

Package 1 – NORTH KARANPURA (3 X 660 mw) – 1720,1721 and 1722 (CATALOGUE 1 and 2)

NITROGEN BLANKETING SYSTEM and CYLINDERS.

NITROGEN BLANKETING SYSTEM – UOM SET	3.000
NITROGEN CYLINDERS – UOM NOS	63.000

THE FOLLOWING ARE THE TECHNICAL DOCUMENTS.

1. NITROGEN BLANKETING SYSTEM AS PER P & ID: 2-24-865-01887/04
2. SPECIFICATION FOR NITROGEN BLANKETING – SYSTEM:BM/NBS:001
3. TECHNICAL DELIVERY CONDITIONS FOR PRESSURE GAUGE – TDC:TCI:101/08
4. 3 INDEPENDENT SYSTEMS TO BE SUPPLIED ALONG WITH THE NITROGEN CYLINDERS
5. THE VENDOR SHALL SUBMIT ALL THE SUPPORTING DOCUMENTS FOR OUR PQR REQUIREMENT.
6. VENDOR QUALITY PLAN SHALL BE SUBMITTED
7. ALL THE DOCUMENTS SHALL BE SUBMITTED AS PER OUR SPECIFICATION REQUIREMENT.

Package 2 – MAITREE (2 X 660 mw) – 1725 AND 1726 (CATALOGUE 3 and 4)

NITROGEN BLANKETING SYSTEM and CYLINDERS.

NITROGEN BLANKETING SYSTEM – UOM SET	2.000
NITROGEN CYLINDERS – UOM NOS	42.000

THE FOLLOWING ARE THE TECHNICAL DOCUMENTS.

1. NITROGEN BLANKETING SYSTEM AS PER P & ID: 2-24-865-01887/04
2. SPECIFICATION FOR NITROGEN BLANKETING – SYSTEM:BM/NBS:002
3. TECHNICAL DELIVERY CONDITIONS FOR PRESSURE GAUGE – TDC:TCI:101/08
4. 2 INDEPENDENT SYSTEMS TO BE SUPPLIED ALONG WITH THE NITROGEN CYLINDERS
5. THE VENDOR SHALL SUBMIT ALL THE SUPPORTING DOCUMENTS FOR OUR PQR REQUIREMENT.
6. VENDOR QUALITY PLAN SHALL BE SUBMITTED
7. ALL THE DOCUMENTS SHALL BE SUBMITTED AS PER OUR SPECIFICATION REQUIREMENT.

Package 3 – TELANGANA (2 X 800 MW) (CATALOGUE 5 and 6)

NITROGEN BLANKETING SYSTEM and CYLINDERS.

NITROGEN BLANKETING SYSTEM – UOM SET	2.000
NITROGEN CYLINDERS – UOM NOS	42.000

THE FOLLOWING ARE THE TECHNICAL DOCUMENTS.

1. NITROGEN BLANKETING SYSTEM AS PER P & ID: 2-24-865-01887/04
2. SPECIFICATION FOR NITROGEN BLANKETING – SYSTEM:BM/NBS:001
3. TECHNICAL DELIVERY CONDITIONS FOR PRESSURE GAUGE – TDC:TCI:101/08
4. 2 INDEPENDENT SYSTEMS TO BE SUPPLIED ALONG WITH THE NITROGEN CYLINDERS
5. THE VENDOR SHALL SUBMIT ALL THE SUPPORTING DOCUMENTS FOR OUR PQR REQUIREMENT.
6. VENDOR QUALITY PLAN SHALL BE SUBMITTED
7. ALL THE DOCUMENTS SHALL BE SUBMITTED AS PER OUR SPECIFICATION REQUIREMENT.

Package 4 – PANKI (1 X 660 MW) (CATALOGUE 7 and 8)

NITROGEN BLANKETING SYSTEM and CYLINDERS.

NITROGEN BLANKETING SYSTEM – UOM SET	1.000
NITROGEN CYLINDERS – UOM NOS	21.000

THE FOLLOWING ARE THE TECHNICAL DOCUMENTS.

1. NITROGEN BLANKETING SYSTEM AS PER P & ID: 2-24-865-01887/04
2. SPECIFICATION FOR NITROGEN BLANKETING – SYSTEM:BM/NBS:001
3. TECHNICAL DELIVERY CONDITIONS FOR PRESSURE GAUGE – TDC:TCI:101/08
4. 1 INDEPENDENT SYSTEMS TO BE SUPPLIED ALONG WITH THE NITROGEN CYLINDERS
5. THE VENDOR SHALL SUBMIT ALL THE SUPPORTING DOCUMENTS FOR OUR PQR REQUIREMENT.
6. VENDOR QUALITY PLAN SHALL BE SUBMITTED
7. ALL THE DOCUMENTS SHALL BE SUBMITTED AS PER OUR SPECIFICATION REQUIREMENT.

