Invoice/Bill. Part payment for part delivery will not be allowed.

7. TEST CERTIFICATE:- Material test certificate from Govt. Approved Laboratory may be submitted along with supplies.

8. **GUARANTEE/WARRANTY:-** The material must conform to the specifications as indicated in the purchase order. Also the material should be guaranteed against any manufacturing defects due to faulty design or bad workmanship or defected material for a period of 12 months from the date of commissioning or 18 months from the date of supply whichever is earlier. If any material or part thereof is found or proved to be defective within this period, you shall be liable to replace the same at free of cost within a reasonable period, failing which Bk.TPP authority will take necessary measure for replacement of damaged material from elsewhere and expenditure incurred on above ground shall be realized from you. The equipment is to be made functional after attending the problem as early as possible. Guarantee Certificate for supplied material is to be submitted along with material.
9. **PERFORMANCE BANK GUARANTEE:-** A Bank Guarantee for 5% of the limiting value of basic price will be submitted for security cum performance guarantee. The said Bank Guarantee will be furnished prior to commencement of supply of materials and Bank Guarantee will remain valid till expiry of the guarantee period.
10. **LIQUIDATED DAMAGE:-** The WBPDCCL reserves the right to repudiate the contract if the materials are not delivered within the stipulated time. However, the authority may waive this condition and impose a L.D. for delayed supply @1/2% on the value of undelivered materials which may be either for total quantity or delivery effected partly beyond the scheduled time and for each week of delay or part thereof up to a maximum of 5% of the total value of the materials.
11. **OTHER REQUIREMENTS:-** Copies of orders received from Govt. agencies, Undertaking along with proof of execution of the orders shall have to be furnished along with the bids.

Notwithstanding any thing stated above WBPDCCL reserves the right to assess the bidder's capability and capacity to perform the contract, should be circumstances warrant such assessment in the overall interest of WBPDCCL.

WBPDCCL reserves the right to split the order, alter the quantity and reject any or all tenders without assigning any reasons whatsoever. WBPDCCL does not take any responsibility for postal delays.

SR. MANAGER (Materials)
BAKRESWAR THERMAL POWER PROJECT
W. B. P. D. C. L.

ANNEXURE-I

TECHNICAL LITURATURE FOR DUAL SOURCE 3 PHASE SECONDARY VOLTAGE & CURRENT INJECTION KIT FOR TESTING OF RELAYS, TRANSDUCERS & CALIBRATION OF METERS AT BAKRESWAR THERMAL POWER PROJECT:

The test kit should be supplied with suitable all accessories (i.e power cable, communication cable, testing cable, software's, hardware's etc) to perform all type of test i.e, mentioned below.

The test kit should compatible for

1) Kit should be Suitable to test and have the following features

- A. High-burden electromechanical relays of all types
- B. Static relays of all types
- C. Numerical relays of all types
- D. IEC 61850 IEDs (GOOSE and Sampled Values)
- E. Bus bar protection relays
- F. Voltage Relays (over and under)
- G. Power Relays (directional)
- H. Differential Relays-biased, high impedance and advanced type
- I. Over current Relays (directional & Non directional, definite time & inverse time etc – all characteristics)
- J. Auto Reclose Relays
- K. Synchronizing relays
- L. Pole slipping relays
- M. Motor protection relays
- N. Different type of Impedance, power, frequency relays
- O. Meters(both Analog and digital): Wh meter, VAh Meter, PF meter, VARh meter etc up to 0.2 class accuracy
- P. Transducers(0.2 class): Current, Voltage, PF, W, VA, VAR, frequency up to 0.2 class accuracy
- Q. Kit should be suitable to test all the relays(electromechanical, static, numerical), meters and transducers of 415V, 6.6kV, 33kV, 220kV, 400kV voltage level

2) Hardware Specification:

2.1. Input Supply: Nominal Input: 110 -240 VAC, 1Ø, not more than 15A

Range Input Voltage: 100-260 V AC

Frequency: 50/60 Hz

Connection: Standard AC socket (IEC 60320)

2.2. Amplifiers:

1. The amplifier stages are to be fully electronic. Range switching should not be permissible.
2. All current amplifiers to be fully overload-, overburden-, over temperature-protected and proof.
3. All amplifiers to use linear amplification elements and to be dc-coupled. Able to generate DC and AC.
4. The amplifiers neutrals, the binary inputs and the main power supply should have galvanic isolation from each other.

