



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್  
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,  
(A Government of India undertaking)  
Electronics Division

PB 2606 , Mysore Road Bangalore , 560026 INDIA

**Tender Documents – Temperature Elements (M/s UPRVUNL  
PANKI Project)**

Sl. No.	Description	Remarks/Dates
1.	Tender RFQ Reference	PRV0000026
2.	RFQ Date	As per NIT @ <a href="https://eprocurebhel.co.in">https://eprocurebhel.co.in</a> website
3.	RFQ Due Date	
4.	Tender Documents Available on	<a href="https://eprocurebhel.co.in">https://eprocurebhel.co.in</a> website
<b>List of Tender Documents</b>		
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CE:PR:001- Rev 03

### **INSTRUCTIONS TO BIDDERS**

**Bidder is requested to read the instructions carefully and submit their quotation taking into consideration of all the points:**

#### **A. GENERAL INSTRUCTIONS:**

1. Any Purchase Order resulting from this enquiry shall be governed by the Instructions to Bidders (document reference: CE: PR: 001 – Rev 03), General Conditions of Contract (document reference: CE: PR: 002 - Rev 02) and Special Conditions of Contract, if any, of the enquiry.
2. Any deviations from or additions to the “General Conditions of Contract” or “Special Conditions of Contract” require BHEL’s express written consent. The general terms of business or sale of the bidder shall not apply to this tender.
3. Regret letter (either through post or by mail or by EPS) indicating reasons for not quoting must be submitted without fail, in case of non-participation in this tender.

Supplier shall be liable for removal as a registered vendor of BHEL when the supplier fails to quote against four consecutive tender enquiries for the same item or all enquiries in last two years for the same item, whichever is earlier.

4. Procurement directly from the manufacturers is preferred. However, if the OEM/ Principal insist on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer/ supplier in the same tender.

Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer/ supplier could bid directly but not both. Agent/Representative authorized by the OEM/Principal in turn cannot further sub authorize any other firm for submitting the offer or for placement of order.

In case bids are received from the manufacturer/ supplier and his agent, bid received from the agent shall be ignored.

5. Consultant / firm (and any of its affiliates) shall not be eligible to participate in the tender/s for the related goods for the same project if they were engaged for consultancy services for the same project.
6. If an Indian representative/associate/liaison office quotes on behalf of a foreign based bidder, such representative shall furnish the following documents:
  - a. Authorization letter to quote and negotiate on behalf of such foreign-based bidder.
  - b. Undertaking from such foreign based bidder that such contract will be honored and executed according to agreed scope of supply and commercial terms and conditions.
  - c. Undertaking shall be furnished by the Indian representative stating that the co-ordination and smooth execution of the contract and settlement of shortages/damages/replacement/repair of imported scope

till the equipment is commissioned and handed over to customer will be the sole responsibility of the Indian representative/associates/agent/liaison office.

d. Refer **Annexure I** on “Guidelines for Indian Agents”.

7. In case of imported scope of supply, customs clearance & customs duty payment will be to BHEL account after the consignment is received at Indian Airport /Seaport. Bidders must provide all original documents required for completing the customs clearance along with the shipment.

Warehousing charges due to incomplete or missing documentation will be to supplier's account. All offers for imported scope of supply by air, must be made from any of the gateway ports (within the country) indicated **(Refer Annexure II)**.

8. The offers of the bidders who are on the banned list and also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of the banned firms is available on BHEL website: [http://www.bhel.com/vender\\_registration/vender.php](http://www.bhel.com/vender_registration/vender.php)
9. Business dealings with bidders will be suspended if they are found to have indulged in any malpractices/misconduct which are contrary to business ethics like bribery, corruption, fraud, pilferage, cartel formation, submission of fake/false/forged documents, certificates, information to BHEL or if they tamper with tendering procedure affecting the ordering process or fail to execute a contract, or rejection of 3 consecutive supplies or if their firms / works are under strike/lockout for a long period. Bidder may refer “Guidelines for Suspension of Business Dealings with Suppliers/ Contractors” available on [www.bhel.com](http://www.bhel.com) for more details.

The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies / guidelines.

10. The bidder along with its associate/collaborators/sub-contractors/sub-vendors/consultants/service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to your notice.
11. Offer is to be submitted in English language only.
12. For this procurement, the local content to categorize a supplier as a Class-I local supplier/ Class-II local supplier/ Non-local supplier and purchase preference to Class-I local supplier, is as defined in Public procurement (Preference to Make in India), Order 2017 dated 16.09.2020 issued by DPIIT.

In case of subsequent Orders issued by the Nodal Ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of price bids against this NIT. Default margin of purchase preference shall be 20% for Class-I local supplier only.

13. The Bidder shall mandatorily submit Declaration as mentioned under Rule 144(xi) of General Financial Rules, 2017 amendment dt 23.07.2020 issued by Ministry of Finance, Govt. of India. Where applicable, evidence of valid registration by the Competent Authority shall be attached.

The Competent Authority for the purpose of registration under this Order shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT). Refer Annexure-X for ‘Restrictions under Rule 144(Xi) of General Financial Rules, 2017 amendment dt: 23.07.2020’.

**B. GUIDELINES FOR PREPARATION OF OFFER:**

1. Quotation shall be submitted in Single Part Bid, Two Part Bid or Three Part Bid, as called for in the tender:
  - **SINGLE PART BID:** Technical and Commercial Bid with prices along with price summary & filled in BHEL Standard Commercial terms and conditions in a single sealed envelope.
  - **TWO PART BID:** Unpriced offer i.e. “Techno-commercial Bid” with filled in BHEL Standard Commercial terms and conditions in a sealed envelope **along with the copy of the “Price Bid” without the prices** should be enclosed in one cover and the cover must be super scribed **“Techno-commercial offer)** and Priced offer i.e. “Price Bid” containing price summary in a separate sealed envelope and must be super scribed **“Price Bid”**.

Both these envelopes shall be enclosed in a single sealed envelope superscribed with enquiry number, due date of tender and any other details as called for in the tender document.

- **THREE PART BID:** Pre-qualification Bid (Part-I), Techno Commercial Bid with filled in BHEL Standard Commercial terms and conditions (Part-II), and Price Bid (Part-III). All three envelopes shall be enclosed in a single sealed envelope superscribed with enquiry number, due date of tender and any other details as called for in the tender document.

If any of the offers (Part I, Part II or Part III) are not submitted before the due date and time of submission (or) if any part of the offer is incomplete, the entire offer of the bidder is liable for rejection.

2. Supplier shall ensure to superscribe each envelope with RFQ number, RFQ Date, RFQ Due date and time, Item Description and Project clearly & boldly. Also mention on the envelope whether it is “Techno Commercial Bid” or “Price Bid” or “Pre-Qualification Bid”.

Please ensure complete address, department name and purchase executive name is mentioned on the envelope (before dropping in the tender box or handing over) so that the tender is available in time for bid opening.

3. BHEL standard Commercial Terms and Conditions (duly filled, signed & stamped) must accompany Technical-Commercial offer without fail and should be submitted in original only.

The above indicated submission of Offers in “sealed envelope/hard copy” as mentioned in points B.1-B.3 is applicable for tenders that are not floated through E-Procurement System (EPS).

4. Validity: Unless otherwise specified in SCC (special commercial conditions of contract), the offer will be valid for a period of 90 days from the date of part-I bid opening and in case of Negotiation/Counter-offer/Reverse Auction, price validity will apply afresh for a period of 60 days from the date of according final price by bidder (or) up to original validity period, whichever is later.
5. Any of the terms and conditions not acceptable to supplier, shall be explicitly mentioned in the Techno-Commercial Bid.

If no deviations are brought out in the offer it will be treated as if all terms and conditions of this enquiry are accepted by the supplier without deviation.

6. Deviation to this specification/item description, if any, shall be brought out clearly indicating “DEVIATION TO BHEL SPECIFICATION” without fail, as a part of Techno-Commercial Bid.

If no deviations are brought out in the offer it will be treated as if the entire specification of this enquiry is accepted without deviation.



7. Suppliers shall submit one set of original catalogue, datasheets, bill of materials, dimensional drawings, mounting details and/or any other relevant documents called in purchase specification as part of Technical Bid.
8. "Price Bid" shall be complete in all respects containing price break-up of all components along with all applicable taxes and duties, freight charges (if applicable) etc. Once submitted no modification / addition / deletion will be allowed in the "Price Bid." Bidders are advised to thoroughly check the unit price, total price to avoid any discrepancy.
9. In addition, bidder shall also quote for erection & commissioning charges/erection supervision & commissioning charges (E&C service charges), documentation charges, testing Charges (type & routine), training charges etc. if & as applicable along with corresponding tax. The price summary must indicate all the elements clearly.
10. Wherever applicable, bidders should indicate "lumpsum" Erection and Commissioning (or) Erection Supervision and Commissioning charges, as applicable (including To & Fro Fare, Boarding, Lodging, Local Conveyance etc.) for carrying out E&C activity and further handing over to customer.  
The quotation shall clearly indicate scope of work, likely duration of commissioning, pre-commissioning checklist (if any).
11. Wherever bidders require PAC (Project Authority Certificate)/applicable certificates for import of raw materials, components required for DECC,EPCG Power Projects, Export Projects or other similar projects wherein supplies are eligible for customs duty benefits, lists and quantities of such items and their values (CIF) has to be mentioned in the offer. Prices must be quoted taking into account of such benefits.
12. Prices should be indicated in both figures & words. Bid should be free from correction/overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.  
Any typographical error, totalling mistakes, currency mistake, multiplication mistake, summing mistakes etc. observed in the price bids will be evaluated as per **Annexure III** "Guidelines for dealing with Discrepancy in Words & Figures – quoted in price bid" and BHEL decision will be final.
13. Documents submitted with the offer shall be signed and stamped in each page by authorized representative of the bidder. However, this requirement is not mandatory for offers uploaded through E-Procurement System (EPS).

#### **C. GUIDELINES FOR OFFER SUBMISSION:**

The under-mentioned clauses 1, 2&3 will not be applicable for EPS tenders.

1. Offers / Quotations must be dropped in tender box before 13.00 Hrs. on or before due date mentioned in RFQ. The offers are to be dropped in the proper slot of the Tender Box kept in our reception area with caption "CE, SC&PV, DEFENCE".  
  
Tenders are opened on 3 days in a week (Monday/Wednesday/Friday). Tender must be deposited in the slot corresponding to the day (Monday - Box no.4/Wednesday - Box no. 6 /Friday - Box no.8) while depositing the offer.
2. E-Mail/ Internet/EDI offers received in time shall be considered only when such offers are complete in all respects. In case of offers received through E-mail, please send the offer to the email ID specified in the SCC document of the tender.
3. Offers of Vendors who already have a valid Technical/Commercial MOU with BHEL-EDN for the items of the RFQ shall mention the relevant MOU reference no. and give only such other details not covered in the MOU.

4. In cases where tender documents are bulky, or due to some reasons tender documents are required to be submitted by hand or through posts/couriers, the offers are to be handed over either of the two purchase officers whose names are mentioned in the SCC document of tender RFQ.
5. Tenders will be opened on due date, time and venue as indicated in the RFQ in the presence of bidders at the venue indicated in the RFQ. For EPS tenders, e-mail notifications will be automatically generated and forwarded to registered e-mail ID/s of bidders during opening of tenders.
6. Bidder will be solely responsible:
  - a. For submission of offers before due date and time. Offers submitted after due date and time will be treated as "Late offers" and will be rejected.
  - b. For submission of offers in the correct compartment of the tender box based on the day of due date (Monday/Wednesday/Friday). Please check before dropping your offer in the correct tender box.
  - c. For depositing offers in proper sealed condition in the tender box. If the bidder drops the tender in the wrong tender box (or) if the tender document is handed over to the wrong person, BHEL will not be responsible for any such delays.
  - d. For offers received through email etc., suppliers are fully responsible for lack of secrecy on information and ensuring timely receipt of such offers in the tender box before due date & time (This clause will not be applicable for EPS tenders).

The above indicated submission of Offers as mentioned in points 6.a-6.d is applicable for tenders that are not floated through EPS.

- e. In case of e-tender, all required documents should be uploaded before due date and time. Availability of power, internet connections, system/software requirements etc. will be the sole responsibility of the bidder.

Wherever assistance is needed for submission of e-tenders, help-line numbers as available in the website of service provider of BHEL may be contacted.

**Purchase Executive/ BHEL shall not be responsible for any of the activities relating to submission of offer.**

#### **D. PROCESSING OF OFFERS RECEIVED:**

1. Any discount/ revised offer submitted by the supplier on its own shall be accepted provided it is received on or before the due date and time of offer submission (i.e. Part-I bid).  
The discount shall be applied on pro-rata basis to all items unless specified otherwise by the bidder.
2. Changes in offers or Revised offers given after Part-I bid opening shall not be considered as a part of the original offer unless such changes/revisions are requested by BHEL.  
In case of withdrawal of any Technical/Commercial deviation(s) by the bidder before opening of price bids/conducting the Reverse Auction, revision of price/impact bid will not be accepted.
3. In case there is no change in the technical scope and/ or specifications and/ or commercial terms & conditions, the supplier will not be allowed to change any of their bids after Technical bids are opened (after the due date and time of tender opening).
4. In case of changes in scope and/ or technical specifications and/ or commercial terms & conditions by BHEL

and it accounts for price implications from bidders, all techno-commercially acceptable bidders shall be asked by BHEL (after freezing the scope, technical specifications and commercial terms & conditions) to submit the impact of such changes on their price bid.

Impact price will be applicable only for changes in technical specification / commercial conditions by BHEL. The impact price must be submitted on or before the cut-off date specified by BHEL and the original price bid and the price impact bid will be opened together at the time of price bid opening.

5. Un-opened bids (including price bids) will be returned to the respective bidders after release of Purchase order.

Regarding Offers for EPS tenders that get rejected on PQC/ techno-commercial grounds, the bids for the subsequent parts will not be opened i.e., both technical bid and price bid (Parts-II & III) will not be opened in case of rejection on PQC ground and price bid (Part-II/Part-III, as applicable) will not be opened in case of rejection on techno-commercial ground.

6. After receipt of Purchase Order, supplier should submit required documents viz., specified drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report, O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/Customer.
7. Any deviation to the terms and conditions not mentioned in the quotation by supplier in response to this enquiry will not be considered, if put forth subsequently or after issue of Purchase Order, unless clarification is sought for by BHEL and agreed upon in the Purchase Order.
8. Evaluation shall be on the basis of delivered cost (i.e. "Total Cost to BHEL").

"Total Cost to BHEL" shall include total basic cost, packing & forwarding charges, taxes and/or duties (as applicable), freight charges, taxes on Services, customs clearance charges for imported items, any other cost indicated by bidder for execution of the contract and loading factors (for non-compliance to BHEL Standard Commercial Terms & Conditions).

Benefits arising out of Nil Import Duty on DEEC, EPCG, DFIA Projects, Physical Exports or such 100% exemptions (statutory benefits), project imports, customer reimbursements of statutory duties (like Basic Customs Duty and cess on customs duty), Input tax credits as applicable will also be taken into account for arriving at the Total cost to BHEL (wherever applicable and as indicated in SCC document of tender).

For EPS tenders, it shall be noted that the prices (including discounts) vis-a-vis currency quoted in EPS portal only will be considered as Final for the purpose of evaluation of the lowest bidder.

Bidder shall ensure to indicate the applicable taxes against each line item in online portal, failing to which the same will be considered as inclusive/NIL.

In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders.

In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

9. The evaluation currency for this tender shall be INR. For evaluation of offers in foreign currency, the exchange rate (TT selling rate of SBI) shall be taken as under:

Single part bids:	Date of tender opening
Two/three part bids:	Date of Part-I bid opening
Reverse Auction:	Date of Part-I bid opening

In case of Performance Bank Guarantee (PBG) also, exchange rate will be considered as mentioned above for converting foreign currency to Indian currency and vice versa.

If the relevant day happens to be a bank holiday, then the exchange rate as on the previous working day of the bank (SBI) shall be taken.

10. Ranking (L-1, L-2 etc.) shall be done only for the techno-commercially acceptable offers.
11. GeM Seller ID shall be mandatory before placement of order/award of contract for goods and services to the successful bidder(s), for orders exceeding Rs.25 lakhs (including all taxes etc.). Department of Expenditure (DoE) OM no.6/9/2020-PPD dated: 24.08.2020 may be referred in this regard.

#### **E. INFORMATION ON PAYMENT TERMS:**

1. All payments will be through Electronic Fund transfer (EFT). Vendor has to furnish necessary details as per BHEL standard format (**Refer Annexure IV**) for receiving all payments through NEFT.(Applicable for Indian vendors only).
2. In case of High Sea Sales transaction, customs clearance of the consignment landed on Indian Sea/Air ports will be done by BHEL based on the original HSS documents provided by vendors.  
All warehousing charges due to delay in submission of complete and or correct HSS documents to BHEL will be to supplier's account only. Such recovery will be made out of any of the available bills (**Refer Annexure V**).
3. Statutory deductions, if any, will be made and the deduction certificate shall be issued.
  - A. In case vendor does not provide PAN details, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act.  
In addition to the above, Foreign vendors shall also submit relevant details of their bankers like Swift Code, Banker's Name &Address etc.
  - B. TDS deduction as per section 51 of CGST Act,2017 shall be applicable as per Gazette Notification No. 50/2018-Central Tax, Dated: 13th September 2018 and subsequent notification/s, as and when released by Govt. authorities.
4. Levy and Collection of TCS by the seller of goods u/s 206C (1H) shall be in compliance with Govt. norms. The seller shall raise the invoice including the amount of TCS in the Tax Invoice and no separate debit note will be entertained.  
The seller should indicate his PAN number and TAN number in the Invoice. The seller should remit the TCS so collected from BHEL and provide TCS certificate/s with invoice no., invoice date, Amount etc.  
If by any chance seller is not remitting /not able to submit TCS certificates to BHEL on time, then the TCS amount with penalty, if any applicable will be recovered from seller in the available bills.
5. Incomplete documentation will not be accepted. Delayed submission of invoice / documents may result in corresponding delay in payment. In this connection, request to also refer clause: G about invoicing & payment formalities under GST regime.

Applicable documents shall be submitted to the purchaser at the time of execution of supplies/services for availing GST input credits.

**F. STANDARD PAYMENT TERMS OF BHEL-EDN:**

<b><u>PURCHASE ORDERS FOR:</u></b>	<b><u>SUPPLY WITH SERVICE(S)</u></b>	<b><u>SUPPLY ONLY</u></b>
<b><u>INDIGENOUS PROCUREMENT</u></b>	<p>a. 100% of basic value with taxes and freight will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation, whichever is later.</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>b. 100% of PO value with taxes and freight will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation, whichever is later.</p>
<b><u>IMPORT PROCUREMENT</u></b>	<p>c. 100% of basic value will be paid against usance draft of 45 days from the date of AWB/BOL on submission of complete set of documents.</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>d. 100% of PO value will be paid against usance draft of 45 days from the date of AWB/BOL on submission of complete set of documents.</p>
<b><u>HIGH-SEA SALES PROCUREMENT</u></b>	<p>e. 100% of basic value will be paid in 45 days from the date of signing of High Sea Sale agreement or 15 days from the date of submission of complete set of documentation, whichever is later</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>f. 100% of basic value will be paid in 45 days from the date of signing of High Sea Sale agreement or 15 days from the date of submission of complete set of documentation, whichever is later.</p>

**g. Erection and Commissioning:**

**Evaluation methodology:** Unless and otherwise specified in SCC, E&C charges should not be less than 10% of the main supply value. In case the quoted total E&C value is less than 10% of the main supply value, BHEL shall

evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards E&C charges.

**Payment term:** 100% E&C charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&C.

**h. Erection Supervision and Commissioning:**

**Evaluation methodology:** Unless and otherwise specified in SCC, E&C charges should not be less than 5% of the main supply value. In case the quoted total E&C value is less than 5% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards E&C charges.

**Payment term:** 100% E&C charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&C.

**i. Comprehensive Annual Maintenance Contract:**

**Evaluation methodology:** Unless and otherwise specified in SCC, CAMC will be applicable for a period of 04 years from the date of expiry of warranty period (or) from the date of completion of commissioning of equipment, whichever is later and the total CAMC value should not be less than 20% of the main supply value. In case the quoted total CAMC value is less than 20% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards CAMC charges.

**Payment terms:** 100% CAMC charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of CAMC on yearly basis.

**j. Terms of Payment for Training:** 100% payment will be made in 45 days from the date of completion of Training or 15 days from the date of submission of complete set of invoice along with documentary evidence, whichever is later.

**LOADING FACTORS FOR DEVIATION IN PAYMENT TERMS (APPLICABLE FOR IMPORT PROCUREMENT ONLY):**

- 1) For offers received with Sight draft payment term in place of Usance draft, loading applicable will be 1.0% of basic value.
- 2) For offers received with Letter of Credit payment term with Usance of 45 days, loading applicable will be 2.5% of basic value.  
Additional loading of 2% will be applicable for payment term as Letter of Credit at Sight.
- k. Any payment term with credit period of less than 45 days for indigenous supply/HSS and any other variation of payment terms are liable for rejection.
- l. Standard payment terms indicated in Clauses: F (a), (b), (c), (d), (e), (f), (g), (h), (i) & (j) will not attract any loading.

**Note 1:** Basic value of Purchase Order mentioned above will include all components of the purchase order and will exclude only taxes, duties, freight, training charges, E&C and AMC charges (wherever applicable). Wherever the Purchase Order is split into import portion and indigenous portion of supply, minimum % to be quoted for Services, wherever mentioned, will be of both purchase order values put together.

**Note 2:** In case of multiple packages/units in a power plant, payment of E&C charges will be processed on pro-rata basis.

**Note 3:** No deviation will be permitted from the duration of Guarantee/Warranty and/or Comprehensive Annual Maintenance Contract period specified in SCC.

**G. Terms & Conditions to be complied under GST regime:**

1. All invoices to contain BHEL-EDN (buyer) GSTIN number: 29AAACB4146P1ZB. However for CGST +SGST/UGST billing outside the state of Karnataka, invoice has to be generated with BHEL's Nodal Agency GSTIN number. Address of Nodal Agency along with GSTIN number will be provided by BHEL at the time of issuing dispatch clearance.
2. The Bidder shall mention Bidder's GSTIN number in all quotations and Invoices submitted.
3. The Bidder shall also mention HSN (Harmonized System of Nomenclature) / SAC (Services Accounting Code) mandatorily in all quotations and invoices submitted.
4. Invoice submitted should be in the format as specified under GST Laws viz., all details as mentioned in Invoice Rules like GST registration number(GSTIN), invoice number with date of issue, quantity, rate, value, taxes with nomenclature – CGST, SGST, UGST,IGST mentioned separately, HSN Code / SAC Code etc. Invoice should be submitted in original for buyer plus duplicate for credit availment.
5. Payment of GST to Vendor will be made only if it is matching with data uploaded by the Vendor in GST portal.
6. For invoices paid on Reverse charge basis – “Tax payable on reverse charge basis” to be mentioned on the invoice.
7. In case GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount will be recoverable from vendor along with interest levied/ leviable on BHEL.
8. In case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law will be recoverable from vendor/contractor along with interest levied/ leviable on BHEL.
9. Vendor should intimate BHEL immediately on the same date of invoicing without any delay.
10. In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the supplies, within the calendar month notified by BHEL.
11. Bidders to note that Rules & Regulations pertaining to E-way bill system are to be strictly adhered to, as and when notified by Govt. authorities.
12. As per Notification 88/2020-Central Tax dated 10th November 2020 (applicable w.e.f. 01 January 2021), the turnover for applicability of E-invoicing provisions has been reduced from 500 crores to 100 crores. In other words, registered person [other than a SEZ unit and those referred in Rule 54(2), 54(3), 54(4) and 54(4A) of the CGST Rules], whose aggregate turnover in any preceding financial year from 2017-18 onwards exceeds 100 crores, is required to comply with the requirement of IRN and QR code in respect of supply of goods or services or both to a registered person or for exports.

**H. Performance bank guarantee (PBG):**

Performance bank guarantee (PBG) will be applicable as called in the tender documents. Unless otherwise specified in the SCC, the PBG against performance of the contract shall be valid for a period of 24 months from the date of dispatch of goods + claim period of 03 months, for a value equal to 10 % of the basic value of the purchase order which will include all components of the purchase order and will exclude only taxes, duties, freight, training charges, E&C and AMC charges (wherever applicable).

1. The BG issued in Indian Rupees by Banks in India is to be executed on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Bank issuing the guarantee.
2. No deviation for the duration and value of PBG will be permitted.
3. PBG shall be from any of the BHEL consortium of bankers (**refer Annexure VI**).
4. PBGs from nationalized banks are also acceptable.
5. PBG should be sent directly by the bank to the dealing executive mentioned in the purchase order located at the address mentioned in the purchase order.
6. PBG should be in the format specified (**refer Annexure VII**). No deviation to this format will be allowed. However in case BHEL changes the PBG format, bidder shall honor the same.
7. Bank Guarantee should be enforceable in Bangalore.
8. In Case of Bank Guarantees submitted by Foreign Vendors-
  - a. From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India) can be accepted subject to the condition that the Bank Guarantee should be enforceable in Bangalore.
  - b. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)
    - b.1 Please note that Bank Guarantee issued by any of the Consortium Banks only will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter-Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It shall be noted that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor.
    - b.2 In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at sl.no. b.1 is required to be followed.
    - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time).
9. Expired PBGs will be returned only after expiry of the claim period.
10. PBG shall not be applicable for spares.

**I. PROVISIONS APPLICABLE FOR MSE VENDORS (MICRO AND SMALL ENTERPRISES) :**

Benefits/facilities as applicable for Micro and Small Enterprises (MSEs) shall be available to MSEs registered with Government designated authorities as per the Purchase & Price Preference Policy of the Government subject to them becoming eligible otherwise.



Vendors who qualify as MSE vendors are requested to submit applicable certificates (as specified by the Ministry of Micro, Small and Medium Enterprises) at the time of vendor registration. Vendors have to submit the Udyog Aadhaar certificate along with attested copy of a CA certificate (Annexure VIII) or Udyam Registration certificate applicable for the relevant financial year (latest audited) along with the tender documents in the Part-I bid to avail the applicable benefits.

Date to be reckoned for determining the deemed validity will be the date of bid opening (Part-I in case of two-part bid and three-part bid).

Documents have to be notarized/attested by a Gazetted officer and must be valid as on the date of part I bid opening for the vendors to be eligible for the benefits applicable for MSE vendors. Please note that no benefit shall be applicable if any deficiency in the above required documents are not submitted before the price bid opening/Reverse Auction. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal.

Bidders to however note the documents that shall be furnished in order to establish credentials as MSE vendor should be as per the extant statutory requirements specified by the Ministry of Micro, Small and Medium Enterprises.

#### **PURCHASE PREFERENCE FOR MSE VENDORS:**

In tender, participating MSEs quoting price within price band of L1+15 percent shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price from someone other than a MSE and such MSE shall be allowed to supply at least 25% of total tendered value. In case of more than one such MSE, the supply shall be shared proportionately (to tendered quantity).