	SPECIFICATION FOR NITROGEN BLANKETING SYSTEM	SPECIFICATION NO.: BM/NBS:002	
		SECTION: Boiler Mountings/PE (FB)	
		REV. NO.: 00	DATE: 07.07.21
		PAGE NO : 2 OF 5	

- I. This Specification covers the Design, Manufacture and supply of **Nitrogen Blanketing System** for Pressure Parts of Boiler for Preservation during short and long shutdown for both Dry and Wet Preservation.

II. Scope of Supply:

1. Supply Manifold: Refer Drawing No. **2-24-865-01887**.
2. **21 no. High pressure empty cylinders of capacity ~47L.**
3. Required connections from Nitrogen Cylinders to manifold including all the accessories (connectors, Pigtail hoses/ flexible hoses with suitable leak proof connectors/Couplings/flanges, gaskets for flanges etc.)
4. Isolating Ball Valves as per ANSI / ASME or equivalent Standard.
5. One Pressure Indicator (as per specification TCI:101) each in the manifold and in the downstream piping with required piping, condensing loop, isolation valve and 3-way valve.
6. Pressure regulating valve as per ANSI / ASME or equivalent Standard.
7. Pressure relief valve as per ANSI / ASME or equivalent Standard.
8. All necessary mating Flanges, Fasteners, Gasket, Sockets at the Terminal point. Kindly note that BHEL Terminal point will be NB50 pipe. (OD 60.3mm)
9. All necessary supports and supporting structures for the supply manifold and for piping which is in supplier scope. Structural base and support (incl. canopy), chain and hook arrangement for holding the cylinders should be provided by the supplier.
10. The system shall be complete within the scope of supplier. All the necessary equipment / attachments / peripheral members required for the erection & commissioning of the system shall be supplied.
11. No of System per Boiler: **1 Independent system** per Boiler.
12. One set of all gaskets, O rings, packing and seals applicable in the system shall be supplied for site hydraulic test.

III. Design:

- The Nitrogen Blanketing system design parameters (Pressure, Flow etc.) shall be as per the P&ID 2-24-865-01887.



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- Supplier shall provide equipment and components in accordance with the supplier's standard vendors with proven track record, unless otherwise specified by BHEL. Equipment or components not listed shall be as per Supplier's standard.
- **Nitrogen cylinders should be supplied as per ISI standard. The capacity shall be approximately 47L. Design pressure of the cylinder shall be 160 kg/cm²g. The cylinders shall be designed as per the standard IS 7285: Part-II: 2004.**
- **The pressure throttling valve shall be self-regulating valves. The controllability range shall be 1:30. The valve inlet and outlet pressure are 30-160 kg/cm²(g) and 5-10 kg/cm²(g) respectively. Full pressure of 160 kg/cm²g will be available in the valve upstream side and gradually as the Nitrogen flows out, the pressure will reduce. The downstream pressure shall be constantly maintained in the range 5-10 kg/cm²(g) by the valve.**
- For Manifold design, enough clearance between the tapping's shall be provided consider the cylinder size for easy replacement/maintenance.
- The relief valve opening pressure shall be factory set at 15 kg/cm²(g) and same shall be adjustable at site if required.
- All piping furnished by the Supplier shall be provided in ASME standard sizes in nominal Metric units (DN sizes). All weld end preparations, socket weld couplings, threaded connections, flange sizes and ratings, at BHEL/Supplier terminal points shall comply with ASME/ANSI standards in Metric units.
- Valve design shall be in accordance with ASME B16.34.
- Material of Construction for Valves and Manifolds shall be SA106 Gr B/ SA06 Gr C/ SA105 or equivalent.
- All flanged connections, if applicable, shall be supplied in accordance with the requirements of ASME B16.5.
- All materials shall be new and in accordance with applicable ASTM specifications or with other recognized standards such as SAE.
- The use of asbestos or material containing asbestos shall not be permitted. The use of mercury or material containing mercury shall not be permitted. All non-metallic materials shall be submitted to BHEL for approval.
- The equipment and materials specified are intended to be the minimum suitable for the intended service. They are not intended to limit the Supplier's responsibility for

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proper design and selection of equipment. It is the Supplier's responsibility to bid a complete system for the intended service and the specification is only for general guidelines. Any changes in proposed equipment or materials during design shall be approved by BHEL.