2.2.1 AC Current output: All current sources should be independent and non convertible. At least dual current source (6 phase current)

6 phase AC (L-N) : 6X(0- not less than 32 A)
3 phase AC (L-N) :3X (0- not less than 64 A)
1 phase AC (LL-LN): 1X (0-not less than 128A)

Power: 6 phase AC (L-N) - 6X 250 VA typical at 25 A
3-phase AC (L-N) - 3 x 500 VA typical at 50 A
1-phase AC (LL-LN) - 1 x 1100 VA typical at 80 A

Accuracy: error- <0.05 % reading + 0.02 % range typical,
error- <0.15 % reading + 0.05 % range maximum

Resolution: 1mA

Distortion: < 0.05 % typical, < 0.15 % guarantee.

Max. Compliance voltage (L-N)/ (L-L)/ (L-L-L-L): 35 Vpk / 70 Vpk / 140 Vpk

Connection banana sockets: 4 mm (0.16 in) banana sockets

2.2.2 AC Voltage output: All voltage sources should be independent and non convertible.

At least 4 phase voltage

4-phase AC (L-N) : 4 x (0-not less than 300 V ac)

3-phase AC (L-N): 3 x 0 ... 300 V

1-phase AC (L-L): 1X 0-not less than 600 V

Power: 3-phase AC (L-N) 3 x 100 VA typ. at 100 ... 300 V
3 x 85 VA guar. at 85 ... 300 V
4-phase AC (L-N) 4 x 75 VA typ. at 100 ... 300 V
4 x 50 VA guar. at 85 ... 300 V
1-phase AC (L-N) 1 x 200 VA typ. at 100 ... 300 V
1 x 150 VA guar. at 75 ... 300 V
1-phase AC (L-L) 1 x 275 VA typ. at 200 ... 600 V
1 x 250 VA guar. at 200 ... 600 V

Accuracy: error < 0.03 % reading. + 0.01 % range typical at 0 ... 300 V
error < 0.08 % reading. + 0.02 % range guarantee at 0 ... 300 V

Distortion: 0.015 % typ., < 0.05 % guar.

Ranges: 150 V / 300 V

Resolution: 5 mV / 10 mV in range 150 V / 300 V

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....5 Vrms

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 0.15 % for current output.
- 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 $23^\circ\text{C} \pm 5^\circ\text{C}$.

- f) All current and voltage amplifiers should be identical, independent and non-convertible.
- g) Output of the kit should be capable to synchronize to external signal using binary connections.

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 V DC. Trigger levels to be adjustable.

Max. error: $< 120 \mu\text{s}$

Max. Measuring time: Infinite

Counting function: $< 3\text{kHz}$, at pulse width $> 150\mu\text{s}$

Binary Inputs: At least 10 binary inputs should have 5 galvanically isolated pairs for potential and potential free binary contacts.

Number: 10

A) Analog AC- DC measuring inputs

Type: AC+DC analog Voltage inputs

Nominal input ranges: min. 100 mV – max. 600 Vrms

Bandwidth: DC...10 kHz

Sampling frequency: up to 28 kHz

B) Dedicated counter inputs

Max. Frequency: 100 kHz

Number: minimum 2

2.5 Analog Measuring Inputs for Transducer

Number: 2

Direct Current Range: 0.... ± 20 mA

Direct Voltage Range:0.... ± 10 V

Error: 0.02 %

2.6 Binary Outputs:

Relays:

Type: potential-free relay contacts, software controlled

Number: 4

Break capacity AC: Vmax: 300 VAC / Imax: 8 A / Pmax: 2000 VA

Break capacity DC: Vmax: 300 VDC / Imax: 8 A / Pmax: 50 W

Transistor:

Type: open collector transistor outputs

Number: 4

Update rate: 10 kHz

Imax: 5 mA

Connection: 16 pin combination socket (rear /front side)

2.7 Auxiliary DC supply

Voltage ranges: 0 ...at least 260 VDC, 0.2 A / 0 ... 132 VDC, 0.4 A / 0 ... 66 VDC, 0.8 A