- 3% of the 25% will be earmarked for women owned MSEs.
- 25% of the 25% (i.e., 6.25% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (1) & (2) are fulfilled.
- In case where no SC/ST category firms are meeting the conditions mentioned in (1) and (2) or have not participated in the tender, the 6.25% of earmarked quantity for SC/ST owned MSE firms will be distributed among the other eligible MSE vendors who have participated in the tender.

In case after the bid opening it is seen that no MSE has become L1, then depending on the nature of the item, if it is not possible to split the tendered items/quantities on account of reasons like customer contract requirements of supplying one make for a given project or technical reasons like the tendered item being a system etc., then BHEL would not counter offer the L1 prices even though there may be MSE bidders within the +15% band of L1. Such information that tendered quantity will not be split, shall be indicated in the SCC.

#### **J. INTEGRITY COMMITMENT IN THE TENDER PROCESS, AND EXECUTION OF CONTRACTS:**

1. Commitment by BHEL: BHEL commits to take all measures necessary to prevent corruption in connection with the Tender process and execution of the Contract. BHEL will, during the tender process, treat all bidder / suppliers in a transparent and fair manner, and with equity.
2. Commitment by Bidder(s)/ Contractor(s):
  - a. The Bidder(s)/ Contractor(s) commit(s) to take all measures to prevent corruption and will not directly or indirectly try to influence any decision or benefit which he is not legally entitled to.
  - b. The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding or any actions to restrict competition.
  - c. The Bidder(s)/ Contractor(s) will not commit any offence under the relevant Acts. The Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain or pass on to others, any information or document provided by BHEL as part of business relationship.
  - d. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made,

and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to the relevant guidelines issued from time to time by Government of India/ BHEL.

If the Bidder(s) / Contractor(s), before award or during execution of the Contract commit(s) a transgression of the above or in any other manner such as to put his reliability or credibility in question, BHEL is entitled to disqualify the Bidder(s) / Contractor (s) from the tender process or terminate the contract and/ or take suitable action as deemed fit.

**K. Integrity Pact (IP):**

- a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner.

Following independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

1. Shri Arun Chandra Verma, IPS (Retd.)  
Email: acverma1@gmail.com
2. Shri Virendra Bahadur Singh, IPS (Retd.)  
Email: vbsinghips@gmail.com

- b) Please refer Section-8 of the IP for Role and Responsibilities of IEMs (Annexure IX). In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEM/s shall be done through email only.

Note: No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are indicated in SCC document of tender.

Annexure

Annexure I  
Guidelines for Indian Agents

- **Definition of Indian Agent:** An Indian Agent of foreign principal is an individual, a partnership, an association of persons, a private or public company, that carries out specific obligation(s) towards processing of BHEL tender or finalization or execution of BHEL's contract on behalf of the foreign supplier.

In case of yes, vendor to note the following and reply accordingly:

- i. BHEL shall deal directly with foreign vendors, wherever required, for procurement of goods. However, if the foreign principal desires to avail of the services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines - which require mandatory submission of an Agency Agreement.
- ii. It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of Government of India, issued from time to time.
- iii. The Agency Agreement should specify the precise relationship between the foreign OEM / foreign principal and their Indian agent and their mutual interest in the business. All services to be rendered by agent/ associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier/ Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the Agreement and be made explicit in order to ensure compliance to laws of the country.
- iv. Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only.
- v. Tax deduction at source is applicable to the agency commission paid to the Indian agent as per the prevailing rules.
- vi. In the absence of any agency agreement, BHEL shall not deal with any Indian agent (authorized representatives / associate / consultant, or by whatever name called) and shall deal directly with the foreign principal only for all correspondence and business purposes.
- vii. The "Guidelines for Indian Agents of Foreign Suppliers" enclosed at annexure - 'A' shall apply in all such cases.

- viii. The supply and execution of the Purchase Order (including indigenous supplies/ service) shall be in the scope of the OEM/ foreign principal. The OEM/ foreign principal should submit their offer inclusive of all indigenous supplies/ services and evaluation will be based on 'total cost to BHEL'. In case OEM/ foreign principal recommends placement of order(s) towards indigenous portion of supplies/ services on Indian supplier(s)/ agent on their behalf, the credentials/ capacity/ capability of the Indian supplier(s)/ agent to make the supplies/ services shall be checked by BHEL as per the extant guidelines of Supplier Evaluation, Approval & Review Procedure (SEARP), before opening of price bids. In this regard, details may be checked as per Annexure-B (copy enclosed). It will be the responsibility of the OEM/ foreign principal to get acquainted with the evaluation requirements of Indian supplier/ agent as per SEARP available on [www.bhel.com](http://www.bhel.com).

The responsibility for successful execution of the contract (including indigenous supplies/ services) lies with the OEM/ foreign principal. All bank guarantees to this effect shall be in the scope of the OEM/ foreign principal.

—X—

Vendor's Signature with Seal

Guidelines for Indian Agents of Foreign Suppliers

- 1.0 There shall be compulsory registration of agents for all Global (Open) Tender and Limited Tender. An agent who is not registered with BHEL shall apply for registration in the registration form in line with SEARP.
- 1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/Original certificate of the Principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/ salary/ retainership being paid by the principal to the agent before the placement of order by BHEL.
- 1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.
- 2.0 **Disclosure of particulars of agents/ representatives in India, if any.**
- 2.1 Tenderers of Foreign nationality shall furnish the following details in their offers:
  - 2.1.1 The Bidder(s)/ Contractor(s) of foreign origin shall disclose the name and address of the agents/ representatives in India if any and the extent of authorization and authority given to commit the Principals. In case the agent/ representative be a foreign Company, it shall be confirmed whether it is existing Company and details of the same shall be furnished.
  - 2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/ representatives in India.
  - 2.1.3 Confirmation of the Tenderer that the commission/ remuneration, if any, payable to his agents/ representatives in India, may be paid by BHEL in Indian Rupees only.
- 2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:
  - 2.2.1 The Bidder(s)/ Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any, indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/ representatives.
  - 2.2.2 The amount of commission/ remuneration included in the price (s) quoted by the Tenderer for himself.
  - 2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/ remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by BHEL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.
- 2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/ remuneration, if any payable to the agents/ representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.
- 2.4 Failure to furnish correct and detailed information as called for in paragraph 2.0 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by BHEL. Besides this there would be a penalty of banning business dealings with BHEL or damage or payment of a named sum.

**ANNEXURE - II**  
**LIST OF INTERNATIONAL GATEWAY AIRPORTS**

For air based consignment, terms of delivery will be on FCA basis from following listed airports only. Vendors are requested to verify this list for use before submission of offer.

SCHEDULE NO	COUNTRY	CURRENCY CODE	AIRPORT
D01	UK	GBP	LONDON (HEATHROW)
D02	UK	GBP	NEW CASTLE
D03	UK	GBP	OXFORD. CHETLAM
D04	UK	GBP	BRISTOL. WELLINGBOROUGH
D05	UK	GBP	BIRMINGHAM
D06	UK	GBP	EAST MIDLANDS
D07	UK	GBP	MANCHESTER
D08	UK	GBP	LEEDS
D09	UK	GBP	GLASGOW
D10	FRANCE	EURO	PARIS (ROISSY) & LYON
D11	SWEDEN	EURO	STOCKHOLM
D12	SWEDEN	EURO	GOTHENBERG & MALMO
D13	ITALY	EURO	ROMA, MILAN
D14	ITALY	EURO	TURIN, BOLOGNA, FLORENCE
D15	NETHERLANDS	EURO	AMSTERDAM, ROTTERDAM
D16	AUSTRIA	EURO	VIENNA, LINZ, GRAZ
D17	BELGIUM	EURO	ANTWERP, BRUSSELS
D18	DENMARK	DKK	COPENHAGEN
D19	JAPAN	JPY	TOKYO, OSAKA
D20	SINGAPORE	SGD	SINGAPORE
D21	CANADA	CAD	TORONTO
D22	CANADA	CAD	MONTREAL
D23	USA	USD	NEW YORK, BOSTON
D24	USA	USD	CHICAGO
D25	USA	USD	SAN FRANCISCO, LOS ANGELES
D26	USA	USD	ALANTA, HOUSTON
D27	GERMANY	EURO	MUNICH, KOLN, DUSSELDORF, HANNOVER, HAMBURG, STUTTGART, DAMSTADT, MANIHIEM, NURUMBERG
D28	GERMANY	EURO	FRANKFURT
D29	GERMANY	EURO	BERLIN
D30	SWITZERLAND	SFR	BASLE, ZURICH, GENEVA
D31	SPAIN	EURO	BARCELONA
D32	AUSTRALIA	AUD	SYDNEY
D33	AUSTRALIA	AUD	MELBOURNE
D34	AUSTRALIA	AUD	PERTH
D35	CZECH	EURO	PRAGUE
D36	HONG KONG	HKD	HONG KONG
D37	NEW ZELAND	NZD	AUCKLAND
D38	RUSSIA	USD	MOSCOW
D39	SOUTH KOREA	USD	KIMPO INTERNATIONAL, INCHEON
D40	FINLAND	EURO	HELSINKI
D41	ROMANIA	EURO	BUCHAREST
D42	NORWAY	EURO	OSLO
D43	IRELAND	EURO	DUBLIN
D44	ISRAEL	USD	TEL AVIV
D45	UAE	USD	DUBAI
D46	OMAN	USD	MUSCAT
D47	EGYPT	USD	CAIRO
D48	TAIWAN	USD	TAIPEI
D49	UKRAINE	USD	KIEV
D50	CHINA	USD	SHANGHAI, SHENZHEN
D51	PHILIPINES	USD	MANILA
D52	MALAYSIA	USD	KUALALUMPUR, PE NANG
D53	CYPRUS	USD	LARNACA
D54	SOUTH AFRICA	USD	JOHANNESBERG, DURBAN
D55	SLOVAKIA	EURO	BARTISLOVA
D56	SAUDI ARABIA	SAR	RIYADH
D57	TURKEY	EURO	ISTANBUL
D58	THAILAND	USD	BANGKOK
D59	BRAZIL	USD	SAO PAULO, RIO DE JANEIRO

### **ANNEXURE – III**

#### **DISCREPANCY IN WORDS & FIGURES – QUOTED IN PRICE BID**

Following guidelines will be followed in case of discrepancy in words & figures-quoted in price bid:

(a) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.

(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

(d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.

**ANNEXURE - IV**  
**Electronic Funds Transfer (EFT) OR**  
**Paylink Direct Credit Form**

Please Fill up the form in **CAPITAL LETTERS** only.

TYPE OF REQUEST(Tick one): ☐ CREATE ☐ CHANGE

BHEL Vendor / Supplier Code:

Company Name :

Permanent Account Number(PAN):

Address

City:

PINCODE

STATE

Contact Person(s)

Telephone No:

Fax No:

e-mail id:

1 Bank Name:

2 Bank Address:

3 Bank Telephone No:

4 Bank Account No:

5 Account Type: Savings/Cash Credit

6 9 Digit Code Number of Bank and branch

appearing on MICR cheque issued by Bank

7 Bank IFSC Code(applicable for NEFT )

8 Bank IFSC code(applicable for RTGS)

(Indian Financial System Code)

- A I hereby certify that the particulars given above are true, correct and complete and that I, as a representative for the above named Company, hereby authorise BHEL, EDN, Bangalore to electronically deposit payments to the designated bank account.
- B If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible.
- C This authority remains in full force until BHEL, EDN, Bangalore receives written notification requesting a change or cancellation.
- D I have read the contents of the covering letter and agree to discharge the responsibility expected of me as a participant under ECS / EFT.

Date:

Authorised Signatory:

Designation:

Telephone No. with STD Code

Company Seal

**Bank Certificate**

We certify that \_\_\_\_\_ has an Account No \_\_\_\_\_ with us and we confirm that the bank details given above are correct as per our records.

Date:

(.....)

Place:

Signature

Please return completed form along with a blank cancelled cheque or photocopy thereof to:

Bharath Heavy Electricals Ltd,

Attn:

Electronics Division, Mysore Road,

BANGALORE - 560 026

In case of any Query, please call concerned purchase executive.



**ANNEXURE - V**  
**PRESENT PROCEDURE FOR SALE IN TRANSIT (HIGH SEA SALES)**

In case of High Sea Sales, vendor should submit following documents:

**1. ORIGINAL HIGH SEA SALES AGREEMENT**

- Sale agreement (on Rs. 200/- non-judicial stamp paper & notarised with 2 witnesses with identity) has to be signed between BHEL and the Party importing material. The date of the sale documents should be in between the date of House Air Way Bill / Bill of Lading and before landing of the goods in Indian origin.
- Following shall be included in the High Sea Sales Agreement:  
"THE BUYER ALSO UNDERTAKE DISCHARGES, THE OBLIGATION AND FULFILLMENT OF CONDITIONS, IF ANY, ATTACHED TO THE IMPORTATION, ASSESSMENT AND CLEARANCE OF THE GOODS IN TERMS CUSTOMS TARIFF ACT 1975, THE CUSTOMS ACT 1962 & RULES & REGULATIONS MADE THERE UNDER AND OTHER RELEVANT ACTS, ORDERS, NOTIFICATIONS".

**2. ORIGINAL INVOICES: INDIGENOUS RUPEE INVOICE & FOREIGN CURRENCY INVOICE**

- Prices should be C.I.F., designated airport/seaport basis.
- I.E.C., C.S.T., K.S.T. Nos. to be mentioned.
- Description of item (Nomenclature), Unit & Quantity in both the Foreign Currency & the Indigenous Invoice in Rupee shall be exactly as per Purchase Order Description of item, Quantity and Unit. The Indigenous Invoice value shall be exactly as per Purchase Order value.
- Seller should give Foreign Currency Invoice from the original consignor. The Foreign Currency Invoice value should be at least 2% (two per cent) less than the Indigenous Rupee Invoice value in equivalent foreign currency.

**4. ORIGINAL HOUSE AIR WAY BILL/ BILL OF LADING**

- The sale agents should duly endorse House Air Way Bill (HAWB) for air shipments or original Bill of Lading (O.B.L.) for sea shipments and Foreign Currency Invoice in favour of BHEL-EDN.

**5. ORIGINAL CARGO ARRIVAL NOTICE FROM FORWARDER.**

**6. ORIGINAL DELIVERY ORDER ISSUED IN NAME OF BHEL-EDN.**

**7. ORIGINAL PACKING LIST.**

**8. A LETTER TO THE COMMISSIONER OF CUSTOMS FOR EFFECTING ABOVE SALE.**

**9. A LETTER TO THE DEPUTY ASSESSOR (OCTROI) FOR EFFECTING ABOVE SALE IN FAVOUR OF BHEL.**

**REMARKS:** In case vendor needs any clarifications on the above, the same may be sought in writing.



ELECTRONICS DIVISION, BANGALORE

**Annexure-VI**

**BHEL MEMBER BANKS (LIST OF CONSORTIUM BANKS)**

Bank Guarantee (BG) shall be issued from the following banks only:

Sl. No.	Nationalised Banks	Sl. No.	Public Sector Banks
1	Allahabad Bank	18	IDBI
2	Andhra Bank		
3	Bank of Baroda	Sl. No.	<b>Foreign Banks</b>
4	Canara Bank	19	CITI Bank N.A
5	Corporation Bank	20	Deutsche Bank AG
6	Central Bank	21	The Hongkong and Shanghai Banking Corporation Ltd. (HSBC)
7	Indian Bank	22	Standard Chartered Bank
8	Indian Overseas Bank	23	J P Morgan
9	Oriental Bank of Commerce		
10	Punjab National Bank	Sl. No.	<b>Private Banks</b>
11	Punjab & Sindh Bank	24	Axis Bank
12	State Bank of India	25	The Federal Bank Limited
13	Syndicate Bank	26	HDFC Bank
14	UCO Bank	27	Kotak Mahindra Bank Ltd
15	Union Bank of India	28	ICICI Bank
16	United Bank of India	29	IndusInd Bank
17	Vijaya Bank	30	Yes Bank

**Note:**

- All BGs must be issued from BHEL consortium banks listed above.
- This list is subject to changes. Hence vendors are requested to check this list every time before issuing BGs.
- Bank Guarantees issued by Co-operative Banks/Financial Institutions cannot be accepted under any circumstance.

Annexure-VII

**BANK GUARANTEE FOR PERFORMANCE SECURITY**

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at \_\_\_\_\_<sup>1</sup> through its Unit at.....(name of the Unit) having awarded to ( Name of the Vendor / Contractor / Supplier) with its registered office at \_\_\_\_\_<sup>2</sup> hereinafter referred to as the 'Vendor / Contractor / Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated .....<sup>3</sup> valued at Rs.....<sup>4</sup> ( Rupees -----)/FC.....(in words.....) for .....<sup>5</sup> (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to .....% (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we, ....., (hereinafter referred to as the Bank), having registered/Head office at ..... and inter alia a branch at ..... being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount of Rs -- .....<sup>6</sup> ( Rupees -----) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. \_\_\_\_\_.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor / Contractor / Supplier shall have no claim against us for making such payment.

We the .....bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract/satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till

all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We .....BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Vendor / Contractor / Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Vendor / Contractor / Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor / Contractor / Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor / Contractor / Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Vendor / Contractor / Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor / Contractor / Supplier 's liabilities.

This Guarantee shall remain in force upto and including.....<sup>7</sup> and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor / Contractor / Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the .....<sup>8</sup>we shall be discharged from all liabilities under this guarantee thereafter.

We, ..... BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed.....<sup>6</sup>
- b) This Guarantee shall be valid up to .....<sup>7</sup>
- c) Unless the Bank is served a written claim or demand on or before .....<sup>8</sup> all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, \_\_\_\_\_ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of  
(Name of the Bank)

Dated.....

Place of Issue.....

<sup>1</sup> NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

<sup>2</sup> NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

<sup>3</sup> DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

<sup>4</sup> CONTRACT VALUE

<sup>5</sup> PROJECT/SUPPLY DETAILS

<sup>6</sup> BG AMOUNT IN FIGURES AND WORDS

<sup>7</sup> VALIDITY DATE

<sup>8</sup> DATE OF EXPIRY OF CLAIM PERIOD

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## Certificate by Chartered Accountant on letterhead

This is to certify that M/s \_\_\_\_\_  
(hereinafter referred to as 'enterprise') having P A N Number \_\_\_\_\_ and  
UDYAM Registration Number \_\_\_\_\_, registered office at \_\_\_\_\_  
\_\_\_\_\_ is falling under the category  
\_\_\_\_\_ (**Micro / Small / Medium**) under MSMED Act 2006. (Copy of UDYAM Registration  
Certificate to be enclosed).

The said classification of \_\_\_\_\_ (**Micro / Small / Medium**) is arrived at based on the  
Notifications / guidelines / clarifications issued under Micro, Small and Medium Enterprises  
Development Act, 2006 including the notification S.O.2119 (E) dated 26<sup>th</sup> June 2020.

The Investment of the enterprise in Plant and Machinery or Equipment as at 31<sup>st</sup> March  
2020 as per Clause 4 of the Notification is \_\_\_\_\_ (Rupees in Lakhs).

The turnover of the Enterprise for the period ending 31<sup>st</sup> March 2020 as per Clause 5  
of the Notification is \_\_\_\_\_ (Rupees in Lakhs).

Date:

(Signature) Name-  
Membership number-

Seal of Chartered Accountant with UDIN reference

## **INTEGRITY PACT**

### **Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

### **and**

\_\_\_\_\_, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

### **Preamble**

The Principal intends to award, under laid-down organizational procedures, contract/s for \_\_\_\_\_

\_\_\_\_\_. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

### **Section 1- Commitments of the Principal**

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions:



## **Section 2 - Commitments of the Bidder(s)/ Contractor(s)**

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and will await their decision in the matter.

## **Section 3 - Disqualification from tender process and exclusion from future contracts**

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

## **Section 4 - Compensation for Damages**

- 4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to



demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

### **Section 5 - Previous Transgression**

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

### **Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors**

- 6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.
- 6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

### **Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors**

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

### **Section 8 - Independent External Monitor(s)**

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

- 8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.
- 8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.
- 8.12 The word 'Monitor' would include both singular and plural.

## **Section 9 - Pact Duration**

- 9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.
- 9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

## **Section 10 - Other Provisions**

- 10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.



- 10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- 10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

-----  
For & On behalf of the Principal

(Office Seal)

Place-----

Date-----

Witness:\_\_\_\_\_

(Name & Address) \_\_\_\_\_  
\_\_\_\_\_

-----  
For & On behalf of the Bidder/

Contractor

(Office Seal)

Witness:\_\_\_\_\_

(Name & Address) \_\_\_\_\_  
\_\_\_\_\_

## **Annexure-X**

### **Restrictions under Rule 144(xi) of General Financial Rules, 2017 amendment dt: 23.07.2020**

- I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority.
- II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
- III. "Bidder from a country which shares a land border with India" for the purpose of this Order means :-
  - a. An entity incorporated, established or registered in such a country; or
  - b. A subsidiary of an entity incorporated, established or registered in such a country; or
  - c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
  - d. An entity whose *beneficial owner* is situated in such a country; or
  - e. An Indian (or other) agent of such an entity; or
  - f. A natural person who is a citizen of such a country; or
  - g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
- IV. The *beneficial owner* for the purpose of (iii) above will be as under:
  1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation--

    - a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company;
    - b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;
  2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್  
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

**Bharat Heavy Electricals Ltd.,**  
**(A Government of India undertaking)**  
**Electronics Division**

PB 2606 , Mysore Road Bangalore , 560026 INDIA

CE: PR: 002- Rev 02

#### **GENERAL COMMERCIAL CONDITIONS FOR CONTRACT**

These 'General Commercial Conditions for Contract for Purchase' herein after referred to as GCC apply to all enquiries, tenders, requests for quotations, orders, contracts and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as "deliveries") to Bharat Heavy Electricals Limited and any of its units, regions or divisions (hereinafter referred to as "BHEL" or the Purchaser) or its projects/ customers.

Any deviations from or additions to these GCC require BHEL's express written consent. The general terms of business or sale of the vendor shall not apply to BHEL. Acceptance, receipt of shipments or services or effecting payment shall not mean that the general terms of business or sale of the vendor have been accepted.

Orders, agreements and amendments thereto shall be binding if made or confirmed by BHEL in writing. Only the Purchasing department of BHEL is authorized to issue the Purchase Order or any amendment thereof.

Definitions: Throughout these conditions and in the specifications, the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.

- a) 'The Purchaser' means Bharat Heavy Electricals Limited, Electronics division, Mysore road, Bangalore 560 026, a Unit of Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the Companies Act having its registered office at BHEL House, Siri Fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
- b) 'The vendor' means the person, firm, company or organization on whom the Purchase Order is placed and shall be deemed to include the vendor's successors, representative heirs, executors and administrator as the case may be. It may also be referred to as Seller, Contractor or Supplier.
- c) 'Contract' shall mean and include the Purchase Order incorporating various agreements, viz. tender/ RFQ, offer, letter of intent/acceptance/ award, the General Conditions of Contract and Special Conditions of Contract for Purchase, Specifications, Inspection/ Quality Plan, Schedule of Prices and Quantities, Drawings, if any enclosed or to be provided by BHEL or his authorized nominee and the samples or patterns if any to be provided under the provisions of the contract.
- d) 'Parties to the Contract' shall mean the 'The Vendor' and the Purchaser as named in the main body of the Purchase Order.

#### Order of Precedence:

In case of any inconsistency or contradiction between any of the documents, the order of precedence shall be Purchase Order, LOI / LOA, Special Conditions of Contract and General Conditions of Contract for commercial conditions; and specific agreement on technical conditions, RFQ/offer and specification for Technical Conditions.

#### Interpretation:

In the contract, except where the context requires otherwise:

- a) words indicating one gender include all genders;
- b) words indicating the singular also include the plural and words indicating the plural also include the singular;

- c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
- d) "Written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

#### **Applicable Conditions:**

1. **Price Basis:** All prices shall be firm until the purchase order is executed / completed in all respects. No price variations / escalation shall be permitted.
2. **Ordering and confirmation of Order:** Vendor shall send the order acceptance on their company letter head/ through e-mail within a week from the date of receipt of Purchase Order or such other period as specified/ agreed by BHEL. BHEL reserves the right to revoke the order placed if the order confirmation differs from the original order placed. The acceptance of goods/services/supplies by BHEL as well as payments made in this regard shall not imply acceptance of any deviations.  
The purchase order will be deemed to have been accepted if no communication to the contrary is received within one week (or the time limit as specified/agreed by BHEL) from the date of receipt of the purchase order.
3. **Documentation:** After receipt of Purchase Order, vendor should submit necessary documents (if & as applicable) like drawings specified, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report, O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/ Customer.  
At any stage within the contract period, the vendor shall notify of any error, fault or other defect found in BHEL's documents / specifications or any other items for reference. If and to the extent that (taking account of cost and time) any vendor exercising due care would have discovered the error, fault or other defect when examining the documents/specifications before submitting the tender, the time for completion shall not be extended. However if errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the vendor's documents, they shall be corrected at his cost, notwithstanding any consent or approval.
4. **Penalty:**
  - a. **For delay in documentation:** In the event of delay in submission of complete set of specified documents ((like drawings, bill of materials, datasheets, catalogues, quality plan etc. as called in tender specifications including soft copies wherever applicable) in required sets beyond two(02) weeks (or as agreed/indicated in the SCC/Purchase Order) from the date of receipt of Purchase Order (by email), penalty at 0.5% (half percent) per week or part thereof, limited to a maximum of 5% (five percent) of the basic material value of the Purchase Order will be applicable.  
  
Penalty for delayed documentation if applicable, shall be deducted at the time of first supply payment. If penalty is applicable for duration of less than a week, penalty @ 0.5% (half percent) of the basic material value will be deducted. GST as applicable will be recovered along with penalty amount.
  - b. **For delay in delivery:** In the event of delay in agreed contractual delivery as per Purchase Order, penalty @ 0.5 % (half percent) per week or part thereof but limited to a max of 10% (ten percent) value of undelivered portion (basic material cost) will be applicable. Delivery will commence from the date of issue of Manufacturing clearance along with approved document. The date for which Inspection call is issued by vendor along with test certificates / test reports / Certificate of Conformance / calibration reports, as proof of completion of manufacturing will be treated as date of deemed delivery for penalty calculation. In the absence of furnishing such document indicated above as proof of completion of manufacturing along with inspection call, actual date of inspection will be considered as date of deemed delivery and BHEL will not be responsible for delay in actual date of inspection.

Penalty for delayed delivery if applicable, shall be deducted at the time of first supply payment. If penalty is applicable for duration of less than a week, penalty @ 0.5% (half percent) of the basic material value will be deducted. GST as applicable will be recovered along with penalty amount.