- The Supplier shall be governed by the applicable regulations, codes, and standards, including their latest respective addenda, amendments, and errata.

The supplier should satisfy the above internally before submission to BHEL.

IV. Terminal Points

As per the drawing **2-24-865-01887**.

V. Documents and Data by Supplier

- **Nitrogen blanketing system consists of N2 empty cylinder. The supplier shall provide DGR/hazardous goods certificate, Material safety data sheets, Sea worthy packing for DGR/hazardous goods & CCOE and other relevant certificate/ documents if applicable.**
- Supplier shall submit Arrangement drawings, Bill of material, calculations (if required), specifications (other than international standards/ codes if used) for approval. (1 set during offer stage and one after order placement)
- The Supplier shall provide dimensional outline drawings of the assembled unit(s). The drawings shall show overall dimensions, terminal box dimensions, mounting connections, clearances required for proper installation and maintenance shall state lifting requirements, and the weights of all major components. In addition to the sectional drawing, supplier has to provide isometric drawing also.
- All drawings, calculations, specifications, bills of materials and other data submitted shall be in Metric units. Metric units shall comply with the International SI System.
- Instrument list and Instrument data sheet(s) (ISA format or equal)
- Test certificates.
- O&M instructions for all items concerned.
- Vendor shall provide assemble/disassemble procedure to be furnished.

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VI. Testing

- Valves shall be tested in accordance with the latest applicable standards and codes.
- Complete system shall be hydraulically tested at 1.5 times the design pressure of the system (Cylinder pressure).
- Complete system shall be tested for functionality of all the components including the pressure relief valve and regulating valve.

VII. Additional requirements

- Painting shall be as per manufacturer standard.
- Machined surfaces shall be suitably protected.
- Valve ends shall be protected by means of metallic covers/polythene caps/rubber and protectors to prevent damage to ends & also to avoid foreign material entering the valve while shipment & storage.
- All components shall be packed suitably in wooden cases in order to avoid damage during transit and also during storage at site.
- Valve tag nos. shall also be incorporated in all the dispatch documents.
- All unpainted surfaces shall be protected with a rust preventive, which can be removed by solvent washing. The use of grease or oil other than light grade mineral oil for corrosion protection is prohibited.
- All exposed machined surfaces shall be coated with suitable rust preventative coating prior to shipment.
- Supplier shall adequately crate, block, anchor and protect equipment as required to prevent damage during transit shipment and outdoor storage for a period of one (1) year.
- All threaded connections shall be plugged or capped with standard pipe plugs or caps.
- List of spares shall be quoted if applicable.

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- At the request of purchaser, vendor shall depute a Field engineer to provide technical assistance during erection and commissioning.

Bharat Heavy Electricals Limited

HIGH PRESSURE BOILER PLANT, TIRUCHIRAPPALLI 620 014.

TECHNICAL DELIVERY CONDITIONS

FOR SUB - DELIVERY COMPONENTS OF
CONTROLS AND INSTRUMENTATION

TDC: TCI: 101 / REV 08

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PRESSURE GAUGE

08	04-02-2017	General Revision	 (AB)	 (NR)	 (RMV)	 (TK)
07	29-03-2004	Revised based on revisiting of the spec (TCI 103 - Draft Gauge Spec is merged with revised TCI 101)	Sd/- (TAM)	Sd/- (KAK)	Sd/- (SSM)	Sd/- (KCM)
06	16-06-1997	General revisions	Sd/-	Sd/-	Sd/-	Sd/-
05	09-07-1993	Page number added	Sd/-	Sd/-	Sd/-	Sd/-
01, 02, 03, 04	----	General Revisions	Sd/-	Sd/-	Sd/-	Sd/-
Rev. No.	DATE	DESCRIPTION	PREPARED	Engg REVIEWED	QAC	APPROVED