Power max: 50 W

Accuracy: error < 2 % typ., < 5 % guar

2.8 Environment

- 1) Application field: For use in high voltage generating station and industrial environments
- 2) Operating Temperature: at least -5 deg C to $+55$ degC

- 3) Storage & transport: at least -45 deg C to +60degC
- 4) Humidity: at least 5% – 95% RH, non-condensing

2.9 Timer:

Timer function displays in Seconds with the following range and resolution:

Seconds: 0.0001 to 99999.9

(Auto Ranging)

Accuracy: $\pm 0.001\%$ of reading, typical. ± 2 least significant digit,
 $\pm 0.005\%$ of reading from 0 to 50° C maximum

Resolution: 100 microseconds

3.0 DC Current Amplitude:

DC (LL-LN): 1X 0 ... ± 180 A (at least)

Power: DC (LL-LN) 1 x 1200 W typ. at ± 80 A
1 x 1000 W guar. at ± 80 A

Accuracy: error- $< 0.05\%$ reading + 0.02% range typical,
error- $< 0.15\%$ reading + 0.05% range maximum

Resolution: 1mA

Distortion (THD+N): $< 0.05\%$ typ., $< 0.15\%$ guar.

3.1 DC Voltage Amplitude:

DC (L-N): 4 x 0 ... ± 300 V (at least)

Power: DC (L-N): 1 x 400 W typ. at ± 300 V
1 x 350 W guar. at ± 300 V

Accuracy: error $< 0.03\%$ rd. 4 + 0.01% rg. 4 typ. at 0 ... 300 V
error $< 0.08\%$ rd. + 0.02% rg. guar. at 0 ... 300 V

Distortion (THD+N) : 0.015% typ., $< 0.05\%$ guar.

Ranges: 150 V / 300 V

Resolution: 5 mV / 10 mV in range 150 V / 300 V

3.2 Phase Angle:

Range: -360° ... $+360^\circ$

Resolution: 0.001°

Error at 50 / 60 Hz: Voltage: 0.02° typ., $< 0.1^\circ$ guar.

Current: 0.05° typ., $< 0.2^\circ$ guar.

3.3 Frequency

Range sine signals: 10 ... 1000 Hz

Range harmonics / interharmonics: voltage: 10 ... 3000 Hz
Current: 10 ... 1000 Hz

Range transient signals: DC ... 3.1 kHz⁷

Accuracy / drift: ± 0.5 ppm / ± 1 ppm

Resolution: < 5 μ Hz

3.4 DC voltage measuring input

Measuring range: 0 ... ± 10 V (at least)

Accuracy: error $< 0.003\%$ rg. 5 typ., $< 0.02\%$ rg. guar.

Input impedance: at least 1 Mohm

3.5 DC current measuring input

Measuring range: 0 ... ± 1 mA, 0 ... ± 20 mA (at least)

Accuracy: error < 0.003 % rg. 5 typ., < 0.02 % rg. guar.
Input impedance: at least 15 ohms

3.6 Counter inputs

Number: 2
Max. counting frequency: 100 kHz
Pulse width: > 3 μ s
Threshold voltage: 6 V
Voltage hysteresis: 2 V
Max. input voltage: ± 30 V
Isolation: Separated or safety extra-low voltage (SELV)

Connection: 16 pin combination socket (rear /front side)

3.7 Trigger on overload

Supported generators: Current generators
Timer accuracy: error < 1 ms

3.8 Low level outputs

Number of outputs: 6
Setting range: 0 ... ± 10 Vpk
Max. Output current: 1 mA
Accuracy: error < 0.025 % typ., < 0.07 % guar. at 1 ... 10 Vpk
Resolution: 250 μ V
Distortion (THD+N): 2 < 0.015 % typ., < 0.05 % guar.
Unconventional CT/VT simulation: linear, Rogowski (transient and sinewave)
Overload indication: available
Isolation: Separated or safety extra-low voltage (SELV)
Usability: completely independent from internal amplifier outputs
Connection: 16 pin combination socket (rear /front side)

4.0 Software Specification:

4.1 General Features:

No programming to be necessary to test any application entry of setting parameters to set up & perform a test with failed/passed evaluation

Future expansions in functionality by means of software updates.
Firmware updating to be handled by the software, i.e. exchange of EPROMs is not permitted

Automatic generation of test report. All graphics & text to be printable including relay parameters used during testing and assessment of the test result. Capability to export report to word processor program (e.g. MS word)

Test programs based on test modules to be easily generated (test wizard) & serving simultaneously for test template & test report

The kit should be capable to trigger on overload condition and switch off on user-defined time.

