

**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/13-14/32/BkTPP      Date: 09.05.2013**

Sealed tenders in two parts, Part A (for technical specification bid) and Part B (for commercial price bid) in duplicate are invited by the General Manager, BkTPP with same material specification for the supply of following material at BkTPP.

1. Description of Material : As per Annexure-I
2. Estimated Cost : Rs. 22,00,000/-
3. Earnest Money : Rs. 40,000/-
4. Cost of Tender Paper : Rs. 1,000/-
5. Sale of Tender Paper : 10.05.2013 to 28.05.2013
6. Pre-bid discussion : 30.05.2013 at 02.30 PM
7. Last Date of Submission : 17.06.2013 at 02.00 PM  
of Sealed Tender Paper
8. Opening of Tender
- 8a. Part-A (for technical bid) : 17.06.2013 at 03:30 PM
- 8b. Part-B (for price bid) : Opening date will be intimated to the successful i.e technically accepted bidders later on.
9. Material Delivery Period : Twenty four (24) weeks from the date of the order.

**[Qualifying Requirement:**

1. Must be ISO certified company having experienced for supplying Calibration standards/ Test Bench for Pneumatic and Hydraulic Pressure and Temperature Measuring Instruments.
2. Documents to prove the experience of the tenderers in successful execution of Purchase Order in the last five financial years they should submit Purchase Order copies for i) amount of Rs.10,00,000/- or above in single order / ii) amount of Rs.7,00,000/- each or above in three orders / iii) amount of Rs.5,00,000/- each or above in five orders. And End user's certificate or Material Receipt Note Voucher is to be submitted as supporting document for proof of execution of above Purchase Order/s.]

Detailed terms & conditions are set forth in the Tender Paper (Non - Transferable) which can be obtained from the Sr. Manager(S&P), BkTPP on application. The cost of Tender Paper is to be deposited in the Account Section, BkTPP from 10.30 AM to 01.30 PM (except Saturday, Sunday and Holiday). Tender Paper will not be issued against DD / MO / Cheque and by post. If any change or extension of due date or any corrigendum, may please visit website. The WBPDC reserves the right to accept or to reject any or all tender either in full or in part or to split up, if necessary without assigning any reasons whatsoever. For qualifying requirements and other details visit website [www.wbpdcl.co.in](http://www.wbpdcl.co.in)

T. K. BOSE  
SR.MGR(S & P)  
BkTPP/WBPDC

# **ANNEXURE-I**

## **Calibration Test Bench For Pneumatic, Hydraulic Pressure and Temperature Instruments**

### **Construction details of test bench: -**

- **Max space provision 16'x 3' in our laboratory. Size of test Bench will be 15'x2.5' Approx.**



- **Work & laboratory table:**

Straight Rectangular type Test Bench with frames of high quality steel construction with suitable laminated bench top surface for easy operations.

- **Bench-top unit:**

Bench-top units are built-in with modules; blank plate & suitable cutout to equip / mount various instruments are provided. The main power pre-wired to cater all the instruments mounted with frontal controls in this bench-top unit. Blank space is provided in the bench top unit.

- **Under bench cabinet:**

Storage space with lockable drawers (3 Nos.) on one side of test bench for keeping necessary stationary items / tools and tackles, etc

*Note: Input Pressure source will be under our scope of supply*

### **Facility: 1**

#### **Mains Power Supply (Bench Mounted)**

Quantity: 1 No.

#### **Specifications**

- 240V AC, 50 Hz single phase main power supply
- For protection of built-in modules/cassettes etc.
- Residual current circuit breaker (Make: ABB/ HAVELLS/SIEMENS)
- Rated fault current : Approx. 30mA
- Rated current : 25 A
- No. of poles : 2
- Emergency off
- Line indicating lamp
- AC Voltmeter
- AC Power Socket: 240V AC/15A/5A - **Quantity: 2 Nos.**
- On-Off Switch : On-Off Lamp indication switch (for each socket)

Make : ABB/ HAVELLS/SIEMENS

This power supply will be used to power up other electrical devices.