CL No.	CHARACTERISTICS	REQUIREMENT	VENDOR COMPLIANCE (Refer Note: 2)
1.0	<u>SITE CONDITIONS</u>		
1.1	Altitude above mean sea level	} Refer to Data Sheet	
1.2	Ambient temperature condition		
1.3	Relative humidity		
1.4	Atmosphere	Tropical, Dusty, salty, corrosive and highly polluted.	
2.0	<u>GENERAL</u>		
2.1	Reference standard	IS 3624 / EN 837 – 1, 2, 3 / ASME B40.100	
2.2	Type	Direct reading	
2.3	Scale	Industrial concentric 270° linear	
2.4	Sensing element	Bourdon - for Pressure Gauges.	
		Diaphragm / Bellows / Capsule - for Draft Gauges.	
2.5	Nominal Dial Size	As specified in data sheet.	
2.6	Accuracy	± 1% of FSD for Pressure ranges	
		± 1.6% of FSD for Draft ranges	
2.7	Over range protection	125% of maximum range.	
2.8	Dial graduation	Graduated in Kg / Sq.cm (g) / mmWC.	
2.9	Zero adjustment	Micrometer adjustable from the front after opening the bezel	
2.10	Enclosure protection	Weather proof, water tight and dust tight IP 65 of IS / IEC:60529 / NEMA Equivalent	
2.11	Painting	Stoved enameled anti – corrosive black painting or Epoxy powder coated. (Not applicable for SS 304 casing)	
2.12	Identification	Separate SS Tag plate with Tag No. and Service legend.	
3.0	<u>PROCESS CONDITIONS</u>		
3.1	Tag No.	} Refer to Data Sheet	
3.2	Medium		
3.3	Application		
3.4	Operating parameter		
3.5	Range	} Refer to Data Sheet	
3.6	Mounting & Entry		
3.7	Process Connection		
3.8	Special Requirement		

CL No.	CHARACTERISTICS	REQUIREMENT	VENDOR COMPLIANCE (Refer Note: 2)
4.0	<u>MATERIAL</u>		
4.1	Case	Die cast aluminium or SS 304	
4.2	Sensor	Bourdon / Diaphragm / Bellows : SS 316	
4.3	Bezel	Cast aluminium with screwed ring type / SS 304 with Snap Action Bayonet type	
4.4	Blow out disc	Neoprene	
4.5	Socket	AISI SS 316 / SS 316L	
4.6	Movement assembly	AISI SS 304	
4.7	Window	Shatter proof glass.	
5.0	<u>INSPECTION & TESTING</u>	As per quality plan QA:CI:STD:QP:01 (Latest Revision)	
6.0	<u>DOCUMENTS</u>		
6.1	To be submitted along with offer in 2 sets.	1. Catalogues.	
		2. Filled in data sheets	
6.2	To be submitted during inspection	1. T.C. for routine test for each gauge.	
		2. T.C. for type test	
		3. Material certificate	
		4. Guarantee certificate	
		5. Calibration certificate	
6.3	To be submitted after inspection: 2 sets of Original & 1 CD.	1. Catalogues	
		2. O & M manuals	
7.0	<u>PACKING</u>	Material shall be packed as per Packing procedure QA: CI: STD: PR: 04. (Latest Revision)	
NOTE: 1. Refer current valid list for revision status of Quality Plan, Drawing No & Packing Procedure. 2. In Vendor Compliance column - vendor shall indicate 'YES', 'NO' or 'NOT APPLICABLE'. 3. GA drawings in AutoCAD and Datasheet in MS WORD/EXCEL shall be prepared and submitted in pdf 4. The entire system and accessories should not contain any asbestos material.			



Technical Pre-Qualification Requirement for Nitrogen Blanketing System

Bidder should have designed, manufactured, tested and supplied Nitrogen Blanketing system with cylinders of minimum supply pressure of 160 bar(g) for preservation application as on the date of techno-commercial bid opening.

For the above, the Bidder has to submit any of the following supporting documents meeting above mentioned pre-qualifying requirement:

- i) Copy of minimum one (1) performance certificate in English from end user along with copy of related PO/LOI/LOA/WO specifying that the product / equipment is running successfully for one (1) year from date of commissioning.

OR

- ii) Minimum two PO/LOI/LOA/WO placed with a minimum gap of one (1) year from same purchaser.

Instructions to Bidder

1. Bidder should submit documents to substantiate technical parameters specified in PQR, if the same is not mentioned in performance certificate / purchase order.
2. All the above PQR satisfying document submissions should be enlisted and submitted as Annexure- D. (the format given below).
3. In case the documents submitted for meeting PQR are in language other than English, notarized English translation shall also be submitted.
4. BHEL reserves the right to assess the capabilities and capacity of the bidder/collaborators to perform the contract, as per BHEL evaluation procedure.
5. Final acceptance of the bidder is subject to BHEL and end customer's approval to consider in this tender.

Format for submission of credentials as ANNEXURE-D

Sl.No.	Description of Project	Brief Scope of work	P.O. Ref. No. & Date	Purchase order value (Rs).	Date of completion as per P.O.	Performance Certificate enclosed (Y/N)	Remark

Abbreviation: (PO) - Purchase order, (LOI) –Letter of Intent, (LOA) - Letter of award, (WO) - Work order