5. Contract variations (Increase or decrease in the scope of supply): BHEL may vary the contracted scope as per requirements at site. If vendor is of the opinion that the variation has an effect on the agreed price or delivery period, BHEL shall be informed of this immediately in writing along with technical details. Where unit rates are available in the Contract, the same shall be the basis for such additional work. Vendor shall not perform additional work before BHEL has issued written instructions/ amendment to the Purchase Order to that effect. The work which the vendor should have or could have anticipated in terms of delivering the service(s) and functionality (i.e.) as described in this agreement, or which is considered to be the result of an attributable error on the vendor's part, shall not be considered additional work.
6. Inspection: Prior written notice of at least 10 days shall be given along with internal test certificates/COC and applicable test certificates. Materials will be inspected by BHEL-EDN-QS/CQS or BHEL nominated Third Party Inspection Agency (TPIA) or BHEL authorized Inspection Agency or Customer / Consultant or jointly by BHEL & Customer / consultant. All tests have to be conducted as applicable in line with approved Quality plan or QA Checklist or Purchase specification and original reports shall be furnished to BHEL-EDN, Bangalore for verification/acceptance for issue of dispatch clearance. BHEL reserves the right for conducting repeat test, if required.  
All costs related to inspections & re-inspections shall be borne by vendor. Whether the Contract provides for tests on the premises of the vendor or any of his Sub-contractor/s, vendor shall be responsible to provide such assistance, labour, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by BHEL only if specifically agreed to in the purchase order.
7. Transit Insurance: Transit insurance coverage between vendor's works and project site shall be to the account of BHEL, unless specifically agreed otherwise. However, vendor shall send intimation directly to insurance agency (as mentioned in dispatch instructions issued by BHEL) through fax/courier/e-mail, immediately on dispatch of goods for covering insurance. A copy of such intimation sent by vendor to insurance agency shall be given to BHEL along with dispatch documents. Dispatch documents will be treated as incomplete without such intimation copy. BHEL shall not be responsible for sending intimations to insurance agency on behalf of the vendor.
8. Mode of dispatch:  
Indigenous Scope: By road on Door Delivery Consignee Copy attached basis through your approved transporter (unless otherwise indicated in Dispatch Instructions), only on receipt of Despatch Clearance from BHEL.  
Imported Scope: By Air/Sea through BHEL approved Freight Forwarder/supplier approved Consolidator respectively as per agreed contractual terms, only on receipt of Dispatch Clearance from BHEL.
9. Changes in Statutory levies:  
If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the execution of Contract, which was or will be assessed on the bidder in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction there from, as the case may be. However, these adjustments would be restricted to direct transactions between BHEL and the bidder /agent of foreign bidder (if applicable). These adjustments shall not be applicable on procurement of raw materials, intermediary components etc. by the bidder /agent.
10. Availing duty/tax exemption benefits by bidder, wherever applicable: BHEL shall issue the required Certificate/s, as per relevant policies of the Govt. of India, to facilitate the bidders to avail any such benefits under the Contract. In case of failure of the bidders to receive the benefits partly or fully from the Govt. of India and/or in case of any delay in receipt of such benefits, BHEL shall neither be liable nor responsible in any manner whatsoever.



11. Taxes against sub-vendor dispatches: All taxes/levies, as applicable in respect of all components, equipments and material to be despatched directly from the sub-vendor's works to Site irrespective of the fact whether such taxes and levies are assessable and chargeable on Vendor or the BHEL, shall be to the vendor's account and no separate claim in this regard will be entertained by BHEL.
12. High Sea Sales (HSS): Customs clearance of the consignment landed on Indian Sea/Air ports will be done by BHEL based on the original HSS documents provided by vendors.  
Any delay in submission of complete/correct HSS documents to BHEL may incur demurrage charges. All demurrage charges on account of incomplete /incorrect HSS documents submission by vendor will be to vendor's account and all such charges will be recovered from any of the available vendor bills with BHEL.
13. Packaging and dispatch: The Seller shall package the goods safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by Sea/ Air / Rail/ Road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures/ hooks and sling marks as may be required for easy and safe handling. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols / instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations.  
The packing, shipping, storage and processing of the goods must comply with the prevailing legislation and regulations concerning safety, the environment and working conditions. Any Imported/Physical Exports items packed with raw/ solid wood packing material should be treated as per ISPM – 15 (fumigation) and accompanied by Phytosanitary/ Fumigation certificate. If safety information sheets (MSDS – Material Safety Data Sheet) exist for an item or the packaging, vendor must provide this information without fail along with the consignment.  
Each package must be marked with Consignee name, Purchase order number, Package number, Gross weight and net weight, dimensions (LxBxH) and Seller's name. Packing list of goods inside each package with PO item number and quantity must also be fixed securely outside the box to indicate the contents of each box. Total number of packages in the consignment must also be indicated in the packing list.  
Separate packing & identification of items should be as follows.
  1. Main Scope - All items must be tagged with part no. & item description.
  2. Commissioning accessories/spares - All items must be tagged with part no. & item description.
  3. Mandatory spares - All items must be tagged with part no. & item description.
 Nevertheless, vendor shall adhere to dispatch & packing instructions issued by BHEL at the time of dispatch.
14. Assignment of Rights & Obligations; Subcontracting: Vendor is not permitted to subcontract the delivery or any part thereof to third party or to assign the rights and obligations resulting from this agreement in whole or in part to third parties without prior written permission from BHEL. Any permission or approval given by the BHEL shall, however, not absolve the vendor of the responsibility of his obligations under the Contract.
15. Progress report: Vendor shall render such report as to the progress of work and in such form as may be called for by the concerned purchase officer from time to time. The submission and acceptance of such reports shall not prejudice the rights of BHEL in any manner.
16. Non-disclosure and Information Obligations: Vendor shall provide with all necessary information pertaining to the goods as it could be of importance to BHEL. Vendor shall not reveal any specified confidential information that may be divulged by BHEL to Vendor's employees not involved with the tender/ contract & its execution and delivery or to third parties, unless BHEL has agreed to this in writing beforehand. Vendor shall not be entitled to use the BHEL name in advertisements and other commercial publications without prior written permission from BHEL.
17. Cancellation /Termination of contract: BHEL shall have the right to completely or partially terminate the agreement by means of written notice to that effect. Termination of the Contract, for whatever reason, shall be without prejudice to the rights of the parties accrued under the Contract up to the time of termination.  
BHEL shall have the right to cancel/foreclose the Order/ Contract, wholly or in part, in case it is constrained to do so on account of any decline, diminution, curtailment or stoppage of the business.

18. Risk Purchase Clause: In case of failure of supplier, BHEL at its discretion may make purchase of the materials / services not supplied / rendered in time at the RISK & COST of the supplier. Under such situation, the supplier who fails to supply the goods in time shall be wholly liable to make good to BHEL any loss due to risk purchase.

In case of items demanding services at site like erection and commissioning, vendor should send his servicemen/representatives within 7 days from the service call. In case a vendor fails to attend to the service call, BHEL at its discretion may also make arrangements to attend such service by other parties at the **RISK & COST** of the supplier. Under such situation the supplier who fails to attend the service shall be wholly liable to make good to BHEL any loss due to risk purchase/service including additional handling charges due to the change.

19. Shortages: In the event of shortage on receipt of goods and/or on opening of packages at site, all such shortages, caused by supplier's act or omission, shall be made good at free of cost within a reasonable time that BHEL may allow from such intimation.

Transit Damages: In the event of receipt of goods in damaged condition or having found them so upon opening of packages at site, supplier shall make good of all such damages within a reasonable time from such intimation by BHEL. In case BHEL raises an insurance claim, the cost of material limited to insurance settled amount less handling charges will be reimbursed to supplier.

20. Remedial work: Notwithstanding any previous test or certification, BHEL may instruct the vendor to remove and replace materials/goods or remove and re-execute works/services which are not in accordance with the purchase order. Similarly BHEL may ask the vendor to supply materials or to execute any services which are urgently required for any safety reasons, whether arising out of or because of an accident, unforeseeable event or otherwise. In such an event, Vendor shall provide such services within a reasonable time as specified by BHEL.

21. Indemnity Clause: Vendor shall comply with all applicable safety regulations and take care for the safety of all persons involved. Vendor is fully responsible for the safety of its personnel or that of his subcontractor's men / property, during execution of the Purchase Order and related services. All statutory payments including PF, ESI or other related charges have to be borne by the vendor. Vendor is fully responsible for ensuring that all legal compliances are followed in course of such employment.

22. Product Information, Drawings and Documents: All specified drawings, technical documents or other technical information received by Vendor from BHEL or vice versa shall not, without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the Disclosing party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are binding only to the extent that they are by reference expressly included in the contract.

Vendor, as per agreed date/s but not later than the date of delivery, provide free of charge information and drawings which are necessary to permit and enable BHEL to erect, commission, operate and maintain the product. Such information and drawings shall be supplied in as many numbers of copies as may be agreed upon.

All intellectual properties, including designs, drawings and product information etc. exchanged during the formation and execution of the Contract shall continue to be the property of the disclosing party.

23. Intellectual Property Rights, Licenses: If any Patent, design, Trade mark or any other intellectual property rights apply to the delivery (goods/related service) or accompanying documentation shall be the exclusive property of the Vendor and BHEL shall be entitled to the legal use thereof free of charge by means of a non-exclusive, worldwide, perpetual license. All intellectual property rights that arise during the execution of the Purchase Order/ contract for delivery by vendor and/or by its employees or third parties involved by the vendor for performance of the agreement shall belong to BHEL. Vendor shall perform everything necessary to obtain or establish the above mentioned rights. The Vendor guarantees that the delivery does not infringe on any of the intellectual property rights of third parties. The Vendor shall do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of any (alleged)

claims by third parties. The Vendor shall indemnify BHEL against any (alleged) claims by third parties in this regard and shall reimburse BHEL for any damages suffered as a result thereof.

24. Force Majeure: Notwithstanding anything contained in the purchase order or any other document relevant thereto, neither party shall be liable for any failure or delay in performance to the extent said failures or delays are caused by the "Act of God" and occurring without its fault or negligence, provided that, force majeure will apply only if the failure to perform could not be avoided by the exercise of due care and vendor doing everything reasonably possible to resume its performance.

A party affected by an event of force majeure which may include fire, tempest, floods, earthquake, riot, war, damage by aircraft etc., shall give the other party written notice, with full details as soon as possible and in any event not later than seven (7) calendar days of the occurrence of the cause relied upon. If force majeure applies, dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.

Notwithstanding above provisions, in an event of Force Majeure, BHEL reserves for itself the right to cancel the order/ contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of deliveries and other schedules.

25. Warranty:

Wherever required, and so provided in the specifications/ Purchaser Order, the Seller shall ensure that the goods supplied shall comply with the specifications laid down, for materials, workmanship and performance.

Unless otherwise specified in SCC, warranty period shall be applicable for a period of 24 months from the date of delivery of goods or 18 months from the date of commissioning of goods, whichever is earlier.

The warranty period as described above shall apply afresh to replaced, repaired or re-executed parts of a delivery. Unless otherwise specifically provided in the Purchase Order, Vendor's liability shall be co terminus with the expiration of the applicable warranty period.

26. Limitation of Liability: Vendor's liability towards this contract is limited to a maximum of 100% of the contract value and consequential damages are excluded. However the limits of liability will have no effect in cases of criminal negligence or wilful misconduct.

The total liability of Vendor for all claims arising out of or relating to the performance or breach of the Contract or use of any Products or Services or any order shall not exceed the total Contract price.

27. Liability during warranty: Vendor shall arrange replacement / repair of all the defective materials / services under its obligation during the warranty period. The rejected goods shall be taken away by vendor and replaced / repaired. In the event of the vendor's failure to comply, BHEL may take appropriate action including disposal of rejections and replenishment by any other sources at the cost and risk of the vendor. In case, defects attributable to vendor are detected during Warranty period or where the commissioning call is issued within the warranty period, vendor shall be responsible for replacement/ repair of the goods as required by BHEL at vendor's cost even after expiry of warranty period.

Further if the equipment or any part thereof cannot be used by reason of such defect and/or making good of such defect, the warranty period of the equipment or such part, as the case may be, shall be extended by a period equal to the period during which the equipment or such part cannot be used by BHEL because of any of the aforesaid reasons. Upon correction of the defects in the facilities or any part thereof by repair/replacement, such repair/replacement shall have the warranty period for a period of twelve (12) months from the time such replacement/repair of the equipment or any part thereof has been completed.

28. Liability after warranty period: At the end of the warranty, the Vendor's liability ceases except for latent defects. For the purpose of this clause, latent defects shall be the defects inherently lying within the material or arising out of design deficiency which do not manifest themselves during the warranty Period, but later. The Contractor's liability for latent defects warranty for the equipment including spares shall be limited to a period of six months from the end of the warranty period of the respective equipment including spares or first time commissioning, whichever is later but not later than one (01) year from the date of expiry of warranty period.

29. Compliance with Laws: Vendor shall, in performing the contract, comply with all applicable laws. The vendor shall make all remittances, give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the laws in relation to the execution and completion of the contract and for remedying of any defects; and the Contractor shall indemnify and hold BHEL harmless against and from the consequences of any failure to do so.
30. Settlement of Disputes: Except as otherwise specifically provided in the Purchase Order, decision of BHEL shall be binding on the vendor with respect to all questions relating to the interpretation or meaning of the terms and conditions and instructions herein before mentioned and as to the completion of supplies/work/services, other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the contract, instructions, orders or these conditions or otherwise concerning the supply or the execution or failure to execute the order, whether arising during the schedule of supply/work or after the completion or abandonment thereof. Any disputes or differences among the parties shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration. Vendor shall continue to perform the contract, pending settlement of dispute(s).
31. Arbitration Clause in case of Contract with vendors other than Public Sector Enterprise (PSE) or a Government Department:

Arbitration & Conciliation:

The parties shall attempt to settle any disputes or difference arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, or in connection with this contract through friendly discussions. In case no amicable settlement can be reached between the parties through such discussions, in respect of any dispute; then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration of an arbitrator appointed by Head of the BHEL–EDN. Such Sole Arbitrator appointed, shall conduct the arbitration in English language.

The Arbitrator shall pass a reasoned award and the award of the Arbitration shall be final and binding upon the Parties.

Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be Bangalore.

The cost of arbitration shall be borne as decided by the Arbitrator upon him entering the reference.

Subject to the Arbitration Clause as above, the Courts at Bangalore alone shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract.

Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the parties shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and efficiency in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.

Arbitration Clause in case of Contract with a Public Sector Enterprise (PSE) or a Government Department:

In the event of any dispute or difference relating to the interpretation and application of the provisions of the Contract, such dispute or difference shall be referred by either party for Arbitration to the Sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any Party aggrieved by such Award may make further reference for setting aside or revision of the Award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary or Additional Secretary when so authorized by the Law Secretary, whose decision shall bind the Parties hereto finally and conclusively. The Parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.'

32. Applicable Laws and Jurisdiction of Courts: Prevailing Indian laws both substantive and procedural, including modifications thereto, shall govern the Contract. Subject to the conditions as aforesaid, the competent courts in Bangalore alone shall have jurisdiction to consider over any matters touching upon this contract.
33. General Terms: That any non-exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents.

That the headings used in this agreement are for convenience of reference only.

That all notices etc., to be given under the Purchase order shall be in writing, type script or printed and if sent by registered post or by courier service to the address given in this document shall be deemed to have been served on the date when in the ordinary course, they would have been delivered to the addressee.



ಭಾರತ್ ಹವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್  
भारत हेवी इलेक्ट्रिकल्स लिमिटेड  
Bharat Heavy Electricals Ltd.,  
(A Government of India undertaking)  
Electronics Division

Page 1 of 5

CE: PR: 003- Rev 02

PB 2606 , Mysore Road Bangalore , 560026 INDIA

**SPECIAL COMMERCIAL CONDITIONS OF CONTRACT**

**Reference is brought to BHEL's Instructions to Bidders (Document Ref: CE: PR: 001- Rev 03) and General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 02).**

**These two documents along with Special Conditions of Contract annexed to this RFQ will form an integral part of the contract as and when the RFQ culminates into a Purchase Order / Contract.**

**RFQ No.** : PRV0000026

**RFQ Date** : } As per NIT @ <https://eprocurebhel.co.in> website

**RFQ Due Date** :

**Customer/Project** : M/s. UPRVUNL/PANKI (1X660 MW)

**Scope Description** : Temperature Elements

Kindly submit your quotation as ~~single~~/**two**/~~three-part bid~~ (PQR+Techno-Commercial bid-1st part & Price bid-2nd Part) in E-Procurement System portal: <https://eprocurebhel.co.in> within the Due- Date of as per NIT before 13.00 hours IST and note that tenders will be opened on the same day at 13.30 hours IST.

**Purchase Executives:** Clarifications with regard to the tender shall be addressed to purchase officers whose e-mail IDs are given below:

[praviirajp@bhel.in](mailto:praviirajp@bhel.in) or [saravanababu@bhel.in](mailto:saravanababu@bhel.in)

**Splitting of tendered quantity to MSE vendors:** ~~The tendered quantity will be split to MSE vendor/s subject to submission of relevant document/s by vendors. Refer clause-I of Instructions to Bidders for conditions applicable and for information on document/s to be submitted.~~

**Destination:** For Indigenous scope of supply, items are to be directly despatched to BHEL site office/stores located at Panki TPP project site in Uttar-Pradesh state, India.. Detailed Consignee details will be issued by BHEL along with Despatch Clearance.

**Terms of Delivery:**

- **Indigenous scope of supply:** Ex-works, <indicate station of dispatch>  
(including Packing & Forwarding charges but excluding Taxes).

**Under-mentioned details shall be provided against indigenous supplies & services:**

a. GSTIN of place of supply : \_\_\_\_\_

- b. HSN (Harmonized System of Nomenclature) code : \_\_\_\_\_  
 Applicable tax and Rate : \_\_\_\_\_ & \_\_\_\_\_
- c. GSTIN of place of supply of service :
- d. SAC (Service Accounting Code) : \_\_\_\_\_  
 Applicable tax and Rate : \_\_\_\_\_ & \_\_\_\_\_
- e. GeM Seller ID mandatorily required for PO placement: \_\_\_\_\_

**I. Bidders to mandatorily provide confirmation/compliance for the under-mentioned terms:**

SL N O.	TERMS	BHEL ACCEPTABLE TERM	BIDDER'S CONFIRMATION	REMARKS, if any
01	<b>Reverse Auction (RA)</b>	BHEL shall be resorting to Reverse Auction (Guidelines as available on <a href="http://www.bhel.com/index.php/vendor">http://www.bhel.com/index.php/vendor</a> ) for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.	AGREE	
02	<b>Parting of license for imported raw materials</b>	<del>In case of projects where Basic Custom Duty is NIL and vendor is importing any raw materials / components for the enquired item, same are eligible for Zero Customs duty. As per EXIM policy, BHEL will part the import licence with the vendors to obtain import licence by themselves and custom clear the raw materials/ components by availing zero customs duty. Hence, please furnish list of raw materials / components to be imported by you with Quantity and CIF value (for which BHEL has to share import licence). The benefit due to the above shall be passed on to BHEL and confirmed in the quotation.</del> If there are no imported raw materials/ components, same shall be confirmed in the offer.	AGREE  CIF value .....  Yes, benefit passed on to BHEL in the priced quotation. (or) We confirm that there are no imported components	
03	<b>Delivery Period</b>	Within <b>12</b> weeks from the date of issue of Manufacturing clearance along with approved document.	AGREE  .....	



		<p>Delay in contractual delivery will attract Penalty as per GCC Clause no.: 04.b.</p> <p>Manufacturing clearance for spares will be provided later as per site delivery schedule of spares.</p> <p>Delivery schedule of spares : March 2023</p>	weeks	
04	<b>Terms of Payment at the time of material supply</b>	<p>Refer Clause “F” of Instructions to Bidder for BHEL standard Payment terms and loading factors applicable for non-compliance against payment terms:</p> <p><b>Indigenous Scope :</b> Supply Only – (b)</p> <p><b>Mandatory Spares :</b> Supply Only – (b)</p>	AGREE	
05	<b>Declaration of local content :</b> The ‘Class-I local supplier’/‘Class-II local supplier’ shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement for ‘Class-I local supplier’/‘Class-II local supplier’, as the case may be.	<p>‘Local content’ means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.</p> <p>{‘Class-I local supplier’ means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50%, as defined under Public procurement order no.P-45021/2/2017-PP (BE-II) dt: 16.09.2020.</p> <p>‘Class-II local supplier’ means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%, as defined under Public procurement order no.P-45021/2/2017-PP (BE-II) dt: 16.09.2020.</p> <p>In the event of any Nodal Ministry prescribing higher or lower margin of purchase preference and/or higher or lower percentage of local content in respect of this procurement, same shall be applicable}.</p> <p>(Refer Clause ‘A’ Sl. No. 12 of Instructions to Bidders).</p> <p>Non-Local Suppliers are also eligible to participate in the tender.</p>	<p>Percentage of local content : _____%</p> <p>Details of the Location(s) at which the local value addition is made : _____</p>	

06	<b>Declaration as a compliance to Rule 144(xi) of GFR, 2017 amendment dt 23.07.2020</b> issued by Ministry of Finance, Govt. of India.	The below declaration is to be submitted on Company Letter head duly signed and sealed by authorised signatory, for ascertaining the eligibility of offer in the tender. “I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that our firm is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that our firm fulfils all requirements in this regard and is eligible to be considered.” (Refer Clause ‘A’ Sl. No. 13 of Instructions to Bidders).		
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**II. Bidder to note that Deviations shall not be permitted for the below mentioned terms and are deemed to be complied. In case of non-compliance/deviation, offer shall be liable for rejection:**

- (1) **Submission of documents post PO viz., drawings /data sheet etc. as indicated in Cl: 04 of GCC:** Within \_02\_ weeks from the date of receipt of Purchase Order. Delay in submission of complete set of specified documents in NIT, will attract Penalty as per GCC Clause no.04.a.
- (2) **Validity:** The offer will be valid for a period of \_90\_ days from the date of part-I bid opening and in case of Negotiation/ Counter-offer, price validity will apply afresh for a period of \_30\_ days from the date of according final price by bidder (or) up to original validity period, whichever is later.

- (3) **Warranty:** 24 months from the date of dispatch of goods.

- (4) **Despatch Documents:** Complete set of despatch documents (original + 1 photocopy set) as per Purchase Order shall be forwarded to Purchase Executive/BHEL directly. Despatch documents shall include the following:

Invoice (01 original and 01 copy with original sign & seal / digitally signed invoice), Lorry Receipt (L/R), Packing List, NIL Short-Shipment Certificate, insurance intimation letter, E-way bill, original Performance Bank Guarantee (directly from issuing bank to BHEL) and original POD (Proof of Delivery) on L/R.

One set of Invoice, Packing List, Lorry Receipt & E-way bill shall be e-mailed immediately to BHEL-EDN at the time of despatch.

Note: Detailed Packing List should indicate package-wise content details and also Net & Gross weight of each package.

- (5) **Freight Charges (for indigenous scope of supply):** Freight charges shall be to vendor's account. Bidder to quote Lump sum reasonable Freight charges along with applicable tax, in price bid for both main supply and mandatory spares separately.

- (6) **Evaluation criteria to determine L1 bidder:** Items will not be split on item-wise lowest offer. Evaluation of the lowest bidder will be done as a combined package basis.
- (7) **Erection Supervision and Commissioning charges:** Not Applicable.
- (8) **PBG:** Not Applicable.

**With this, we hereby confirm that all the terms & conditions as indicated in Instructions to Bidders (Document Ref: CE: PR: 001- Rev 03) & General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 02) are accepted without any deviation.**

Vendor's Signature with  
Seal



**SPECIFICATION  
FOR  
TEMPERATURE ELEMENTS**

CE/416/PANKI/TE/PS  
REV. NO.: 00  
PROJECT: PANKI 1X660 MW

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THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

**PROJECT: PANKI 1X660 MW**  
**CUSTOMER: M/S. UPRVUNL**  
**CONSULTANT: M/S. NTPC**  
**CONTRACTOR: M/S. BHEL**

**PURCHASE SPECIFICATIONS  
FOR  
TEMPERATURE ELEMENTS**

**REVISION : 00**

**APPROVED**

**(PPS)**

**PREPARED**

**(PRK)**

**ISSUED**

**416**

**DATE**

**05/04/2021**

**Pre-Qualification Requirements (PQR) of Bidders for Temperature Elements:**

1. "Bidder shall have successfully completed design, engineering, manufacturing, testing and supply of Temperature Elements with Thermowells in Thermal Powerplants of unit size not less than 500 MW before One (1) year as on date 02.11.2015. To qualify to this point, Bidders shall furnish details of supplies made with applications covering the Mediums Steam and Water. Details should include PO copies and Supply documents.  
Performance certificates from end user (if available) can also be furnished.
2. Manufacturers based outside India, who are making offer for this tender, shall have authorized representatives in India for support related to Documentation.
3. All required documents against this Tender/Specification shall be submitted in English only.
4. Whenever required during evaluation of bids, vendor is required to be present at BHEL Electronic Division, Bangalore, for discussions. Further, in the event of order, during approval of the Vendor documents by End users/Customers, Vendor shall accompany BHEL representative for discussions if required.
5. BHEL shall submit filled sub-supplier Questionnaire format (shall be filled by bidder Which is part of this specification) and credentials/details furnished by Bidder with their offers to customer and await customer's decision for a maximum of (30) Thirty Days from the date of submission to customer. If approval not received within above period, BHEL shall treat the offer as "Not Meeting PQR" criteria and offer shall be rejected.
6. In case Bidder does not include the details or meet the Pre-qualification requirements their offer will summarily be rejected.

**SUPPLY REQUIREMENTS:** Vendor shall quote for the following items indicated below. Without this, the offer shall be treated as incomplete and shall be rejected. All the Elements below shall be provided with CERAMIC Terminal Blocks and Nickel Plated Brass Screw type with Silver coated and spring loaded Connectors. Two Electrical Connections shall be provided, one with Gold plated Plug in socket type external connectors shall be provided (6 pin connectors for thermocouples and 10 pin connectors for RTD) and other Entry shall be with Blind Plug.

**1.0 PROJECT REQUIREMENT :**

**A) SCOPE:** The offer for the following items shall be as per Instrument Schedule & related Tapping point Drgs.

SL. NO	Material Code	Description	Unit Qty	Minimum Mandatory Spares Qty	GRAND TOTAL (Nos)
1	PR019000033	T/C K type threaded Barstock thermowell IBR	88	20	108
2	PR019000034	T/C K type with flanged thermowell	32	5	37
3	PR019000035	T/C R type with flanged Inconel 600 thermowell	8	2	10
4	PR019000036	T/C K Type with 25mtr Flexible MI extension cable and Barstock Thermowell	38	8	46
5	PR019000037	T/C K type Metal Temperature Measurement 30 Mtr MI cable.	10	2	20

SL. NO	Material Code	Description	Unit Qty	Minimum Mandatory Spares Qty	GRAND TOTAL (Nos)
6	PR0190000384	T/C K type with Tungsten carbide thermowell	32	5	37
7	PR0190000392	T/C K type with flanged Inconel 600 thermowell	35	6	55
8	PR0200000330	RTD with threaded Barstock thermowell	53	12	65
9	PR0200000349	RTD with flanged thermowell	48	8	56
10	PR0200000365	RTD with threaded Barstock thermowell IBR	17	8	25
<b>Total Qty (Nos)</b>			<b>361</b>	<b>76*</b>	<b>437</b>

### **B) Mandatory Spares:**

\*Minimum mandatory spares qty indicated in the table above, Actual Qty shall be as indicated below.