### **Facility: 2**

#### **Fixed DC power Supply (Bench Mounted)**

Quantity: 1 No.

Make : ABB/ HAVELLS/SIEMENS/APLAB

**Specifications**

Input Volts : 240V AC, 50Hz, 1 Phase  
Output Volts : 24VDC / 5A  
Banana Socket : 1 Nos. with On-Off Lamp indication Switch

**Facility: 3**

**Regulated DC power Supply (Bench Mounted)**

Quantity: 1 No.

Make : ABB/ HAVELLS/SIEMENS/APLAB

**Specifications**

Input Volts : 240V AC, 50Hz, 1 Phase  
Output Volts : 0-64 VDC Adjustable  
Out amps : 0- 1Amp adjustable  
Banana Socket : 1 Nos. with On-Off Lamp indication Switch

**Facility: 4**

**110VAC Power Supply (Bench Mounted)**

Make : ABB/ HAVELLS/SIEMENS/APLAB

Input Power Supply : 240VAC, 50 Hz  
Output: 110VAC/5A  
Power Socket : 240VAC/5A - 2 Nos.  
On-Off Switch : On-Off Lamp indication switch (for each socket)

**Facility: 5**

**Fixed DC Power Supply (Bench Mounted)**

Make : ABB/ HAVELLS/SIEMENS/APLAB

**Specifications**

Input Volts : 240V AC, 50Hz, 1 Phase  
Output Volts : 220VDC / 5A  
On-Off Switch : On-Off Lamp indication switch (for each socket)  
Output: Power Socket: 220V DC//5A - **Quantity: 2 Nos.**

**Facility: 6**

**Control plate / mimic panel (Bench Mounted)**

Quantity: 1 No.

a. Pressure regulators	
Make	Standard
Model	Standard
Range	0.06 to 2 kg/cm <sup>2</sup>
Accuracy	0.07 kg/cm <sup>2</sup>
b. Pressure gauge	
Make	standard

<b>Range</b>	<b>0 to 10000 mmWC</b>
<b>Digital Display</b>	5 Digits
<b>Accuracy</b>	<b>± 0.05% FS</b>
c. Output Connection	1/4" BSP (M)

**Facility: 7**

**Control plate / mimic panel** (Bench Mounted)

Quantity: 1 No.

a. Pressure regulators	
Make	standard
Model	Standard
Range	0.07 to 4 kg/cm <sup>2</sup>
Accuracy	0.03 kg/cm <sup>2</sup>
b. Pressure gauge	
Make	standard
<b>Range</b>	<b>0 to 4 kg/cm<sup>2</sup></b>
<b>Digital Display</b>	5 Digits
<b>Accuracy</b>	<b>± 0.05% FS</b>
c. Output Connection	1/4" BSP (M)

**Facility: 8**

**Control plate / mimic panel** (Bench Mounted)

Quantity: 1 No.

a. Pressure regulators	
Make	standard
Model	Standard
Range	0.42 to 10 kg/cm <sup>2</sup>
Accuracy	0.05 kg/cm <sup>2</sup>
b. Pressure gauge	
Make	standard
<b>Range</b>	<b>0 to 10 kg/cm<sup>2</sup></b>
<b>Digital Display</b>	5 Digits
<b>Accuracy</b>	<b>± 0.05% FS</b>
c. Output Connection	1/4" BSP (M)

**Facility: 9**

**Vacuum Panel** (Bench Mounted)

Quantity: 1 No.