Over current Char. Grabber

Advanced Trans-play

State Sequencer

Transient Ground Fault

transducer Test

synchronizing relay test

Auto-reclosure relay test

4.2 General purpose test module

For direct control of all the functioned of the test and connected amplifier output value to be entered numerically or specified in vector diagram

Continuous monitoring of up to 10 binary inputs

Time counter from injection start of voltages and / or current qualities till binary input activated

Step variation (manually or

automatically)capabilities in voltage, current, angle and frequency

Ramp variation capabilities in voltage, current, angle and frequency

4.3 Test module for multifunction relay

Generation of test sequences (> 100) with for each test sequence, possibility to defined up to 16 voltage and current signals in amplitude 3, 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.

Software should capable for generating pulse ramping signal

4.4 Test module for advance distance relay

Manual and automatic test in impedance plane and Z/t grading diagram.

Test module supported : constant current & constant voltage for all fault loop : 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 be supported

Impedance characteristics (theoretical with tolerance) to be displayed graphically (both quadrilateral, lens & Mho and any combination)

Feedback signals: up to 10 binary inputs. Graphical display of contact response vs time.

Graphical display of waveforms injected to the relay.

4.5 Test module for frequency, voltage, current and power relay etc.

Automatic testing

Generation of up to 5 amps for amplitude. Phase angles frequency of signal, with capability to amps 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.

Individual changing of sequence voltages i,e V1, V2 and V0

Individual changing of sequence current i,e I1,I2,& I0

Individual changing of P,Q &VA

Individual changing of frequency, phase angle, & Impedence

4.6 Test module for advance differential relays

Manual and automatic testing

Selection of 2nd up to 20th harmonic (50Hz) for restraint test.

Result assessment : passed- failed

Graphic display of relay characteristics with tolerances

Feedback signal : up to 10 binary inputs

4.7 Modules for transient playback

Transplay allows the loading and playback of transient files containing voltage and current analog transient waveform. COMTRADE files can be automatically played back, This results in the injection of these signals into the relay. These signals may be simple harmonic waveforms or actual power system faults recorded from a digital fault recorder or calculated by a simulation program, such as EMTP. The playback length is only limited by the size of the hard disk.

The software supports the following formats

- a) IEEE COMTRADE (C 37.111-1991 and P37.111/D11-1999) respectively IEC 60255-24 (for replaying records with multiple sampling rates advance transplay is required)
- b) Microsoft windows WAV

Transplay also includes synchronizing capability for use with an external trigger.

IEEE COMTRADE, PL4 (EMTP)

Voltage and current traces as well as digital signals and relay responses to be displayed graphically

4.8 Module for harmonic signals generation

Easy generation in COMTRADE format of harmonic signals and phase angle for the requested harmonics with respect to the fundamental

Ability to generate signals containing up to the 50th harmonics (50Hz)

4.9 Communication ports of protocols

The kit should have following Ethernet interfaces

10/100 Mbit/s (10/100 base TX, auto-sensing, auto-crossover, RJ 45 connector for CAT 5 twisted pair cable)

10/100 Mbit/s (10/100 base -FX, OMTR/connector).support for specific substation protocols such as the GOOSE/GSSE massaging according to IEC 61850-8-1 or UCA 2.0

Dedicated USB port for communication & control.

4.10 Test Modules for Meter Testing:

The kit should perform any balanced or unbalanced load for:

- Single phase meters (or a single measurement element of a 3-phase meter)
- 3-wire meters
- 4-wire meters

Testing of the following meter functions should be supported:

- Wh importing/exporting
- VARh importing/exporting
- VAh
- I^2h and V^2h (load/no-load losses of transformers)
- Qh (quantity hour)

The test kit should perform the following tests on meters:

- Load test - Accuracy of measurement unit (time power method)
- Mechanism test - Accuracy of entire meter including display
- Gated Mechanism test - testing internal meter registers
- Injection test - Quick check (wiring, sense of rotation)
- No-load test - No start-up at zero load
- Creep test - Start-up at low loads

For testing the behavior of meters with harmonics or DC components, the following current signal waveforms shall be available :

- a) Sine
- b) Sine+ Harmonics
- c) Sine+ DC

The test quantities shall be displayed graphically by means of the voltage, current and power vector diagrams.