Mandatory spares shall be 15 % of Total Qty for each type, Each Process Connection Size and Each Thermowell size(IL&EL) OR Minimum 1 Number of each type, Each Process Connection Size and Each Thermowell size(IL&EL) whichever is higher shall be included as mandatory spares.

Note: It is responsibility of bidder to calculate mandatory spares correctly, vendor can chose the length of IL and EL to optimize the mandatory spares qty without affecting the specification requirement. No commercial implication will be allowed for change in mandatory spares quantity due to calculation of WFC. During datasheets submission if BHEL finds that Thermowell length has to be corrected as per ASME PTC 19.3 2016 and if it results in change of qty in mandatory spares then no commercial implication will be allowed. However, if change of IL is due to inputs such as Operating and design parameters furnished by BHEL, then commercial implications due to those changes will be allowed.

Note: Verification of WFC(Includes Thermowell Insertion and Extension Lengths) will be done as per ASME PTC 19.3 2016 only after PO placement.

**Vendors shall submit Mandatory spares list for reference in excel copy.**

**Vendors shall submit Quality Plan for RTD and Thermocouple for approval along with datasheets for approval.**

### **Instrument Schedule & Tapping Point Drg. References.**

1. Instrument Sch. Ref. CE/416/PANKI/TE/SCH

2. Tapping Point Drgs Ref:  
PE-DG-426-145-I101  
PANKI-TEMP-METAL-01  
3-FS-156-00032  
3-55-335-02053  
4-97-288-94273  
4-97-288-94275

4-97-288-94279  
4-97-288-94282

## 2.0 Technical Requirements :

Tag number shall be engraved on thermowell, service engraved in stainless steel tag plate and tied to Temperature Element with SS chain.

### 2.1 RTD (PT-100)

Requirement	Description
Type of RTD	Duplex - Ungrounded elements, Four wire 100 Ohm platinum at 0 DegC and shall Conform to DIN-43760
Accuracy	+/-0.5% of span as per IEC-60751 or Class A accuracy as per DIN 43760
Housing/Head	Terminal Head shall be IP-65 or better universal screw type. Terminal head cover shall be provided with gaskets and SS 316 captive chain. Terminal head shall be of Die cast aluminium or better.
Terminal Block	Terminal block shall be constructed of High Temperature ceramic. Head shall be designed for positive connection and for a terminal temperature Difference of not more than 0.05 deg.C.
Sheath	Sheathing of RTD's shall be 8 mm OD SS 316 seamless tubes with Magnesium oxide (MgO) (Purity 99.4%) insulation.
Element size	Element lead size shall be 18 AWG
Insulation resistance	The insulation resistance at 540 deg.C. shall not be less than 5 mega ohms.
Electrical connection	Two Electrical Connections shall be provided, one with Gold plated Plug in socket type external connectors shall be provided (10 pin connectors for RTD) and other Entry shall be with Blind Plug.
Neck Extension length	150mm SS316 Nipple union Nipple shall be provided with ½" Sch 80 pipe with ½" NPT(M) connection size for all Barstok Thermowells.
Characteristic	Characteristics shall be linear with respect to temperature within +/-0.5% of top range.
Response Time	Response time shall be 6-10 Sec bare & 30 Sec. With protective sheath/thermowell.

### 2.2 Thermocouples

Requirement	Description
Type of Thermocouple	Dual / Duplex Ungrounded elements, 16 AWG wire for Chromel - Alumel (Type K) and 24 AWG wire for Pt-Rhodium Pt (Type R).



	(Vendor to furnish the test reports for verification of wire gauges during inspection)
Calibration and accuracy	As per IEC-751/ANSI-C-96.1(special limits of Error)
Sheath	Sheathing of K-Type Thermocouple shall be 8 mm OD SS 316 seamless tubes with magnesium oxide packing for insulation. R-Type thermocouple, sheathing shall be 8mm OD of Inconel 600 with magnesium oxide packing for insulation (purity 99.4% above).
Insulation resistance	The insulation resistance at 540 deg.C. shall not be less than 5 mega ohms.
Housing/Head	Terminal Head shall be IP-65 or better universal screw type. Terminal head cover shall be provided with gaskets and SS 316 captive chain. Terminal head shall be of Die cast aluminium or better.
Terminal Block	Terminal block shall be constructed of High Temperature ceramic base with Brass screw type terminals, spring loaded Mineral insulated thermocouples. Thermocouple Head shall be designed for positive connection and for a terminal Temperature Difference of not more than 0.05 DegC
Electrical connection	Two Electrical Connections shall be provided, one with Gold plated Plug in socket type external connectors shall be provided (10 pin connectors for RTD) and other Entry shall be with Blind Plug.
Neck Extention length	150mm SS316 Nipple union Nipple shall be provided with ½" Sch 80 pipe with ½" NPT(M) connection size for all Barstok Thermowells.
Characteristic	Characteristics shall be linear with respect to temperature within +/-0.5% of top range.
Response Time	Response time shall be 6-10 Sec bare & 30 Sec. With protective sheath/thermowell.

**2.3 Metal temperature Thermocouples** shall be provided as per the following specification:-

Requirement	Description
Measuring medium:	Metal
Material of thermocouple element:	Chromel - Alumel- Type K
Insulation Packing	Mineral insulation of magnesium oxide
Thermocouple wire gauge	16 AWG
Protective sheath	SS321
Protective sheath dia	8 mm O.D
Characteristics of thermocouple	Special limits of error as in ANSI C 96.1
Mounting accessories	½" BSP SS sliding end connector weld pad welded on clamping of heat resistance SS310

Cold end sealing	SS pot seal with colour coded PTFE headed sleeve insulated flexible tails. Sealing Component Epoxy Resin
Minimum bending radius	30 mm

#### **2.4 Thermowell for above shall conform to following requirements:**

**2.4.1** Threaded thermowell shall be Single piece SS316/SS316H material (As identified in Ins. Sch) material, tapered, drilled from Barstock threaded Thermowells shall have 25 mm Tip Dia.

For Barstock Thermowell, Extension Length shall be Minimum 100mm above the Insulation on pipe and Minimum 160 mm when there is no insulation on pipe.

Thermowell Design shall conform to Standard per ASME PTC 19.3-2016 or latest. IBR certification shall be furnished for thermowells, as applicable.

Bore Concentricity +5% of wall thickness

Vendor shall quote IL and EL lengths in multiple of 5mm only.

Maximum Insertion Length of the Threaded Thermowell shall not exceed 400mm.

Vendor shall explain the criteria to accept / select "Insertion length" as per ASME PTC 19.3, 2016 & shall have the software to size the Thermowell as per ASME PTC 19.3 2016 or latest, along with the offer vendor has to submit the correct calculations for Reynolds number, Strouhal number, Vortex Frequency Shredding, Resonance Frequency, Inline Resonance Velocity, Cyclic Stress, Steady state Stress (LHS & RHS), Dynamic Stress (LHS & RHS), Pressure Limit etc.

Note: Verification of Wake Frequency calculation (Includes Thermowell Insertion and Extension Lengths) will be done as per ASME PTC 19.3 2016 only after PO placement.

**2.4.2** For Mill classifier outlet (i.e. Medium is Coal/Air mixture), long life Solid Sintered Tungsten Carbide material of high abrasion resistance shall be provided Tungsten Carbide Thermowell size= 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.

**2.4.3** For Air/Flue gas services, Inconel 600/SS316 Thermowell protection tube of Tip Diameter of 26.7 mm with welded cap at the end ( of 100 mm min. length from tip) shall be fabricated from 3/4" Sch 80 Seamless Pipes as identified in the Instrument schedule.

**2.4.4** For Furnace zone(R Type T/C), Adjustable SS316 flange, Inconel 600 Thermowell with additional overprotection by Tungsten carbide coating. Inconel 600 tube shall be fabricated from 3/4" Sch 80 seamless pipe with welded cap at the end (of 100 mm min. length from tip). This construction would ensure thermowell should not break due to any shock.

For flanged connections (In Air/Fluegas services); Adjustable SS316 flange, Studs, nuts and gaskets of suitable material with Cadmium plated shall be provided. Flanges shall be as per ANSI-B 16.5.

#### **3.0 Documents to be furnished in the event of Tendering stage:**

- 3.1 Technical offer
- 3.2 Point wise compliance to Purchase specification with company seal and signature on Purchase specification.
- 3.3 Technical Literature / Catalogues.
- 3.4 Engineering Checklist to be fill and submitted with seal and signature.
- 3.5 Mandatory spares list as per specification.
- 3.6 Vendor to submit filled sub-supplier Questionnaire format (Which is part of this specification). This will be submitted to NTPC for vendor approval in this project. Please note that BHEL will wait 30 days for vendor approval from the date of submission, if the same is not received from customer within this period your offer will not be acceptable.

**4.0** Documents to be furnished, for Approval by BHEL / Owner or End-User, in the event of order:

- 4.1 Datasheets / Assembly Drawings
  - 4.2 Technical Literature / Catalogues
  - 4.3 Quality Plan \*\* for Thermocouples, RTD's and Thermowells
  - 4.4 Thermowell Design Calculations as per ASME PTC 19.3-2016 or latest.
- Above documents shall be submitted in Soft copy as one PDF file and 6 sets of Hardcopies for approval.
- 4.5 Test Certificates / Reports as per approved Quality plan.
  - 4.6 Copy of Approved Data sheet (Two sets with supply to Site + 1 Copy to BHEL- EDN)

**\*\* NOTE:** The Quality Plan shall include the following as minimum in addition to tests called by relevant standards (ANSI 96.1 & DIN 43760); Dimension Check, Process/Electrical connections Checks, Calibration Tests (100 % by Vendor & 10 % by BHEL / Owner), Ultrasonic/Radiography Test for bore concentricity of Thermowell, Insulation Resistance Tests, IBR Certificates (as Applicable), Hydro tests, all Material Test Certificates etc.

Inspection shall be carried out based on the Approved Quality plan.

Important Note:

Mandatory Spares shall be sent in pre-decided lots in secure boxes distinctly marked in Red colour with boldly written "S" mark on each face of the secure boxes.

PROJECT: PANKI YK880 MW  
CUSTOMER: M/s UPJVNL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PSH

SL NO	KKS_TAG	DESCRIPTION	SENSR_TYPE	OP_PRESS	DGN_PRESS	Unit of Pressure	OP_TEMP (Deg.C)	DGN_TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x TH) (mm.)	VELOCITY (Meter/Sec)	INSULN THICK (mm.)	RANGE ( Deg.C )	IRI Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
1	10LAA01CT011	DEA FST TEMP	PRT-100	12.4	15.5	Kg/cm2	188.7	400	COND			--	0 - 450	Yes	PE-DG-426-145-H101	M3X2	64		150	1	P	PR0200000365
2	10LAA01CT012	DEA FST TEMP	PRT-100	12.4	15.5	Kg/cm2	188.7	400	COND			--	0 - 450	Yes	PE-DG-426-145-H101	M3X2	64		150	1	P	PR0200000365
3	10LAB10CT011	TDBFP-A BP SUC TEMP	PRT-100	12.87	20	Kg/cm2	190	200	FW	406.4 x 9.53	2.72	60	0-250	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
4	10LAB20CT011	TDBFP-B BP SUC TEMP	PRT-100	12.87	20	Kg/cm2	190	200	FW	406.4 x 9.53	2.72	60	0-250	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
5	10LAB30CT011	MOBFP BP SUC TEMP	PRT-100	12.87	20	Kg/cm2	190	200	FW	406.4 x 9.53	2.72	60	0-250	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
6	10LAB40CT014	BFP DISCH HDR TEMP AFT FCS	PRT-100	337.3	390	Kg/cm2	196	200	FW	ID370 x 64	5.85	60	0-250	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
7	10LAB1CT011	FW TEMP AT HPH-7 IL	PRT-100	337.3	390	Kg/cm2	196.2	200	FW	ID370 x 64	5.85	75	0-250	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
8	10LAB2CT011	FW TEMP AT HPH-8 IL	PRT-100	337.3	390	Kg/cm2	224.1	230	FW	ID375 x 65	5.9	80	0-250	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
9	10LAB40CT011	FW TEMP AT HPH-9 IL	PRT-100	337.3	390	Kg/cm2	276.8	290	FW	ID390 x 68	5.92	110	0 - 400	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
10	10LAB44CT011	FW TEMP BEF HPH-7 DES HTR	PRT-100	337.3	390	Kg/cm2	305	315	FW	ID405 x 70	5.84	125	0 - 400	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
11	10LAB50CT011	FW TEMP AFT HPH-7 DES HTR	PRT-100	337.3	390	Kg/cm2	308	320	FW	ID405 x 70	5.89	135	0 - 400	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
12	10LAB60CT011	FW TO ECO TEMP	Cr-Al	337.3	390	Kg/cm2	308	320	FW	ID405 x 70	5.89	160	0 - 400	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0190000333
13	10LAB60CT012	FW TO ECO TEMP	Cr-Al	337.3	390	Kg/cm2	308	320	FW	ID405 x 70	5.89	160	0 - 400	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0190000333
14	10LAE31CT001	BFP SPRAY TEMP	PRT-100	---	390	Kg/cm2	---	200	Water	168.3 x 27.5	--	50	0-250	Yes	PE-DG-426-145-H101	M3X2	45		150	1	P	PR0200000365
15	10LBA01CT011	MS TEMP AT SH OL-LEFT	Cr-Al	279	294.8	Kg/cm2	596	601	Steam	ID 330 x 97	41.31	335	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
16	10LBA01CT012	MS TEMP AT SH OL-LEFT	Cr-Al	279	294.8	Kg/cm2	596	601	Steam	ID 330 x 97	41.31	335	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
17	10LBA01CT013	MS TEMP AT SH OL-LEFT	Cr-Al	279	294.8	Kg/cm2	596	601	Steam	ID 330 x 97	41.31	335	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
18	10LBA02CT011	MS TEMP AT SH OL-RIGHT	Cr-Al	279	294.8	Kg/cm2	596	601	Steam	ID 330 x 97	41.31	335	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
19	10LBA02CT012	MS TEMP AT SH OL-RIGHT	Cr-Al	279	294.8	Kg/cm2	596	601	Steam	ID 330 x 97	41.31	335	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
20	10LBA02CT013	MS TEMP AT SH OL-RIGHT	Cr-Al	279	294.8	Kg/cm2	596	601	Steam	ID 330 x 97	41.31	335	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
21	10LBA10CT011	HPBP-1 US TEMP	Cr-Al	270	294.8	Kg/cm2	593	601	Steam	ID 200 x 54	74.64	300	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
22	10LBA10CT012	HPBP-1 US TEMP	Cr-Al	270	294.8	Kg/cm2	593	601	Steam	ID 200 x 54	74.64	300	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
23	10LBA11CT005	HP TURB IL TEMP	Cr-Al	270	294.8	Kg/cm2	593	601	Steam	ID 330 x 97	42.65	335	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
24	10LBA20CT011	HPBP-2 US TEMP	Cr-Al	270	294.8	Kg/cm2	593	601	Steam	ID 200 x 54	74.64	300	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
25	10LBA20CT012	HPBP-2 US TEMP	Cr-Al	270	294.8	Kg/cm2	593	601	Steam	ID 200 x 54	74.64	300	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
26	10LBB01CT011	HRH STM TEMP AT RH OIL - LEFT	Cr-Al	57.46	67.3	Kg/cm2	593	601	Steam	ID 630 x 37	50.08	360	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
27	10LBB01CT012	HRH STM TEMP AT RH OIL - LEFT	Cr-Al	57.46	67.3	Kg/cm2	593	601	Steam	ID 630 x 37	50.08	360	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
28	10LBB01CT013	HRH STM TEMP AT RH OIL - LEFT	Cr-Al	57.46	67.3	Kg/cm2	593	601	Steam	ID 630 x 37	50.08	360	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
29	10LBB02CT011	HRH STM TEMP AT RH OIL - RIGHT	Cr-Al	57.46	67.3	Kg/cm2	593	601	Steam	ID 630 x 37	50.08	360	0-700	Yes	PE-DG-426-145-H101	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333

PROJECT: PANKI 1080 MW  
CUSTOMER: M/s UPVVL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PSH

SL NO	KKS_TAG	DESCRIPTION	SENSE TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP TEMP (Deg.C)	DGN. TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x TH) (mm.)	VELOCITY (Meter/Sec)	INSUL. THICK (mm.)	RANGE ( Deg.C)	IR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
30	10LBB02CT012	HRH STM TEMP AT RH OIL - RIGHT	Cr-Al	57.46	67.3	Kg/cm2	593	601	Steam	ID 630 x 37	50.08	360	0-700	Yes	PE-DG-426-145-H01	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
31	10LBB02CT013	HRH STM TEMP AT RH OIL - RIGHT	Cr-Al	57.46	67.3	Kg/cm2	593	601	Steam	ID 630 x 37	50.08	360	0-700	Yes	PE-DG-426-145-H01	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
32	10LBB11CT005	P TURB IL TEMP - RIGHT	Cr-Al	57.46	67.3	Kg/cm2	593	601	Steam	ID 630 x 37	50.08	360	0-700	Yes	PE-DG-426-145-H01	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
33	10LBB12CT005	P TURB IL TEMP - LEFT	Cr-Al	57.46	67.3	Kg/cm2	593	601	Steam	ID 630 x 37	50.08	360	0-700	Yes	PE-DG-426-145-H01	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
34	10LBC01CT011	CRH STM TEMP AT RH IL-LEFT	Cr-Al	62.13	73.1	Kg/cm2	359	375	Steam	762 x 30	24.84	180	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
35	10LBC02CT011	CRH STM TEMP AT RH IL-RIGHT	Cr-Al	62.13	73.1	Kg/cm2	359	375	Steam	762 x 30	24.84	180	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
36	10LBC10CT011	HP TURB OIL TEMP	Cr-Al	62.13	73.1	Kg/cm2	359	375	Steam	965 x 37	35.19	185	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
37	10LBC12CT007	HP TURB IL TEMP	Cr-Al	270	294.8	Kg/cm2	593	601	Steam	ID 330 x 97	42.65	335	0-700	Yes	PE-DG-426-145-H01	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
38	10LBF11CT011	HPBP-1 D/S TEMP	Cr-Al	35.31	73.1	Kg/cm2	360	375	Steam	508 x 20	97.36	150	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
39	10LBF11CT012	HPBP-1 D/S TEMP	Cr-Al	35.31	73.1	Kg/cm2	360	375	Steam	508 x 20	97.36	150	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
40	10LBF11CT013	HPBP-1 D/S TEMP	Cr-Al	35.31	73.1	Kg/cm2	360	375	Steam	508 x 20	97.36	150	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
41	10LBF21CT011	HPBP-2 D/S TEMP	Cr-Al	35.31	73.1	Kg/cm2	360	375	Steam	508 x 20	97.36	150	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
42	10LBF21CT012	HPBP-2 D/S TEMP	Cr-Al	35.31	73.1	Kg/cm2	360	375	Steam	508 x 20	97.36	150	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
43	10LBF21CT013	HPBP-2 D/S TEMP	Cr-Al	35.31	73.1	Kg/cm2	360	375	Steam	508 x 20	97.36	150	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
44	10LBG10CT011	MAIN STM TEMP TO APRDS	Cr-Al	270	294.8	Kg/cm2	593	601	Steam	215.1 x 45	37.39	265	0-700	Yes	PE-DG-426-145-H01	M3X2	45	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H.	150	1	P	PR0190000333
45	10LBG02CT011	CRH STM TEMP TO APRDS	Cr-Al	64.84	73.1	Kg/cm2	365.7	375	Steam	114.3 x 6.02	23.10	110	0-600	Yes	PE-DG-426-145-H01	M3X2	64		150	1	P	PR0190000333
46	10LBG30CT011	AUX STM HDR TEMP	Cr-Al	16	20	Kg/cm2	290	350	Steam	457 X 9.53	45.64	115	0 - 400	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
47	10LBG30CT012	AUX STM HDR TEMP	Cr-Al	16	20	Kg/cm2	290	350	Steam	457 X 9.53	45.64	115	0 - 400	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
48	10LBG30CT013	AUX STM HDR TEMP	Cr-Al	16	20	Kg/cm2	290	350	Steam	457 X 9.53	45.64	115	0 - 400	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
49	10LBQ62CT011	EXT STM TEMP TO HPH-7 DESH	Cr-Al	27.41	32	Kg/cm2	473.4	475	Steam	355.6 x 9.53	35.96	225	0 - 600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
50	10LBQ64CT011	EXT STM TEMP AT HPH-7 IL	Cr-Al	26.94	32	Kg/cm2	314.9	320	Steam	355.6 x 9.53	27.6	120	0 - 400	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
51	10LBQ72CT001	EXT STM TEMP AT HPH-8 IL	Cr-Al	62.13	73.1	Kg/cm2	359	375	Steam	355.6 x 15.09	32.66	155	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
52	10LBQ82CT011	EXT STM TEMP AT HPH-9 IL	Cr-Al	92.34	100	Kg/cm2	417.9	425	Steam	273 x 15.09	21.28	180	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
53	10LBS21CT011	EXT STM TEMP AT LPH-3 IL	PRT-100	1.4	3.5	Kg/cm2	126	130	Steam	813 x 10	54.4	40	0 - 150	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000365
54	10LBS31CT011	EXT STM TEMP AT LPH-4 IL	PRT-100	3.18	3.5	Kg/cm2	201.4	205	Steam	660 x 10	38.5	75	0-200	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000365
55	10LBS41CT011	EXT STM TEMP AT LPH-5 IL	Cr-Al	5.82	7	Kg/cm2	264	270	Steam	559 x 10	30.09	110	0-350	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
56	10LBS51CT001	EXT STM TEMP TO DEA	Cr-Al	12.89	15	Kg/cm2	367.1	375	Steam	406.4 x 9.53	47.03	155	0-600	Yes	PE-DG-426-145-H01	M3X2	45		150	1	P	PR0190000333
57	10LCAB0CT012	COND. SUCTION HEADER TEMP	PRT-100	0.1042	1.1	Kg/cm2	44.2	60	COND	508 x 9.53	0.96	-	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330

PROJECT: PANKI 1080 MW  
CUSTOMER: M/s UPRVUNL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PSH

SL NO	KKS_TAG	DESCRIPTION	SENSR_L TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP TEMP (Deg.C)	DGN. TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x Tth) (mm.)	VELOCITY (Meter/Sec)	INSUL. THICK (mm.)	RANGE ( Deg.C )	IR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
58	16LCA01CT011	CEP-A SUC TEMP	PRT-100	0.1042	1.1	Kg/cm2	44.2	60	COND	508 x 9.53	0.96	-	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
59	16LCA02CT011	CEP-B SUC TEMP	PRT-100	0.1042	1.1	Kg/cm2	44.2	60	COND	508 x 9.53	0.96	-	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
60	16LCA03CT011	CEP-C SUC TEMP	PRT-100	0.1042	1.1	Kg/cm2	44.2	60	COND	508 x 9.53	0.96	-	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
61	16LCA20CT011	TEMP AT GLAND STM COND IL	PRT-100	33.5	50	Kg/cm2	44.5	60	COND	457 x 12.7	2.46	-	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
62	16LCA20CT013	TEMP AT GLAND STM COND OIL	PRT-100	33.5	50	Kg/cm2	44.5	60	COND	457 x 12.7	2.46	-	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
63	16LCA61CT011	TEMP AT LPH-1 OIL	PRT-100	33.5	50	Kg/cm2	57.2	90	COND	457 x 12.7	2.46	25	0 - 100		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
64	16LCA62CT015	TEMP AT DRAIN COOLER OIL	PRT-100	33.5	50	Kg/cm2	44.5	60	COND	457 x 12.7	2.46	-	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
65	16LCA64CT011	TEMP AT LPH-2 IL	PRT-100	33.5	50	Kg/cm2	57.2	90	COND	457 x 12.7	2.46	25	0 - 100		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
66	16LCA64CT012	TEMP AT LPH-2 OIL	PRT-100	33.5	50	Kg/cm2	74.5	90	COND	457 x 12.7	2.49	25	0 - 100		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
67	16LCA72CT011	TEMP AT LPH-3 IL	PRT-100	33.5	50	Kg/cm2	106	130	COND	457 x 12.7	2.49	25	0 - 150		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
68	16LCA72CT012	TEMP AT LPH-3 OIL	PRT-100	33.5	50	Kg/cm2	106	130	COND	457 x 12.7	2.95	25	0 - 150		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
69	16LCA82CT011	TEMP AT LPH-4 IL	PRT-100	33.5	50	Kg/cm2	131.7	160	COND	457 x 12.7	3.91	40	0 - 200		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
70	16LCA82CT012	TEMP AT LPH-4 OIL	PRT-100	33.5	50	Kg/cm2	106	130	COND	457 x 12.7	2.95	25	0 - 150		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
71	16LCA90CT011	COND TEMP TO LPH-6	PRT-100	33.5	50	Kg/cm2	153.7	160	COND	457 x 12.7	3.06	40	0 - 200		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
72	16LCA90CT012	TEMP AT LPH-6 OIL	PRT-100	33.5	50	Kg/cm2	153.7	160	COND	457 x 12.7	3.06	40	0 - 200		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
73	16LCA90CT013	COND TEMP TO DEA IL	PRT-100	33.5	50	Kg/cm2	153.7	160	COND	457 x 12.7	3.06	40	0 - 200		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
74	16LCA90CT014	COND TEMP TO DEA IL	PRT-100	33.5	50	Kg/cm2	153.7	160	COND	457 x 12.7	3.06	40	0 - 200		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
75	16LCH20CT011	HPH 7 NORMAL DRN TEMP TO DEA	PRT-100	26.5	32	Kg/cm2	200	200	COND	355.6 x 9.53	1.65	60	0-250	Yes	PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000365
76	16LCH40CT011	HPH 8 NORMAL DRN TEMP TO HPH 7	PRT-100	60.76	73.1	Kg/cm2	231.6	235	COND	273 x 12.7	1.47	75	0-300	Yes	PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000365
77	16LCH60CT011	HPH 9 NORMAL DRN TEMP TO HPH 8	Cr-Al	90.57	110	Kg/cm2	282.4	290	COND	219.1 x 12.7	1.79	90	0-350	Yes	PE-DG-426-146-H01	M3X2	45		150	1	P	PR0190000333
78	16LCJ10CT011	LPH-3 DRN TO DRP PUMP'S TEMP	PRT-100	1.53	3.5	Kg/cm2	111.3	115	COND	273 x 6.35	1.09	25	0 - 150		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
79	16LCJ11CT011	DRN CLR OIL TEMP TO FIT-A	PRT-100	0.1934	3.5	Kg/cm2	48.7	50	COND	219.1 x 6.35	0.57		0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
80	16LCJ20CT011	LPH 2 DRN TEMP TO LPH 1 (U/S OF CV)	PRT-100	0.4109	3.5	Kg/cm2	76.06	80	COND	219.1 x 6.35	0.35	25	0 - 100		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
81	16LCJ30CT011	LPH 4 DRN TEMP TO LPH-3 (U/S OF CV)	PRT-100	3.12	3.5	Kg/cm2	110.1	110	COND	219.1 x 6.35	1.08	25	0 - 150		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
82	16LCJ40CT011	LPH 5 DRN TEMP TO LPH 4 (U/S OF CV)	PRT-100	5.71	7	Kg/cm2	136.2	140	COND	168.3 x 7.11	0.94	25	0 - 150		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
83	10PAB20CT011	CONDENSER-1 IL TEMP-R	PRT-100	2.45	6	Kg/cm2	33	60	WATER	2600 NB	2.2	--	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
84	10PAB20CT012	CONDENSER-1 OIL TEMP-R	PRT-100	2.21	6	Kg/cm2	36.68	60	WATER	2600 NB	2.2	--	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
85	10PAB20CT013	CONDENSER-2 OIL TEMP-R	PRT-100	1.99	6	Kg/cm2	49.44	60	WATER	2600 NB	2.2	--	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330
86	10PAB25CT011	CONDENSER-1 IL TEMP-L	PRT-100	2.45	6	Kg/cm2	33	60	WATER	2600 NB	2.2	--	0 - 60		PE-DG-426-146-H01	M3X2	45		150	1	P	PR0200000330