Make : Reputed Indian Make

**Specifications**

Vacuum Gauge :1> - 1 to 0 Kg/cm<sup>2</sup>  
Dial Size: 160 mm, Accuracy: ± 0.25%F.S  
2> Digital Pr gauge , 5 Digit Display, 0.05% Accuracy

Regulator : Suitable regulator will be provided  
O/P Coupling : ¼ BSP(M) connector suitable for hose connection  
Hose : Suitable hose for this vacuum connection

With Vacuum Pump

Make : Toshniwal  
Model : 72:240-D

**Features:**

- Portable
- Highly reliable
- Low noise operation
- Double Stage pumps
- Compact and sturdy design
- Advanced lubricating system
- Easy maintenance and usage

**Specifications:**

Free Air Displacement : 240 Lit / Min  
Ultimate Pressure :  $1 \times 10^{-3}$  Torr  
Motor : 0.55 kW  
Voltage : 220V, 50 Hz, Single Phase  
Intake Fittings : KF 25  
Oil Capacity : 1 Lit  
Dimensions : 528 x 145 x 280 mm  
Net Weight : 22 Kgs  
RPM : 1400

**Related Accessories 4 sets each**

**Facility: 10**

**Smart Pressure Calibrator-Advance Microprocessor Based (Pneumatic)**

Make : Nagman, Chennai.  
Model : MPC-P-B+  
Quantity : 1 No.

**Features:**

- Advanced Technology
- Light Weight / Compact
- Resolution : Minimum 5 digits
- Large Graphic Display
- Touch Membrane Keypad
- Selectable Engineering Pressure Units
- Switch Test capability & Zero Offset facility
- Audio & Visual Alarms for Over Pressure
- Pressure Transducer – all Media compatible with SS316

**Specifications:**

Range : - 1 to 2 Bar  
Accuracy :  $\pm 0.025\%$  F.S.  
Pressure Units \* : bar, psi, kg/cm<sup>2</sup>, kpa, mpa, mmHg, atm, mH<sub>2</sub>O, inHg, inH<sub>2</sub>O, ftH<sub>2</sub>O, cmH<sub>2</sub>O, mbar  
Temperature Compensation : 0 to 50°C (Automatic)  
Resolution : Minimum 5 digits  
Display : Large Graphic Display  
mA Input : 50 mA (Active Loop) & 25 mA (Passive Loop) Load Resistance: 800  $\Omega$   
Volt Input : 0 to 30V DC  
Resolution (mA / V) : 0.001  
Pressure Switch Test : Maximum 5V DC  
Instrument Casing : Trendy, Elegant Case  
Over Pressure Alarm : 120% FS (Audio / Visual)  
Battery : Rechargeable Battery & Charger  
Low Battery Indication : Provided

**Generation** : **External Hand Pump Make: Nagman, Chennai,  
Model: PHP – 2 (-0.85 to 2 Bar)**

*\* Units selected depending on the range & resolution*

**Facility: 11**  
**Pneumatic Hand Pump (Portable)**

**Make** : **M/s. Nagman, Chennai**  
**Model** : **PHP-40**  
**Quantity** : **2 Nos.**

**Features:**

- Compact, Light Weight, Hand Operated
- Combined Vacuum & Pressure Pump with Pressure / Vacuum Changeover option
- Generation (Range) of
  - Pressure: Upto 40 Bar
  - Vacuum: Upto 0.9 Bar
- Fine Adjustment Vernier to realize upto 1 mBar Resolution / Sensitivity
- Very Low Leakage rate
- Flexible Nylon Hose (1 Meter) with Swivel Adaptor to connect devices under test
- Test Connection Port : 1/4" (F) BSP
- Gauge / Indicator Connection Port : 3/8" (F) BSP
- Weight (approx.): 750 gms.
- Instrument Dimension (H x W x D) : 230 x 140 x 65 mm

**Specifications:**

**Range** : **- 0.9 bar Vacuum to 40 Bar Pressure**  
**Medium** : **Air**  
**Sensitivity / Resolution** : **Upto 1 mBar**