For testing multifunctional meters, or meters with two directions of rotation, a table per test function should be available (multiple tabs).

The results of an automatic test shall be clearly summed up in a tabular test report (one line per test point). For a manual test, generating any test quantities without defining a complete test procedure can quickly check the correct functioning of meters. In this mode the constant of a meter can also be determined, in case it is not known or if there are doubts about it.

Suitable scanning heads should be provided to carry out these testing.

Operation in conjunction with an external reference meter should be possible. When testing with a reference meter, the test set shall be used as a current and voltage source.

During a load test, the pulses of the meter under test as well as those of the reference meter are registered. The later form the the reference for error calculation.

4.11 Transducer testing

a) The software module for testing measurement transducers enables a test kit for manual or automatic testing of any measurement function, such as:

- Real power (single- or three-phase)
- Reactive power (single- or three-phase)
- Apparent power (single- or three-phase)
- Frequency
- Current
- Voltage (phase-to-ground, phase-to-phase)
- $\cos \Phi$
- Phase angle (V-I, V-V, I-I)
- DC quantities (current, voltage, power)
- Signed average of currents

b) The module supports testing of the following types of characteristics:

- Linear
- Compound
- Quadratic
- Symmetrical or non-symmetrical

c) The error of a transducer is determined by comparing the theoretical signal and the actually measured output signal. Relative, absolute and device errors are derived and graphically displayed in a diagram. If multiple test runs are performed, the average error shall be indicated.

d) Measuring transducers for three-wire (Aaron circuit) as well as four-wire systems can be tested. Currents as well as voltages can be generated as pure sine signals or superimposed with harmonics or DC components.

New generation transducers often no longer have classical mA or VDC output. They rather transmit the measured data via transfer protocol or/and visualize values at a display. The mode “open loop testing” shall support testing this type of transducer.

4.12 Harmonics Analysis

Kit should be capable of on-line analysis of signals upto 64th Harmonic at 50Hz

Following quantities should be displayed:

Magnitude and phase of the fundamental

Frequency, magnitude and THD of the overall signal

Magnitude and phase of the harmonic

4.13 Trend recording

Capability of recording following quantities over time:

- Frequency 1 (any channel)
- Frequency 2 (any channel)
- Currents (RMS value)
- Voltage (RMS value)
- Phase angles
- Real power (single and three phase)
- Reactive power (single and three phase)
- Apparent power (single and three phase)
- Cos Φ

4.14 Test Object Definition with XRIO

All the relevant data for a device to be tested is kept in the standard XRIO format. The corresponding data can either be manually entered or alternatively be imported. Test object parameters can also be exported, making them available across any existing test plans.

LinkToXRIO

LinkToXRIO allow test modules the direct use of a defined test object parameter for testing. If a certain parameter changes, the test plans using it do not need to be modified. The test plans will perform their specified test then using the modified parameter.

XRIO Converters

XRIO Converters optionally allow for the fast and easy entry and conversion of the data available in the relays' own parameter structure. A number of helpful examples are included in the software. XRIO Converters can be written and customized by the users. The growing library of relay-specific XRIO Converters is part of the standard delivery of the Test Universe software and also offered for free download in the customer area of the supplier's website.

4.15 Protection Testing Library (PTL)

This library provides user a free access to prepared test plans and relay models (XRIO Converters) as well as parameter import filters for specific protection devices. Based on the protection parameters and technical details documented in the manual of the particular protection device, XRIO Converters model the protection characteristics and tolerances (e.g. impedance zones, I/t diagram shape, etc.). Any user can easily extend or customize the test plans to meet the individual requirements.

The PTL is extended and maintained on a constant basis. The library for example provides access to templates and XRIO Converters for line, power transformer, and generator protection relays. Specific relay types of ABB, AREVA, GE, SEL, Siemens, Toshiba, and other manufacturers are supported

4.2.9 Analog Measurement Functions

Kit should have capability of analog measurement inputs with recording capabilities. Voltage measurement upto 300V rms alternatively currents can also be measured using suitable shunts. Shunts of suitable rating should be provided with the kit.