PROJECT: PANKI 1080 MW  
CUSTOMER: M/s UPPIVIL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PS

SL NO	KKS_TAG	DESCRIPTION	SENSR_TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP. TEMP (Deg.C)	DGN. TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x Tn) (mm.)	VELOCITY (Meter/Sec)	INSUL. THICK (mm.)	RANGE ( Deg.C )	IR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
87	10PAB25CT012	CONDENSER-1 OIL TEMP-L	PRT-100	2.21	6	Kg/cm2	36.68	60	WATER	2600 NB	2.2	--	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330
88	10PAB25CT013	CONDENSER-2 OIL TEMP-L	PRT-100	1.99	6	Kg/cm2	40.44	60	WATER	2600 NB	2.2	--	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330
89	10PCB0CT011	SELF CLEANING STAINERS DISCH TEMP	PRT-100	3.2	7.5	Kg/cm2	36	60	ACW	1100 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
90	10PCB61CT011	ACW TEMP AFT PHE-A FOR SG AUX	PRT-100	2.15	7.5	Kg/cm2	41.5	60	ACW	400 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
91	10PCB2CT011	ACW TEMP AFT PHE-B FOR SG AUX	PRT-100	2.15	7.5	Kg/cm2	41.5	60	ACW	400 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
92	10PCB3CT011	ACW TEMP AFT PHE-A FOR TG AUX	PRT-100	2.2	7.5	Kg/cm2	41.5	60	ACW	700 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
93	10PCB4CT011	ACW TEMP AFT PHE-B FOR TG AUX	PRT-100	2.2	7.5	Kg/cm2	41.5	60	ACW	700 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
94	10PCB5CT011	ACW TEMP AFT PHE-C FOR TG AUX	PRT-100	2.2	7.5	Kg/cm2	41.5	60	ACW	700 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
95	10PCB71CT011	ACW TEMP AFT VAC PUMP-1 HE	PRT-100	2.65	7.5	Kg/cm2	38	60	ACW	150 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
96	10PCB72CT011	ACW TEMP AFT VAC PUMP-2 HE	PRT-100	2.65	7.5	Kg/cm2	38	60	ACW	150 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
97	10PCB73CT011	ACW TEMP AFT VAC PUMP-3 HE	PRT-100	2.65	7.5	Kg/cm2	38	60	ACW	150 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
98	10PCB74CT011	ACW TEMP AFT VAC PUMP-4 HE	PRT-100	2.65	7.5	Kg/cm2	38	60	ACW	150 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	185	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316L	150	1	P	PR0200000330
99	10PGC10CT011	TG DMCW PUMP DISCH HDR TEMP	PRT-100	6.3	10	kg/cm2	44.4	60	DMCW	900 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330
100	10PGC11CT011	TG PHE-A DMCW OUTLET TEMP	PRT-100	6.3	10	kg/cm2	39	60	DMCW	700 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330
101	10PGC12CT011	TG PHE-B DMCW OUTLET TEMP	PRT-100	6.3	10	kg/cm2	39	60	DMCW	700 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330
102	10PGC13CT011	TG PHE-C DMCW OUTLET TEMP	PRT-100	6.3	10	kg/cm2	39	60	DMCW	700 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330
103	10PGC40CT011	SG DMCW PUMP DISCH HDR TEMP	PRT-100	8.5	12	kg/cm2	44.5	60	DMCW	350 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330
104	10PGC41CT011	DMCW TEMP AT PHE-A SG OIL	PRT-100	7.5	12	kg/cm2	39	60	DMCW	350 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330
105	10PGC42CT011	DMCW TEMP AT PHE-B SG OIL	PRT-100	7.5	12	kg/cm2	39	60	DMCW	350 NB	2.0	--	0 - 60		PE-DG-426-145-H01	M3X2	45		150	1	P	PR0200000330
106	10HA019CT004	WATER STORAGE DOWNCOMER TEMP	Cr-Al	307.3	330.5	kg/cm2	345	374	WATER	457x65	5	130	0-500	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
107	10HA019CT005	BWCP SUCTION LINE TEMP	Cr-Al	329.3	350.1	kg/cm2	307	348	WATER	457x65	5	110	0-500	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
108	10HA019CT002	LNK TO FLASH TANK SYSTEM TEMP	Cr-Al	319.2	344.5	kg/cm2	345	374	WATER	457x65	5	130	0-500	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
109	10HA019CT003	LNK TO FLASH TANK SYSTEM TEMP	Cr-Al	319.2	344.5	kg/cm2	345	374	WATER	457x65	5	130	0-500	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
110	10LAB19CT001	FEED WATER LINE DRAIN TEMPERATURE	Cr-Al	-	344.2	kg/cm2	-	348	METAL	33.4x6.35	-	-	0-450		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376
111	10HA027CT001	BWCP COOLING WATER SUPPLY TEMP	PRT-100	7	28.2	kg/cm2	38	60	WATER	88.3x5.49	5	120	0-80		4-97-288-94275	M3X2	130		150	1	T	PR0200000330
112	10HA027CT002	BWCP COOLING WATER RETURN TEMP	PRT-100	3.9	28.2	kg/cm2	44	60	WATER	88.3x5.49	5	120	0-80		4-97-288-94275	M3X2	130		150	1	T	PR0200000330
113	10HAC19CT001	ECON INLET FW TEMP AFTER FLOW ELEMENT	Cr-Al	328	344.2	kg/cm2	307	348	WATER	558.8x80	10	110	0-450	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
114	10HAC19CT002	ECON INLET FW TEMP AFTER FLOW ELEMENT	Cr-Al	328	344.2	kg/cm2	307	348	WATER	558.8x80	10	110	0-450	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
115	10HAC19CT003	ECONOMISER INLET LNKK DRAIN TEMPERATURE	Cr-Al	-	344.2	kg/cm2	-	348	METAL	33.4x6.35	-	-	0-450		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376



PROJECT: PANKI 1X880 MW  
CUSTOMER: M/s UPFVNL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PSCH

SL NO	KKS_TAG	DESCRIPTION	SENSR_TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP TEMP (Deg.C)	DGN TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x Tth) (mm.)	VELOCITY (Meter/Sec)	INSULK THICK (mm.)	RANGE ( Deg.C )	IR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Hgght (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
116	19AH23CT081	ECON OUTLET LINK TEMP	Cr-Al	319.2	343.4	kg/cm2	345	385	WATER	457x70	10	130	0-450	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
117	19AH23CT082	ECON OUTLET LINK TEMP	Cr-Al	319.2	343.4	kg/cm2	345	385	WATER	457x70	10	130	0-450	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
118	19AH23CT083	ECON OUTLET TEMP	Cr-Al	321.9	343.4	kg/cm2	345	385	WATER	600x100	10	130	0-450	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
119	19AH23CT084	ECON OUTLET TEMP	Cr-Al	321.9	343.4	kg/cm2	345	385	WATER	600x100	10	130	0-450	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
120	19AH03CT081	FURN LOWER FRONT INLET HEADER DRAIN TEMPERATURE	Cr-Al	-	342.8	kg/cm2	-	385	METAL	114.30x20.0	-	-	0-600		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376
121	19AH19CT037	FURN INTERM LEFT SIDE HEADER DRAIN TEMPERATURE	Cr-Al	-	329.8	kg/cm2	-	458	METAL	73.0x14.02	-	-	0-500		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376
122	19AH23CT037	FURN INTERM FRONT SIDE HEADER DRAIN TEMPERATURE	Cr-Al	-	329.8	kg/cm2	-	458	METAL	73.0x14.02	-	-	0-500		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376
123	19AH23CT037	FURN INTERM REAR SIDE HEADER DRAIN TEMPERATURE	Cr-Al	-	329.8	kg/cm2	-	458	METAL	73.0x14.02	-	-	0-600		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376
124	19AH46CT037	FURN INTERM RIGHT SIDE HEADER DRAIN TEMPERATURE	Cr-Al	-	329.8	kg/cm2	-	458	METAL	73.0x14.02	-	-	0-600		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376
125	19AH01CT081	WATER SEPARATOR "A" OUTLET TEMP	Cr-Al	304.6	324.7	kg/cm2	435	<477	STEAM	273.1x50	25	190	0-600	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
126	19AH01CT082	WATER SEPARATOR "A" OUTLET TEMP	Cr-Al	304.6	324.7	kg/cm2	435	<477	STEAM	273.1x50	25	190	0-600	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
127	19AH02CT081	WATER SEPARATOR "B" OUTLET TEMP	Cr-Al	304.6	324.7	kg/cm2	435	<477	STEAM	273.1x50	25	190	0-600	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
128	19AH02CT082	WATER SEPARATOR "B" OUTLET TEMP	Cr-Al	304.6	324.7	kg/cm2	435	<477	STEAM	273.1x50	25	190	0-600	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
129	19AH03CT081	WATER SEPARATOR "C" OUTLET TEMP	Cr-Al	304.6	324.7	kg/cm2	435	<477	STEAM	273.1x50	25	190	0-600	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
130	19AH03CT082	WATER SEPARATOR "C" OUTLET TEMP	Cr-Al	304.6	324.7	kg/cm2	435	<477	STEAM	273.1x50	25	190	0-600	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
131	19AH04CT081	WATER SEPARATOR "D" OUTLET TEMP	Cr-Al	304.6	324.7	kg/cm2	435	<477	STEAM	273.1x50	25	190	0-600	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
132	19AH04CT082	WATER SEPARATOR "D" OUTLET TEMP	Cr-Al	304.6	324.7	kg/cm2	435	<477	STEAM	273.1x50	25	190	0-600	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
133	19AH015CT081	WTR STORAGE TANK DOWNCOMER TEMP	Cr-Al	305.5	326.9	kg/cm2	435	477	WATER	457x65	5	130	0-600	Yes	4-97-288-94275	M3X2	65		150	1	T	PR0190000333
134	19AH05CT081	SH FURN ROOF INLET HEADER DRAIN TEMPERATURE	Cr-Al	-	319	kg/cm2	-	490	METAL	73.0x14.02	-	-	0-600		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376
135	19AH14CT081	BACKPASS LOWER FRONT HEADER DRAIN TEMPERATURE	Cr-Al	-	319	kg/cm2	-	490	METAL	88.90x20.0	-	-	0-600		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376
136	19AH14CT082	BACKPASS LOWER REAR HEADER DRAIN TEMPERATURE	Cr-Al	-	319	kg/cm2	-	490	METAL	88.90x20.0	-	-	0-600		PANKI-TEMP-METAL-01	As per Drg		Metal Temperature Measurement Thermocouple with 30 mtr M cable	Not Applicable	1	T	PR0190000376
137	19AH28CT081	LNK TO SH FRONT PLATEN INLET HOR-TEMP	Cr-Al	292.9	309.7	kg/cm2	493	471	STEAM	457x80	35	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
138	19AH28CT082	LNK TO SH FRONT PLATEN INLET HOR-TEMP	Cr-Al	292.9	309.7	kg/cm2	493	471	STEAM	457x80	35	100	0-600	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
139	19AH17CT081	LNK TO SH DESH-1A TEMP	Cr-Al	292.9	309.7	kg/cm2	493	534	STEAM	508x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
140	19AH17CT082	LNK TO SH DESH-1A TEMP	Cr-Al	292.9	309.7	kg/cm2	493	534	STEAM	508x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
141	19AH17CT083	LNK TO SH DESH-1A TEMP	Cr-Al	292.9	309.7	kg/cm2	493	534	STEAM	508x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
142	19AH17CT081	LNK TO SH DESH-1B TEMP	Cr-Al	292.9	309.7	kg/cm2	493	534	STEAM	508x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
143	19AH17CT082	LNK TO SH DESH-1B TEMP	Cr-Al	292.9	309.7	kg/cm2	493	534	STEAM	508x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
144	19AH17CT083	LNK TO SH DESH-1B TEMP	Cr-Al	292.9	309.7	kg/cm2	493	534	STEAM	508x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
145	19LAE17CT081	STAGE 1SH /DSH "A" SPRAY WATER TEMP (UPSTREAM OF SPRAY FLOW NOZZLE)	Cr-Al	-	309.7	kg/cm2	-	493	WATER	114.3x17.12	10	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333

PROJECT: PANKI Y880 MW  
 CUSTOMER: M/s UPVVL  
 CONTRACTOR: M/s BHEL  
 Ref: CE/416/PANKI/TE/PSH

	KVS_TAG	DESCRIPTION	SENSR_TYPE	OP_PRESS	DGN_PRESS	Unit of Pressure	OP_TEMP (Deg.C)	DGN_TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x Tth) (mm.)	VELOCITY (Meter/Sec)	INSULK THICK (mm.)	RANGE ( Deg.C )	IR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE	
146	18LAE7ZCT001	STAGE 1SH /DSH "B" SPRAY WATER TEMP (UPSTREAM OF SPRAY FLOW NOZZLE)	Cr-Al	-	309.7	kg/cm2	-	493	WATER	114.3x17.12	10	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333	
147	18AH471CT004	LINK FROM SH DESH-1A TEMP	Cr-Al		291.9	309.7	kg/cm2	485	508	STEAM	508x80	35	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
148	18AH471CT005	LINK FROM SH DESH-1A TEMP	Cr-Al		291.9	309.7	kg/cm2	485	508	STEAM	508x80	35	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
149	18AH471CT006	LINK FROM SH DESH-1A TEMP	Cr-Al		291.9	309.7	kg/cm2	485	508	STEAM	508x80	35	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
150	18AH472CT004	LINK FROM SH DESH-1B TEMP	Cr-Al		291.9	309.7	kg/cm2	485	508	STEAM	508x80	35	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
151	18AH472CT005	LINK FROM SH DESH-1B TEMP	Cr-Al		291.9	309.7	kg/cm2	485	508	STEAM	508x80	35	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
152	18AH472CT006	LINK FROM SH DESH-1B TEMP	Cr-Al		291.9	309.7	kg/cm2	485	508	STEAM	508x80	35	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
153	18AH491CT001	LINK TO SH DESH-2A TEMP	Cr-Al		285.2	302	kg/cm2	536	554	STEAM	558.8x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
154	18AH491CT002	LINK TO SH DESH-2A TEMP	Cr-Al		285.2	302	kg/cm2	536	554	STEAM	558.8x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
155	18AH491CT003	LINK TO SH DESH-2A TEMP	Cr-Al		285.2	302	kg/cm2	536	554	STEAM	558.8x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
156	18AH492CT001	LINK TO SH DESH-2B TEMP	Cr-Al		285.2	302	kg/cm2	536	554	STEAM	558.8x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
157	18AH492CT002	LINK TO SH DESH-2B TEMP	Cr-Al		285.2	302	kg/cm2	536	554	STEAM	558.8x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
158	18AH492CT003	LINK TO SH DESH-2B TEMP	Cr-Al		285.2	302	kg/cm2	536	554	STEAM	558.8x80	30	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
159	18LAE91CT001	STAGE 1SH /DSH "A" SPRAY WATER TEMP (UPSTREAM OF SPRAY FLOW NOZZLE)	Cr-Al	-	302	kg/cm2	-	536	WATER	88.9x15.24	10	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333	
160	18LAE92CT001	STAGE 1SH /DSH "B" SPRAY WATER TEMP (UPSTREAM OF SPRAY FLOW NOZZLE)	Cr-Al	-	302	kg/cm2	-	536	WATER	88.9x15.24	10	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333	
161	18AH491CT004	LINK FROM SH DESH-2A TEMP	Cr-Al		284.2	302	kg/cm2	528	538	STEAM	558.8x80	25	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
162	18AH491CT005	LINK FROM SH DESH-2A TEMP	Cr-Al		284.2	302	kg/cm2	528	538	STEAM	558.8x80	25	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
163	18AH491CT006	LINK FROM SH DESH-2A TEMP	Cr-Al		284.2	302	kg/cm2	528	538	STEAM	558.8x80	25	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
164	18AH492CT004	LINK FROM SH DESH-2B TEMP	Cr-Al		284.2	302	kg/cm2	528	538	STEAM	558.8x80	25	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
165	18AH492CT005	LINK FROM SH DESH-2B TEMP	Cr-Al		284.2	302	kg/cm2	528	538	STEAM	558.8x80	25	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
166	18AH492CT006	LINK FROM SH DESH-2B TEMP	Cr-Al		284.2	302	kg/cm2	528	538	STEAM	558.8x80	25	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
167	18HAJ21CT001	LINK TO RH DESH-4 TEMP	Cr-Al		59.1	71	kg/cm2	565	576	STEAM	660.4x35	50	100	0-750	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
168	18HAJ21CT002	LINK TO RH DESH-4 TEMP	Cr-Al		59.1	71	kg/cm2	565	576	STEAM	660.4x35	50	100	0-750	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
169	18HAJ21CT003	LINK TO RH DESH-4 TEMP	Cr-Al		59.1	71	kg/cm2	565	576	STEAM	660.4x35	50	100	0-750	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
170	18HAJ22CT001	LINK TO RH DESH-8 TEMP	Cr-Al		59.1	71	kg/cm2	565	576	STEAM	660.4x35	50	100	0-750	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368
171	18HAJ22CT002	LINK TO RH DESH-8 TEMP	Cr-Al		59.1	71	kg/cm2	565	576	STEAM	660.4x35	50	100	0-750	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr lngth With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000368

PROJECT: PANKI 1080 MW  
CUSTOMER: Ms UPVIVIL  
CONTRACTOR: Ms BHEL  
Ref: CE/416/PANKI/TE/PSH

SL NO	KVS_TAG	DESCRIPTION	SENSR_ TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP TEMP (Deg.C)	DGN. TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x Tth) (mm.)	VELOCITY (Meter/Sec)	INSUL. THICK (mm.)	RANGE ( Deg.C )	IRI Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
172	10HAZ2CT003	LNK TO RH DESH-B TEMP	Cr-Al	59.1	71	kg/cm2	565	576	STEAM	660.4x35	50	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316H. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000338
173	10LAE21CT001	RH / DSH "A" SPRAY WATER TEMP (UPSTREAM OF SPRAY FLOW NOZZLE)	Cr-Al	-	210	kg/cm2	-	545	WATER	88.9x15.24	10	50	0-300	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
174	10LAE22CT001	RH / DSH "B" SPRAY WATER TEMP (UPSTREAM OF SPRAY FLOW NOZZLE)	Cr-Al	-	210	kg/cm2	-	545	WATER	88.9x15.24	10	50	0-300	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
175	10HAJ21CT004	LNK FROM RH DESH-A TEMP	Cr-Al	58.8	71	kg/cm2	544	555	STEAM	660.4x35	50	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000336
176	10HAJ21CT005	LNK FROM RH DESH-A TEMP	Cr-Al	58.8	71	kg/cm2	544	555	STEAM	660.4x35	50	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000336
177	10HAJ21CT006	LNK FROM RH DESH-A TEMP	Cr-Al	58.8	71	kg/cm2	544	555	STEAM	660.4x35	50	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000338
178	10HAJ22CT004	LNK FROM RH DESH-B TEMP	Cr-Al	58.8	71	kg/cm2	544	555	STEAM	660.4x35	50	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000338
179	10HAJ22CT005	LNK FROM RH DESH-B TEMP	Cr-Al	58.8	71	kg/cm2	544	555	STEAM	660.4x35	50	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000336
180	10HAJ22CT006	LNK FROM RH DESH-B TEMP	Cr-Al	58.8	71	kg/cm2	544	555	STEAM	660.4x35	50	100	0-700	Yes	4-97-288-94275	M3X2	65	BARSTOCK THERMOWELL MATERIAL SHALL BE SS316. Thermocouple with Flexible Mineral Insulated extension Cable 25 mtr length With Head and Thermowell shall be Provided	Not Applicable	1	T	PR0190000338
181	10HCB1CT001	SB STEAM SUPPLY TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	127x12.5	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
182	10HCB3CT001	RIGHT SIDE LR BLOWERS DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	60.3x5.54	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
183	10HCB3CT002	RIGHT SIDE LR BLOWERS DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	60.3x5.54	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
184	10HCB4CT001	WALL BLOWERS-RIGHT & REAR DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	60.3x5.54	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
185	10HCB4CT002	WALL BLOWERS-RIGHT & REAR DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	60.3x5.54	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
186	10HCB3CT001	RAPH "A" SB DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	60.3x5.54	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
187	10HCB3CT002	RAPH "A" SB DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	60.3x5.54	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
188	10HCB3CT003	RAPH "B" SB DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	60.3x5.54	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
189	10HCB3CT004	RAPH "B" SB DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	60.3x5.54	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
190	10HCB1CT001	LEFT SIDE LR BLOWERS DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	73x5.16	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
191	10HCB1CT002	LEFT SIDE LR BLOWERS DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	73x5.16	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
192	10HCB2CT001	WALL BLOWERS-LEFT & FRONT DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	73x5.16	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
193	10HCB2CT002	WALL BLOWERS-LEFT & FRONT DRAIN TEMP	Cr-Al	40	50	kg/cm2	435	500	STEAM	73x5.16	120	50	0-600	Yes	4-97-288-94275	M3X2	130		150	1	T	PR0190000333
194	10HPE71CT001	PULV "A" PRIMARY AIR INLET TEMP	Cr-Al	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341

PROJECT: PANKI 1080 MW  
CUSTOMER: M/s UPVVL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PSCH

SL NO	KKS_TAG	DESCRIPTION	SENSR_L TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP. TEMP (Deg.C)	DGN. TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x TIN) (mm.)	VELOCITY (Meter/Sec)	INSUL. THICK (mm.)	RANGE (Deg.C)	IR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
195	10HFE71CT002	PULV "A" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
196	10HFE71CT003	PULV "A" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
197	10HFE72CT001	PULV "B" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
198	10HFE72CT002	PULV "B" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
199	10HFE72CT003	PULV "B" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
200	10HFE73CT001	PULV "C" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
201	10HFE73CT002	PULV "C" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
202	10HFE73CT003	PULV "C" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
203	10HFE74CT001	PULV "D" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
204	10HFE74CT002	PULV "D" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
205	10HFE74CT003	PULV "D" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
206	10HFE75CT001	PULV "E" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
207	10HFE75CT002	PULV "E" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
208	10HFE75CT003	PULV "E" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
209	10HFE76CT001	PULV "F" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
210	10HFE76CT002	PULV "F" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
211	10HFE76CT003	PULV "F" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
212	10HFE77CT001	PULV "G" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
213	10HFE77CT002	PULV "G" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
214	10HFE77CT003	PULV "G" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
215	10HFE78CT001	PULV "H" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
216	10HFE78CT002	PULV "H" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
217	10HFE78CT003	PULV "H" PRIMARY AIR INLET TEMP	Cr-AI	676	1045	mmWC	231	300	HOT PA	2250x1450	16	140	0-350		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
218	10HFC10CT001	PULV "A" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AIR+COAL	-	-	-	0-350		4-97-288-94282	RC1.5"		Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Stinted Tungsten Carbide Thermowell size: 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000384
219	10HFC10CT002	PULV "A" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AIR+COAL	-	-	-	0-350		4-97-288-94282	RC1.5"		Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Stinted Tungsten Carbide Thermowell size: 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000384
220	10HFC10CT019	PULV "A" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AIR+COAL	-	-	-	0-350		4-97-288-94282	RC1.5"		Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Stinted Tungsten Carbide Thermowell size: 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000384
221	10HFC10CT020	PULV "A" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AIR+COAL	-	-	-	0-350		4-97-288-94282	RC1.5"		Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Stinted Tungsten Carbide Thermowell size: 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000384
222	10HFC20CT017	PULV "B" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AIR+COAL	-	-	-	0-350		4-97-288-94282	RC1.5"		Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Stinted Tungsten Carbide Thermowell size: 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000384

NO	KKS_TAG	DESCRIPTION	SENDER TYPE	OP PRES	CON PRES	Unit of Pressure	OP TEMP (Deg.C)	CON TEMP (Deg.C)	MEDIUM	PIPE SIZE (Dia x Tsk) (mm.)	VELOCITY (Mtr/Sec)	INSULK THICK (mm.)	RANGE (Deg.C)	IRS Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
223	10HFC20CT018	PULV "B" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
224	10HFC20CT019	PULV "B" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
225	10HFC20CT020	PULV "B" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
226	10HFC30CT017	PULV "C" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
227	10HFC30CT018	PULV "C" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
228	10HFC30CT019	PULV "C" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
229	10HFC30CT020	PULV "C" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
230	10HFC40CT017	PULV "D" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
231	10HFC40CT018	PULV "D" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
232	10HFC40CT019	PULV "D" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
233	10HFC40CT020	PULV "D" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
234	10HFC50CT017	PULV "E" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
235	10HFC50CT018	PULV "E" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
236	10HFC50CT019	PULV "E" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
237	10HFC50CT020	PULV "E" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
238	10HFC60CT017	PULV "F" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
239	10HFC60CT018	PULV "F" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
240	10HFC60CT019	PULV "F" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
241	10HFC60CT020	PULV "F" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
242	10HFC70CT017	PULV "G" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
243	10HFC70CT018	PULV "G" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
244	10HFC70CT019	PULV "G" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394
245	10HFC70CT020	PULV "G" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AR+COAL	-	-	-	0-350		4-97-289-94292	RC1.5"	150	Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size 24mm OD x 8 mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000394

PROJECT: PANKI 1080 MW  
CUSTOMER: M/s UPVVL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PSCH