**Facility: 12**  
**Digital Multimeter (Bench Mounted)**

**Fluke 45 Bench Meter with dual display**

<b>VDC</b>	<b>Range:</b> 0V-1000V <b>Resolution:</b> 1 $\mu$ V-0.01V <b>Best Accuracy:</b> $\pm 0.025\% + 2^*$
<b>VAC (True-rms, AC Coupled) Freq. 20 Hz-100 khz</b>	<b>Range:</b> 0V-750V <b>Resolution:</b> 1 $\mu$ V-0.01V <b>Best Accuracy:</b> $\pm 0.2\% + 10^*$
<b>dB Readout (600 <math>\Omega</math> Ref.) (Ref. Z 2<math>\Omega</math>-8000<math>\Omega</math>)</b>	<b>Range:</b> -34 $\pm$ 60 <b>Resolution:</b> 0.01 dB-0.1 dB <b>Best Accuracy:</b> $\pm 0.08$ dBm *
<b>ADC</b>	<b>Range:</b> 0 mA-10A <b>Resolution:</b> 0.1 $\mu$ A-10 mA <b>Best Accuracy:</b> $\pm 0.05\% + 2^*$
<b>AAC (True-rms, AC Coupled) Freq. 20 Hz-20 khz</b>	<b>Range:</b> 15 $\mu$ A-10A <b>Resolution:</b> 0.1 $\mu$ A-10 mA <b>Best Accuracy:</b> $\pm 0.5\% + 10^*$
<b>Resistance</b>	<b>Range:</b> 0 $\Omega$ -100 M $\Omega$ <b>Resolution:</b> 0.001 $\Omega$ -1m $\Omega$ <b>Best Accuracy:</b> $\pm 0.05\% + 2^*$

<b>Frequency</b>	<b>Range:</b> 5 Hz - 1 MHz <b>Resolution:</b> .01 Hz-1 kHz <b>Best Accuracy:</b> $\pm 0.05\% + 1^*$
<b>Size</b>	216 mm W x 93 mm H x 286 mm D (8.5" W x 3.67" H x 11.27" D)
<b>Weight</b>	Net 2.4 kg (5.2 lb); with battery 3.2 kg (7 lb)
<b>One Year Warranty</b>	One year calibration interval

**Facility: 13**

**Portable Digital Pressure Calibrator** (Portable, supply separately)

**Calibration Range:** 0 to 400 bar Pressure

Accuracy:  $\pm 0.025\%$  F.S

Resolution: Minimum 9 Digits

Switch test: Max. 9V

Automatic temperature compensation(0-50 DegC)

Touch membrane keypad

Large graphic display; 15 Engineering units; Pressure generation through Priming pump & Fine adjustment Vernier; Inbuilt battery charger; Heavy duty casing.

[Model: PPC-H+ , Make: NAGMAN] or Equivalent

Quantity 2 Nos.

**Related Accessories 4 sets each**

**Facility: 14**

**Portable Digital Pressure Calibrator** (Portable, supply separately)

**Calibration Range:** -0.85bar (vac.) to 20 bar Pressure

Accuracy:  $\pm 0.025\%$  F.S

Resolution: Minimum 9 Digits

Switch test: Max. 9V

Automatic temperature compensation

Large graphic display; 15 Engineering units; Pressure generation through Priming pump & Fine adjustment Vernier; Inbuilt battery charger; Heavy duty casing.

[Model: PPC-P+ , Make: NAGMAN] or Equivalent

Quantity 2 Nos.

**Related Accessories 4 sets each**

**Facility: 15**

**Comparison Tester** (Bench Mounted)

Range: pressure upto 700 bar

Good accuracy, resolution, repeatability level

Single piston type, hydraulic series

Quantity: 1 No.