Following quantities should be displayed:

- RMS value and phase for V, I (AC)
- DC values for voltage, current and power
- Line-to-line voltage
- Frequency of signal

5.0 IEC 61850 GOOSE

Simulation: Mapping of binary outputs to data attributes in published GOOSE messages.
Number of virtual binary outputs: 360

Number of GOOSEs to be published: 128

Subscription: Mapping of data attributes from subscribed GOOSE messages to binary inputs.

Number of virtual binary inputs: 360

Number of GOOSEs to be subscribed: 128

Performance: Type 1A; Class P2/3 (IEC 61850-5).

Processing time (application to network or vice versa): < 1 ms

6.0 Electromagnetic Compatibility

EMC: The product adheres to the electromagnetic compatibility (EMC) Directive 2004/108/EC (CE conform).

International: IEC 61326-1; IEC 61000-6-4; IEC 61000-3-2/3

USA: FCC Subpart B of Part 15 Class A

7.0 Safety Standards

Safety: The product adheres to the low voltage Directive 2006/95/EC (CE conform).

International / USA: IEC 61010-1 / UL 61010-1

Canada: CAN/CSA-C22.2 No 61010-1-04

Produce Noise by the kit should be under control less than 90db

8.0 Communication Interfaces

Laptop: Branded laptop (Make: HP/COMPAQ/IBM/ DELL) with parallel and spare USB ports,
CPU: Pentium core i3 3.0 GHz or above

Hard disk: 500 GB Hard disk

RAM: 2GB or above

Operating System: User friendly Windows based operating system. Windows XP not be allowed

Others: LAN Card, Inbuilt DVD Combo drive. Should be preloaded with license and registered software

Necessary Microsoft S/W: MS Office 2010/ 2007 (Professional) version.

Interface: Ethernet, RS232, RJ45.

9.0 Dimension & Physical Strength

The test set dimension should be such that it can be easily transported to any site via four wheeler jeep like vehicles.

9.1 Weight

The test set weight should be such that it can be lifted by 2 persons.

9.2 Shocks & Vibrations

The kit shall be used for testing the relays of 415V, 6.6kV, 33kV, 220kV, 400kV voltage level at various locations at BkTPP generating station. The kit will therefore be required extensive transportation by road, making it prone to shocks & vibration and its performance should not be affected in any way. This is very important feature and hence relevant type test satisfying relevant IEC/IS should be conducted in accredited national lab and test certificate should be attached for the same. Offered kit should be supplied with heavy duty transport case with wheels.

9.3 Protection: All current and voltage outputs are fully overload and short circuit proof and protected against external high-voltage transient signals and over temperature

9.4 HMI:

Software: User friendly

Language: English (mainly)
Keyboard: Built-in

9.5 Connection to ground (earth): 4 mm (0.16 in) banana socket (rear side)

9.6 Hardware diagnostics: Self diagnostics upon each start-up

The offered kit should have at least five years of performance certificate to be produce along with the documents. Supported software's are to be supplied with CD's and key license. To be a technical qualifier, participated party should demonstrate their kit at Bk.TPP site on specified date mentioned by the Bk.TPP authority. During demonstration offered kit should perform all the tests asked by Bk.TPP authority. After a successful demonstration, price bid of the technical qualifier to be opened.

ANNEXURE-II



THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED
Bakreswar Thermal Power Project, Birbhum
West Bengal

NIT No.: WBPDC/Tend-Adv/CC/15-16/18/BKTPP

Date:22.04.2015

SUB.: TENDER DOCUMENTS FOR PROCUREMENT OF 01 NO. DUAL SOURCE 3 PHASE SECONDARY VOLTAGE & CURRENT INJECTION KIT FOR TESTING OF RELAYS, TRANSDUCERS & CALIBRATION OF METERS AT BAKRESWAR THERMAL POWER PROJECT:

Description	Qty.	Ex-Works Unit Rate (Rs.)	E.D. & Surcharge	Sale Tax./VAT (Rs.)	Service Tax if Any (Rs.)	Transportation Charge (Rs.)	Any other Charges if any (Rs.)	Discount if any	Gross Rate at BkTPP Store (Rs.)
Material	01 No.								
For Commissioning									