SL NO	KKS_TAG	DESCRIPTION	SENSR_TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP. TEMP (Deg.C)	DGN. TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x Tth) (mm.)	VELOCITY (Meter/Sec)	INSULK THICK (mm.)	RANGE (Deg.C)	IR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DNO REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
246	10HFC8CT017	PULV "H" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AIR+COAL	-	-	-	0-350		4-97-288-94282	RC1.5"		Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size> 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000384
247	10HFC8CT018	PULV "H" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AIR+COAL	-	-	-	0-350		4-97-288-94282	RC1.5"		Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size> 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000384
248	10HFC8CT019	PULV "H" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AIR+COAL	-	-	-	0-350		4-97-288-94282	RC1.5"		Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size> 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000384
249	10HFC8CT020	PULV "H" OUTLET TEMP	Cr-AI	274	650	mmWC	88	100	AIR+COAL	-	-	-	0-350		4-97-288-94282	RC1.5"		Thermocouple with Flexible Mineral Insulated extension Cable 15 mtr length With Head and Thermowell shall be Provided. Sintered Tungsten Carbide Thermowell size> 24mm OD x 9mm ID. Insertion length 160 mm, Extension Length 160mm.	150	1	T	PR0190000384
250	10HFE15CT001	PA FAN-A INLET TEMPERATURE AT SUCTION CHAMBER	PRT-100	-16	-25	mmWC	27	50	COLD PA	-	16	200	0 to 80		3-55-335-02063			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
251	10HFE15CT001	PA FAN-B INLET TEMPERATURE AT SUCTION CHAMBER	PRT-100	-16	-25	mmWC	27	50	COLD PA	-	16	200	0 to 80		3-55-335-02063			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
252	10HFE20CT001	PA FAN-A OUTLET TEMPERATURE	PRT-100	929	1295	mmWC	35	58	COLD PA	3000 x 3600	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
253	10HFE25CT001	PA FAN-A OUTLET TEMPERATURE	PRT-100	929	1295	mmWC	35	58	COLD PA	3000 x 3600	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
254	10HFE30CT001	AH-A PA INLET TEMPERATURE	PRT-100	917	1285	mmWC	35	58	COLD PA	3000 x 3000	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
255	10HFE30CT002	AH-A PA INLET TEMPERATURE	PRT-100	917	1285	mmWC	35	58	COLD PA	3000 x 3000	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
256	10HFE35CT001	AH-B PA INLET TEMPERATURE	PRT-100	917	1285	mmWC	35	58	COLD PA	3000 x 3000	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
257	10HFE35CT002	AH-B PA INLET TEMPERATURE	PRT-100	917	1285	mmWC	35	58	COLD PA	3000 x 3000	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
258	10HFE40CT001	AH-A PA OUTLET TEMPERATURE	Cr-AI	880	1245	mmWC	318	400	HOT PA	3500 x 3100	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
259	10HFE40CT002	AH-A PA OUTLET TEMPERATURE	Cr-AI	880	1245	mmWC	318	400	HOT PA	3500 x 3100	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
260	10HFE40CT003	AH-A PA OUTLET TEMPERATURE	Cr-AI	880	1245	mmWC	318	400	HOT PA	3500 x 3100	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
261	10HFE40CT004	AH-A PA OUTLET TEMPERATURE	Cr-AI	880	1245	mmWC	318	400	HOT PA	3500 x 3100	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
262	10HFE45CT001	AH-B PA OUTLET TEMPERATURE	Cr-AI	880	1245	mmWC	318	400	HOT PA	3500 x 3100	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
263	10HFE45CT002	AH-B PA OUTLET TEMPERATURE	Cr-AI	880	1245	mmWC	318	400	HOT PA	3500 x 3100	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
264	10HFE45CT003	AH-B PA OUTLET TEMPERATURE	Cr-AI	880	1245	mmWC	318	400	HOT PA	3500 x 3100	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
265	10HFE45CT004	AH-B PA OUTLET TEMPERATURE	Cr-AI	880	1245	mmWC	318	400	HOT PA	3500 x 3100	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
266	10HLB19CT001	FD FAN-A INLET TEMPERATURE AT SUCTION CHAMBER	PRT-100	-13	-30	mmWC	27	50	COLD SA	-	16	200	0 to 80		3-55-335-02063			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
267	10HLB15CT001	FD FAN-B INLET TEMPERATURE AT SUCTION CHAMBER	PRT-100	-13	-30	mmWC	27	50	COLD SA	-	16	200	0 to 80		3-55-335-02063			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
268	10HLA19CT001	FD FAN-A OUTLET TEMPERATURE	PRT-100	252	400	mmWC	30	53	COLD SA	4400 x 4200	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
269	10HLA15CT001	FD FAN-B OUTLET TEMPERATURE	PRT-100	252	400	mmWC	30	53	COLD SA	4400 x 4200	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
270	10HLA20CT001	AH-A SA INLET TEMPERATURE	PRT-100	232	380	mmWC	30	53	COLD SA	4400 x 4250	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
271	10HLA20CT002	AH-A SA INLET TEMPERATURE	PRT-100	232	380	mmWC	30	53	COLD SA	4400 x 4250	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
272	10HLA20CT003	AH-A SA INLET TEMPERATURE	PRT-100	232	380	mmWC	30	53	COLD SA	4400 x 4250	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
273	10HLA20CT004	AH-A SA INLET TEMPERATURE	PRT-100	232	380	mmWC	30	53	COLD SA	4400 x 4250	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
274	10HLA25CT001	AH-B SA INLET TEMPERATURE	PRT-100	232	380	mmWC	30	53	COLD SA	4400 x 4250	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
275	10HLA25CT002	AH-B SA INLET TEMPERATURE	PRT-100	232	380	mmWC	30	53	COLD SA	4400 x 4250	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
276	10HLA25CT003	AH-B SA INLET TEMPERATURE	PRT-100	232	380	mmWC	30	53	COLD SA	4400 x 4250	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
277	10HLA25CT004	AH-B SA INLET TEMPERATURE	PRT-100	232	380	mmWC	30	53	COLD SA	4400 x 4250	16	200	0 to 80		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
278	10HLA30CT001	AH-A SA OUTLET TEMPERATURE	Cr-AI	160	310	mmWC	316	400	HOT SA	5300 x 5300	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
279	10HLA30CT002	AH-A SA OUTLET TEMPERATURE	Cr-AI	160	310	mmWC	316	400	HOT SA	5300 x 5300	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
280	10HLA30CT003	AH-A SA OUTLET TEMPERATURE	Cr-AI	160	310	mmWC	316	400	HOT SA	5300 x 5300	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
281	10HLA30CT004	AH-A SA OUTLET TEMPERATURE	Cr-AI	160	310	mmWC	316	400	HOT SA	5300 x 5300	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
282	10HLA35CT001	AH-B SA OUTLET TEMPERATURE	Cr-AI	160	310	mmWC	316	400	HOT SA	5300 x 5300	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
283	10HLA35CT002	AH-B SA OUTLET TEMPERATURE	Cr-AI	160	310	mmWC	316	400	HOT SA	5300 x 5300	16	140	0 to 500		4-97-288-94279	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392



PROJECT: PANKI 1080 MW  
CUSTOMER: M/s UPVIVNL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PSCH

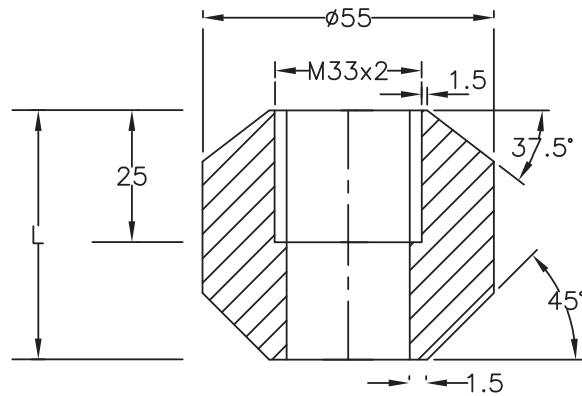
SL NO	KVS_TAG	DESCRIPTION	SENSR_TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP TEMP (Deg.C)	DGN. TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia. T/N) (mm.)	VELOCITY (Meter/Sec)	INSUL. THICK (mm.)	RANGE (Deg.C)	IR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
284	19HLA3CT063	AH-B SA OUTLET TEMPERATURE	Cr-AI	160	310	mmWC	316	400	HOT SA	5300 x 5300	16	140	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
285	19HLA3CT064	AH-B SA OUTLET TEMPERATURE	Cr-AI	160	310	mmWC	316	400	HOT SA	5300 x 5300	16	140	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
286	19HHL19CT061	SA TO WINDBOX TEMPERATURE-LEFT	Cr-AI	112	260	mmWC	316	400	HOT SA	6200 x 2500	16	140	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
287	19HHL19CT062	SA TO WINDBOX TEMPERATURE-LEFT	Cr-AI	112	260	mmWC	316	400	HOT SA	6200 x 2500	16	140	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
288	19HHL19CT063	SA TO WINDBOX TEMPERATURE-LEFT	Cr-AI	112	260	mmWC	316	400	HOT SA	6200 x 2500	16	140	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
289	19HHL19CT061	SA TO WINDBOX TEMPERATURE-RIGHT	Cr-AI	112	260	mmWC	316	400	HOT SA	6200 x 2500	16	140	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
290	19HHL19CT062	SA TO WINDBOX TEMPERATURE-RIGHT	Cr-AI	112	260	mmWC	316	400	HOT SA	6200 x 2500	16	140	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
291	19HHL19CT063	SA TO WINDBOX TEMPERATURE-RIGHT	Cr-AI	112	260	mmWC	316	400	HOT SA	6200 x 2500	16	140	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
292	19HBK29CT061	FRONT PLATEN SH OUTLET TEMPERATURE-LEFT	PL-Rh-PL	-6	-15	mmWC	1097	1200	FLUE GAS	19507 x 18898	12	240	0 to 1300	4-97-288-94273	As per Drg			Total Thermowell Length below Head 1500mm, Thermowell Material Inconel 600 with Tungsten Carbide Coating on Thermowell	Not Applicable	1	T	PR0190000350
293	19HBK29CT061	FRONT PLATEN SH OUTLET TEMPERATURE-RIGHT	PL-Rh-PL	-6	-15	mmWC	1097	1200	FLUE GAS	19507 x 18898	12	240	0 to 1300	4-97-288-94273	As per Drg			Total Thermowell Length below Head 1500mm, Thermowell Material Inconel 600 with Tungsten Carbide Coating on Thermowell	Not Applicable	1	T	PR0190000350
294	19HBK30CT061	REAR PLATEN SH OUTLET TEMPERATURE-LEFT	PL-Rh-PL	-7	-15	mmWC	997	1200	FLUE GAS	19507 x 18898	12	240	0 to 1300	4-97-288-94273	As per Drg			Total Thermowell Length below Head 1500mm, Thermowell Material Inconel 600 with Tungsten Carbide Coating on Thermowell	Not Applicable	1	T	PR0190000350
295	19HBK30CT061	REAR PLATEN SH OUTLET TEMPERATURE-RIGHT	PL-Rh-PL	-7	-15	mmWC	997	1200	FLUE GAS	19507 x 18898	12	240	0 to 1300	4-97-288-94273	As per Drg			Total Thermowell Length below Head 1500mm, Thermowell Material Inconel 600 with Tungsten Carbide Coating on Thermowell	Not Applicable	1	T	PR0190000350
296	19HBK40CT061	FINISH RH OUTLET TEMPERATURE-LEFT	PL-Rh-PL	-8	-16	mmWC	908	1100	FLUE GAS	19507 x 18898	12	240	0 to 1300	4-97-288-94273	As per Drg			Total Thermowell Length below Head 1500mm, Thermowell Material Inconel 600 with Tungsten Carbide Coating on Thermowell	Not Applicable	1	T	PR0190000350
297	19HBK45CT061	FINISH RH OUTLET TEMPERATURE-RIGHT	PL-Rh-PL	-8	-16	mmWC	908	1100	FLUE GAS	19507 x 18898	12	240	0 to 1300	4-97-288-94273	As per Drg			Total Thermowell Length below Head 1500mm, Thermowell Material Inconel 600 with Tungsten Carbide Coating on Thermowell	Not Applicable	1	T	PR0190000350
298	19HBK50CT061	FINISH SH OUTLET TEMPERATURE-LEFT	PL-Rh-PL	-13	-30	mmWC	673	900	FLUE GAS	19507 x 18898	12	240	0 to 1000	4-97-288-94273	As per Drg			Total Thermowell Length below Head 1500mm, Thermowell Material Inconel 600 with Tungsten Carbide Coating on Thermowell	Not Applicable	1	T	PR0190000350
299	19HBK55CT061	FINISH SH OUTLET TEMPERATURE-RIGHT	PL-Rh-PL	-13	-30	mmWC	673	900	FLUE GAS	19507 x 18898	12	240	0 to 1000	4-97-288-94273	As per Drg			Total Thermowell Length below Head 1500mm, Thermowell Material Inconel 600 with Tungsten Carbide Coating on Thermowell	Not Applicable	1	T	PR0190000350
300	19HBK60CT061	LYRN OUTLET TEMPERATURE-LEFT	Cr-AI	-65	-70	mmWC	462	700	FLUE GAS	19507 x 18898	12	240	0 to 900	4-97-288-94273	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
301	19HBK65CT061	LYRN OUTLET TEMPERATURE-RIGHT	Cr-AI	-65	-70	mmWC	462	700	FLUE GAS	19507 x 18898	12	240	0 to 900	4-97-288-94273	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
302	19HNA21CT061	ECONOMISER OUTLET TEMPERATURE-LEFT	Cr-AI	-87	-140	mmWC	346	400	FLUE GAS	10000 x 6500	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
303	19HNA22CT061	ECONOMISER OUTLET TEMPERATURE-RIGHT	Cr-AI	-87	-140	mmWC	346	400	FLUE GAS	10000 x 6500	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
304	19HNA27CT061	AH-A FLUE GAS INLET TEMPERATURE	Cr-AI	-300	-477	mmWC	346	400	FLUE GAS	12800 x 5100	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
305	19HNA27CT062	AH-A FLUE GAS INLET TEMPERATURE	Cr-AI	-300	-477	mmWC	346	400	FLUE GAS	12800 x 5100	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
306	19HNA27CT063	AH-A FLUE GAS INLET TEMPERATURE	Cr-AI	-300	-477	mmWC	346	400	FLUE GAS	12800 x 5100	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
307	19HNA27CT064	AH-A FLUE GAS INLET TEMPERATURE	Cr-AI	-300	-477	mmWC	346	400	FLUE GAS	12800 x 5100	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
308	19HNA28CT061	AH-B FLUE GAS INLET TEMPERATURE	Cr-AI	-300	-477	mmWC	346	400	FLUE GAS	12800 x 5100	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
309	19HNA30CT062	AH-B FLUE GAS INLET TEMPERATURE	Cr-AI	-300	-477	mmWC	346	400	FLUE GAS	12800 x 5100	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
310	19HNA30CT063	AH-B FLUE GAS INLET TEMPERATURE	Cr-AI	-300	-477	mmWC	346	400	FLUE GAS	12800 x 5100	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
311	19HNA30CT064	AH-B FLUE GAS INLET TEMPERATURE	Cr-AI	-300	-477	mmWC	346	400	FLUE GAS	12800 x 5100	13	170	0 to 500	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
312	19HNA30CT061	AH-A FLUE GAS OUTLET TEMPERATURE	Cr-AI	-403	-738	mmWC	129	150	FLUE GAS	8600 x 5500	13	40	0 to 300	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
313	19HNA30CT062	AH-A FLUE GAS OUTLET TEMPERATURE	Cr-AI	-403	-738	mmWC	129	150	FLUE GAS	8600 x 5500	13	40	0 to 300	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
314	19HNA30CT063	AH-A FLUE GAS OUTLET TEMPERATURE	Cr-AI	-403	-738	mmWC	129	150	FLUE GAS	8600 x 5500	13	40	0 to 300	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
315	19HNA30CT064	AH-A FLUE GAS OUTLET TEMPERATURE	Cr-AI	-403	-738	mmWC	129	150	FLUE GAS	8600 x 5500	13	40	0 to 300	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
316	19HNA35CT061	AH-B FLUE GAS OUTLET TEMPERATURE	Cr-AI	-403	-738	mmWC	129	150	FLUE GAS	8600 x 5500	13	40	0 to 300	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
317	19HNA35CT062	AH-B FLUE GAS OUTLET TEMPERATURE	Cr-AI	-403	-738	mmWC	129	150	FLUE GAS	8600 x 5500	13	40	0 to 300	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
318	19HNA35CT063	AH-B FLUE GAS OUTLET TEMPERATURE	Cr-AI	-403	-738	mmWC	129	150	FLUE GAS	8600 x 5500	13	40	0 to 300	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
319	19HNA35CT064	AH-B FLUE GAS OUTLET TEMPERATURE	Cr-AI	-403	-738	mmWC	129	150	FLUE GAS	8600 x 5500	13	40	0 to 300	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0190000341
320	19HNA61CT061	ESP-A OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
321	19HNA61CT062	ESP-A OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
322	19HNA62CT061	ESP-B OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
323	19HNA62CT062	ESP-B OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200	4-97-288-94279	As per Drg			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349

PROJECT: PANKI 1080 MW  
CUSTOMER: M/s UPVIVIL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PSCH

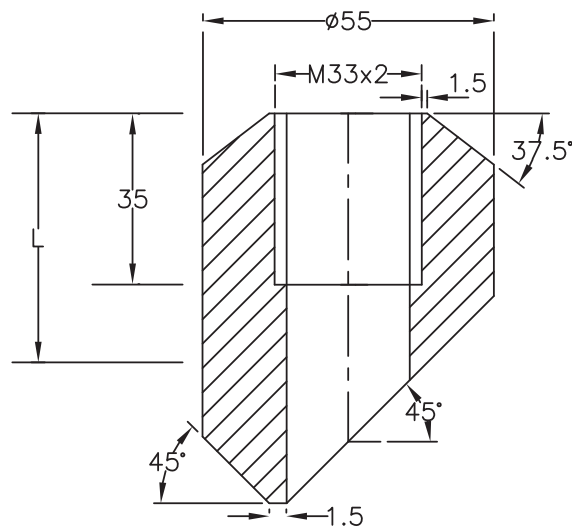
SL NO	KKS_TAG	DESCRIPTION	SENSR_TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP. TEMP (Deg.C)	DGN. TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x Thick) (mm.)	VELOCITY (Meter/Sec)	INSUL. THICK (mm.)	RANGE (Deg.C)	IR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRG REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE
324	19HNA5CT001	ESP-C OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
325	19HNA5CT002	ESP-C OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
326	19HNA5CT001	ESP-D OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
327	19HNA5CT002	ESP-D OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
328	19HNA5CT001	ESP-E OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
329	19HNA5CT002	ESP-E OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
330	19HNA5CT001	ESP-F OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
331	19HNA5CT002	ESP-F OUTLET TEMPERATURE	PRT-100	-443	-745	mmWC	129	150	FLUE GAS	3400 x 2350	13	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
332	19HNC10CT001	ID FAN-A INLET TEMPERATURE AT SUCTION CHAMBER	PRT-100	-469	-745	mmWC	129	150	FLUE GAS	-	13	40	0 to 200		3-55-335-02053			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
333	19HNC10CT001	ID FAN-B INLET TEMPERATURE AT SUCTION CHAMBER	PRT-100	-469	-745	mmWC	129	150	FLUE GAS	-	13	40	0 to 200		3-55-335-02053			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
334	19HNA70CT001	ID FAN-A OUTLET TEMPERATURE	PRT-100	378	620	mmWC	129	150	FLUE GAS	8750 x 6500	15	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
335	19HNA70CT001	ID FAN-A OUTLET TEMPERATURE	PRT-100	378	620	mmWC	129	150	FLUE GAS	8750 x 6500	15	40	0 to 200		4-97-288-94279			Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	T	PR0200000349
336	QHX10 CT001	COOLING WATER SUPPLY HEADER TEMPERATURE	PRT-100	6	12	kg/cm2	38	60	Water	323.8X6.4	2		0-100°C		M33X2		45		150	1	PC	PR0200000030
337	QHX11 CT001	COOLING WATER RETURN HEADER TEMPERATURE	PRT-100	6.5	12	kg/cm2	40	60	Water	323.8X6.4	2		0-100°C		M33X2		45		150	1	PC	PR0200000030
338	QLL20 CT001	FLASH TANK DRAIN TANK TEMPERATURE	PRT-100	1.1	7.03	kg/cm2	110	177	Water	2743X16			0-200°C		M33X2			Insertion Length 200mm and Extension Length 140mm	150	1	PC	PR0200000030
339	HAN11 CT001	FLASH TANK DRAIN TANK TO DRAIN SUMP	PRT-100	6	7.03	kg/cm2	177	177	Water	406.4X9.53			0-200°C		M33X2			Insertion Length 200mm and Extension Length 140mm	150	1	PC	PR0200000030
340	LB070 CT001	TEMPERATURE OF AUX STEAM TO SCAPH	Cr-Al	16	20	kg/cm2	290	350	Steam	219.1X8.18	61.96		0-400°C	Yes		M3X2	45		150	1	PC	PR0190000033
341	LB073 CT001	TEMPERATURE OF SCAPH-A DRAIN TO FLASH TANK	Cr-Al	16	20	kg/cm2	290	350	Steam	88.9X5.49	1.52		0-400°C	Yes		M3X2	64		150	1	PC	PR0190000033
342	LB074 CT001	TEMPERATURE OF SCAPH-B DRAIN TO FLASH TANK	Cr-Al	16	20	kg/cm2	290	350	Steam	88.9X5.49	1.52		0-400°C	Yes		M3X2	64		150	1	PC	PR0190000033
343	LB078 CT001	TEMPERATURE AT SCAPH DRAIN TO FLASH TANK	Cr-Al	16	20	kg/cm2	290	350	Steam	114.3X5.02	1.76		0-400°C	Yes		M3X2	64		150	1	PC	PR0190000033
344	00QHL30CT001	FD FAN OUTLET TEMPERATURE	PRT-100	419	561	mmWCg	30	63	SEC AIR	1000 x 2000	12.7	--	0-70					Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	V	PR0200000349
345	00QHN10CT001	BOILER BANK OIL TEMPERATURE	Cr-Al	65	84	mmWC	360	370	FLUE GAS	1100 X 2700	20	120	0-600		1.6" ANSI B 16.5 150#RF Adjustable Flange OD: 812.7, PCD: 098.4, 4 Holes Ø15.7 TH: 17.5, RF: 73.2, RFT: 1.6mm			Total Thermowell Length below head 600mm, Thermowell material Inconel 600.	Not Applicable	1	T	PR0190000392
346	00QLA10CT001	TEMP. AT DRUM FL	Cr-Al	23.6	26.2	Kg/ cm2	105	227	WATER	76.1 X 4.5	6	80	0-300	Yes		M3X2	64		150	1	V	PR0190000033
347	00QHC10CT001	SB DRAIN TEMP.	Cr-Al	19	25	Kg/cm2g	212	355	STEAM	60.3X3.91	65	50	0-400	Yes		M3X2	64		150	1	V	PR0190000033
348	00QLB30 CT001	MAIN STEAM TEMPERATURE	Cr-Al	19	22	Kg/cm2g	290	310	STEAM	Ø 273x6.35	38		0-400	Yes		M3X2	45		150	1	V	PR0190000033
349	00QLA01 CT001	FEED TANK STORAGE TEMPERATURE	PRT-100	1.23	3	Kg/cm2g	105	135	WATER	Ø 300x10.16	5		0-200		M33x2		45		150	1	V	PR0200000030
350	19HTA01CT001	Unit-1 Absorber Inlet Temperature Element (Before GGH)	PRT-100	3.5	1.5~16.5	Kpa	300	300	Flue Gas	Duct size - 6000 X 6750 mm			0-300 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
351	19HTA01CT002	Unit-1 Absorber Inlet Temperature Element (Before GGH)	PRT-100	3.5	1.5~16.5	Kpa	300	300	Flue Gas	Duct size - 6000 X 6750 mm			0-300 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
352	19HTA01CT003	Unit-1 Absorber Inlet Temperature Element (Before GGH)	PRT-100	3.5	1.5~16.5	Kpa	300	300	Flue Gas	Duct size - 6000 X 6750 mm			0-300 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
353	19HTA01CT004	Unit-1 Absorber Inlet Temperature Element (After GGH)	PRT-100	2.75	1.5~16.5	Kpa	300	300	Flue Gas	Duct size - 4400mm X 7150mm			0-300 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
354	19HTA01CT005	Unit-1 Absorber Inlet Temperature Element (After GGH)	PRT-100	2.75	1.5~16.5	Kpa	300	300	Flue Gas	Duct size - 4400mm X 7150mm			0-300 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
355	19HTA01CT006	Unit-1 Absorber outlet Temperature Element (Before GGH)	PRT-100	2.75	1.5~16.5	Kpa	55	60	Flue Gas	Duct size - 7324mm X 14515 mm			0-200 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
356	19HTA01CT007	Unit-1 Absorber outlet Temperature Element (Before GGH)	PRT-100	2.75	1.5~16.5	Kpa	55	60	Flue Gas	Duct size - 7324mm X 14515 mm			0-200 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
357	19HTA01CT008	Unit-1 Absorber outlet Temperature Element (Before GGH)	PRT-100	2.75	1.5~16.5	Kpa	55	60	Flue Gas	Duct size - 7324mm X 14515 mm			0-200 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
358	19HTA01CT009	Unit-1 Absorber Outlet Temperature Element (After GGH)	PRT-100	0.8 Kpa	1.5~16.5	Kpa	300	300	Flue Gas	Duct Size - 6000 x 13500 mm			0-300 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
359	19HTA01CT010	Unit-1 Absorber Outlet Temperature Element (After GGH)	PRT-100	0.8 Kpa	1.5~16.5	Kpa	300	300	Flue Gas	Duct Size - 6000 x 13500 mm			0-300 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 1000mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
360	19HT002CT001	Unit-1 Oxidation Air Temperature Element	PRT-100	90 Kpa	110 Kpa	Kpa	-	300	Oxidation Air	Pipe size - 350 mm			0-300 Deg C		3-FS-156-00032	As per Drg		Total Thermowell Length below head 400mm, Thermowell material SS316.	Not Applicable	1	BAP	PR0200000349
361	19HTX00CT001	AUXILIARY Steam line for distribution	PRT-100	1300 Kpa	1500 Kpa	Kpa	150		STEAM	Pipe Size = 100 mm			0-200 Deg C	Yes	3-FS-156-00032	As per Drg	300	Insertion Length 350mm and Extension Length 140mm	150	1	BAP	PR0200000036
																			Total Main Qty	361		

PROJECT: PANKI 1080 MW  
CUSTOMER: M/s UPRVNL  
CONTRACTOR: M/s BHEL  
Ref: CE/416/PANKI/TE/PS

SL NO	KKS_TAG	DESCRIPTION	SENSR. TYPE	OP. PRESS	DGN. PRESS	Unit of Pressure	OP. TEMP (Deg.C)	DGN. TEMP (Deg.C)	MEDIUM	PPE SIZE (Dia x Tth) (mm.)	VELOCITY (Meter/Sec)	INSULN. THICK (mm.)	RANGE ( Deg.C )	IBR Required for Thermowell	STUB DETAIL / PROCESS / THERMOWELL DRO REF	PROCESS CONNECTION SIZE	Stub Height (mm)	REMARKS	SS316 Nipple Union Nipple Length (mm)	Qty	Input unit	MATERIAL CODE	
Notes :																				Minimum Spares Qty (Refer Note 2)	70		
1.0	For Barstock Thermowell, Extension Length shall be Minimum 100mm above the Insulation on pipe and Minimum 100 mm when there is no Insulation on pipe. Minimum number spares qty indicated in specification, actual Mandatory spares qty shall be 15% of Total Qty for each type, Each Process Connection Size and Each Thermowell size(IL&EL) OR Minimum one Numbers of each type, Each Process Connection Size and Each Thermowell size(IL&EL) whichever is higher shall be included as mandatory spares.																		Minimum Total Qty	431			
2.0	Note: It is responsibility of bidder to calculate mandatory spares correctly, vendor can chose the length of IL and EL to optimize the mandatory spares qty without affecting the specification requirement. No commercial implication will be allowed for change in mandatory spares quantity due to calculation of WFC. During datasheets submission if BHEL finds that Thermowell length has to be corrected as per ASME PTC 19.3-2010 and if it results in change of qty in mandatory spares then no commercial implication will be allowed. However, if change of IL is due to inputs such as Operating and design parameters furnished by BHEL, then commercial implications due to those changes will be allowed.																						