**Standard Pressure Gauges: Model: 5214, Accuracy :  $\pm 0.25\%$ , Make: Budenberg Gauge Co Ltd, UK**

**Dial 150 mm**, supply separately.

<b>Range</b>	<b>Quantity</b>
-1 to 0 kg/cm <sup>2</sup>	1No.
0 to 1 kg/cm <sup>2</sup>	1No.
0 to 1.6 kg/cm <sup>2</sup>	1No.
0 to 2.5 kg/cm <sup>2</sup>	1No.
0 to 6 kg/cm <sup>2</sup>	1No.
0 to 10 kg/cm <sup>2</sup>	1No.
0 to 16 kg/cm <sup>2</sup>	3Nos.
0 to 40 kg/cm <sup>2</sup>	1No.
0 to 100 kg/cm <sup>2</sup>	1No.
0 to 160 kg/cm <sup>2</sup>	1No.
0 to 250 kg/cm <sup>2</sup>	1No.
0 to 400 kg/cm <sup>2</sup>	1No.

**Standard Pressure Gauges: Model: 5414, Accuracy : + -- 0.15%, Make: Budenberg Gauge Co Ltd, UK**

**Dial : 250mm,**

-1 to 0 kg/cm <sup>2</sup>	1No.
0 to 1 kg/cm <sup>2</sup>	1No.
0 to 2.5 kg/cm <sup>2</sup>	1No.
0 to 6 kg/cm <sup>2</sup>	1No.
0 to 10 kg/cm <sup>2</sup>	1No.
0 to 16 kg/cm <sup>2</sup>	1No.
0 to 250 kg/cm <sup>2</sup>	3Nos.

**Facility: 16**

**Hydraulic Dead Weight Tester (Portable, supply separately)**

Make: Pressurements, UK

Model: M2100/1

Pressure range upto 1 to 600 kg/cm<sup>2</sup>

Accuracy: + -- 0.015% of indicated pressure

Dual piston type

Quantity: 1 No. (ISO 9000 Certified or equivalent)

**Facility: 17-**

**Dry Block Temperature Calibrator 650 H**

Make :M/s. Nagman, Chennai

Quantity: 1 No.

**Features:**

- Range : 20°C above Ambient to 650°C
- Accuracy : ±1.5°C
- Immersion Depth : 650 H – 110mm
- Heavy Duty Portable / Bench-top Model
- Rugged Field Use & for Calibration at Site
- Auto-tune PID Control
- Switch Test Capability
- Fast and Reliable
- Improved Accuracy, Resolution & Stability
- Interchangeable Thermowell Inserts : Single / Multihole
- Meets CE Norms

**Specifications:**

<b>Temperature Range</b>	:	<b>20 °C above amb. To 650 °C</b>
<b>Resolution</b>	:	<b>0.1 °C</b>
<b>Accuracy</b>	:	<b>±1.5 °C</b>
<b>Stability</b>	:	<b>±0.5 °C</b>
<b>Stabilisation Time</b>	:	<b>25 Minutes</b>
<b>Well Dia</b>	:	<b>25 mm</b>
<b>Well Depth</b>	:	<b>110 mm</b>
<b>Heating time (to Max)</b>	:	<b>20 minutes</b>
<b>Cooling time (to 100 °C)</b>	:	<b>60 minutes</b>
<b>Interchangeable Thermowells</b>	:	<b>Single hole to suit 1/4" &amp; 1/2" Probes</b>
<b>Switch Test facility / Supply</b>	:	<b>Provided / 5VDC (open)</b>
<b>Power Consumption</b>	:	<b>1200 watts</b>
<b>Power Supply</b>	:	<b>230 VAC ±10% / 50Hz</b>

**Additional Thermowells /**

**Insertion Tubes** :

- **Single hole: 3, 4, 5, 6, 7, 8, 10, 12, 14mm probe**



**Facility: 18**

**Test Bench Accessories:** (supply separately)

Make : Standard Indian Make  
Both side 1/4" BSP Parallel Female hose 2 Metre length 4 Nos.