TEMPERATURE STUB FOR STRAIGHT IMMERSION



TEMPERATURE STUB FOR SLANT IMMERSION

## NOTE :

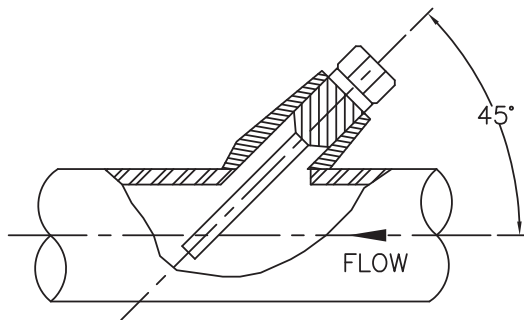
1. MATERIAL OF THE BOSS SHALL BE THE SAME AS THE PIPE INTO WHICH IT IS WELDED.
2. LENGTH OF THE STUB (L) SHALL BE 64/45 mm DEPENDING UPON PIPE SIZE, AS PER CORPORATE STD. AA 7326102.(FOR PIPE OD 88.9 mm TO 159 mm STUB HEIGHT SHALL BE=64mm & FOR PIPE OD  $\geq 219.1$ mm STUB HEIGHT SHALL BE=45mm)
3. STRAIGHT IMMERSION STUBS SHALL BE USED FOR PIPE OD'S 168.3 mm & ABOVE. THE STUB HEIGHT FOR PIPE OD 168.3 mm TO  $< 219.1$  mm SHALL BE 64 mm.
4. SLANT IMMERSION STUBS SHALL BE USED FOR PIPE OD'S 88.9 mm TO 159 mm.
5. FOR MAIN PIPE OD'S 88.9 mm & BELOW SUITABLE EXPANDER SHALL BE USED.
6. PLEASE REFER SHEET-6 FOR THERMOWELL INSTALLATION.
7. FOR PU COATED PIPE REFER SHT NO.8

TITLE :

STD INSTRUMENT STUB  
DETAILS

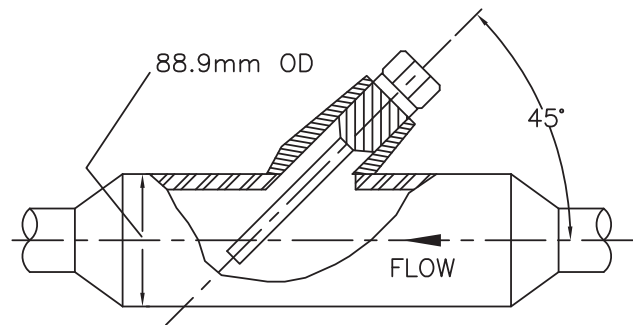
TEMPERATURE STUB

DRG. NO.  
PE-DG-426-145-I101  
REV. 00  
SH. 05 OF 08



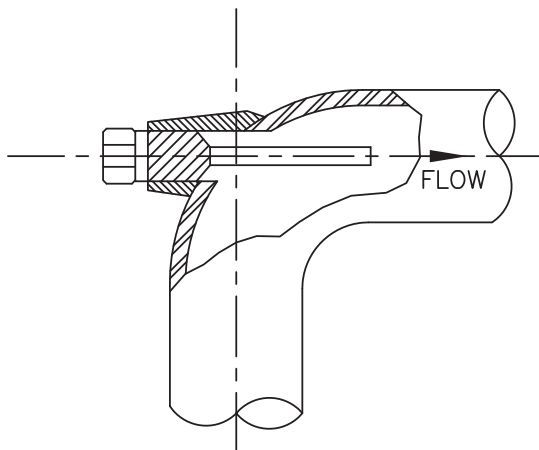
### INSTALLATION TYPE-1

FOR MAIN PIPE OD 88.9mm to 159mm



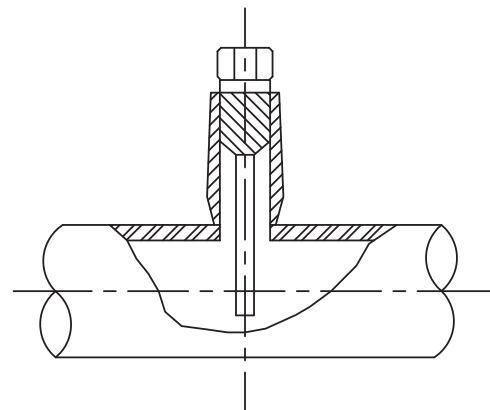
### INSTALLATION TYPE-2

FOR MAIN PIPE OD BELOW 88.9mm



### INSTALLATION TYPE-3

FOR MAIN PIPE OD 88.9mm & BELOW



### INSTALLATION TYPE-4

FOR MAIN PIPE OD 168.3mm & ABOVE

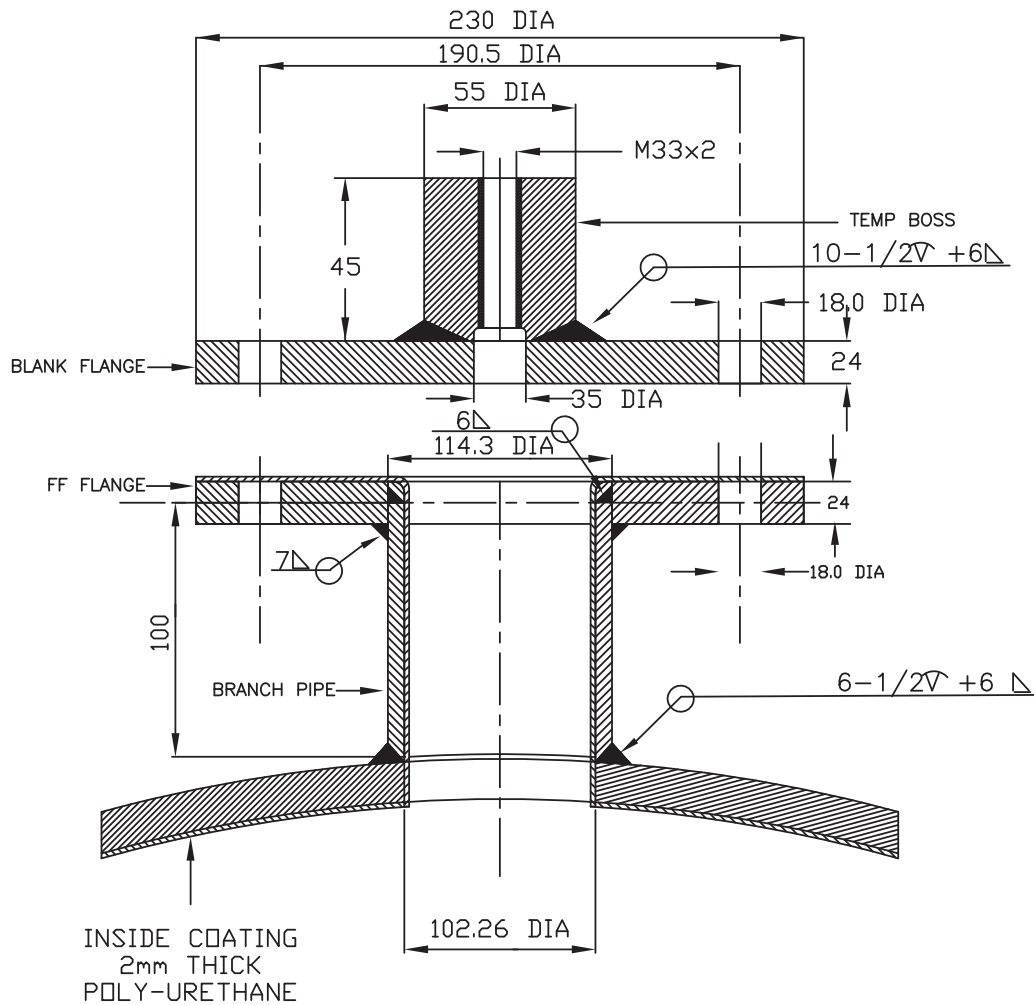
TITLE :



STD INSTRUMENT STUB  
DETAILS

THERMOWELL INSTALLATION

DRG. NO.  
PE-DG-426-145-I101  
REV 00  
SH. 06 OF 08



### NOTES :-

1. THIS TYPE OF TEMPERATURE TAPPING IS APPLICABLE FOR PU COATED PIPING.
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE INDICATED.
3. MATERIAL OF THERMOWELL SHALL BE SS316L.
4. MATERIAL OF BLANK FLANGE, TEMP BOSS SHALL BE OF SS304.
5. BRANCH PIPE MATERIAL SHALL BE SAME AS MAIN PIPE MATERIAL.
6. FF FLANGE SHALL BE NB100, CLASS 150 AND OF THE SAME MATERIAL AS THAT OF MAIN PIPE.

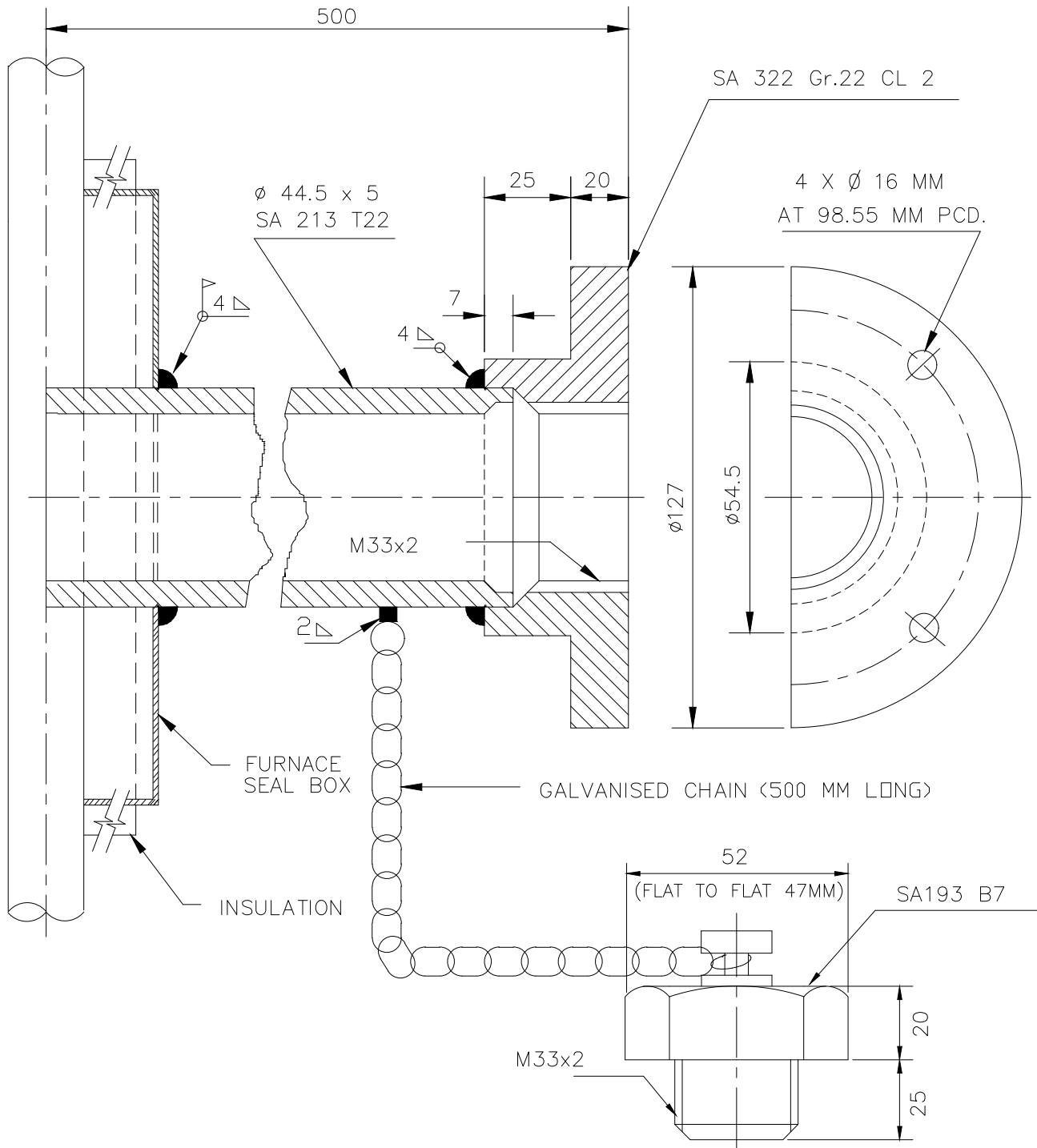


TITLE :  
**INST. STUB DETAILS (TEMP)**  
APPLICABLE FOR PU COATED PIPES  
( CW/ACW SYSTEM)

DRG. NO.  
**PE-DG-426-145-I101**  
REV. 00  
SH. 08 OF 08 SHS.



PROJECT : UPRVUNL, PANKI TPP EXTENSION 1x660MW  
TITLE : TEMPERATURE MEASUREMENT IN FURNACE



NOTES :

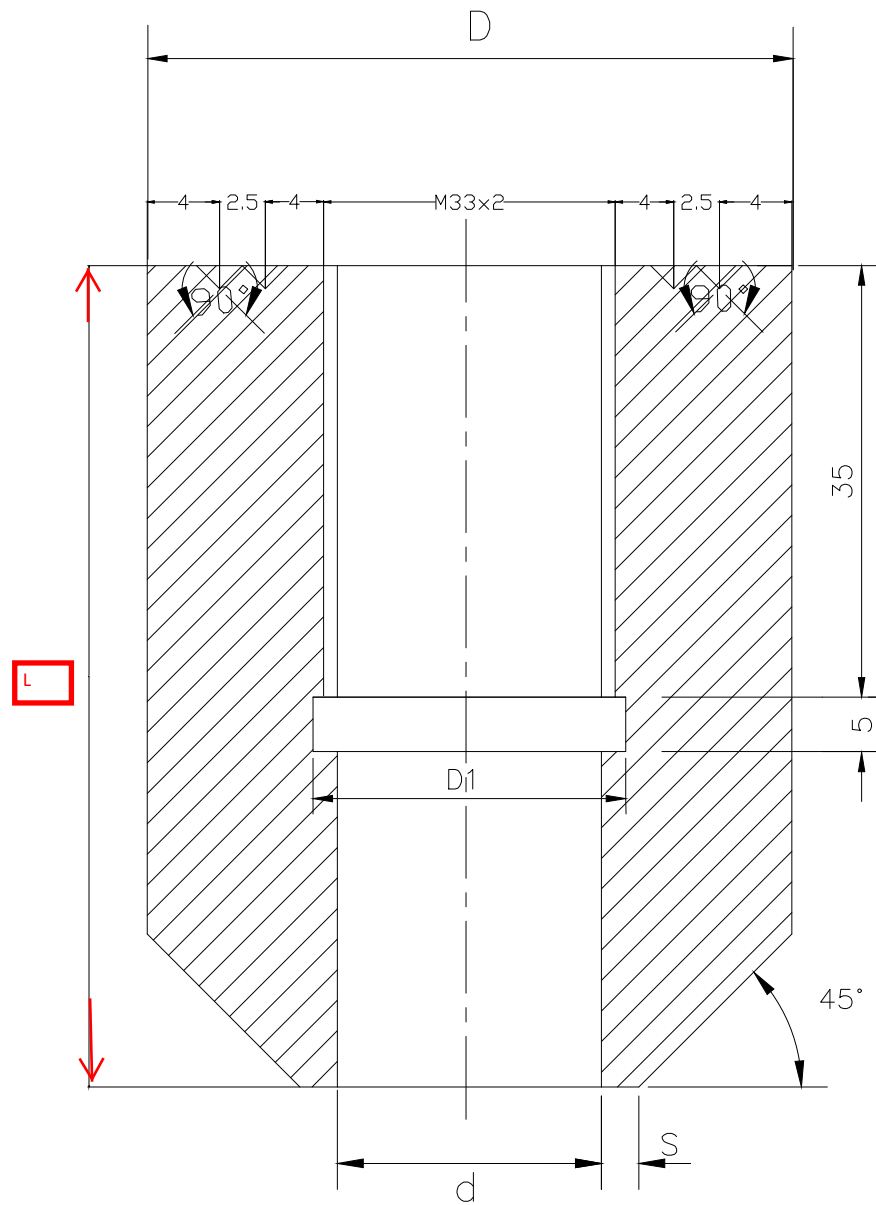
1. FURNACE SEAL BOX DEPTH (~150MM) SHALL BE TAKEN CARE WHILE DECIDING THERMOCOUPLE LENGTH.
2. FLANGE DIMENSIONS EXCEPT BORE ARE AS PER ANSI B16.5 CLASS 150 NPS 1-1/2 INCH.
3. TOLERANCE FOR ALL MEASUREMENT(LINEAR AND ANGULAR): ISO 2768-C.
4. TOLERANCE FOR TUBE THICKNESS AS PER A450 OF ASTM.

ALL DIMENSIONS ARE IN MM

PREPARED	KCN	APPROVED	BMK	DRG. NO.	REV.
CHECKED	APK	DATE	01.09.2018	4-97-288-94273	00



PROJECT : UPRVUNL, PANKI TPP EXTENSION 1x660MW  
TITLE : TEMPERATURE STUB FOR PRESSURE PARTS



BELOW NB 150	29	86	33.5	1.5	130
NB 150 & ABOVE	29	86	33.5	1.5	65
MAIN PIPE SIZES	d	D	D1	S	L

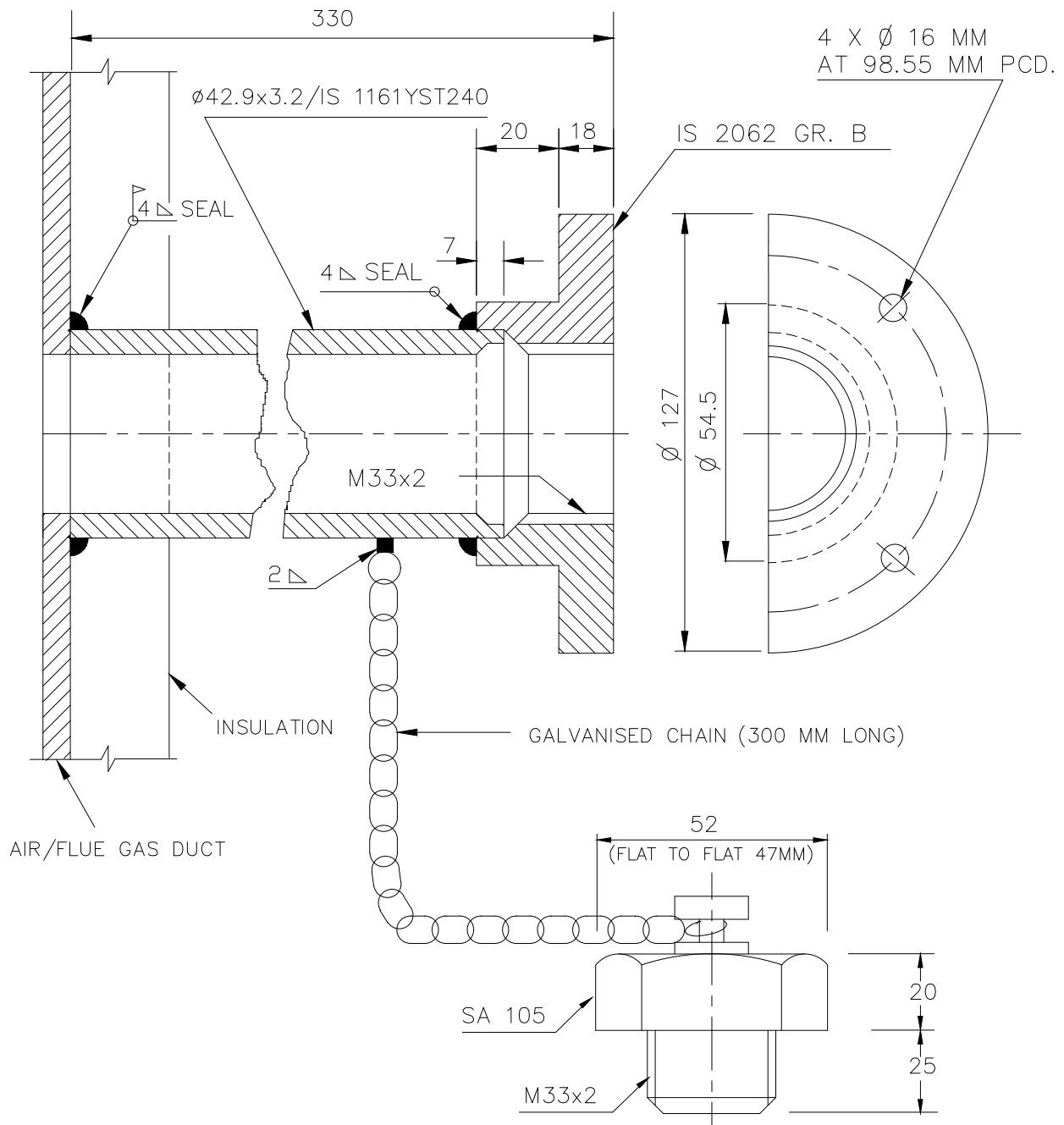
ALL DIMENSIONS ARE IN MM

PREPARED	KCN	APPROVED	BMK	DRG. NO.	REV.
CHECKED	APK	DATE	01.09.2018	4-97-288-94275	00





PROJECT : UPRVUNL, PANKI TPP EXTENSION 1x660MW  
TITLE : TEMP. MEASUREMENT IN AIR & FLUE GAS DUCT



NOTES :

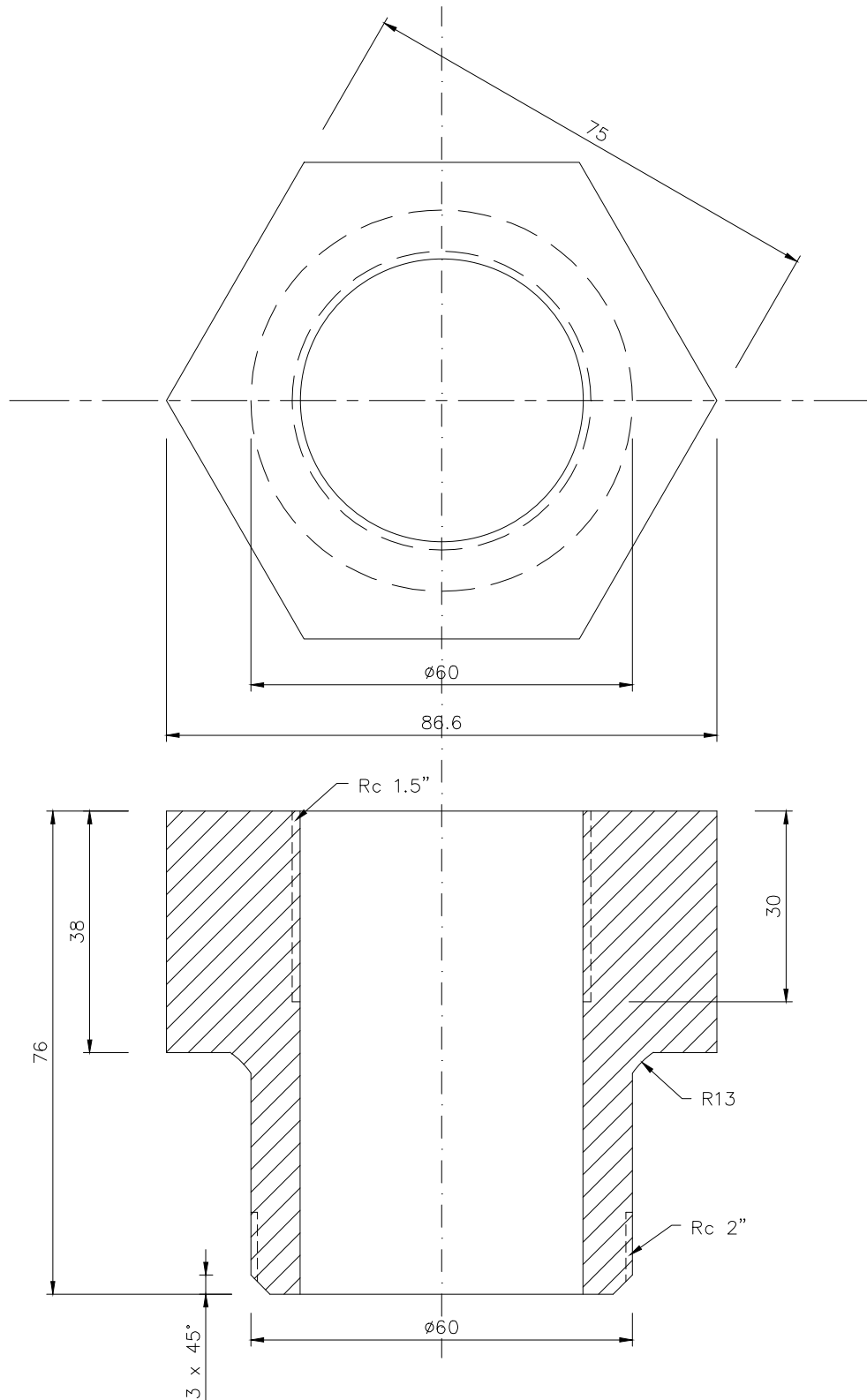
1. FLANGE DIMENSIONS EXCEPT BORE AS PER ANSI B16.5, CLASS 150 NPS 1-1/2 INCH.
2. TOLERANCE FOR ALL MEASUREMENT: COARSE CLASS AS PER IS 2102.
3. TOLERANCE FOR LIGHT PIPE THICKNESS AS PER IS 1161 STEEL TUBES.

ALL DIMENSIONS ARE IN MM

PREPARED	KCN	APPROVED	BMK	DRG. NO.	REV.
CHECKED	APK	DATE	01.09.2018	4-97-288-94279	00



PROJECT : UPRVUNL, PANKI TPP EXTENSION 1x660MW  
TITLE : MILL COAL AIR TEMPERATURE MEASUREMENT STUB

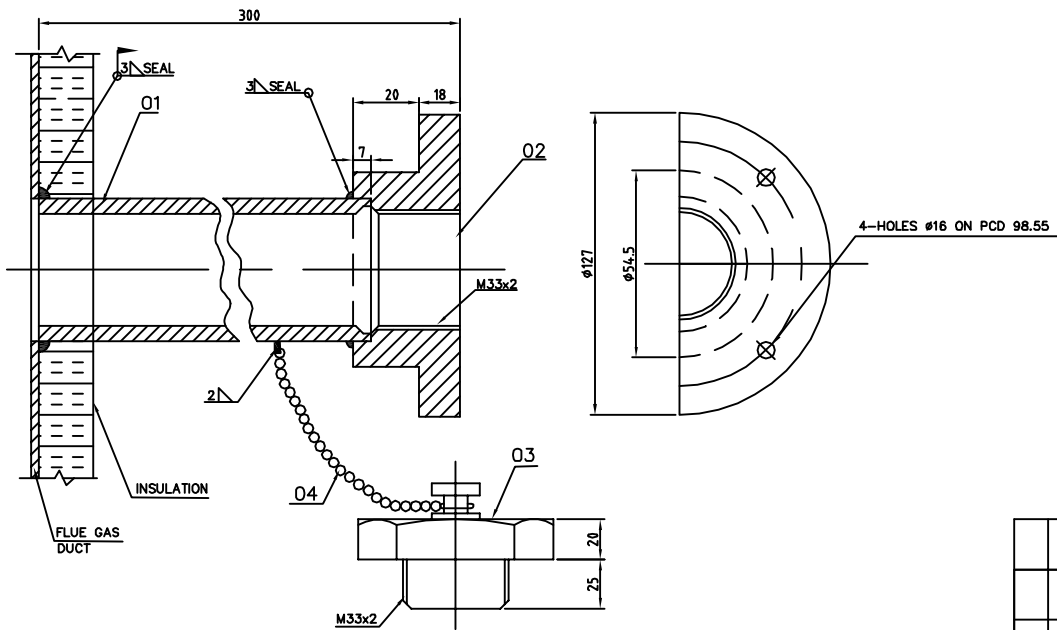


ALL DIMENSIONS ARE IN MM

PREPARED	KCN	APPROVED	BMK	DRG. NO.	REV.
CHECKED	APK	DATE	01.09.2018	4-97-288-94282	00

DRAWING NO. 3-FS-156-00032


ALL DIMENSIONS ARE IN MILLIMETRES



04	G.I CHAIN -300 MM LONG GALVANISED			96150030			0.150		
							1		
03	SEAL PLUG ROUND DIA 63-65			150391430000			0.440		
				ASTMA105			1		
02	END FLANGE ROUND DIA 125-38			150392810000			1.735		
				ASTM A105			1		
01	TUBE DIA 42.9x3.25-269			150380610000			0.855		
				IS 1239			1		
VAR NO.	ITEM NO.	DESCRIPTION	DRAWING NO.	STD	ITEM NO.	MATL CODE	UNIT	UNIT WT.	Q.S. ZONE
					VAR NO.	MATL SPECN	DI	QTY.	

REV	DATE	ALTERED
		CHECKED

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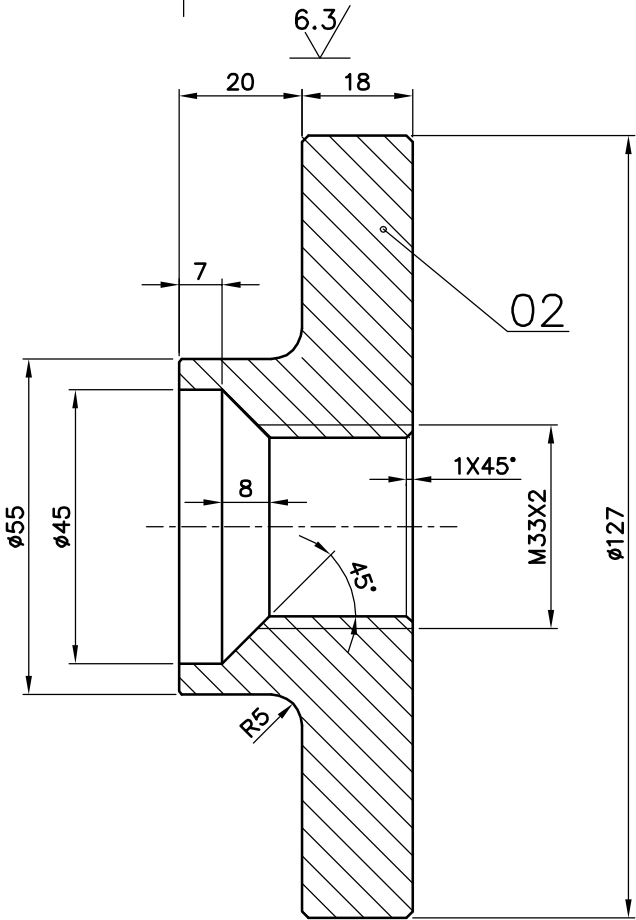
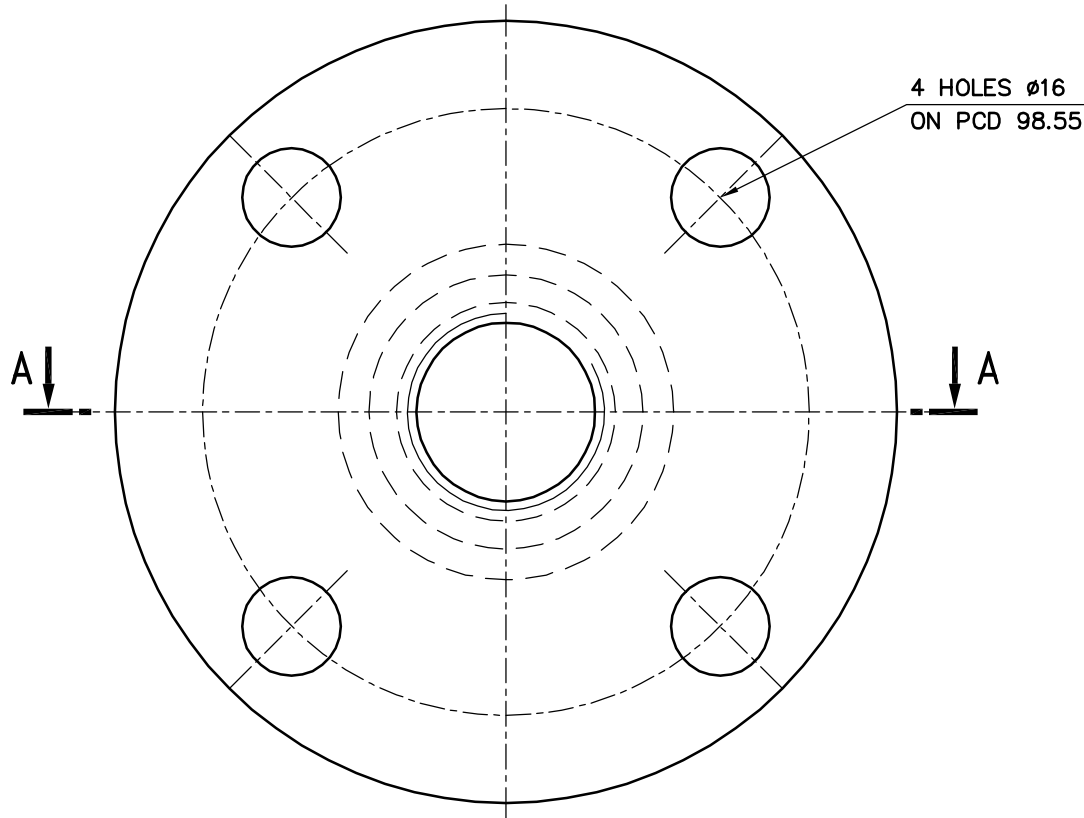
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT									
 <b>BHARAT HEAVY ELECTRICALS LTD.,</b> UNIT: BOILER AUXILIARIES PLANT. RANIPET - 632 406.				DRN	NAME GANGATHAR	SIGN <i>[Signature]</i>	DATE 12.10.2007	NO.OF VAR.	
				CHD	C.GANESH	<i>[Signature]</i>	12.10.2007		
				APPD	C.GANESH	<i>[Signature]</i>	12.10.2007		
DEPT	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	REF. TO ASSY/OLD DRG.				ITEM NO.	NO. OF ITEMS
CODE	PR:QA:500	NTS	3.180	4-97-288-91299					
TITLE TEMPERATURE MEASUREMENT IN FLUE GAS DUCT (DIRECT)				U 01	CARD DRAWING NO. 3-FS-156-00032				REV

3-55-335-02053  
DRAWING NO.

ALL DIMENSIONS ARE IN MILLIMETRES

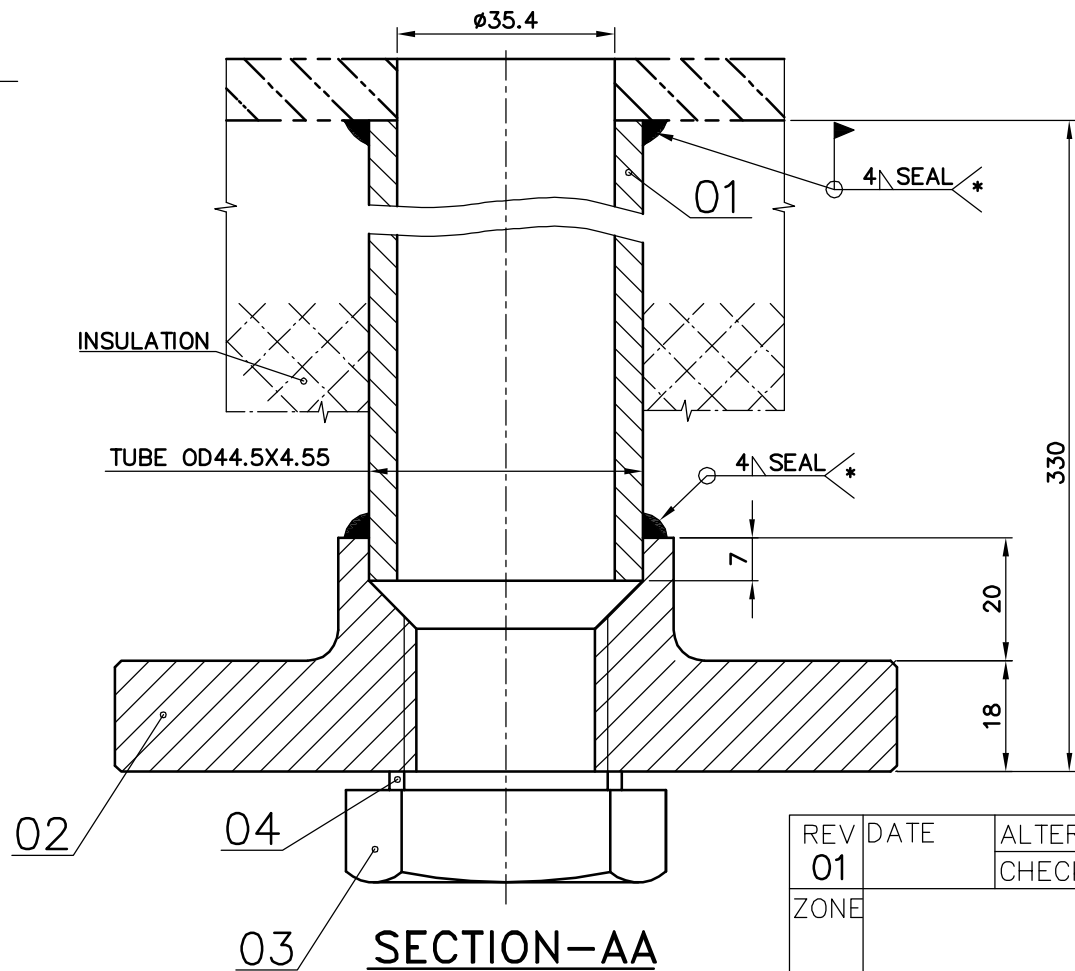
FOR PRODUCTION  
REF. PR:QA:590 FOR PAINTING  
REF. PR:QA:500 FOR UNTOL. DIMNS.  
REF. APPLICABLE GMS FOR MATCODE&SPEC.

6.3/  
~ /




NOTES:

01. \* MARKED WELDS ARE TO BE CHECKED BY LPI OR MPI  
02. SHARP EDGES ARE TO BE CHAMFERED BY 0.5X45°



04	CU FLAT SEALING RING 33X39	S		220208350000			0.006		
03	SCREW PLUG M33X2			971620640000			0.200		
02	PL 45XD135			150111090000			1.900		
01	TUBE D44.5X4.55;L-299			IS 2062GRB			1		
				150860630000			1.340		
				ASTM A210 GRA1			1		
VAR NO	ITEM NO	DESCRIPTION	CAT	DRAWING No.	ITEM NO VAR NO	MATL CODE MATL SPECN	A P C D I	UNIT QTY	GS ZONE


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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT											
				BHARAT HEAVY ELECTRICALS LTD., UNIT: BOILER AUXILIARIES PLANT, RANIPET - 632 406.			DRN	NAME A.M.REDDY	SIGN Sd/-	DATE 28.02.15	NO.OF VAR.
DEPT FANS				GRADE OF UNTOL.DIM PR:QA:500		SCALE N.T.S		WEIGHT (KG). 3.446		REF. TO ASSY/OLD DRG.	
CODE 864								APPD A.V.N		DATE 28.02.15	
TITLE STUDS FOR TEMP. SENSOR						CARD CODE U 01		DRAWING NO. 3-55-335-02053			REV

REV	DATE	ALTERED
01		CHECKED
ZONE		


**ENGINEERING CHECKLIST****PROJECT:Panki 1X660 MW****Temperature Elements****Important Note: Bidders to Mandatorily fill the below checklist (with Company seal and Signature) otherwise offers shall be rejected.**

Sl. No.	DESCRIPTION	CONFIRMED (If applicable Please Tick Mark 'V')	Not CONFIRMED (If applicable Please Tick Mark 'V')
1	"Bidder shall have successfully completed design, engineering, manufacturing, testing and supply of Temperature Elements with Thermowells in Thermal Powerplants of unit size not less than 500 MW before One (1) year as on date 02.11.2015. To qualify to this point, Bidders shall furnish details of supplies made with applications covering the Mediums Steam and Water. Details should include PO copies and Supply documents		
2	All the Elements below shall be provided with CERAMIC Terminal Blocks and Nickel Plated Brass Screw type with Silver coated and spring loaded Connectors. Two Electrical Connections shall be provided, one with Gold plated Plug in socket type external connectors shall be provided (6 pin connectors for thermocouples and 10 pin connectors for RTD) and other Entry shall be with Blind Plug.		
3	Minimum number spares qty indicated in specification, actual Mandatory spares qty shall be 15 % of Total Qty for each type, Each Process Connection Size and Each Thermowell size(IL&EL) OR Minimum One Numbers of each type, Each Process Connection Size and Each Thermowell size(IL&EL) whichever is higher shall be included as mandatory spares.  Note: It is responsibility of bidder to calculate mandatory spares correctly, vendor can chose the length of IL and EL to optimize the mandatory spares qty without affecting the specification requirement. No commercial implication will be allowed for change in mandatory spares quantity due to calculation of WFC. During datasheets submission if BHEL finds that Thermowell length has to be corrected as per ASME PTC 19.3 2010 and if it results in change of qty in mandatory spares then no commercial implication will be allowed. However, if change of IL is due to inputs such as Operating and design parameters furnished by BHEL, then commercial implications due to those changes will be allowed.		
4	Thermocouple and RTD shall be Duplex Type		
5	RTD shall be 4 wired		
6	Element size for RTD shall be 18 AWG		
7	Element size for K Type Thermocouple shall be 16 AWG		
8	Element size for R Type Thermocouple shall be 24 AWG		
9	Response time shall be 6-10 Sec bare & 30 Sec. With protective sheath/thermowell.		
10	For Thermocouple with Barstock Thermowell, Wherever Design Temperature is More that 573 DegC. Barstock Thermowell Material shall be SS316H		
11	150mm SS316 Nipple union Nipple shall be provided with ½" Sch 80 pipe with ½" NPT(M) connection size for all Barstock Threaded and Tunsten carbide Thermowells.		
12	Head of Temperature Elements shall be Die Cat Aluminium or better.		
13	Sheath Material for R Type Thermocouple shall be Inconel 600		
14	K Type Thermocouple, R Type Thermocouple and RTD shall be Mgo Mineral Insulated (Purity 99.4%)		
15	For Steam and Water related mediums Thermowell shall be made from Solid Barstock.		
16	For Coal+Air Mixture Services, Solid Sintered Tungsten Carbide Thermowell shall be Offered.		
17	For Barstock Thermowell, Extension Length shall be Minimum 100mm above the Insulation on pipe and Minimum 160 mm when there is no insulation on pipe.		
18	For Material Code PR0190000368, K Type Thermocouple shall be with 25Mtr Flexible MI Extension cable along with Mounting plate for Head.		
19	For R Type Thermocouple, Inconel 600 Thermowell with additional overprotection by Tungsten carbide. Inconel 600 tube shall be fabricated from 3/4" Sch 80 seamless pipe with welded Barstock cap at the end (of 100 mm min. length from tip). This construction would ensure thermowell should not break due to any shock.		
20	For flanged connections; Studs, nuts and gaskets of suitable material with Cadmium plated shall be provided. Flanges shall be as per ANSI-B 16.5.		
21	Mandatory Spares shall be sent in pre-decided lots in secure boxes distinctly marked in Red colour with boldly written "S" mark on each face of the secure boxes.		
22	Pl. confirm that There is no deviation w.r.t Purchase Specifications.		
23	At later stage if it is found that vendor offer is not in line with tender specification then vendor to supply material in line with tender specification without any price impact to BHEL.		
24	Sub-Supplier Questionnaire format to be filled and submitted. This will be submitted to NTPC for vendor approval in this project. Please note that BHEL will wait 21 days for vendor approval from the date of submission, if the same is not received from customer within this period your offer will not be acceptable.		
25	Mandatory spares list to be submitted as per specification.		


(Company seal and Signature)

	<b>CORPORATE QUALITY ASSURANCE/ कॉर्पोरेट गुणवत्ता आश्वासन</b> <b>SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली</b>
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<b>i.</b>	<b>Item/Scope of Sub-contracting</b> उप-संविदा(अनुबंध) का मद/ दायरा	
<b>ii.</b>	<b>Address of the registered office</b> पंजीकृत कार्यालय का पता  	<b>Details of Contact Person</b> संपर्क व्यक्ति का विवरण  (Name, Designation, Mobile, Email) (नाम, पदनाम, मोबाइल, ईमेल)
<b>iii.</b>	<b>Name and Address of the proposed Sub-vendor's works where item is being manufactured</b> प्रस्तावित उप-विक्रेता के कार्यों का नाम और पता, जहां मद का निर्माण किया जा रहा है  	<b>Details of Contact Person:</b> संपर्क व्यक्ति का विवरण  (Name, Designation, Mobile, Email) (नाम, पदनाम, मोबाइल, ईमेल)
<b>iv.</b>	<b>Annual Production Capacity for proposed item/scope of sub-contracting</b> उप-संविदा(अनुबंध) के प्रस्तावित मद / दायरे के लिए वार्षिक उत्पादन क्षमता	
<b>v.</b>	<b>Annual production for last 3 years for proposed item/scope of sub-contracting</b> उप-संविदा(अनुबंध) के प्रस्तावित मद / दायरे के लिए पिछले 3 वर्षों का वार्षिक उत्पादन	
<b>vi.</b>	<b>Details of proposed works</b> प्रस्तावित कार्यों का विवरण	
<b>1.</b>	<b>Year of establishment of present works</b> वर्तमान फैक्टरी की स्थापना का वर्ष	
<b>2.</b>	<b>Year of commencement of manufacturing at above works</b> उपरोक्त फैक्टरी में निर्माण कार्य शुरू होने का वर्ष	
<b>3.</b>	<b>Details of change in Works address in past (if any)</b> पूर्व में फैक्टरी स्थल में परिवर्तन का विवरण (यदि कोई हो)	
<b>4.</b>	<b>Total Area</b> कुल क्षेत्र	
<b>4.</b>	<b>Covered Area</b> शामिल क्षेत्र	
<b>5.</b>	<b>Factory Registration Certificate</b> फैक्टरी पंजीकरण प्रमाण पत्र	<b>Details attached at Annexure – F2.1</b> विवरण अनुलग्नक- एफ 2.1 पर संलग्न है
<b>6.</b>	<b>Design/ Research &amp; development set-up</b> डिजाइन / अनुसंधान और विकास सेटअप (No. of manpower, their qualification, machines & tools employed etc.) (श्रमिकों की संख्या, उनकी योग्यता, मशीन और उपलब्ध उपकरण आदि)	<b>Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design)</b> <b>Details attached at Annexure – F2.2</b> (if applicable) लागू / लागू नहीं, अगर विनिर्माण मुख्य संविदाकार / खरीददार के डिजाइन के अनुसार है) विवरण अनुलग्नक –एफ 2.2 पर संलग्न है। (यदि लागू हो)
<b>7.</b>	<b>Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)</b> मैनपावर विवरण के साथ समग्र संगठन का चार्ट( डिजाइन / विनिर्माण / गुणवत्ता आदि )	<b>Details attached at Annexure – F2.3</b> विवरण अनुलग्नक – F2.3 में संलग्न है।
<b>8.</b>	<b>After sales service set up in India, in case of foreign sub-vendor(Location, Contact Person, Contact details etc.)</b> भारत	<b>Applicable / Not applicable</b> लागू / लागू नहीं

	<b>CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन</b> <b>SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली</b>
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	में बिक्री सेवा की स्थापना के बाद, विदेशी उप-विक्रेता के मामले में (स्थल, संपर्क व्यक्ति, संपर्क विवरण आदि)	<i>Details attached at Annexure – F2.4</i> विवरण अनुलग्नक -2.4 पर संलग्न है।
9.	<i>Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any</i> फ्लोचार्ट सहित विनिर्माण प्रक्रिया निष्पादन योजना, जिसमें आउटसोर्स प्रक्रिया, यदि कोई हो, सहित कच्चे माल से तैयार उत्पाद तक विनिर्माण के विभिन्न चरणों को दर्शाया गया हो,	<i>Details attached at Annexure – F2.5</i> विवरण अनुलग्नक - F2.5में संलग्न है।
10.	<i>Sources of Raw Material/Major Bought Out Item</i> कच्चे माल के स्रोत / खरीदे हुए मुख्य मद	<i>Details attached at Annexure – F2.6</i> विवरण अनुलग्नक - F2.6में संलग्न है।
11.	<i>Quality Control exercised during receipt of raw material/BOI, in-process, Final Testing, packing</i> कच्चे माल / खरीदे हुए मद, प्रक्रियाबद्ध, अंतिम परीक्षण, पैकिंग करते समय गुणवत्ता नियंत्रण	<i>Details attached at Annexure – F2.7</i> विवरण अनुलग्नक - F2.7 पर संलग्न है
12.	<i>Manufacturing facilities (List of machines, special process facilities, material handling etc.)</i> विनिर्माण सुविधा (मशीनों की सूची, विशेष प्रक्रिया सुविधाएं, सामग्री रख-रखाव आदि)	<i>Details attached at Annexure – F2.8</i> विवरण अनुलग्नक - F2.8में संलग्न है।
13.	<i>Testing facilities (List of testing equipment)</i> परीक्षण सुविधाएं (परीक्षण उपकरण की सूची)	<i>Details attached at Annexure – F2.9</i> विवरण अनुलग्नक – F2. 9 में संलग्न है।
14.	<i>If manufacturing process involves fabrication then-</i> यदि निर्माण प्रक्रिया में फेब्रिकेशन की गई है तो- <i>List of qualified Welders</i> पात्र वेल्डर की सूची <i>List of qualified NDT personnel with area of specialization</i> विशेषज्ञता के क्षेत्र सहित पात्र एनडीटी कार्मिकों की सूची	<i>Applicable / Not applicable</i> लागू / लागू नहीं <i>Details attached at Annexure – F2.10</i> विवरण अनुलग्नक - F2.10में संलग्न है। <i>(if applicable)</i> लागू / लागू नहीं
15.	<i>List of out-sourced manufacturing processes with Sub-Vendors' names &amp; addresses</i> सब-वेंडर द्वारा बाह्य स्रोतों (उनके नाम और पते सहित) से करवाए गए निर्माण प्रक्रियाओं की सूची	<i>Applicable / Not applicable</i> लागू / लागू नहीं <i>Details attached at Annexure. –F2.11</i> विवरण अनुलग्नक - F2.10में संलग्न है। <i>(if applicable)</i> (यदि लागू हो)
16.	<i>Supply reference list including recent supplies</i> नवीनतम आपूर्ति सहित आपूर्ति संदर्भ सूची	<i>Details attached at Annexure – F2.12</i> विवरण अनुलग्नक - F2.12 में संलग्न है। <i>(as per format given below)</i> ( नीचे दिए गए प्रारूप के अनुसार )
<i>Project/ package</i> परियोजना / पैकेज	<i>Customer Name</i> ग्राहक का नाम	<i>Supplied Item (Type/Rating/Model /Capacity/Size etc)</i> आपूर्ति की गई वस्तु (प्रकार / रेटिंग / मॉडल / क्षमता / आकार आदि)
17.	<i>Product satisfactory performance feedback letter/certificates/End User Feedback</i> उत्पाद के संतोषजनक प्रदर्शन संबंधी फीडबैक पत्र / प्रमाण पत्र / अंतिम उपयोगकर्ता फीडबैक	<i>Attached at annexure - F2.13</i> अनुलग्नक F2. 3पर संलग्न है
18.	<i>Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product</i>	<i>Applicable / Not applicable</i> लागू / लागू नहीं

	<b>CORPORATE QUALITY ASSURANCE/ कॉर्पोरेट गुणवत्ता आश्वासन</b> <b>SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली</b>
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	<i>(similar or higher rating)</i> प्रस्तावित उत्पाद (एक समान या उच्च रेटिंग वाले) के लिए टाइप टेस्ट रिपोर्ट (टाइप टेस्ट विवरण, रिपोर्ट संख्या, एजेंसी, जांच की तारीख) का सारांश नोट: - रिपोर्ट प्रस्तुत करने की आवश्यकता नहीं है <i>Note:- Reports need not to be submitted</i>	<i>Details attached at Annexure – F2.14</i> विवरण अनुलग्नक - F2.1 4 में संलग्न है <i>(if applicable)</i> (यदि लागू हो)
19.	<b>Statutory / mandatory certification for the proposed product</b> प्रस्तावित उत्पाद के लिए वैधानिक / अनिवार्य प्रमाणीकरण	<i>Applicable / Not applicable</i> लागू / लागू नहीं  <i>Details attached at Annexure – F2.15</i> <i>(if applicable)</i> (यदि लागू हो)
20.	<b>Copy of ISO 9001 certificate</b> आईएसओ 9001 प्रमाण पत्र की प्रति <i>(if available)</i> (यदि उपलब्ध हो)	<i>Attached at Annexure – F2.16</i> अनुलग्नक में संलग्न - F2.1 6 है
21.	<b>Product technical catalogues for proposed item</b> <i>(if available)</i> प्रस्तावित मद के लिए उत्पाद तकनीकी कैटलॉग (यदि उपलब्ध हो)	<i>Details attached at Annexure – F2.17</i> विवरण अनुलग्नक - F2.1 7 में संलग्न है

<b>Name:</b>		<b>Desig:</b>		<b>Sign:</b>		<b>Date:</b>	
<b>नाम:</b>		<b>पद:</b>		<b>हस्ताक्षर:</b>		<b>तिथि:</b>	

**Company's Seal/Stamp:- कंपनी की मुहर/ मोहर:-**