**a) Adaptors: Standard Indian Make (Material SS304)**

- 1/4" BSP Male x 1/8" BSP Parallel Female – 10 Nos
- 1/4" BSP Male x 1/8" NPT Female – 10 Nos
- 1/4" BSP Male x 1/8" BSP Parallel Male – 10 Nos
- 1/4" BSP Male x 1/8" NPT Male – 10 Nos
  
- 1/4" BSP Male x 1/4" NPT Female – 10 Nos
- 1/4" BSP Male x 1/4" NPT Male – 10 Nos
- 
- 1/4" BSP Male x 3/8" BSP Parallel Female – 10 Nos
- 1/4" BSP Male x 3/8" NPT Female – 10 Nos
- 1/4" BSP Male x 3/8" BSP Parallel Male – 10 Nos
- 1/4" BSP Male x 3/8" NPT Male – 10 Nos
  
- 1/4" BSP Male x 1/2" BSP Parallel Female – 10 Nos
- 1/4" BSP Male x 1/2" NPT Female – 10 Nos
- 1/4" BSP Male x 1/2" BSP Parallel Male – 10 Nos
- 1/4" BSP Male x 1/2" NPT Male – 10 Nos

- b) Equal Tee 1/8" BSP 10 Nos.
- Equal Tee 1/4" BSP 10 Nos
- Equal Tee 3/8" BSP 10 Nos

- c) Unequal Tee 1/4 x 1/8"x 1/8" BSP 10 Nos.
- Unequal Tee 1/2" x 1/4" x 1/4" BSP 10 Nos.
- Unequal Tee 3/8" x 1/4" x 1/4" BSP 10 Nos

- Fittings material should be SS316

**d) Tools (spanners): Make Taparia, (supply separately)**

- Slide wrench 6", 9", 12" – 2 Nos. Each
  
- Allen keys (Normal Type)
  - Inch type (1.5mm, 2mm, 2.5mm, 3mm, 4mm, 5mm, 6mm, 8mm, 10mm) – 2 Set
  - Metric type (1/16", 5/64", 3/32", 1/8", 5/32", 3/16", 7/32", 1/4", 5/16", 3/8") – 2 Set
  
- Allen keys (Ball type)
  - Inch type (1.5mm, 2mm, 2.5mm, 3mm, 4mm, 5mm, 6mm, 8mm, 10mm) – 2 Set
  - Metric type (1/16", 5/64", 3/32", 1/8", 5/32", 3/16", 7/32", 1/4", 5/16", 3/8") – 2 Set
  
- **Screw Driver Set ( Make: Taparia or equivalent)** – 2 Set Each Type
  
- 1. Screw driver Set(Flat Slot)

2. Screw driver Set(Philips)
3. Screw driver Set(Pozidriv (SupaDriv))
4. Screw driver Set(Hex)
5. Screw driver Set(Tri Wing )
6. Square socket(Robertson)
7. Torx(external) 6lobes
8. Torx(internal) 6 lobes
9. One way removal tool

**Facility: 19**

**Continuity Tester** (Bench Mounted)

**Make: Reputed Indian Make**

**Application:** To test on/off devices like pressure and Temperature switches. Acoustical Warning will be provided.

**Facility: 20**

**Transmitter Mounting Stand (1 No.)**

**Facility: 21**

**Gauge Mounting Block (2 Nos.)**

**Facility: 22**

**Test Leads**

Make :Standard Indian Make

a) Test Lead One End Crocodile type, other end Banana type suitablefor Test Bench

Qty. : 6 Sets. (Red & Black)

b) Test Lead One End Normal Pin type, other end Banana type suitable for Test Bench

Qty. : 6 Sets. (Red & Black)

c) Both end banana type suitablefor Test Bench

Qty : 6 Sets. (Red & Black)

**SCOPE OF WORK**

1. Supply of Test Bench for Pneumatic and Hydraulic Pressure and Temperature Measuring Instrument Calibration.
2. Installation, Testing & Commissioning of same system.
3. On site Training of newly installed system.
4. Calibration Test Certificates of all Instruments from NABL Certified Lab.
5. Instruction manual in both softcopy and hard copy(one set) containing all individual instruments literature. Individual equipment's detail specification, Part No., Order Code are to be provided.
6. Certificates for warrantee/Guarantee of each instruments